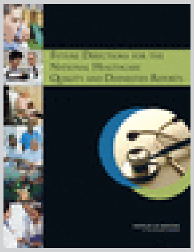

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FUTURE DIRECTIONS FOR THE NATIONAL HEALTHCARE QUALITY AND DISPARITIES REPORTS

Committee on Future Directions for the National Healthcare Quality and Disparities Reports

Board on Health Care Services

Cheryl Ulmer, Michelle Bruno, and Sheila Burke, *Editors*

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"Knowing is not enough; we must apply.
Willing is not enough; we must do."
—Goethe

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[1] Served through November 9, 2009.

Reviewers

This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the National Research Council's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following individuals for their review of this report:

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Although the reviewers listed above provided many constructive comments and suggestions, they were not asked to endorse the conclusions or recommendations nor did they see the final draft of the report before its release.

The review of this report was overseen by **NEAL A. VANSELOW,** IOM member, and **CASWELL A. EVANS, JR.,** University of Illinois at Chicago. Appointed by the National Research Council and Institute of Medicine, they were responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring committee and the institution.

Foreword

Ten years after the publication of the Institute of Medicine's landmark *Quality Chasm* series of reports, we often do not know to what extent quality of care has improved. A range of studies and reports indicate that the quality of health care received in our nation is less than optimal, but we continue to lack sufficient information to determine how well new programs, changes in processes, and other interventions improve the quality and equity of care.

The National Healthcare Quality and Disparities Reports play a fundamental role in examining quality improvement and disparities reduction. In this report, prepared at the request of the Agency for Healthcare Research and Quality, the Institute of Medicine suggests ways to reformulate and enhance our nation's essential measures of quality and equity, to facilitate informed decision-making, and to help set the strategic direction of the nation's quality improvement enterprise.

I am grateful for the support of our sponsor and to the committee, ably led by Sheila Burke, which grabbled with complex issues involving the selection and prioritization of different measures, the needs of users, and advances in the field of quality measurement. Their work was reinforced by staff working under the direction of Cheryl Ulmer and including Michelle Bruno, Bernadette McFadden, and Cassandra Cacace. I commend both committee and staff for this product and believe it provides a sound basis for strengthening the National Healthcare Quality and Disparities Reports.

Harvey V. Fineberg, M.D., Ph.D.
President, Institute of Medicine
April 2010

Preface

In 1998, the President's Advisory Commission on Consumer Protection and Quality of Care in the Health Care Industry called for a national commitment to improving quality and reducing disparities at every level of the health care system. To reinforce this commitment, annual reports to Congress from the Agency for Healthcare Research and Quality (AHRQ) were initiated to document national trends, identify gaps in care, and paint a picture of the state of health care quality and disparities. These reports—the National Healthcare Quality Report (NHQR) and the National Healthcare Disparities Report (NHDR)—are consulted by health services researchers, state health officials, organizations implementing quality improvement and disparity elimination programs, advocates for specific health conditions or priority populations, and other stakeholders. Five years after the reports were first published, AHRQ turned to the Institute of Medicine (IOM) to evaluate the current NHQR and NHDR and to present a vision for their future content and presentation.

Our IOM committee felt it essential to think about how the reports' content and presentation could best foster action by various audiences to close health care quality gaps, particularly in measurement areas that represent the greatest opportunities for creating a high-quality, high-value, equitable health care system. It is through a lens of actionability and better matching of products to audience needs that the committee evaluated the current reports and made its recommendations. Embedded in the pages of this report are discussions of the ways to transform future iterations of the NHQR and NHDR. AHRQ could:

- track national priorities for quality improvement and high impact measurement areas to inform collective action across federal and other public and private sector health care delivery programs;
- conceptually and operationally link quality improvement and disparities elimination in the NHQR and NHDR;
- highlight quality achievement by presenting best-in-class benchmarks;
- move from only presenting historical trend data to also extrapolating rates of change to indicate when gaps might be closed at the existing pace;
- present an assessment of the effect on population health of bridging quality and equity gaps;
- analyze and present data in meaningful ways that identifies for Congress, states, and others the results of and prospects for evidence-based policies and interventions; and
- support broader and sustained dissemination of report content.

We hope this report will be of help to AHRQ in promoting progress toward achieving optimal health care for the American people.

As chair of this committee, I would like to thank my fellow committee members for giving their time and expertise so generously toward the completion of this report. Their spirited deliberations and contributions are greatly appreciated. On behalf of the committee, I would also like to thank the staff of the Board on Health Care Services who ably supported the committee in its endeavor. In particular, Cheryl Ulmer, study director, should be thanked for steering the committee throughout the process.

Sheila Burke, *Chair*
Committee on Future Directions
for the National Healthcare
Quality and Disparities Reports

Acknowledgments

The committee and staff are grateful to many individuals and organizations who contributed to this study. The committee would like to thank the Institute of Medicine Subcommittee on Standardized Collection of Race/Ethnicity Data for Healthcare Quality Improvement. The subcommittee members[1] were:

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Funding for this study was provided by the Agency for Healthcare Research and Quality (AHRQ). The committee appreciates AHRQ's support for this project and wishes to especially thank Carolyn Clancy, Ernest Moy, Jeff Brady, Farah Englert, Karen Ho, and Allan Lazar for sharing their expertise about the development and dissemination of the NHQR and NHDR.

In addition, the committee benefited from the testimony of the following individuals before the committee and subcommittee during public workshops: Karen Adams (National Quality Forum), Donald Berwick (Institute for Healthcare Improvement), Andrew Bindman (University of California, San Francisco, and CA Medicaid Research Institute), Kathryn L. Coltin (Harvard Pilgrim Health Care), Brenda Edwards (Division of Cancer Control & Population Sciences, National Cancer Institute), Marc Elliott (RAND Corporation), Irene Fraser (Agency for

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[1] Committee members Ignatius Bau, David Nerenz, and Paul Schyve were also members of the subcommittee.

Healthcare Research and Quality), Allen Fremont (RAND Corporation), Ron Hays (Division of General Internal Medicine and Health Services Research, UCLA), Karen Humes (U.S. Census Bureau), Deeana Jang (Asian & Pacific Islander American Health Forum, speaking on behalf of Out of Many, One's Health Data Taskforce), Marjorie Kagawa-Singer (UCLA School of Public Health), Karen Kmetik (American Medical Association and The Physician Consortium for Performance Improvement), David Lansky (Pacific Business Group on Health), Nicole Lurie (RAND Corporation, Center for Population Health and Health Disparities), Jennifer Madans (National Center for Health Statistics), Paul McGann (Office of Clinical Standards and Quality, Centers for Medicare and Medicaid Services), Marsha Regenstein (The George Washington University), Thomas Reilly (Office of Research, Development and Information, Centers for Medicare and Medicaid Services), Michael Rodriguez (Department of Family Medicine, David Geffen School of Medicine, UCLA), Patrick Romano (Divisions of General Medicine and General Pediatrics, Center for Healthcare Policy and Research, University of California, Davis), Joachim Roski (Engelberg Center for Health Care Reform, The Brookings Institution), Maribeth Shannon (Market and Policy Monitor Program, California HealthCare Foundation), Gayle Tang (National Diversity, Kaiser Permanente), Kalahn Taylor-Clark (Engelberg Center for Healthcare Reform, The Brookings Institution), Grace Ting (Health Equities Programs, Wellpoint, Inc.), Katherine K. Wallman (U.S. Office of Management and Budget), Thomas Williams (Integrated Healthcare Association), and Mara Youdelman (National Health Law Program).

Others also provided valuable advice on the issues under study; these include Kirsten Anderson (Aetna), Douglas Boenning (U.S. Department of Health and Human Services), Arleen F. Brown (UCLA Division of General Internal Medicine), Helen Burstin (National Quality Forum), Pat Callaghan (Minnesota Department of Human Services), Eric Coleman (University of Colorado, Denver), Janet Corrigan (National Quality Forum), William Golden (Arkansas Medicaid, Department of Human Services), Sheldon Greenfield (University of California, Irvine), William E. Hammond (Duke University), W. David Helms (AcademyHealth), Catherine Hess (National Academy for State Health Policy), Bill Imada (IW Group, Inc.), George Isham (HealthPartners), Francine Jetton (Society of General Internal Medicine), Sherrie Kaplan (University of California, Irvine), Paul Kaye (Hudson River Health Care, Inc.), Alison Kirchgasser (Massachusetts Office of Medicine), Ann Kohler (National Association of State Medicaid Directors), Chris Lee (Kaiser Family Foundation), Lisa Lee (Kentucky Children's Health Insurance Program), Dave Michalik (Delaware Division of Medicaid and Medical Assistance), Jeannette Noltenius (Out of Many, One), Nancy A. Rigotti (Massachusetts General Hospital), J. James Rohack (American Medical Association), Barbara Rudolph (The Leapfrog Group), Adam Schickedanz (University of California, San Francisco, and National Academy of Sciences Mirzayan Science and Technology Fellow through May 2009), Cathy Schoen (The Commonwealth Fund), Susan Schow (Maine Health Data Organization), Sora Park Tanjasiri (Center for Cancer Disparities Research), Caroline Taplin (U.S. Department of Health and Human Services), Alan Weil (National Academy for State Health Policy), and Judy Womack (Quality Oversight Bureau of TennCare).

In addition, we would like to thank Suzanne Niemeyer and Chris Shreeve (Ketchum), Jeanette Chung and David Meltzer (University of Chicago), and Howard Wainer (National Board of Medical Examiners) who acted as consultants during the project and drafted additional materials for the report.

Lastly, many individuals within the IOM were helpful throughout the study process including Clyde Behney, Patrick Burke, Rosemary Chalk, Janice Mehler, Abbey Meltzer, Christine Stencel, Vilija Teel, Jackie Turner, and Jordan Wyndelts. We would also like to thank Kerry Kemp for assisting in copyediting this report.

Contents

APPENDIXES

Figures, Tables, and Boxes

Summary

Figure

Table

Boxes

Chapter 1

Figures

Table

Box

Chapter 2

Table

Boxes

Chapter 3

Figures

Boxes

Chapter 4

Figures

Tables

Boxes

Chapter 5

Figures

Tables

Boxes

Chapter 6

Figures

Tables

Boxes

Chapter 7

Figure

Summary

As the United States continues to devote extensive resources toward achieving a high-value, high-quality health care system, the capacity to evaluate the state of care is increasingly important. Since 2003, the annual publication of the National Healthcare Quality Report (NHQR) and National Healthcare Disparities Report (NHDR) by the Agency for Healthcare Research and Quality (AHRQ) has played an important role in documenting trend data on the state of health care quality and disparities. The general message from the most recent reports is that while some areas have improved, the overall quality of health care in the United States is suboptimal. Across all of the process of care measures tracked in the NHQR, persons received the recommended care less than 60 percent of the time.[1] Furthermore, even when quality has improved on a measure tracked in the NHQR, disparities in care often persist across socioeconomic groups, racial and ethnic groups, and geographic areas (AHRQ, 2009a,b).

AHRQ asked the Institute of Medicine (IOM) to review past NHQRs and NHDRs and provide a vision so that the reports can contribute to advancing the quality of health care for all persons in the United States. The IOM formed the Committee on Future Directions for the National Healthcare Quality and Disparities Reports to address this task. Through its research and deliberations, the Future Directions committee concluded that while the reports alone will not improve the quality of health care, they can make a compelling case for closing the gap between current performance levels and recommended standards of care. The committee recommends that AHRQ:

- Align the content of the reports with nationally recognized priority areas for quality improvement to help drive national action.
- Select measures that reflect health care attributes or processes that are deemed to have the greatest impact on population health.
- Affirm through the contents of the reports that achieving equity is an essential part of quality improvement.
- Increase the reach and usefulness of AHRQ's family of report-related products.
- Revamp the presentation of the reports to tell a more complete quality improvement story.
- Analyze and present data in ways that inform policy and promote best-in-class achievement for all actors.
- Identify measure and data needs to set a research and data collection agenda.

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[1] Personal communication, Ernest Moy, Agency for Healthcare Research and Quality, August 10, 2009.

The Future Directions committee makes these recommendations with the aim of helping AHRQ to focus its national reporting endeavor on the central aspirations of quality improvement—improving health, value, and equity—by directing attention to the closure of performance gaps in health care areas likely to have the greatest population health impact, be most cost effective, and have a meaningful effect on eliminating disparities.

ESTABLISHING NATIONAL PRIORITY AREAS

As part of its charge, the Future Directions committee was to establish priority areas in health care quality and disparities. The committee evaluated priorities previously put forth by numerous organizations, such as those included in an earlier IOM report *Priority Areas for National Action: Transforming Health Care Quality* (IOM, 2003).

Box S-1 contains the list of priority areas recommended by the Future Directions committee; the list includes six priority areas identified by the National Priorities Partnership (NPP) (NPP, 2008)[2] plus two additional areas that the committee believes are essential: access to health care and health systems infrastructure. These eight priority areas should help guide the selection of measures to be featured in the national healthcare reports.

> **Recommendation 1: AHRQ should ensure that both the NHQR and NHDR report on the progress made on the priority areas for health care quality improvement and disparities elimination, and should align selection of measures with priority areas. Until a national set of priority areas is established, AHRQ should be guided by the Future Directions committee's recommended priority areas.**

A variety of stakeholders and legislative initiatives have called for a national strategy for quality improvement and disparities reduction. Common priority areas and goals can help drive concerted national and local action toward the same ends. National priority areas, and goals within those priority areas, have implications for resource allocation across the U.S. Department of Health and Human Services (HHS) and externally, and therefore cannot be set by AHRQ alone.

The IOM report *Leadership by Example: Coordinating Government Roles in Improving Health Care Quality* stressed that if the federal government could take collective action across programs for which it has accountability, it would lead the way to action elsewhere (IOM, 2002a). The HHS Secretary is positioned to direct HHS programs to focus on the achievement of national priorities and goals through policies that support a stronger quality improvement infrastructure (e.g., measure development, the collection and analysis of evidence-based performance information), health policy interventions (e.g., changes in insurance coverage, support of prevention and care coordination services), public reporting, incentive payments, demonstration projects, benefit design, health professions education, or other avenues, such as refining performance measures through research and funding data sources.

The Future Directions committee wants to underscore the importance of such a broader commitment to national priority areas and the need for this direction to come from the Secretary of HHS. The committee, however, refrains from offering a specific recommendation to the Secretary about national priority areas because its charge was limited to advising AHRQ. Health care reform legislation passed in March 2010 has a requirement and process for establishing national quality improvement priorities.[3] AHRQ can use the priority areas offered in this report to guide the selection of measures and the content of the NHQR and NHDR until a national strategy is formulated that replaces them.

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[2] The National Priorities Partnership (NPP) includes 32 public and private organizations including AHRQ, the Centers for Medicare and Medicaid Services (CMS), the IOM, the Robert Wood Johnson Foundation's Aligning Forces for Quality, The Leapfrog Group, and The Joint Commission.

[3] *Patient Protection and Affordable Care Act*, Public Law 111-148 § 3011, 111th Cong., 2d sess. (March 23, 2010).

BOX S-1
The Committee's Eight Recommended National Priority Areas for Health Care Quality Improvement

The IOM Committee on Future Directions for the National Healthcare Quality and Disparities Reports recommends a set of eight national priority areas for health care quality improvement for use in the NHQR and NHDR; it believes these priorities can guide the national healthcare reports. The recommended areas include six priority areas identified by the National Priorities Partnership (NPP, 2008), as well as two additional priorities that the committee believes are important to highlight.

The six NPP priority areas included in the committee's set of national priority areas are:

1. **Patient and family engagement:** Engage patients and their families in managing their health and making decisions about their care.
2. **Population health:** Improve the health of the population.
3. **Safety:** Improve the safety and reliability of the U.S. health care system.
4. **Care coordination:** Ensure patients receive well-coordinated care within and across all health care organizations, settings, and levels of care.
5. **Palliative care:** Guarantee appropriate and compassionate care for patients with life-limiting illnesses.
6. **Overuse:** Eliminate overuse while ensuring the delivery of appropriate care.

The two additional priority areas in the committee's set are:

7. **Access:** Ensure that care is accessible and affordable for all segments of the U.S. population.
8. **Health systems infrastructure capabilities:** Improve the foundation of health care systems (including infrastructure for data and quality improvement; communication across settings for coordination of care; and workforce capacity and distribution among other elements) to support high-quality care.

UPDATING THE CONCEPTUAL FRAMEWORK FOR THE REPORTS

AHRQ has designed the NHQR and NHDR around a conceptual framework of quality recommended in earlier IOM reports (IOM, 2001, 2002b). The Future Directions committee presents an updated framework as shown in Figure S-1. The components of quality care now explicitly include access and efficiency as areas to present in both reports. Care coordination and capabilities of health care systems infrastructure were also added and are displayed as foundational components; progress on these elements can contribute to each of the other components across all types of care.

The components of quality care in the revised framework can continue to be used as a way to categorize measures by topic and to organize the chapters of the NHQR and NHDR. Furthermore, the framework incorporates the crosscutting dimensions of value and equity, and reporting on each measure should include, whenever data permit, the potential contribution to both value and equity of closing the gap between current and desired performance levels.

> **Recommendation 2: AHRQ should adopt the committee's updated framework for quality reporting to reflect key measurement areas for health care performance and use it to ensure balance among the eight components of quality care in AHRQ's overall measure portfolio. AHRQ should further use its crosscutting dimensions of equity and value to rank measures for inclusion in the reports.**

Priority areas (Box S-1) are not expected to change annually; they should be in place for a number of years so that actions can be directed toward them and progress monitored. Over time, however, priorities may change, while the classification framework (Figure S-1) is expected to be more enduring.

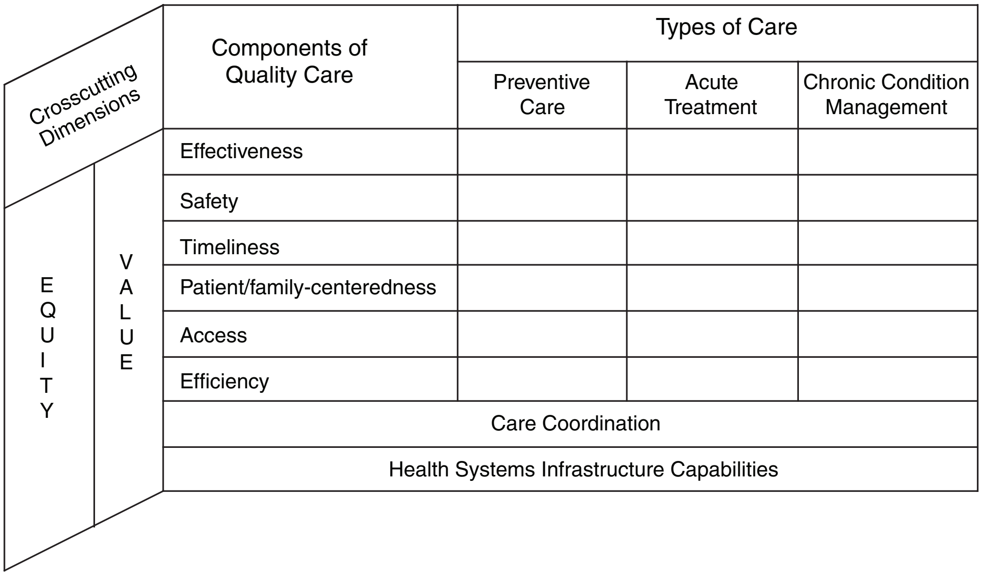

FIGURE S-1 An updated conceptual framework for categorizing health care quality and disparities measurement.

ADOPTING A TRANSPARENT AND QUANTITATIVE MEASURE SELECTION PROCESS

The question has arisen as to whether the measures AHRQ currently monitors in the national healthcare reports reflect attributes and processes with the greatest potential to improve the health of the country. AHRQ has indicated that it has reached capacity for the number of measures it can monitor given the agency's current resources for data collection, analysis, and presentation. Adding or removing measures from the established set is challenging for AHRQ because there are advocates for each of the current NHQR and NHDR measures.

The Future Directions committee recommends a new measure selection approach. Determining relevance to priority areas, categorization into framework components, and ranking are sequential steps in ascertaining which measures should be selected for reporting. Candidate measures within each component of quality in the framework are assessed for their relative contribution to improving value (i.e., population health) and equity, and ranked according to that potential. Measures with higher potential would be chosen for tracking in the NHQR and NHDR.

AHRQ's measure selection process should have external input based on objective and quantitative methods and should be transparent. The Future Directions committee recommends establishing a Technical Advisory Subcommittee for Measure Selection to the AHRQ National Advisory Council for Healthcare Research and Quality (NAC). This body would apply quantitative techniques to establish the value of closing the quality gap (such as clinically preventable burden, cost-effectiveness analysis, and net health benefit) and to discern the degree of disparities.

The committee's proposed measure selection process is intended to guide AHRQ in selecting, ranking for inclusion in reports or other products, and retiring measures. The process also accounts for systematic identification of areas requiring further measurement research or data development.

> **Recommendation 3: AHRQ should appoint a Technical Advisory Subcommittee for Measure Selection to the National Advisory Council for Healthcare Research and Quality (NAC). The technical advisory subcommittee should conduct its evaluation of measure selection, prioritization, inclusion, and retirement through a transparent process that incorporates stakeholder input and provides public documentation of decision-making. This subcommittee should:**
>
> - **Identify health care quality measures for the NHQR and NHDR that reflect and will help measure progress in the national priority areas for improving the quality of health care and**

eliminating disparities while providing balance across the IOM Future Directions committee's revised health care quality framework.
- **Prioritize existing and future health care quality measures based on their potential to improve value and equity.**
- **Recommend the retirement of health care quality measures from the NHQR and NHDR for reasons including but not limited to the evolution of national priorities, new evidence on the quality of the measure, or the attainment of national goals.**
- **Recommend a health care quality measure and data source development strategy for national reporting based on potential high-impact areas for inclusion in AHRQ's national quality research agenda.**

Box S-2 summarizes the roles of the Technical Advisory Subcommittee and the NAC.

ENHANCING HEALTH CARE DATA RESOURCES

As the nation enhances health information technology (HIT) and its health care data infrastructure, AHRQ should leverage its position as producer of the NHQR and NHDR to identify measurement and data needs and promote promising measures for which national data may not yet be available. Data emerging from electronic health records, health information exchanges, national registries, and provider- and community-based initiatives have the potential to complement or replace some of the data sources currently used in the NHQR and NHDR, and AHRQ will need financial support to take advantage of these data opportunities.

Subnational data (e.g., state-level or voluntary disease registry data) can complement AHRQ's current sources when national data do not provide information about important performance measurement questions. For instance, subnational data that meet specified criteria for appropriateness could be featured as illustrative textboxes or sidebars; they would be denoted as not being nationally representative, but rather, as helping inform national dialogue.

BOX S-2
Proposed Roles in Selecting Measures and Developing a Research Agenda

AHRQ's National Advisory Council for Healthcare Research and Quality (NAC) [existing entity]
- provides guidance to AHRQ on priorities for a national health services research agenda across all of AHRQ's portfolio of activities [current role];
- provides, through existing informal subcommittee, general guidance on the NHQR and NHDR and associated products [current role and could continue as a separate subcommittee or be subsumed by the Technical Advisory Subcommittee]; and
- comments on the recommendations of the Technical Advisory Subcommittee for Measure Selection and considers measurement and data needs agenda for inclusion in AHRQ's research portfolio [new role].

NAC Technical Advisory Subcommittee for Measure Selection [new entity]
Provides guidance to AHRQ and the NAC by:
- soliciting suggestions for measure selection and exclusion from external stakeholders;
- reviewing measures for use as core measures in the NHQR and NHDR and for supplementary measures for State Snapshots and other online data resources;
- recommending a prioritized measurement list by considering national priority areas, impact on value and equity, and utilization of techniques to quantify the impact of closing the quality gap;
- identifying aspirational measurement areas and data needs and a strategy for development (including a research agenda); and
- identifying measures for retirement based on continued contribution to quality advancement and needs of stakeholder groups.

Recommendation 4: AHRQ should use subnational data for domains that do not yet have national data in order to illustrate the types of national data that need to be developed to satisfy measurement and data gaps. Subnational data should meet the following minimum requirements for reporting:

- **The data source allows the calculation of a measure of interest, ideally one identified as a national priority.**
- **The data source uses reliable and well-validated data collection mechanisms and tested measures.**
- **The sample used in the data source is representative of the population intended to be reported on (e.g., a region, state, population group) or is drawn from the entire population group even if it is not necessarily generalizable to the nation.**

Fundamental to addressing disparities in care is the need to expand the availability of descriptive data for populations at risk for poor quality care. An independent consensus study conducted by a subcommittee to the Future Directions committee culminated in the report *Race, Ethnicity, and Language Data: Standardization for Health Care Quality Improvement*, which was released in August 2009 (IOM, 2009).[4] That report highlighted the need to increase the standardized collection and use of race, ethnicity (including granular ethnicity), and language need data across all sources of quality improvement data, and the Future Directions committee concurs with that report's recommendations (see Appendix G).

The NHQR and NHDR would benefit from further analyses and presentation of quality data as a function of race, ethnicity, and language need, as well as of socioeconomic and insurance status. Socioeconomic status (SES), for instance, may be an intervening variable between race, ethnicity, and disparities. Therefore, examining the relationships between race/ethnicity and quality, both with and without SES included, would provide important information. The 2008 IOM report *State of the USA Health Indicators* recommended that data be first presented by race, ethnicity, and SES, and then by race and ethnicity stratified by SES (IOM, 2008). This committee agrees with that recommendation and finds it important for AHRQ to stratify race and ethnicity by SES and, when able, control for SES via multivariate regression. Presenting this detail in graphic form for each measure could become unwieldy in the context of the print reports, so the committee suggests that AHRQ present data when they reveal disparities or note that the analyses were performed and did not reveal a disparity, particularly after taking SES into account.

Recommendation 5: AHRQ should:

- **Continue to stratify all quality measures in the NHDR by at least the OMB race and Hispanic ethnicity categories, by socioeconomic status variables (e.g., income, education), and by insurance status.**
- **Strive toward stratifying measures by language need (i.e., English language proficiency and preferred spoken language for health care-related encounters), and extend its analyses in the NHDR and derivative products to include quality measures stratified by more granular ethnicity groups within the OMB categories whenever the data are available.**
- **Document shortcomings in the availability of OMB-level race and Hispanic ethnicity data, granular ethnicity data, language need, and socioeconomic and insurance status data to support these analyses; work to enhance the collection of these data in future iterations of the source datasets; and whenever necessary, should utilize alternative valid and reliable data sources to provide needed information even if it is not available nationally.**

IMPROVING PRESENTATION AND DISSEMINATION

Clearly conveying information about the gaps that exist in the quality of U.S. health care and the benefits of closing those gaps would provide audiences for the NHQR and NHDR with a stronger rationale for improving

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[4] The full text of this report is available online: http://www.nap.edu/catalog.php?record_id=12696.

specific elements of care. The Future Directions committee underscores the importance of integrating disparities elimination into quality improvement activities by enhancing the structural relationship between the two national healthcare reports (i.e., a shared Highlights section for both reports, health care access and equity information in the NHQR, and health care quality benchmarks in the NHDR). Therefore, the committee recommends:

Recommendation 6: AHRQ should ensure that the content and presentation of its national healthcare reports and related products (print and online) become more actionable, advance recognition of equity as a quality of care issue, and more closely match the needs of users by:

- **incorporating priority areas, goals, benchmarks, and links to promising practices;**
- **redesigning print and online versions of the NHQR and NHDR to be more integrated by recognizing disparities in the NHQR and quality benchmarks in the NHDR;**
- **taking advantage of online capability to build customized fact sheets and mini-reports; and**
- **enhancing access to the data sources for the reports.**

The audiences for the NHQR and NHDR include a range of stakeholders with specific areas of interest (e.g., heart disease, rural health, racial disparities, delivery settings), as well as varying degrees of sophistication in data analysis. To better meet the needs of these diverse audiences, the committee suggests that AHRQ refine and expand its product line (Table S-1) and focus the NHQR and NHDR on a national quality improvement strategy. Additionally, the committee encourages enhanced Web-based data capabilities so that users can customize reports to their own topical needs and access primary data for analyses.

The story AHRQ relays in the national healthcare reports should engage readers and encourage, guide, or support action by them. For that reason, the committee believes that AHRQ should modify the reports from their current chartbook format to make them less a catalog of data and instead a more forward-looking and action-oriented document that tells a quality improvement story. Such a document would include: (1) takeaway messages that address the performance gap (i.e., time to close gap at current rate of change, the net benefit for health of closing the gap), (2) benchmarks to demonstrate high levels of attained performance and to inform realistic targets for goals, (3) data analyzed and presented in ways that can inform specific actors or policies (e.g., data by payer type, by insurance status, by program type), (4) illustrative examples of promising practices and islands of excellence, and (5) identified data and measurement needs required to strengthen the quality improvement infrastructure.

The committee believes that the NHQR and NHDR should both remain annual publications to maintain visibility of the issues they cover. However, the reports could emphasize different priority areas or components of quality from year to year to allow for more in-depth coverage.

By incorporating demonstrably attained but challenging benchmarks based on best-in-class performance, the NHQR, the NHDR, and the State Snapshots can help serve as catalysts for improvement. Defining a benchmark, though, can depend on the data source and unit of analysis in the research question being asked. Some measures may be suited to analyzing data only by one type of unit such as states, health plans, or hospitals, while others may be by more than one type of unit (such as by both state and hospital). Because providing multiple benchmarks may add too much visual clutter in graphic displays, some achievement levels could be presented in sidebars. Presenting benchmarks set by best state performance may particularly satisfy the needs of Congressional and state policy makers, principal audiences to which the reports are geared.

For comparative purposes, the committee suggests presenting a uniform quality benchmark across the NHQR and NHDR. For each measure, the performance benchmark in the NHQR should also be available in the NHDR to inform how each population group relates to the benchmark as well as continuing to show the differences among population groups.

Recommendation 7: To the extent that the data are available, the reporting of each measure in the NHQR and NHDR measure set should include routinely updated benchmarks that represent the best known level of performance that has been attained.

TABLE S-1 Tailoring Products to Meet the Needs of Multiple Audiences

Product	Potential Audiences	Recommended Content
Shared "Highlights" Section [redefined product to be used in both the NHQR and NHDR and that can be disseminated as a stand-alone product]	Policy makers, media, public, foundations and other funders of research, national quality organizations	Features progress on the national priorities areas and measurement areas with the greatest potential for quality improvement impact on population health, value, and equity; evidence-based policies/best practices that will enhance or hinder progress; actions that stakeholder groups can take; and what is needed to make progress toward national goals. Includes a summary of progress by states. Includes summary on state of disparities.
NHQR [refinement of existing product]	Quality, advocacy, and standards setting organizations; health care providers, plans, payers, and purchasers at the national and state level; research community	Information on a set of measures organized by the expanded quality framework to address: effectiveness, safety, timeliness, patient-centeredness, access, efficiency, care coordination, and capabilities of health systems infrastructure. Includes access, a topic previously addressed only in the NHDR. Details that disparities exist (beyond the current displays on geographic variation or age) by including a separate chapter or summary on socioeconomic, racial, and ethnic disparities; and acknowledges in messages when socioeconomic and racial disparities exist for individual measures.
NHDR [refinement of existing product]	Quality, advocacy, and standards setting organizations; health care providers, plans, payers, and purchasers at the national and state level; research community	Maintains parallelism with the NHQR by applying the expanded quality framework to its organization and presentation of measures. Includes benchmarks, not just comparisons among populations. Provides more in-depth coverage of priority populations.
Fact Sheets and Mini-Reports [expanded products]	Advocacy groups, strategic partners for dissemination, media, public	Includes short story of key facts and potential actions related to certain disease-specific or priority population topics in the NHQR and NHDR.
State Snapshots [refinement of existing product]	State government; health care providers, plans, payers, and purchasers at the state and local level	Provides expanded measure set sortable by core measures, Healthcare Effectiveness Data and Information Set (HEDIS) measures, state rankings, and comparisons between states with similar population characteristics, not simply in neighboring geographic regions. Adds to context by including best performance attained (for all states and for peers), variation within state (e.g., by geography, providers, payers, race/ethnicity/language, and the availability and type of insurance). Includes access measures.
Online Data Access [expansion of existing approaches] • Customizing reports via the NHQRDRnet • Data repository of primary datasets	Advocacy groups; stakeholders in quality improvement, media, and public Researchers (for access to primary data for additional national-, state-, and local-level analyses)	Has capability to collect text and data by topic to yield a customized report. Links to other helpful data sources and intervention information. Provides access to full datasets for user manipulation, and links to other sites that provide expanded metrics on health care data (e.g., CMS), and more local and organizational-level data. Has tools to show users how to mirror AHRQ's analytic approaches.
Guide to Using the NHQR and NHDR [new product]	All potential user audiences, but particularly researchers	Explains how to access and utilize available data. Gives examples of how different stakeholder groups can apply the knowledge to action.

Because the success of the national healthcare reports relies so heavily on presentation and dissemination, the committee recommends engaging external experts to further assist in conceptualizing the reports' presentation techniques and raising their profile among current and potential user audiences.

> **Recommendation 8: AHRQ should engage experts in communications and in presentation of statistical and graphical information to ensure that more actionable messages are clearly communicated to intended audiences, summarization methods and the use of graphics are meaningful and easily understood, and statistical methods are available for researchers using data.**

IMPLEMENTING RECOMMENDED CHANGES

Implementing many of the Future Directions committee's recommendations will require additional federal funding, although it is expected that numerous upgrades can be made to the NHQR, NHDR, and State Snapshots with existing funds. While the committee is fully cognizant of federal budgetary constraints, it is also aware of growing stakeholder demand for value and equity in the face of substantial expenditures for health care (an estimated $2.3 trillion in 2009) (CMS, 2010; Cutler, 2009). The redesigned NHQR and NHDR would specifically focus on the factors of value and equity, and the closure of gaps in quality in high impact areas. Additional funds would be required to: (1) support the measure prioritization process, (2) strengthen performance metrics, (3) obtain the necessary data for new measurement areas from sources both within and external to HHS, (4) produce the re-envisioned national healthcare reports and related products and disseminate them effectively to engage national and state policy makers and other actors, and (5) sponsor a rigorous evaluation.

> **Recommendation 9: To the extent that existing resources cannot be reallocated, or AHRQ cannot leverage its resources by partnering with other stakeholders and HHS agencies, AHRQ should work to obtain additional funds to support the work of the Technical Advisory Subcommittee for Measure Selection, the upgrades and additions to AHRQ's national healthcare report-related products, and the development of new measures and supporting data sources.**

In Chapter 7, the committee presents a suggested timeline of steps for implementation of activities related to the committee's recommendations, and in Appendix I, the committee presents one possible funding scenario.

The ultimate purpose of the NHQR and NHDR is to produce relevant information for policy makers, the public, and individuals and entities responsible for implementing quality interventions. AHRQ will therefore need to evaluate the NHQR and NHDR and related products, their use, and their impact as a basis for understanding how they might most efficiently and effectively contribute to improving national health care quality and eliminating disparities.

> **Recommendation 10: AHRQ should regularly conduct an evaluation of its products to determine if they are meeting the needs of its target audiences and to assess the degree to which the information in the AHRQ products is leveraged to spur action on quality improvement and the elimination of disparities.**

Underlying all of the committee's recommendations is a consensus that the NHQR and NHDR should promote action to improve the quality of U.S. health care, not just create awareness of historical trends in the quality of care. The NHQR and NHDR can and should be tools to catalyze and leverage public and private efforts to improve health care quality and promote equity. The reports are natural vehicles for transmitting a strategic vision for health care quality improvement and tracking the effect of health reform legislation. No report alone will make change, but a common effort to close quality and disparities gaps will help us accomplish the vision of better health care and health for the country.

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1

Introduction

Our nation devotes extensive resources to health care and expects high-quality, high-value care for its investment. Three influential Institute of Medicine (IOM) studies—*To Err Is Human: Building a Safer Health System* (IOM, 2000), *Crossing the Quality Chasm: A New Health System for the 21st Century* (IOM, 2001a), and *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care* (IOM, 2003b)—provide evidence-based narratives for the necessity of addressing quality and eliminating disparities in health care in the United States. Evidence continues to mount confirming widespread variation in the quality of care by geographic area, by health care delivery site, and by population (AHRQ, 2009a,b; Fisher et al., 2009; HHS, 2009c).

An oft-cited maxim in quality improvement is that "efforts to improve quality require efforts to measure it" (Casalino, 2000, p. 520). One such effort is the annual publication of the National Healthcare Quality Report (NHQR) and the National Healthcare Disparities Report (NHDR) by the Agency for Healthcare Research and Quality (AHRQ), of the U.S. Department of Health and Human Services (HHS). These congressionally mandated reports track U.S. trends in health care performance, identify gaps in quality, and assess the degree of disparities in care.[1] Although the authorizing legislation indicates that the primary audience for the NHQR and NHDR is the U.S. Congress, over time, the NHQR, NHDR, and their associated products have grown in scope and have come to be read by a broader audience than the originally intended one of legislative policy makers. AHRQ has asked the IOM to review these reports and provide a vision for their future direction that will enhance their role not only in documenting but also in advancing the state of health care quality and promoting equity.

STUDY CHARGE AND APPROACH

Soon after the U.S. Congress passed the Healthcare Research and Quality Act of 1999,[2] which required the annual production of both reports, AHRQ contracted with the IOM to develop a vision for the NHQR and NHDR and to establish the reports' content and presentation. That request led to the publication of two IOM consensus reports: *Envisioning the National Healthcare Quality Report* (IOM, 2001b) and *Guidance for the National Healthcare Disparities Report* (IOM, 2002a). A summary of the IOM's previous recommendations for the national healthcare reports is presented in Appendix A.

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[1] The 2008 NHQR and NHDR, as well as links to previous and subsequent editions of these reports, are available on AHRQ's website: http://www.ahrq.gov/qual/qrdr08.htm.

[2] *Healthcare Research and Quality Act of 1999*, Public Law 106-129 § 902(g) and § 913(b)(2), 106th Cong., 1st sess. (November 19, 1999).

AHRQ has published the NHQR and NHDR since 2003. In late 2008, after five years of producing both reports and in recognition of the changing landscape of health care delivery and quality measurement, AHRQ returned to the IOM to seek additional external guidance on the next generation of reports. In response to AHRQ's request, the IOM Committee on Future Directions for the National Healthcare Quality and Disparities Reports was formed to revisit previous IOM guidance pertaining to the NHQR and NHDR, examine the evolution of these reports and their related products, provide an updated assessment of how these reports and their related products can best fulfill their purpose, and establish priority areas in health care quality and disparities. The committee's statement of task is presented in Box 1-1.

NATIONAL REPORTING ON THE STATE OF QUALITY AND DISPARITIES

The NHQR and NHDR monitor the *health care performance* of the nation rather than the *health* of the nation. The ultimate goal of health care is to improve an individual's health (physical or mental well-being). Two HHS publications that complement AHRQ's national healthcare reports by focusing more directly on the health status of Americans are: *Health, United States* (HHS, 2009b), which is an annual chartbook of U.S. health statistics, and *Healthy People 2010* and *Healthy People 2020*, which present U.S. health and health care indicators with targets set for achievement by 2010 and 2020, respectively (HHS, 2000, 2009a).

Overview of Progress

AHRQ's national healthcare reports have helped raise awareness of the state of the nation's health care and identify where gaps in quality and equitable care exist across different types of care (i.e., preventive care, acute treatment, chronic condition management), care for specific conditions (e.g., diabetes, heart disease), in specific health care settings (e.g., hospital, long-term care, ambulatory), and for specific population groups (e.g., race,

BOX 1-1
Statement of Task for the IOM Committee on Future Directions for the National Healthcare Quality and Disparities Reports

The Institute of Medicine (IOM) will form a consensus committee to review and synthesize current evidence to establish priority areas in health care quality and disparities for a combined update of the 2001 IOM report *Envisioning the National Healthcare Quality Report* and the 2002 IOM report *Guidance for the National Healthcare Disparities Report*. Previous recommendations regarding questions and objectives to be addressed relevant to quality of care and disparities will be evaluated and updated and new ones considered. The update's final findings and recommendations will address important questions evaluating quality and disparities in health care and will result in insight and guidance to the Agency for Healthcare Research and Quality (AHRQ) on ways of improving the National Healthcare Quality Report (NHQR) and National Healthcare Disparities Report (NHDR). The committee will take note of recommendations that are estimated to be a reach for the current resources of AHRQ.

In addition, a separate subcommittee of experts will report to the committee on the lack of standardization of collection of race and ethnicity data at the federal, state, local, and private sector levels due to the fact that the federal government has yet to issue comprehensive, definitive guidelines for the collection and disclosure of race and ethnicity data in health care quality improvement. The subcommittee will focus on defining a standard set of race, ethnicity, and language categories and methods for obtaining this information to serve as a standard for those entities wishing to assess and report on quality of care across these categories. The subcommittee will carry out an appropriate level of detailed, in-depth analysis and description, which can be issued as a stand-alone report and summarized in the final overall report by the committee.[a]

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[a] The subcommittee's focus was on a specific data issue relevant to identifying disparities. Its report *Race, Ethnicity, and Language Data: Standardization for Health Care Quality Improvement* was released on August 31, 2009, and can be accessed at http://www.nap.edu/catalog.php?record_id=12696.

income, age). The NHQR and NHDR highlight performance in the health care system in delivering health care that is safe, timely, effective, and patient-centered.[3]

The 2008 NHQR states that quality of health care in the United States has improved for a majority of the individual measures it tracks (of the 46 core measures that AHRQ reports on in the print version of the NHQR, 87 percent showed improvement, and of the expanded set of 190 measures tracked, 69 percent showed improvement),[4,5] but concludes with the message that the overall quality of health care in the United States is suboptimal, and the pace of improvement is slow. Among performance measures that AHRQ tracks, the median annual rate of change is low (1.8 percent for the 46 core measures featured in the print reports and 1.4 percent for an expanded set of 190 measures that AHRQ monitors [AHRQ, 2009b]).

Because rates of change in quality measures diminish as high performance levels are achieved and because there is no standard or ideal rate of quality improvement, gaps between the level of health care people receive and what is recommended provide a more telling picture of the state of the nation's health care quality than just historic rates of change. The 2008 NHQR documents that quality achievement varies widely across different measures—from 96 percent of hospitalized heart attack patients receiving recommended care[6] to only 15 percent of dialysis patients being registered on a waiting list for kidney transplantation (AHRQ, 2009b).

Across all the process of care quality measures tracked in the NHQR, patients received the recommended care less than 60 percent of the time.[7] Other studies have documented similar shortcomings in the delivery of recommended care. Figure 1-1 illustrates the findings from several studies looking across 12 selected communities; less than 60 percent of adults received recommended health care regardless of the type of care or its function (Asch et al., 2006; Kerr et al., 2004; McGlynn et al., 2003).

When overall national performance rates are improving, disparities in receipt of care among population groups often remain evident (AHRQ, 2009a). Moreover, disparities even exist in geographic areas noted as having the highest performance on quality of care measures, so there is "no simple story" to explain patterns of disparities across different regions, health plans, or by type of care (Baicker, 2004, p. 33; Trivedi et al., 2006). Knowing whether disparities exist depends on the availability of descriptive population data to allow stratification of performance measurement data. The NHQR and NHDR primarily use the same set of quality measures, and the NHDR shows when differences exist in national performance levels for various sociodemographic groups. Too often in quality measurement, however, these more detailed population descriptors are not available, but they are essential for use in analysis and subsequent planning of interventions to reach affected populations. For example, Aetna, Inc. Health Plan found disparities in the quality of care received even among its insured minority populations, "when they paid attention to this issue, and began collecting race and ethnicity data" (Betancourt et al., 2006, p. 3). Armed with such information, Aetna sought to integrate disparities reduction into quality improvement efforts.

Other health care quality reports also find overall performance on quality measures is less than optimal and that disparities continue to persist, although they may look at different topics and sets of measures (for example, Byers, 2010; Cantor et al., 2007; The Commonwealth Fund Commission on a High Performance Health System, 2008; IOM, 2000, 2001a, 2002b, 2003a,b, 2004a,b, 2005, 2006, 2007; Kaiser Family Foundation, 2009; McCarthy et al., 2009; NCQA, 2008, 2009; President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry, 1998; Rowe et al., 2010; Schuster et al., 2005). Despite progress being made in many areas, the United States still has far to go before the entire population receives the level of care it expects, desires, and deserves.

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[3] These attributes—safe, timely, effective, and patient-centered—are four of six aims for health care systems' quality outlined by the IOM in the 2001 report *Crossing the Quality Chasm: A New Health System for the 21st Century*.

[4] Personal communication, Ernest Moy, Agency for Healthcare Research and Quality, September 22, 2009.

[5] A misprint in the 2008 NHQR in Figure H.1 (p. 3), states that the NHQR reports on 45 rather than the correct number of 46 measures. Core measures denote a smaller group of measures that AHRQ has selected as having the greatest importance and scientific soundness; the AHRQ core measures are not the same as the core measures used by the Centers for Medicare and Medicaid Services (CMS) or The Joint Commission.

[6] Based on all payers, 95.8 percent of hospitalized heart attack patients received aspirin within 24 hours of heart attack and at discharge, beta blocker within 24 hours of attack and at discharge, ACE inhibitor or ARB treatment, and smoking cessation counseling for those that smoke.

[7] Personal communication, Ernest Moy, Agency for Healthcare Research and Quality, August 10, 2009.

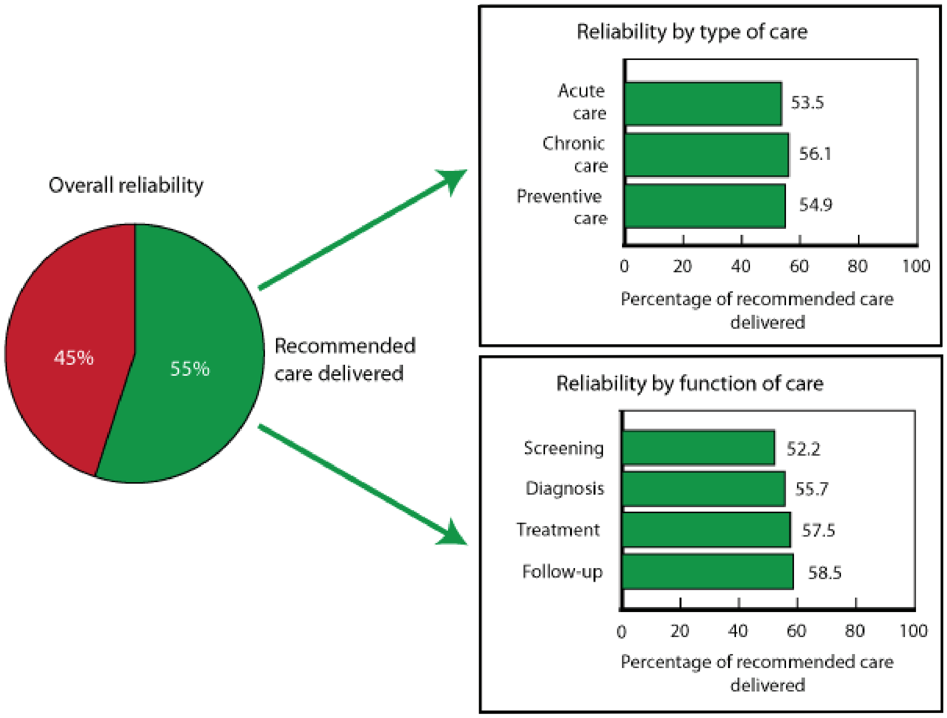

FIGURE 1-1 Overall reliability of the U.S. health system: Percentage of recommended care delivered.
SOURCES: Asch et al., 2006; Kerr et al., 2004; McGlynn et al., 2003. Reprinted, with permission, from RAND Corporation, 2010. Copyright 2010 by RAND Corporation.

Reporting as One Aspect for Quality Improvement

In testimony to the Future Directions committee, AHRQ staff observed that the primary utility of the national healthcare reports is to raise awareness of the level of health care quality and the existence of disparities (Moy, 2009). In response, the IOM Future Directions committee considered how such awareness could more readily be translated into action, given that health care delivery tends to be a local enterprise, and to examine the relationship of national or more localized reporting to quality improvement.

The Strategic Framework Board (SFB), which was formed in 1999 to design a national quality measurement and reporting strategy, provides one schematic showing relationships among quality improvement activities. The SFB schematic illustrates how measurement and reporting should be integrally tied to other elements of quality improvement, including establishment of national goals, building a strong evidence base for measures and interventions, and widespread adoption in the field (Figure 1-2) (McGlynn, 2003). The SFB stressed that stronger linkages between these activities would “increase the likelihood that measurement and reporting can drive change” (McGlynn, 2003, p. I-6) and that it is essential to think about how collected “information should be packaged and made available to maximize utility for decisions” (McGlynn, 2003, p. I-5).

To make collective strides toward improved health care delivery, a national quality improvement effort requires standardization of measurement tools; harmonization of measures for reporting purposes; implementation of interventions and public reporting on performance; and setting priorities and performance goals through collaborative processes (Smith Moore et al., 2007). Recent efforts by the National Priorities Partnership (NPP), convened by the National Quality Forum,[8] have achieved a consensus among numerous private and public sector stakeholders,

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[8] The NPP consisted of 28 members when the initial priorities and goals were established in 2008; it has since grown and now consists of 32 members (http://www.nationalprioritiespartnership.org/Partners.aspx).

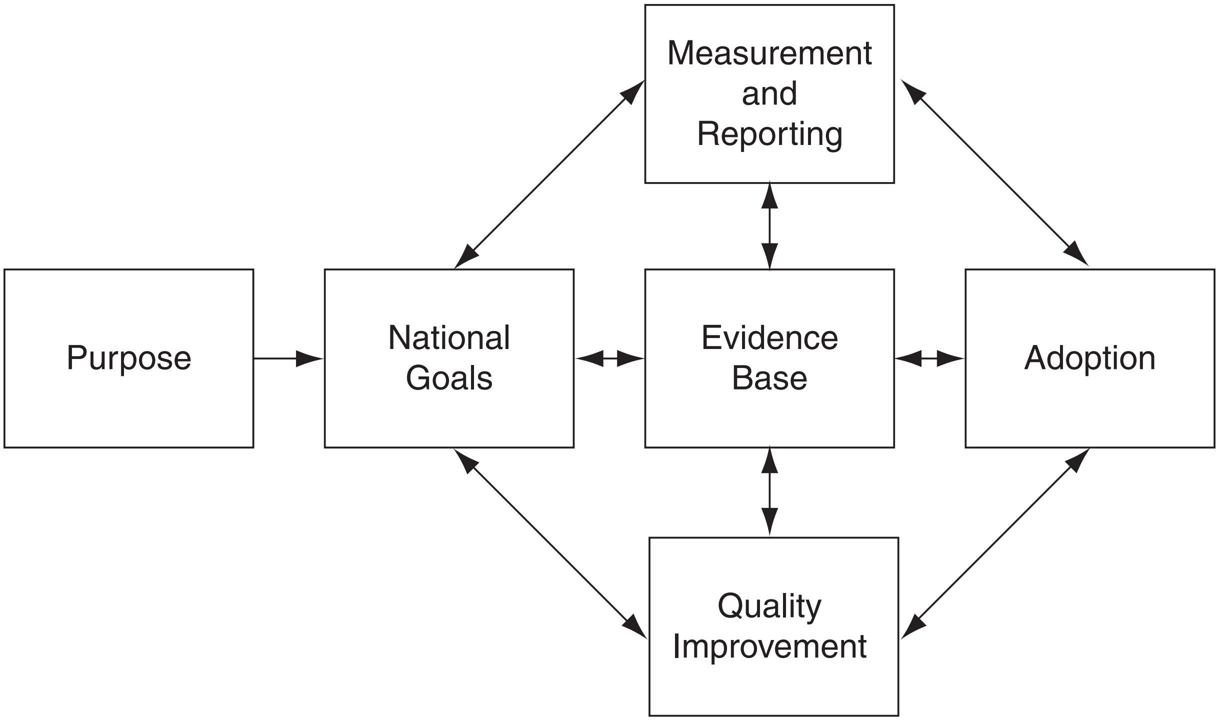

FIGURE 1-2 Conceptual framework for a national quality measurement and reporting system.
SOURCE: McGlynn, 2003. Copyright © 2003, *Medical Care*. All Rights Reserved.

including some federal agencies (including AHRQ, the Centers for Medicare and Medicaid Services, and the Centers for Disease Control and Prevention, among others) on national priority areas for quality improvement action. The NPP has identified 6 priority areas for health care with 27 specific goals, all of which address "four major challenges—eliminating harm, eradicating disparities, reducing disease burden, and removing waste—that are important to every American" (NPP, 2008, p. 8). The Future Directions committee's task includes recommending priority areas for quality improvement and disparities in the context of national reporting, and these six NPP priority areas, along with earlier IOM advice on priority areas, are further reviewed in Chapter 2.

KEY ISSUES ADDRESSED BY THE COMMITTEE

Throughout much of the period of the Future Directions committee's deliberations, the nation considered expanding insurance coverage and investments in quality monitoring.[9,10] With trillions of dollars already being spent on health care, monitoring the state of health care quality improvement and the degree of disparities is essential. The committee acknowledges the tremendous effort that AHRQ and its data partners have made in bringing forth the national healthcare reports and related products to document the state of U.S. health care. The following

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[9] *National Health Care Quality Act*, Bill S.966, 111th Cong., 1st sess. (May 4, 2009); *American Recovery and Reinvestment Act of 2009*, Public Law 111-5, 111th Cong., 1st sess. (January 6, 2009); *Medicare Improvements for Patients and Providers Act of 2008*, Public Law 110-275, 110th Cong., 2d sess. (July 15, 2008); *Children's Health Insurance Program Reauthorization Act*, Public Law 111-3, 111th Cong., 1st Sess. (January 6, 2009); *Affordable Health Care for America Act*, HR 3962, 111th Cong., 1st sess. (October 29, 2009); *Patient Protection and Affordable Care Act*, HR 3590, 111th Cong., 1st sess. (December 24, 2009).

[10] This IOM report was written during the health reform debate of 2009 and 2010. In March 2010, the *Patient Protection and Affordable Care Act* was signed into law [*Patient Protection and Affordable Care Act*, Public Law 111-148, 111th Cong., 2d sess. (March 23, 2010)].

discussion focuses on improving AHRQ's current products so that the products might ultimately set a direction for progress and drive change among stakeholders.

The committee sought input from experts through testimony, interviews, and commissioned papers to determine how best to enhance the usefulness of the NHQR and NHDR in contributing to the overall advancement of health care quality and equity. The committee heard from a variety of individuals and organizations that these reports relay a lot of facts for specific conditions, populations, and measures. Most often, stakeholders found the NHQR and NHDR to be useful sources for quotable information in bringing attention to specific quality issues that their state, institution, or organization might examine. As examples, health services researchers use data from the reports in articles they produce or presentations they give, and advocacy groups educate their members and funders about access and utilization gaps in recommended care.

Generally, however, observers thought that the NHQR and NHDR could be improved in numerous ways that would make them more influential in promoting change in the U.S. health care system, in addition to being a source of technical data on past trends. In view of the slow progress in improving quality or reducing disparities, the committee approached its task with the overall aim of improving the actionability of the national healthcare reports and their related products.

Several key themes for improving the NHQR and NHDR emerged from the committee's research, including the need for AHRQ to:

- Identify the most important opportunities for concerted national action.
- Develop measures and data sources to support monitoring of "high-impact" areas (e.g., those showing the greatest net health benefit; those showing greatest opportunity for increasing value and equity if the gaps between current achievement and desired performance levels were closed).
- Increase understanding of the content and visibility of the national healthcare reports in both print and Web-based forms.

Issues raised in assessing the national healthcare reports, as well as potential solutions, identified through the committee's outreach and deliberations are featured in Table 1-1. The topics identified in that table and the committee's recommendations will be taken up in subsequent chapters of this report.

LIMITATIONS OF THE STUDY

For many of the issues addressed in this report by the Future Directions committee, no specific evidence base of peer-reviewed articles exists. For that reason, the committee's recommendations are generally based on the expert consensus of committee members in consultation with other experts in the fields of performance measurement and communications. Whenever possible, connections between the committee's decisions and those of other prominent groups are identified.

ORGANIZATION OF THE REPORT

This introductory chapter has described the context for this report, including the committee's charge, as well as issues and potential solutions related to the national healthcare reports, and the limitations of the study. In subsequent chapters, the committee makes recommendations to AHRQ for modifying future editions of the NHQR and NHDR, identifying priority areas and developing a process for the selection of measures to evaluate progress, strengthening data resources for quality measurement and disparities identification, and providing for additional resources to fulfill the recommended changes.

- **Chapter 2—Re-envisioning the NHQR and NHDR.** Chapter 2 examines legislative guidance on the purpose of the national healthcare reports and the intended audience of Congress. In addition, the chapter discusses a vision for the NHQR and NHDR that is more forward-looking and action-oriented by tying the

TABLE 1-1 Issues Raised and Potential Solutions Related to the National Healthcare Reports and Their Related Products

Issues Raised	Potential Solutions
The Need to Identify the Most Important Opportunities for Concerted National Action	
1. The NHQR and NHDR do not sufficiently direct readers on what to focus quality improvement efforts.	1. Establish national priority areas and give guidance on setting a hierarchy among measures.
2. The reports may not use the most impactful measures for bringing about quality improvement.	2. Make the measure selection criteria more explicit and the selection process more transparent.
3. Disparities elimination should not be considered as a separate issue from quality improvement.	3. Have one report rather than two reports or improve shared content across the NHQR and NHDR.
4. The NHQR and NHDR passively report data rather than being action-oriented.	4. Establish goals for priority areas and provide benchmarks for individual measures; tell a story by defining a problem, describing through measurement, and providing examples of intervention; integrate intervention activities in text and through online linkages; highlight evidence-based policies that could accelerate progress.
5. Access to health care is not addressed as a quality issue in the NHQR, only a disparities issue in the NHDR.	5. Consider access as part of the NHQR as well as the NHDR.
6. Important measurement areas are missing in both the NHQR and NHDR.	6. Examine the current quality framework for continued applicability.
The Need to Develop Measures and Data Sources to Support Monitoring of "High-Impact" Areas	
1. Measures used in the NHQR and NHDR reflect available data sources, but additional measures and data sources are desirable.	1. Identify or develop measures for areas with the greatest potential quality improvement impact and identify or develop additional data sources that satisfy those measures.
2. Data are inadequate to identify poor quality of health care within and between all population groups.	2. Increase the availability of race, ethnicity, and language need data along with health care quality data.
3. Improved measures and data may be available in some locales rather than on a national basis.	3. Consider the use of additional subnational data in the NHQR and NHDR.
The Need to Increase Understanding and Visibility of Report Content in Both Print and Web-based Forms	
1. The presentation and content of the NHQR and NHDR do not adequately serve the primary audience for these reports (i.e., Congress).	1. Reorient the Highlights section of the NHQR and NHDR.
2. Multiple audiences use the NHQR and NHDR and associated online products but the needs of these audiences are different.	2. Better align reports and products associated with the NHQR and NHDR to serve the needs of multiple audiences.
3. Many pertinent parties that could be involved in implementation or reporting activities do not know about the reports.	3. Market the NHQR and NHDR to additional audiences; optimize online search strategies.
4. The NHQR and NHDR draw the most attention when they are first released but lose visibility thereafter.	4. Sustain interest over time through improved and targeted dissemination; provide content in additional formats with more easily digestible collections of information that could be more widely distributed (e.g., fact sheets or topic-specific products with more detailed analyses dedicated to specific populations, conditions, and types of care or settings).
5. A great deal of data is available in the NHQR and NHDR but it is difficult to find all of the pieces related to a specific topic.	5. Improve organization of print documents and improve content access for the State Snapshots (e.g., best state performance) and NHQRDRnet.
6. There is insufficient attention in the NHQR and NHDR to the needs of priority populations.	6. Expand information on priority populations in reports to extent feasible and provide additional, more detailed collections of information for specific populations in special reports, fact sheets, or online.

TABLE 1-1 Continued

Issues Raised	Potential Solutions
7. Graphic displays and summary measures in the NHQR and NHDR do not always convey information in a readily understandable manner—either for the key message each is trying to provide to audiences or adequate statistical analytics for researchers.	7. Improve graphic displays in the NHQR and NHDR.
8. A lot of data are available in the NHQR and NHDR, but some users desire more detail and the ability to manipulate the primary data themselves.	8. Guide users of the NHQR and NHDR to more detailed datasets underlying the reports, tools for analysis, and a guide on "how to" apply data; provide links to additional complementary and expanded data sources that are not necessarily reflected in the reports.

reports to national priorities and a national quality improvement strategy. In accordance with its charge, the committee identifies a set of national priority areas to help guide measure selection for the reports.

- **Chapter 3—Updating the Framework for the NHQR and NHDR.** Chapter 3 presents an updated framework that has evolved from previous IOM guidance. The chapter provides a rationale for the four new components of the framework (i.e., access, efficiency, care coordination, and capabilities of health systems infrastructure). The framework is to be used by AHRQ as a tool to categorize measures and thereby ensure balance in its overall portfolio of measures (e.g., included in State Snapshots not just the reports). Core measures featured in the reports, however, should meet more stringent tests—applicability to priority areas and having the highest potential to improve population health compared to other candidate measures. Equity and value are highlighted as crosscutting dimensions of the framework and serve as criteria in the process for ranking measures as well as distinct data elements for inclusion in the national healthcare reports.
- **Chapter 4—Adopting a More Quantitative and Transparent Measure Selection Process.** Chapter 4 reviews AHRQ's current measure selection process and makes a case for a more transparent and quantitatively based measure selection and ranking process. The chapter includes discussion of the applicability of parameters such as clinically preventable burden, cost-effectiveness, and net health benefit. The committee's recommendation process can also help prioritize areas for measure and data source development as well as retirement of measures.
- **Chapter 5—Enhancing Data Resources.** Chapter 5 examines the ways in which AHRQ can play a role in establishing needed content for the nation's health care data infrastructure by suggesting areas for measure and data source development, and by defining areas where data enhancement is desirable. Criteria are set for use of subnational data to inform quality improvement efforts when national data are not yet available in key areas. Further, the chapter examines the need for analyses that stratify health care quality measures by sociodemographic factors and for standardization of race, ethnicity, and language need data to foster their collection and the ability to compare findings for subgroups across settings.
- **Chapter 6—Improving Presentation of Information.** Chapter 6 highlights issues pertaining to the presentation of data in the NHQR, NHDR, and related products, with a focus on setting benchmarks to illustrate the best levels of performance that have been achieved. It expands on ways to improve specific products by telling a more complete quality improvement story and by drawing stronger parallels between the NHQR and NHDR so that disparities reduction is not seen as a separate activity from quality improvement.
- **Chapter 7—Implementing Recommended Changes.** Chapter 7 reviews the major tasks recommended by the committee and identifies areas in which AHRQ would need additional resources to support the recommended changes.

The Future Directions committee offers a vision for future editions of the NHQR and NHDR. Both data and analyses in the reports must focus on promoting improvements in the U.S. health care system and what various stakeholders can do to positively affect desired outcomes. The national healthcare reports alone will not transform the quality of health care in the United States. By refocusing national attention on areas with potential for the greatest health impact, presenting data to identify the best levels of achievement and accountable actors, stimulating measure and data development, and identifying evidence-based policies and practices, the reports should stimulate greater progress on closing quality gaps and eliminating disparities.

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2

Re-Envisioning the NHQR and NHDR

The NHQR and NHDR have documented historical trends in U.S. health care quality and disparities, but the Future Directions committee offers a vision for the reports that is more forward-looking and action-oriented. To accomplish this vision, the committee recommends that AHRQ align the reports with national priority areas, along with other strategies to foster change and inform policy. The committee recommends eight national priority areas for use by AHRQ in guiding measure selection and prioritizing content for the NHQR and NHDR. The Future Directions committee underscores the necessity of a broader commitment to national priorities through policies and practices that support data collection on key metrics, and support activities to address gaps in care identified in the national healthcare reports. The Future Directions committee concludes that this broader commitment should at least come at the level of the Secretary of HHS, who can help set the national agenda for quality improvement. Progress on this agenda could then be monitored by the national healthcare reports.

AHRQ charged the Future Directions committee to assess the national healthcare reports, provide guidance on what the future generation of these reports should embody, and advise on national priority areas for health care quality improvement and disparities elimination. The committee began its deliberations by clarifying the purpose and audience for the reports, and identifying what those audiences could be in the future. Specifically, this chapter assesses the general needs of the audiences, how data analysis might better inform users, the frequency of reporting, and the naming of priority areas.

Noting that in an initial meeting with the committee, AHRQ Director Carolyn Clancy indicated that “a clear signal and recommendation from this committee on actionability is something, frankly, we would welcome” (Clancy, 2009), the committee deliberated on how such actionability might be achieved. One part of doing so is to align the reports with national priority areas. In this chapter, the committee recommends a set of eight priority areas.

AHRQ will also need to engage the community of actors who do the day-to-day work of quality improvement. These public and private partners, including the whole HHS health care endeavor, would help inform the best practices and intervention aspects of the reports, support data collection and direct service delivery, and help provide solutions to barriers to improvement.

The Future Directions committee refrains from offering a specific recommendation that the Secretary adopt the offered national priority areas because the committee's charge was limited to advising AHRQ, but the committee wants to underscore the importance of such a broader commitment to national priority areas. The committee recognizes that health insurance reform legislation establishes a process and method for setting quality improvement priorities in HHS,[1] and it believes that the content of the two NHQR and NHDR should align as closely as possible with whatever priorities are ultimately established.

PURPOSE AND AUDIENCES

The Healthcare Research and Quality Act of 1999 called for AHRQ to "submit to Congress an annual report on national trends in the quality of health care provided to the American people," which became the NHQR, and "a report regarding prevailing disparities in health care delivery as it relates to racial factors and socioeconomic factors in priority populations,"[2] which became the NHDR. Thus, the legislation states the basic purpose is to report trends and makes clear that the primary intended audience is the U.S. Congress. AHRQ has expressed interest in increasing the visibility of its products among congressional staff and other policy makers as well as other actors in the fields of quality improvement and disparity reduction (Social & Scientific Systems and UserWorks, 2009). AHRQ has interpreted the legislative guidance to mean that the national healthcare reports should report on where the country stands today on selected performance measures and should look back over time (generally the time period from 1998 to 1999 to the latest date for which data are available) to see how far the nation has come. The Future Directions committee believes it is now time to report on trends and be forward-thinking, not just historical.

Previous IOM guidance viewed the audience for the NHQR and NHDR as reaching beyond Congress, and envisioned the reports as vehicles for "educating the public, the media, and other audiences about the importance of health care quality and the current level of quality" (IOM, 2001b, p. 31). Moreover, AHRQ has indicated that today, five main types of users tend to consult the national healthcare reports' family of print and online products: (1) federal policy makers and congressional staff; (2) associations of state and local agencies and state-based users (e.g., state and local policy makers, Medicaid medical directors, health commissioners, data providers); (3) federal researchers (e.g., researchers at the National Institutes of Health, the HHS Office of Minority Health staff); (4) private sector quality improvement researchers (e.g., researchers at organizations such as The Commonwealth Fund or Kaiser Family Foundation, health care providers, insurers, quality improvement organizations); and (5) advocacy groups (e.g., groups representing priority populations, persons having specific diseases, and professional groups) (Social & Scientific Systems and UserWorks, 2009). The Future Directions committee also believes these audiences need to be aware not only of the current state of system performance, but also what the potential impact of improvement is on the health of the nation and what each action can contribute to its achievement.

Overview of Products and Recommended Changes

Although there is little comprehensive evidence on how users take the information in the NHQR and NHDR and put it into action, there is some limited information on the number of copies ordered and the degree of internet traffic, which at a minimum suggest the products are consulted and quoted to document specific quality problems and disparities. Besides the annual print and Web-based versions of the NHQR and NHDR, report-related products developed by AHRQ include annual State Snapshots (which rate each state's performance overall and on selected measures relative to other states), an online data query system called the NHQRDRnet, and a limited number of topical fact sheets.

The Future Directions committee finds the print and Web versions of the NHQR and NHDR and their associated online resources are solid compendia of data about the quality of health care and related disparities in the United States. Their strengths have been in their use of "measures and datasets that meet rigorous scientific standards" (IOM, 2002a, p. 6) and promotion of a common understanding of the domains of quality. Nevertheless,

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[1] *Patient Protection and Affordable Care Act*, Public Law 111-148 § 399HH, 111th Cong., 2d sess. (March 23, 2010).

[2] *Health Research and Quality Act of 1999*, Public Law 106-129 § 902 and § 913, 106th Cong., 1st sess. (December 6, 1999).

the Future Directions committee recommends modifying the national healthcare reports in a number of ways, and further specifies, in Chapter 6, changes to the presentation of existing products and expansion to others. The committee offers a number of objectives that AHRQ's reporting effort should strive to achieve (Box 2-1).

Here, the committee would like to call attention to several overall questions that it considered: whether to continue annual reporting, whether there should continue to be two reports, and how the Highlights section of the two reports might be designed to engage more readers.

Continuing Annual Reporting

The committee believes annual reporting, which is required by law, sustains the visibility of the NHQR and NHDR. To help address AHRQ staff concerns about workload, the committee suggests that every measure need not be reported each year (particularly when the data do not change from year to year) as long as the reporting between the NHQR and NHDR are on the same content areas. Adopting this suggestion would open opportunities for more in-depth treatment of certain topics (e.g., patient safety or a priority population). Similarly, several priorities might get more in-depth treatment in one year but not necessarily the next.

BOX 2-1
Objectives for AHRQ's Reporting Effort in the NHQR, NHDR, and Related Products

The IOM Future Directions committee believes that the NHQR, NHDR, and related products should play a vital role in U.S. health care quality improvement and disparity elimination efforts. Thus, AHRQ should make sure that the reports:

- Incorporate a set of national priorities for U.S. health care quality improvement and disparities elimination and generate data to monitor progress toward achieving those priority area goals.
- Identify for policy makers the problem areas in health care quality that most need their attention and action, with the understanding that these priorities may change over time and differ by geographic location, population, or other contextual factors.
- Identify aspects of the health care system that improve or impede quality for all, and specify that disparities elimination is an integral part of quality improvement.
- Supply a common understanding of quality, as reflected by the framework for quality, that considers value, equity, effectiveness, safety, timeliness, patient-centeredness, access, efficiency, care coordination, and capabilities of health systems infrastructure.
- Identify measures that reflect the best current approaches, practices, and opportunities for measurement improvement even when data are not yet available nationally.
- Stimulate the refinement of existing measures and the development of new ones and identify opportunities for data source improvement.
- Stimulate data collection and analysis efforts at the state and local levels (mirroring the national effort) to facilitate and monitor targeted quality improvements.
- Identify credible data sources that will support national reporting and allow subnational (state and local) and subgroup analyses by race, ethnicity, language need, and socioeconomic status.
- Stimulate the collection of standardized race, ethnicity, language need, and socioeconomic status data in all health care quality data sources.
- Provide policy makers, purchasers, health care providers, and others with benchmarks for quality of care by showcasing the best attained performance in a class.
- Educate the public, the media, and other audiences about the importance of health care quality and the current level of quality by making the AHRQ products more accessible in terms of presentation and more extensive dissemination.
- Stimulate the development of a health care data infrastructure to support quality measurement and reporting across systems and payers for comparison.
- Refine quantitative methods for prioritizing measures of health care quality.
- Include linkages to successful interventions to make the reports more actionable.
- Make it easier to compare the performance outcomes of the U.S. health care system with that of other nations.

SOURCE: Updated from IOM, 2001b, p. 30.

Clarifying the Connection Between Quality and Disparities

The committee wants to ensure that the issue of disparities in health care is regarded as an integral part of any overall health care quality improvement strategy. The recent IOM report *State of the USA Health Indicators* underscored this point: "The very existence of a disparity implies that the overall national level for the corresponding indicator is not optimal" (IOM, 2008, p. 49). Thus, the committee considered whether the NHQR and NHDR should be merged into one report to strengthen the connection between issues of quality and disparity in the minds of users.

Advocacy groups expressed to the committee that they depend on the NHDR as a reliable source of analyses to paint a picture of the state of quality by demographic factors; this observation is supported by the fact that there tend to be more downloads from the NHDR website than the NHQR website (59,272 and 49,223, respectively, in FY 2007-2008).[3] These users expressed concern about diminishing the visibility of disparity issues if the reports were merged. At the same time, the committee noted that the audiences for the NHQR and NHDR were often different sets of stakeholders, and that attention to disparities was often given short shrift in quality improvement efforts, or the composition of the population was given as a rationale for why quality metrics were not higher. In fact, some stakeholders noted that it is quite possible to raise national performance levels without ever addressing disparities. On the other hand, focusing solely on closing the disparity gap between one population and another, as reported in the NHDR, often does not set the bar for performance achievement on specific quality metrics high enough for any population.

As a result of these considerations, the committee does not recommend a change in statutory requirements for the annual production of the two reports, but suggests ways to build in stronger connections between the two reports (discussed in more detail in Chapter 6). For example, the Future Directions committee advocates for comparing population groups in the NHDR to a quality benchmark or goal, not just to each other. A case in point is the presentation of data in the 2008 NHDR for diabetes preventive services. While it might be statistically valid to report that the Hispanic/non-Hispanic difference in care is narrowing for diabetes preventive services, as reported in the Priority Population section of the 2008 NHDR (AHRQ, 2009b, p. 211), it is misleading—although the difference may be narrowing, both groups are doing worse over time in the use of services (AHRQ, 2009b, p. 49). Another way to build stronger connections between the reports is developing a shared Highlights section for both reports.

Producing a Shared Highlights Section

As previously discussed, the primary intended audiences for the Highlights sections of the NHQR and NHDR include Congress, congressional staff, and other federal and nonfederal policy makers (Moy, 2009; Social & Scientific Systems and UserWorks, 2009). The committee suggests that AHRQ develop a common Highlights section that would serve as the introduction to both the NHQR and NHDR and as a separate stand-alone document that can be distributed more broadly. This can become an effective vehicle for engaging public and private policy makers, the media, foundations and other funders of research, and the public. Wider distribution and readership of the Highlights section of the national healthcare reports could also pique the interest of new audiences to the more detailed reports and the Web-based resources that AHRQ provides.

The committee finds that the current approach in the Highlights sections of summarizing the number of performance measures that improve, stay the same, or decline does not engage readers to understand what is most important; indeed, all measures are given equal value. Moreover, the key messages in the Highlights section have thus far remained much the same from year to year—specifically, that the quality of health care in the United States is suboptimal, the pace of improvement is slow, and disparities persist. (Key messages from each year of the reports are summarized in Appendix B.) One of the committee's observations is that the messages conveyed in the Highlights tend to be couched in general terms and not be related to specific priorities or actions. As a result, the messages are not very compelling and provide a limited vision or roadmap for improving quality and promoting equity. Accordingly, key messages should become more targeted and action-oriented.

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[3] Personal communication, Ernest Moy, Agency for Healthcare Research and Quality, November 1, 2009, based on a summary from Jeff Hardy dated February 11, 2009.

The Highlights section needs to present a quality improvement strategy. The committee's newly imagined, common Highlights section for the two reports would feature areas with the greatest potential for quality improvement impact and detail the value of closing those gaps, along with providing key messages to different audiences such as policy makers, health providers and payers, and the public on what they can do to spur improvement on priority areas and associated high impact measurement areas (e.g., include findings from data analyses on evidence-based policies that are proven to support better performance or remove barriers that prevent better performance; inclusion of a State Scorecard; assessment of the state of disparities).

Need for Data Analyses to Better Inform Policy and Practice

AHRQ's role as a research agency is not to develop policy for all of HHS with regard to quality improvement activities; setting policy is an executive leadership and legislative function, but AHRQ can provide data to inform policy decisions. AHRQ has indicated that the NHQR and NHDR are awareness-raising documents, and that function will continue but needs to be supported by additional analyses that inform actions and actors.

Providing Analyses by Accountable Actors

The committee suggests that the NHQR and NHDR include more information about how performance compares across public and private health systems, payers, programs, and other accountable actors. To date, the inclusion of such comparative information has been limited, and little analysis has been presented beyond straight reporting on individual measures; some limited stratification and multivariate analyses are included in the NHDR by population but not by entities providing care or paying for it. The Future Directions committee recommends sufficient resources be provided to AHRQ for the data collection and analysis necessary to provide such comparative information (Chapter 7).

The committee believes that federal and state policy makers are most likely to be interested in performance data—reported according to units of accountability (e.g., payment streams, federally funded programs, state program performance)—on health care areas and programs for which they have some public responsibility. Specifically, Congress would be interested in programs of HHS and other federally funded programs for which Congress has responsibility. Such programs include the Medicare and Medicaid programs overseen by the Centers for Medicare and Medicaid Services (CMS); programs of the Indian Health Service; health care service delivery programs of the Health Resources and Services Administration (HRSA); and other service delivery programs under the auspices of other federal agencies, including the U.S. Department of Veterans Affairs (VA) and the U.S. Department of Defense (DOD). Similarly, state legislators are likely to be interested in the performance of the Medicaid program and the Children's Health Insurance Program (CHIP). This list is not meant to limit AHRQ's data presentation to federally sponsored programs; indeed there is interest, for example, in having data from all payer databases.

Members of Congress are also interested in how their own state performance in the public and private sectors compares to others, and while AHRQ has a wealth of state-based data available, it is not easily summarized in one place. Such data could be summarized in the Highlights section using information from the online State Snapshots dashboard (perhaps in a way similar to that used in The Commonwealth Fund State Scorecard) (The Commonwealth Fund Commission on a High Performance Health System, 2008).

Using Data to Inform Policy and Practice

The committee urges AHRQ to analyze and present its data in ways that better inform users of where performance is better, how long it will take to get to goal levels, and what the best programs or drivers might be to attain higher achievement. For example,

- AHRQ could analyze and present data by accountable units (e.g., payers, programs, states) so that it is possible to more closely identify where the best performance exists and how different actors perform.

- The performance trend data that AHRQ has collected thus far should now be used to project how long it would take to close quality gaps between current performance on the measure and achieving the recommended standard of care (e.g., 100 percent of target population receiving care or some other goal that is set).
- New approaches to thinking about policy-relevant outcome measures may be necessary, such as determining whether there has been a reduction of readmission rates on acute myocardial infarction (AMI) since public reporting by CMS, or whether there is an actual increase in receipt of needed services or patient disease management adherence when uninsurance is removed as a barrier.
- Further analyses would be useful to increase understanding of the implications of differences among populations; for example, what are the implications of the differences found in access to preventive services between Hispanic and non-Hispanic Whites for diabetes care in the NHDR (AHRQ, 2009b, p. 49), particularly in view of the projected growth of the Hispanic population in the United States and studies showing that for Hispanics born in 2000, 53 percent of girls and 45 percent of boys will develop diabetes during their lifetimes (CDC, 2007).
- The National Priorities Partnership has suggested a quality improvement goal of: "All Americans will receive the most effective preventive services recommended by the U.S. Preventive Services Task Force" (NPP, 2008, p. 26). It is known, however, that only 50 percent of adults received the screenings and preventive care appropriate to their age and gender (The Commonwealth Fund Commission on a High Performance Health System, 2008; McGlynn et al., 2003; NPP, 2008). In addition to AHRQ reporting the average national performance for receipt of preventive services, related analyses might be proffered that would inform policies and practices in both the public and private sector: (1) comparing payers that include such services in benefit packages with reduced or no co-payments with those that do not, (2) comparing those who are insured with those who are uninsured, (3) comparing the quality improvement impact of focusing interventions on specific at risk groups or age groups, and/or (4) comparing use among low-income users across state Medicaid programs or by community health centers.
- A finding in the NHDR that low-income persons consistently fall behind on health quality measures should lead to examination of program-specific data that might illuminate if any specific health care delivery system is making important strides to close that gap (for instance, interventions that have improved care in community health centers might benefit other settings that serve low-income populations [Chin et al., 2007; Landon et al., 2007]).

Because AHRQ primarily tracks health care process measures, there needs to be an assessment of the benefit of improved access to or adherence to processes of care on health outcomes to help determine whether expanded investment in specific areas of care is warranted. To the extent possible, data should be presented in ways that inform potential policy directions and program practices by being more outcome oriented. The committee builds into its recommended measure selection process an assessment of the potential impact of closing performance gaps on the ultimate outcome of improving population health.

CALLS FOR NATIONAL PRIORITY AREAS

In past years, the IOM and other entities have called for the establishment of national priority areas and goals for coordinated health care quality improvement efforts. Examples of these calls for national priorities are described below, along with discussion of the limited actions taken by AHRQ with respect to incorporating priority areas into the NHQR and NHDR.

In its 2001 report *Crossing the Quality Chasm: A New Health System for the 21st Century*, the IOM recommended establishing specific goals to enhance the usefulness of a national health care quality report "as a stimulus for performance improvement" (IOM, 2001a, p. 7). No specific overall goals have been set for each aim, although for some individual measures, *Healthy People 2010* targets are displayed.

The IOM's 2001 and 2002 guidance on the development of the NHQR and NHDR emphasized that these reports should identify "for policy makers the problem areas in health care quality that most need their attention and action, with the understanding that these priorities may change over time" and "should continually reflect and be used to shape goals for quality improvement by presenting information that is useful to policy makers and others to define clear objectives, assess progress, and define appropriate actions" (IOM, 2001b, pp. 31-32, 2002a). When AHRQ summarizes the nation's progress, all measures are given equal weight.

More recently, in March 2009, Stand for Quality, a diverse public-private coalition of 165 diverse organizations, issued six recommendations to improve both the quality and affordability of health care. Noting that performance measurement is a core building block to providing high-quality, affordable care, Stand for Quality urged the executive branch and Congress to expand public investment in performance measurement, and called for the establishment of priorities as part of the need to strengthen the "performance measurement, reporting and improvement enterprise" (Stand for Quality, 2009).[4] Similarly, recent health insurance reform bills have called for the formulation of a national strategy for quality improvement, including naming priority areas and a mechanism for choosing them.[5]

Despite the many calls for national priorities, HHS has yet to establish national priority areas for health care performance measurement and quality improvement that could help focus the collective efforts across HHS programs and be adopted by other federal agencies and entities engaged in health care quality improvement, including the elimination of disparities. HHS has a strategic planning process in place that sets goals for HHS programs and offers targets for monitoring progress on specific performance indicators. Most of the strategic plan indicators are for program management rather than setting goals for achievement of health care process or outcome measures. Thus, for example, under the HHS strategic objective of "Broaden health insurance and long-term coverage," the performance indicators deal with increasing the percentage of Medicare beneficiaries with Part D coverage and reducing the percentage of improper payments under the fee-for-service program (HHS, 2008, p. 48). In response to a 2007 congressional request for the IOM to assess whether HHS was "ideally organized to meet the enduring and emerging health challenges facing our nation" (IOM, 2009, p. 2), the IOM recommended improvements in HHS's strategic planning process—specifically, improving alignment across HHS on a small set of measurable goals.

The IOM Future Directions committee, while recognizing that HHS has many missions other than health care performance measurement, believes that improving health care performance measurement is fundamental to

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[4] Supporting entities include national organizations such as the Federation of American Hospitals, the National Partnership for Women & Families, Aetna, the American Academy of Family Physicians, The Leapfrog Group, as well as local, state, and regional organizations such as the Pacific Business Group on Health, the Puget Sound Health Alliance, and the Oklahoma Foundation for Medical Quality. A full list of supporting organizations is available at www.standforquality.org (accessed May 13, 2010).

[5] The final bill, the *Patient Protection and Affordable Care Act* (Public Law 111-148 § 3011, 111th Cong., 2d sess. (March 23, 2010)) has the following provisions:

- The Secretary, through a transparent collaborative process, shall establish a national strategy to improve the delivery of health care services, patient health outcomes, and population health.
- The Secretary shall identify national priorities for improvement in developing the strategy.
- The Secretary shall ensure that priorities identified under subparagraph (A) will—(i) have the greatest potential for improving the health outcomes, efficiency, and patient-centeredness of health care for all populations, including children and vulnerable populations; (ii) identify areas in the delivery of health care services that have the potential for rapid improvement in the quality and efficiency of patient care; (iii) address gaps in quality, efficiency, comparative effectiveness information, and health outcomes measures and data aggregation techniques; (iv) improve Federal payment policy to emphasize quality and efficiency; (v) enhance the use of health care data to improve quality, efficiency, transparency, and outcomes; (vi) address the health care provided to patients with high-cost chronic diseases; (vii) improve research and dissemination of strategies and best practices to improve patient safety and reduce medical errors, preventable admissions and readmissions, and health care-associated infections; (viii) reduce health disparities across health disparity populations (as defined in section 485E) and geographic areas; and (ix) address other areas as determined appropriate by the Secretary.
- The national strategy shall include a comprehensive strategic plan to achieve the priorities.

Not later than January 1, 2011, the Secretary shall create an Internet website to make public information regarding—(1) the national priorities for health care quality improvement established under subsection (a)(2); (2) the agency-specific strategic plans for health care quality described in subsection (b)(2)(B); and (3) other information, as the Secretary determines to be appropriate.

Earlier versions contained the same or similar provisions: The Affordable Health Care for America Act passed by the U.S. House of Representatives in November 2009 would require the Secretary of Health and Human Services (HHS Secretary) to establish national priorities for health care quality improvement (*Affordable Health Care for America Act* (H.R. 3962), Section 1441 (pp. 883-885), and the Patient Protection and Affordable Health Care Act passed by the U.S. Senate in December 2009 would require the HHS Secretary to develop a national strategy for health care quality improvement (*Patient Protection and Affordable Health Care Act* (H.R. 3590 amended Section 3011)) (pp. 692-698)).

ensuring an effective and efficient U.S. health care system. HHS has contracted with the National Quality Forum (NQF) to formulate a "national strategy and priorities for health care performance measurement" over the next few years under the authority of Section 183 of the Medicare Improvements for Patients and Providers Act of 2008 (MIPPA) (HHS, 2009a). The Future Directions committee concludes that the United States needs national priorities and measures of quality that will address the health care needs of the entire U.S. population, not just individuals covered by Medicare.

THE COMMITTEE'S RECOMMENDED PRIORITY AREAS

As required by its statement of task (see Chapter 1), the Future Directions committee identifies a set of eight national priority areas for focusing national health care quality improvement efforts and for use in selecting measures for the NHQR and NHDR. Before presenting the committee's recommendations, however, it is important to define and distinguish among the terms *aim*, *priority area*, *goal*, *benchmark*, and *target* as they are used by this committee (see Box 2-2).

Over time, setting an ideal level of performance in a priority area (aspirational goal) would be informed by progress on the highest quantifiable level of performance achieved so far (benchmark) so that realistic levels of actual performance can be utilized in setting national targets for achievement. (The use of benchmarking in health care is discussed further in Chapter 6.)

Previously Identified National Priorities

The committee considered efforts by various entities that have identified priority areas specifically for health care quality improvement, developed scorecards on key quality performance areas, or focused resources on health care quality improvement and disparities elimination. As discussed below, these efforts include work by previous IOM committees, the National Priorities Partnership (NPP) convened by NQF, HHS, and others.

BOX 2-2
Definitions Used in This Report

In the interest of clarity, the IOM Future Directions committee defines the terms *aim*, *priority area*, *goal*, *benchmark*, and *target* as they are used in this report.

- **Aim.** A desired state or characteristic of health care. As indicated in the 2001 IOM report *Crossing the Quality Chasm*, the aims for quality health are safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity (IOM, 2001a).
- **Priority area.** An area of health care having importance or urgency over others that is expected to result in "substantial improvements in health and healthcare"[a] (NPP, 2008).
- **Aspirational goal.** The ideal level of performance in a priority area (e.g., no patients are harmed by a preventable health care error; all diabetes patients receive a flu shot—unless contraindicated).[a]
- **Benchmark.** The quantifiable highest level of performance achieved so far (e.g., the benchmark among states would be set at 66.4 percent of diabetes patients receiving a flu shot because that represents the highest performance level of any state).[b]
- **Target.** A quantifiable level of actual performance to be achieved relative to a goal, usually by a specific date (e.g., by January 1, 2015, 75 percent of diabetes patients will receive an annual influenza shot).

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[a] This definition was adopted by the Future Directions committee to be consistent with how the term is used by the National Priorities Partnership (NPP).

[b] National average for noninstitutionalized, high-risk adults ages 18-64 with diabetes who had a flu shot in the last 12 months, 2006, with a range of 24.4 percent to 66.4 percent (Table 2_1_6.3). Available at http://www.ahrq.gov/qual/qrdr08/2_diabetes/T2_1_6-3.htm.

Previous IOM Committees' Recommended Priorities

The 2001 *Crossing the Quality Chasm* report (IOM, 2001a) delineated six aims for quality health care (safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity) and recommended that goals be set for each of the aims. That report also identified 16 priority conditions on the basis of their high cost to the system, although the report set no specific goals with regard to these conditions and none were set subsequently. AHRQ has used four of the six aims specified in the *Crossing the Quality Chasm* report as a way to frame the organization of the NHQR and NHDR (see Chapter 3).

In the 2003 report *Priority Areas for National Action: Transforming Health Care Quality*, the IOM proffered 20 priority areas for national action (IOM, 2003). That report stressed a mix of early interventions, self-management, and care coordination for conditions or populations that had a high impact from the burden of the condition (disability, mortality, and economic costs) on "patients, families, communities, and societies" (p. 4) and that had a probability that the gap between current practice and desired levels of recommended care could be improved. AHRQ has included many of these priority areas in its portfolio of measures (IOM, 2003). More recently, conversations about transforming the U.S. health care system and its quality have stressed the significance of looking at the whole patient experience over time and across sites of care (e.g., episodes of care, care coordination) instead of just looking at single condition-specific process measures (HHS, 2009a; McKethan et al., 2009; NPP, 2008).

The National Priorities Partnership's Six Recommended Priority Areas

In 2008, the NPP was convened by NQF as a cross-section of 28 public and private stakeholders, including AHRQ, the IOM, CMS, and the Centers for Disease Control and Prevention.[6] That same year, the NPP reached consensus on a set of six national priority areas considered to be "the work of many to achieve the transformational change that is needed for the United States to have a high-performing, high value healthcare system" (NPP, 2008, p. 7). The NPP focused on national priorities—as well as on what the NPP considered to be aspirational but ultimately achievable goals for each priority—that would,[7] if implemented broadly, reduce harm, improve patient-centered care, eliminate health care disparities, and remove waste from the U.S. health care system. The six NPP priorities for the U.S. health care system are: (1) patient and family engagement, (2) population health, (3) safety, (4) care coordination, (5) palliative care, and (6) overuse (NPP, 2008).

The NPP's identification of these six national priorities has several attractive features:

- The NPP priority areas involve measuring health care quality in new ways that represent the whole patient rather than a single disease, look across settings of care, and trace care and outcomes longitudinally (i.e., patient-focused episodes of care).
- The NPP priority areas and goals were established through a robust, consensus-based process involving a broad variety of public and private stakeholders.

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[6] The NPP consisted of 28 members when the initial priorities and goals were established in 2008 (http://www.nationalprioritiespartnership.org/Partners.aspx [accessed May 14, 2010]). The Partnership has since grown and now consists of 32 members. They represent multiple stakeholder groups in both the public and private sectors (e.g., health plans, providers, medical associations, workforce interest groups). Stakeholders include AARP, AFL-CIO, Agency for Healthcare Research and Quality, Aligning Forces for Quality, Alliance for Pediatric Quality, American Board of Medical Specialties, American Health Care Association, American Nurses Association, America's Health Insurance Plans, AQA, Centers for Disease Control and Prevention, Centers for Medicare and Medicaid Services, Certification Commission for Health Information Technology, Consumers Union, Hospital Quality Alliance, Institute for Healthcare Improvement, Institute of Medicine, Johnson & Johnson, The Joint Commission, The Leapfrog Group, National Association of Community Health Centers, National Business Group on Health, National Committee for Quality Assurance, National Governors Association, National Institutes of Health, National Partnership for Woman & Families, National Quality Forum, Pacific Business Group on Health, Physician Consortium for Performance Improvement convened by the American Medical Association, PQA, Quality Alliance Steering Committee, and the U.S. Chamber of Commerce.

[7] The goals are aspirational because they typically set a high bar for achievement—for example, "All Americans will receive the most effective preventive services recommended by the U.S. Preventive Services Task Force"; or "Seek to eliminate *all* healthcare-associated infections and serious adverse events." (Note: Emphasis added.)

- The NPP's national priority areas and goals represent areas in which the NPP thought it possible to achieve substantial progress by beginning with measures that are available now and adding to them as new measures become available.
- The NPP was convened by the NQF, which is recognized as "a neutral convener of consumers, purchasers, providers, practitioners, government and oversight agencies, supporting industries and other interested parties to identify and standardize 'best-in-class' measures of clinical quality and health system performance" (RWJF, 2009b).
- Each of the NPP priority areas is supported by an extensive evidence base reviewed by the partners.[8] (Note: This evidence base is not repeated in this report; for more information see the 2008 NPP report *National Priorities & Goals. Aligning Our Efforts to Transform America's Healthcare* [NPP, 2008].[9])
- The NPP priorities are ones to which the public and policy makers can easily relate.
- Within the first year of the release of the NPP priority areas, numerous groups outside the original circle of developers found that the NPP priorities reflect their own priorities and are moving to align activities. Such activities include (1) strategic planning (e.g., nursing and pediatric groups), (2) operations (e.g., Aligning Forces for Quality's regional health care collaborative in Maine), (3) research (e.g., Regenstrief Center for Healthcare Engineering), and (4) public outreach (e.g., the development by the National Business Group on Health of consumer-friendly fact sheets around NPP-identified areas of unnecessary overuse of health care).[10]

Since its inception, the NPP has grown in membership to broaden the engagement of more than the initial core of partners. It also has established a workgroup for each priority area (NPP, 2009c). These workgroups are continuing to identify strategies such as promoting the adoption of the Consumer Assessment of Healthcare Providers and Systems (CAHPS) and measures that support the priorities, and attempting to achieve parsimony in designating measures (e.g., a single rather than multiple care coordination measures or a palliative care measure applicable for multiple diseases). No one organization or single initiative can bring about the degree of change necessary to address the substantial gaps in the quality of U.S. health care, but collaborative efforts are expected to have greater reach (NPP, 2009a,b).

Although the NPP plans to conduct an evaluation of the uptake of its recommended priority areas and goals in the activities of various entities, neither the NPP nor NQF have plans to be a central repository of data for national tracking related to the priorities.[11] It is quite conceivable, therefore, that AHRQ's future NHQRs and NHDRs could play important roles by relaying these national priorities to audiences, and providing a means for reporting on the progress made toward achieving priorities and goals. Moreover, just as the NPP and the nation can benefit from having the priorities tracked in the AHRQ reports, AHRQ can benefit from the ongoing work of the NPP and its expanding networks of actors.

Other Entities' Recommended Priority Areas

Numerous entities in the United States, apart from the NPP and previous IOM committees, have sought to identify priority areas for health care quality improvement, develop scorecards on performance, or focus resources on health care quality improvement. The committee scanned articulated priority areas for health care quality improvement across a variety of these entities and has summarized them, along with priority areas identified by the previous IOM committees and the NPP, in Table 2-1.

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[8] The NPP did not limit selection of national priority area goals to areas where proven interventions are available (e.g., obesity is a problem, but there is not a clear-cut intervention strategy).

[9] The NPP's 2008 report is available online at http://www.nationalprioritiespartnership.org/AboutNPP.aspx (accessed May 13, 2010).

[10] Personal communication, Karen Adams, National Priorities Partnership, National Quality Forum, November 15, 2009.

[11] Personal communication, Janet Corrigan, National Quality Forum and Karen Adams, National Priorities Partnership, National Quality Forum, May 11, 2009.

The IOM Future Directions Committee's Eight Priority Areas

The eight national priority areas recommended after considerable deliberation by the Future Directions committee are shown in Box 2-3. The committee thought that the NPP's six priorities captured most of the key priorities for health care quality improvement. Thus, six of the committee's eight recommended priorities for health care quality improvement are the priorities recommended by the NPP (NPP, 2008). In addition, the committee added two priority areas not included in the NPP's recommended priorities—access to care and health systems infrastructure capabilities.

The NPP's priorities presuppose access to care. Yet access to health care remains a challenge for a large segment of the U.S. population and is a fundamental dimension of health care quality for all populations. Consequently, the committee believes that it is vital to single out access to care, especially in light of upcoming changes to health insurance coverage.[12] Lack of coverage is a well-documented barrier to care, but it is not the only one (others include transportation, ability to take time off from work to seek care, lack of a regular source of care, unwillingness of providers to accept specific types of insurance, and affordability of coverage, co-payments, and deductibles) (Ahmed et al., 2001; Cummingham et al., 2008; Goins et al., 2005; Goldman and McGlynn, 2005; Grumbach and Mold, 2009; Hall et al., 2008; Lofland and Frick, 2006; RWJF, 2002; Wang et al., 2009).

The development of health systems infrastructure, also not included in the NPP's national priorities, is similarly considered by the committee to be an area demanding national attention. With the health care data sources that are available today, AHRQ has been stymied in its ability to obtain data that are more directly related to care processes and outcomes. The adoption of electronic health records and establishment of health information exchanges spurred through the *American Recovery and Reinvestment Act of 2009*[13] will eventually open up new possibilities for obtaining clinical data across areas and payers (Arrow et al., 2009; Blumenthal, 2009; Kern et al., 2009) (see Chapter 5). These investments in data development and "meaningful use" of that data for quality improvement could eventually support national-level reporting in the NHQR and NHDR. Strengthening standardized collection of race, ethnicity, and language need data will assist in identifying the nature and scope of disparities in health care related to these factors. Furthermore, the development of organizational capacity to coordinate care (e.g., e-prescribing, patient-centered medical homes) and provision of a sufficient workforce are important areas of infrastructure that are relevant to health care quality and disparities (these components of infrastructure are examined further in Chapter 3 and Appendix D). Thus, the committee makes the following recommendation:

> **Recommendation 1: AHRQ should ensure that both the NHQR and NHDR report on the progress made on the priority areas for health care quality improvement and disparities elimination, and should align selection of measures with priority areas. Until a national set of priority areas is established, AHRQ should be guided by the Future Directions committee's recommended priority areas.**

While the committee has recommended eight national priority areas that are crosscutting in nature, that does not mean that tracking disease-specific measures of health care quality will no longer be necessary. There will still be audiences for whom that level of detail is important, but the print versions of the AHRQ reports do not always have to feature each disease-specific element; some elements can be included in expanded data featured online via an appendix to the report or other Web-based product.

FOCUSING RESOURCES AND ATTENTION ON NATIONAL PRIORITY AREAS

Priority setting is a systematic approach to distributing available resources among multiple demands in the effort to create the best health care system possible given economic constraints. Priority setting is also a first step toward actionability by focusing attention on areas that are considered most important (McGlynn, 2004; McMahon and Heisler, 2008; Ranson and Bennett, 2009; Sabik and Lie, 2008; Whitlock et al., 2010). Priorities matter because

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[12] *Patient Protection and Affordable Care Act*, Public Law 111-148, 111th Cong., 2d sess. (March 23, 2010).

[13] *American Recovery and Reinvestment Act of 2009*, Public Law 111-5, 111th Cong., 1st sess. (February 17, 2009).

TABLE 2-1 Overview of Priority Areas for Improving Health Care Identified by Leading Organizations, Initiatives, and Reports

National Priorities Partnership (NPP, 2008)	**Institute for Health Care Improvement *Triple Aim* (IHI, 2009)**	**HHS *Strategic Plan—FY 2007–2011* (HHS, 2008)**	**Centers for Medicare and Medicaid Services *Roadmap for Quality Measurement* (CMS, 2008)**	**HHS *Meaningful Use Matrix* (HHS, 2009b)**	**The Commonwealth Fund (Commission on a High Performance Health System, 2008)**
Increase patient and family engagement	Improve patient experience of care (quality, access, and reliability)		Confident, informed consumers; transparency	Patient engagement	
Improve population health (Reducing disease burden)	Improve population health	Public health promotion and protection (including promotion of preventive health care)		Improved population health	Healthy lives; prevention and treatment
Improve safety and reliability of health system (Eliminating harm)		Improve safety of health care	Safety, transparency	Improved safety	Safe and quality care
Guarantee compassionate care for persons with life-limiting illnesses					
Ensure well coordinated care			Smooth transitions of care	Coordination of care	
Eradicating disparities			Eliminating disparities (geography, race, income, language, diagnosis)	Reduction of racial disparities	Equity for all
	Improve patient experience of care (access)	Improve quality, affordability and accessibility to health care			Access for all
Eliminating overuse and ensure appropriate care	Reduce the per capita costs of health care		Efficiency; effectiveness; high-value health care	Increased efficiency	Efficient care; avoidable hospital use and cost
			Effectiveness (ensuring care is evidence-based)		
				Ensure adequate privacy and security protections for personal health information	System capacity

IOM *State of USA Health Indicators* **(IOM, 2008)**	**Robert Wood Johnson Foundation** *Aligning Forces for Quality* **(RWJF, 2009a)**	**Quality Alliance Steering Committee (QASC, 2009)**	**IOM** *Priority Areas for National Action* **(IOM, 2003a)**	**IOM** *Crossing the Quality Chasm* **(IOM, 2001a)**
	Increasing consumer engagement	Help consumers make informed choices	Self-management/ health literacy	Patient-centered health care
Improve population health outcomes and reduce risky behaviors			Immunization for children and adults; pregnancy and childbirth; tobacco dependence; obesity	
	Safer care		Medication management; nosocomial infections	Safe health care
			End-of-life care; frailty with old age; pain control in advanced cancer	
	Well coordinated care		Care coordination	
	Addressing equity and recognizing that language matters	Help reduce large racial and ethnic disparities in care		Equitable health care (e.g., gender, race, ethnicity, geographic location, and socioeconomic status)
Access (insurance coverage)				Timely health care
Cost (per capita expenditures; preventable hospitalizations)	More effective care	Structure payment to improve quality and efficiency		Efficient health care
				Effective health care
	Improving the "how to" of quality improvement; increasing public reporting	Help providers improve quality of care		
Indicators for health outcomes, health-related behaviors, and health systems			Priority conditions: asthma, cancer screening, diabetes, hypertension, ischemic heart disease, major depression, severe and persistent mental illness, stroke, children with special needs	Priority conditions: cancer, diabetes, emphysema, high cholesterol, HIV/AIDS, hypertension, ischemic heart disease, stroke, arthritis, asthma, gall bladder disease, stomach ulcers, back problems, Alzheimer's disease and other dementias, depression and anxiety disorders

BOX 2-3
The Committee's Eight Recommended National Priority Areas for Health Care Quality Improvement

The IOM Committee on Future Directions for the National Healthcare Quality and Disparities Reports recommends a set of eight national priority areas for health care quality improvement for use in the NHQR and NHDR; it believes these priorities can guide the national healthcare reports. The recommended areas include six priority areas identified by the National Priorities Partnership (NPP, 2008), as well as two additional priorities that the committee believes are important to highlight.

The six NPP priority areas included in the committee's set of national priority areas are:

1. **Patient and family engagement:** Engage patients and their families in managing their health and making decisions about their care.
2. **Population health:** Improve the health of the population.
3. **Safety:** Improve the safety and reliability of the U.S. health care system.
4. **Care coordination:** Ensure patients receive well-coordinated care within and across all health care organizations, settings, and levels of care.
5. **Palliative care:** Guarantee appropriate and compassionate care for patients with life-limiting illnesses.
6. **Overuse:** Eliminate overuse while ensuring the delivery of appropriate care.

The two additional priority areas in the committee's set are:

7. **Access:** Ensure that care is accessible and affordable for all segments of the U.S. population.
8. **Health systems infrastructure capabilities:** Improve the foundation of health care systems (including infrastructure for data and quality improvement; communication across settings for coordination of care; and workforce capacity and distribution, among other elements) to support high-quality care.

resources of all of kinds (e.g., labor/time, funding for research on measures, data development and analysis) are limited. The setting of national priority areas for the measurement of health care quality improvement can be viewed as having the potential for influencing the "allocation of limited resources among many desirable but competing programs or people;" thus, "it is highly political and can be controversial" (AHRQ, 2009a; McKneally et al., 1997; Whitlock et al., 2010, p. 493).

As the Future Directions committee's charge read to "establish national priority areas," the committee considered its role to be to advise AHRQ on a set of priorities. At the same time, AHRQ asked for advice on making the national healthcare reports more actionable, and others who came before the Future Directions committee or whose reports the committee reviewed also stressed the need for greater progress. Many are frustrated with the slow progress toward improvement despite repeated documentation of the same quality shortcomings and persistent disparities. However, focusing the combined efforts of many actors and various intervention techniques on the same priorities could be expected to enhance progress, whether they are the priorities that are recommended in this report or a set that emerges as a result of developing the national quality improvement strategy pursuant to health reform legislation.[14]

While AHRQ can use the priority areas offered in this report to select measures and guide the content of the NHQR and NHDR, it is not AHRQ's role to set intervention-related policies for a national quality improvement agenda that can have implications for resource allocation across HHS and external sources. Since AHRQ falls under the direction of the Secretary of HHS, the Future Directions committee concludes that HHS leadership is needed to establish national priorities and set clear goals that can be featured in the national healthcare reports and thereby bring to bear the resources of the department.

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[14] *Patient Protection and Affordable Care Act*, Public Law 111-148 § 3012, 111th Cong., 2d sess. (March 23, 2010).

Leadership in Establishing National Priorities and Goals

Although measures and reports such as the national healthcare reports cannot improve the quality of U.S. health care directly, they provide context and motivation for quality improvement (Moy, 2009). Reports can also present data in ways that better inform policy and practice. Complementary policies and practices that would help close priority area quality gaps and support more widespread implementation of programmatic initiatives are essential to drive progress. As noted in Chapter 1, the concept of a national quality measurement and reporting system outlined by the Strategic Framework Board depends not only on reporting, but also on the setting of goals, adoption of comparable measures, and interventions to change the state of quality and disparities (McGlynn, 2003). Thus, other incentives and collaborative efforts are needed to get to higher levels of performance (see Box 2-4 for examples of mechanisms and actors).

Having AHRQ alone adopt priority areas for use in the national healthcare reports without support across HHS is less likely to advance quality than if these other actors become engaged. Having common priority areas can help drive concerted national and local action toward the same ends. Part of the Future Directions committee's logic in adopting the six NPP priority areas was the NPP's ability to draw consensus from a reputable group of private and public sector members and the NPP's continuing engagement in fostering progress on those priority areas. The NPP has recommended priority areas and goals; the Future Directions committee's charge only extended to the naming of priority areas for quality improvement, not goals, although it heartily endorses the setting of goals and/or targets by HHS.

Furthermore, the word "national" is part of the names of the NHQR and NHDR, and the Future Directions committee observes that no report could present a full picture of national health care delivery without considering how priorities and goals are integrated and implemented in the health systems under the auspices of the VA, DOD, the Federal Employees Benefit Program, and the federal Bureau of Prisons. Under the *Patient Protection and Affordable Health Care Act*, the President would convene an interagency working group to foster collaboration between departments and agencies with respect to developing and disseminating strategies and goals for national health care quality priorities. The working group would be comprised of representatives from various HHS agencies, the Department of Commerce, the Office of Management and Budget, the Social Security Administration, the Department of Labor, the U.S. Office of Personnel Management, DOD, the VA, and the Department of Education, among others.[15]

The IOM report *Leadership by Example*: *Coordinating Government Roles in Improving Health Care Quality* stressed that if the federal government could take collective action across programs for which it has accountability, it would lead the way to action elsewhere (IOM, 2002b). To make substantial progress on national priorities and associated goals, there needs to be unequivocal endorsement and commitment at least at the level of the HHS Secretary to make substantial change in performance levels. Such a commitment could be embodied through a range of regulations and policies, including systematic reporting on quality metrics by federally sponsored direct health care service programs. The HHS Secretary is positioned to direct HHS programs to focus on the achievement of national priorities and goals through policies that support a stronger quality improvement infrastructure (i.e., measure development and the collection and analysis of evidence-based performance information), health care interventions (e.g., changes in insurance coverage, support of preventive and care coordination services), public reporting, incentive payments, demonstration projects, benefit design, and health professions education, as well as refining performance measures through research and funding of data sources (IOM, 2009). These HHS-wide efforts would complement efforts by the NPP.

Implementation by the HHS Secretary of initiatives for expanding health insurance coverage and reforming payment for services will require monitoring to ensure that the initiatives and existing programs will have the desired effect on quality of care, its costs, equitable treatment, and ultimately the health of the nation.[16] Additionally, substantial federal funds are being invested in strengthening electronic health records and providing for their meaningful use in quality improvement.[17] The NHQR and NHDR are natural vehicles for tracking the effect of

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[15] *Patient Protection and Affordable Care Act*, Public Law 111-148 § 3012, 111th Cong., 2d sess. (March 23, 2010).

[16] *Patient Protection and Affordable Care Act*, Public Law 111-148, 111th Cong., 2d sess. (March 23, 2010).

[17] *American Recovery and Reinvestment Act of 2009*, Public Law 111-5, 111st Cong., 1st sess. (February 17, 2009).

BOX 2-4
Health Care Quality Improvement: Illustrative Mechanisms of Influence and Actors

- **Payment incentives**—Centers for Medicare and Medicaid Services (CMS), private health plans
- **Public reporting**—CMS, states, National Committee for Quality Assurance (NCQA), health plans, private purchasers
- **Accreditation**—NCQA, The Joint Commission, American Board of Medical Specialties for credentialing/recredentialing
- **Leadership within institutions**—hospitals, provider groups
- **Compatible measurement, benchmarking, and feedback on performance**—CMS, states, NCQA, health plans, hospitals, Department of Veterans Affairs, Department of Defense, Health and Human Services direct service delivery programs (e.g., community health centers, Indian Health Service), provider groups, The Leapfrog Group, Consumer Reports
- **Entities influencing other entities involved in quality improvement and disparities reduction**—National Quality Forum, National Priorities Partnership, Out of Many, One, patient advocates

these changes, utilizing the data that emerge for national reporting, and reporting on designated priority areas. The NHQR and NHDR should contain a strategic vision for U.S. health care quality improvement efforts by reporting on areas with the potential to achieve the best value and equity for the dollars invested while having the greatest impact on population health. This strategic vision is the basis for the measure selection process for the NHQR and NHDR outlined in Chapter 4. The results of quantitative assessments of quality improvement impact for measurement areas and the identification of benchmarks based on best-in-class performance (Chapter 6) would additionally inform realistic goal- and target-setting for priority areas.

SUMMARY

To meet the needs of Congress and various other users for information on health care quality and to articulate a vision for national health care quality improvement, the committee believes that the NHQR and NHDR should do more than reporting on what has already transpired. The NHQR and NHDR and related products have the potential to articulate a vision for health care quality improvement and engage others to achieve quality improvement goals. Because disparities in care are a health care quality issue, greater integration between the NHQR and NHDR is recommended.

As required by its charge, the committee recommends a set of eight priority areas for national health care improvement: (1) patient and family engagement, (2) population health, (3) safety, (4) care coordination, (5) palliative care, (6) overuse, (7) access, and (8) capabilities of health systems infrastructure. While the Future Directions committee believes AHRQ can incorporate the offered priority areas into the NHQR and NHDR, especially through its messaging and measure selection process, more progress will be made toward achieving priority area goals if there is more widespread adoption and integration of national priority areas into a common quality and disparities improvement strategy.

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3

Updating the Framework for the NHQR and NHDR

The Future Directions committee's updated framework for health care quality builds on previous IOM recommendations for measuring the state of health care in the NHQR and NHDR. The revised framework encompasses both well-established and emerging components of high-quality health care. The framework is a tool for examining AHRQ's portfolio of measures for comprehensiveness and for categorizing measures presented in the NHQR and NHDR. The framework's quality of care components are effectiveness, safety, timeliness, patient-centeredness, access, efficiency, care coordination, and health systems infrastructure capabilities. The committee includes in the framework the crosscutting dimensions of value and equity, which are to be reported for each of the quality of care components and to be considered when ranking measures for inclusion in the NHQR and NHDR.

Before beginning to publish the annual NHQR and NHDR in 2003, AHRQ sought the IOM's guidance regarding the overall content and organization for the reports (Appendix A). The IOM reports *Envisioning the National Healthcare Quality Report* (IOM, 2001b) and *Guidance for the National Healthcare Disparities Report* (IOM, 2002) provided the original conceptual framework for quality measurement in the NHQR and NHDR (Appendix C), upon which the Future Directions committee has built. This chapter provides the rationale for an expanded framework and, in a complementary Appendix D, explores measurement possibilities for the new framework components.

The framework is intended to define "dimensions and categories of measurement that will outlast any specific measures used at particular times. In essence, it lays down an enduring way of specifying *what* should be measured while allowing for variation in *how* it is measured over time" (IOM, 2001b, p. 42). In this sense, the framework presents a performance measure classification matrix that is of use not only for the NHQR and NHDR but also for all national healthcare report-related products. Because the framework components accommodate a broad spectrum of measures, and the universe of potential measures is voluminous and ever expanding, the priority areas discussed in the previous chapter are one element in helping define a narrower set of measures within the framework components. (Chapter 4 includes the Future Directions committee's recommendations on further defining the set of measures according to their potential health care quality impact.)

THE ORIGINAL FRAMEWORK FOR THE NHQR AND NHDR

The original conceptual framework put forth in the 2001 *Envisioning the National Healthcare Quality Report* highlighted four components of health care quality: (1) safety, (2) effectiveness, (3) patient-centeredness, and (4) timeliness. These components corresponded to four of the six aims of quality health care set forth in the 2001 IOM report *Crossing the Quality Chasm: A New Health System for the 21st Century* (see Box 3-1). At the time, measurement of efficiency was considered underdeveloped and thus omitted from the framework. The component of equitable care was deemed a crosscutting dimension (see Appendix C for the framework originally adopted by AHRQ for the NHQR and NHDR).

Envisioning the National Healthcare Quality Report recommended that the performance measures presented in the NHQR be framed in consumer categories (i.e., in terms of "staying healthy, getting better, living with illness or disability, and coping with end-of-life care") (IOM, 2001b, p. 6). Subsequently, AHRQ found it more useful to frame the presentation of data by clinical stages of care (i.e., prevention, acute treatment, management) because that is the context in which most measures are currently developed. Although AHRQ's clinical stages of care are less patient-focused than the consumer categories, the committee agrees that the clinical stages of care are easily understood by patients as well as the policy makers, health care professionals, and researchers to whom the information in the NHQR and NHDR is primarily directed. Moreover, although data in the reports are not presented by the consumer categories, AHRQ indicated that these categories are implicitly considered when identifying potential measures for inclusion in its full measure set.[1]

Envisioning the National Healthcare Quality Report acknowledges that the conceptual framework should be dynamic in nature in order to adjust to "changes in conceptualization of quality or significant changes in the nature of the U.S. health care system" (IOM, 2001b, p. 42). Indeed, since the development of the original conceptual framework, new areas for health care performance measurement have emerged, as have attributes of what constitutes high-quality care, thus leading the Future Directions committee to update the framework.

AN UPDATED FRAMEWORK FOR THE NHQR AND NHDR

The six quality aims expressed in the 2001 IOM *Crossing the Quality Chasm* report (see Box 3-1) have become the basic vernacular for discussing health care quality improvement and disparities elimination. Many other organizations, ranging from providers to health plans to quality improvement organizations, have used the six aims to organize their own measurement or reporting efforts. For example, Aetna's High Performance Provider Initiatives and Hudson River Health Care (a safety net clinical setting) track performance measurement based on these aims (Aetna, 2008; Hudson River Healthcare, 2009). Because continuity is important to preserve and because the original conceptual framework for the national healthcare reports stems from the IOM's six aims, the committee decided to build on the pre-existing framework rather than propose an entirely new one. The framework remains applicable to both the NHQR and NHDR.

The Future Directions committee looked to prominent organizations and collaboratives engaged in health care quality improvement and disparities elimination for their informed perspectives on the latest advancements in and concerns about the current state of health care. Sources included the Healthy People 2020 Consortium, the National Quality Forum (NQF), the Institute for Healthcare Improvement, the Centers for Medicare and Medicaid Services (CMS), the HHS Office of Minority Health, the Kaiser Family Foundation, the World Health Organization (WHO), the Robert Wood Johnson Foundation, the Health Care Quality Indicators Project of the Organisation for Economic Co-operation and Development (OECD), The Commonwealth Fund's Commission on a High Performance Health System, the Quality Alliance Steering Committee, the National Committee for Quality Assurance, the Out of Many One Health Data Task Force, and the AQA alliance.

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[1] Personal communication, Future Directions committee chair's site visit to AHRQ, April 30, 2009.

BOX 3-1
The Six Aims of Quality Care from the IOM's *Crossing the Quality Chasm* Report

The IOM's 2001 report *Crossing the Quality Chasm: A New Health System for the 21st Century* found that the U.S. health care delivery system does not provide consistent, high-quality care to all people. The report says that between the health care that Americans have now and the care that they could have "lies not just a gap, but a chasm" (p. 1).

The *Quality Chasm* report strongly recommends that all health care constituencies—health professionals, federal and state policy makers, public and private purchasers of care, regulators, organization managers and governing boards, and consumers—commit to adopting a shared vision for improvement based on six specific aims for health care:

- **Safe**—avoiding injuries to patients from the care that is intended to help them
- **Effective**—providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and overuse, respectively)
- **Patient-centered**—providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions
- **Timely**—reducing waits and sometimes harmful delays for both those who receive and those who give care
- **Efficient**—avoiding waste, including waste of equipment, supplies, ideas, and energy
- **Equitable**—providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status

SOURCE: IOM, 2001a, pp. 5-6.

Framework Additions

Figure 3-1 shows the expanded conceptual framework for health care quality and disparities reporting. First, the committee explicitly includes access and efficiency as quality care components. These components are currently presented in one report or the other (access measures are reported in the NHDR but not the NHQR, and efficiency measures are beginning to be reported in the NHQR but not the NHDR). The inclusion of these two components in the framework reflects their relevance for reporting in both the NHQR and NHDR.

The Future Directions committee identified care coordination and capabilities of health systems infrastructure as necessary health care components to include in the national healthcare reports. These components are not necessarily health care aims/attributes in themselves, but are a means to those aims since they are elements of the health care system that better enable the provision of quality care. Care coordination and health systems infrastructure are of interest to the extent that they improve effectiveness, safety, timeliness, patient-centeredness, access, or efficiency. For this reason, these components are depicted as foundational, supporting the performance measurement of the other quality components and spanning across the different types of care. Measures and data sources for care coordination and systems infrastructure tend to be at a developmental stage,[2] and evidence of the impact on quality improvement for many measures in these areas has yet to be strongly established. Therefore, for these foundational components, the committee suggests that only measures that have demonstrated improvement in at least one of the other six components of care be reported in the national healthcare reports. For example, the Care Transitions Measure (often referred to as the CTM-3 measure) is a validated care coordination measure that quantifies hospital performance based on patient or caregiver experience with hospital transitions (Coleman, 2006; Parry et al., 2008). The care process captured by this measure has demonstrated positive health outcomes including reduced readmissions of patients discharged from hospitals and improved self-management and recovery of symptoms (Care Transitions Program, 2009). Reporting of this measure is not yet national in scope, but it holds promise as a care coordination measure that could be reported in the national healthcare reports at some point in the future.

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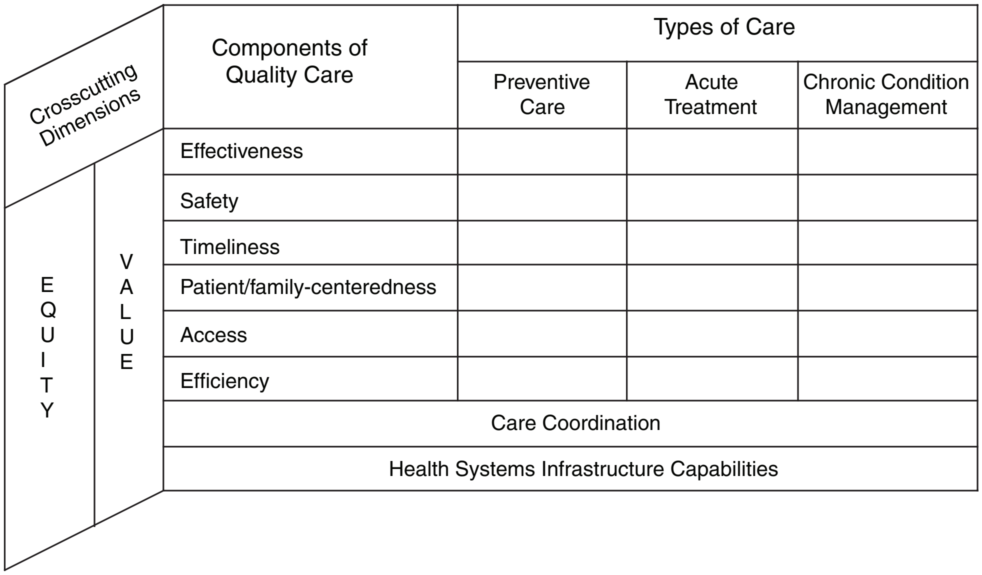
[2] In the context of this report, the term *developmental* refers to measures that are currently partially developed but not yet well tested or validated, or measures that have been validated but still lack sufficient national data on which to report. *Aspirational* refers to performance areas for which no measures yet exist—at best, there is a proposed way to measure performance.



Components of Quality Care	Types of Care		
	Preventive Care	Acute Treatment	Chronic Condition Management
Effectiveness			
Safety			
Timeliness			
Patient/family-centeredness			
Access			
Efficiency			
Care Coordination			
Health Systems Infrastructure Capabilities			

FIGURE 3-1 An updated conceptual framework for categorizing health care quality and disparities measurement.

Another enhancement to the conceptual framework is the presence of equity and value, which are displayed in a manner that conveys their applicability to each quality component, including the foundational elements of care coordination and health systems infrastructure. The committee views the dimensions of equity and value as ideals that can and should be achieved by improvement in each of the other framework components.

Although the committee has added components to the framework on which AHRQ should report, AHRQ should have flexibility to provide a more in-depth focus on some, but not necessarily all, of the identified priorities and their component parts from one year to the next, as long as there is comparability between the NHQR and NHDR for the measures selected for that year's report.

Application of the Care Components

As noted in *Envisioning the National Healthcare Quality Report*, "The framework is a tool for organizing the way one thinks about health care quality. It provides a foundation for quality measurement, data collection, and subsequent reporting" (IOM, 2001b, p. 42). The Future Directions committee's expanded matrix of care components and types of care provides a way for AHRQ to continue categorizing potential and existing measures, ensure a balance in measure selection across the framework components, and identify gaps in its portfolio of measures selected for tracking—including those featured in the NHQR, NHDR, and the online resources, such as the State Snapshots and NHQRDRnet. For example, if the NPP priority area to "eliminate overuse while ensuring the delivery of appropriate care" were adopted for the national healthcare reports, then overuse measures would fall within the efficiency component of the framework. Likewise, measures for the priority of palliative care would help fill the current gap in the reports related to patient-centered performance measures for the management of chronic conditions.

The committee's recommended framework is not intended to specify the priority areas for quality measurement discussed in Chapter 2. There is currently some overlap between priority areas and framework components. Priorities might, at times, place more emphasis on one area of the framework than another, and measures applicable to one priority might apply to a single or multiple framework component(s) (see Chapter 4, Figure 4-3).

AHRQ has strived for breadth by covering much of the framework's matrix in the annual healthcare reports and maintaining a more comprehensive measure set in derivative products. AHRQ acknowledges that maintaining and reporting on such a vast collection of measures has limited its ability to provide more in-depth treatment of the topics covered (Moy, 2009). Therefore, the committee presents priorities that can be used as a first step in whittling the measurement possibilities, and then followed by more quantitative steps described in Chapter 4.

Application of Equity and Value

Equity and value apply to each of the care components, including the foundational elements, and the results of equity and value assessments should be reported for each measure in the NHQR and NHDR. Findings can be included in graphics or text describing whether equity has been achieved and the value (based on the costs and benefits) that would accrue if quality gaps between current and desired levels of performance were closed (for example, if all persons, rather than 55 percent,[3] received preventive services) and if equity gaps were closed.

AHRQ currently applies the concept of equity by presenting quantitative differences in performance levels by geographic areas (NHQR) and different populations (NHDR). The Future Directions committee observes this has been useful for dividing the content between the two reports, but that at times the separation can lead to misleading conclusions about the progress of the country in achieving quality. As noted in Chapter 2, the committee believes that the NHQR should include population equity findings and the NHDR should include additional information on the potential impact of closing the quality gap.

Presenting value for each component is a complex endeavor because value can mean various things to different people. (For the broad definition of value used in this report, see Box 3-2.) AHRQ has begun to incorporate total and indirect costs for medical conditions, and estimates of the cost effectiveness of interventions (e.g., quality adjusted life years [QALYs]). The Future Directions committee lauds this movement, but also encourages AHRQ to report for each measure the potential quantifiable value of closing the gap between current and desired performance levels. Depending on the data available to describe the impact of closing the gap, findings might be presented in terms such as net health benefit, the size of the population affected, or estimated expenditure and possible cost savings.

The committee believes that using its updated framework provides AHRQ with a matrix to classify its current and future portfolio of measures to examine where measurement gaps might exist, while accommodating shifting priorities for the nation's health care system. Additionally, since equity and value are criteria in the proposed measure selection process (see Chapter 4), quantification of these concepts should be included in the data presented in the national healthcare reports. As a result, the committee recommends:

> **Recommendation 2: AHRQ should adopt the committee's updated framework for quality reporting to reflect key measurement areas for health care performance and use it to ensure balance among the eight components of quality care in AHRQ's overall measure portfolio. AHRQ should further use its crosscutting dimensions of equity and value to rank measures for inclusion in the reports.**

Additional justification for including equity and value, as well as each of the added quality of care components, is discussed in the following sections. To complement the justifications, Appendix D explores measurement possibilities for access, efficiency, care coordination, and health systems infrastructure.

RATIONALE FOR THE DIMENSIONS OF EQUITY AND VALUE

Equity and value represent dimensions of quality integral to all aspects of health care; each represents a larger goal of quality improvement that should be reflected in assessing individual quality measurement data.

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[3] In an examination of the quality of care delivered to a random sample of patients nationwide, McGlynn and colleagues estimated that only 55 percent of the population was receiving the recommended level of care (McGlynn et al., 2003).

BOX 3-2
Definitions of Equity and Value as Used in This Report

Because the committee proposes a new approach for assessing equity and value in future iterations of the NHQR and NHDR, and because there are many interpretations of the term *value*, the committee thought it important to define the terms *equity* and *value* as they are used in this report.

The Future Directions committee bases its definition of equity on the previous IOM definition of what is equitable:

> providing health care to all individuals in a manner "that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status." (IOM, 2001a, p. 6)

The committee defines value as:

> a measure of stakeholder utility (subjective preference by a group or individual) for a particular combination of quality and cost of care or performance output.

Equity

Envisioning the National Healthcare Quality Report and *Guidance for the National Healthcare Disparities Report* recommended the inclusion of equity in the framework (IOM, 2001b, p. 62, 2002, p. 11), and the Future Directions committee's framework retains it as a crosscutting element. Although the illustrated framework in the IOM's *Envisioning the National Healthcare Quality Report* did not explicitly include equity, the report specifically recommended that "equity be examined as an essential crosscutting issue" and that variations in the quality of care by race, ethnicity, gender, age, income, geographic location, insurance status, or socioeconomic status "have to be considered within each cell of the classification matrix in order to examine equity" (IOM, 2001b, p. 62). *Guidance for the National Healthcare Disparities Report* reiterated that AHRQ should use the framework recommended in *Envisioning the National Healthcare Quality Report* as the basis for the NHDR and that the NHDR was to "highlight health care issues related to equity and the extent to which health care disparities undermine its achievement" (IOM, 2002).

AHRQ focuses the NHQR on geographic differences by state and the NHDR on differences by gender, ethnicity, and socioeconomic status, as well as rural and metropolitan differences. Usually, the terms *equity* and *disparities* are more closely aligned in the literature with the quality of care, or lack thereof, being delivered to the populations featured in the NHDR. AHRQ has indicated that it defines disparities for the NHDR as "simple differences" and that its use of the term "disparities" does not have any more detailed implications. Others researchers and quality stakeholders distinguish the meaning of differences and disparities (see Figure 3-2 for one such example). The IOM report *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care* (2003b) describes a disparity as a difference in health or clinical outcomes that is not attributable to clinical appropriateness or patient preferences.

A body of literature identifies inequities in health care for different populations, primarily for low-income or certain racial and ethnic groups (Asch et al., 2006; Baicker et al., 2004; Blendon et al., 2007; Doescher et al., 2001; Fiscella et al., 2000). The Census Bureau projects that by 2045, half of the people living in the United States will be members of racial minority population groups (U.S. Census Bureau, 2008). Given these demographic changes, disparities may affect an even greater number of individuals in the future. Studies have assessed the implications of such demographic trends, coupled with known disparities, on costs to the health care system (LaVeist et al., 2009; Waidmann, 2009).

Equity has often been viewed separately from quality when in fact, the two concepts are interconnected. Equity for minority, low-income, and other populations should be on the nation's quality improvement agenda to ensure "equal access to available care for equal need, equal utilization for equal need, equal quality of care for all" (Whitehead, 1990, p. 8). Achieving equity should not be the sole purview of those working to address the core needs of low-income populations or communities of color. The interconnectedness of equity and qual-

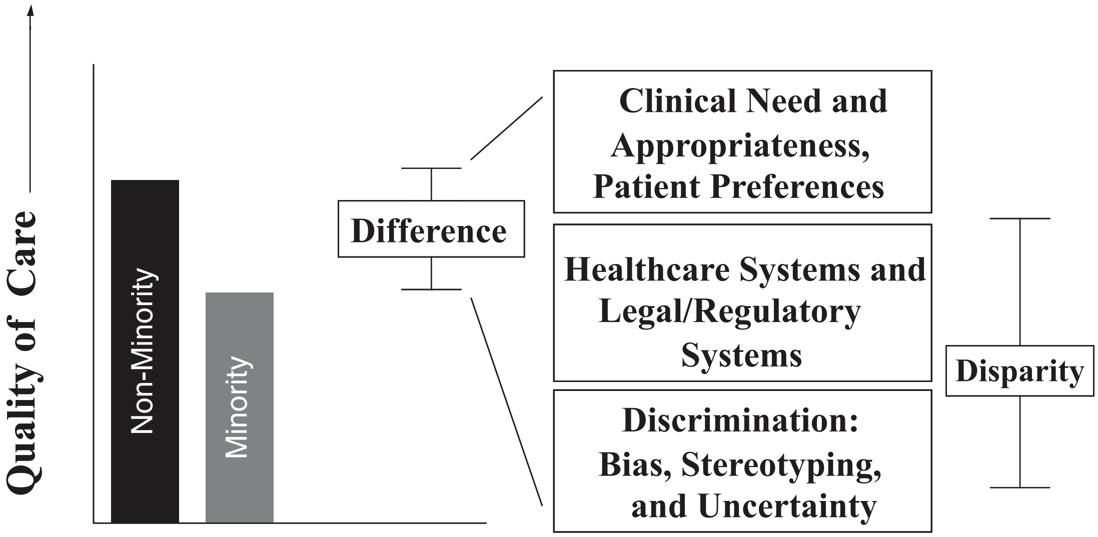

FIGURE 3-2 Differences, disparities, and discrimination: Populations with equal access to health care.
SOURCE: IOM, 2003b. Reprinted with permission from Mark G. McGuire 2010.

ity has been recognized by numerous entities and individuals within the quality enterprise (Chin and Chien, 2006; Disparities Solution Center, 2009; Frist, 2005; RWJF, 2010), indicating that equity is an "integral part of quality improvement scholarship" (Chin and Chien, 2006, p. 79). This connection should be made more visible by quality improvement programs (Chin et al., 2007; Watson, 2005), and the NHQR can play a role in doing so. As Chin and Chien stated: "We know a considerable amount about the mechanisms causing these [racial] disparities. There is therefore a crying need for solutions to reduce disparities, and QI [quality improvement] interventions must play a key role," (Chin and Chien, 2006, p. 79). Integrating equity information into the NHQR and spotlighting promising interventions can assist in linking disparities elimination to quality improvement.

The causes of both quality problems and disparities are often context-specific. Bias might be a significant problem in one area whereas access or costs might predominate in another. Arguably, access-related issues (e.g., insurance, costs, geography, health literacy, language) are among the most important drivers of health care disparities. The Future Directions committee agrees that AHRQ can primarily report differences among population groups without determining the cause, but that AHRQ should examine, whenever data allow, the effect of possible drivers so that analyses will better inform policy. Fully understanding the degree of disparities is often made difficult by data limitations, a topic further addressed in Chapter 5.

Value

The term *value* is used in varied ways in contemporary health care parlance. Some definitions are deceptively simple (e.g., "quality for cost"). Correspondingly, some observers take the term *high value* to be synonymous with a good cost-effectiveness ratio—the best achievable health outcomes per dollar spent (Porter, 2009). The committee recognizes that in the quality improvement literature, value-based care often refers to developing quality health care that is cost effective (CMS, 2008a; HHS, 2009; Patrick, 2009; Wong et al., 2009), or optimizing the "the ratio of benefits to cost" (IOM, 2010, p. 29). Other definitions of value are more complex and encompassing, and attempt to incorporate subjective attributes of value in the health care system, such as positive patient experiences with desired health outcomes (Wharam and Sulmasy, 2009).

The Future Directions committee presents value as a crosscutting dimension of health care quality such that a high-value health care system is one that maximizes all the components of quality care outlined in the proposed conceptual framework (Figure 3-1). For the purposes of this report, the committee defines value as "a measure of stakeholder utility (subjective preference by a group or individual) for a particular combination of quality and cost of care or performance output" (see Box 3-2). This is a broad concept, not limited to enhancing economic value but also enhancing health impact and patient experience. Assessing value is not to be confused with measuring the efficiency of health care services, which refers to maximizing objective performance (health care outcomes) by producing the best possible outputs from a given set of resources or inputs (McGlynn, 2008). While more difficult to measure and more subjective, the broad concept of value is ultimately the key overarching utility placed on health care, and thus the committee believes that it is important to include in its framework this concept explicitly and distinctly from efficiency.

A high-value health care system involves providing care whose benefits "are worth" or exceed their costs by being appropriate and affordable to society, and where treatment has large aggregate health benefits, measured, for example, using the concept of clinically preventable burden. (Cost-effectiveness and clinically preventable burden are discussed further in Chapter 4.) For some health care services and some dimensions of care, it will be difficult to quantify cost-effectiveness or clinically preventable burden. Examples include *making care more patient-centered* and *improving care coordination*, which can be fundamental to a patient's perception of experiences with care (Wharam and Sulmasy, 2009). The fact that quantifying cost-effectiveness and clinically preventable burden may be difficult for these dimensions of health care does not mean that improving these dimensions does not enhance value. So while the committee wants increased consideration in the NHQR and NHDR of the quantitative benefits that would accrue from closing the gap based on available value metrics (e.g., cost-effectiveness analysis), the committee acknowledges that such quantitative data are just one facet of assessing value.

RATIONALE FOR THE FOUR NEW QUALITY OF CARE COMPONENTS

The committee concludes that high-quality, equitable health care is facilitated by enhanced access to care, efficiency, care coordination, and a supportive health systems infrastructure. For that reason, the committee has included all four of these quality components in the updated framework. This chapter does not present the rationale for including the pre-existing framework components of effectiveness, safety, timeliness, and patient centeredness as the rationale for each was presented in *Envisioning the National Healthcare Quality Report*, and AHRQ has responded by reporting on these topics.

Access

The IOM defines access as "the timely use of personal health services to achieve the best possible health outcomes" (IOM, 1993, p. 4). Access to care remains a central challenge for the U.S. health care system (Ginsburg et al., 2008; IOM, 1993, 1998, 2009), and this topic has been highlighted in the NHDR as a component of health care quality that exhibits disparities. The committee finds that improving access is a fundamental aspect of quality for the entire population. Therefore, access should be addressed in both reports.

With more than 46 million uninsured Americans as of 2008 (U.S. Census Bureau, 2009a) and large numbers of Americans reporting they have gone without needed care (Cunningham and Felland, 2008; IOM, 2009), access is a critical issue for the nation. Uninsurance affects all population groups, not only low-income or minority groups. For example, as of 2008, people with household incomes greater than $50,000 per year (middle and higher income families) constituted 22.2 percent of the uninsured population (U.S. Census Bureau, 2009b), and non-Hispanic Whites made up nearly half of the uninsured individuals in the United States (U.S. Census Bureau, 2009c). Although the availability of health insurance is significant when measuring access and utilization—insurance is an entryway into the health care system and is often linked with health status (DeVoe et al., 2003; Hadley, 2002; Ross et al., 2006)—other aspects are also barriers to receiving appropriate medical care. For example, even if more people obtain insurance coverage, problems will likely persist in access to care, including affordability (Cummingham et al., 2008; IOM, 2009), access to a usual or ongoing primary care provider (Goldman and McGlynn, 2005; Sack, 2008), and the ability to see those physicians (Ahmed et al., 2001; Hall et al., 2008).

Affordability of health care is a major concern for Americans (Blendon et al., 2004; Gallup Consulting, 2009)—medical causes and related costs (in the form of medical bills, or lost wages due to days unable to work) were behind 62 percent of all personal bankruptcies in the United States in 2007 (Himmelstein et al., 2009). Additionally, 35 percent of adults with health insurance still experience access problems due to cost (Collins et al., 2008; Cummingham et al., 2008; Gabel et al., 2009; Wang et al., 2009). Deemed the underinsured, the number of individuals who fall into this category rose from 16 to 25 million from 2003 to 2007 (Schoen et al., 2008). High deductibles and copayments, exclusion by condition or by service, the Medicare Part D donut hole, and caps on coverage all contribute to lack of affordability (Briesacher et al., 2009; IOM, 2009).

Primary care represents the entry point and foundation for successful health care systems (Grumbach and Mold, 2009; Starfield and Shi, 2002, 2007). Individuals who report having usual and continuous sources of care (particularly primary care) are associated with overall better health regardless of other factors (including general health status, insurance status, greater utilization of health care services, fewer delays in getting care, and better preventive care) (Doescher et al., 2001; RWJF, 2002; Starfield and Shi, 2007; Starfield et al., 2003). Ensuring access to care for other specialties, such as mental and oral health care, is also important for overall health and availability to needed care (Chapin, 2009; Edelstein and Chinn, 2009; Pomerantz et al., 2008). Regular access to health care services has been shown to correlate with reduced hospital use while preserving quality because ongoing clinical preventive services allow for the prevention of disease or detection of asymptomatic disease or risk factors at early, treatable stages (Bodenheimer, 2005). If someone is not seeking ongoing care for his or her conditions, it is possible that the illness will not be managed effectively (Collins et al., 2008), increasing one's risk of a worsened condition that ultimately may be costlier to treat.

The combination of insurance coverage, affordability, and access to ongoing sources of care illustrates that access is a broad topic with multiple dimensions, and that it can be assessed by a variety of measures (AHRQ, 2009b; Cantor et al., 2007; The Commonwealth Fund Commission on a High Performance Health System, 2008; NCQA, 2009). The printed version of the 2008 NHDR reported on 10 access measures (AHRQ, 2009b). AHRQ breaks down the access section in the NHDR into two categories: "facilitators and barriers to care" and "health care utilization" (which includes measures of dental, emergency, and mental health care). By organizing the access section in this way, AHRQ attempts to capture the discrete variables that affect access. The committee suggests that AHRQ begin, at a minimum, to include those same or related measures in the NHQR as indicators of how well the structure of the nation's health care system responds to the various needs of patients.[4] Exploratory methods for measuring some other aspects of access to care are presented in Appendix D.

Efficiency

Efficient care is defined in the IOM's *Quality Chasm* report as "avoiding waste, including waste of equipment, supplies, ideas, and energy" (IOM, 2001a, p. 6). While this definition captures the concept of efficiency, to better convey the technical aspects involved with measuring efficiency, the committee also uses a definition put forth by Safavi (2006) and McGlynn (2008): maximizing performance (health care outcomes) by producing the best possible outputs from a given set of resources or inputs. Efficiency measurement includes optimal management of resources (such as administrative, operational, and clinical policies and practices) in order to maximize health care value (Bentley et al., 2008).

Efficiency is only one aspect of value-based care. Assessing efficiency is a distinct process that focuses solely on the objective use of resources (e.g., human labor, supplies, devices, money) relative to producing health care outcomes (e.g., hospital discharge, clinical examinations). For instance, measuring efficient performance could mean assessing the number of health care professionals required to properly execute a surgical procedure. Unlike value, it does not include aspects of patient-centeredness or valued patient experiences (for which there are limited metrics) nor is it always equated with comparative-effective analysis, which is another way to assess value.

Efficiency was previously omitted from the original framework recommended in *Envisioning the National Healthcare Quality Report* on the grounds that it was "outside the scope of the Quality Report and will be better addressed by specific efforts designed to face the considerable methodological and measurement challenges

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[4] This committee has been informed by AHRQ staff that the 2009 NHQR will include data on insurance and underinsurance status.

involved" (IOM, 2001b, p. 66). Nine years later, growing costs and purchaser concern with value have created an increased level of interest in measures of efficiency for the health system. As of 2008, the United States spent 16.2 percent of its gross domestic product (GDP) ($2.3 trillion) on health care (CMS, 2010), a total that is projected to reach nearly 20 percent of the GDP (an estimated $4.3 trillion) by 2017 (Keehan et al., 2008). The committee, therefore, agrees that the contribution of efficiency to health care value and quality cannot be ignored and that this component must be more comprehensively addressed in the NHQR and NHDR. AHRQ first attempted to address the component of efficiency in the 2007 NHQR, yet efficiency remains an underdeveloped aspect of the report for which AHRQ has specifically requested guidance.

In assessing efficiency, it is important to note that much of the research on health care efficiency suggests that cost and quality are not necessarily correlated (Fisher et al., 2003; Roski et al., 2008; Scholle et al., 2005; Solberg et al., 2002): the amount of money or resources spent on health care is not always indicative (or predictive) of the quality of services received or outcomes achieved (Weinstein and Skinner, 2010). Examples show that some of the most cost-efficient delivery of health care services is occurring in settings with the highest quality care, providing models for others of how to attain efficient and high-quality care that offers high value (Cantor et al., 2007; The Commonwealth Fund Commission on a High Performance Health System, 2008). Yet there are examples that demonstrate the contrary, where higher total per capita state spending on health care is correlated with better quality care (Cooper, 2009a). The complexity implied in these results illustrates the challenges in providing national measures of efficiency.

To better understand how efficiency can be measured, it is useful to refer to Bentley and colleagues' description of the different types of waste in the U.S. health care system. Equating waste with inefficiency, they break down the different aspects of efficiency in the system into three main components: administrative, operational, and clinical:

> *Administrative waste* is the excess administrative overhead that stems primarily from the complexity of the U.S. insurance and provider payment systems (e.g., billing/claims processing, sales/marketing practices, compliance procedures, benefits design), *operational waste* refers to other aspects of inefficient production process (e.g., unnecessary or duplicative procedures, use of defective devices that cause errors, or wasted time transporting people or materials), and *clinical waste* is created by the production of low-value outputs (e.g., overuse of certain procedures). (Bentley et al., 2008, p. 632)

Because outputs are always considered when evaluating efficiency measures, there is a distinction to be made between efficiency measures and measures of cost. Cost measures consider resource consumption (the inputs used) relative to costs without consideration, or in isolation, of the results produced (i.e., resources used by unit price) (AQA, 2009; Krumholz et al., 2008).

Efforts to incorporate quality outcomes (whether a patient's health outcomes or a provider's performance outcomes) in the construction of efficiency measures are underdeveloped, and significant questions have been raised regarding the use of these measures for public reporting, tiered network design, or pay-for-performance (McGlynn, 2008). Nonetheless, some cost and efficiency measures being used may help suggest opportunities for development of this area in the NHQR and NHDR (see Appendix D).

This committee encourages the development of efficiency measures that determine health outcomes as an output. McGlynn's systematic review identifies two different types of outputs, or products, of the health care system: health services (e.g., visits, drugs, admissions) and health outcomes (e.g., preventable deaths, functional status, blood pressure control) (McGlynn, 2008). The review notes that the vast majority of efficiency measures from the examined literature focused on *health services* as the output, and that only 4 (out of 250) used *health outcomes* as the desired end. The committee agrees that ideal assessments of efficiency would use health outcomes as the outputs of interest, as the goal of high-value care is not merely to provide inexpensive care. The dearth of such efficiency measures deserves attention, and their development in the future could be an area that AHRQ plays a role in supporting. Involvement in this task will be important because a number of unresolved methodological issues persist regarding the creation of credible and reliable efficiency measures (e.g., how to incorporate quality outcomes, ensuring reliability of measurement, attribution of providers, and validating risk-adjustment methods) (Hussey and McGlynn, 2009).

Considerations for Reporting Efficiency Measures

The committee acknowledges the inevitable trade-off in reporting measures that capture information at a national level rather than at a more local or organizational level; the more national level a measure is, the more useful it might be to policy makers and the less useful it might be to health care providers or community-level decision-makers. Likewise, the more local or organizationally specific measures are, the more the reverse is true. However, the committee agrees that as national reports, the NHQR and NHDR should continue to primarily focus on reporting system-level (state and national) efficiency measures that reflect a broader perspective. Additional data relevant to other stakeholders (e.g., providers, payers), or reported at a more local level, could be presented via online mechanisms, derivative publications (e.g., fact sheets), or links to other source data (e.g., CMS).

AHRQ should begin presenting cost and efficiency measures in both the NHDR and the NHQR and stratify these measures in ways that illustrate the variation in care for different populations. Such stratification will be useful because significant differences have been found regarding the use of health care services among different populations. For example, non-Hispanic Whites have high rates of overuse for many procedures including coronary revascularization (Epstein et al., 2003), typanostomy tubes (Kogan et al., 2000), and use of antibiotics (Gonzalez et al., 1997). In comparison, African Americans, and in some cases Latinos, have higher rates for theoretically avoidable procedures (e.g., treatment of late stage cancer, limb amputations) and inappropriate use of emergency department visits and hospitalizations for avoidable conditions (potentially due to neglected prevention screenings and disease management) (Fiscella, 2007; Shavers et al., 2009). Reporting such findings is informative for promoting more targeted quality and disparities interventions.

Care Coordination

The IOM has previously identified care coordination as 1 of its 20 national priorities for improving quality and as a primary area for performance measurement (IOM, 2003a, 2006). Other organizations, including CMS, WHO, The Commonwealth Fund, NQF, and the NPP, have also identified care coordination as a valuable component for enhancing health care delivery and patient experiences (CMS, 2008b; The Commonwealth Fund Commission on a High Performance Health System, 2006; NPP, 2008; NQF, 2009; WHO, 2008). Increasing evidence shows that fragmented or uncoordinated care often hinders optimal patient care. Suboptimal care coordination can refer to poor transitions at hospital discharge (Coleman et al., 2007), inadequate reconciliation of medications (NPP, 2008), and inadequate communication between primary care physicians, specialists, and other health care providers that can lead to contradictory messages or instructions for patient care. These gaps contribute to errors, adverse events, and avoidable costs including avoidable hospitalizations and unnecessary duplication of tests and procedures (Bodenheimer, 2008; Epstein, 2009; Wolff et al., 2002). Consequently, the committee feels that care coordination is sufficiently important for providing quality care, and highlights it as a separate framework component.

In a well-coordinated system, information for decision-making and care provision is shared across providers and settings so that integrated and well-communicated care occurs seamlessly throughout a patient's care experience (AHRQ, 2007). Efforts to coordinate care occur within a variety of health care environments (including across public and private sectors) and aim to improve patient outcomes and reduce health care spending (AHRQ, 2007). Care coordination programs have been found to reduce readmissions in hospitals, increase length of time between discharge and readmission, improve patient and caregiver communication (AHRQ, 2007; Naylor et al., 2004), improve patient satisfaction with care received (Neumeyer-Gromen et al., 2004), and improve health outcomes (Foy et al., 2010; Peikes et al., 2009; Wadhwa and Lavizzo-Mourey, 1999). Most of these programs address complex chronic diseases and aim to reduce the costs associated with these conditions (CMS, 2009a). That said, there is reason to believe that care coordination can benefit all populations and individuals (Starfield and Shi, 2004).

Involving the patient in information exchanges and decision-making is another aspect:

> Care coordination is a function that helps ensure that the patient's needs and preferences for health services and information sharing across people, functions, and sites are met over time. Coordination maximizes the value of services delivered to patients by facilitating beneficial, efficient, safe, and high-quality patient experiences and improved healthcare outcomes. (NQF, 2006)

Care coordination's importance as an emerging area for measurement is further supported by its potential to reduce costs to the health care system. While evidence of cost reduction is mixed, in some instances, increasing the integration of services or coordination of care among multiple settings has been demonstrated to be cost-effective (AHRQ, 2007; Choudhry et al., 2007; Neumeyer-Gromen et al., 2004; Peikes et al., 2009; Smith et al., 2007). Such findings are particularly significant given that 10 percent of individuals in the U.S. account for 70 percent of total health care expenditures (Monheit, 2003). In other instances, however, care coordination programs have not been shown to provide any cost savings (Peikes et al., 2009; Wadhwa and Lavizzo-Mourey, 1999).

In spite of the mixed empirical findings, the committee believes that care coordination, because of the potential to improve health outcomes and patient experiences and lower costs, is an important foundational element of quality across the spectrum of care and contributes to each of the other care components (e.g., effectiveness, safety, patient-centeredness). Thus, care coordination should be monitored through reporting in the NHQR and NHDR.

Although AHRQ is expected to report on a number of care coordination measures in the 2009 NHQR and NHDR, some measures are intended to appear only once due to limitations in AHRQ's data sources. Among those measures being planned for reporting include: integration of information (receipt of test results, doctor with information about care from specialists, and other providers in practice with enough information about an individual to provide care), transitions of care (complete written discharge instructions, inadequate discharge information), and perception of care coordination.[5] Reporting of these measures is an improvement, and the committee believes that AHRQ should continue to report care coordination measures in future reports, giving the topic appropriate attention in a separate chapter. Additional suggestions for reporting care coordination measures can be found in Appendix D.

Capabilities of Health Systems Infrastructure

Ensuring well-coordinated, high-quality health care requires supportive systems infrastructure. Such an infrastructure means having information systems in place for data collection, quality improvement analysis, and clinical communication support. Additionally, systems infrastructure includes having an adequate and well-distributed workforce in place, and the organizational capacity to support emerging models of care, cultural competence services, and ongoing improvement efforts. Adequate systems infrastructure for various care models helps promote and sustain performance improvement and has the potential to increase system efficiency by streamlining administrative, operational, and clinical processes, and reducing duplication of work (Bodenheimer and Grumbach, 2003; Bodenheimer et al., 2002, 2009; Grumbach, 2003; Grumbach and Bodenheimer, 2004). Conversely, a lack of system capabilities can disadvantage specific populations (e.g., rural populations with fewer available health care professionals, minority populations served by providers without health information technology [HIT] support).

Because many of the performance measures for infrastructure capabilities are still developing, the committee encourages further investigation and evaluation of measures in this area. Among the infrastructure capabilities that could be further evaluated for reporting in the national health care reports are care management processes, the adoption and use of HIT, workforce distribution, and the relevance of these capabilities to disparity populations.

Integrated Delivery Systems

Growing evidence highlights the benefits of integrated delivery systems on system efficiency and patient outcomes (Bradley et al, 2005; Coleman et al., 2009; Enthoven, 2009), including integrated systems that promote cultures of safety and team-based practices (Shortell et al., 2004; Singer et al., 2009). Examples of effective integrative models of care include the patient centered medical home (PCMH) and Wagner's chronic care model (CCM). Each promotes the collaboration of various health care professionals, within and across settings, to provide continuous, patient-centered care. A PCMH is defined as "a team-based model of care led by a personal [primary care] physician who provides continuous and coordinated care throughout a patient's lifetime to maximize health outcomes" (American College of Physicians, 2010). Medical homes enhance access to care through "open schedul-

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[5] Personal communication, Ernest Moy, Agency for Healthcare Research and Quality, October 13, 2009.

ing, expanded hours, and new options for communication between patients, their personal physician, and practice staff" (The Patient-Centered Primary Care Collaborative, 2007). One study has shown that disparities in health care quality can be diminished or eliminated through clinical practices (e.g., ready telephone access, availability of medical care or advice on weekends/evenings, organized and timely office visits, provider continuity) (Beal et al., 2007). Similarly, the CCM promotes health systems whose structure enables community-based services, support for self-management of care, information support systems, and delivery system design (Improving Chronic Care Illness, 2010). The element of information support systems is particularly important for these models of care, as it provides continuity in patient records and clinician communication.

HIT Infrastructure

As the future of health care becomes more electronically driven, adequate HIT systems will increasingly provide a foundation for tracking quality improvement in care delivery and patient outcomes. Although the adoption of an HIT system is no guarantee of better health care quality outcomes, and more work is needed to determine its impact on quality improvement, the increased and more efficient use of HIT can make available additional sources of valuable data on clinical outcomes (Arrow et al., 2009). Appropriate HIT represents a supportive foundation for new health care models (e.g., the CCM and PCMH) and payment reforms (e.g., pay-for-performance and value-based purchasing) (Bodenheimer et al., 2002; The Patient-Centered Primary Care Collaborative, 2007). The adoption and use of HIT as a tool to manage costs and improve the quality of care delivered (Balfour et al., 2009) has been shown to help reduce medical errors and adverse events, enable better documentation and file organization, provide patients with information that assists their adherence to medication regimens and scheduled appointments, and assist doctors in tracking their treatment protocol (Balfour et al., 2009; Herzer and Seshamani, 2009; Keenan et al., 2006; Keyhani et al., 2008; O'Connell et al., 2004). The committee recognizes, though, that not all aspects of HIT adoption have resulted in positive effects. Systems that integrate poorly with other information systems may be more time-consuming to use or may unnecessarily duplicate efforts (Campbell et al., 2006). Many electronic health record (EHR) systems that providers currently use have little, if any, interoperability with one another, creating an inability to share information between providers (Improving Chronic Care Illness, 2010). Furthermore, heavy reliance on these systems may affect general provider communication skills and the occurrence of face-to-face interactions among clinicians or with their patients (Ash et al., 2007).

The proposed requirements for receiving incentive payments under the HITECH Act include the collection and reporting of race, ethnicity, and language data for at least 80 percent of Medicare or Medicaid patients seen by that hospital or provider (CMS, 2009b, pp. 50, 55, 69, 77-78). Each hospital or provider seeking a HITECH incentive payment will have to provide patient quality data stratified by race, ethnicity, and language (CMS, 2009b, pp. 52, 56, 83). As these hospitals and providers implement HIT systems, and as states build health information exchanges to share these data, the nation's overall capacity for quality data collection and reporting by race, ethnicity and language will dramatically increase. These additional data will provide a stronger basis for identifying cultural competence needs and other disparity gaps. Such endeavors highlight the advantage of having solid infrastructure capabilities from which the national healthcare reports will likely benefit.

The adoption of HIT in the United States is relatively low. Evidence suggests that only 17 percent of physicians in ambulatory care environments have EHR access (RWJF et al., 2008), and a study of acute care hospitals shows that only 1.5 percent of those surveyed have a comprehensive EHR system (i.e., present in all clinical units) (Jha et al., 2009). Nevertheless, the need to establish such systems has gathered momentum from the HITECH portion of the *American Recovery and Reinvestment Act of 2009* (ARRA).[6] In 2009, the federal government invested $49 billion for HIT, most specifically for EHRs, but also for e-prescribing, quality reporting, and health information exchange (Chang, 2009). HITECH, which focuses on quality, promotes HIT as a means to improve health outcomes and efficiency of health care systems (Blumenthal, 2009).

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[6] *American Recovery and Reinvestment Act of 2009*, Public Law 111-5 § 4101, 111th Cong., 1st sess. (February 17, 2009).

Health Care Workforce

The health care workforce is another aspect of systems infrastructure on which the NHQR and NHDR should report. Considered the backbone of the health care system, the workforce is comprised of all health care providers, from physicians, dentists, and nurses, to laboratory and pharmacy technicians, to nursing home staff. Ensuring a sufficient number of providers is important for the health care delivery system and can be an indicator of the quality of care delivered. For example, Cooper examined the supply of physicians in various states relative to reported state rankings of quality care and found that the total supply of physicians (both specialists and primary care) was associated with the quality of care delivered (Cooper, 2009b). Other studies demonstrate that the ratio between nurses and patients in a given organization can also impact the quality of care delivered (Gordon et al., 2008; Kane et al., 2007; Needleman et al., 2002). Currently, staffing shortages are a concern for several physician specialties (AMA, 2009; IOM, 2008), nurses (Gerson et al., 2005), and other health care professionals (HRSA, 2009). Ensuring a large enough and appropriately distributed workforce to respond to expected increases in patient demand (IOM, 2008) will be an important task.

The implications of shortages are illustrated by recent data that indicate access to primary care has been declining, in part due to an emerging primary care workforce shortage (Bodenheimer et al., 2007). A significant number of primary care physicians cannot and will not accept new patients (CDC, 2007). Combined with the aging of the baby boomer population, shortages of primary care and other health care professionals are expected to remain in many areas of the country (IOM, 2008).

The ratio of providers per 100,000 has been widely used to estimate provider shortages in geographic areas (HRSA, 2009). For example, there are numerous parts of the United States that are designated as medically underserved areas or populations (MUA/Ps) as well as areas designated as health professional shortage areas (HPSAs) (HRSA, 2009), where the distribution of health care professionals or sites available to serve populations are lower than what is recommended. Southern and mid-western states tend to have the highest number of HPSAs compared to other regions of the country (HRSA, 2010). Reporting some data on these designated underserved areas, perhaps at the state level, may help inform where additional action could be taken to improve delivery of or access to care. Furthermore, analyzing these data in conjunction with information on receipt of health care services and patient outcomes would be the type of informative analyses that the Future Directions committee would like to see provided in the NHQR and NHDR. AHRQ could provide other assessments of availability for various types of health care professionals to better inform this issue, including but not limited to information on primary care and specialist physicians, nurses, mental health, and dental care professionals.

Infrastructure to Support Access and Utilization

The significance of health infrastructure capabilities can be of particular importance for underserved areas and priority populations. Appropriate information systems and a well-trained workforce are key elements for providing access to needed care in the form of enabling services, such as patient outreach, patient navigation services, and training in cultural competence (Fiscella, 2007; HRSA, 2007; Ro et al., 2003).

Knowledge of a patient or group's language and cultural needs better equips providers to deliver high-quality care and communicate effectively with patients. Currently, there are limited national data regarding linguistic competency (among providers or patients) or the use of various interpreter services (e.g., in-person translation, telephonic and video health care interpretation, translation of documents). Yet, the presence of these services in health care settings will be increasingly important as the population of the United States increases in diversity and potentially includes more individuals with limited English proficiency (Betancourt et al., 2005; Moreno et al., 2009). For example, with the U.S. Hispanic population projected to comprise 30 percent of the population by 2050 (U.S. Census Bureau, 2008), reporting on measures that capture the persistence of linguistic barriers will be important.

AHRQ currently reports data on a measure of workforce diversity that reflects the racial and ethnic make-up of reported registered nurses, licensed practical nurses, and licensed vocational nurses in the United States, and another measure on the availability of language assistance at the usual source of care for limited English-proficient adults (AHRQ, 2009a). Striving to report these data at the state level would be even more informative. AHRQ might also further analyze the data reported for the workforce diversity and language assistance measures to determine whether the individuals who receive culturally or linguistically competent care have better outcomes. Since the purpose of performance reporting is to inform how to improve quality care and patient outcomes, analysis that can illuminate these findings will be beneficial.

SUMMARY

The framework proposed by this committee can be viewed as a building block for AHRQ's national healthcare reports, as it provides a foundation on which to base the reporting of national health care performance. The additional quality components of access, efficiency, care coordination, and health systems infrastructure capabilities should be viewed as areas in which evidence has shown potential for improving quality care, and progress should be made in how to measure the impact of these components on the delivery system. The committee recognizes that some measures for these additional framework components are still in the developmental stage, but encourages AHRQ to foster measure development by highlighting gaps and promoting the research necessary to advance measurement and reporting endeavors. By choosing to identify new framework components for which there are often only developmental measure choices, the Future Directions committee has set a course for looking beyond data availability and encouraging the development of measures and data that may demonstrate greater effectiveness for improving the standard of care.

While the committee recognizes that the national healthcare reports are an inappropriate testbed for the creation of actual measures, it believes that AHRQ can play a role in identifying possible areas for future measure development. The committee encourages AHRQ and other entities to identify or develop impactful measures for each of the eight framework components. Areas of research could include establishing more targeted measures for efficiency, or evaluating the evidence of the quality impact of workforce trained in emerging models of care, such as the integrated systems promoted by the PCMH model. Such exploration could help the national healthcare reports be as responsive as possible to desired or developing areas of performance measurement and reporting.

The expanded portfolio of measures that may result from applying this proposed framework to the national healthcare reports should reflect the needs of a variety of stakeholders but should not be so large as to unduly tax AHRQ's resources. To streamline measure selection for the increased number of framework components, reporting on a measure should occur only after it has been subject to the measure selection process proposed by the committee in Chapter 4. The work required to transition the NHQR and NHDR to report on a potentially different set of measures, as dictated by a national set of priorities and the proposed strategies for measure selection, could be significant. To alleviate some of this burden, the committee recommends additional resources (see Chapter 7).

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4

Adopting a More Quantitative and Transparent Measure Selection Process

The IOM Future Directions committee recommends changes to AHRQ's measure selection process in order to focus the outcome of the process on the central aspirations of quality improvement—improving health, value, and equity—by closing performance gaps in health care areas likely to have the greatest population impact, be most cost effective, and have a meaningful impact on eliminating disparities. In order to enhance the transparency of AHRQ's process for measure selection, a Technical Advisory Subcommittee for Measure Selection is recommended under the existing AHRQ National Advisory Council for Healthcare Research and Quality (NAC) to advise on ranking measures for selection, inclusion in the national healthcare reports, and retirement. As part of this process, this subcommittee should recommend strategies for the development and acquisition of new measures and data sources.

Conceptual models of improving health care quality and eliminating disparities include measurement and reporting as integral to achieving performance goals; performance improvement systems, in turn, depend on the quality of data to support measures (Berwick et al., 2003; Kilbourne et al., 2006; Langley et al., 1996). Over the past decade, growing attention to health care quality measurement has led to the generation of a large number of quality measures now being available for use. Illustrating the magnitude of the universe of possible quality measures, the National Quality Measures Clearinghouse inventory now contains 1,475 potential quality measures (National Quality Measures Clearinghouse, 2009a,b). Likewise as of October 2009, the National Quality Forum (NQF) maintained a list of 537 measures meeting its standards for endorsement (NQF, 2009b). The growth in the number of possibilities necessitates a critical assessment of how to prioritize among existing and future measures for use in the NHQR and NHDR. There have been calls to develop a parsimonious common set of measures to "serve policy and frontline information needs" (McGlynn, 2003, p. I-39).

Since 2003, AHRQ has refined its measure set for the national healthcare reports and related products, and the measure set now includes approximately 260 individual measures, including a set of 46 core measures that are more prominently featured in the body of the 2008 NHQR and NHDR. The larger set of 260 measures is featured in online products such as the Web-based State Snapshots, NHQRDRnet, and appendixes to the NHQR and NHDR. The selection of measures for the national healthcare reports by AHRQ has been influenced by the availability of national data sources internal to HHS.

ARHQ has been urged to add more performance measures to the NHQR, NHDR, and related products, and has asked the IOM Future Directions committee for guidance on prioritization among measures so that new measures could be added and highlighted in the reports while other measures could receive less emphasis or be removed entirely from AHRQ's tracking. AHRQ regards the production of the NHQR and NHDR as having reached capacity given the agency's current resources for measurement reporting, analysis, and presentation. AHRQ staff has deliberated about retiring some measures to allow for the incorporation of new measurement domains or measures, but the agency has found it difficult to retire measures because of advocacy, both internal and external to HHS, for each of the current measures.

The Future Directions committee reviewed AHQR's existing measure selection processes and criteria to shed light on how these processes might be improved, particularly in support of the committee's overall aim to have the national healthcare reports focus on areas that matter most and to encourage various stakeholders to take action on the highest impact areas for quality improvement and disparities elimination.

In this chapter, the committee describes how AHRQ's measure selection process might be enhanced by selecting measures that support national priority areas for health care quality improvement (see Chapter 2), by incorporating concepts of value and equity (see Chapter 3), and by applying more explicit quantitative techniques in the selection process. Taking these steps would help direct attention to those performance areas with the greatest potential impact to transform health care quality for the country and for specific populations, and identify key areas for measure and data source development.

AHRQ'S APPROACH TO SELECTING MEASURES

The measure selection process for the national healthcare reports has been undertaken primarily by AHRQ staff in consultation with an HHS Interagency Workgroup consisting of program and data experts, as well as with some limited external feedback from AHRQ's NAC.

AHRQ's Initial Measure Selection Process and Criteria

AHRQ's initial selection approach for measures in the NHQR and NHDR began with a call for measures involving all HHS agencies, as well as substantial input from private-sector entities that were solicited by the IOM during the research for its 2001 *Envisioning the National Healthcare Quality Report* (IOM, 2001). More than 600 candidate measures were generated through the call (AHRQ, 2003a).

Subsequently, the HHS Interagency Workgroup for the NHQR/NHDR reduced the 600 candidate measures for tracking to about 140: (1) by applying three basic criteria recommended by the IOM in 2001—importance, scientific soundness, and feasibility (see discussion in Box 4-1)—to each individual measure; (2) by mapping potential measures to the elements of the earlier quality framework (effectiveness, safety, timeliness, and patient-centeredness); and (3) by selecting clinically important conditions within effectiveness measures (AHRQ, 2003a).

During the summer of 2002, public comments were solicited from hospitals, providers, researchers, and others via a public hearing conducted by the National Committee on Vital and Health Statistics (NCVHS) and through a *Federal Register* notice (AHRQ, 2002; NCVHS, 2002). As the HHS Interagency Workgroup refined the final package of measures for the NHQR and NHDR, input was sought from the HHS Data Council, technical and policy experts within AHRQ, and the Quality Interagency Coordination Task Force, which spanned several federal agencies (Veterans Affairs, Department of Defense, Federal Bureau of Prisons, and others).[1] A separate review process was held for home health measures, which were not included in the initial public review cycle (AHRQ, 2003b).

As a result of this effort, the first edition of the NHQR published by AHRQ reported on 147 measures; of these, effectiveness measures (97 measures; 65 percent of the total measures) focused on the clinical conditions

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[1] See http://www.quic.gov (accessed November 28, 2009) for a full list of member agencies. The HHS Data Council coordinates all health and non-health data collection and analysis activities of HHS, including an integrated health data collection strategy, coordination of health data standards and health information and privacy activities. The HHS Data Council consists of senior level officials designated by their agency or staff office heads, the HHS Privacy Advocate, and the Secretary's senior advisor on health statistics. It is co-chaired by the Assistant Secretary for Planning and Evaluation and a rotating Operating Division (OpDiv) head; AHRQ is the current OpDiv co-chair. For more information, see http://aspe.hhs.gov/datacncl/ (accessed May 14, 2010).

BOX 4-1
The IOM 2001 Recommendations for Measure Selection Criteria for the NHQR and NHDR

In the IOM's 2001 report *Envisioning the National Healthcare Quality Report*, three major criteria were proposed for measure selection:

1. **Importance of what is being measured**
   - ***Impact on health.*** What is the impact on health associated with this problem?
   - ***Meaningfulness.*** Are policy makers and consumers concerned about this area?
   - ***Susceptibility to being influenced by the health care system.*** Can the health care system meaningfully address this aspect or problem?
2. **Scientific soundness of the measure**
   - ***Validity.*** Does the measure actually measure what it is intended to measure?
   - ***Reliability.*** Does the measure provide stable results across various populations and circumstances?
   - ***Explicitness of the evidence base.*** Is there scientific evidence available to support the measure?
3. **Feasibility of using the measure**
   - ***Existence of prototypes.*** Is the measure in use?
   - ***Availability of required data across the system.*** Can information needed for the measure be collected in the scale and time frame required?
   - ***Cost or burden of measurement.*** How much will it cost to collect the data needed for the measure?
   - ***Capacity of data and measure to support subgroup analyses.*** Can the measure be used to compare different groups of the population?

The 2001 IOM report stipulated that it is desirable for a measure to meet all 10 elements within the three overall criteria, but noted that it is not required that all 10 apply in order for a given measure to be considered for inclusion in the NHQR and NHDR.

The 2001 IOM committee indicated that the three criteria, as listed above, provide a hierarchy by which measures should be considered, with priority to be given to measures evaluated for importance and scientific soundness and then by feasibility. For example, the committee stated:

> Measures that address important areas and are scientifically sound, but are not feasible in the immediate future, deserve potential inclusion in the data set and further consideration. However, measures that are scientifically sound and feasible, but do not address an important problem area, would not qualify for the report regardless of the degree of feasibility or scientific soundness.

SOURCE: IOM, 2001, pp. 83 and 87.

chosen for Healthy People 2010 (cancer, diabetes, end-stage renal disease, heart disease, HIV/AIDS, maternal and child health, mental health, respiratory disease, and nursing home and home health care) (AHRQ, 2003a; HHS, 2009b).

AHRQ's Current Measure Selection Process and Criteria

AHRQ reduced the number of measures presented in subsequent editions in response to criticisms that the first edition was unwieldy (Gold and Nyman, 2004). The intent was to be able to "highlight measures with in-depth analysis, rather than broad, but sparse, coverage of all 179 measures" (AHRQ, 2004).[2] That basic format is maintained by AHRQ today, with a set of approximately 46 core measures presented in the body of the reports and more detailed tables available online for a larger set of measures. To select the 46 core measures for the NHQR and NHDR, AHRQ staff and the HHS Interagency Workgroup prioritized measures by the three original IOM criteria and several additional ones. *Usability* was added as a new primary criterion—one that is also articulated

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[2] Additional measures were added to the initial full measure set.

by NQF in considering the suitability of any measure as a voluntary consensus standard.[3] AHRQ's current criteria and principles for prioritizing measures in the NHQR and NHDR are summarized in Box 4-2. AHRQ gives greater weight to "primary criteria" than to "secondary criteria," and the "balancing principles" were also added to ensure that the final set of core measures covered a variety of conditions and sites of care.

AHRQ also emphasizes health care process measures over health outcome measures due to the fact that the focus of the reports is health care delivery and that outcome measures are often too distal or rare (e.g., mortality) to be linked to the delivery of a particular service. Whenever a close relationship is deemed to exist (e.g., use of colorectal cancer screening to presentation with more advanced colorectal cancer), then AHRQ has tried to present paired process and outcome measures. The Future Directions committee recognizes the limitations of process measures, as does AHRQ, and encourages AHRQ to continue to report paired measures whenever possible. Additionally, the committee encourages AHRQ to develop or adopt outcome measures as they hold great interest for policy makers, particularly outcomes associated with the implementation of specific programs. For example, AHRQ already reports on receipt of care for heart attack and inpatient mortality, but could also report related information on outcomes such as: "Since the beginning of public reporting on readmission rates for AMI by the Centers for Medicare and Medicaid Services [CMS], the readmission rates have been reduced X percent, yielding a potential savings to the federal Medicare budget of $Y."

Assessing Importance of Topic Areas for Inclusion

Over time, AHRQ has taken stock of which health conditions or intervention topic areas warranted consideration within the NHQR and NHDR to determine if there should be measurement additions or deletions. AHRQ provided the Future Directions committee with a side-by-side comparison of the specific factors considered in identifying important topics for national reporting (Appendix E). These factors include: the leading causes of death, disability, or activity limitation; principal hospital diagnoses; costly conditions in general and among hospitalizations specifically; areas with notable Black-White racial and educational-level disparities measured in life years lost; other significant racial and ethnic disparities; and priority areas named in several advisory reports from the IOM and HHS (e.g., HHS strategic plans; the 2003 IOM report *Priority Areas for National Action: Transforming Health Care Quality*)[4] (IOM, 2003). From the sources, AHRQ has identified nationally relevant topics not yet reported in the NHQR, NHDR, or related products. For example, AHRQ added measures, such as obesity and substance abuse measures[5] to the 2008 reports.

AHRQ's NAC provides advice on content. The NAC and an existing subcommittee consisting of a few NAC members with an interest in the NHQR and NHDR serve as a sounding board for AHRQ staff and provide input to the AHRQ report development process (e.g., recommendations to improve dissemination and to pay increased attention to child health measures; the need to close measurement gaps and set priorities; the need to address cost, waste, and value issues). Thus, the selection of new measures appears to be driven primarily by the need to address new topic areas based on expert opinion (e.g., IOM, NAC, HHS Interagency Workgroup), some general quantitative information about the overall burden of a condition on society and individuals, and the availability of data to report on a topic. In 2008, the NAC observed that the caliber of the NHQR and NHDR has improved with each updating (AHRQ, 2008a), and the Future Directions committee agrees.

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[3] The measure evaluation criteria used by NQF for measure endorsement are available at http://www.qualityforum.org/uploadedFiles/Quality_Forum/Measuring_Performance/Consensus_Development_Process%E2%80%99s_Principle/EvalCriteria2008-08-28Final.pdf?n=4701 (accessed March 26, 2009). There is substantial overlap in the criteria for measure endorsement and selection to date, whether past IOM recommendations or current AHRQ processes for selection.

[4] Similarly, NQF uses factors such as "affects large numbers, leading cause of morbidity/mortality, high resource use (current and/or future), severity of illness, and patient/societal consequences of poor quality" in determining the importance of a measure for endorsement (NQF, 2009a).

[5] Obesity-related measures include ones addressing whether adults with obesity ever received advice from a health provider to exercise more, or whether children received advice from a health provider about healthful eating or being physically active. Substance abuse measurement relates to the number of persons age 12 years and over who needed treatment for illicit drug use and received such treatment at a specialty facility in the past 12 months.

BOX 4-2
AHRQ's Current Criteria and Principles for Prioritizing Measures

Primary Criteria

1. **Importance**
    - impact on health (e.g., clinical significance, prevalence);
    - meaningfulness; and
    - susceptibility to being influenced by the health system (e.g., high utility for directing public policy, and sensitive to change).
2. **Scientific Soundness** (assumed because AHRQ only uses consensus-based endorsed measures).
3. **Feasibility**
    - capacity of data and measure for subgroup analysis (e.g., the ability to track multiple groups and at multiple levels so a number of comparisons are possible);
    - cost or burden of measurement;
    - availability of required data for national and subgroup analysis; and
    - measure prototype in use.
4. **Usability:** easy to interpret and understand (methodological simplicity).
5. **Type of Measure:** evidence-based health care process measures favored over health outcome measures because most outcome measures were too distal to an identified intervention.

Secondary Criteria

- applicable to general population rather than unique to select population;
- data available regularly/data available recently;
- linkable to established indicator sets (i.e., *Healthy People 2010* targets); and
- data source supports multivariate modeling (e.g., socioeconomic status, race, and ethnicity).

Balancing Principles

- balance across health conditions;
- balance across sites of care;
- at least some state data; and
- at least some multivariate models.

SOURCE: AHRQ, 2005.

IMPROVING MEASURE SELECTION

The Future Directions committee concludes that for the NHQR and NHDR to be more strategic and address the most important opportunities for concerted national action, AHRQ's approach to measure selection needs to be modified. The Future Directions committee recommends broadening the range of input that AHRQ currently receives, making the process transparent, and incorporating a more systematic and quantitative process for ranking measures. The proposed selection process more closely looks at the gap between current and desired performance levels and the relative value of bridging that gap while also taking equity into account. This is a somewhat different approach for AHRQ, one that focuses on closing the quality gap rather than simply selecting conditions and measures based on the highest prevalence and costs.

Focusing on High-Impact Areas

The committee's definition of high-impact areas for quality improvement builds on previous IOM and NQF guidance on determining what constitutes the criteria of *importance* in measure selection and endorsement (IOM, 2001, p. 83; NQF, 2009a). Specifically, the committee's definition refocuses how AHRQ evaluates "impact on health" for the purposes of selecting measures for the NHQR and NHDR.

High impact areas for health care quality improvement: Ideally, "high impact" quality improvement and disparity reduction areas would be assessed by quantitatively ranking the population health impact of closing the gap between current performance and desired levels of performance (such as 100 percent of persons in need achieving guideline recommended care). These could be assessed for the entire population of the nation and/or for specific priority populations when data allow.

The committee's advice should not be construed to mean that an area would be considered a high impact area solely based on how large the gap is between current performance and desired performance levels (e.g., a spread of 25 percentage points is not automatically more befitting of attention than one that has a spread of 10 percentage points); closure of a smaller gap could be ranked higher than a larger gap if its closure would yield a greater health outcome for the nation's population. While the committee members' emphasis is on quantitative assessment, they are cognizant that data limitations will at times require expert opinion to qualitatively rank measures, particularly in the absence of detailed data to allow assessment of equity considerations for different population groups. In these cases, a qualitative assessment of the impact of the intervention targeted by the measure would be combined with a quantitative assessment of the size of the gap or the disparity in order to rank the relative importance of the measure.

The NAC has observed that health care quality measurement in the United States has been "incremental and evolutionary," unfolding in the absence of a unified performance measurement strategy backed by a plan to obtain data to support key measures. The Future Directions committee hopes that an additional outcome of its proposed measure selection process would be the identification of measure and data needs and the formulation of a strategy for their development.

For the reasons just cited and discussed further below, the committee recommends that AHRQ establish a new Technical Advisory Subcommittee on Measure Selection that can advise the NAC and AHRQ on performance measure selection:

Recommendation 3: AHRQ should appoint a Technical Advisory Subcommittee for Measure Selection to the National Advisory Council for Healthcare Research and Quality (NAC). The technical advisory subcommittee should conduct its evaluation of measure selection, prioritization, inclusion, and retirement through a transparent process that incorporates stakeholder input and provides public documentation of decision-making. This subcommittee should:

- **Identify health care quality measures for the NHQR and NHDR that reflect and will help measure progress in the national priority areas for improving the quality of health care and eliminating disparities while providing balance across the IOM Future Directions committee's revised health care quality framework.**
- **Prioritize existing and future health care quality measures based on their potential to improve value and equity.**
- **Recommend the retirement of health care quality measures from the NHQR and NHDR for reasons including but not limited to the evolution of national priorities, new evidence on the quality of the measure, or the attainment of national goals.**
- **Recommend a health care quality measure and data source development strategy for national reporting based on potential high-impact areas for inclusion in AHRQ's national quality research agenda.**

The committee's rationale for the establishment of the proposed NAC Technical Advisory Subcommittee for Measure Selection is discussed below. Subsequent sections of this chapter discuss desirable attributes of transparency in AHRQ's process for selecting performance measures, a stepwise process to applying qualitative and quantitative criteria in prioritizing measures, and quantitative methods that have potential applicability to the process for assessing value and equity.

Establishing an Entity for Measure Selection

The Future Directions committee considered several organizational alternatives to take on the responsibility of measure selection, but ultimately recommended the formation of the NAC Technical Advisory Subcommittee for Measure Selection.

Retaining the Status Quo

Retaining the status quo, with responsibility resting with AHRQ staff and HHS Interagency Workgroup members, is considered less desirable, even after possibly supplementing the current process with opportunities for public input and comment, because the process would likely retain its current limitations. The status quo did not appear tenable because AHRQ and HHS Interagency Workgroup members have already acknowledged the difficulty of being able to prioritize and eliminate health care quality measures through the current process (other than plans to semi-retire from the 2009 reports process measures that have a greater than 95 percent achievement rate [AHRQ, 2008a]).[6] Furthermore, a critical parallel can be drawn to the lessons learned from Healthy People 2010. While Healthy People 2010 contains too many "primarily disease-oriented" objectives, it is nonetheless a "challenge to move away from a biomedical model because it is easier to create specific and measurable health targets that are disease specific," "funding for many of the possible interventions is disease-specific," and there are "strong constituencies," both internal and external, for featuring those diseases (Fielding, 2009). Currently, the NHQR and NHDR are heavily weighted to the clinical conditions in Healthy People 2010, and a Future Directions committee concern is that some of the NHQR and NHDR content may be a product of this same history.

Ultimately, the committee felt strongly that the decision-making process about measures needed to be a public one rather than internal to the HHS Interagency Workgroup and AHRQ staff so that decisions are more transparent and justified to those who advocate for the inclusion or exclusion of specific measures. AHRQ could improve the transparency of its existing practices by (1) publicizing on its website the documentation supporting decisions behind the agency's selection of measures and (2) establishing a public comment period on those decisions. However, the Future Directions committee also believes that AHRQ needs more focused external support to make difficult decisions when ranking among measures, particularly as the selection process may result in a substantial change in the portfolio of measures over time. Furthermore, they need the technical, quantitative expertise to evaluate candidate measures.

Changing the Status Quo

The NAC provides AHRQ with advice on "the most important questions that AHRQ's research should address in order to promote improvements in the quality, outcomes, and cost-effectiveness of clinical practice" (AHRQ, 2010). The committee considered whether the existing NAC could perform the necessary assessment of performance measures recommended by the Future Directions committee and concluded that it could not.

The NAC's advice is solicited for all of AHRQ's activities and is not solely directed to the content and presentation of the NHQR and NHDR (AHRQ, 2009b). Private sector members are appointed for three-year terms, and members of seven federal agencies also serve in an ex-officio capacity. The NAC currently meets three times a year for one day each time. The NAC, as currently constituted, does not have sufficient technical expertise to systematically apply constructs of clinically preventable burden (CPB), cost effectiveness (CE), and other valuation techniques to measurement prioritization and selection. Adequate expertise is necessary to evaluate any staff or contract work that supports the evaluation exercises; other prioritization and evaluation processes for guidelines and measures have found the need for such technical expertise on the decision-making body itself when employing rigorous grading of recommendations (Baumann et al., 2007; Guyatt et al., 2006). Additionally, the workload associated with quality measure selection and prioritization would be substantial and could interfere with current NAC duties.

A new body to advise AHRQ with no affiliation with the NAC could be formed with the requisite expertise, but this approach raised concerns about lines of communication with AHRQ and disengagement from AHRQ's

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[6] Personal communication, Ernest Moy, Agency for Healthcare Research and Quality, October 9, 2009.

overall portfolio of work. Instead, building on precedent, the committee decided to recommend a technical advisory subcommittee to the NAC.

Proposed NAC Technical Advisory Subcommittee for Measure Selection

The recommended NAC Technical Advisory Subcommittee for Measure Selection would differ from the current informal NAC subcommittee that provides general advice on the NHQR and NHDR. The current subcommittee is made up of NAC members and has limited face time with AHRQ staff (e.g., approximately one hour prior to the overall NAC meeting). The Technical Advisory Subcommittee for Measure Selection should have a more formal structure and will need more days per year to do its work, as well as the ability to commission and fund studies through AHRQ to support its deliberations.

A precedent for this more formal relationship is the NAC Subcommittee on Quality Measures for Children's Healthcare in Medicaid and Children's Health Insurance Programs that was formed for a specific task—namely, the identification of an initial core measure set for children under the *Child Health Insurance Program Reauthorization Act*.[7] This NAC subcommittee includes two members from the NAC but meets separately from the NAC for detailed working sessions. The relationship of the NAC Subcommittee on Quality Measures for Children's Healthcare in Medicaid and Children's Health Insurance Programs is shown in Figure 4-1, and the Future Directions committee envisions the same relationship for the NAC Technical Advisory Subcommittee for Measure Selection for the NHQR and NHDR. Other NAC subcommittees have previously been formed for specific substantive tasks (e.g., safety).

Individuals chosen to serve on the proposed subcommittee should include people with responsibilities for performance measurement and accountability; experts in measure design and data collection; health services researchers; and subject matter experts in applying quantitative techniques to evaluate gaps between current and desired performance levels, and on issues of disparities, economics, and bioethics. The subcommittee should ensure that membership accounts for both consumer and provider perspectives. A subject matter expert in disparities need not be limited to health services researchers but could also include representation, for example, from communities of color to ensure sensitivity to the concerns of smaller population groups when determining high impact areas. It would also be useful to have an individual with expertise in quality improvement in fields other than health care to share the challenges faced and overcome. The committee believes that the NAC Subcommittee for Measure Selection should have approximately 10 to 15 persons in order to encompass all of these areas of expertise. The emphasis in the skill set of the subcommittee is technical expertise; the NAC will balance this out with its broader stakeholder representation.

The NAC Technical Advisory Subcommittee for Measure Selection will need staff and resources to help carry out its work in quantifying which areas of measurement constitute the greatest quality improvement impact considering value (health outcome for resource investment or net health benefit)[8] and population and geographic variability. The committee believes that AHRQ's current NHQR and NHDR staff would play an important role in identifying content areas where there are actionable quality problems. However, the committee concludes that AHRQ would need to supplement its current report staff with other in-house technical experts, and/or seek assistance from entities such as the AHRQ-sponsored Evidence-Based Practice Centers or other outside contractors. Such additional experts could provide much of the detailed quantitative analyses to support the measure prioritization and selection process for review by the subcommittee. The Evidence-Based Practice Centers might be an attractive model because they could develop a core of expertise and then gear up and down using contracting mechanisms according to the review workload (AHRQ, 2008b). Even with this additional expertise available, the NAC Technical Advisory Subcommittee for Measure Selection should include individuals with sufficient expertise to evaluate technical materials in areas such as cost-effectiveness analysis, statistics, assessment of clinically preventable burden, and valuation from a bioethics as well as an economic perspective.

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[7] *Children's Health Insurance Program Reauthorization Act*, Public Law 111-3, 111th Cong., 1st sess. (January 6, 2009).

[8] Health outcome for resource investment and net health benefit reflect quantitative concepts and are aspects of the concept of value discussed in Chapter 3.

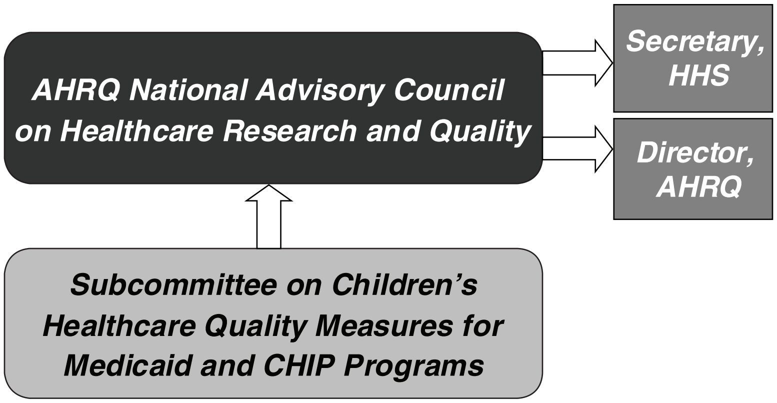

FIGURE 4-1 AHRQ, NAC, and subcommittee roles.
SOURCE: AHRQ, 2009a.

The NAC Technical Advisory Subcommittee for Measure Selection might want to use a variety of approaches in soliciting measures for the reports and in refining its selection criteria. Possible approaches include (1) issuing a public call for measures for inclusion/exclusion and areas needing measurement development or refinement, as well as suggestions for data support; (2) commissioning studies (e.g., comparison of different valuation techniques on the prioritization scheme, development of systematic reviews of presumed high-impact areas, valuation of disparities); (3) forming strategic partnerships with entities doing measurement development and endorsement applicable to the reports (e.g., NQF, the National Committee for Quality Assurance, the National Priorities Partnership, the American Medical Association's Physician Consortium for Performance Improvement, other HHS agencies such as CMS) to reduce duplication of effort; and (4) working with the Centers for Disease Control and Prevention (CDC) on those areas of health care improvement closely linked to priority public health outcomes and goals as well as the similar application of valuation techniques recommended for community-based prioritization in conjunction with Healthy People 2020 (see Box 4-3 later in this chapter).

Enhancing Transparency in the Selection Process

The committee believes that transparency in AHRQ's process for selecting performance measures for the NHQR and NHDR is extremely important. In 2008, an IOM report stressed that transparency is a key to building public trust in decisions by having "methods defined, consistently applied, [and] available for public review so that observers can readily link judgments, decisions or actions to the data on which they are based" (IOM, 2008, p. 12). Transparent processes for decision-making bodies have been described as:

- documenting decision-making by providing a public rationale;
- reviewing the effects of the prioritization (Downs and Larson, 2007; Sabik and Lie, 2008); and
- establishing and applying clear principles and criteria on which prioritization is based.

Each of these aspects of transparency is examined in the discussion that follows. The NAC and its subcommittees—which would include the proposed NAC Technical Advisory Subcommittee for Measure Selection—conduct their business in public under the *Federal Advisory Committee Act*.[9] The fact that these bodies operate in public under this law is an attractive facet of their operation.

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[9] *Federal Advisory Committee Act*, Public Law 92-463, 92nd Cong., 2nd sess. (October 6, 1972).

Documenting Decision-Making by Providing a Public Rationale

Documentation of the rationale behind the NAC subcommittee prioritization decisions, the evidence supporting the decisions, and an understanding of the role that data or resource constraints play in the decisions should be transparent. Furthermore, that information should be readily available for public access and in a timely fashion (Aron and Pogach, 2009). Such documentation should include analyses and syntheses of data and evidence produced by staff or obtained through other means. The Future Directions committee is particularly interested in this level of documentation because of its potential value in stimulating creation of an agenda for measure and data source development (including testing additional questions on existing data collection surveys or inclusion of elements in electronic health records) when desirable measures or data are not yet available (Battista and Hodge, 1995; Gibson et al., 2004; Whitlock et al., 2010). Documentation would also support why certain measures might either no longer be included in the print version of reports or removed from tracking altogether.

Reviewing the Effects of Prioritization

Prioritization is not a static activity but an "iterative process that allows priority setting to evolve" (Sabik and Lie, 2008, p. 9). With respect to the 46 core measures used in the print versions of the NHQR and NHDR, the process for selecting performance measures recommended by this committee could result in extensive changes in the measure set; the process, however, will be an iterative one. The existing measures displayed in the reports or the State Snapshots would not necessarily all be replaced. It would be logical for the NAC Technical Advisory Subcommittee for Measure Selection to begin its work by determining the relative prioritization within the existing core measure group, as currently there is no priority hierarchy within selected measures as all are given equal weight in assessing progress.

It is not known to what extent the existing measures within the NHQR, NHDR, or Web-based State Snapshots are specifically adopted as action items in whole or part by various audiences. This makes it difficult to evaluate the impact of changing the current measures on aspects other than report production within AHRQ. The committee posits that making public the conversation about which measures will or will not have national or state data provided for them will enable AHRQ to begin to document in a more systematic fashion who uses the reports, how the data are used, and the potential impact of keeping or deleting measures.

PRINCIPLES AND CRITERIA FOR SELECTION

In order to establish a transparent process for creating a hierarchy among performance measures being considered by AHRQ, the articulation of principles and criteria is necessary.

Principles

Before outlining the steps in the measure selection process, the Future Directions committee defined two principles that would guide the design. The first guiding principle is the *use of a quantitative approach*, whenever feasible, for assessing the value of closing the gap between current health care practice and goal levels (i.e., aspirational goal of 100 percent or other goal such as one derived from the relevant benchmark).[10] To date, AHRQ's measure selection process has not focused on evaluating what it would take to close the performance gap, or the potential benefits that could accrue to the nation in doing so for the reported measures. The committee's second principle in prioritizing measures is taking specific note of significant, *unwarranted variation* in health care per-

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[10] The terms *aspirational goal*, *benchmark*, and *target* as used in this report are defined in Box 2-1 in Chapter 2. An aspirational goal is the ideal level of performance in a priority area (e.g., no patients are harmed by a preventable health care error; all diabetes patients receive a flu shot—unless contraindicated). Benchmark is the quantifiable highest level of performance achieved so far (e.g., the benchmark among states would be set at 66.4 percent of diabetes patients received a flu shot because that represents the highest performance level of any state). Target is a quantifiable level of actual performance to be achieved relative to goal, usually by a specific date (e.g., by January 1, 2015, 75 percent of diabetes patients will receive an annual influenza shot).

formance with regard to disparities across population groups, geographic areas, and other contextual factors such as types of providers or payment sources. Application of these principles can result in reducing the burden of reporting to those areas that are deemed most important (Romano, 2009).

Upon applying the principles in the measure selection process, the following provide further guidance:

- Simply stated, measures should be prioritized and selected based on their potential for maximizing health care value and equity at the population level.
- Priority should be given to selecting measures that maximize health benefit, improve equity, and minimize costs within a context that is respectful of and responsive to patient needs and preferences.
- Measures that are principally relevant to a particular group even if they have less significance to the U.S. population as a whole (e.g., quality measures for treatment of sickle cell anemia) should be considered in measure selection.
- The process, to the extent feasible, should be operationalized using formal quantitative methods and transparent decision-making.

Thus, the emphasis is on investing in measures of conditions with the most impact while considering the ethical principle of fairness. Siu and colleagues (1992) used such quantitative approaches to recommend measures for health plans in recognition that "limited resources [are] available for quality assessment and the policy consequences of better information on provider quality, priorities for assessment efforts should focus on those areas where better quality translated into improved health" (Siu et al., 1992).

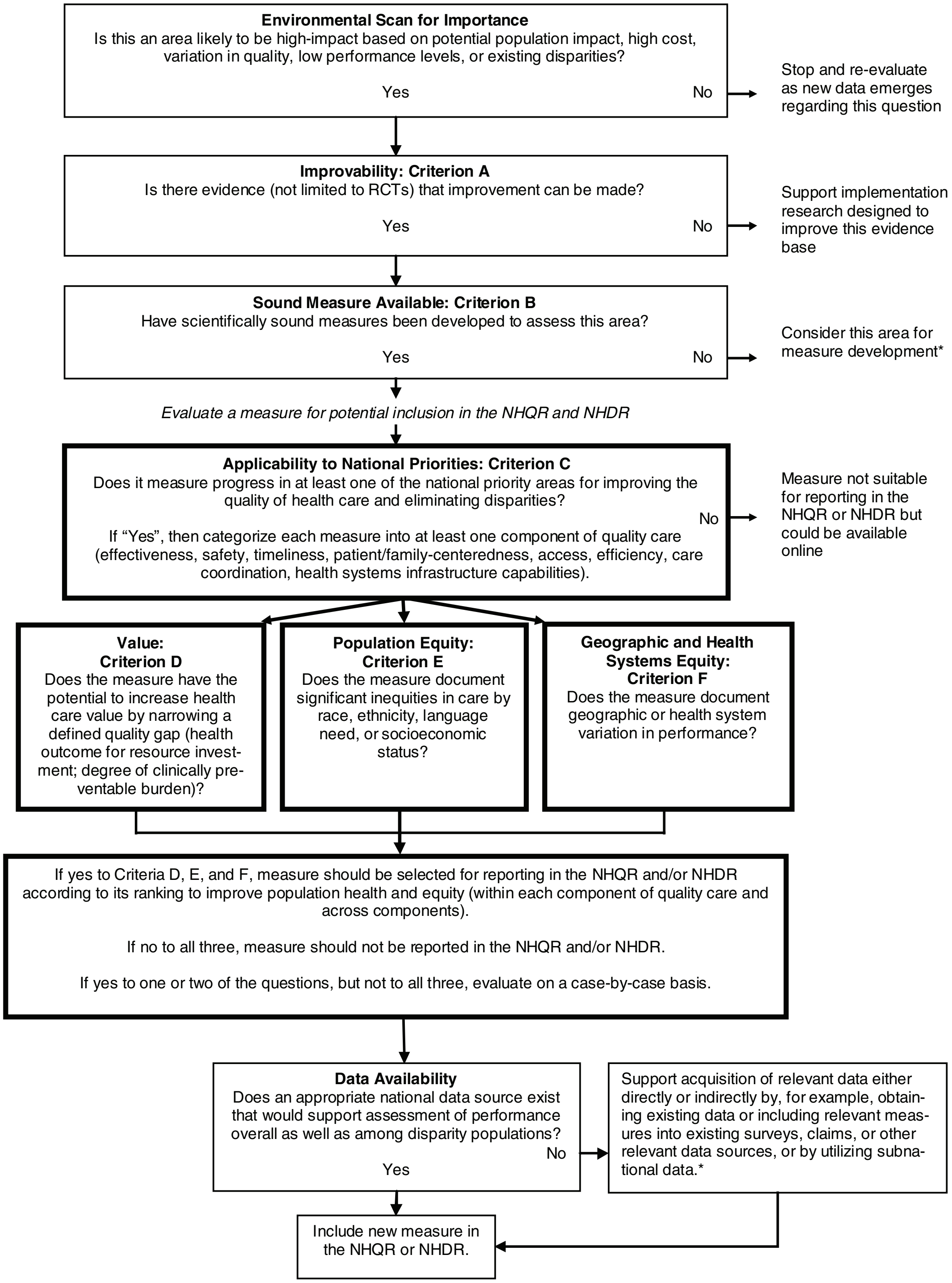
Steps in the Process and Criteria

Figure 4-2 provides a schematic outline of the steps in the Future Directions committee's proposed process for reviewing performance measurement areas—both for currently reported measures and new measures—for inclusion in the NHQR and NHDR. Inherent in relative ranking would be the identification of measures that could be dropped by AHRQ from tracking if they rank at a low level. Additionally, the process builds in specific steps for identification of measure and data source needs that should be formally captured for inclusion in a strategy for research and data acquisition for future national reporting.

Previous IOM guidance regarding the selection of performance measures for the NHQR and NHDR gave greater prominence to the criterion of *importance*, noting that measures not meeting this criterion "would not qualify for the report regardless of the degree of feasibility or scientific soundness" (IOM, 2001, p. 83). NQF similarly stresses that every candidate measure for the NQF endorsement process "must be judged to be important to measure and report in order to be evaluated against the remaining criteria" (NQF, 2009a). To date, NQF has endorsed more than 500 measures. Although each of these measures may be useful for a specific quality improvement circumstance, there is a need to prioritize among the many possible measures for national reporting purposes. This committee recommends refining the pre-existing AHRQ-, IOM-, and NQF-recommended measure selection and endorsement criteria of *importance* to include consideration of recommended national *priority areas*, and an evaluation of the relative value of closing quality gaps, including consideration of equity (see Criteria A, B, C, D, E, and F).

Environmental Scan for Importance

Identifying which areas should be considered important to monitor for performance improvement is a first step and could be undertaken by AHRQ staff prior to the Technical Advisory Subcommittee meeting. An environmental scan to identify those potential areas would include the type of factors that AHRQ has previously considered (see Appendix E), as well as looking to the potential effects of changing population dynamics on overall national health status, the burden of disease, and appropriate health care utilization. Additionally, ideas for possible candidate measurement areas for review could come from staff review of the literature for presumed high-impact areas and from nominations of areas for consideration from sources internal and external to HHS, including the assessment



Environmental Scan for Importance
Is this an area likely to be high-impact based on potential population impact, high cost, variation in quality, low performance levels, or existing disparities?

Stop and re-evaluate as new data emerges regarding this question

Improvability: Criterion A
Is there evidence (not limited to RCTs) that improvement can be made?

Support implementation research designed to improve this evidence base

Sound Measure Available: Criterion B
Have scientifically sound measures been developed to assess this area?

Consider this area for measure development*

Evaluate a measure for potential inclusion in the NHQR and NHDR

Applicability to National Priorities: Criterion C
Does it measure progress in at least one of the national priority areas for improving the quality of health care and eliminating disparities?

If "Yes", then categorize each measure into at least one component of quality care (effectiveness, safety, timeliness, patient/family-centeredness, access, efficiency, care coordination, health systems infrastructure capabilities).

Measure not suitable for reporting in the NHQR or NHDR but could be available online

Value: Criterion D
Does the measure have the potential to increase health care value by narrowing a defined quality gap (health outcome for resource investment; degree of clinically preventable burden)?

Population Equity: Criterion E
Does the measure document significant inequities in care by race, ethnicity, language need, or socioeconomic status?

Geographic and Health Systems Equity: Criterion F
Does the measure document geographic or health system variation in performance?

If yes to Criteria D, E, and F, measure should be selected for reporting in the NHQR and/or NHDR according to its ranking to improve population health and equity (within each component of quality care and across components).

If no to all three, measure should not be reported in the NHQR and/or NHDR.

If yes to one or two of the questions, but not to all three, evaluate on a case-by-case basis.

Data Availability
Does an appropriate national data source exist that would support assessment of performance overall as well as among disparity populations?

Support acquisition of relevant data either directly or indirectly by, for example, obtaining existing data or including relevant measures into existing surveys, claims, or other relevant data sources, or by utilizing subnational data.*

Include new measure in the NHQR or NHDR.

FIGURE 4-2 The Future Directions committee's proposed decision-making process for selecting performance measures for the NHQR and NHDR and identifying measure and data needs.
NOTE: The steps noted with an asterisk (*) can inform a measure and data development strategy.

of measures for leading conditions under Medicare by the NQF (HHS, 2009c). This process could include a public call for measure priorities, including measures specific to priority populations. Given the national healthcare reports have Congress as a major audience, querying staff of pertinent committees of their interest areas would be advised; some of these interests are expressed in existing and proposed legislation (e.g., high cost conditions under Medicare; insurance coverage; child health).

In general, the measurement areas that are important for the nation's population as a whole tend to be equally important for smaller population groups; disparities can be found in most of the standard quality measures included in sets such as HEDIS (Fiscella, 2002; Lurie et al., 2005; Nerenz, 2002). Thus, it is useful to have the same measures in both the NHQR and NHDR. However, the NHDR also reports on priority populations, and the environmental scan should note if there are specific measures that should be considered and ranked for individual populations (e.g., racial and ethnic groups, rural areas, individuals with disabilities). There are conditions and circumstances that disproportionately affect minority and other priority populations, and consideration should be given to developing measures for those areas if they do not yet exist (The Commonwealth Fund, 2002).

Improvability

Criterion A, improvability, contains several aspects: one is whether a higher level of quality is feasible, as evidenced by high performance in some sectors or among some populations, and another is whether methods of improvement are available, and as applicable, whether the barriers to that improvement can be identified.[11] The cost of implementing quality improvement activities can be a realistic barrier. That should not preclude further evaluation of a measurement area for national reporting, but it may ultimately affect its ranking. The Technical Advisory Subcommittee may encounter areas that are considered very important but have an insufficient evidence base for reliable and perhaps lower cost interventions; in that case, the topic areas should be considered for further implementation research to improve the evidence base. Most implementation research, however, does not rise to the level of rigor of randomized controlled trials (RCTs); the Future Directions committee believes other types of trustworthy study designs can be utilized to establish the evidence base.

Scientifically Sound Measure Availability

Application of Criterion B, scientific soundness, follows identification of importance and improvability because if the area is not one that is meaningful and important, it will not matter how scientifically sound a measure is. Furthermore, valid measures may not yet be ready for all areas considered very important, and thus these measurement areas should be considered as part of a measure development strategy.

Ranking Measures

Under the process outlined in Figure 4-2, the actual ranking of measures weighs their applicability to national priorities (Criterion C), the value of closing the gap between current and desired performance levels (Criterion D), and equity concerns (Criterion E for disparities among sociodemographic groups, and Criterion F for disparities among geographic regions or health systems/payers).

Major questions face AHRQ with regard to measures in the NHQR and NHDR:

- Are the 46 measures in its core set for the NHQR and NHDR the right ones to accelerate health care quality improvement in the nation?
- Would a different set of measures offer a better yield on investment in interventions to close quality gaps?

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[11] The IOM report *Priority Areas for National Action: Transforming Health Care Quality* (IOM, 2003) set about identifying priorities for quality improvement, specifically to identify areas for actionability; the report used the term *improvability*—the extent of the gap between current practice and evidence-based best practice and the likelihood that the gap can be closed and conditions improved though change in an area.

In a similar vein, when thinking about selection of measurement areas for tracking and improvement in Healthy People 2020, the question was asked, "If I have my last dollar what should I spend it on?" (Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020, 2008a). The implicit notion in selecting a measure for national reporting should be that there is a significant quality gap that needs to be addressed/closed. The elevation of an area and its measure to national prominence would likely mean that resources would ultimately follow to implement quality measurement as well as provide interventions to eliminate those gaps. Making choices among measures has consequences for influencing national quality improvement efforts.

Thus, to answer the first question, the NAC Technical Advisory Subcommittee for Measure Selection could begin with evaluating AHRQ's current core measure set to determine how much improved performance in those areas would contribute to the nation's health. Any newly considered measurement areas could be compared with the existing set as might some measures in the expanded measure set featured in the State Snapshots or NHQRDRnet. The committee believes that the subcommittee could be formed immediately to begin this work. To answer the second question, measures would be ranked according to their potential contribution; depending on the focus of any national strategy or realignment of investment, there can be differentials in outcomes (see discussion later in the chapter of the work of Tengs and Graham [1996] and in Appendix F contributed by Meltzer and Chung).

Candidate measures would then be screened for their applicability to national priority areas (Criterion C). See Box 2-3 in Chapter 2 for the Future Directions committee's recommended priority areas; other priorities may emerge in establishing a national health reform quality improvement strategy. The AHRQ measure selection process can help inform which measures should be highlighted as part of any such national strategy. It may turn out that numerous measures might pass through the screen of being applicable to national priority areas; not all of these should be automatically included in the national healthcare reports. Other ranking criteria need to be taken into account. Nevertheless, applicability to national priorities is an important factor for inclusion of measures in the reports. There may be measures that have been tracked by AHRQ that do not directly correspond to the national priority areas, and if deemed desirable, these could continue to be tracked in other report-related formats (e.g., online appendixes, State Snapshots, or NHQRDRnet) or through links to more extensive datasets (e.g., the National Health Interview Survey or Centers for Medicare and Medicaid Services' analyses or datasets) so that interested stakeholders could continue to track those data. The committee recognizes that priority areas may change over time, so encourages flexibility in maintaining additional measures.

The next step involves screening candidate measures for their relative quality improvement impact (see boxes with Criteria D, E, and F in Figure 4-2). Measures would be assessed according to the potential to increase health care value (Criterion D), and this step also recognizes inequities along demographic lines and the possibilities of geographic and health systems variance (Criteria E and F).

Criterion D A value (Criterion D) is assigned to a measurement area based on a quantitative expression of the outcome of closing the gap between the current average U.S. performance and the desired performance level. The most simplistic approach would be to assess all measures against the aspirational level of 100 percent performance. While it might be desirable to have all appropriate persons receive a service, alternate fixed points other than 100 percent could also be used for analyses to further establish rankings for interventions; for instance, comparing the quality improvement impact if 90 percent versus 100 percent received care, as there may be only a very marginal impact after achieving a certain level of performance. Similarly, there may be a better yield when quality improvement interventions are focused on certain populations or age groups (see Appendix F for further discussion of assessing the value of quality improvement). Goal levels could also be informed by the benchmarks achieved by best-in-class performers. Several scenarios of performance may need to be assessed for each measure to determine how best to focus resources and how to ultimately rank measures. Quantitative techniques for valuation are discussed later in this chapter.

In some areas of quality measurement, the applicability of techniques such as net health benefit and cost effectiveness analysis may work less well, or sufficient data may not be available. However, it is rarely the case that one has all the necessary information to do these estimates; invariably the analyst has to make some assumptions for analysis. It would be possible to consider, at a minimum, for most measures:

- What is the size of the population affected by the performance or equity gap (e.g., number of persons who would benefit if current levels of performance were improved to best performer [benchmark] or goal level)? This can readily be calculated based on the difference between the number of persons who would benefit under optimal versus current conditions. This factor often drives estimations of net health benefit.
- Existing measures can be ranked based on the relative size of the population affected. When considering equity, the number of additional persons within particular disparity populations who would receive the intervention (if equity in performance were achieved) should be compared.
- What is the potential impact of the intervention or care process reflected by the measure on health, well being, patient-centeredness, and/or costs? Interventions and care processes differ in their available evidence base, but numbers needed to treat (NNT) or a comparable measure of population impact are feasible. Effectiveness, safety, and timeliness measures can be prioritized based on interventions/processes that maximize population impact (e.g., lower NNT) while minimizing costs. Efficiency measures should be prioritized based on interventions/processes that minimize costs while maximizing health benefit. Access measures can be similarly assessed based on the evidence base for health benefit or linkage to key interventions associated with health benefit and health care system costs (e.g., avoidable hospital admissions). Patient/family-centeredness measures can be evaluated based on estimations of the potential impact for improving the responsiveness of the system to patient/family needs, values, and preferences related to care processes and interventions.

Criteria E and F Once value assessments are made, rankings can be established from greatest to lowest impact and then the impact on equity would be taken into account. What does taking equity into account mean? Having evidence of large disparities and variation would give greater weight for inclusion in the NHQR and NHDR to measures that are otherwise equal in the valuation step. Equity differences (both Criteria E and F) can be separately ranked by applying quantitative techniques such as net health benefit and cost effectiveness analysis; however, data are often not available to stratify every measure by sociodemographic variables, payers, and small area geography. Furthermore, ranking each measure by 15 sociodemographic categories and by multiple geographic variables, for example, may not lead to a consistent ranking pattern. However, available studies and data can inform the expected degree of disparity and allow assumptions about whether disparities exist at all, are relatively minor in degree of difference, or are of major concern.

AHRQ has chosen its current measure set, in part, based on the availability of subpopulation data to be able to report differences among population groups in the NHDR; thus, equity rankings may be more feasible with these measures. Incorporating new and better measures may mean that subpopulation data are not yet always available, but this factor alone should not preclude selection of such a measure.

If equity is hard to determine, why should it be part of the measure selection process? The need to pay specific attention to equity has been noted in other health-care prioritization practices (Bleichrodt et al., 2004, 2008; Stolk et al., 2005). Because populations at risk of disparities may have a small number of members, prioritizing measures based on overall national health impact or burden alone is unlikely to result in measures that capture some disparity gaps—even significant ones—to rise to the top of a ranking for inclusion in the NHQR and NHDR. At times, equity considerations may need to trump the overall valuation (for instance, if there is a large disparity gap, but the overall difference between national performance and the aspirational performance level is relatively small). Additionally, there may be measurement areas where the impact of a condition for one of the priority populations is profound. In these cases, the needs of the population could have precedence even if the overall valuation did not rank the measure highly for the entire population of the nation; then, the measure may be most appropriate to feature in the priority population section of the NHDR.

Measure and Data Development Strategy

The committee envisions the measure selection process as not only prioritizing measures but also informing a strategy for measure and data development (see boxes with asterisks in Figure 4-2). The results of applying the criteria of improvability (Criterion A) and availability of a validated measure (Criterion B) are steps in the selection process to inform the measurement research agenda when the answer to those criteria is not affirmative. A final consideration is the availability of national data to support reporting. A measure need not be excluded if national or subpopulation data are not currently available; alternative sources such as subnational data may be useful (see Chapter 5). It is realistic that the cost of acquiring data will remain a feasibility consideration, although the committee recommends that sufficient resources be available to AHRQ to revamp its products and acquire data to support important measurement areas (see Chapter 7).

Finalizing the List of Measures for the National Healthcare Reports

By quantitatively evaluating measures based on their potential value and equity, a hierarchical list should emerge. The relative ranking of measures within each of the framework's eight components of quality care (see Chapter 3) and across these components will help guide the number of measures chosen within each component and overall. The committee is neither recommending the specific number of measures that should be included in the NHQR, NHDR, or related products (or a number for each of the eight quality of care components of the framework) nor establishing a specific threshold of how large the impact must be for a measure to be adopted by AHRQ.

Nevertheless, it is possible that more measures could emerge (i.e., affirmative answers to each of Criteria D, E, and F) than AHRQ resources can manage. In that instance, the Technical Advisory Subcommittee's expert opinion would need to be employed in setting a threshold within the quantitative rankings to determine which measures should be included just as it would need to be engaged in deciding which measures to include when the answer is affirmative to one or two but not all of the impact criteria (value and equity).

The committee further acknowledges that quantitative techniques do not uniformly apply to all elements of the updated framework. Given that, the Future Directions committee still encourages some representation of each component. However, over time better data may allow more even application of the quantitative methods across the components and it could turn out that some components will have a greater quality improvement impact than others and thus should become areas of greater focus within the national healthcare reports.

Relationship Among Priority Areas, Framework, and Measure Selection

Priority setting, use of the framework, and measure ranking are sequential steps in determining the final selection of measures to be reported in the NHQR and NHDR. First, AHRQ and the Technical Advisory Subcommittee should identify metrics that are relevant to priority areas. They should explicitly explore each component of the framework when looking for measures related to each priority area. Then, within each component of quality, they should assess the value and equity contribution of closing the gap between current performance and desired levels for each measure. Finally, they should select measures for reporting that have the highest relative impact on value and equity.

To further clarify the relationships, Figure 4-3 illustrates how specific measures might be aligned with individual national priority areas and categorized by the framework components. Although the names of some priority areas and components are similar or the same, the roles for priority areas and framework components in this model are distinct.

Figure 4-3a depicts a scenario in which three potential measures are identified from the priority area of improving safety; each of these measures is also categorized into the framework component of safety. Each safety measure then undergoes the rigors of the evaluation process outlined above; safety measure number 1 is chosen for inclusion, whereas the fate of the second and third measures depends on the relative ranking of each compared to other safety measures. In addition to the example in the figure, AHRQ and the Technical Advisory Subcommittee should explore whether there are safety measures in other framework components (in addition to the safety component) (e.g., are there measures of timeliness that are relevant to the priority area of safety?). In this way, the framework serves as a check on the comprehensiveness and robustness of the measures being proposed for the identified priority area.

Figure 4-3b depicts a scenario in which measures relate to the priority area of improving population health through different components of the framework. Population health measure number 1 is an access measure and

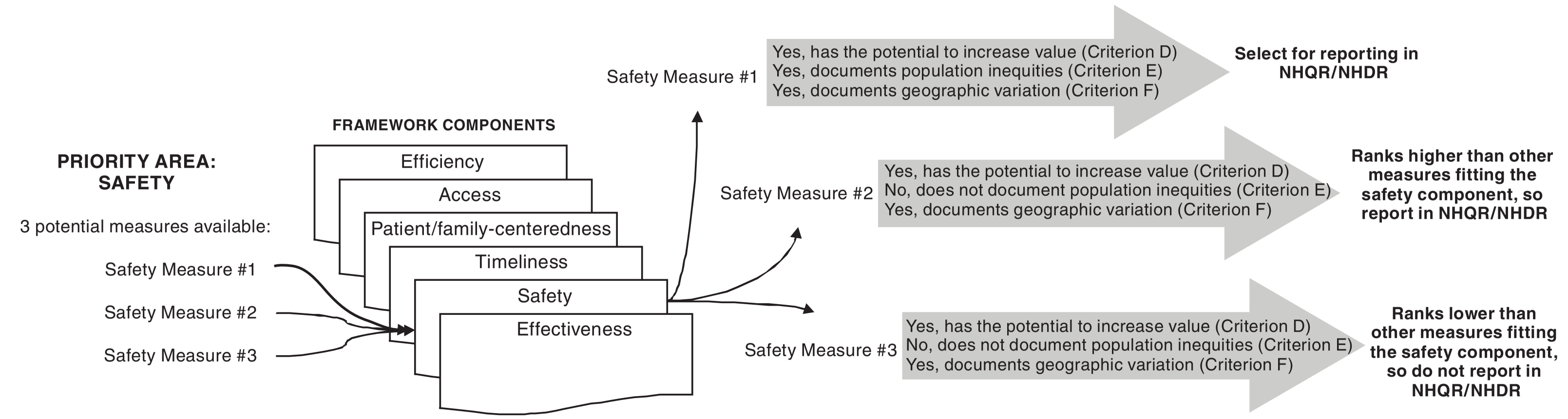

FIGURE 4-3a

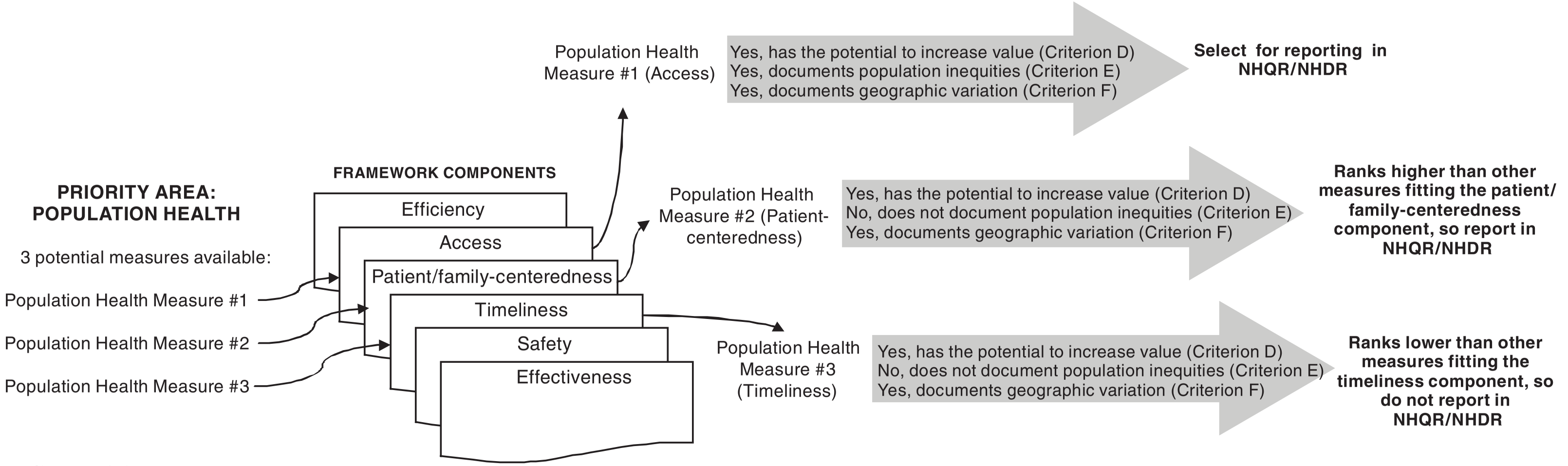

FIGURE 4-3b

FIGURE 4-3 Examples of how measures fitting two different priority areas might ultimately be ranked.

should be compared against other access measures for initial ranking. Similarly, population health measures numbers 2 and 3 should be assessed against other measures categorized as fitting the framework components, patient/family-centeredness and timeliness, respectively. When sufficient quantitative data (e.g., CPB, net health benefit) are available to compare the highest ranking measures from each component with other components' measures, then another ranking step could be taken.

QUANTITATIVE TOOLS FOR PRIORITIZING MEASURES

Techniques for assessing and describing relative degree of value and equity/inequity among performance measures and their utilization in prioritizing performance measures for inclusion in the NHQR and NHDR are considered in the discussion that follows. Similarly, the Phase 1 report for Healthy People 2020 indicated that as communities seek to prioritize their own local objectives for improvement, they should try to use more quantitative techniques in the process (Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020, 2008a). Box 4-3 defines types of quantification approaches that can be applied to prioritizing measures.

BOX 4-3

Healthy People 2020: An Explanation of the Prioritization Criteria Used for Sorting Healthy People Objectives

Overall burden. The burden of a disease is a numerical description of the health impact of disease and injury at the population level. Burden can be measured in terms of the number of deaths in a population, or the number of existing cases in a population. A summary measure, or index, of population health can also be used. The quality-adjusted life year (QALY) is a summary measure that is commonly used to describe burden. It is a measure of years of life lived (or years of life gained due to an intervention), which has been statistically adjusted to take quality of life into account.

Preventable or reducible burden. This is an estimate, based on best available evidence, of the degree to which a particular disease and its overall burden can be prevented. Decision makers at multiple levels can use this information to decide which clinical preventive services matter the most, so that they can prioritize their actions. For example, preventable clinical burden can be calculated to include the cumulative effect of delivering a service multiple times at recommended intervals over a recommended age range, instead of delivering the service at a single point in time to one large sample of individuals (Barclay and Lie, 2006).

A variety of approaches can be considered to determine the preventability of disease burden. For example, one could look at the burden of death and disability that can be avoided through means such as: vaccination, early diagnosis, timely and adequate medical treatment, application of hygienic measures, environmental sanitation, implementation of policy change (e.g., increased tax on alcohol products), or health education usually coupled with other actions.

Cost-effectiveness. Cost-effectiveness analysis is used to evaluate the outcomes and costs of interventions that are designed to improve health. It has been used to compare costs and years of life gained for interventions such as screening for breast cancer and vaccinating against pneumococcal pneumonia (Russell et al., 1996). The outcomes are usually not assigned monetary values, as is the case in cost-benefit analysis (Sarvela and McDermott, 1993). Instead, results are typically summarized in terms of ratios that show the cost of achieving a unit of health outcome (such as the cost per year of life, QALY gained) for different types of patients or populations and different types of interventions (Russell et al., 1996). The purpose of analyzing the cost-effectiveness of interventions is to examine the tradeoffs, or "opportunity costs," of making various choices.

Several concerns have been raised about use of cost-effectiveness analysis for setting priorities. These include the difficulties of: measuring quality of life; developing valid summary measures of population health over the life course; generalizing results to different settings; accounting for the fact that programs work synergistically (thereby making it difficult to isolate the effects of one intervention); and addressing "uncertainty" and lack of information about the cost-effectiveness of many potential interventions (Russell et al., 1996).

Effectiveness measures compose about 80 percent of the measures in the 2008 quality report; others have similarly found the measurement domain of effectiveness the most "metric-saturated" (Romano, 2009). This is the type of measure to which the quantitative evaluation measures might be most easily applied. The committee emphasizes that performance measures for which these quantitative evaluation techniques cannot be applied should not necessarily be removed from consideration or reporting in the NHQR and NHDR.

Tools for Assessing Value

Prioritizing among performance measures involves assessing the relative value of a measure's associated intervention to other interventions on the basis of evidence and data that can provide a quantitative ranking. A number of metrics measure different aspects of value (e.g., cost, quality, or impact on health outcomes). The following discussion reviews these available metrics for their use in prioritizing among measures and presents two different strategies that use these tools to highlight health care interventions that may yield the greatest impact for quality improvement.

Despite the validity of these concerns, they need not prevent the use of cost-effectiveness analysis to inform decision making. For example, uncertainty about the cost-effectiveness of an intervention does not necessarily mean that the intervention should not be implemented. Information about the probable costs of an intervention, as well as the likelihood that it will be effective can be taken into consideration in calculating an estimate of its expected cost-effectiveness.

To help users make decisions based on the best information available, Healthy People 2020 should provide data on the degree of confidence concerning these key factors. For example, in the case of burden, Healthy People 2020 should provide quantitative estimates of uncertainty (i.e., information about the reliability of the estimate based on current evidence), as well as qualitative information that could influence uncertainty, (e.g., factors such as the estimate of current burden).

In the face of substantial uncertainty, users will need to make decisions based on incomplete information. Presenting the best available information can permit informed decision-making. In some cases, effects can be quantified by drawing on statistical, epidemiological, economic, or other quantitative methods. Sensitivity analysis (a technique for assessing the extent to which changed assumptions or inputs will affect the ranking of alternatives) may be used (HHS, 2009a) (e.g., how the life expectancy gains of cancer surgery change as the rate of surgical mortality changes).

Value of information (VOI) analysis could also be used to determine when collecting more information on uncertain factors could be worth the cost of generating that information. In other cases, more qualitative approaches to decision-making under uncertainty will need to be used.

Net health benefit. A program's net health benefit is the difference between the health benefit achieved by a program, and the amount of health gain that would be needed to justify the program's costs. If resources are spent on one program instead of another one that would create a higher net health benefit, an opportunity for greater net gains in health is lost. The difference between the net health benefit of two different interventions is the cost of choosing to spend resources on the "wrong" program. Thus, net health benefit is different from cost-effectiveness in that it looks more explicitly at the "opportunity costs" of investing in programs of lesser net value (Hauck et al., 2004).

Reduced health inequities. Some have noted that health inequities can be reduced by diminishing the health status of those who are better off. Healthy People 2020 should be explicit about the need to focus on improving the health status of those who are worse off. Because minority populations in the United States often have worse health status than the general population, this principle specifies the need to improve the health of these groups.

It must also be acknowledged that data-based criteria for priorities could disadvantage population groups with limited data or limited tests of interventions. Lack of complete data about these population sub-groups should not justify a lack of action aimed at reducing disparities. Improving the data on the needs of these groups and intervention effectiveness for these groups should be a priority.

NOTE: Healthy People 2020 suggests synergy, time frame, and accepting accountability and working together as other prioritization criteria.
SOURCE: Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020, 2008b.

Selecting Measures with the Potential for the Greatest Health Impact

Quality-adjusted life years (QALYs) are the most widely used metric for quantifying the impact on health of health care interventions. QALYS can play a role in identifying areas where quality improvement interventions could have the greatest health impact. The use of QALYs as a value metric is rooted in the assumption that people value additional years of life spent in better health than they otherwise would have enjoyed without the application of some clinical intervention. QALYs have been derived for many clinical preventive services and for some commonly used diagnostic tests and therapeutic procedures. They have been identified as the best standardized measures of health effectiveness because of their "widespread use, flexibility, and relative simplicity" (IOM, 2006, p. 10). Life years can be estimated based on absolute risk reduction from clinical trials, and QALYS can be obtained directly from participants in clinical trials or estimated based on published quality-of-life data for various conditions. A similar construct, disability-adjusted life years (DALYs), is often used by the World Health Organization in international studies (Gold et al., 2002).

When beneficial clinical interventions are applied to medically affected populations, the result in health benefit (measured as the total QALYs saved based on the number of persons affected by the intervention) is referred to as CPB (Maciosek et al., 2009). CPB is the health burden that is prevented or averted by a clinical intervention; it represents the absolute risk reduction from the intervention that can then be generalized to the relevant population (e.g., nation as a whole).

Conceptually, it does not matter whether CPB results from improved use of a proven intervention (e.g., influenza vaccination, which is one of AHRQ's effectiveness measures) or from reduction in harm to patients through improvement care processes (e.g., reduction of adverse drug events, which is one of AHRQ's safety measures). In either case, an improvement in health, measurable in QALYs saved, has been achieved.

CPB is relevant to prioritizing quality measures based on its ability to quantify the health impact of a measure's associated clinical intervention. Therefore, CPB provides a means for comparisons across different clinical interventions (e.g., mammography versus maintenance-phase medications for depression), facilitating prioritization of measures of those clinical interventions. Additionally, estimates of health impact can be used to compare measures either for the overall population or for subpopulations (in the context of assessing disparities).

Selecting Measures That Target the Most Effective Use of Health Care Resources

The high (and growing) cost of health care in the United States is pushing cost considerations to the forefront of the political agenda (Davis, 2008; Fisher et al., 2009). Cost-effectiveness analysis (CEA) is perhaps the most widely used method for considering cost in the context of health gain from medical care (Gold et al., 1996). In its most complete form, CEA "measures net cost per QALY saved [using a clinical intervention], for which net costs equal the cost of the intervention minus any downstream financial savings" (Maciosek et al., 2009, p. 350). CEA facilitates comparisons across interventions by providing a common metric for comparing costs across different interventions or activities, thus informing allocation decisions designed to maximize health (measured by QALYs) within confined resources (Gold et al., 1996; Neumann et al., 2008; Wong et al., 2009).

There have been calls for explicit consideration of CEA in the prioritization of quality measures and health care policy (Maciosek et al., 2009; Neumann et al., 2008; Siu et al., 1992; Wong et al., 2009; Woolf, 2009). These recommendations are supported by a burgeoning literature on the cost-effectiveness of several clinical preventive services and certain diagnostic testing and therapies (e.g., surgical and other procedures, devices, drugs and behavioral interventions), including the establishment of a searchable registry for CEA (Center for the Evaluation of Value and Risk in Health, 2009; NIHR Centre for Reviews and Dissemination, 2009). Most of the preventive and diagnostic services or interventions for which CEA data may be available fall within AHRQ's framework component of effectiveness measures (Bentley et al., 2008; Hurley et al., 2009); less is known about the cost-effectiveness of clinical interventions in the safety or timeliness components, but there are some examples (Barlow et al., 2007; Furuno et al., 2008; Rothberg et al., 2005; van Hulst et al., 2002). Data permitting, CEA could play a role in selecting and prioritizing quality measures for a number of framework components.

The committee recognizes that there has been some resistance to using CEA for health care improvement.

One criticism relates to the potential for bias in the conduct of CEA. For example, CEAs conducted by industry (e.g., health plans, pharmaceutical companies) frequently provide quite favorable results (Bell et al., 2006). Too often, CEA data follow rather than precede release of an intervention or technology into practice, limiting their usefulness at the time of its implementation (Greenberg et al., 2004). Furthermore, few CEAs report actual costs of implementing the intervention into routine care (Neumann et al., 2008), but instead focus largely on the cost of the intervention itself. Finally, ethical questions have been raised in terms of the impact of CEA on different populations, such as the elderly or disabled. Strict application of CEA to interventions designed to improve quality of life among the dying might yield results suggesting that minimal additional QALYs might not outweigh the costs.

These issues are potentially addressable (Neumann et al., 2008). For example, CEAs could employ standard and transparent methods, which may require some public financing so that they are not solely conducted by entities with a business interest in the result. Further, ethical considerations can be accounted for by incorporating balance and equity into policy decisions in conjunction with CEA, which is consistent with this committee's broader definition of health care value (see Chapter 3).

CEA represents one approach to formal, evidence-based comparisons of interventions that account for tradeoffs in costs and health benefits. These analyses could help track an important aspect of health care value and target the selection of measures that promote optimal health outcomes (e.g., QALYs, mortality rates, life expectancy).

Prioritizing Measures with High Health Impact and Effective Resource Use

To identify measures with the greatest potential value, particularly related to clinical effectiveness measures, the committee examined two strategies that employ health impact analysis and cost-effectiveness analysis. Without endorsing any specific strategy or methodology, the committee believes that the discussion below provides examples of ways in which AHRQ could select high-value, prioritized measures for performance reporting.

An Approach with Separate and Combined Clinically Preventable Burden and Cost-Effectiveness Rankings

Measurement of health impact in terms of both CPB and cost-effectiveness (CE) can be used to determine which among a given list of preventive measures has the greatest potential for quality improvement. In one example of this approach, Maciosek and colleagues examined a list of measures based on health care services interventions recommended by the U.S. Preventive Services Task Force (USPSTF). (Detailed methods for these calculations and additional information on the results are published elsewhere [Maciosek et al., 2006a,b]). CE and CPB calculations were used as the criteria to assess the relative value of each service. CPB was defined as "the total QALYS that could be gained if the clinical preventive service was delivered at recommended intervals" to a designated cohort; that is, total QALYs were compared between 100 percent of patients being advised to use or consider the intervention, and no use at all. CE was defined as "the average net cost per QALY gained in typical practice by offering the clinical preventive service at recommended intervals to a U.S. birth cohort over the recommended age range" (Maciosek et al., 2006a, pp. 53-54) (i.e., net cost of the intervention divided by the QALYs saved).

Once calculations for health impact and CE were completed for each service, analysts ranked the calculations by scoring them on a scale of 1 to 5, with 5 being the best score (i.e., the highest estimates for health impact, and the lowest cost-effectiveness ratio for CE). This quintile scale was created to rank the calculated estimates of CPB and CE without overstating the precision of the individual estimates. An overall score was then derived by adding the CPB and CE scores together, conveying services of greatest value within a given set. Table 4-1 depicts these individual and combined scores with the ultimate ranking of clinical preventive services.

Although the calculations for CE in the study by Maciosek and colleagues effectively included CPB (as the denominator of the equation), presenting CE and CPB separately allows decision-makers to consider both criteria either simultaneously or in isolation. This separation of factors may be useful when a measure's associated intervention ranks low in cost-effectiveness yet has a significantly high health impact, which decision-makers may value more and thus give the measurement area a higher priority. Measures and associated interventions that rank lower in a prioritization scheme should be assumed to retain value to some stakeholders or regions who may want to continue to invest in tracking or improvement activities in those areas. Although the Maciosek study was

TABLE 4-1 Ranking of Clinical Preventive Services for the U.S. Population

Clinical Preventive Service	CPB	CE	Total
Discuss daily aspirin use: men 40+, women 50+	5	5	10
Childhood immunizations	5	5	10
Smoking cessation advice and help to quit: adults	5	5	10
Alcohol screening and briefing counseling: adults	4	5	9
Colorectal cancer screening: adults 50+	4	4	8
Hypertension screening and treatment: adults 18+	5	3	8
Influenza immunization: adults 50+	4	4	8
Vision screening: adults 65+	3	5	8
Cervical cancer screening: women	4	3	7
Cholesterol screening and treatment: men 35+, women 45+	5	2	7
Pneumococcal immunization: adults 65+	3	4	7
Breast cancer screening: women 40+	4	2	6
Chlamydia screening: sexually active women under 25	2	4	6
Discuss calcium supplementation: women	3	3	6
Vision screening: preschool children	2	4	6
Folic acid chemoprophylaxis: women of childbearing age	2	3	5
Obesity screening: adults	3	2	5
Depression screening: adults	3	1	4
Hearing screening: 65+	2	2	4
Injury-prevention counseling: parents of child 0-4	1	3	4
Osteoporosis screening: women 65+	2	2	4
Cholesterol screening: men <35, women <45 at high risk	1	1	2
Diabetes screening: adults at risk	1	1	2
Diet counseling: adults at risk	1	1	2
Tetanus-diptheria booster: adults	1	1	2[a]

NOTE: The services shown in this table were services that had been recommended by the U.S. Preventive Services Task Force through December of 2004.

[a] Corrected from Maciosek et al., 2009. In article, mistakenly listed as "1."

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specific to preventive services, the same methods can be applied to rank the value of other types of health care services (i.e., acute treatment, chronic condition management) as long as there is enough information to perform the calculations.

A Net Health Benefit Approach

Another approach to prioritizing measures is based on the concept of net health benefits (Stinnett and Mullahy, 1998). This approach is used to quantify the potential value of quality improvement for a given measure by estimating the incremental health benefit gained by a clinical standard of care net of its incremental costs: "the difference between the health benefit achieved by a program, and the amount of health gain that would be needed to justify the program's cost" (Hauck et al., 2004, p. 85; Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020, 2008a).

This approach assumes that measures are defined with reference to some standard of care, that the benefits of implementation are measureable in terms of QALYs (or a similar metric of health benefit) on the basis of clinical evidence or consensus, and that the standard of care pertains to clinical quality, patient safety, organizational characteristics, utilization, or aspects of patient-provider relationships. The logic is as follows—if the costs and health benefits of standard-concordant care are known, and the costs and health benefits of non-standard-concordant care are also known, then the net health benefit (NHB) of the standard (the measure) can be calculated—the result being the population health benefits net of cost. As a result, different clinical interventions can be compared to see which are most productive.

Tengs and Graham (1996) illustrate how spending could be directed to clinical interventions with the potential for the greatest return. They examined the costs and benefits of 185 interventions, finding that the United States spent about $21.4 billion on these lifesaving interventions, averting 56,700 premature deaths and, in doing so, saving 592,000 life years. However, a smaller amount of funds could have been better allocated to minimize premature deaths and maximize life years to save an additional 595,000 life years.

Although cost-effectiveness estimates (measured in QALYs) are used in this method, they are only a part of the total calculation. In addition to comparing the costs and effectiveness of a standard of care, the net health benefit for a standard of care takes into account society's willingness to pay for an additional unit of health benefit (as measured by QALYs). Knowing the societal cost-effectiveness threshold allows for the calculation of opportunity costs for achieving the desired standard of care. Thus, a net health benefit calculation derives the actual costs and opportunity cost of accomplishing a standard of care if an intervention were fully implemented to maximize its benefit. This, in turn, allows one to calculate the expected population value of improving the performance rate of a measure for a given clinical intervention to 100 percent.

In Appendix F, a commissioned paper by David Meltzer and Jeanette Chung provides an illustrative analysis of Pap smears and estimates that 405,999 life years would be gained if every 18-year-old female received triennial screening (while current actual rates of screening yield 293,351 life years). Thus, the value of quality improvement would be the difference between perfect and actual implementation: 112,648 life years lost.

Meltzer and Chung's paper explores the net health benefit methods and their theoretical applicability to 14 NHQR measures that span different framework components. The strategy can be used to estimate the potential value of improving performance on existing quality measures, which can then be used to prioritize measures for reporting. Meltzer and Chung examine the applicability of these techniques for process measures with an associated standard of care, composite process of care measures, and incidence rates of complications (e.g., foreign body left in during a procedure per 1,000 hospital discharges). While the technique is well suited to analyze process measures, it is difficult to use for composite process measures or for most outcome measures because no specific treatment or intervention is defined. The issues with each of these measure types are discussed in more depth in their paper.

Limitations of These Strategies

While both of the approaches discussed above are useful for informing decision-makers of where to invest resources to improve health care, they have important limitations. First, these methods for prioritization do not include any equity or disparities considerations for specific priority population groups. It is conceivable, however, that CPB and CE estimates could be calculated for specific population groups if the necessary data were available; a few studies on the economic impact of disparities have recently been released (LaVeist et al., 2009; Waidmann, 2009). Second, the information necessary to compute CE and health impact calculations may not be readily available; it is rarely the case that analysts have all of the necessary information to do these estimates and must consequently make assumptions. These assumptions should be clearly identified, and sensitivity analyses should be used to examine the effect of assumptions on results. In the absence of data from the peer-reviewed literature, the assumptions should be guided by expert opinion and the gray literature.

A third limitation, and an important one given the multidimensional aspect of health care value, is that the above-discussed approaches for prioritization are not readily applicable to all measures given that the calculation rests on quantifiable standards of information (e.g., financial cost, QALYs). The approaches apply primarily to clinical effectiveness measures and, to some extent, to safety and efficiency measures when a health care service or intervention has been identified to improve health outcomes with known costs. Yet there are measures reported in the NHQR and NHDR—some access, timeliness, and patient-centeredness measures—for which underlying interventions or processes are not easily tied to monetary or life duration factors. For example, the health impact of patient perceptions of care that promotes informed patient decision-making or alleviates suffering at the end-of-life is not easily translated to QALYs. Measures without an easily quantifiable impact arguably represent important and desirable ends in themselves, apart from any demonstrable effect on health. For these measures, alternative means are needed to weigh the relative impact of gaps or disparities. This might be achieved through formal assessment of the relative value, or ranking of the health care processes captured in qualitative dimensions by consumers. Such rankings could facilitate prioritization if coupled with consideration of the gap or disparity in performance and the size of the population affected by the gap. Although this approach would not allow direct comparison with CPB or net health benefit, it would help facilitate prioritization among measures falling within a particular quality component of the framework.

The framework components of care coordination and health systems infrastructure capabilities were not assessed using these strategies because measures for these components were not presented in the latest edition of the national healthcare reports. Chapter 3 referenced some studies that indicated potential cost-effectiveness using care coordination and implementing HIT. However, the evidence base for such interventions on improving the quality of care would need to be further examined to evaluate the applicability of these prioritization strategies to them.

Finally, the resources required to discover, collect, and collate the data needed for these prioritization approaches, along with the human capital to perform the computation and analysis are substantial. Depending on the data available, a thorough search of the literature and calculations for a single measure will require a considerable amount of dedicated time. If the NAC Technical Advisory Subcommittee for Measure Selection and AHRQ were to use such prioritization approaches, which this committee strongly recommends, appropriate resources to support this effort would be required. The Phase 1 report on Healthy People 2020 suggests that communities use similar techniques to prioritize their objectives and that support be given to communities in terms of technical support materials to make this possible. There would be synergy in AHRQ and CDC partnering to advance these more quantitative approaches to prioritization as well as partnerships with other public or private entities utilizing these techniques.

Tools for Assessing Equity

A high-value health care system, by definition, requires the provision of equitable, high-value care to all individuals; therefore, metrics that assess equity in health care delivery should be considered in the prioritization process for measure selection. Measures in which the nation as a whole is performing well (i.e., for which there is little or no gap between the national average and achieving recommended care for the entire applicable population) may show performance gaps when the data are stratified by population subgroups. Therefore, the goal of achieving value in health care must be balanced by considering the needs of population groups that differ in age, race, ethnicity, gender, disability, and socioeconomic status. Chosen quality measures should promote the core quality dimension of equity in health care.

An inequity is a measurable, observable difference that can and should be closed (Carr-Hill, 2001; Whitehead and Dahlgren, 1991). For example, because the incidence of AIDS is more than 20 times higher among Black than White women, and two-thirds of new AIDS cases among women are in Black women (Kaiser Family Foundation, 2009), the CPB of interventions related to AIDS, such as use of highly active antiretroviral therapy, is much greater among Black women than among the population of all women.

As is further discussed in Chapter 5, the identification of disparities is often hampered by sample sizes and a lack of systematic, standardized collection of sociodemographic data. Yet large disparities that are statistically insignificant due to small sample sizes may still be indicative of problems with equity (Siegel et al., 2009). This section explores some of the established techniques and tools that allow for the identification of disparities. It is important to consider (1) whether the disparity is measured on a relative or absolute scale, (2) the reference point from which differences are measured, and (3) whether the disparity is weighted by population size or degree of inequity.

Relative and Absolute Difference

Absolute and relative measures of disparity can provide contradictory evidence regarding changes in a disparity over time. In the context of health care quality improvement, increasing relative but decreasing absolute inequality occurs when the rate of improvement is smaller for the group with the worst performance rate (Harper et al., 2010). In concert with one another, absolute and relative differences can provide a more comprehensive picture of a disparity than either method alone. The committee does not recommend a single approach to measuring disparities and instead emphasizes that the method of measurement can determine the size and direction of a potential disparity.

AHRQ presents information on disparities in terms of both relative and absolute differences in either adverse or favorable outcomes. In the Highlights section of the 2008 NHDR, AHRQ presents the three largest disparities in quality for different groups using relative differences (AHRQ, 2009c). The committee was not able to assess the validity of these rankings. A relative measure expresses the disparity as a ratio relative to the reference point or group, so that reference point becomes the unit of comparison. Absolute measures of disparity are simply the difference between a group rate and the reference group; most of the AHRQ graphs reflect absolute differences. See Table 4-2 below for a list of ways to measure absolute and relative health disparity.

The following example highlights how examining relative and absolute differences can lead to different conclusions, especially when comparing over time. In 2000, the rate of a specific disease was 8 percent in the African American population and 4 percent in the White population. In absolute terms, this was a 4-point difference, whereas in relative terms, the African American rate was twice the White rate. In 2010, the African American rate is 6 percent, and the White rate is 3 percent. Both groups have better rates, and the African American rate has improved more than the White rate. In absolute terms, the gap has shrunk from 4 points to 3 points. In relative terms, the African American rate is still double the White rate. In this case, the relative rate does not reflect that the situation is better in 2010 than it was in 2000. A 2005 report released by the CDC advised that to promote a more complete understanding of the "magnitude of disparities," disparities should be measured in both absolute and relative terms, especially when making comparisons over time, geographic regions, or populations (Keppel et al., 2005). Additionally, Harper and colleagues have urged researchers against always using a single measure (e.g., a rate ratio), and instead advised researchers to "pay more attention to the normative choices inherent in measurement" (Harper et al., 2010, p. 22).

When both absolute and relative difference cannot be presented (due to space constraints, for instance), major medical journals are trending toward presenting absolute differences (Braveman, 2006; Dombrowski et al., 2004;

TABLE 4-2 Measures of Absolute and Relative Health Disparity

Measures of Absolute Disparity	
Rate Difference	Simple arithmetic difference between two groups (usually between the less-advantaged group and the more-advantaged group).
Between-Group Variance	The sum of squared deviations from a population average. The variance that would exist in the population if each individual had the average health of their social group.
Absolute Concentration Index	Measures the extent to which health or illness is concentrated among a particular group.
Slope Index of Inequality	Absolute difference in health status between the bottom and top of the social group distribution.
Measures of Relative Disparity	
Rate Ratio	Measures the relative difference in the rates of the best and worst group.
Index of Disparity	Summarizes the difference between several group rates and a reference rate and expresses the summed differences as a proportion of the reference rate.
Relative Concentration Index	Measures the extent to which health or illness is concentrated among a particular group.
Relative Index of Inequality	Measures the proportionate rather than the absolute increase or decrease in health between the highest and lowest group.
Theil Index and Mean Log Deviation	Measures of disproportionality. Summaries of the difference between the natural logarithm of shares of health and shares of population.

NOTE: Although this table is on measures of health disparities rather than health care disparities, the same concepts can be applied to measuring disparities in health care performance.
SOURCE: Harper and Lynch, 2007.

Regidor et al., 2009; Rosvall et al., 2008). The advantage of this approach is that it is more consistent with using population health burden as a metric for prioritizing within populations. When both measures cannot be presented, the committee suggests AHRQ might include absolute rates in graphs and tables and add a comment in the text about whether the relative disparity is changing.

Calculating Disparities Using Odds Ratios

By expressing disparities in terms of odds ratios, researchers can calculate and present the risk of one group over another (similar to relative rate).[12] AHRQ employs this method to calculate the "odds," for example, for uninsurance for Black and Asian adults to White adults. This method allows AHRQ to easily convey that the risk of uninsurance is 0.9 times higher for Blacks and 1.1 times higher for Asians (AHRQ, 2009c). Odds ratios should be used with caution as they can exaggerate differences and may be misleading in terms of clinical significance. For any notion of causality, notations of the absolute difference should be readily available (that is, on the probability scale).

The Reference Population

As Nerenz and Fiscella have noted, the quality measures that matter to the overall population also matter to minority populations (Fiscella, 2007; Nerenz et al., 2006). Disparities may be assessed by stratifying quality data by various population groups. Indeed, AHRQ presents data on measures for priority populations in this way in the NHDR. This method also has the benefit of being able to use the same measures to assess performance levels for both disparities and quality among populations. However, additional measures of disparity may be relevant and necessary to fully document the extent or presence of inequities.

Measuring disparities requires a comparison group. The reference group or point can be the unweighted mean of all groups, the weighted mean of the total population, the most favorable rate among population groups, or an external deliberate standard such as a Healthy People 2010 target or benchmark. Although each of these reference points can be useful, the group with the most favorable rate is often chosen as the reference point in disparities studies because it assumes that every group in the population has the potential to achieve the health of the best-off group. (In Chapter 6, the committee suggests that in the NHDR, AHRQ use benchmarks based on the best-in-class performance rate not just the highest population rate, which often is worse than the best-in-class performance rate.)

An Index of Health Care Disparities

Indices of disparities summarize average differences between groups and express the summation as a ratio of the reference rate (Harper et al., 2008). Most disparity indices measure statistically significant disparities across all populations for a given condition or disease (e.g., among all races in a given state), but do not always measure variance for a single discrete population group (Gakidou et al., 2000). Pearcy and Keppel's Index of Disparity gives equal weight to each group, even when each group represents different proportions of the population (Pearcy and Keppel, 2002). This kind of unweighted measure of disparity means that an individual in a larger population group may receive more weight than an individual in a smaller population group. To be clinically relevant to providers, a disparity index needs to measure disparities in care among discrete subpopulations and needs to give greater weight to disparities that affect greater numbers of patients (Siegel et al., 2009). Doing so captures population impact. Siegel and colleagues developed a disparities index that takes in account the quality of health care being provided to all patients, the size of the affected population, and changes over time (Siegel et al., 2009). Another

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[12] "Odds ratios are a common measure of the size of an effect and may be reported in case-control studies, cohort studies, or clinical trials. Increasingly, they are also used to report the findings from systematic reviews and meta-analyses. Odds ratios are hard to comprehend directly and are usually interpreted as being equivalent to the relative risk. Unfortunately, there is a recognized problem that odds ratios do not approximate well to the relative risk when the initial risk (that is, the prevalence of the outcome of interest) is high. Thus there is a danger that if odds ratios are interpreted as though they were relative risks then they may mislead" (Davies et al., 1998, p. 989).

benefit of using population-weighted measures is that they are able to account for changes in the distribution of the population that inevitably occur over time (Harper and Lynch, 2005).

For the purposes of the national healthcare reports, measures of equity may need to consider more than just the number of individuals affected in the entire population. For instance, a very large gap in quality of care between one relatively small subpopulation and the overall population may have significant implications for quality. A report prepared for the National Cancer Institute on measuring cancer disparities adopted a population health perspective on disparities. This perspective means that the researchers were primarily concerned with the total population burden of disparities and thus considered both absolute differences between groups and the size of the population subgroups involved (Harper and Lynch, 2005).

Conclusion

The methods discussed above should be considered when analyzing data relevant to assessing disparities in performance among different populations and prioritizing measure selection. Measures that reveal an equity gap, even when those same measures are equivalent in assessments of value, should be considered for prioritization as they exhibit an important attribute of the health care system where greater improvements in health care quality can be made.

SUMMARY

The Future Directions committee has recommended improving the process for selecting performance measures for the NHQR and NHDR to make the process more transparent and quantitative. It has also recommended establishing a Technical Advisory Subcommittee for Measure Selection to advise AHRQ through the NAC. Although there are limits to applying more quantitative techniques in valuing measurement areas, they should be used whenever feasible. Their use is common in prioritization practices for resource allocation. National prioritization of measures can influence where resources are devoted to quality improvement. The potential impact of focusing quality improvement on closing the performance gaps of specific measure choices should be analyzed with care, particularly as the committee believes the national reports should be driving action rather than passively reporting on past trends.

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5

Enhancing Data Resources

As the nation moves forward with enhanced health information technology (HIT) and building a health care data infrastructure, AHRQ can leverage its position as the producer of the national healthcare reports to identify health care quality measurement and data needs. Subnational data, for example, can inform trends on emerging measures and serve as a model for the development of more widespread data collection on measures that show promise for quality improvement. Race, ethnicity, and language need, among other sociodemographic variables, continue to influence the quality of care individuals receive. For that reason, standardized information regarding these variables is a necessary component of the national health care data infrastructure.

Collecting and reporting accurate, comparative data that are useful to measuring health care quality is a "time-consuming" process (NPP, 2008). There is movement among quality improvement stakeholders to harmonize performance measures to reduce the data burden on organizations and health care providers. At the same time, there is extensive development and testing of new measures to fill shortcomings in measurement areas or improve existing measures. The Future Directions committee believes AHRQ, by leveraging its position as the producer of the NHQR and NHDR can identify health care quality measurement and data needs for development, and utilize subnational data sources when national data do not yet exist. This chapter underscores the importance of the evolving national health care data infrastructure as an emerging source of information for the NHQR and NHDR. The chapter also outlines the pros and cons of using subnational data to fill needs for measurement areas in the NHQR and NHDR and proposes criteria for the use of such data.

In addition, the chapter summarizes the independent consensus study of a subcommittee to the Future Directions committee, which culminated in the report *Race, Ethnicity, and Language Data: Standardization for Health Care Quality Improvement*.[1] The subcommittee's recommendations in that report (see Appendix G) emphasized the need to increase the availability of standardized race, ethnicity, and language need data across the health care system. This chapter addresses the relationship of the subcommittee's findings to improving the content and analyses in the NHDR and discusses the utilization of socioeconomic and insurance status data in analyses for the NHDR and NHQR.

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[1] The full text of *Race, Ethnicity, and Language Data: Standardization for Health Care Quality Improvement* is available at http://www.nap.edu/catalog.php?record_id=12696.

BUILDING A NATIONAL DATA INFRASTRUCTURE

Information on quality and disparities can promote understanding of where health care needs and quality gaps exist. In the mid-1960s, the National Halothane Study first indicated how data on variation in performance can advance our understanding of health care and provide opportunities for improvement. The results from the Halothane Study, which principally evaluated mortality rates in the use of anesthesia, revealed unexpected variation in surgical outcomes across hospitals. After adjusting for differences in procedure, age, and physical status, differences in death rates between institutions remained "very much larger" than the differences among anesthetics used (Subcommittee on the National Halothane Study of the Committee on Anesthesia, 1966, p. 128). Looking beyond anesthesia, health care variation by both institution and geographic region remains very much an issue in 2010, including how variation in quality affects the cost of health care (Fisher et al., 2009; Skinner et al., 2010; Weinstein and Skinner, 2010). We now understand that "unwarranted variation" occurs and must be identified in order to be addressed in a "logical and manageable fashion" (Wennberg and Wennberg, 2003, p. 614). Once health care organizations have evaluated and identified the factors contributing to undesirable variation, they are better positioned to develop and implement quality improvement interventions to reduce or eliminate it.

The absence of a national health care data infrastructure hinders the potential for national measurement and reporting to actually improve quality (James, 2003). The development of such an infrastructure has been labeled an "awesome task" (Mechanic, 2007, p. 46) that requires national coordination of performance measures, data aggregation, methodology, and technology (Roski, 2009). Yet AHRQ can play a role in defining the content for such a national health care data infrastructure by identifying and fostering measures and data sources, even if the measures and data are not yet national in scope, and by specifying measurement areas with the greatest potential to improve population health as quality and equity gaps are closed.

Data directly related to care processes and outcomes are needed to comprehensively describe the quality and quantity of care provided by individuals and institutions. Accordingly, data illuminating how care is delivered, who is delivering care, and where care is delivered are necessary to identify opportunities for system change. Electronic health records (EHRs), patient-based registries, and all-payer claims data (APCD) offer long-term potential for comprehensive patient data that can be used to measure the quality of care being provided across settings and time. These data sources have the potential to link use of services, intermediate outcomes, and demographics, and may be large enough to address questions about the quality of care provided to specific subpopulations.

The *American Recovery and Reinvestment Act of 2009*[2] authorizes and provides resources for the Office of the National Coordinator for Health Information Technology (ONC) within HHS to guide the "development of a nationwide health information technology infrastructure that allows for the electronic use and exchange of information." Proposed rules on standards to receive Medicare and Medicaid reimbursement incentives for the implementation of EHRs were issued in December 2009 and describe ways in which EHR systems should be used for purposes that include quality improvement and the elimination of disparities in health and health care (CMS, 2010).

In addition, there is potential for data linkages between health information exchanges (HIEs) and APCD databases (Rogers, 2009). An APCD database would ideally contain information on all covered services, regardless of the setting or the location of the provider, and would include eligibility information and medical, pharmacy, and dental claims. APCD databases may be able to provide data by payers and plans, and could provide the sample size necessary to report on populations and measurement areas where statistical power currently limits quality reporting. Ideally, APCD could be used to define episodes of care and to handle issues of risk and severity adjustment without the need for medical records data. In reality, putting together the requisite data and addressing patient confidentiality concerns require significant investment of time and resources. For instance, Maine, New Hampshire, and Vermont, among others, have APCD databases, but these databases do not always capture care for residents who have out-of-state plans and none of these databases have integrated Medicare data to allow long-term follow-up. Kansas' APCD database, which is called the Kansas Health Insurance Information System (KHIIS), is a repository for data from group insurers, Medicaid, the Children's Health Insurance Program (CHIP), and the state employee health plan. It does not include Medicare data and faces budgetary, political, and data quality hurdles (Allison,

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[2] *American Recovery and Reinvestment Act of 2009*, Public Law 111-5 § 3002(b)(2)(B)(vii), 111th Cong., 1st sess. (February 17, 2009).

2009). In December 2009, HHS announced its intent to build a universal claims database for health research.[3] In the interim, state-based claims databases may provide comparative data.

In the near term, multi-site clinical registries may provide data that allow the NHQR and NHDR to illustrate the potential of a health care data infrastructure for national performance measurement. The Northern New England Cardiovascular Disease Study Group, National Surgical Quality Improvement Program, and National Quality Program of the Cystic Fibrosis Foundation are examples of registries with an explicit focus on provider-specific performance, sharing data, exploring the causes of variations in outcomes, and applying established quality improvement techniques (e.g., benchmarking and site visits to high-performing providers) (American College of Surgeons, 2009; Cystic Fibrosis Foundation, 2009; Leavitt et al., 2009; Likosky et al., 2006). These collaboratives may provide insight into what levels of performance are possible.

As EHR and other HIT provisions are implemented, and as national registries, health information exchanges, and APCD become more comprehensive and available, the potential to build the NHQR and NHDR on a solid foundation of provider- and community-specific performance measurement will become even greater. These data sources have the potential to complement or replace some of the data sources AHRQ currently uses to monitor specific conditions; however, AHRQ may face resource challenges to analyze and use new data sources without additional funding.

In the near term, AHRQ should continue to work with various stakeholders, such as states, the National Quality Forum (NQF), and other HHS agencies to stimulate data development when data do not exist to support desirable measures. Such data development could be accomplished by adding pertinent questions to existing surveys, or data elements to EHR systems and existing registries. AHRQ could work with the Centers for Medicare and Medicaid Services (CMS), for instance, to further develop datasets on a widening array of clinical services. CMS is already beginning to publicly report on risk-adjusted 30-day outcomes for acute myocardial infarction (AMI) across almost all U.S. hospitals (CMS, 2009); the reported measure tracks outcomes in addition to mortality and could supplement AHRQ's current measure on AMI mortality rates. Furthermore, AHRQ could capitalize on other opportunities for partnership in measure and data development, particularly given the contract awarded by HHS to the NQF to identify the most important quality and efficiency measures for individuals cared for under Medicare (NQF, 2009).

Additionally, in AHRQ's portfolio of research, including the burgeoning field of comparative effectiveness, there are opportunities to promote the generation of measures that may be of high impact for quality improvement. Previous AHRQ-funded research projects have yielded performance measures. For example, a project focused on aggregating utilization data on psychopharmacology use among children enrolled in Medicaid resulted in several potentially useful quality and safety measures, even though the project was not specifically aimed to develop measures (Crystal et al., 2009). Additionally, AHRQ could fund measure development activities, as it has done in the past. For example, from 1996 through 1999, AHRQ funded the Expansion of Quality of Care Measures (Q-SPAN) project to develop and test clinical performance measures focused on specific conditions, patient populations, or health care settings. AHRQ may need additional resources to support measure development in areas identified in its measurement agenda (see Chapters 4 and 7).

The preceding discussion indicates that analysis of quality and disparities can be informed by multiple data sources—nationally representative provider-based and household surveys, administrative databases such as the Medicare and Medicaid programs and hospital discharge data, and clinical data obtained from sources such as EHRs and disease registries (IOM, 2002). Comprehensive quality and disparities reporting currently requires utilizing data available from all of these types of sources.

FILLING MEASUREMENT AND DATA NEEDS

The NHQR and NHDR are a "mosaic of existent data sources" (IOM, 2001, p. 128). To compile the 2008 NHQR and NHDR, AHRQ used 35 diverse data sources, including population surveys, vital statistics databases,

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[3] For more information, see the Federal Business Opportunities website: https://www.fbo.gov/?s=opportunity&mode=form&id=71d119aea45a6f2efdc5862cac9cb6e2&tab=core&_cview=0 (accessed December 20, 2009).

administrative data, and clinical data (see Table 5-1). Despite the use of these data sources, the committee finds important areas of measurement for which data are not included in the NHQR and NHDR (see Chapter 3). In many of these measurement areas (e.g., HIT adoption and care coordination), national data sources do not support such measures. In some cases, though, the Future Directions committee believes that data sources beyond those currently included in the NHDR and NHQR have the potential to provide important insight into certain aspects of quality and disparities measurement.

Incorporating information from additional data sources into the NHQR and NHDR could help to ensure that the reports tell a more complete story of the nation's progress in improving the quality of health care. These additional data sources may be nationally representative *or* national in scope (e.g., the National Surgical Quality Improvement Program, the Cystic Fibrosis Patient Registry) and may provide clinical information, data on alternate payment streams, and information on populations of interest (e.g., children with special health care needs) that are not represented in large enough numbers in existing datasets used by AHRQ. For example, Healthcare Effective-

TABLE 5-1 Data Sources Used in the 2008 NHQR and NHDR

Federally Funded National Surveys
AHRQ, CAHPS Hospital Survey (HCAHPS)
AHRQ, Center for Quality Improvement and Patient Safety (CQUIPS), National CAHPS Benchmarking Database (NCBD)
AHRQ, Medical Expenditure Panel Survey (MEPS)
CDC, Behavioral Risk Factor Surveillance System (BRFSS)
CDC-National Center for Health Statistics (NCHS), National Health Interview Survey (NHIS)
CDC-NCHS, National Immunization Survey (NIS)
Substance Abuse and Mental Health Services Administration (SAMHSA), National Survey on Drug Use and Health (NSDUH)
Health Care Facilities and Clinical Data
AHRQ, Healthcare Cost and Utilization Project (HCUP), Nationwide Inpatient Sample (NIS)
AHRQ, Healthcare Cost and Utilization Project (HCUP), State Inpatient Database (SID)
American Cancer Society (ACS), National Cancer Data Base (NCDB)
CDC-NCHS, National Ambulatory Medical Care Survey (NAMCS)
CDC-NCHS, National Hospital Ambulatory Medical Care Survey (NHAMCS)
CDC-NCHS, National Hospital Discharge Survey (NHDS)
CMS, End Stage Renal Disease Clinical Performance Measures Project (ESRD CPMP)
CMS, Home Health Outcomes and Assessment Information Set (OASIS)
CMS, Medicare Patient Safety Monitoring System (MPSMS)
CMS, Nursing Home Minimum Dataset (MDS)
CMS, Quality Improvement Organization (QIO) program, Hospital Quality Alliance measures
National Institutes of Health (NIH), U.S. Renal Data System (USRDS)
SAMHSA, Treatment Episode Datasets (TEDS)
Surveillance and Vital Statistics Data
CDC, HIV/AIDS Surveillance System
CDC, National Program of Cancer Registries (NPCR)
CDC, National Tuberculosis Surveillance System (NTBSS)
CDC, National Vital Statistics System: Link Birth and Infant Death Data (NVSS-I)
CDC, National Vital Statistics System: Mortality Data (NVSS-M)
CDC, National Vital Statistics System: Natality (NVSS-N)
National Cancer Institute (NCI), Surveillance, Epidemiology, and End Results program (SEER)
Other
CMS, Medicare Administrative Data (MAD)
CMS-National Hospice and Palliative Care Organization (NHPCO), Family Evaluation of Hospice Care Survey (FEHCS)
HHS, HIV Research Network (HIV RN)
Indian Health Service (IHS), National Patient Information Reporting System (NPIRS)
National Committee for Quality Assurance (NCQA), Healthcare Effectiveness Data and Information Set (HEDIS)
NIH-National Institute of Mental Health (NIMH), Collaborative Psychiatric Epidemiology Surveys (CPES)
University of Michigan, Kidney Epidemiology and Cost Center

SOURCES: AHRQ, 2009a,b.

ness Data and Information Set (HEDIS) data often include ambulatory clinical care measures that expand beyond information available in administrative data to provide details on actual treatment, not just testing.

Using Subnational Data in the Absence of National Data

As David Lansky of the Pacific Business Group on Health told the Future Directions committee, "a snapshot of national performance is instructive to establish a national vocabulary on quality for trending and benchmarking, but there is a risk of 'looking under the lamppost' and failing to focus on the right (and evolving) problems" (Lansky, 2009). The committee believes that looking "under the lamppost" and potentially missing important areas of quality measurement is an apt metaphor of caution for the selection of national measures for inclusion in the NHQR, NHDR, and related products.[4] If the reports measure only areas for which national data are currently available, the measure selection process becomes circular, precluding development of new measures in national priority areas for health care quality improvement. For that reason, it is important for AHRQ to identify novel quality measurement possibilities and to look beyond existing data sources.

Defining Subnational Datasets

Although it is preferable that the national healthcare reports rely on nationally representative data or data that are national in scope, there are instances, whether due to insufficient sample sizes at the national level (e.g., ethnic populations in some surveys) or underdeveloped areas for measure development and reporting (e.g., end-of-life care, adoption of HIT), when subnational data may be informative for additional or otherwise overlooked measures of quality and disparities. The IOM's 2002 *Guidance for the National Healthcare Disparities Report* described subnational datasets as "surveys produced by single states" or surveys of "all or multiple" states or localities. Subnational data also includes, for instance, state-based APCDs.

Subnational datasets can represent health care entities (e.g., hospitals, payers) in certain areas of the country or contain data on specific population groups. Currently, AHRQ uses several subnational datasets to fill gaps in data on specific population groups and on specific measures. State-based data from states with a high proportion of specific racial or ethnic groups can help portray the health care issues specific to populations not well represented in national datasets (e.g., data for Native Hawaiians in Hawaii or on individuals of specific Asian ethnicities in California).[5] The California Health Interview Survey (CHIS), for instance, provides estimates of insurance coverage and barriers to care for many of the sizable population groups present in California, such as recent immigrants, however, for which national data are lacking. AHRQ uses CHIS to supplement some information in the NHDR that is principally provided by the Medical Expenditure Panel Survey (MEPS). Other state-based surveys (e.g., the Rhode Island Health Interview Survey, the Hawaii Health Survey, and the Massachusetts State Health Survey) may also provide useful data for AHRQ; these surveys tend to have smaller samples sizes than CHIS.

Rationale for Using Subnational Datasets

For certain areas of quality and disparity reporting, national databases provide insufficient or no data. As an example, quality data for all major population groups—as defined by the Office of Management and Budget (OMB) categories of White, Black or African American, Asian, Hispanic, American Indian or Alaska Native, and Native Hawaiian or Other Pacific Islander—are often unavailable because national survey samples often contain insufficient data to stratify all measures for each population group. Due to small sample sizes, this problem particularly arises for AHRQ in the case of American Indian or Alaska Natives, and Native Hawaiian or Other Pacific Islanders.

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[4] A man is on his knees under a lamppost crawling around looking for something. A passerby asks him what is he doing. "Looking for lost keys," he replies. "Is this where you lost them?" "No, but there is light here" (Rogers and Wright, 1998; Salinger, 2006).

[5] Numerous organizations including Papa Ola Lokahi, the Asian and Pacific Islander American Health Forum, and the National Indian Health Board encourage and foster the development of subnational datasets specific to racial and ethnic groups that are underrepresented in national surveys.

Although oversampling has the potential to resolve information gaps, costs and logistical issues constrain the use of oversampling techniques (Madans, 2009). In an effort to provide information in the 2008 NHDR on quality measures that were otherwise limited by sample size, AHRQ included data from the Indian Health Service for several measures (AHRQ, 2009b).

As discussed in Chapter 3 and Appendix D, information gaps exist for measurement areas such as the adoption of HIT, end-of-life care, efficiency, and care coordination. Several subnational datasets provide information that could be used to fill measurement gap areas (as examples, see Box 5-1 and Box 5-2). A principal rationale for using subnational data is that these data would inform a priority area identified by this Future Directions committee or by the Secretary as a result of health reform[6] that is not sufficiently addressed with current national data. Using subnational data could not only fill gaps where important national measures do not currently exist, but also could spur development of nationally representative data for measurement areas.

Criteria for the Use of Subnational Data

As the previous discussion indicates, subnational datasets have the potential—in both the interim and long-term—to supplement information presented in the NHQR and NHDR. The committee deliberated on the degree to which AHRQ should rely on these data in the national healthcare reports. On one hand, utilizing these datasets in the NHQR and NHDR may provide insight into important opportunities for quality improvement or reduction of disparities. On the other hand, these datasets are, by definition, not nationally representative as they represent only specific populations or geographic regions. The presentation of subnational data has the potential to mislead readers; therefore, AHRQ should clearly underscore the limitations of such data. The committee suggests that AHRQ only use subnational data when national data are not available and that AHRQ should clearly present caveats to ensure that readers of the NHQR and NHDR understand what population the data represent (i.e., subnational data should not be advertised as being nationally representative). AHRQ may, for example, explicitly note: “We do not currently have national data for this specific measure; these data represent a region, a particular population, or a sector.” Presenting the information in either textboxes or sidebars would help clarify that subnational data are examples of areas for future measure or data development.

Recommendation 4: AHRQ should use subnational data for domains that do not yet have national data in order to illustrate the types of national data that need to be developed to satisfy measurement and data gaps. Subnational data should meet the following minimum requirements for reporting:

- **The data source allows the calculation of a measure of interest, ideally one identified as a national priority.**
- **The data source uses reliable and well-validated data collection mechanisms and tested measures.**
- **The sample used in the data source is representative of the population intended to be reported on (e.g., a region, state, population group) or is drawn from the entire population group even if it is not necessarily generalizable to the nation.**

To further the development of strong subnational datasets and encourage the generation of needed national data, AHRQ could collaborate with sponsors of datasets such as the type identified in Table 5-2. This list is meant to illustrate the kinds of subnational datasets that may be useful but is not comprehensive in scope. These datasets share several key characteristics—they are used to generate measures that are robust in their accuracy and actionability; they have an established infrastructure, and a process for measure development and reporting that has gained credibility and trust among key stakeholders; and, the tools and methods used are not idiosyncratic and are thus replicable in other parts of the country. AHRQ might partner with the Quality Alliance Steering Committee (QASC), the National Committee for Quality Assurance (NCQA), the Institute for Healthcare Improvement (IHI), the Robert Wood Johnson Foundation’s Aligning Forces for Quality initiative, the National Association of

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[6] *Patient Protection and Affordable Care Act*, Public Law 111-148 § 3013, 3014, 111th Cong., 2d sess. (March 23, 2010).

BOX 5-1
Using Subnational Data to Provide Insight into Potential Health Information Technology Measures

While the adoption of HIT is no guarantee of quality, HIT is a stepping stone to quality improvement as it facilitates interoperability, data sharing, and streamlined work processes. Currently, data at the national level are available to report on the adoption and use of HIT in some, but not all, health care settings. This measurement area is therefore considered developmental.

While there are not reliable estimates of the rates of HIT use in all health care settings, national data on the adoption of HIT in hospitals have been collected via survey by the American Hospital Association (Jha et al., 2009). Additionally, proprietary data on the uptake of computerized physician order entry (CPOE) and its impact on length of stay and costs are collected by The Leapfrog Group (The Leapfrog Group, 2010). Furthermore, the Healthcare Information and Management Systems Society (HIMSS) Analytics collects and analyzes proprietary data related to the HIT market in hospitals and integrated health care delivery systems (HIMSS Analytics, 2010).

Regional quality improvement initiatives such as Minnesota Community Measurement, the Integrated Healthcare Association, and the Wisconsin Collaborative for Healthcare Quality measure HIT use within their respective states (Minnesota, California, and Wisconsin, respectively) and report on measures of electronic prescribing, use of electronic lab or diagnostic results, and use of electronic clinical reminders (IHA, 2009a; Mayberry and Hunkins, 2008; Minnesota Community Measurement, 2009b; Wisconsin Collaborative for Healthcare Quality, 2009). AHRQ might feature (in a sidebar, for example) some of the measures used by these initiatives to examine the use of HIT and its impact on quality improvement.

BOX 5-2
Measuring Medical Home in Large, Population-Based Surveys

An important indicator of quality is whether individuals, especially those with chronic conditions, receive their care through a “medical home,” that is, a source of care that provides comprehensive, ongoing, coordinated, patient-centered care. Most questionnaires that measure whether a person has a medical home were developed for studying care coordination, communication, and doctor-patient relationships in clinical settings.

The UCLA Center for Health Policy Research included medical home measures in the 2009 California Health Interview Survey (CHIS), a large, comprehensive population health survey that the state’s policy makers and researchers use to assess the prevalence and care of chronic conditions in California’s ethnically and racially diverse population. CHIS developed a survey module that collects information from respondents on (1) whether they report having a medical home (i.e., a usual source of care and specific health care professional) (RAND, 2000), (2) whether in the last year they contacted their provider’s office with a question about their condition and received a timely answer (AHRQ, 2006), (3) whether their provider worked with them to develop a care management plan (RAND, 2000), (4) whether the patient is confident about managing their own condition (Beal et al., 2007), and (5) whether their provider helps coordinate their medical care. These indicators are considered important elements of a medical home. CHIS’s comprehensive questionnaire and large, diverse sample will permit analyses of the extent to which California residents with differing characteristics have a medical home and, of particular interest to AHRQ, the existence of disparities.

Beal and colleagues analyzed data from the 2005 Household Component of the Medical Expenditure Panel Survey (MEPS) to identify Latino subgroup variation in having a medical home, the impact of having a medical home on disparities, and the factors associated with Latinos having a medical home. The researchers used MEPS data to determine whether patients had a medical home based on (1) having a regular provider, (2) the role of the provider in total care for the patient (i.e., preventive care, ongoing health problems, referrals), (3) patient engagement in care (e.g., provider asked patient about medications), and (4) patient access to care (e.g., ability to contact provider during business hours, on nights or weekends). Because the MEPS survey oversamples Black and Latino households, the data had enough statistical power to provide unbiased national estimates (Beal et al., 2009).

State Medicaid Directors, the National Association of State Offices of Minority Health, the Association of State and Territorial Health Officials, health information exchanges, and other regional quality collaboratives. Although some of these organizations are national in scope, they often sponsor regional or state-based initiatives that may provide population- or measure-specific data.

The committee did not investigate whether costs or confidentiality agreements would interfere with utilization of datasets such as those included in Table 5-2 but encourages AHRQ to explore the feasibility of incorporating additional data sources and enhancing those currently used. The committee understands that AHRQ currently spends about half of its reports-related budget on data acquisition and analysis even though much of the data incorporated in the reports is provided by AHRQ's federal partners. AHRQ will need additional funding to support and expand its data acquisition to additional external sources (see Chapter 7).

IMPROVING RACE, ETHNICITY, LANGUAGE NEED, SOCIOECONOMIC, AND INSURANCE STATUS DATA

The NHDR reveals that even as health care quality improves on specific measures, disparities often persist. Addressing such disparities begins with the fundamental step of bringing the nature of the disparities and the groups at risk for those disparities to light by analyzing health care quality information stratified by race, ethnicity, language need, socioeconomic, and insurance status data (IOM, 2009a,b; NRC, 2004). This section of the report briefly examines the need for each of these sociodemographic data elements in documenting disparities in health care, and summarizes a recent IOM report on standardizing race, ethnicity, and language need data for quality improvement. Then, it evaluates the variables by which AHRQ stratifies data, the data sources used to create the NHDR, and the ways in which AHRQ analyzes disparities data.

Enhanced Collection, Analysis, and Reporting

In 2008, AHRQ contracted with the IOM to form the Subcommittee on Standardized Collection of Race/Ethnicity Data for Healthcare Quality Improvement in conjunction with the Committee on Future Directions for the National Healthcare Quality and Disparities Reports. As required by the project's statement of task (see Chapter 1), the subcommittee conducted its own consensus-based, in-depth analysis that was then issued as an independently reviewed, stand-alone report. The subcommittee's report *Race, Ethnicity, and Language Data: Standardization for*

TABLE 5-2 Examples of Subnational Datasets Not Currently Used in the NHDR and NHQR That May Provide Supporting Data

Dataset	Responsible Organization
California pay for performance (P4P) data	Integrated Healthcare Association (IHA)
Kaiser Permanente data on its health plan regions	Kaiser Permanente
Maine Quality Forum data	Dirigo Health Agency
Minnesota HealthScores	Minnesota Community Measurement
Northern New England Cardiovascular Disease Study Group (NNECDSG) Database	Dartmouth-Hitchcock Medical Center
Pennsylvania Health Care Cost Containment Council Interactive Database	Pennsylvania Health Care Cost Containment Council (PHC4)
State health interview surveys (e.g., Hawaii Health Survey, Massachusetts State Health Survey, Rhode Island Health Interview Survey)	Various
Wisconsin Performance & Progress Report	Wisconsin Collaborative for Healthcare Quality

SOURCES: IHA, 2009b; Kaiser Permanente, 2009; Maine Health Data Organization, 2009; Minnesota Community Measurement, 2009a; Wisconsin Collaborative for Healthcare Quality, 2009.

Health Care Quality Improvement was released on August 31, 2009.[7] It identified current methods for categorizing and coding race, ethnicity, and language need data; discussed the challenges involved in obtaining these data in health care settings; and made recommendations for improvement. The subcommittee's findings and recommendations (see Appendix G) provide background information relevant to the committee's task of recommending ways to improve the data reported in the NHQR and NHDR. The committee draws on the subcommittee's work regarding race, ethnicity, and language need data, but also addresses socioeconomic and insurance status data, which were outside of the scope of work for the subcommittee.

Rationale for Granular Ethnicity Data

Since the 2003 release of the IOM's *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*, evidence of disparities in health care among racial and Hispanic populations, as these populations are categorized by the OMB,[8] has continued to accumulate. There is more information on differences in life expectancy (IOM, 2008a) and mortality risks or rates for certain medical conditions (Murthy et al., 2005; Wang et al., 2006), along with knowledge of disparities in general health status, access to health care, and utilization rates (Cohen, 2008; Flores and Tomany-Korman, 2008; Kaiser Family Foundation, 2009a; Ting et al., 2008). Even as quality-of-care indicators show improvement for the overall U.S. population (e.g., screening for colorectal cancer), disparities persist among the OMB race and Hispanic ethnicity categories (Moy, 2009; Trivedi et al., 2005). Therefore, the subcommittee endorsed continued collection of the OMB categories because they are useful for comparative analysis and have been the standard since 1977 (with adjustments in 1997).

There has been relatively less attention paid to the issue of disparities as they relate to more discrete ethnic groups *within* the OMB categories (e.g., persons of Cuban, Russian, Chinese, or Nigerian ethnicity, whether born in the United States or elsewhere). The OMB categories are not always sufficiently precise to capture population groups of interest to national and local quality improvement efforts. Currently, the NHDR presents the OMB-defined race and Hispanic ethnicity groups as homogenous populations. For example, the section of the NHDR that discusses Hispanics as a priority population makes no mention of the wide range of cultures, languages, and health-related behaviors encompassed by the Hispanic ethnicity category. Because some national surveys collect data on individuals of Mexican, Puerto Rican, and Cuban ethnicities, among others, it would be possible to provide illustrative examples of disparities, when they exist, among these specific ethnic groups.

These more specific data can highlight quality gaps among more precisely defined populations that differ in the extent of risk factors, degree of health problems, quality of care received, and outcomes. Numerous studies have described heterogeneity in health and cultural factors within the OMB's Black or African American population, and the need to examine this population in greater detail (e.g., Black individuals of African heritage versus those of Caribbean heritage) (Kington and Nickens, 2001; Pallotto et al., 2000; Read et al., 2005). Similarly, disparities are apparent within other OMB-defined groups, including in the broad OMB-defined White, Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, and Hispanic categories. For example, the need for health care services can depend, in many instances, on ancestry: large differences exist in asthma burden between groups of Hispanic children in the United States. One study indicated that compared to children of Mexican heritage, children of Puerto Rican heritage had a higher prevalence (10 percent and 26 percent, respectively) and rate of recent asthma attacks (4 percent and 12 percent, respectively) (Lara et al., 2006).

Because disparities can exist within the broad OMB categories, there is value in collecting and utilizing data that have more fine-grained ethnicity categories than those put forth by the OMB (Blendon et al., 2007; Jerant et al., 2008; Read et al., 2005; Shah and Carrasquillo, 2006). The subcommittee recommended, and the committee concurs, that health care-related entities should collect data on granular ethnicity—defined as "a person's ethnic origin

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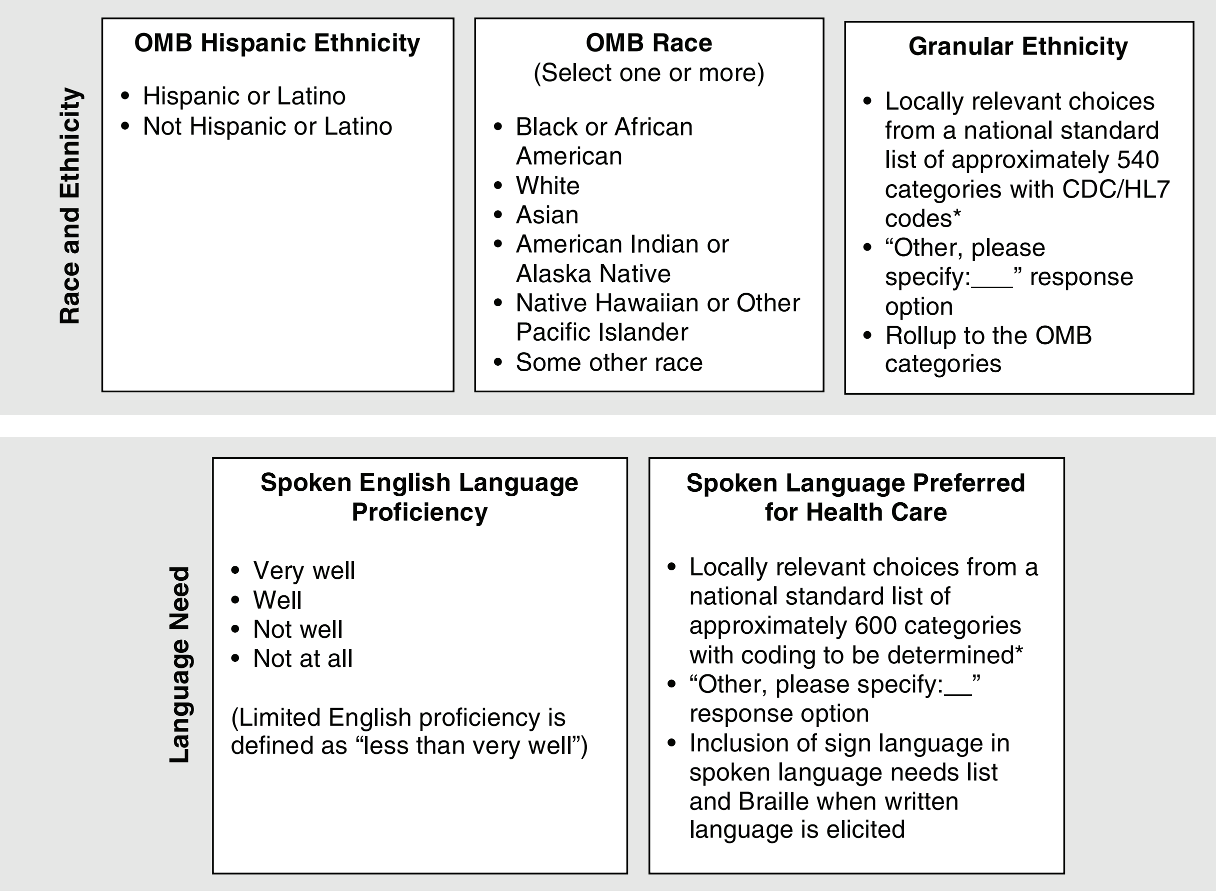
[7] The full text of *Race, Ethnicity, and Language Data: Standardization for Health Care Quality Improvement* is available at http://www.nap.edu/catalog.php?record_id=12696.

[8] The OMB's *Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity* (1997) include a minimum of two ethnic categories: (1) Hispanic or Latino and (2) Not Hispanic or Latino, and five race categories: (1) American Indian or Alaskan Native, (2) Asian, (3) Black or African American, (4) Native Hawaiian or Other Pacific Islander, and (5) White. Federal data collection requires that respondents be allowed to select more than one race.

or descent, 'roots,' or heritage, or the place of birth of the person or the person's parents or ancestors" (U.S. Census Bureau, 2008a)—in addition to soliciting data in the OMB race and Hispanic ethnicity categories (Figure 5-1). More discrete population data are necessary to identify opportunities for quality improvement and outreach without unnecessarily and inefficiently targeting interventions to an entire broad race or Hispanic population.

The design of the national healthcare reports may make it difficult to display data on a large number of granular ethnicity groups for each measure. For instance, the heart disease measure presented on page 62 of the 2008 NHDR would become overwhelmingly complex if the figure also included data for Americans of Mexican, Japanese, and Jamaican ethnicity. A derivative product of the NHQR and NHDR that focused on subgroups within the broad OMB race or ethnicity groups would be well suited to present more discrete population information. Additionally, online functionalities that allow users to further analyze subgroup data would facilitate more discrete data analyses without imposing additional data into the print version of the NHDR.



Race and Ethnicity

OMB Hispanic Ethnicity

- Hispanic or Latino
- Not Hispanic or Latino

OMB Race
(Select one or more)

- Black or African American
- White
- Asian
- American Indian or Alaska Native
- Native Hawaiian or Other Pacific Islander
- Some other race

Granular Ethnicity

- Locally relevant choices from a national standard list of approximately 540 categories with CDC/HL7 codes*
- "Other, please specify:___" response option
- Rollup to the OMB categories

Language Need

Spoken English Language Proficiency

- Very well
- Well
- Not well
- Not at all

(Limited English proficiency is defined as "less than very well")

Spoken Language Preferred for Health Care

- Locally relevant choices from a national standard list of approximately 600 categories with coding to be determined*
- "Other, please specify:__" response option
- Inclusion of sign language in spoken language needs list and Braille when written language is elicited

FIGURE 5-1 Recommended variables for standardized collection and reporting of race, ethnicity, and language need.
* EHR systems should be able to code data elements from national standard sets of response categories. The subcommittee merged lists of granular ethnicities and languages and their corresponding codes to provide templates from which HHS can develop national standard lists of response categories and codes. Every health professional may not actually use, either in data collection processes or in subsequent analyses, all of the hundreds of possible categories of granular ethnicity or language. However, EHR systems should be designed to accommodate all of the national categories and codes so that a provider can choose the top categories encountered in his or her patient population.
SOURCE: IOM, 2009b.

The Rationale for Language Need Data

Robust evidence exists that patients with limited English-proficiency encounter significant disparities in access to health care (Hu and Covell, 1986), decreased likelihood of having a usual source of care (Kirkman-Liff and Mondragon, 1991; Weinick and Krauss, 2000), increased probability of receiving unnecessary diagnostic tests (Hampers et al., 1999), and more serious adverse outcomes from medical errors (Divi et al., 2007) and drug complications (Gandhi et al., 2000). The most compelling case for collection and use of language need data is that appropriate, understandable communication represents a foundation of quality health care. That is, patient understanding, comprehension, and informed decision-making are necessary for the provision of high-quality care.

Consequently, HHS, in conformance with Department of Justice principles to prevent discrimination and to ensure access to federally funded programs, provides guidance on collecting language need data (HHS, 2003) in its Culturally and Linguistically Appropriate Services (CLAS) standards. However, English language proficiency and preferred language for health care encounters are not often captured in clinical, survey, or administrative datasets. While surveys may capture language need by noting the language in which the survey was administered, surveys are often only administered in Spanish and English, and measures of language need are more detailed than simply listing an individual's language preference.

The subcommittee concluded, and the committee agrees, that language need can best be assessed by asking two questions: one aimed at determining whether an individual speaks English "less than very well" and a second aimed at identifying the individual's preferred spoken language during a health care encounter (Figure 5-1 above).[9] In evaluating spoken English proficiency, the subcommittee determined that the threshold of speaking English "less than very well" (as opposed to "less than well") is the most sensitive for assessing effective communication. Individuals with limited English proficiency may need to have greater English proficiency for health care encounters than for other daily tasks because of the unfamiliarity of health concepts and the complexity of medical terminology (Karliner et al., 2008; Siegel et al., 2001).

Collecting and storing standardized language need information allows its use in measuring system-level quality (e.g., the availability of interpreters and translated materials, and evaluating whether patients have been matched with language-concordant providers), and for stratifying measures by English language proficiency. Collecting these data for analysis at the national level could inform the need for culture competency measures or help target areas where culturally and linguistically appropriate policies and interventions are necessary.

While the subcommittee principally focused on the categorization of race, ethnicity, and language need—as it was charged to do—it recognized the role of health literacy, among other variables in health care quality. The subcommittee adopted the following definition of health literacy:

> The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions. (Ratzan and Parker, 2000, p. vi)

Medical information is complex to understand, even without the added barrier of having a primary language other than English. Comprehending many health-related materials requires education at the high school level, as most materials are written at a 10th-grade reading level or higher (D'Alessandro et al., 2001; Downey and Zun, 2007; IOM, 2004a). To ensure effective communication, patients may need to discuss written materials with an interpreter or bilingual provider even if the materials are translated into the patients' primary language, which is why the subcommittee prioritized the collection of spoken language ability over written language ability when data systems limit the number of data elements that can be collected.

The Rationale for Socioeconomic Data

Examining socioeconomic status (SES) and insurance status was outside the scope of the subcommittee's task, although the subcommittee acknowledged the importance of these factors when assessing health care quality.

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[9] The subcommittee's recommendation to collect English language proficiency and preferred spoken language is closely aligned to how the NQF defines primary language—the self-selected language the patient wishes to use to communicate with his or her health care provider (NQF, 2009).

Therefore, the Future Directions committee looked at other studies to evaluate the usefulness of these data. The multidimensional construct of SES, which can be represented by various measures (e.g., income, education, occupation), can act as both a mediator of racial and ethnic health care disparities, and a further source of disparities.

The terms *socioeconomic status*, *socioeconomic position*, and *class* are often used interchangeably. Isaacs and Schroeder, for instance, determined that class can be measured by income, wealth, and education (2004). These are the same components that a National Research Council committee concluded to encompass a broad set of socioeconomic characteristics defined as socioeconomic position (SEP) (NRC, 2004).[10] This committee uses the term SES because it is used in the literature more frequently than SEP or class. The committee understands SES to be a broad concept that encompasses income, wealth, and education.

Higher SES is related to better health and health care quality (Fiscella et al., 2009). Studies have found, for example, that higher income and education are associated with lower mortality (Deaton and Paxson, 2004; Egerter et al., 2009; Mechanic, 2007; Sorlie et al., 1995) and that SES is correlated with cancer incidence and mortality (Singh, 2003). While the relationship between SES and health care is complex, there are several established pathways. First, income is related to affordability. Even among the insured, most health care plans include premiums, deductibles, copayments, and non-covered services. Persons with a higher income level are better able to afford these expenses (McWilliams, 2009), as well as to take time off from work to seek care. Second, education is linked with health knowledge, behavior, employment, income, social and psychological factors, and social standing, and is therefore a "crucial path" to health (Egerter et al., 2009). Because education is related to wealth and income, it is therefore related to an individual's ability to both access and afford the health insurance market (NRC, 2004). Third, a low level of health literacy is associated with less use of preventive services and a greater use of emergency departments (Arispe et al., 2005). Conversely, higher health literacy, which is correlated with education, is generally associated with improved ability to navigate a highly complex and disjointed health delivery and health care payment system (NRC, 2004). Additionally, higher education is associated with greater diffusion and uptake of newer technology, presumably due to a combination of health literacy and social networks (Chang and Lauderdale, 2009).

A person's health and health care are "greatly influenced by powerful social factors such as education and income and the quality of neighborhood environments" (RWJF Commission to Build a Healthier America, 2009, p. 10). While the casual relationships between income, class, neighborhood, and health care are complex, it is clear that where people live, learn, and work have implications for the health services they receive (California Newsreel, 2008; Health Policy Institute, 2008; RWJF Commission to Build a Healthier America, 2009). Among other factors, diet, housing conditions, educational quality, and neighborhood environment are a function of class, and neighborhood conditions constrain access to healthful foods, quality medical care, and opportunities for exercise (California Newsreel, 2008).

Although there is some evidence for reverse causality (e.g., poor health results in lower income due to downward occupation drift), the balance of the evidence suggests that the primary pathway is from SES to health and health care (Marmot, 2006). Although measures of SES are correlated, each distinctly influences health and health care outcomes (Mechanic, 2007). For example, although education is associated with income, wealth, and occupation, it has independent effects beyond these joint influences (Mechanic, 2007). SES provides a crude index of health status (and thus health care need) within a population and has implications for both allocation of resources and assessment of health performance (Casalino and Elster, 2007; Fiscella et al., 2009). Without collecting SES data, it is difficult to assess whether policies and interventions are mitigating or exacerbating health and health care disparities.

The Rationale for Insurance Status Data

A 2009 IOM report on the consequences of uninsurance concluded that "health insurance is integral to personal well-being and health" (IOM, 2009a, p. 5) and that high levels of uninsurance undermine the quality of the nation's

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[10] In 2004, the National Research Council of the National Academy of Sciences defined SEP as a "complex concept, encompassing a number of elements of a person's position in society, including economic resources (earnings, income, and wealth), social resources (social networks and connections to community resources), education (formal credentials, communication skills, and health information), and occupation" (NRC, 2004, pp. 33-34).

health care, even for insured populations. The report presented a robust body of evidence that demonstrated the substantial health and health care benefits of insurance and supported a previous IOM report's conclusion that "health insurance contributes essentially to obtaining the kind and quality of health care that can express the equality and dignity of every person" (IOM, 2004b, p. 159). AHRQ reviewed the impact of uninsurance on many of the measures included in the 2006 NHQR and NHDR and found, for instance, that uninsured individuals were much less likely than those with private or public insurance to have a usual primary care provider (AHRQ, 2008).

The Availability of Data for Disparities Analysis and Reporting

The categories for collection and methods of aggregation for reporting race, ethnicity, and language need data vary across the data sources used to create the NHDR. As previously indicated, the 2008 NHQR and NHDR are comprised of data from a variety of sources; these data sources do not uniformly report on all variables (e.g., poor, White, Black or African American, Hispanic, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander) for each measure. For example, all core quality measures in the NHDR cannot be broken down even into each of the OMB race and Hispanic ethnicity categories. This is evident in the 2008 NHDR where 24 of the 46 core measures are missing data from at least one of the OMB categories. For these 24 measures, reliable data were unavailable for specific groups, most commonly the American Indian or Alaska Native population (AHRQ, 2009a). More recently, AHRQ has indicated that it can analyze most of the core measures by insurance status.

The subcommittee report *Race, Ethnicity, and Language Data: Standardization for Health Care Quality Improvement* recommended actions to improve data processes across the health care system. These recommendations, with which the Future Directions committee agrees, are as follows:

- The necessary variables for disparities measurement (i.e., race, Hispanic ethnicity, granular ethnicity, English language proficiency, and preferred spoken language) should be included in clinical records, surveys, and administrative data.
- HHS, states, and accreditation and standards setting organizations can require or encourage this adoption through a variety of mechanisms (see Appendix G).

AHRQ's ability to analyze such data for the national healthcare reports is dependent on the uptake of these recommendations; AHRQ should work with its data partners to increase the availability of these descriptors.

Federally Funded National Surveys

National-level surveys, which include the National Health Interview Survey (NHIS), the Health and Retirement Study (HRS), the National Health and Nutrition Examination Survey (NHANES), and the National Immunization Survey (NIS), are designed—among other purposes—to make comparisons across time, providers, and geographic areas (Madans, 2009). Much of what is known about racial and ethnic disparities has been derived from surveys of the national population (Sequist and Schneider, 2006). For example, the available evidence on health and health care disparities among granular ethnicity groups in the U.S. population is limited primarily to those groups for which there is currently discrete categorization on national survey instruments.

The various federally funded health surveys that provide data for the NHQR and NHDR collect race and Hispanic ethnicity data in the six categories specified by the OMB and a usually common set of 9 to 12 more granular ethnicity categories. For example, the NHIS, National Survey on Drug Use and Health (NSDUH), and Medical Expenditure Panel Survey (MEPS) all include the OMB categories plus Mexican, Cuban, Puerto Rican, Asian Indian, Chinese, Filipino, Japanese, Korean, and Vietnamese categories, among others.[11]

Many studies using data from large national datasets still often need to pool data over multiple years to get sample sizes sufficient to support reliable inferences and conclusions for racial and ethnic groups. As an example,

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[11] These categories generally correspond to the check-off boxes included in Census 2000, Census 2010, and intercensal American Community Survey (ACS) questions on race and ethnicity.

using logistic regression analyses of MEPS data pooled from 2002 through 2005, AHRQ identified the independent effects of socioeconomic factors on obese adults given advice by a doctor about exercise (AHRQ, 2009a). Without pooling the data, information on subgroups would have been small and less reliable for analysis.

Health Care Facilities and Clinical Data

AHRQ utilizes a variety of clinical data sources in the NHQR and NHDR. The subcommittee found, and the committee concurs, that a lack of standardization of race, ethnicity, and language need variables and categories has been a barrier to the widespread collection, aggregation, and utilization of these data. Hospitals, health plans, and accrediting bodies, for example, have expressed reluctance to implement data collection because they did not have guidance on what exactly to collect (Taylor and Gold, 2009; Weinick et al., 2008). Standardization can promote greater comparability and ability to aggregate data collected by providers or plans, or, for instance, transferred from providers to multiple plans or from multiple plans to a state. The *American Recovery and Reinvestment Act of 2009* (ARRA)[12] lays out expectations for the collection of race, ethnicity, and language data by specifying the inclusion of these variables in EHRs (CMS, 2010). Clinical data would be valuable for the NHQR and NHDR because provider settings supply data otherwise not collected in surveys or administrative datasets.

Administrative Data

Surveys are useful to capture information for which patients are considered the best reporters (e.g., patient-centeredness), whereas administrative data sources generally provide more reliable and detailed information about aspects of care that are not based on patient recall (e.g., utilization of services, costs, efficiency). Ensuring the collection of race, ethnicity, language need, and SES in Medicare, Medicaid, and Children's Health Insurance Program (CHIP) claims and enrollment data is important to documenting disparities.

As indicated in Table 5-1, the NHQR and NHDR utilize several CMS data sources, including data from the Nursing Home Minimum Dataset and the Home Health Outcomes and Assessment Information Set, but there is potential to use additional CMS data sources, including data from Medicare Part D. As a byproduct of administering the Medicare program, CMS has a wealth of information on enrollment, utilization, and costs, among other variables (McGann, 2009; Reilly, 2009), on the nearly 100 million individuals it insures.[13] Thus, Medicaid and Medicare datasets are particularly useful in determining utilization rates for different types of services (IOM, 2002), although they may not contain sufficient clinical information (such as the need for a particular service or its outcome) and they often contain incomplete, inaccurate, or even no data on race, ethnicity, language need, or SES (Bonito et al., 2008).[14] These are critical limitations because Medicare and Medicaid claims data are among the few publicly available data sources that would be large enough to provide data on small population subgroups.

Improvement in the collection of race, ethnicity, language need, and SES data in Medicare and Medicaid files is needed. To date, CMS has conducted some preliminary studies using indirect estimation tools to enhance race and ethnicity data obtained through current collection methods. Under the *Medicare Improvements for Patients*

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[12] *American Recovery and Reinvestment Act of 2009*, Public Law 111-5 § 3002(b)(2)(B)(vii), 111th Cong., 1st sess. (February 17, 2009).

[13] At least 100 million of the 300 million people in the U.S. are served by three programs administered by HHS—Medicare, Medicaid, and community health centers. There were 44.8 million Medicare beneficiaries in 2008, 58.7 million Medicaid and CHIP recipients in 2006, 10 million with dual enrollment, and 8.9 million uninsured or privately insured individuals served by health centers. The U.S. population, as of July 1, 2008, was 304 million (HRSA, 2008; Kaiser Family Foundation, 2009b; U.S. Census Bureau, 2008b).

[14] Because Medicare historically relied on the race and ethnicity data individuals provided when they applied for a Social Security number (SSN), racial and ethnic identifiers were limited to "Black," "White," and "Other" responses included on the SSN application form (unless the individual changed enrollment to a specific health plan). Consequently, Medicare data have been of limited use in studying differences in patterns of care for populations identified by the OMB categories (Bilheimer and Sisk, 2008; Bonito et al., 2008; U.S. House Committee on Ways and Means Subcommittee on Health, 2008). The limitations of the Medicare data for race and Hispanic ethnicity have been acknowledged by CMS officials, and CMS is actively working to improve its coding of race and ethnicity within existing datasets (Bonito et al., 2008). As of August 2009, the Social Security Administration (SSA) has updated its SS-5 form (to include all of the OMB race and Hispanic ethnicity categories) (Social Security Administration, 2009). This is an important update as SSA provides demographic information to Medicare.

and Providers Act of 2008,[15] CMS is required to address quality reporting by race and ethnicity, and a report by CMS detailing its proposed actions is due to be publicly available in 2010.

Using Indirectly Estimated Data

When directly collected race or ethnicity data are incomplete or unavailable in a dataset, estimating the probability of a person's race or ethnicity from other information (e.g., zip code, surname) may be useful. Indirect estimates of race and ethnicity can allow for analyses of associations between race and ethnicity and outcomes of interest. The subcommittee's report recommended that such inferences can be useful when the limits of direct collection of racial and ethnic data have been reached.

One of the simplest indirect approaches is to use area-level population data derived from the Census. Such data include the racial and ethnic composition of an area, as well as socioeconomic measures such as median income, percent in poverty, distribution by years of educational attainment, percent reporting speaking a language other than English at home, and proficiency with English. Substantial literature on the use of "geocoding" in health research compares the effects of using data aggregated to various geographic levels (Fiscella and Fremont, 2006; Fremont et al., 2005; Krieger et al., 2003a,b,c, 2005; Rehkopf et al., 2006; Subramanian et al., 2006); generally, research has concluded that effects are detected more sensitively when data are linked to smaller (more detailed) geographic units.

Additionally, names have been used as indicators of racial and ethnic identity. For some names, there is a corresponding racial and ethnic composition based on self-identification of people with that name in Census data. These data have been summarized in lists of common Spanish and Asian surnames and more specific lists of surnames associated with different Asian-origin ethnicities (Elliott et al., 2008; Fiscella and Fremont, 2006; Wei et al., 2006).

The distributions of race and ethnicity in an area or for a particular name can be interpreted as probabilities that a randomly chosen person from the group (of residents of the area or persons with that name) is a member of each race or ethnicity. Under the assumption that information such as area composition and name are independent given the person's race, the information can be combined using Bayes's theorem to produce a posterior probability for each race and ethnicity (Elliott et al., 2008; Fiscella and Fremont, 2006).

Although the use of indirectly estimated data at the individual level is limited by the probabilistic nature of the data and the consequent possibility of error, the subcommittee concluded—and the committee concurs—that these techniques can be used to bridge gaps for analysis until directly collected data are available. In several illustrative analyses, disparities identified with these methodologies closely matched those identified using self-reported race and ethnicity data (Elliott et al., 2008). However, users of indirectly estimated data should be cautioned against interpreting such data to make conclusions about individual characteristics (e.g., assigning a race to a person's individual medical chart).

Stratifying Quality Measures

The most analytically simple approach to reporting disparities is to calculate and present the differences between groups being compared. The NQF has noted that addressing issues of quality within "vulnerable patient populations" requires stratifying measures by "gender, race, ethnicity, SES, primary language, and insurance status." This chapter's discussion of the rationale for race, ethnicity, language need, SES, and insurance status data highlights the importance of exploring quality measures by these variables. Analyzing these measures within the context of social determinants of health (e.g., neighborhood environments) could also be an effective strategy to explore complex relationships between race, ethnicity, income, education, class, and health care.

Further, the ability to stratify measures by gender and age is important to consider as females, children, and older adults are among AHRQ's priority populations. Studies have shown, for instance, that women with cardiovascular disease are treated less aggressively than men and are less likely to undergo cardiac procedures (Chou

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[15] *Medicare Improvements for Patients and Providers Act of 2008*, Public Law 110-275 § 118, 110th Cong., 2d sess. (July 15, 2008).

et al., 2007). Further stratification may be particularly important, however, in the context of intra- and inter-race variability. Studies that have stratified cardiac care patients by gender and race have found higher rates of clinically appropriate care among men and underuse of clinically appropriate care among Blacks (Epstein et al., 2003), with the lowest rates of clinically appropriate care utilization being for Black women (Steiner and Miller, 2008). In addition, the analysis of disparity measures by age will provide important insight. For example, a measure that depicts receipt of a vaccine by the elderly population could adjust for age to show whether the likelihood of being vaccinated by a given age is the same for all population groups.

With perfect data, AHRQ might be able to control for a variety of factors (e.g., age, gender, SES, comorbid behavioral and health disorders) to determine whether such factors confound or mediate relationships between high-quality care and race or ethnicity. However, these data are not uniformly available. When possible, AHRQ might discuss in text whether uncontrolled factors would likely mitigate or worsen disparities and could also discuss data limitations. The 2008 NHDR includes a table listing AHRQ's ability to stratify the core measures by the OMB race and Hispanic ethnicity categories, and by whether individuals have household incomes less than 100 percent of federal poverty thresholds[16] (AHRQ, 2009a, p. 287). The committee commends AHRQ for indicating where reliable data are and are not available and encourages AHRQ to expand its table of data availability to include not only all of the OMB race and Hispanic ethnicity categories, but also availability of granular ethnicity, language need, SES, and insurance status data.

The IOM's 2002 *Guidance for the National Healthcare Disparities Report* advised AHRQ to present analyses of racial and ethnic disparities that take into account the effect of SES (IOM, 2002). Similarly, the 2008 IOM report *State of the USA Health Indicators* recommended that data be first presented by race, ethnicity, and SES, and then by race and ethnicity data stratified by SES (e.g., a bar chart in which each part represents an income group within a specific race) (IOM, 2008b). Stakeholders have suggested that data presentation in the NHDR could be further strengthened by stratifying race and ethnicity by SES or, in some cases, controlling for SES via multivariate regressions (IOM, 2008b). AHRQ has only done this to a limited extent (e.g., see pages 199 and 143 of the 2008 NHDR for examples of how AHRQ presents multiple stratifications). Figure 5-2 shows another way in which AHRQ might present such data. This format would allow readers to examine racial, ethnic, and SES aspects of a specific disparity and would show the independent and combined contributions of each of these factors. In the 2008 NHDR, AHRQ presented multivariate regression analyses for three measures: obese adults who were given advice about exercise, people without insurance, and people who have a usual primary care provider (AHRQ, 2009a).

There are both positive and negative implications of controlling for various factors depending on whether they are viewed primarily as confounders or mediators. The IOM report *Unequal Treatment* acknowledges that income is one of many intervening variables between race, ethnicity, and disparities (IOM, 2003). However, controlling for SES may possibly "mask" the "main effects" of disparities (IOM, 2008b). Moreover, controlling for SES may obscure important differences among providers that deserve attention, such as poorer performance among providers caring for disadvantaged populations or lack of resources available to provide services in low-income areas (Williams, 2008). For these reasons, it is best to present data both with and without adjustment for income and insurance status. One way of teasing out its potential mediating role is by examining the relationships between race, ethnicity, and quality both with and without income included. The committee does not intend that AHRQ report on all measures stratified by all of the above-discussed variables; rather, AHRQ should present data when they reveal disparities or should note that the analyses were performed and did not reveal a disparity.

Recommendation 5: AHRQ should:

- **Continue to stratify all quality measures in the NHDR by at least the OMB race and Hispanic ethnicity categories, by socioeconomic status variables (e.g., income, education), and by insurance status.**
- **Strive toward stratifying measures by language need (i.e., English language proficiency and preferred spoken language for health care-related encounters), and extend its analyses in**

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[16] Twenty-three measures are not assessed by income level.

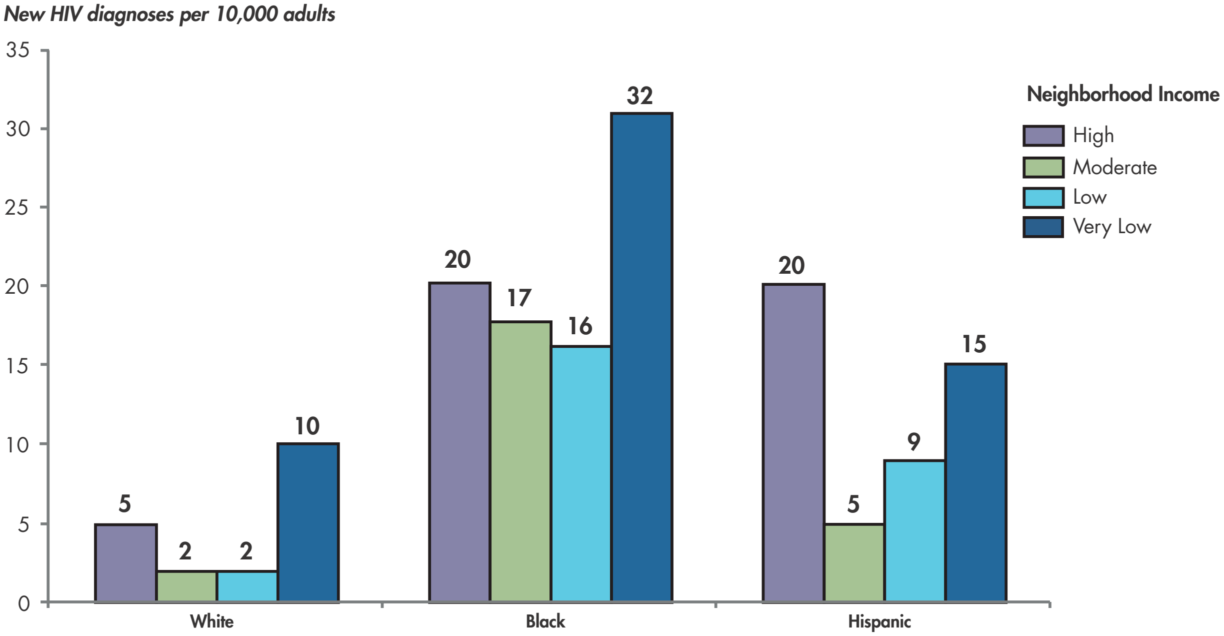

FIGURE 5-2 Both poor and wealthy New York City neighborhoods have high rates of new HIV diagnoses; overall, very low income Black New Yorkers have the highest rates of HIV diagnoses.
SOURCE: Karpati et al., 2004. Reprinted, with permission, from the New York City Department of Health and Mental Hygiene. Copyright 2004 by the New York City Department of Health and Mental Hygiene.

the NHDR and derivative products to include quality measures stratified by more granular ethnicity groups within the OMB categories whenever the data are available.

- **Document shortcomings in the availability of OMB-level race and Hispanic ethnicity data, granular ethnicity data, language need, and socioeconomic and insurance status data to support these analyses; work to enhance the collection of these data in future iterations of the source datasets; and whenever necessary, should utilize alternative valid and reliable data sources to provide needed information even if it is not available nationally.**

SUMMARY

This chapter has detailed a variety of shortcomings in health care quality and disparities data. First, national data are often removed from the clinical setting. Although surveys and administrative databases are enormously valuable, measuring outcomes often requires detailed clinical data collected at the point of care. Second, national data are not available on all measures of health care priority areas, including measures of care coordination, efficiency, and HIT. And finally, high-quality data on race, ethnicity, language need, SES, and insurance status are not always available for stratifying quality metrics and assessing disparities.

The committee finds that these limitations can be addressed by AHRQ in several ways—showcasing subnational datasets in the reports when they illustrate measurement opportunities; noting when shortcomings in data exist so attention can be focused on filling them; and supporting measures and data source development for the future through its research agenda, whether by collaboration or direct funding.

Efforts are under way to institute national standards for HIT, performance measurement, and data aggregation and exchange that complement local data collection and experiences with performance improvement and reporting (Roski, 2009). AHRQ has the opportunity to exhibit leadership on the content for national reporting that should be embedded in the nation's health care data infrastructure. The committee envisions AHRQ providing information in the NHQR and NHDR that not only monitors where the nation currently stands in terms of measurement and data capacity, but also where the nation can go.

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6

Improving Presentation of Information

The NHQR and NHDR can be forward-looking documents that not only present historical trend data but also convey a story of the potential for progress and the health benefits to the nation of closing quality and disparity gaps. To serve as catalysts for improvement, the Future Directions committee envisions that the reports will extrapolate rates of change to indicate when gaps between current and recommended care might be closed and will present benchmarks on best-in-class performance. The committee makes suggestions for organizing report content to tell a more complete quality improvement story, realize greater integration between quality improvement and disparities elimination, improve takeaway messages and data displays, and achieve a better match between the AHRQ products and potential audiences.

The NHQR and NHDR provide an enormous amount of data—principally presented in graphs—about how the United States is performing on various measures of health care and how performance has bettered or worsened over time. Although these data are useful, the NHQR and NHDR have potential beyond reporting on historical trends; the reports can also illuminate realistic levels of performance for all to strive toward and provide information on how long it will take to close gaps between current and recommended care at the current pace of improvement.

In this chapter, the committee expands on its vision that future versions of the NHQR and NHDR should tell a more complete story of how to move toward achieving a high-quality, high-value health care system. To make the information presented in the NHQR and NHDR more forward-looking and action-oriented, the committee recommends that AHRQ make greater use of benchmarking and suggests improvements to data displays and the general organization of the NHQR and NHDR. Helping audiences for the NHQR and NHDR better understand gaps in the quality of U.S. health care—whether between actual performance and receiving the recommended standard of care, or between population groups or geographic regions—and better understand the benefits of closing those gaps would provide audiences with stronger evidence and rationales for improving quality.

The chapter begins by reviewing the Future Directions committee's suggestions for how AHRQ's lineup of products could better serve current and expanded audiences. The committee underscores the importance of integrating disparities reduction into quality improvement by enhancing the relationship between the structure of the two national healthcare reports. Finally, suggestions are made on improving data displays and the statistical quality of quality reporting.

MATCHING PRODUCTS TO AUDIENCE NEEDS

At present, the national healthcare reports and related products are consulted by a variety of stakeholders, many of which have different interest areas (e.g., heart disease, rural health, racial disparities, delivery settings) and different levels of sophistication for data interpretation and analysis. The 2001 IOM report *Envisioning the National Health Care Quality Report* stated that the NHQR was not to be a "single static report, but rather a collection of annual reports tailored to the needs and interests of particular constituencies" (IOM, 2001, p. 6). The committee believes that AHRQ needs to expand and refine its quality reporting product line to provide products and data that are useful and understandable for a variety of audiences. Therefore, the committee recommends the following:

> **Recommendation 6: AHRQ should ensure that the content and presentation of its national healthcare reports and related products (print and online) become more actionable, advance recognition of equity as a quality of care issue, and more closely match the needs of users by:**
>
> - **incorporating priority areas, goals, benchmarks, and links to promising practices;**
> - **redesigning print and online versions of the NHQR and NHDR to be more integrated by recognizing disparities in the NHQR and quality benchmarks in the NHDR;**
> - **taking advantage of online capability to build customized fact sheets and mini-reports; and**
> - **enhancing access to the data sources for the reports.**

The committee's suggested products, along with their potential audiences, are reviewed in Table 6-1.

Refining the Organization of the NHQR and NHDR

Integrating efforts to improve quality with efforts to eliminate disparities increases opportunities to positively affect change. Presenting the same organizational framework and measures in both reports reinforces users' understanding of the relationship between overall health care quality and the depth of health care disparities. But currently, the two reports are not well linked beyond presenting the same measures.

Changing the Highlights Section of the Reports

The committee proposes that AHRQ present the same Highlights section in both the NHQR and NHDR to underscore the relationship between health care quality and equity. The text of the Highlights section should be developed so that the section can be published as a stand-alone document that could be the subject of dissemination events targeted to relevant stakeholder audiences. The document could:

- Spotlight areas with the greatest potential for quality improvement impact and provide detail on what the value of closing quality gaps would be to population health and equity.
- Feature progress on priority areas and toward any established national goals.
- Discuss evidence-based policies and best practices that may enhance quality improvement or factors that hinder progress as informed by data within the body of the report.
- Emphasize takeaway messages directed to different audiences (e.g., policy makers, health care providers, and the public) on what they can do to improve health care quality on prioritized topics and measures.
- Include a summary of state performance and the state of disparities.

The committee believes that a summary of state performance should be part of the Highlights section of the reports and would be of interest to legislators and policy makers at the state and national levels. A one- to two-page summary of state performance, perhaps in a scorecard fashion, should be included, and AHRQ could compile this from the information it already provides in the State Snapshots (e.g., ratings from very strong to very weak on overall health care quality, preventive measures, acute care measures, chronic measures, hospital care measures, cancer care measures). Currently, the State Snapshots are not available until several months after the reports have

TABLE 6-1 Tailoring Products to Meet the Needs of Multiple Audiences

Product	Potential Audiences	Recommended Content
Shared "Highlights" Section [redefined product to be used in both the NHQR and NHDR and that can be disseminated as a stand-alone product]	Policy makers, media, public, foundations and other funders of research, national quality organizations	Features progress on the national priorities areas and measurement areas with the greatest potential for quality improvement impact on population health, value and equity; evidence-based policies/best practices that will enhance or hinder progress; actions that stakeholder groups can take; and what is needed to make progress toward national goals. Includes a summary of progress by states. Includes a summary on state of disparities.
NHQR [refinement of existing product]	Quality, advocacy, and standards setting organizations; health care providers, plans, payers, and purchasers at the national and state level; research community	Information on a set of measures organized by the expanded quality framework to address: effectiveness, safety, timeliness, patient-centeredness, access, efficiency, care coordination, and capabilities of health systems infrastructure. Includes access, a topic previously addressed only in the NHDR. Details that disparities exist (beyond the current displays on geographic variation or age) by including a separate chapter or summary on socioeconomic, racial, and ethnic disparities; and acknowledges in messages when socioeconomic and racial disparities exist for individual measures.
NHDR [refinement of existing product]	Quality, advocacy, and standards setting organizations; health care providers, plans, payers, and purchasers at the national and state level; research community	Maintains parallelism with the NHQR by applying the expanded quality framework to its organization and presentation of measures. Includes benchmarks, not just comparisons among populations. Provides more in-depth coverage of priority populations.
Fact Sheets and Mini-Reports [expanded products]	Advocacy groups, strategic partners for dissemination, media, public	Includes short story of key facts and potential actions related to certain disease-specific or priority population topics in the NHQR and NHDR.
State Snapshots [refinement of existing product]	State government; health care providers, plans, payers, and purchasers at the state and local level	Provides expanded measure set sortable by core measures, Healthcare Effectiveness Data and Information Set (HEDIS) measures, state rankings, and comparisons between states with similar population characteristics, not simply in neighboring geographic regions. Adds to context by including best performance attained (for all states and for peers), variation within state (e.g., by geography, providers, payers, race/ethnicity/language, and the availability and type of insurance). Includes access measures.
Online Data Access [expansion of existing approaches] • Customizing reports via the NHQRDRnet • Data repository of primary datasets	Advocacy groups; stakeholders in quality improvement, media, and public Researchers (for access to primary data for additional national, state, and local level analyses)	Has capability to collect text and data by topic to yield a customized report. Links to other helpful data sources and intervention information. Provides access to full datasets for user manipulation, and links to other sites that provide expanded metrics on health care data (e.g., CMS), and more local and organizational level data. Has tools to show users how to mirror AHRQ's analytic approaches.
Guide to Using the NHQR and NHDR [new product]	All potential user audiences, but particularly researchers	Explains how to access and utilize available data. Gives examples of how different stakeholder groups can apply the knowledge to action.

been released; the committee urges AHRQ to include this information in the Highlights section even if the detailed Snapshots are not posted online at the same time. Additionally, a summary on the state of disparities should be included.

Although the Highlights document proposed by the committee would be longer than the current Highlights section, sharing the same Highlights section should streamline AHRQ staff efforts.

Organizing the NHQR and NHDR by the Framework Components

The framework for health care quality and disparities measurement (see Chapter 3) is both a tool to assess whether balance is achieved in the selection of quality measures and a way to organize the reports. Table 6-2 suggests chapters (or sections) for future iterations of the NHQR and NHDR. To increase parallelism across both national healthcare reports, access to care, a topic currently addressed only in the NHDR, should also be included in future NHQRs. After carefully considering whether efficiency and health systems infrastructure should be featured in both reports, the committee concludes, as discussed in Chapter 3, that efficiency measures of overuse and underuse are of interest for populations included in the NHDR and infrastructure is also applicable to equity concerns. Given the limited nature of measures at this time, however, the same efficiency and infrastructure measures may not always be available to include in both reports.

Incorporating Equity into the NHQR

Based on interviews with current and potential users, the committee finds that, to some extent, the NHQR and NHDR have different audiences. There is one school of thought that improving health care performance overall will ameliorate the problem of disparities in health care; this view tends to neglect the reality that disparities in health care usually persist even as overall performance levels improve. The committee believes that closing equity gaps is one of the most important factors in raising overall health care quality (Chin and Chien, 2006; Clarke et al., 2004). For that reason, the NHQR should incorporate the concept of equity by including an additional section focusing on disparities elimination.

Quantifying the impact of disparities on overall quality performance may be one way to define the connection between health care quality and disparities in the Highlights section of the reports. Furthermore, the commentary on each measure within the NHQR could reflect the degree to which disparities remain or are growing even as quality improves so that conclusions on the state of quality are not misleading. An HIV/AIDS measure reported

TABLE 6-2 Sections Recommended for Future National Healthcare Reports

	NHQR	NHDR
Highlights[a]	New focus	New focus
Effectiveness	✓	✓
Patient safety	✓	✓
Timeliness	✓	✓
Patient-centeredness	✓	✓
Efficiency	✓	New
Access	New	✓
Care coordination	New	New
Health systems infrastructure	New	New
Priority populations[b]	New (women, children, elderly)	✓
Disparities summary[b]	New	
State performance summary[b]	New	New

✓ Currently in the report.

[a] Not a framework component, but a section currently in the NHDR.

[b] Not a framework component.

in the 2008 NHQR provides a concrete example of a situation where the nation as a whole is performing well but data in the NHQR mask disparities shown in the NHDR (AHRQ, 2009d, p. 65, 2009e, p. 63).

Presenting Data on Priority Populations

The NHDR is required by the 1999 federal law under which it was established to report on "prevailing disparities in health care delivery as it relates to racial factors and socioeconomic factors in priority populations."[1] Priority populations were defined in the authorizing legislation with respect to the agency's full portfolio of activities (research, evaluation, and demonstration projects): low-income groups, minority groups, women, children, the elderly, and individuals with special health care needs, including individuals with disabilities and individuals who need chronic care or end-of-life health care. AHRQ's overall activities are also to address inner-city and rural areas. The fourth chapter of the NHDR, "Priority Populations," includes limited supplemental measures specific to each priority population.

AHRQ has presented data on priority populations in the NHDR by offering: (1) summaries of the findings presented earlier in the report on access and on the core measures the NHDR shares with the NHQR (e.g., Tables 4.2 and 4.3 in the 2008 NHDR), and (2) occasional additional measures of particular interest for specific populations (e.g., hospital admissions for uncontrolled diabetes for American Indian and Alaska Native populations). The committee encourages more comprehensive treatment of the priority populations both within the reports and through other vehicles (e.g., alternate year treatment of priority populations in the reports, spinoff mini-reports with additional detail, customization of data via NHQRDRnet). The national reports should convey key measures that address top health concerns of the priority populations if they are not already part of the AHRQ set of core measures; inclusion would depend on passing the same rigorous evaluation process for measures outlined in Chapter 4.

Given the limitations in the length of a print version of the NHDR, other vehicles can provide additional opportunities for more in-depth treatment. Specialized products for audiences interested in specific priority populations may garner more attention than solely expanding the priority population sections within the NHQRs and NHDRs. These derivative products could be published over time, perhaps in conjunction with partners who have a particular interest in care related to a topic or population.

While "women," "children," and the "elderly" are priority populations, they do not belong solely in the NHDR. At a minimum, the committee believes a summary of findings for these populations should be available in the NHQR. Moving to the NHQR much of this material, which is now in the NHDR, would open up space in the NHDR. The committee expects further inclusion of children's quality measures in the future as a result of the findings from AHRQ's National Advisory Council Subcommittee on Quality Measures for Children in Medicaid and Children's Health Insurance Programs, and the ongoing AHRQ- and CMS-funded IOM study of Pediatric Health and Health Care Quality Measures (AHRQ, 2009c; IOM, 2010). The full number of metrics and the various analyses that might be performed will likely exceed the capacity of the print NHQRs and NHDRs; as noted earlier, more detailed treatment could be accomplished through a special topic report, alternating in-depth sections in the NHQR or NHDR, and/or an ability to customize reports through Web-based capabilities.

Bridging the NHQR and NHDR

An inherent problem in having two separate reports is that data on a subject (e.g., cancer, heart disease, a priority population) are split between the NHQR and NHDR. Moreover, in the NHDR, data on a subject are often hard to find because information is dispersed between different sections (see Box 6-1). This fragmentation of information will continue to exist, but adding an index at the end of each book would help users find information more readily.

The committee also notes that introductory page(s) for the same topic in the NHQR and NHDR tend to cover the same types of information but are laid out differently; this requires unnecessary effort on the part of AHRQ staff and leads to confusion by readers. For example, the pages on effectiveness of cancer screening in the NHQR

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[1] *Healthcare Research and Quality Act of 1999*, Public Law 106-129, 106th Cong., 1st sess. (November 19, 1999).

BOX 6-1
How Do I Find Disease-Specific Information in the NHDR?

When examining a health topic or specific population in the NHDR, the information is often difficult to find. For example, if one aims to look at colorectal cancer, one is unable to access all of the information about colorectal cancer in one place.[a] The report is organized by sections, and all but one (Access to Health Care) contain some information on colorectal cancer. (See the following sections in the 2008 NHDR: Quality of Health Care, pp. 39-43, 46, 122, 127; and Priority Populations, pp. 177-181, 185, 188-189, 199, 201, 203, 207, and 211 [AHRQ 2009d]). These pages include information on screening, mortality, and differences by race and socioeconomic status. Additional data on colorectal cancer are available in the NHQR.

Where should consumers, policy makers, or health services researchers go to access sought-after information? Should one search in the Quality of Health Care section or the Priority Population section of the NHDR? Without an accompanying index, one must sift through the entire report to find all disease-specific information. All of the information on a single topic could be linked through an online search tool within the existing NHQRDRnet (which now only supports data tables but not text), other search tools, and linkages between sections in the NHQR and NHDR on the main report site. Even with linkages, the multiple areas in which a single topic appears within the NHQR and NHDR may not be intuitive to readers.

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[a] Colorectal cancer and breast cancer are reported in alternate years in the NHDR.

(AHRQ, 2009e, pp. 32-33) and NHDR (AHRQ, 2009d, p. 39) contain similar yet not identical information. The committee finds it logical to convey the same information in both locations.

Expanding and Sustaining Interest Through Derivative Products

AHRQ provides online access to the national healthcare reports and State Snapshots, to a few report-related fact sheets, and to an online data query system (NHQRDRnet); the Future Directions committee suggests changes to each of these products (see Table 6-1, presented earlier in this chapter).

Fact Sheets and Mini-Reports

AHRQ has previously developed three fact sheets to supplement the NHQR and NHDR. The fact sheets have addressed the subjects of children and adolescents (AHRQ, 2005b, 2008a, 2009b), women's health (2005c), and rural health (2005a). These fact sheets are not easily accessible on the national healthcare report-related websites; instead they are listed on AHRQ's Measuring Quality website.

Concise fact sheets are a way to expand AHRQ's reach of NHQR and NHDR findings and are useful for reaching new audiences. Timing the release of fact sheets to specific events (e.g., heart disease or breast cancer awareness months) could help sustain interest in the national healthcare reports throughout the year. Currently, Internet traffic to the NHQR and NHDR tends to decrease about two months after the report release date. Periodic releases of fact sheets could direct Internet traffic to the reports.

There may be times when a derivative product elaborating on a specific topic (e.g., a mini-report) could provide information beyond what can be contained in a fact sheet. The committee believes that such mini-reports could provide expanded treatment of priority populations. Priority population-specific derivative products would allow fuller exploration, for example, of the particular health care concerns of a priority population (e.g., children, women) or the diversity of health care experiences of different granular ethnicity groups within a race category (e.g., the Asian American population, for instance, is made up of persons of Japanese, Korean, and Cambodian heritage, among other granular ethnicity groups).

State Snapshots

In 2006, using data collected for the NHQR, AHRQ created the Web-based State Snapshots to fulfill the needs for state-level information of members of Congress, state officials, health care providers, and purchasers. As noted by previous IOM guidance, "analyses such as state-by-state comparisons on health care are familiar and meaningful to members of Congress, other policy makers, and consumers" (IOM, 2002, p. 5). The committee finds AHRQ's Web-based State Snapshots to be a valuable addition to the NHQR and NHDR and recognizes recent improvements to the State Snapshots website. Nevertheless, the committee urges further development. For example, the State Snapshots do not show any data on access measures, and the committee believes these data are important to have at the state-level.

Health care report cards provide information about the quality of care by geographic regions, health plans, hospitals and other institutions, and even individual practitioners (Epstein, 1995). Report cards use various systems of scoring and passing judgment on quality, whether the end result is to grade national health performance, rank a state's health care quality against all others, compare head-to-head the quality of care delivered in cities across the country, or to develop a list of best value hospitals (Brooke et al., 2008; Chernew and Scanlon, 1998; Davies et al., 2002; Hibbard and Jewett, 1997; Romano et al., 1999). A 2006 qualitative study conducted by AcademyHealth indicated that users of the State Snapshots suggested a rank ordering of states so that states could compare their performance against all others (Martinez-Vidal and Brodt, 2006). Currently, in the State Snapshots, each state is ranked on 18 selected measures. The committee's view is that state-by-state ratings should be more clearly available so that states know what the best attained level of quality performance is, and then they could contact and learn from states with the best rates on specific quality measures. Additionally, it would be useful if state data and rankings were easily sortable for high-profile sets of metrics such as AHRQ core or HEDIS (Healthcare Effectiveness Data and Information Set) measures, given the almost 200 measures that AHRQ tracks for states.

AHRQ displays average regional performance on measures in the State Snapshots, but state audiences have indicated that adjoining states are not always peers. AHRQ has provided a graphical "dial" to show states how they fit on a spectrum of contextual factors (i.e., demographics, health status, etc.), but states have noted that they would like flexibility to be able to identify a different coterie of peer states (for example, states that have the same degree of contextual factors). Then, for example, a state policy maker could assess state performance against states that have a comparable extent of persons below the poverty level.

NHQRDRnet

Users of the NHQR and NHDR suggest that their needs for information tend to be topic specific and episodic; most users of the national healthcare reports are unlikely to read the reports from cover to cover. Additionally, the reports are viewed and downloaded online more than they are used in hard copy.[2] Thus, improving the ability of users to find needed information online is an important aim. In 2008, AHRQ added an online interactive tool called NHQRDRnet that can be used to query and search the databases behind the NHQR and NHDR by content areas (quality, access, patient safety, priority populations), clinical conditions, care type or settings, and dimensions of access (e.g., insurance coverage, usual source of care, utilization).

The committee applauds AHRQ's intent to facilitate searching for content in the national healthcare reports but finds navigating the NHQRDRnet website difficult. The committee also observes that it takes fewer steps to gain similar information from the more straightforward and easier to use Appendix D of the NHQR and NHDR. AHRQ recently commissioned a usability survey that queried current users of the national healthcare reports about their experience with and impressions of the NHQR and NHDR and related Web content (Social & Scientific Systems and UserWorks, 2009). Comments from survey participants regarding ease of using the website and clarity of information echoed the committee's findings (e.g., difficulty finding the reports using a basic Web search, organization of report, and Web content not matching user expectations).

The major change the Future Directions committee suggests for the NHQRDRnet is the development of a tool or sorting function that would allow users to customize their own reports. Now, one can search for all data

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[2] Personal communication, Farah Englert, Agency for Healthcare Research and Quality, November 12, 2009.

related to a topic—for example, cancer—and all data files since 2002 are displayed for download; the search does not yield a fact sheet or summarization of the current content on the subject of interest. At a minimum, links to relevant text of the current year's NHQR and NHDR would enhance the site's usability and ability to tell a more comprehensive story. Additionally, one- or two-page fact sheets or more in-depth mini-reports on topics (whether individual clinical conditions, framework components, or something more specific, such as quality and disparities issues of specific interest to Hispanic persons) would be useful. AHRQ's partnerships with other stakeholders would be assisted by having prepackaged collections of information in its NHQRDRnet index.

Web-based products, in addition to the NHQRDRnet, can be configured to make it easier to guide readers to other AHRQ or non-AHRQ resources that may help with quality improvement. For example, future online versions of the NHQRs and NHDRs could link to interventions highlighted in the AHRQ Health Care Innovations Exchange or other related resources (e.g., CMS, entities utilizing measures for which data at the national level are still aspirational). This linking capacity should also be available through the Web-based version of the NHQR and NHDR without the reader having to go through the NHQRDRnet.

Online Access to Data Used in the NHQR and NHDR

The committee discussed the extent to which the NHQR and NHDR should provide data for geographic areas below the state level. Various stakeholders have noted that the national healthcare reports contain information that is too "high level" for making decisions at the local or practice level. Consequently, the reports may be of less use to some health care providers, local policy makers, or some researchers than if the performance data were stratified to show performance at more local or organizational levels and provided in a timelier manner. State-based data are a unit of analysis that policy makers as well as the public can easily relate to and use for comparative purposes. Given the interest in substate variation (e.g., the Dartmouth Atlas, the University of Wisconsin/Robert Wood Johnson Foundation county-by-county health rankings), these data would be useful to develop over time (The Dartmouth Institute for Health Policy & Clinical Practice, 2010; RWJF and the University of Wisconsin, 2010). The NHQR and NHDR could also include linkages to other HHS data resources on community health status indicators (HHS, 2010).

The data included in the NHQR and NHDR may be reported nearly a year or more after they have been submitted to AHRQ because of the processes involved with compiling data sources, cleaning the data, analyzing it, reviewing the reports at the departmental level, and submitting the work for production. For entities that are evaluating performance in real time (daily, weekly, monthly), such data may have limited use. Still, there are groups that do not have day-to-day access to performance measurement data and would benefit from the wider availability of nationally collected data at a more local level (Kerr et al., 2004). For example, AHRQ has made available county-level data on the number of Hispanic Medicare beneficiaries with diabetes who did not have an eye exam so that one area's community aging agencies could focus intervention efforts (Moy, 2009).

In deciding whether to recommend that AHRQ provide more locally based data, the committee balanced the usefulness of local data, its timeliness, its reliability, and the additional workload for AHRQ staff. AHRQ staff indicated that it is possible to drill down to at least the larger Metropolitan Statistical Areas for about half of the State Snapshot measures, but that smaller Metropolitan Statistical Areas and counties would be more difficult because, for instance, some datasets are likely to require special permissions to present the data in these ways.[3] The committee encourages AHRQ to explore the feasibility and value of drilling down for at least some high-impact measures. When summarized in the reports, the Highlights section, or the proposed guide to using the NHQR and NHDR (discussed below), more localized data can inform readers about variation within states. Such detail could be presented in the State Snapshots to show substate variation, particularly when it is readily available in the datasets AHRQ already uses, and perhaps as a derivative product similar to the *Atlas of Mortality*

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[3] Personal communication, Ernest Moy, Agency for Healthcare Research and Quality, November 18, 2009. AHRQ staff estimate that data for large Metropolitan Statistical Areas (MSAs) could be provided for more than 50 percent of the State Snapshots measures. All CMS Compare systems could support MSA-level estimates. The Behavioral Risk Factor Surveillance System (BRFSS) could be used for MSA-level analyses for the top 150 MSAs. Other data sources, such as vital statistics data and hospital data from Healthcare Cost and Utilization Project (HCUP) states, would require special permissions in order to analyze and publish data at the MSA-level.

(Pickle et al., 1996), depending on the availability of data for coverage of the United States. Links could be made to the HHS Community Health Status indicators site if it eventually included health care-related metrics and not just health status.

Individuals wanting to work with primary data are often not satisfied with the data available through the national healthcare reports' website. AHRQ provides Excel files with the data points reflected in its graphs and text, but it does not provide access to the original datasets. Although AHRQ does not have in-house all of the databases it uses in the NHQR and NHDR, most of the data AHRQ uses are from federally sponsored datasets. The committee believes that data access could be expanded so that researchers can download the full dataset to manipulate it as needed. This is consistent with the efforts of data.gov, a website currently under development that will house all federal executive branch datasets, to "increase public access to high value, machine readable datasets generated by the Executive Branch of the Federal Government."[4] AHRQ is among the agencies contributing data, as are other federal agencies whose data AHRQ acquires (e.g., the Centers for Disease Control and Prevention, CMS). Because the website is still under construction, the committee is unable to discern which of AHRQ's datasets will be made available. Nonetheless, the committee feels that making available datasets that support findings in the NHQR and NHDR would be a service to providers and health services researchers.

The committee encourages AHRQ and its partners to provide access to the data in a timely fashion, even prior to its publication in the NHQR and NHDR, to allow those with the capacity for analysis to use it for their own needs. Such data access was previously recommended to AHRQ by the IOM in the 2001 report *Envisioning the National Health Care Quality Report*. Further, AHRQ should provide tools for analysts who want to replicate AHRQ's methods to produce comparative data for their locale or population cohort. Until such tools are available, analytic methods will need to be clearly specified in methodology descriptions.

Proposed Development of a Guide to Using the NHQR and NHDR

Given the diversity of resources that AHRQ now offers and the potential for greater direct data access, the committee suggests that AHRQ develop a guide to using the NHQR and NHDR. As envisioned by the committee, this technical assistance product would review the resources that the print NHQR and NHDR and websites have to offer and, more importantly, would provide examples of how different stakeholder groups can apply the knowledge to action (e.g., Hispanic elders diabetes project). The guide to using the NHQR and NHDR would go beyond telling someone how to navigate a website. Instead, it would tells users how to access the data resources, provide tools for manipulating data for analyses, explain the methods used by AHRQ in its analyses, and offer suggestions for meaningful analyses. This guide, when it becomes available, should be referenced in the Highlights section of the NHQR and NHDR.

Dissemination Strategies

The committee proposes communicating the findings of the NHQR and NHDR to diverse audiences through a series of new products and modifications to existing documents. The goal of expanded dissemination efforts should be to raise awareness, visibility, and use of the reports. Between 2003 and 2008, AHRQ distributed approximately 24,000 print copies of the NHQR and NHDR.[5] The annual release of the NHQR and NHDR should be more widely publicized in advance, and momentum from the release of the reports should not be permitted to dwindle. The committee sought input on dissemination and media strategies for the NHQR and NHDR, as well as sample fact sheets, from Ketchum, a public relations and communications firm.[6]

Ketchum suggested ways to repackage the wealth of information contained in the NHQR and NHDR throughout the year so that findings can be made continually relevant. AHRQ could, for example, produce succinct derivative materials that convey targeted messages (e.g., mini-reports and fact sheets), and link distribution

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[4] The data.gov website is accessible at http://www.data.gov/ (accessed December 12, 2009).

[5] Personal communication, Farah Englert, Agency for Healthcare Research and Quality, November 16, 2009.

[6] Copies of the sample media and communication plan and sample fact sheets developed by Ketchum were provided directly to AHRQ staff and archived in the IOM public access file for the Future Directions project.

and media outreach to appropriate audiences (e.g., advocacy groups for specific clinical conditions or population groups). In addition to relying on traditional media outreach (e.g., participating in roundtables, telebriefings, radio media tours, outreach around editorial calendars), AHRQ could take advantage of wide-reaching and increasingly common Web-based tools (e.g., blogs, advanced search engine options, inbound linking programs, social media such as Facebook and Twitter).

In Chapter 5, the committee emphasizes that a patient's language need is relevant to health care quality and disparities. Communicating information about quality and disparities in languages other than English is one way to reach diverse audiences. The committee acknowledges the potential resource burdens of document translation and does not intend for AHRQ to translate the entire NHQR and NHDR. When derivative products are specifically geared to audiences that may have limited English proficiency, AHRQ may wish to consider translation. HHS' Office of Minority Health Resource Center provides technical assistance in communications and outreach to other HHS agencies (HHS, 2009b). As AHRQ expands dissemination of the reports and their derivative products to diverse stakeholder audiences, the Health Resource Center may provide valuable capacity-building support.

TELLING A STORY IN THE NHQR AND NHDR

The committee recommends that the NHQR and NHDR tell a clear and compelling story about the *impact* of making progress—or of not making progress. The ways in which information is presented and summarized in the reports and related products can enhance or impede users' understanding of the messages the reports are meant to convey. For that reason, the committee believes that AHRQ should move the reports from their current chartbook format to make them less a catalog of data and more of a comprehensive story that conveys key messages through text, graphs, and displays.[7] The committee believes that doing this effectively requires enhancing the presentation of takeaway messages on the state of quality and disparities, focusing attention on closing gaps in performance, including benchmarks to allow comparisons with high-quality performance, identifying ways to affect change, and providing information that contributes to the development of the national health care data infrastructure (Box 6-2).

Enhancing the Presentation of Takeaway Messages

In the *Healthcare Research and Quality Act of 1999*,[8] Congress directed AHRQ to submit "an annual report on national trends in the quality of health care," and AHRQ has interpreted this as needing to present "assessments of change over time" (Moy et al., 2005). Although documenting the past performance of the U.S. health care system is important and historical data certainly play a role in forming a comprehensive picture of health care quality and disparities, users of the national healthcare reports have indicated that the performance of past years (especially more than 5 years ago) is not necessarily helpful for assessing where and how quality improvements can be made today (Lansky, 2009; Martinez-Vidal and Brodt, 2006). The committee believes it would be more useful for AHRQ to interpret national trends as a way to inform the future, using available historical data to inform readers of the likelihood of closing gaps in health care quality at the current pace. Forward-looking messages regarding national trends for the future could be determined using the following central pieces of information:

- the nation's current level of performance (expressed using means and standard errors);
- how the nation has achieved the current level of performance (expressed by the historical annual rate of change and standard error of the estimated change); and
- how far the nation has to go to close the performance gap between current practice and the recommended standard of care (goal or the benchmark)—the number of years to achieving the desired performance level based on the historical annual rate of change and corresponding interval estimate.

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[7] In 2004, AHRQ was advised to use a chartbook format for future iterations of the NHQR (Gold and Nyman, 2004).

[8] *Healthcare Research and Quality Act of 1999*, Public Law 106-129 § 902(g) and § 913(b)(2), 106th Cong., 1st sess. (November 19, 1999).

BOX 6-2
Key Elements of Telling a Story in the NHQR and NHDR

Enhancing Takeaway Messages that Address Closing the Performance Gap

- "At the current rate of change, it will take 'X' years to close the gap between current practice and the recommended standard of care (goal level or the benchmark)."
- The net health benefit of closing the gap (including clinical preventable burden and cost-effectiveness) is quantified.
- Areas on which to focus attention so as to more effectively improve quality are specified.

Identifying Ways to Effect Change in the Health Care System

- Highlight the impact of evidence-based policies that can help drive change.
- Provide data analyses.
- Include vignettes or links to innovative practices that have resulted in higher performance.

Presenting Benchmarks and Other Data

- benchmark of best-in-class performance;
- between and within-state variation, when available;
- variation by sociodemographic variables (e.g., race, ethnicity, language need, socioeconomic status, and insurance status);
- data presented by accountable units, whenever feasible (e.g., types of payers, delivery sites);
- displays with visual clarity and embedded explanations of the essential finding(s); and
- meaningful summarizations.

Contributing to the National Health Care Data Infrastructure

- illustrating developmental* and emerging measures even when only subnational data are available; and
- highlighting when data are unavailable and when greater efforts are needed for national collection.

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* Developmental refers to measures that are currently partially developed but not yet well tested or validated, or measures that have been validated but still lack sufficient national data on which to report.

Using this strategy, AHRQ could transform its wealth of available trend data into an informative direction for the future. Possible templates for presenting rates of change and years to closing quality and disparity gaps are offered in Appendix H.

As previously described in Chapter 4, the impact of closing the gap would be determined as part of the measure selection/ranking process, and data gleaned (e.g., reduction in clinically preventable burden, increase in net health benefit, and cost-effectiveness) in determining the relative ranking of measures are useful and should be presented for each measure in the reports. Additionally, the benefit to the country—if, for example, all states were performing at the level of the highest one—would also be key information.

Presenting Benchmarks and Other Data

To better convey key messages, data displays should present benchmarks. The committee believes benchmarking is a key tool for continuous quality improvement. Thus, it is expected that benchmarks will change over time depending on the frequency of obtaining updated data from the sources for the national healthcare reports. Goals, on the other hand, tend to be fixed for a longer period and set by an advisory body or at the direction of some entity such as the Secretary of HHS. (See Chapter 2 for committee definitions of goals, benchmarks, and targets.) In the context of the national healthcare reports and AHRQ's role, the Future Directions committee emphasizes the use of benchmarks rather than goals because the committee believes the presentation of performance data, but not the setting of national goals, is within AHRQ's purview. Benchmarks reflect empirical facts. On the other hand, the committee believes that the setting of goals for health care quality improvement (e.g., for priority areas and/or measures) requires the direction of the Secretary of HHS.

Goals or fixed targets for measures can complement benchmarks and could be set at various levels of attainment. For example, they may be aspirational—"All patients shall receive." Goals might be set at a lower level if a finding from the measure selection assessment shows that there is little gain in health benefit beyond 85 percent of the target population receiving a service. Or a goal might be set for all states to achieve the rate of the best performing state.

Data illuminating who is delivering care and where care is delivered are necessary to identify opportunities for system change; these accountable units may be states, types of payers (e.g., Medicare, Medicaid, private insurance), or delivery systems. The committee encourages the development and presentation of these data in the reports and State Snapshots. This topic is addressed more fully in Chapter 2.

Identifying Ways to Affect Improvements in the Health Care System

Although the reports by themselves do not affect change, they can link to entities that have improved quality and reduced or eliminated disparities. For policy makers and those engaged in measurement and improvement, having the reports illustrate actual, effective quality improvement interventions alongside comparative data would be useful. As previously discussed, AHRQ's NHQRDRnet site links to AHRQ's Health Innovation Exchange, and this type of connection should also be included in the online version of the reports through embedded hyperlinks. Additionally, AHRQ should consider qualitatively highlighting "islands of excellence" (whether health systems, hospitals, or geographic regions) that consistently deliver recommended care that is less costly, more efficient, and produces better outcomes (Fisher et al., 2008). Such better performing communities or entities can be showcased in textboxes and sidebars.

Currently, AHRQ links State Snapshots to other measure report cards in specific states and should continue such nonfederal linkages. In addition to the Health Innovation Exchange, AHRQ might link with sources such as the Robert Wood Johnson Foundation's (RWJF's) Finding Answers: Disparities Research for Change program (www.SolvingDisparities.org), The Commonwealth Fund's "Why Not the Best?" quality improvement resource (http://whynotthebest.org), and the Institute for Healthcare Improvement's (IHI) website (www.ihi.org). These sources, among others, offer multiple strategies for hospitals, providers, and other actors to improve the quality of health care. The links should be accompanied by an expressed caveat that the links are intended to highlight known best or promising practices, and that their inclusion should not be construed as an endorsement of the program or entity by AHRQ.

USING BENCHMARKS TO SHOW ACHIEVEMENT

Benchmarks are one method of comparing data in order to improve the efficiency and the quality of health care (Deming, 1994). In Chapter 2, the committee defined a benchmark as the quantifiable highest level of performance achieved to date. (Some additional definitions of benchmarking are shown in Table 6-3.) Presenting performance

TABLE 6-3 Definitions of Benchmarking from Various Sources

Source	Definition of Benchmarking
Vaziri, 1992	A *continuous* process comparing an organization's performance against that of the best in the industry considering critical consumer needs and determining what should be improved.
Kleine, 1994	An excellent tool to use in order to identify a performance goal for improvement, identify partners who have accomplished these goals, and identify applicable practices to incorporate into a redesign effort.
Cook, 1995	A kind of performance improvement process by identifying, understanding, and *adopting outstanding practices* from within the same organization or from other businesses.
Camp, 1998	The *continuous* process of measuring products, services, and practices against the toughest competitors or those companies recognized as industry leaders.

SOURCES: Camp, 1998; Cook, 1995; Kleine, 1994; Vaziri, 1992.

data in the context of benchmarks stimulates debate around policy priorities, promotes transparency, fosters accountability, indicates what needs to be done, and supplies concrete milestones for evaluation and identification of areas to improve (Gawande et al., 2009; van Herten and Gunning-Schepers, 2000a,b).

Benchmarks identify "demonstrably attainable," superior performance and encourage others to emulate the practices by which this is achieved (Kiefe et al., 1998, p. 443). The original idea of using benchmarks in Continuous Quality Improvement and Total Quality Management (CQI/TQM) was that organizations could learn from the processes of an organization with better outcomes and adapt those processes, as appropriate, to their own circumstances (Dattakumar and Jagadeesh, 2003; McKeon, 1996). Benchmarking is not a static process; ideally, the level of best performance will continually evolve as positive progress is made, and the benchmark will move accordingly. At each successive stage—or in each publication year of the NHQR or NHDR—a different entity has the potential to take the role of "best-in-class," which may engender a "race to the top" (Weissman et al., 1999).

The committee proposes approaches to benchmarking that AHRQ could incorporate into the NHQR, NHDR, and related products. The benchmarking approaches proposed by the committee do not require AHRQ to develop targets that must be attained by a specific endpoint (as has been done for Healthy People 2010); rather these strategies use benchmarks to highlight standards of care that are reported in data available to AHRQ.

The Current Use of Benchmarks in the National Healthcare Reports

The NHQR and NHDR were initially envisioned as a means to provide policy makers with snapshots of quality and disparities over time and to allow "providers and payers" to "assess their performance relative to national benchmarks" (Moy et al., 2005, p. 377). The hope was that government agencies, communities, and providers would turn to the NHQR and NHDR to compare their own health care data against national progress. Until recently, AHRQ used only an implicit benchmark—namely, the need to strive for better-than-average performance. Displays in the reports imply that states with rates below average performance should aim to achieve performance rates better than average. In a 2006 review of AHRQ's presentation of state data, state policy makers indicated that presenting performance relative to the national average was misleading: while a state may have been doing better than average on a given measure, if the average was low compared to the recommended standard of care, the level of performance could be taken out of context to indicate that the state need not focus quality improvement efforts in that area (Martinez-Vidal and Brodt, 2006).

For a limited number of measures in the 2008 NHQR and NHDR, AHRQ reports targets established for Healthy People 2010. Partially because Healthy People focuses on measuring *health* improvement rather than *health care* improvement, these targets are not available for all measures presented in the NHQR and NHDR. The Healthy People targets are not tied to actual performance achieved by providers and health care organizations, and most targets are consequently viewed as aspirational.[9] According to the committee's definition, a benchmark should be demonstrated as being attained by some defined entity, not just as being aspirational. For this reason, Healthy People targets tend not to be the ideal source of benchmarks for the national healthcare reports. While the inclusion of these targets may be useful and warranted as one point of information, they should be presented in conjunction with more realistic benchmarks.

Presenting Best-in-Class Benchmarks

One of the most common and easily understood methods of benchmarking is to provide comparisons relative to top performing nations, states, geographic regions, or health care entities. A key issue in benchmarking is whose performance is being measured and to which audiences the benchmark is relevant. In health care quality improvement, best practices can occur at various levels of the health care system, including at the individual physician level (Kiefe et al., 2001); at the service provision level, such as in intensive care units (Zimmerman et al.,

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[9] The HealthyPeople 2010 targets are, in almost all cases, higher than the currently achieved national progress or even the best performing state. For some measures presented in the NHQR and NHDR, however, performance is at or above the Healthy People target. For example, the composite measure for children ages 19-35 months who received all recommended vaccines includes the Healthy People target of 80 percent attainment. The national average for this measure was at 80.6 percent, achieving this target.

2003); at the health care system level; or at the state level (Reintjes et al., 2007). The committee also explored establishing benchmarks at discrete levels of the health care system (e.g., top decile of hospitals), as well as at the state level. Defining a benchmark can depend on the "class" from which the measure is derived. For example, a benchmark might provide information on the best performance rate among states, the best performance rate among hospitals, the best performance rate among large hospitals, or the best performance rate for care received by Hispanics in any state.

Although it is technically true that AHRQ could choose any "class" from which it would designate a "best-in-class" benchmark, the committee finds that in the context of the national healthcare reports, where much of the analysis is done at the state level, setting benchmarks by state may appeal to a number of relevant audiences and may be most feasible given data availability. State-level data are generally available to AHRQ, and thus state-level benchmarking units can be determined for many, although not all, measures in the NHQR and NHDR. This approach could satisfy the needs of congressional and state policy makers, principal audiences to which the reports are geared. A 2004 AHRQ publication *A Resource Guide for State Action* was designed to help states assess the quality of care in their states and develop strategies to address gaps in quality. The *Resource Guide* advised that the "rate for the top State or top tier of States" may be "assumed to be a feasible goal for States to achieve" (Coffey et al., 2004).

Figure 6-1 shows that it is possible to display a best-in-class benchmark (a state in this instance) along with the national performance average and the Healthy People target. The committee does not intend that the style, format, and layout of this figure be adopted by AHRQ; rather, the committee presents this figure to show the relationship of a benchmark relative to the type of performance data that are in the domain of the NHQR or NHDR. From the perspective of the NHQR, which tends to provide state-based data as well as national average performance, the highest performing state, Oregon, provides a benchmark that could be applied across both reports.

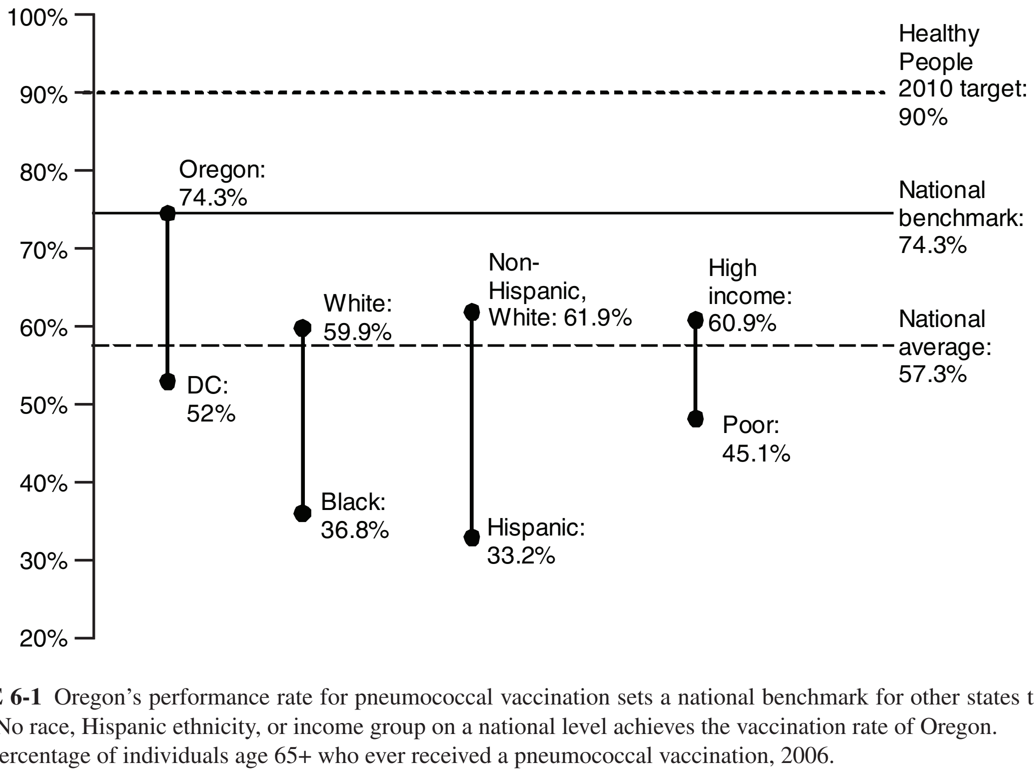

FIGURE 6-1 Oregon's performance rate for pneumococcal vaccination sets a national benchmark for other states to strive to achieve. No race, Hispanic ethnicity, or income group on a national level achieves the vaccination rate of Oregon.
NOTE: Percentage of individuals age 65+ who ever received a pneumococcal vaccination, 2006.
SOURCE: Adapted from data in the AHRQ State Snapshots.

The committee recognizes that some measures and their corresponding data sources may be amenable to choosing a different benchmarking "class" than a state. A measure that uses only HEDIS data may, for instance, lend itself to analyzing data by health plans. Thus, AHRQ could present a best performing plan as the benchmark. Similarly, AHRQ might decide that the hospitals comprising the HCUP datasets constitute a comparable set of observations and could present a best performing hospital as the benchmark.

Denoting a best-in-class benchmark is as important for measures in the NHDR as it is for measures in the NHQR, and the committee concludes that for each measure, the benchmark used in the NHDR should mirror the benchmark used in the NHQR. The goal of quality improvement efforts should not be to strive just for the Hispanic population to receive care at the rate of the non-Hispanic population. Rather, quality improvement efforts should aim to improve the quality of care for all populations. In the case of the NHDR, different disparity populations would be compared against the quality benchmark in addition to being compared against the best performing population. For example, AHRQ may establish a state-based benchmark for a specific measure of lipid control and use this same benchmark in both the NHQR and NHDR. The committee recognizes that reporting in the NHDR which state has the best rate on lipid control by specific populations would be useful (e.g., reporting that X state has the highest performance level for Hispanics and Y state has the highest performance level for African Americans), but such data are not always available. Adopting a separate benchmark based on the best performing population group within a "class" can prove difficult as there are multiple population groups studied in the NHDR and detailed data are not always available or sample sizes may be too small to stratify population data by hospital, health plan, or even state. Ideally, data would be available for sociodemographic descriptors within whichever class a benchmark was being set; when they are not, this leads to looking to an alternate solution for presenting a benchmark in the NHDR. The committee advises AHRQ that the benchmark can be the best performing state or can come from the class of units compared in the measure's data source. When the data are available, the committee encourages AHRQ to present multiple population-specific benchmarks (i.e., a benchmark that is uniform with the NHQR as well as other benchmarks that are population specific). When multiple achievement levels are available, alternatives to presenting the data graphically may be needed (e.g., listing in textboxes).

The committee encourages the analysis of performance data by accountable units (e.g., states, health plans, hospitals). When it is feasible for AHRQ to analyze data for a measure by multiple accountable units, there is the possibility for multiple benchmarks of attained performance for one specific measure. Presenting multiple benchmarks might add clutter to graphs, so AHRQ may choose to present the multiple achievement levels in a sidebar text box.

The Future Directions committee believes benchmarks provide a means to supply concrete milestones for comparison and evaluation. For comparative purposes, having a uniform benchmarking unit such as a state may be useful, although other classes (e.g., plans, hospitals) may be informative for entities implementing programs to improve quality and eliminate disparities. Thus, the committee recommends:

> **Recommendation 7: To the extent that the data are available, the reporting of each measure in the NHQR and NHDR measure set should include routinely updated benchmarks that represent the best known level of performance that has been attained.**

Data Limitations in Benchmarking

As discussed above, AHRQ could present data on a high-performing entity for which data are available (e.g., the best performing health plans based on data from the National Committee for Quality Assurance). This approach, however, may require particular attention to issues of statistical reliability. The population distribution from which a benchmark is derived must be considered carefully so that entities are not evaluated against a population that is not well-matched to their particular case-mix, geography, or other relevant factors (Linderman et al., 2006). When the population of analysis includes high-performing entities that have a small number of cases, the analysis must be corrected to account for the small-numbers problem (Normand et al., 2007). There are techniques—including the Achievable Benchmarks of Care method, which uses a Bayesian estimator to reduce the impact of entities with a small number of eligible patients—that AHRQ could use to adjust for the small denominator problem (i.e., if a plan had only one qualifying patient, then the performance of that plan could be either 0 percent or 100 percent) (Weissman et al., 1999).

As an additional consideration, data on state performance may be unavailable for all measures. Although the State Snapshot website does not include state data for 26 of AHRQ's 46 core measures, the committee finds it feasible for AHRQ to obtain state data for some of these (e.g., access measures, measures from Centers for Disease Control and Prevention data).[10] Furthermore, for measures in which data on the best performing state are available, not all states may have reported on the measure or been included in analysis (e.g., the Healthcare Cost and Utilization Project). Therefore, the best performing state may actually be the "reported best performing state." AHRQ may consider recognizing this in either introductory text or in a footnote.

For many measures of health care quality, even the highest performing state, population, or provider does not deliver the level of care recommended in guidelines. Benchmarking within a field of low performers may result in further underperformance because low performance is seen as normal (Reinertsen and Schellekens, 2005). AHRQ should take this into consideration when determining the class from which to derive a benchmark and should ensure the benchmark represents a desirable level of performance.

REFINING THE PRESENTATION OF DATA

The success of the NHQR and NHDR in reaching various audiences and spurring action depends on the presentation of information. The products developed by AHRQ have the potential to tell a more complete quality improvement story, provided the products are accessible, engaging, and informative.

Improving the Presentation of Graphic Displays

Graphic displays in the NHQR and NHDR document historical trends, present geographic variation using maps, and stratify measures by demographic characteristics. Communicating information through the simultaneous presentation of words, numbers, and, in some cases, pictures, requires that the displays be as effective as possible (Tufte, 1983). Therefore, visual design problems can undermine the usefulness of data being presented (Few, 2006). To assess the quality of graphic displays in the two reports, the committee commissioned input from Howard Wainer, an expert on data display.[11] The suggestions presented to AHRQ are only one way of enhancing data displays, but they represent well-regarded, theory-based practice.

Documenting Historical Trend Data

As noted earlier, the committee finds there should be less reliance in the NHQR and NHDR on trended data displays unless the trends inform future activities rather than solely document the past. Currently, most trend data take up substantial space in the documents without being particularly informative other than to reinforce a repeated message—that the pace of change is slow. These trend graphs are often visually cluttered with overlapping lines and many numbers over-written on a graph (see Box 6-3).

Captioning and Labeling

Captions for each display should be informative and focused. A good graph can be made even stronger by having an informative and interpretive caption or figure heading. Captions that explicitly relay the principal point of the display have benefits: the reader can discover the point of the display more easily and less helpful displays are eliminated. Additionally, strong graphical displays avoid legends whenever possible because legends require

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[10] Because the State Snapshots were initially developed to supplement measures in only the NHQR, access measures are not included in the State Snapshots; in accordance with the committee's recommendation to integrate access in the quality portfolio of measures, it is important for AHRQ to include access measures in the State Snapshots.

[11] Howard Wainer's paper, "Commentaries on the 2008 National Healthcare Quality Report, the 2008 National Healthcare Disparities Report and State Snapshots," was provided directly to AHRQ staff and archived in the IOM public access file for the Future Directions project.

BOX 6-3
A Suggested Approach to Improving Data Displays

Figure A (both *before* and *after*) presents data on patients with tuberculosis who completed treatment, but the original Figure A (below left) is visually cluttered: the graph contains a multitude of data points, a y-axis that is not descriptive, a caption that does not convey findings, and labels that are far from the data points. The reader is less readily able to discern which age groups performed best, which performed worst, and if any age groups had improved in the percentage of patients that received the recommended care.

To more clearly convey information, Figure A (below right) was revised so that the reader can more readily gain a sense of the component data without having to append the "visual noise of numerical values." These improvements include:

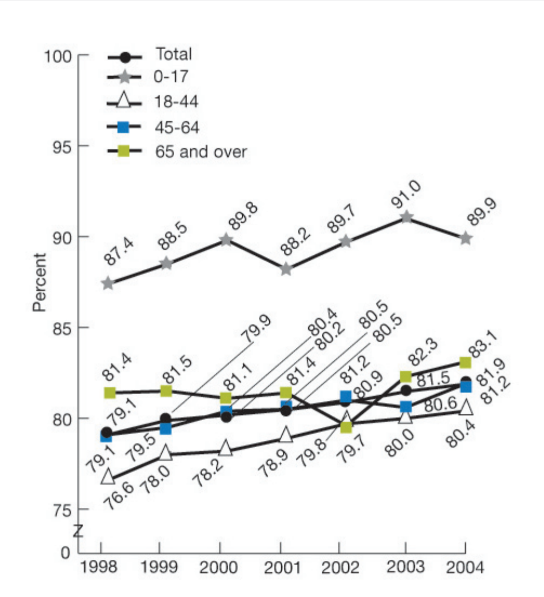
- eliminating the numerical value from each data point (the numerical values should be archived online if they are not in the text). Data for the terminal year should be provided in text if not inserted into the graph;
- less compression of the y-axis makes the graph more readable; and
- adjusting the scales on the x- and y-axis to reflect the data distribution and provide maximum acuity.

Additionally, instead of a heading that defines the measure specifications, the heading was changed to an informative caption that conveys the graph's key finding: "Although rates of completion of tuberculosis treatment have been increasing overall, adults are 10% less likely than children to complete treatment."

When AHRQ determines the scales of the x- and y-axes, the purpose of the graph should be taken into consideration. For example, in the "after" figure below, the compressed y-axis scale may exaggerate differences between age groups. However, the compression allows readers to more easily determine the best and worst performing groups. AHRQ should weigh these considerations and consider the absolute level of performance when choosing axes scales.

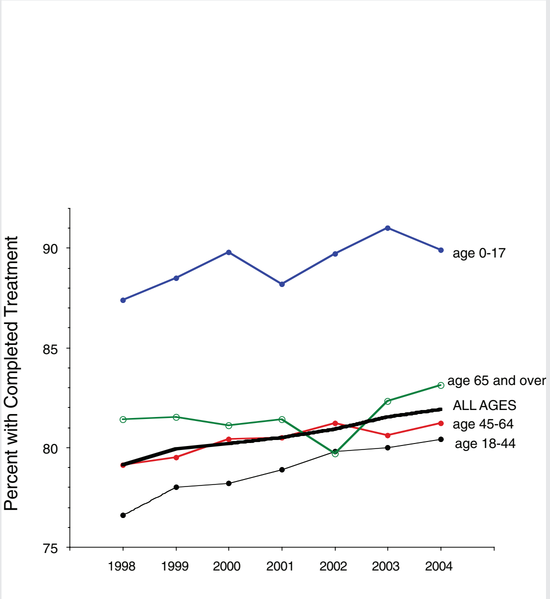
BEFORE

Figure A. Patients with tuberculosis who completed a curative course of treatment within 1 year of initiation of treatment, by age group, 1998-2004.



AFTER

Figure A. Although rates of completion of tuberculosis treatment have been increasing overall, adults are 10% less likely than children to complete treatment.



SOURCE for the "Before" Graph: AHRQ, 2009e, p. 83.

the viewer to learn the legend *and* apply it to the display. This requires two moments of perception and makes the viewer *read* the display rather than *see* it (Green, 1998). See Boxes 6-4 and 6-5 for examples.

Scales

The choice of x- and y-axis scales can influence the readability and interpretability of a graph. The x- and y-axis should place observed differences on a scale that acknowledges the range of possible clinically important differences. In a series of experiments conducted at AT&T Bell Laboratories, Cleveland and colleagues determined that scales should be chosen so that the data fill as much of the scale-line rectangle as possible (Cleveland, 1994a,b). A separate issue that must be considered is the choice of the ratio of the x- and y-axis scales. Altering the ratio

BOX 6-4
A Suggested Approach to Improving the Labeling of Graphic Data

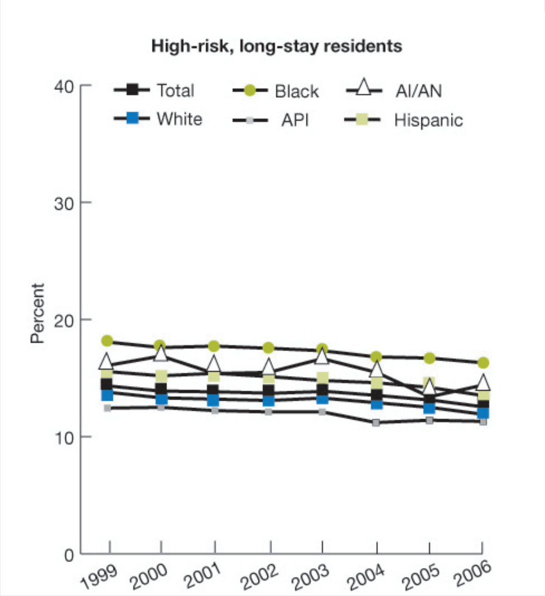
Figure B (both *before* and *after*) presents data on rates of pressure sores among nursing home residents. The original figure (below left) could better convey its key finding (that although rates of pressure sores have been declining, Black residents still have higher rates compared to all other racial groups) with modifications:

- The display should have a caption that interprets the data as opposed to simply naming the measure.
- The graphic elements should be labeled directly (i.e., legends should be used as infrequently as possible).

Terminal year data should be included in text if AHRQ decides not to include it in the graph.

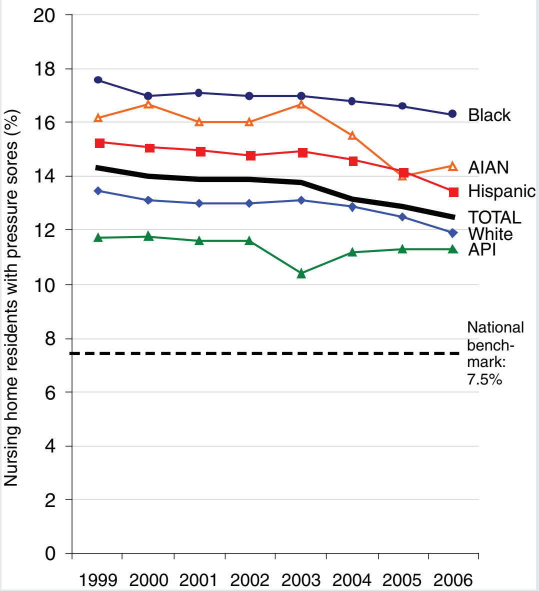
BEFORE

Figure B. High-risk, long-stay nursing home residents with pressure sores, by race/ethnicity, 1999-2006.



AFTER

Figure B. Although rates of pressure sores among high-risk, long-stay nursing home residents have decreased in recent years, Black residents still have higher rates compared to all other racial groups.



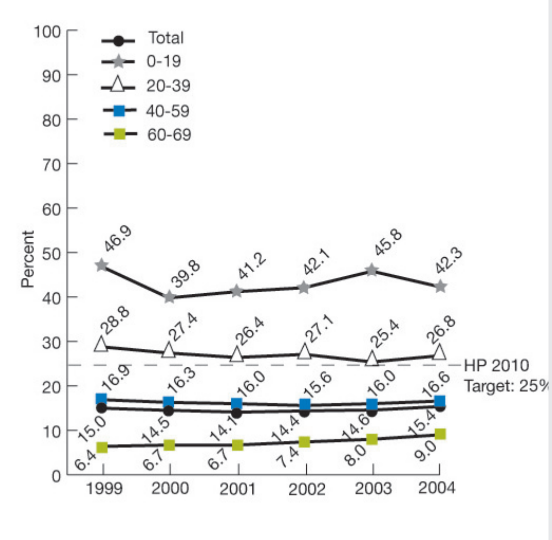
SOURCE for the “Before” Graph: AHRQ, 2009d, p. 84.

BOX 6-5
An Example of a Complex Data Display

An informative heading or caption should explain what constitutes better performance. The measure captions currently used as headings in the NHQR and NHDR do not always indicate whether better performance is associated with a positive percentage change or a negative percentage change. As shown in Figure C, below left, without reading the supporting text for this figure, a reader might not readily grasp that being on a transplant waiting list for a dialysis patient is a positive thing and that a high percentage is desirable.

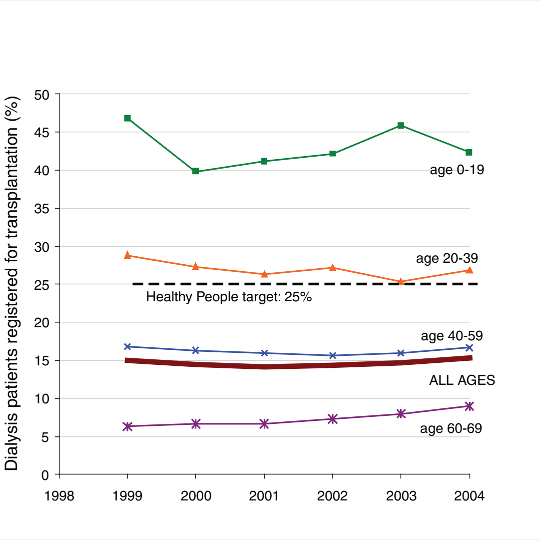
BEFORE

Figure C. Dialysis patients under age 70 who were registered on a waiting list for transplantation, by age group, 1999-2004.



AFTER

Figure C. Although standards of care recommend that dialysis patients (under age 70) be registered for transplantation, older patients are less likely than younger patients to be registered.



SOURCE for the "Before" Graph: AHRQ, 2009e, p. 50.

of the scale can modify a person's perception of the data (Cooper et al., 2003; Schriger and Cooper, 2001). The committee encourages AHRQ to choose an aspect ratio that appropriately conveys the data.

Alternative Data Displays

In addition to displaying trend data in graphs, AHRQ might consider utilizing alternate visual displays. For example, Figure 6-2 below, which was created by the CDC, succinctly presents information to readers, including readers who may not be data experts. The figure could be further improved by specifying whether the symbols represent absolute numbers of infected people or a rate ratio. In creating the figure, CDC likely meant for the figure to represent a rate ratio; however, readers may draw the conclusion that seven times more African Americans are infected than Whites (an absolute count). The display could be made clearer by including 100 small symbols for each group, and coloring in 7 for the African American population, 2.5 for the Hispanic population, and 1 for the White population.

The committee recognizes that there are benefits to readers in using a small number of graphic formats with the same type of display from page-to-page, so that readers do not have to learn to interpret a new type of graph,

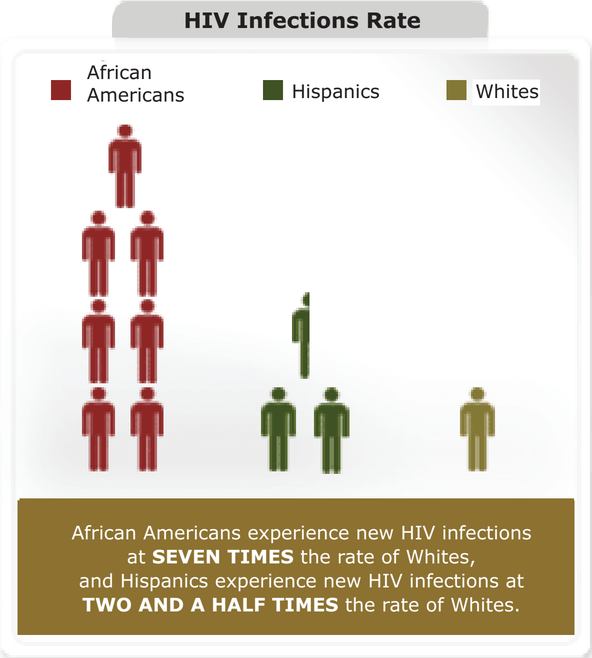


FIGURE 6-2 Example of an alternate visual display.
SOURCE: HHS, 2009a.

but finds that some diversity of presentation can enhance a report. Alternative displays might be particularly useful for the Highlights section and fact sheets.

The legends on the maps in the NHQR and NHDR are often uninformative as they are simply *above average*, *average*, *below average*, and *no data*. For ease of comprehension, the labels might, at a minimum, contain numeric values (averages and ranges). Additionally, ordering by performance level achieved makes a coherent visual impact and suggests an implicit underlying structure. For example, gradations of a single color would better show performance levels on maps (see Figure 6-3 below). A sequence of "increasing darkness" of a single color can assist the reader in identifying increasing or decreasing rates, as utilized by Pickle and colleagues over five gradients (Pickle et al., 1996). Additionally, colors should be chosen to avoid common color vision deficiencies and so that no single color visually dominates (Pickle et al., 1996). In the NHQR and NHDR maps, the color black represents better performance and AHRQ's use of two other colors (green and blue) does not have the visual impact of a single color gradient. Examples of such visual displays abound, and the committee believes that AHRQ may benefit from additional professional consultation on how to better present its data.

Enhancing the Supporting Text for Data Displays

The text supporting a data display should convey information gleaned from data analysis, such as analysis not captured in the figure and implications of significant findings. Currently, supporting text for displays in the NHQR and NHDR describes what the graph depicts. The text refrains from providing additional analyses and provides minimal direction on methods that could be used to improve quality or eliminate disparities.

Refining the Presentation of Summarized Information

Summary and composite measures are useful tools for conveying information about complex constructs, such as the multiple elements of appropriate care for a stage of life (e.g., end-of-life care) or a condition that is

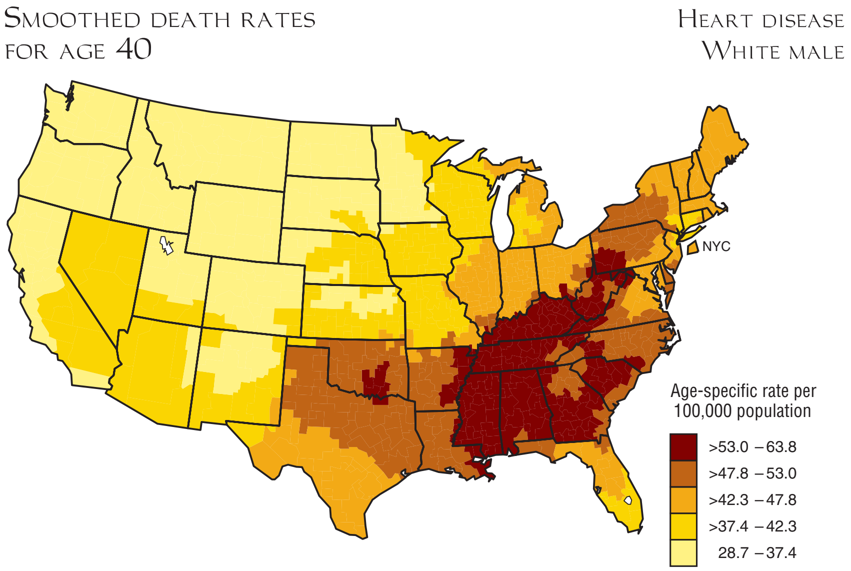


FIGURE 6-3 Illustration of a gradient shading scheme.
SOURCE: Pickle et al., 1996.

inadequately portrayed through a single measure (e.g., diabetes). To be consistent with AHRQ's use of the terms *composite* and *summary measures*, this report defines composite measures as the bundling of two or more measures that look at different aspects of care for a specific clinical condition (AHRQ, 2008b).[12] As an example, the composite measure on diabetes care is the percentage of adults age 40 and over with diabetes who received all three recommended services (hemoglobin A1c measurement, dilated eye examination, foot examination).

Summary measures bundle a number of conceptually similar specific measures of health care services or outcomes across multiple conditions or health care settings in order to present a single metric for a given aspect of health care delivery (e.g., combining performance rates for all prevention measures). AHRQ's State Snapshots present such summary measures to report the performance of single and combined states on measures for different types of care (i.e., preventive, acute treatment, chronic care) and settings of care (i.e., home health, hospital, nursing home, ambulatory) (AHRQ, 2009a). Similarly, AHRQ summarizes measures in the Highlights section by core measure totals, types of settings, and types of clinical measures (including some clinical conditions across composite and individual measures).

The committee's purpose is not to recommend specific composite or summary measures for inclusion in the national healthcare reports; rather, the committee considers desirable properties that AHRQ may consider when evaluating the way in which such measures are reported. A principal consideration in the use of a composite or summary measure is the quality of the individual measures being inputted and the relationship of these measures to one another (Murray et al., 2000). The weight of the measures that comprise the composite or summary measure may need to be considered. AHRQ does not use differential weights in its composite and summary measures; rather, it weighs every component measure equally. Implicit in choosing weights are subjective judgments about the relative clinical significance and prioritization of the component measures. AHRQ should clearly denote that composite and summary measures use equal weights and provide the denominators for each component measure (in an appendix, for instance) so that users of the data can perform their own analyses using differential weights, if they so choose (Martinez-Vidal and Brodt, 2006).

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[12] Ten out of the 12 reported composite measures in the reports involve the bundling of process measures, while the other 2 involve outcome measures for surgical procedures.

Presenting the Methodology of Summary and Composite Measures

Several standard pieces of information should accompany any composite or summary measure. While such information need not be displayed in the main body of a report, it should appear at least as an appendix, including:

- the methodological considerations taken into account when creating a composite or summary measure (e.g., how the measure is weighted);
- a description of the individual constituent measures that make up the composite or summary measure, their data source, and the distribution (e.g., means, standard deviations, ranges, floor and ceiling effects);
- a summary description of the psychometric properties of the composite measure, including how the component measures relate to each other (i.e., the pair-wise correlation coefficients of the individual quality measures or a coefficient alpha); and
- the standard error of the composite measure, in addition to the estimated composite measure.

The general methodology for the composite measures presented in the 2008 NHQR is discussed in the print report (AHRQ, 2009e, p. 20), and some measure specifications for composites included in the NHQR and NHDR are provided via online appendixes.[13] However, the appendixes do not contain all of the information outlined above. For instance, data on the individual constituent measures for the reported composite measures are sometimes unavailable or not easily accessible. Likewise, some methodological information is provided online for the summary measures used in the State Snapshots,[14] but much of the above information is also missing for those measures.

For example, the first figure presented in the 2008 NHQR (AHRQ, 2009e, p. 3) pools trend data from quality measures to quantify the overall change in quality for the health care system according to the measures AHRQ has chosen to profile. The median annual rate of change from baseline to most recent data year is reported as 1.4 percent. The NHQR does not, however, report the distribution of the underlying rates of change across measures, including the distribution and variability of the underlying rates. While it is important to know how many indicators are getting better and how many are getting worse, standard errors and correlations in rates of change are essential to identifying which measures tend to improve or worsen together.

The committee recognizes the benefits of using composite measures and summarization techniques, and AHRQ staff should continue to identify measurement areas that can benefit from such presentation. However, the committee finds that AHRQ needs to be more transparent in its methods. Methodological information may be presented in the print and online reports, although such detail may be more appropriate for appendixes where researchers who need such facts can obtain them.

Enhancing the Summary Dashboards of the State Snapshots

Dashboards are a valuable tool for efficiently and effectively communicating summarized information (Few, 2006). AHRQ utilizes this technique to provide a picture of how a state is performing relative to other states on “overall health care quality” and for 12 topics across types of care (i.e., prevention, acute, and chronic), settings of care, and clinical conditions.[15] Despite the intended purpose of simplistically conveying information, the state dashboards may confuse users. For instance, Montana appears to be doing worse today than in the baseline year, although performance may or may not be better than in the past. The Montana dashboard does not say the arrows on the meters are reflecting relative performance, nor does it have a statement such as, “Montana’s overall perfor-

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[13] The 2008 measure specifications are accessible at http://www.ahrq.gov/qual/qrdr08/measurespec/ (accessed January 15, 2010).

[14] Accessible by visiting the Methods section of the State Snapshots at http://statesnapshots.ahrq.gov/snaps08/Methods.jsp?menuId=58&state=#stateSummary (accessed January 15, 2010).

[15] See the Montana dashboard at http://statesnapshots.ahrq.gov/snaps08/dashboard.jsp?menuId=4&state=MT&level=0 (accessed December 8, 2009).

mance is better in the most recent data year than its baseline performance, but other states have improved more, so its overall performance ranks lower than previously."

In the State Snapshots, Arkansas is positively rated for having a low disparity rate.[16] This rating, however, may not reflect better outcomes. The low disparity rate is principally because the performance metrics of Arkansas's White population are lower than the corresponding data for the White population in other states. Meanwhile, the quality data attributed to Arkansas's Black or African American population are in line with the corresponding national measures. Thus, lower quality metrics associated with *both* White and Black individuals in Arkansas results in a smaller difference between the two populations (and thus a smaller disparity).[17]

Statistical Quality of Data Reporting

Given the volume and numerous sources of reported measures, there are challenges in providing clear and useful information to readers. However, clearly stating the analytic methodology for the reports and making this methodology more readily available is important for the researchers, as they may seek to manipulate the data for their own purposes, or look to replicate such measurement reporting. Providing such methodological information also enhances the transparency of the NHQR and NHDR.

For three sections of the NHQR or NHDR, the committee assessed (1) measurement properties and definitions of quality indicators, (2) the description and use of analytical adjustments, (3) methods of summarization, (4) selection and use of benchmarks, and (5) use of prediction rules. (See Appendix H for additional information.) The committee's review indicated that, when possible, AHRQ should make available online the following supplementary information to inform the research community:

- *Data quality.* Information regarding who collected the data, the reliability and validity of collected data, limitations of the data, and the extent of missing data should be reported. While this information may be difficult to gather, the quality of the NHQR and NHDR hinge on the quality of the data. A standard template could be constructed and populated, and when information cannot be determined, at a minimum, this fact could be stated.
- *Description and use of analytical adjustments.* Key features of analytical adjustment are required for readers to understand and correctly interpret findings. These features include a clear definition of the outcome (including the units of measurement); the observed covariates and definitions used in adjustment; justification for adjustment and how the adjustment was made; the sample sizes or weights used in the analysis; the reference population used; and how well the statistical model performed (fit) for adjustment.
- *Summary measures.* The choice and definition of methods of summarization should be made explicit. For example, if the summary measure is a change in performance from one time period to the next, the time periods need to be stated; the estimate should be defined (regression-based coefficient or difference in means); and the statistical significance or other metric for displaying uncertainty in the estimate should be provided.
- *Prediction rules.* In some instances, prediction inferences for when a particular goal will be achieved are made. In such instances, the statistical model used for the prediction should be stated, its fit assessed relative to reasonable competitor models, and the statistical uncertainty surrounding the prediction should be reported. One prediction would be the number of years to reach a particular benchmark at the current rate of change.

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[16] See Arkansas: Focus on Disparities at http://statesnapshots.ahrq.gov/snaps08/disparities.jsp?menuId=47&state=AR&level=83 (accessed December 20, 2009).

[17] Personal communication, William Golden, University of Arkansas for Medical Sciences and Arkansas Medicaid, Department of Human Services, December 8, 2009.

Conclusions on Data Presentation

Taking advantage of the full power of data displays and concise summarization will be critical for AHRQ to continue to streamline a vast amount of information. To strengthen data presentation in the reports, the committee recommends:

> **Recommendation 8: AHRQ should engage experts in communications and in presentation of statistical and graphical information to ensure that more actionable messages are clearly communicated to intended audiences, summarization methods and the use of graphics are meaningful and easily understood, and statistical methods are available for researchers using data.**

SUMMARY

The data presented in the NHQR, NHDR, and their related products need to provide clear and coherent messages about the state of health care and the level of quality that has been achieved. The reports should strive to promote actionability by relaying realistic benchmarks and leading users to resources that illuminate methods of quality improvement and disparities elimination. As discussed, AHRQ can explore various dissemination strategies to ensure the messages are effectively conveyed to relevant audiences. By employing the messaging and presentation strategies discussed in this chapter, the NHQR and NHDR may be more valuable to a wider spectrum of users while still presenting data and methods useful to researchers in the field.

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Implementing Recommended Changes

An enhanced role is envisioned for the NHQR and NHDR in helping drive health care quality improvement for the nation. The NHQR and NHDR can provide a valuable context and a potential focus for the hundreds of thousands of independent quality improvement activities occurring across the nation. The reports alone cannot generate improvement in the quality of U.S. health care, but they can clearly present compelling information that identifies gaps in care, describes the progress of the nation in closing those gaps, sets a direction for investments in improvement, and identifies evidence-based policies and practices that can assist in achieving higher quality and equitable care. The changes that the Future Directions committee envisions for the NHQR, NHDR, and associated products will require additional resources for the Agency for Healthcare Research and Quality.

Throughout this report, the IOM Future Directions committee has recommended changes in the content and presentation of the NHQR and NHDR. These changes are intended to make the reports more forward-looking and action-oriented by engaging national and state policy makers and other stakeholders in the quest to improve health care quality for the nation. The redesigned NHQR, NHDR, and their related products would continue to fulfill the congressional mandate to report on trends and prevailing disparities, but the focus would be more on driving improvement.[1]

Despite the considerable strengths of the national healthcare reports, the committee assessed them as lacking:

- a clear set of national priorities on which to focus quality measurement and highlight, through the presentation of data, how policies and practices support achievement of these priorities;
- an affirmation in both the NHQR and NHDR that achieving equity is an essential part of quality improvement;
- an assessment of which measurement areas could have the greatest impact if gaps between current and recommended levels of performance were closed;

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[1] *Health Research and Quality Act of 1999*, Public Law 106-129 § 902, 913, 106th Congress, 1st sess. (December 6, 1999).

- identification of important measurement and data gaps to set a research and data collection agenda;[2] and
- best-in-class benchmarks that show the gap between current average performance and the best attained performance.

Overall, the presentation in the reports needs to tell a more complete quality improvement story.

In previous chapters, the Future Directions committee has recommended a number of steps to address these issues. Specifically, the committee suggests a set of national priority areas for quality improvement and disparities, and recommends that AHRQ ensure the NHQR and NHDR report on progress made toward these national priorities (Chapter 2). AHRQ should more closely align future iterations of the NHQR and NHDR to ensure a focus on equity in the NHQR; the relationship between quality and equity is underscored in the updated quality framework, which includes equity and value as crosscutting components (Chapter 3). Moreover, the committee recommends the use of a more quantitative and transparent process for ranking performance measures for use in the NHQR and NHDR and for documenting measurement and data gaps (Chapter 4). New data sources, including subnational ones, may be appropriate for inclusion in future national reports. Furthermore, to ensure the ability to measure and compare quality across all population groups, standardized data on race, ethnicity, and language need, as well as other sociodemographic descriptors, must be collected and analyzed (Chapter 5). Finally, the committee recommends that the current emphasis in the NHQR on comparing quality data to average national performance be modified so that greater emphasis is placed on outcomes that have been previously attained by health care providers, health care organizations, or states (i.e., best-in-class benchmark) (Chapter 6).

Performance gaps have been *repeatedly* documented by the national healthcare reports and other quality reporting entities. The Future Directions committee supports the broader dissemination of re-designed reports and associated products to spur the engagement of actors across the U.S. health care system in affecting substantial and accelerated progress on national priority areas. Change, however, will require a broad national commitment and engagement. Impetus for action, complementary to the reports, should come from a combination of federal and state leadership with broad stakeholder consensus on national priorities, from leadership and direction by public and private sector entities (particularly insurers and employers), and from the commitment of resources that aim to remove barriers to improving the quality of U.S. health care.

RESOURCES REQUIRED TO IMPLEMENT RECOMMENDATIONS

The statement of task for the Future Directions committee (see Chapter 1) specifically asked that the committee "take note of recommendations that are estimated to be a reach for the current resources of AHRQ" (IOM, 2008). The committee acknowledges that implementing most elements of the recommendations presented in this report will require additional funding.

Investing in National Quality Measurement Efforts

When considering the need for AHRQ to receive additional funding to implement the committee's recommendations, the committee used existing and expected health care spending and recent recommendations for funding quality measurement enterprises as a context for understanding the necessary degree of investment. With \$2.3 trillion spent on U.S. health care in 2008, health care expenditures constitute more than 16 percent of the U.S. gross domestic product (GDP) (CMS, 2010; Cutler, 2009). Moreover, health care spending is projected to comprise 20 percent of the country's GDP by 2017 (Keehan et al., 2008) and up to 40 percent of the GDP by 2050 (CBO, 2007).

A number of proposals—elements of which are similar to activities proposed by the Future Directions committee—have estimated funding needed to enhance the nation's quality improvement infrastructure. For example,

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[2] The 2008 NHDR lists the population groups (e.g., Asian or Pacific Islander, American Indian/Alaska Native, and poor) for which data are not available for its core measures (p. 287).

- The 2006 IOM report *Performance Measurement: Accelerating Improvement* (IOM, 2006) recommended the formation of a National Quality Coordination Board with a budget of $100-$200 million.[3] This estimate constituted approximately 0.1 percent of the Medicare budget at the time.
- In 2009, the organization Stand for Quality—supported by 165 organizations coalescing around the issues of setting national priorities, making "performance information available and actionable," and supporting a "sustainable infrastructure for quality improvement"—estimated that $300 million is needed for each of the next 3 years[4] (Stand for Quality, 2009).
- Under the authority of the *Medicare Improvements for Patients and Providers Act of 2008*, HHS awarded $10 million over each of the next several years to the National Quality Forum (NQF) to identify the most important quality and efficiency measures that would reflect the high cost of chronic disease and the continuum of care across settings for those cared for under Medicare (NQF, 2009).[5]
- A national health reform bill passed by the U.S. House of Representatives in November 2009 called for $4 million per year from fiscal years 2010 through 2014 for health care priority setting by the HHS Secretary; $50 million per year from fiscal years 2010 through 2014 for health care quality measure development; and $12 million per year from fiscal years 2010 through 2012 for a consensus-based entity to ensure multi-stakeholder input for measure development specific to public reporting and public health care programs.[6] A national health reform bill passed by the U.S. Senate in December 2009 and that became law in March 2010 called for $75 million per year from fiscal years 2010 through 2014 for the development of new quality measures and for $20 million per year from fiscal years 2010 through 2014 for additional improvements in quality measurement.[7]

Congress has designated the NHQR and NHDR as *the* national reports on health care quality and disparities.[8] Therefore, the reports are deserving of sufficient funding to ensure they have a more widespread impact on quality improvement.

Additional Funding Required for AHRQ for Implementation

When Congress mandated the NHQR and NHDR in 1999, it did not provide dedicated funding for the reports. Currently, the report-related effort is funded within AHRQ at an annual cost of approximately $3.7-$4.0 million. To implement the improvements recommended by the Future Directions committee, a substantial increase over current funding may be necessary. Transforming the report products, engaging national and state policy makers and other actors, strengthening performance metrics, improving data, and supporting the committee's recommended measure selection process are important avenues for improving health care quality for the nation.

The Future Directions committee is not able to determine to what extent, if at all, AHRQ might be able to reprogram funds within its existing budget to cover some implementation needs. The committee urges AHRQ to

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[3] The National Quality Coordination Board was conceived as an independent body housed in the Office of the Secretary with a proposed $100-$200 million budget. Its functions included specifying the purpose and aims for American health care; establishing short- and long-term national goals for improving the health care system; and identifying and funding a research agenda for the development of new measures to address gaps in performance measurement. Other functions included designating, or if necessary developing, standardized performance measures for evaluating the performance of current providers; monitoring the nation's progress toward these goals; ensuring the creation of data collection, validation, and aggregation processes; establishing public reporting methods responsive to the needs of all stakeholders; and evaluating the impact of performance measurement on pay for performance, quality improvement, public reporting, and other policy levers.

[4] The major activities cited include setting national priorities and providing coordination; endorsing and maintaining national standard measures; developing measures to fill gaps in priority areas; consulting with stakeholders; collecting, analyzing, and making performance information available and actionable; and supporting a sustainable infrastructure for quality improvement. The $300 million includes at least $100 million for translational research on payment models.

[5] *Medicare Improvements for Patients and Providers Act of 2008*, Public Law 110-275, 110th Cong., 2d sess. (July 15, 2008).

[6] *Affordable Health Care for America Act*, HR 3962 § 1441, 1442, 1445, 111th Cong., 1st sess. (November 7, 2009).

[7] The Senate bill was passed into law in March 2010 as the *Patient Protection and Affordable Care Act* (Public Law 111-148 § 3013, 3014, 111th Cong., 2d sess. (March 23, 2010)).

[8] The strategic plan reporting requirement in the *Patient Protection and Affordable Care Act* would inform but not duplicate AHRQ's national healthcare reports (*Patient Protection and Affordable Care Act,* Public Law 111-148 § 3011, 111th Cong., 2d sess. (March 23, 2010)).

continue to leverage its own resources by partnering with other entities and agencies to accomplish as much of the new vision set out by the committee as possible. The committee was not tasked with making specific budgetary recommendations or estimates; therefore, the wording of the committee's recommendation speaks to providing sufficient funds rather than a specific amount:

> **Recommendation 9: To the extent that existing resources cannot be reallocated, or AHRQ cannot leverage its resources by partnering with other stakeholders and HHS agencies, AHRQ should work to obtain additional funds to support the work of the Technical Advisory Subcommittee for Measure Selection, the upgrades and additions to AHRQ's national healthcare report-related products, and the development of new measures and supporting data sources.**

An illustrative example of how the committee's recommended improvements might be funded is provided in Appendix I. The committee believes that given the need for health care quality improvement, an increase in funds available to AHRQ would be worthwhile, and that over time, upgrades to the NHQR and NHDR, Web-based resources, derivative products, engagement activities, prioritization analyses, measure development, and data acquisition may require specific additional funding beyond the illustrative amounts contained in Appendix I. For example, the work of the NAC Technical Advisory Subcommittee for Measure Selection will generate ideas for the development of health care quality measures or data sources for high-impact areas that would be tracked nationally; these developmental activities can be quite expensive and are not accounted for in the scenario outlined in the appendix.

Upgrading the Reports and State Snapshots

In calendar year 2010, with a modest increase in staffing and resources, AHRQ should be able to include numerous upgrades in the 2010 NHQR, NHDR, and State Snapshots (which would be released in early 2011) by incorporating:

1. The topic of access into the NHQR and the State Snapshots
2. Benchmarks that reflect best attained performance for each measure
3. Extrapolation of when performance levels close the current gap between current practice and the recommended standard of care (goal or benchmark) will be met based on historical trends
4. Recognition of the degree of variation among population groups on quality measures relative to best attained performance
5. A summary of disparities data in the NHQR and an introductory exposition of the interrelationship between quality and equity in both reports
6. A summary of performance by state in the NHQR and NHDR (not just in the State Snapshots)
7. Improved presentation (e.g., sharper key messages, identified data needs and best practices, redefined Highlights section)
8. Measures and new report sections that support the committee's recommended set of national priority areas and new framework components (e.g., care coordination and infrastructure)
9. Fuller exposition on the specific needs of priority populations

While the first six of these suggestions may be able to be accomplished within existing resources, the movement from a statistical chartbook format to one that tells a more vivid and complete story of the current status of health care quality will require revamping the current products, conceptually and analytically (e.g., not just reporting overall performance on an individual measure, but producing analyses that include, for example, findings on specific program performance, the effect of health insurance by type, or relationships among process measures and outcomes). As recommended in Chapter 6, AHRQ should consult with communication and statistical experts to hone presentation methods for broad audiences while still providing sufficient information on analytic methods for specialized users. In the near term, AHRQ can begin to add new sorting functions in the State Snapshots (see Chapter 2, Table 2-2) and begin to drill down into the datasets to provide information on substate variation for some measures. The Future

Directions committee observes that there is limited treatment of priority populations in the NHDR and feels that there should be some expansion of content relevant to those populations both within the reports and via spinoff products.

There will be occasions where new analyses and data acquisition will be required, whether national or subnational in character (e.g., multipayer databases, program-specific data). As new measures and data sources become available (e.g., data from the Centers for Medicare and Medicaid Services [CMS], data from electronic health records), the committee hopes that through collaborative partnerships, much of these data and their subsequent analyses can be supplied without charge to AHRQ as data and analysis already takes up at least half of the AHRQ report budget. Currently the NHQR and NHDR have limited reporting based on Medicare, Medicaid, and private sector data, and the committee urges AHRQ to expand these data in future editions.

Upgrading Online Resources, Adding Derivative Products, and Enhancing Dissemination

The committee has recommended AHRQ directly or via contracts update the State Snapshots and the NHQRDRnet to:

- Include fact sheets, topic-specific derivative products (e.g., expanded mini-reports on priority populations), and capability to customize reports to user needs.
- Ensure links between the NHQR and NHDR on the same measures.
- Increase the visibility of AHRQ products through a better dissemination and engagement plan (e.g., meetings with stakeholders including organizations representing communities of color, Web optimization, targeting fact sheet topics to specific audiences, and translating some materials into user languages).
- Provide tools that show AHRQ's analytic methods for users who want to manipulate primary datasets.
- Develop the *Guide to Using the NHQR and NHDR* and other topic-specific derivative products.

In 2010, AHRQ should determine, in conjunction with a dissemination plan, a longer term development strategy for products that have priority for development. It is unlikely that all of the fact sheets, mini-reports, and tools can be developed within one year.

The committee's recommendation for expanded dissemination activities is not considered superfluous to AHRQ's work on the NHQR and NHDR. In fact, the committee believes it is essential to it. If the NHQR, NHDR, and related products are to serve as conduits for information that have the potential to drive change, that information needs to be properly distributed to relevant stakeholders and reflect their needs, engage them in improvement activities related to priorities and measures monitored in the reports, and assess the impact of the information and partnerships across time.

Implementing a More Quantitative and Transparent Measure Selection Process

The committee has recommended that AHRQ establish an external advisory process for the selection and ranking of measures for the national reports—a Technical Advisory Subcommittee for Measure Selection within the existing structure of AHRQ's National Advisory Council for Healthcare Research and Quality (NAC). This subcommittee should be established in calendar year 2010 to begin planning for the assessment of measures. New funds would be required to staff the subcommittee and conduct its public deliberations when prioritizing among measures to be featured in the AHRQ reports. In addition, AHRQ will need specific funds to hire staff or contract for the systematic review and analyses required to apply quantitative techniques toward assessing how much closing specific gaps in performance will benefit the overall health of the nation and that of specific priority populations.[9]

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[9] Personal communication, Michael Maciosek, HealthPartners. January 6, 2010. Estimates for conducting these types of quantitative reviews vary depending on the depth of the literature review, experience with the methods and availability of data, options for intervention, complexity of technology being assessed, and other factors. For example, a *de novo* cost-effectiveness evaluation with a thorough but not necessarily systematic review might cost $100,000. Reports from the Health Technology Assessment program in the United Kingdom, which tend to be very thorough, typically cost between £100,000 and £500,000 per technology assessment (see http://www.hta.ac.uk/project/htapubs.asp).

Funding Measure and Data Infrastructure for the NHQR and NHDR

Oft-cited quality improvement axioms are, "What gets measured gets done/managed," and "You cannot improve what you do not measure."[10] But there is a third cautionary saying: "Be careful what you measure." In view of this latter sentiment, the committee recognizes that naming national measures of health care quality carries potential risks, because doing so can divert resources from other potentially valuable initiatives.

The Future Directions committee believes it important for AHRQ to have resources to support not only the activities of the NAC Technical Advisory Subcommittee for Measure Selection in evaluating and ranking quality improvement measures for the greatest health benefit, but also to examine new evidence related to the performance measures it uses in the NHQR and NHDR and to support the evaluation of alternative or new measures and the development of data.

Questions raised previously with regard to specific measures endorsed by NQF and used by The Joint Commission and CMS illustrate the importance of making this investment. In recent years, for example, there has been debate in the literature over whether increased adherence to a set of heart failure process measures results in improved patient outcomes (Fonarow and Peterson, 2009; Fonarow et al., 2007; Kfoury et al., 2008) and whether measures related to antibiotic timing in patients with pneumonia have unintended adverse effects (Dean, 2009; Wachter et al., 2008). AHRQ will need to partner with others to ensure that the strength of the science of measures remains high and up-to-date, but the agency may need to be able to promote and potentially fund some separate investigations.

The IOM reports published in 2001 and 2002 to advise AHRQ on the NHQR and NHDR encouraged the development of quality measures and data sources that were not immediately feasible (IOM, 2001, p. 83, 2002). The Future Directions committee agrees that such development needs to occur, particularly in concert with consideration of measurement areas and their prioritization. Such investigation of future measure and data possibilities is less likely to happen without the investment of funds. Health insurance reform bills considered in the U.S. Congress in 2009 and early 2010 lodged the responsibility for funding the development of quality improvement measures with the HHS Secretary. The Senate version, which was signed into law in March 2010, specifically stipulates measure development is to be done in consultation with AHRQ, CMS, and NQF.[11]

When existing health care quality measures and data sources are insufficient to track national progress in the identified national priority areas, AHRQ should directly or indirectly support the development of needed measures and the acquisition of relevant data sources. For report purposes, AHRQ tends to pay data use fees but does not pay for infrastructure development (e.g., data collection), partially because AHRQ has had limited funds available for this purpose. As illustrated by the development of the Consumer Assessment of Healthcare Providers and Systems (CAHPS) surveys, there is precedent for AHRQ leadership when a demonstrated measurement need has not been filled elsewhere.

The Centers for Disease Control and Prevention (CDC) develops critical data infrastructure needs through a granting process, an approach that AHRQ might consider for key areas determined to be a priority (for example, providing some support in selected states for all-payer claims databases; other developmental areas might include patient registries and all-patient databases derived from provider rather than insurance sources).[12]

To date, AHRQ has lacked the resources to fully take advantage of public administrative data (e.g., Medicare and Medicaid data) or to obtain more timely data from existing report sources, so the benefit of developing new databases will need to be weighed against the benefit of more comprehensively using existing sources. The prin-

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[10] The scientist Lord Kelvin said, "When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thoughts advanced to the stage of science" (Thompson, 1889, p. 73). Later, this statement was abbreviated to "if you can measure it, you can manage it" and "if you cannot measure it, you cannot manage it;" these statements are often attributed to Peter Drucker.

[11] *Patient Protection and Affordable Care Act*, Public Law 111-148 § 3013 and 3023, 111th Cong., 2d sess. (March 23, 2010). Quality measure development was also addressed in the *Affordable Health Care for America Act*, HR 3962 § 1442, 111th Cong., 1st sess. (November 7, 2009).

[12] After the Future Directions committee concluded its deliberations, HHS announced its intent to build a universal claims database for health research; see https://www.fbo.gov/?s=opportunity&mode=form&id=71d119aea45a6f2efdc5862cac9cb6e2&tab=core&_cview=0 (accessed January 12, 2010).

ciples for prioritizing the selection of quality measures discussed in Chapter 4 can also be used to prioritize areas for developing measures and data sources.

The committee believes the development of additional data sources and sound quality measures in national priority areas for the national healthcare reports can be supported by all federal agencies that conduct research and collect health care-related data (e.g., AHRQ, CMS, CDC, the U.S. Department of Defense, the Department of Veterans Affairs, and the National Institutes of Health). Additionally, measure development is an important area for strategic partnerships, including, perhaps, jointly funded research with AHRQ's non-federal partner organizations (e.g., NQF, the National Committee for Quality Assurance, The Joint Commission, the Physician Consortium for Performance Improvement convened by the American Medical Association, The Leapfrog Group, organizations representing communities of color). Regional consortia, academic institutions, health plans, and professional societies, among others, also play roles in measure development and adaptation, and a two-way interchange between these entities and AHRQ through the selection and prioritization process of the NAC Technical Advisory Subcommittee for Measure Selection would be beneficial.

EVALUATION OF THE AHRQ REPORT-RELATED ENDEAVOR

Along with its recommendation for an increase in financial support to AHRQ to facilitate transformation of the NHQR, NHDR, and their associated products, the Future Directions committee recommends a rigorous evaluation of the reports so that AHRQ can gain a better understanding of the reports' contribution to quality improvement and disparities reduction. The committee recommends that AHRQ institute an explicit, ongoing program of internal and independent external evaluations of the national healthcare reports and associated products to:

- Offer fresh perspectives on how the reports are being used to produce change.
- Assess what types of analyses are most actionable.
- Examine why AHRQ products may not be used by their targeted audiences.
- Determine ways in which the reports could provide better and more actionable information.
- Evaluate how the results associated with the products justify the investment in them.

Regular, formal reviews of AHRQ's portfolio of products should consider how to produce the most relevant information possible for policy makers, the public, and individuals and entities responsible for implementing quality improvement interventions, including organizations representing and serving communities of color. The committee does not want to convey the idea that just producing *more* fact sheets or other derivative products is an end in and of itself. The relevance of these various products should be assessed to assist AHRQ in determining priorities for the continuation of existing products or the development of future ones given available resources. Thus,

> **Recommendation 10: AHRQ should regularly conduct an evaluation of its products to determine if they are meeting the needs of its target audiences and to assess the degree to which the information in the AHRQ products is leveraged to spur action on quality improvement and the elimination of disparities.**

TIMELINE FOR IMPLEMENTING RECOMMENDATIONS

Although the IOM Future Directions committee recognizes that the transformation of the NHQR and NHDR and related products will not happen overnight, action steps can begin with the 2010 reports. The 2010 NHQR and NHDR are under development during calendar year 2010 and planned for release in early 2011. The committee's suggested timeline for action steps is presented in Figure 7-1; any one step in the timeline could be performed earlier than suggested.

Calendar Year 2010		Calendar Year 2011		Calendar Year 2012
AHRQ upgrades presentation aspects of NHQR, NHDR, and State Snapshots; begins consultation with graphics and presentation experts (see Chapters 2 and 6)	⇨	AHRQ continues to refine presentation (NHQR, NHDR, State Snapshots, NHQRDRnet) by consulting graphics, statistical, communication, and technology/website experts	⇨	AHRQ continues refinements in presentation as recommended by experts
AHRQ maps measure and data needs to national priority areas; incorporates available measures (see Chapters 2 and 3)	⇨	AHRQ incorporates new measures and data that support priority areas as they become available either nationally or subnationally; notes where measure and data needs remain	⇨	AHRQ incorporates new measures and data that support priority areas; notes where measure and data needs remain
AHRQ plans for development of fact sheets and other derivative products, and for expanded dissemination (see Chapter 6)	⇨	AHRQ begins developing NHQRDRnet capabilities that allow users to customize reports AHRQ develops user guide on accessing primary data and how to apply findings in action	⇨	AHRQ upgrades online presentation of NHQRDRnet to allow customization of reports and utilization of fact sheets and derivative products to support data
AHRQ forms theTechnical Advisory Subcommittee for Measure Selection to NAC that - plans for analysis of current core measures and additional measures for relative health care quality impact - issues call for suggested additions and deletions to core measure set - begins to identify measure and data gaps (see Chapter 4)	⇨	Technical Advisory Subcommittee - releases findings on relative rankings of its current measures and on some additional quality measures - recommends to NAC/AHRQ areas for funding research on measures and data acquisition	⇨	Technical Advisory Subcommittee - releases additional findings on relative ranking of quality measures - continues analysis of measures as needed - recommends to NAC/AHRQ areas for funding research on measures and data acquisition
AHRQ contracts for evaluation of current user groups' practices and how change would affect the reports' utility for these users (see Chapter 7)	⇨	AHRQ evaluates user groups' application of report findings to affect change	⇨	AHRQ incorporates updates to the reports based on user group evaluations and reexamines effectiveness of dissemination and partnership efforts
AHRQ seeks additional funding (see Chapter 7)	⇨	AHRQ funds development/evaluation of measures and data sources	⇨	AHRQ continues to fund development and evaluation of measures and data sources

FIGURE 7-1 Suggested timeline for implementing recommended activities.

CONCLUSION

The committee recognizes the excellent work that has been done by AHRQ with regard to the publication of the NHQR and NHDR despite some resource constraints. The committee believes that these reports can be made more forward-looking and action-oriented, offering diverse audiences a picture of what constitutes desired health care, where shortcomings in care now lie, and what policies and practices may spur overall improvement in U.S. health care quality and disparities elimination. Sufficient additional resources will be required to support the role that the committee envisions the NHQR and NHDR playing in the future of U.S. quality improvement efforts.

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Acronyms

ACS	American Cancer Society
AHRQ	Agency for Healthcare Research and Quality
AIDS	acquired immune deficiency syndrome
AMI	acute myocardial infarction
ARRA	*American Recovery and Reinvestment Act of 2009*
BRFSS	Behavioral Risk Factor Surveillance System
CAHPS	Consumer Assessment of Healthcare Providers and Systems
CBO	Congressional Budget Office
CDC	Centers for Disease Control and Prevention
CE	cost-effectiveness
CEA	cost-effectiveness analysis
CHIP	Children’s Health Insurance Program
CHIS	California Health Interview Survey
CLAS	culturally and linguistically appropriate services
CMS	Centers for Medicare and Medicaid Services
CPB	clinically preventable burden
CPES	Collaborative Psychiatric Epidemiology Surveys
CQUIPS	Center for Quality Improvement and Patient Safety
CTM	Care Transitions Measure
DALY	disability-adjusted life year
DOD	U.S. Department of Defense
EHR	electronic health record
ESRD CPMP	End Stage Renal Disease Clinical Performance Measures Project
FEHCS	Family Evaluation of Hospice Care Survey

FY	fiscal year
GDP	gross domestic product
HCAHPS	CAHPS Hospital Survey
HCUP	Healthcare Cost and Utilization Project
HEDIS	Healthcare Effectiveness Data and Information Set
HHS	U.S. Department of Health and Human Services
HIT	health information technology
HIV RN	HIV Research Network
HPSAs	health professional shortage areas
HRSA	Health Resources and Services Administration
HIT	health information technology
HITECH	*Health Information Technology for Economic and Clinical Health Act*
ICU	intensive care unit
IHI	Institute for Healthcare Improvement
IHS	Indian Health Service
IOM	Institute of Medicine
MAD	Medicare Administrative Data
MDS	Nursing Home Minimum Data Set
MEPS	Medical Expenditure Panel Survey
MPSMS	Medicare Patient Safety Monitoring System
MRI	magnetic resonance imaging
MSA	Metropolitan Statistical Area
NAC	National Advisory Council for Healthcare Research and Quality
NAMCS	National Ambulatory Medical Care Survey
NCBD	National CAHPS Benchmarking Database
NCDB	National Cancer Data Base
NCHS	National Center for Health Statistics
NCI	National Cancer Institute
NCQA	National Committee for Quality Assurance
NCVHS	National Committee on Vital and Health Statistics
NHAMCS	National Hospital Ambulatory Medical Care Survey
NHANES	National Health and Nutrition Examination Survey
NHB	net health benefit
NHDR	National Healthcare Disparities Report
NHDS	National Hospital Discharge Survey
NHIS	National Health Interview Survey
NHPCO	National Hospice and Palliative Care Organization
NHQR	National Healthcare Quality Report
NIH	National Institutes of Health
NIMH	National Institute of Mental Health
NIS	National Immunization Survey
NPCR	National Program of Cancer Registries
NPIRS	National Patient Information Reporting System
NPP	National Priorities Partnership
NQCB	National Quality Coordination Board

NQF	National Quality Forum
NSCH	National Survey of Children's Health
NSDUH	National Survey on Drug Use and Health
NSQIP	National Surgical Quality Improvement Program
NTBSS	National Tuberculosis Surveillance System
NVSS-I	National Vital Statistics System: Link Birth and Infant Death Data
NVSS-M	National Vital Statistics System: Mortality Data
NVSS-N	National Vital Statistics System: Natality
OASIS	Home Health Outcomes and Assessment Information Set
OECD	Organisation for Economic Co-operation and Development
OMB	Office of Management and Budget
OMH	Office of Minority Health
ONC	Office of the National Coordinator for Health Information Technology
QALY	quality-adjusted life year
QASC	Quality Alliance Steering Committee
QIO	Quality Improvement Organization program
QuIC	Quality Interagency Coordination Taskforce
RWJF	Robert Wood Johnson Foundation
SAMHSA	Substance Abuse and Mental Health Services Administration
SEER	Surveillance, Epidemiology, and End Results program
SEP	socioeconomic position
SES	socioeconomic status
TEDS	Treatment Episode Data Sets
USPSTF	U.S. Preventive Services Task Force
USRDS	U.S. Renal Data System
VA	U.S. Department of Veterans Affairs
WCHQ	Wisconsin Collaborative for Healthcare Quality
WHO	World Health Organization

Appendix A

Previous IOM Recommendations for the National Healthcare Reports

Subsequent to passage of the *Healthcare Research and Quality Act of 1999*,[1] AHRQ contracted with the IOM to develop a vision for the NHQR and NHDR. That request led to the publication of two sets of IOM recommendations in the IOM consensus documents: *Envisioning the National Healthcare Quality Report* (IOM, 2001) and *Guidance for the National Healthcare Disparities Report* (IOM, 2002). The recommendations offered by the IOM committees follow.

Recommendations for the NHQR

(IOM, *Envisioning the National Health Care Quality Report,* 2001)

1. The conceptual framework for the National Health Care Quality Report should address two dimensions: components of health care quality and consumer perspectives on health care needs. Components of health care quality—the first dimension—include safety, effectiveness, patient-centeredness, and timeliness. Consumer perspectives on health care needs—the second dimension—reflect changing consumer needs for care over the life cycle associated with staying healthy, getting better, living with illness or disability, and coping with the end of life. Quality can be examined along both dimensions for health care in general or for specific conditions. The conceptual framework should also provide for the analysis of equity as an issue that cuts across both dimensions and is reflected in differences in the quality of care received by different groups of the population.
2. The Agency for Healthcare Research and Quality should apply a uniform set of criteria describing desirable attributes to assess potential individual measures and measure sets for the content areas defined by the framework. For individual measures, the committee proposes 10 criteria grouped into the three following sets: (1) the overall importance of the aspects of quality being measured, (2) the scientific soundness of the measures, and (3) the feasibility of the measures. For the measure set as a whole, the committee proposes three additional criteria: balance, comprehensiveness, and robustness.

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[1] *Healthcare Research and Quality Act of 1999*, Public Law 106-129 § 902(g) and § 913(b)(2), 106th Cong., 1st sess. (November 19, 1999).

3. The Agency for Healthcare Research and Quality should have an ongoing independent committee or advisory body to help assess and guide improvements over time in the National Health Care Quality Report.
4. The Agency for Healthcare Research and Quality should set the long-term goal of using a comprehensive approach to the assessment and measurement of quality of care as a basis for the National Health Care Quality Data Set.
5. When possible and appropriate, and to enhance robustness, facilitate detection of trends, and simplify presentation of the measures in the National Health Care Quality Report, the Agency for Healthcare Research and Quality (AHRQ) should consider combining related individual measures into summary measures of specific aspects of quality. AHRQ should also make available to the public information on the individual measures included in any summary measure, as well as the procedures used to construct them.
6. The National Health Care Quality Data Set should reflect a balance of outcome-validated process measures and condition- or procedure-specific outcome measures. Given the weak links between most structures and outcomes of care and the interests of consumers and providers in processes or practice related aspects as well as outcome measures, structural measures should be avoided.
7. Potential data sources for the National Health Care Quality Data Set should be assessed according to the following criteria: credibility and validity of the data, national scope and potential to provide state-level detail, availability and consistency of the data over time and across sources, timeliness of the data, ability to support population subgroup and condition-specific analyses, and public accessibility of the data. In addition, in order to support the framework, the ensemble of data sources defined for the National Health Care Quality Data Set should be comprehensive.
8. The Agency for Healthcare Research and Quality will have to draw on a mosaic of public and private data sources for the National Health Care Quality Data Set. Existent data sources will have to be complemented by the development of new ones in order to address all of the aspects included in the proposed framework and resulting measure set. Over the coming decade, the evolution of a comprehensive health information infrastructure, including standardized, electronic clinical data systems, will greatly facilitate the definition of an integrated and comprehensive dataset for the Quality Report.
9. The data for the National Health Care Quality Report should be nationally representative and, in the long term, reportable at the state level.
10. The National Health Care Quality Report should be produced in several versions tailored to key audiences—policy makers, consumers, purchasers, providers, and researchers. It should feature a limited number of key findings and the minimum number of measures needed to support these findings.

SOURCE: IOM, 2001.

Recommendations for the National Healthcare Disparities Report

(IOM, *Guidance for the National Health Care Disparities Report,* 2002)

1. The National Healthcare Disparities Report should present analyses of racial and ethnic disparities in health care in ways that take into account the effects of socioeconomic status.
2. AHRQ should pursue a research initiative to more accurately and meaningfully measure socioeconomic status as it relates to health care access, service utilization, and quality.
3. Access is a central aspect of health care quality. As such, the National Healthcare Disparities Report should give it prominent attention.
4. The National Healthcare Disparities Report should include measures of high utilization of certain health care services that indicate poor health care quality. It should also include measures of low utilization of certain health care services, which are more commonly used to indicate poor health care quality.
5. The National Healthcare Disparities Report should present data on disparities at the state level. It should also present data on disparities along a rural-urban continuum.
6. In the future, if AHRQ continues to rely on subnational data sources for the National Healthcare Disparities Report, it should work with public and private organizations that sponsor key subnational data sources to identify core elements in these surveys that can be standardized.
7. AHRQ should receive adequate resources to develop datasets and measures needed for the National Healthcare Disparities Report.

SOURCE: IOM, 2002.

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Appendix B

Key Findings of the NHQRs and NHDRs

The Future Directions committee scanned key messages from each year of the NHQR (Table B-1) and the NHDR (Table B-2) to evaluate the content of these messages. Each year's statements are variations on similar themes: that the quality of health care is suboptimal, that the pace of improvement is slow, and that disparities persist. The committee recommends reformulating the Highlights section of the reports, where such key messages are presented, to be more focused on priority areas, and geared toward future actions. Accordingly, key messages should be more targeted and action-oriented.

TABLE B-1 Key Findings of the National Healthcare Quality Report from 2003 to 2008, by Year

2003	2004	2005	2006	2007	2008
Greater improvement is possible High quality health care is not yet a universal reality Opportunities for preventive care are frequently missed Management of chronic diseases presents unique quality challenges There is more to learn	Quality is improving in many areas, but change takes time The gap between the best possible care and actual care remains large Further improvement in health care is possible	Health care quality continues to improve at a modest pace across most measures of quality Health care quality improvement is variable, with notable areas of high performance Health care quality is improving, but more remains to be done to achieve optimal quality Sustained rates of quality improvement are possible	Most measures of quality are improving, but the pace of change remains modest Variation in health care quality remains high The rate of improvement accelerated for some measures while a few continued to show deterioration Quality improvement varies by setting and phase of care	Health care quality continues to improve, but the rate of improvement has slowed Variation in quality of health care across the Nation is decreasing, but not for all measures The safety of health care has improved since 2000, but more needs to be done	Health care quality is suboptimal and continues to improve at a slow pace Reporting of hospital quality is leading improvement, but patient safety is lagging Health care quality measurement is evolving, but much work remains

SOURCE: AHRQ, National Healthcare Quality Reports, 2003-2008.

TABLE B-2 Key Findings of the National Healthcare Disparities Report from 2003 to 2008, by Year

2003	2004	2005	2006	2007	2008
Inequality in quality persists Improvement is possible Data limitations hinder targeted improvement efforts Differential access may lead to disparities in quality Knowledge of why disparities exist is limited Disparities come at a personal and societal price Opportunities to provide preventive care are frequently missed	Disparities are pervasive Improvement is possible Gaps in information exist, especially for specific conditions and populations	Disparities still exist Some disparities are diminishing Opportunities for improvement remain Information about disparities is improving	Disparities remain prevalent Some disparities are diminishing while others are increasing Opportunities for reducing disparities remain Information about disparities is improving, but gaps still exist	Overall, disparities in health care quality and access are not getting smaller Progress is being made, but many of the biggest gaps in quality and access have not been reduced The problem of persistent uninsurance is a major barrier to reducing disparities	Disparities persist in health care quality Magnitude and pattern of disparities are different within subpopulations Some disparities exist across multiple priority populations

SOURCE: AHRQ, National Healthcare Disparities Reports, 2003-2008.

Appendix C

Previous Conceptual Framework

The *Healthcare Research and Quality Act of 1999*[1] directed AHRQ to develop two annual reports. Shortly thereafter, AHRQ contracted with the IOM to develop a vision for the reports and the reports' content and presentation. AHRQ's request subsequently led to the publication of two IOM reports: *Envisioning the National Healthcare Quality Report* (IOM, 2001) and *Guidance for the National Healthcare Disparities Report* (IOM, 2002). The recommendation of the IOM report *Envisioning the National Healthcare Quality Report* was that the conceptual framework for the NHDR be the same as that for the NHQR. Although equity was not visually represented in the conceptual framework presented in *Envisioning the National Healthcare Quality Report*, it clearly stated that equity was to be a crosscutting component. The conceptual framework was later modified by *Guidance for the National Healthcare Disparities Report* to visually depict equity, which is the framework depicted in Figure C-1.

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IOM (Institute of Medicine). 2001. *Envisioning the National Healthcare Quality Report.* Washington, DC: National Academy Press.

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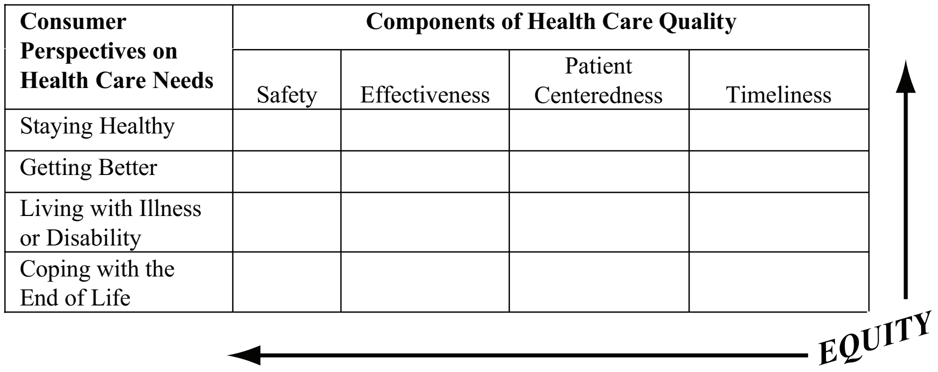
[1] *Healthcare Research and Quality Act of 1999*, Public Law 106-129 § 902(g) and § 913(b)(2), 106th Cong., 1st sess. (November 19, 1999).



Consumer Perspectives on Health Care Needs	**Components of Health Care Quality**			
	Safety	Effectiveness	Patient Centeredness	Timeliness
Staying Healthy				
Getting Better				
Living with Illness or Disability				
Coping with the End of Life				

FIGURE C-1 The original conceptual framework for the NHQR and NHDR.
SOURCE: IOM, 2002.

Appendix D

Measurement Opportunities for the Framework's Components of Quality Care

In Chapter 3, the committee recommends for the NHQR and NHDR an updated framework that includes components of quality care not previously included (access, efficiency, care coordination, and health systems infrastructure capabilities). The committee examined the current set of health care quality measures presented in the NHQR and NHDR for measures that could satisfy these new care components. The committee determined that AHRQ would need to evaluate new measures in order to adequately report on these quality components. Some measures for the new components are considered either aspirational for AHRQ's work or still too developmental to immediately include in the NHQR or NHDR. In the context of this report, the term *aspirational* refers to performance areas for which no measures yet exist—at best, there is a proposed way to measure performance, but no evidence that it has been put into practice. *Developmental* refers to measures that are currently partially developed but not yet well tested or validated, or measures that have been validated but still lack sufficient national data on which to report.

By identifying new framework components for which the capacity for national reporting is still developing or aspirational (i.e., efficiency, care coordination, health systems infrastructure capabilities, end-of-life care), the committee faced a challenge in suggesting measures for immediate or even near-term inclusion in the national healthcare reports. The inclusion of unvalidated or insufficiently tested measures is not an option for the NHQR or NHDR and many of these areas are still in a research phase or undergoing validation.

Nonetheless, the committee presents some available measures that could serve to satisfy reporting on the newly added framework components of access, efficiency, care coordination, and health systems infrastructure capabilities (see Chapter 3 for the rationale of adding these components). Their implications for quality improvement and disparities reduction are discussed and exploratory ideas for measure development in some of these areas are also presented.

THE CURRENT STATE OF QUALITY MEASUREMENT

To date, most health care quality measurement efforts in the United States have focused largely on chronic conditions such as diabetes, asthma, and heart failure, and on measures of recommended preventive or screening services such as immunizations and mammograms. Data on these topics are readily available, and relevant guidelines can be easily translated into measures that express performance as the rate of receipt of recommended services in a defined denominator population. Less is known, however, about other clinical areas of performance measurement that might have a high impact for improving population health and providing value for the investment in care, but for which effectiveness research, measurement development, or sufficient data collection are still needed. Examples include the provision and management of oncology care (not just prevention) and surgical procedures for specific specialties (e.g., orthopedic surgery measures), both of which were brought to the committee's attention as high-cost items that patients, business, and insurers want to ensure are delivered in the most effective and efficient manner. While there may be some validated measures for these topics, the measures often lack either intensive data collection or sufficient ability to support analyses for disparities, and therefore have not been well represented in national reporting efforts.

A review of quality performance measurement in California found a lack of measures in use for mental health, hospital-acquired infections, obesity, and dental care (University of California at Davis, 2008). Given the recent attention to poor oral health (e.g., reported deaths in children due to untreated dental disease) and documented oral health disparities (AHRQ, 2003), additional or more targeted measures could be developed.[1] The *Children's Health Insurance Program Reauthorization Ac*t (CHIPRA)[2] may provide one mechanism for collecting data, for instance, on a children's dental care measure. CHIPRA required the Secretary of HHS to recommend a set of children's health care quality measures for voluntary use by Medicaid, the Children's Health Insurance Program (CHIP), and health insurance issuers and managed care entities that enter into contracts with Medicaid or CHIP programs. The initial set of measures, proposed in January 2010, includes one dental measure: "Total eligibles receiving preventive dental services" (HHS Office of the Secretary, 2009). If AHRQ expands reporting on the priority population of children, the National Survey of Children's Health (NSCH) could provide data on children who received needed mental health treatment, a measurement area on which AHRQ does not currently report, but that AHRQ may determine to be of high impact.[3]

Efforts to identify developmental performance measures for health are currently being undertaken by Healthy People 2020. A draft of Healthy People 2020's objectives includes several quality indicators identified as developmental, signifying that these measures are still being assessed for their validity and reliability for reporting (HHS, 2009). The National Priorities Partnership (NPP)—a collaborative of 32 major national organizations interested in transformational change in the U.S. health care system convened by the National Quality Forum (NQF)—promotes aspirational measurement for areas where improvement is believed to have potential for high health impact. Although the NPP has identified a number of NQF-endorsed measures compatible with its priorities, for many measures, little or no data are available on a national scale. Work is under way at the NQF to provide a roadmap of measures available in the short- and long-term to support documentation and build consensus among provider, payer, consumer, and community groups for these potential areas and measures.[4] These efforts are of interest because they relate to the priorities proposed by the Future Directions committee (see Box 2-3 in Chapter 2).

REPORTING OPPORTUNITIES FOR THE FOUR NEW COMPONENTS

Just as Chapter 3 did not go into the discussion of the care components that were included in the original framework for the NHQR and NHDR (i.e., effectiveness, safety, timeliness, patient-centeredness), this appendix does not present additional suggestions for reporting measures in those areas. The following sections address measure reporting possibilities for the new components of access, efficiency, care coordination, and health care systems infrastructure. Equity and value are crosscutting dimensions that were also added to the framework but do not have specific measures associated with them, and so are not addressed in this appendix. The committee offers

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[1] In the NHQR and NHDR, AHRQ currently reports on three dental care measures: percent of children age 2-17 with a dental visit in the past year (note: this measure is reported in the NHQR in alternate years); people who were unable to get or delayed in getting needed dental care in the past 12 months; people who were unable to get or delayed in getting needed dental care due to financial or insurance reasons (note: these two latter measures are usually reported as part of composite measures in the NHDR). Another measure, "People who had a dental visit in the calendar year," is reported in an online appendix to the reports.

[2] *Children's Health Insurance Program Reauthorization Act*, Public Law 111-3, 111th Cong., 1st sess. (January 6, 2009).

[3] AHRQ and CMS are implementing the quality provisions of CHIPRA and have identified mental health and substance abuse services for children as a priority area for pediatric quality measurement. A proposed core set of children's health care quality measures for use by Medicaid and CHIP programs includes a measure on follow-up after hospitalization for mental illness (HHS Office of the Secretary, 2009).

[4] Personal communication, Karen Adams, National Priorities Partnership, National Quality Forum, November 17, 2009.

the following information, but counsels that any measure should be assessed according to the process outlined in Chapter 4 to determine if it meets the test for inclusion in the NHQR and NHDR.

Reporting Opportunities for Access Measures

As discussed in Chapter 3, insurance status, affordability, and continuity of care are interrelated aspects of access. Insurance status often determines one's access to a usual or ongoing source of care. In addition, affordability can affect someone's ability to seek necessary, ongoing care, increasing risks of a worsened condition that ultimately may be costlier to treat (Collins et al., 2008).

The 2008 version of the NHDR reported data for 10 access measures that focus mainly on health insurance status, continuity of care, and access to needed services,[5] and in Chapter 3, the Future Directions committee suggests the inclusion of data on these measures in future NHQRs. Further, the NHQR contained only partial information on two measures that captured affordability issues related to access, appearing in a summary table at the end of that chapter.[6] The more detailed data on those measures and a handful of related measures were reported in an online appendix of data tables for the reports where the measures and data receive little visibility.[7] Because affordability is often of concern to patients, data on this topic deserves consideration in the national healthcare reports. Other affordability indicator examples include reporting the percentage of low-income families that spend less than 10 percent of their income on out-of-pocket medical costs and premiums, or the number of adults under the age of 65 living in states where premiums for employer-sponsored health coverage are less than 15 percent of under-age 65 median household income (The Commonwealth Fund Commission on a High Performance Health System, 2008). These measures may give a sense of how close the nation is to providing more affordable health care. Data for these measures are available from the Medical Expenditure Panel Survey (MEPS) database and provide additional insight into the barriers of affordability in the health care system.

Continuity of care, both for primary and specialist care, can be affected as individuals come in and out of the health care system or change insurance companies through new employment. Based on coverage limitations, individuals may need a new physician following a change of insurance, an experience that often causes patients to report less satisfaction and increased access problems (Smith and Bartell, 2004). An emerging model of care, the patient-centered medical home, seeks to address this problem by establishing a usual source of care that is selected by the patient and coordinates care around patient preferences and needs (Kaye and Takach, 2009; NASHP, 2009; NQF, 2009c). Validated measures of medical homes are discussed in the capabilities of health systems infrastructure section of this appendix, as they are more closely related to ensuring structures that promote coordinated care.

Given the importance of health insurance coverage as a predictor of access, it would be useful if AHRQ could stratify insurance information by age. For example, when reporting data on insurance coverage, AHRQ could separate children 0-17 years of age from individuals aged 18-64. Reporting data on insurance status by age is important since a majority of low-income children are covered by state-sponsored programs, such as CHIP and Medicaid, while many adults are not covered by these programs. In 2008, the number of uninsured adults rose to 20.3 percent from 19.6 in 2007, while uninsured children decreased to 9.9 percent, the lowest number since 1987 (U.S. Census Bureau, 2009). As the nature of coverage changes, monitoring the type of coverage available to different age groups will be essential.

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[5] Examples of access measures presented in the printed 2008 NHDR include people under age 65 with health insurance; people under age 65 who were uninsured all year; people with a specific source of ongoing care; people with a usual primary care provider; people without a usual source of care who indicated a financial or insurance reason for not having a source of care; people who were unable to get or delayed in getting needed care; people unable to get or delayed in getting needed care due to financial or insurance reasons; people who had a dental visit in the calendar year; perforated appendixes per 1,000 admissions with appendicitis; adults who received mental health treatment or counseling in the past 12 months; and people age 12 and older who received any treatment for illicit drug or alcohol abuse in the past 12 months.

[6] Those two measures are "People without a usual source of care who indicated a financial or insurance reason for not having a source of care" and "People unable to get or delayed in getting needed care due to financial or insurance reasons" (AHRQ, 2009c, pp.164-165).

[7] Related measures include "People unable to get or delayed in getting needed medical care, dental care, or prescription medicines in the last 12 months due to financial or insurance reasons" and "People unable to get or delayed in getting needed medical care, dental care, or prescription medicines due to financial or insurance reasons."

Reporting Opportunities for Efficiency Measures

Efficiency refers to producing the best possible outputs from a given set of inputs or producing a specific output with the least costly inputs. Efficiency measures are differentiated from cost measures because they take into account the outputs produced by a process as well as the resources used (inputs), whereas cost measures only take into account the resources used (inputs) relative to costs (i.e., resources used by unit price) (AQA, 2009; Krumholz et al., 2008).

Referring to descriptions of administrative, operational, and clinical waste put forth by Bentley and colleagues,[8] the Future Directions committee identified clinical efficiency measures as those on which AHRQ should focus its immediate developmental attention. Only a small number of health care efficiency measures currently address administrative or operational waste, largely due to the challenges involved in identifying positive administrative or operational costs or activities and teasing them apart from those that constitute waste (Reischauer, 2009). Therefore, these latter measures will need further development before they can be used reliably.

Types of Cost and Efficiency Measures

Most clinical efficiency measures developed thus far consist of cost measures that calculate population-based expenditures, or efficiency measures that address clinical waste by focusing on overuse. Resource use measures, for example, are cost measures that summarize how many services or how much money is spent to provide care (e.g., per capita Medicare costs for certain conditions or cost per admission).

The National Committee for Quality Assurance (NCQA) has developed relative resource use measures that use standardized risk-adjusted data to compare health plans on the average cost of care for people with certain conditions (e.g., diabetes, asthma, cardiovascular conditions, acute low-back pain, uncomplicated hypertensions, chronic obstructive pulmonary disease) for which Healthcare Effectiveness Data and Information Set (HEDIS) effectiveness-of-care measures allow for the evaluation of efficiency (NCQA, 2009b). Health plans apply NCQA-standardized prices to the relevant units of health services. The use of a standardized fee schedule allows the measures to address the intensity of resource utilization within and across these service categories and enables comparisons of different mixes of services using a common scale. The total spending for one health plan can be compared to the spending that would be expected for a similar patient group based on the experience of all similar plans (NCQA, 2009a), providing some insight into system-wide spending for certain services or populations.

Resource use measures can be combined with other health care quality measures, such as episode-of-care measures (more commonly referred to as groupers), to describe the efficiency of care. An episode of care has been defined as “a health problem from its first encounter with a health care provider through the completion of the last encounter related to that problem” (Lamberts and Hofmans-Okkes, 1996). Defining an episode as a fixed unit creates “a clinically meaningful unit of analysis for measuring both the cost and quality of patient care” (Bassin, 1999, p. 319) and has led to the development of evaluation tools that measure both. The basis of these tools are groupers, which are algorithms that bundle together claims for services rendered as part of an episode across a certain period of time. Relying on claims data, software applications determine the cost of an episode from the onset to the end of care from treatments provided that are related to a patient’s reason for seeking medical attention (Ingenix, 2008). With these tools, information on multiple episodes of care can be analyzed individually or collectively to assess levels of quality (by comparing the costs incurred by a physician to those of another physician delivering similar levels and types care).

Reporting data on resource use in combination with data on episodes of care may be useful because it would allow comparison of similar kinds of patients, taking into account the different kinds of services used and costs incurred; enable evaluation of care across time, settings, and providers; and potentially encourage care coordination

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[8] “*Administrative waste* is the excess administrative overhead that stems primarily from the complexity of the U.S. insurance and provider payment systems [e.g., billing/claims processing, sales/marketing practices, compliance procedures, benefits design], *operational waste* refers to other aspects of inefficient production process [e.g., unnecessary or duplicative procedures, use of defective devices that cause errors, or wasted time transporting people or materials], and *clinical waste* is created by the production of low-value outputs [e.g., overuse of certain procedures]” (Bentley et al., 2008, p. 632).

(CMS, 2008). Although the complex process of knitting together measures to fit the parameters of these episodes remains a work in progress,[9] it is anticipated that as HIT systems become more sophisticated, they will be able to provide the types of measures and data desired by multiple stakeholders, and could eventually be reported in the NHQR and NHDR (once they are sufficiently developed and tested for reporting). Growing consensus that episode-based care will provide the basis for many new health care payment models (Pham et al., 2010) will likely also make the development of related measures a priority for national reporting. Until these measures are available, there are examples of more basic strategies that attempt to capture information on resource use relative to quality of care. The example highlighted in Box D-1 is one approach for presenting related cost and quality data.

Related to resource use is the overuse of medical services. Overuse in health care has been defined as "the provision of health services for which the potential risks outweigh the potential benefits" (Chassin et al., 1998) and refers to wasteful services, such as duplicative procedures or avoidable admissions. An example is NCQA's measure of imaging use for low-back pain: percentage of patients with new low-back pain who received an imaging study (plain X-ray, magnetic resonance imaging, CT scan) conducted on the episode start date or in the 28 days following the episode start date (NCQA, 2009b). Other examples of NCQA-developed and NQF-endorsed measures that address overuse include the "appropriate treatment for children with upper respiratory infection (URI)" and "avoidance of antibiotic treatment in adults with acute bronchitis" (NCQA, 2009b).

The NPP, as well as this committee, has identified overuse as priority area for which the goal is to enhance the affordability and safety of care (NPP, 2008). The NPP identified a number of NQF-endorsed measures that could help address this aspect of care (see Table D-1). Data collection on these measures has yet to be widely established, but the measures present examples of areas in which AHRQ could foster development and strive to report in future versions of the NHQR and NHDR.

Currently, five efficiency measures are reported in the NHQR (see Table D-2). Although they might represent the best available data on certain efficiency measures, the committee felt that the presentation of these measures could be improved. Several points made in the efficiency chapter of the NHQR were confusing to readers, and insufficient data were available to verify or fully understand some of the information presented (see Appendix H for additional comments on the efficiency chapter of the NHQR). AHRQ additionally reports on several measures for avoidable admissions via the online version of the reports, only one of which is presented in the printed NHDR, framed under a subsection of the access measures, where it does not get much visibility. The committee feels that these measures could be highlighted in the efficiency section of both reports, as better examples of clear cost measures. AHRQ has also commented that data on new efficiency measures will be reported in the 2009 NHQR, including avoidable hospitalizations among patients housed in skilled nursing facilities or patients getting home health care; potentially avoidable emergency room visits; and unnecessary prostate specific antigen testing in men aged 75 years or older.[10]

In the near term, AHRQ should consider reporting data for several measures discussed in the previous sections, particularly those on resource use and overuse provided by NCQA, for which there are data collected using the HEDIS tool. Similarly, AHRQ should strive to report on the NPP-identified measures of overuse as well (see Table D-1 above), looking to the Centers for Medicare and Medicaid Services (CMS), other payer databases, and subnational datasets for potential data. (See Chapter 5 for discussion on use of subnational datasets for the NHQR and NHDR.)

Reporting Opportunities for Care Coordination Measures

Care coordination and health systems infrastructure are of interest to the extent that they improve effectiveness, safety, timeliness, patient-centeredness, access, or efficiency, which is why they are depicted as foundational elements in the conceptual diagram for the framework (see Figure 3-1 in Chapter 3). Although evidence for specific

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[9] The committee notes that there has been criticism of episode-based groupers because of the difficulty in defining which services should be grouped together (e.g., is the cardiac care for someone with diabetes a separate episode, or part of the diabetes episode of care?). NQF is currently attempting to capture the performance of episode-based care through the development of a conceptual model of a longitudinal episode that incorporates ambulatory, acute, and post-acute care for conditions such as back pain and acute myocardial infarction.

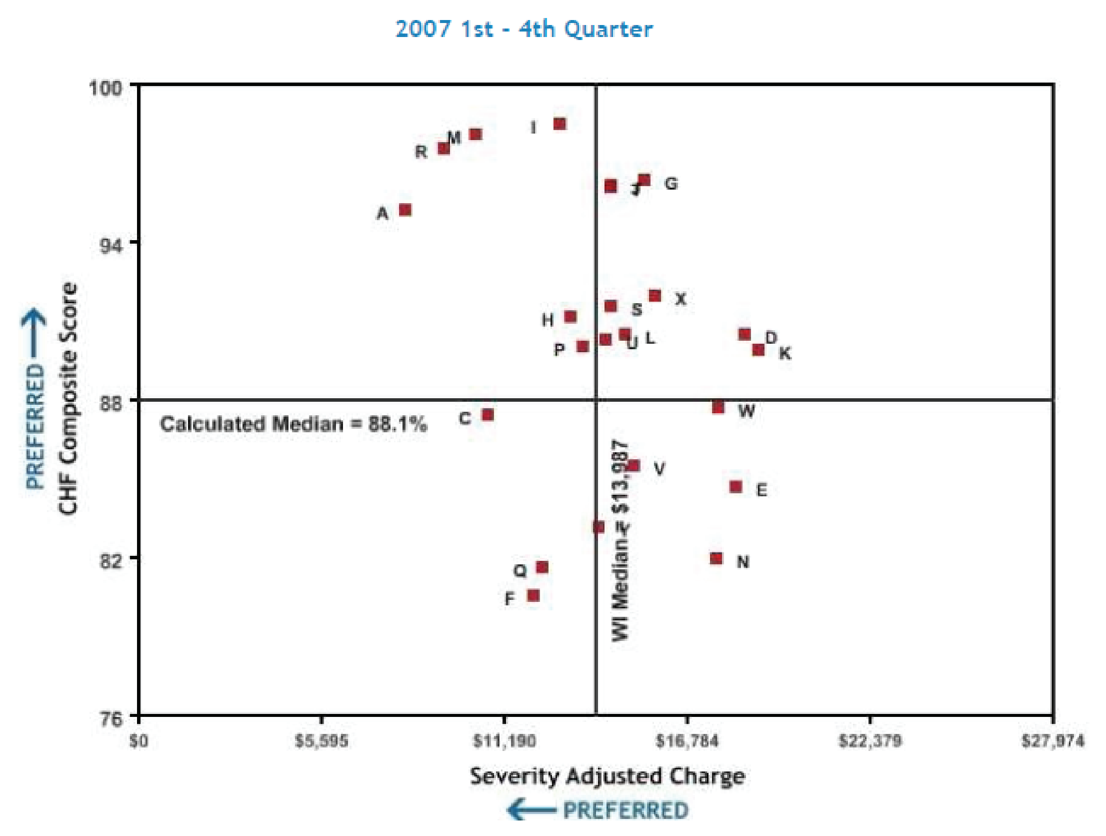
[10] Personal communication, Ernest Moy, Agency for Healthcare Research and Quality, October 13, 2009.

BOX D-1
Using Subnational Data to Provide Insight into Potential Efficiency Measures

The Wisconsin Collaborative for Healthcare Quality (WCHQ) is working to develop measures that reflect efficiency in hospitals and health care systems. While each of the WCHQ's six reported efficiency measures is presented with a disclaimer that it is only an attempt to measure the relationship between "quality outcomes and charges/length of hospital stay," understanding these relationships is helpful in moving performance measurement in this area forward. AHRQ could feature efficiency data from the WCHQ as a subnational example of promising practices for measuring efficiency, thereby educating others about ongoing development. At the least, WCHQ's work could serve as an example of alternate ways to present quality and value information.

WCHQ's six efficiency measures compare quality of heart attack care, heart failure care, and pneumonia care to either hospital charges or length of stay, often used as indicators/proxies for how efficiently hospitals deliver care. The figure below depicts the Heart Failure Care Hospital Charges and Quality Comparison measure. This quadrant analysis "attempts to quantify the value each hospital provides." Hospitals that performed well on the congestive heart failure composite measure (y-axis) and with low severity adjusted charges (x-axis) are in the upper left quadrant and may be assumed to be providing higher value care. Conversely, hospitals that are not performing as well on the heart failure measure while having high severity-adjusted charges are depicted in the lower right quadrant. These hospitals may be said to be providing lower value care. These data can lead to further investigations of what might contribute to the variation and the resolution of such variation.

Heart Failure Care Hospital Charges and Quality Comparison Measure



SOURCE: Wisconsin Collaborative for Healthcare Quality, 2009.

TABLE D-1 NQF-Endorsed Measures Identified by National Priorities Partnership to Satisfy the Overuse Priority Area

Measure Description
Low back pain: use of imaging studies. Percentage of patients with new low back pain who received an imaging study (plain X-ray, magnetic resonance imaging, CT scan) conducted on the episode start date or in the 28 days following the episode start date.
Proportion receiving chemotherapy in the last 14 days of life.
Proportion with more than one emergency room visit in the last days of life.
Proportion with more than one hospitalization in the last 30 days of life.
Proportion admitted to the ICU in the last 30 days of life.
Proportion dying from cancer in an acute care setting.
The percentage of patients with a diagnosis of back pain for whom the physician ordered imaging studies during the six weeks after pain onset, in the absence of “red flags” (overuse measure, lower performance is better).
Cesarean rate for low-risk, first-birth women (a.k.a. NTSV [nulliparous, term, singleton, vertex] Cesarean Section rate). Identifies the portion of cesarean births that has the most variation among practitioners, hospitals, regions and states. Unlike other cesarean measures, it focuses attention on the proportion of cesarean births that is affected by elective medical practices such as induction and early labor admission.
Percentage of patients undergoing cervical spine radiographs in trauma who do not have neck pain, distracting pain, neurological deficits, reduced level of consciousness, or intoxication.
Magnetic resonance imaging (MRI) of the lumbar spine for low back pain. This measure estimates the percentage of people who had an MRI of the lumbar spine with a diagnosis of low back pain without claims based on evidence of antecedent conservative therapy. (Studies are limited to the outpatient place of service.)

SOURCE: NQF, 2009b.

measures’ impact is limited, the committee examines potentially promising areas for performance reporting for these components.

Current care coordination measures focus primarily on ensuring good communication, smooth transitions, and timeliness of care among and between health care teams and patients. Much of the data for these measures are gathered through surveys that ask patients (or family members) for their perceptions of the care received. Patient-reported measures of care coordination include those presented in the Components of Primary Care Index (Flocke, 1997), which evaluates their experiences with their health care; the Care Evaluation Scale, which measures family experiences with their family members end-of-life care (Morita et al., 2004); and certain questions included on the Consumer Assessment of Healthcare Providers and Systems (CAHPS) surveys, such as following

TABLE D-2 Efficiency Measures Reported in the 2008 NHQR

Measure Title	Type of Measure
Average annualized percentage changes in national health care expenditures and quality for general population and people with selected conditions (heart disease, cancer, diabetes)	Cost (overarching or system wide)
National trends in potentially avoidable hospitalization rates, by type of hospitalization (chronic, acute)	Efficiency (clinical waste)
Total national costs associated with potentially avoidable hospitalizations	Efficiency (clinical waste)
Re-hospitalizations for congestive heart failure per 1,000 initial admissions for congestive heart failure (CHF) in 9 states	Efficiency (clinical waste)
Average estimated relative hospital cost efficiency index for a selected sample of urban community hospitals	Efficiency (operational)

NOTE: The sources of these measures are the Health Care Cost and Utilization Project (HCUP) and Medical Expenditure Panel Survey (MEPS) databases, which are developed under AHRQ.
SOURCE: AHRQ, 2009d.

up with test results and evaluating how informed a personal doctor is about a patient's care received from other providers (AHRQ, 2009b).

The care transitions measure (CTM) is a validated process of care measure that quantifies hospital performance based on patient or caregiver experience with hospital transitions (Coleman, 2006; Parry et al., 2008). This measure has demonstrated positive health outcomes including reduced readmissions of patients discharged from hospitals and improved self-management and recovery of symptoms (Care Transitions Program, 2009). This measure is currently being collected in all Maine hospitals[11,12] (Adams, 2009; NQF, 2009a), and data collected in Maine may serve as a subnational dataset to which AHRQ could look. The NQF has endorsed the CTM measure along with others (e.g., timely initiation of care, medical home system survey) (NQF, 2009d).

AHRQ should consider including data on the measures mentioned for which data are collected, such as the CAHPS measures for test results follow-up, and provider knowledge of patient care at other settings (AHRQ, 2009a). Eventually, AHRQ could begin reporting on the coordination measures currently identified by the NPP (and endorsed by the NQF). Although some of the identified measures are considered developmental due to a lack of national data collection, the committee concludes that they are sufficiently important to strive to include in future reports.

Opportunities for Reporting on Health Systems Infrastructure Capabilities

A handful of validated measures track the adoption of health information systems and care models for effective organization capacity; as of yet, these measures lack national data for reporting but data may become available over the next 5 years.

Currently, health information technology (HIT) measures are not widely reported in health care settings across the country. However, tens of thousands of hospitals, community health centers, physicians, and other Medicare and Medicaid providers are anticipated to begin implementing HIT systems over the next few years in order to be eligible for HIT incentive payments under HITECH and MIPPA.[13,14] Examples of potential measures for HIT include the NQF's recently endorsed measures, which are listed in Table D-3. They address various aspects of HIT including electronic prescribing, computerized order entry, and electronic laboratory ordering and reporting. As data collection on these measures increases over time, AHRQ should review these for their applicability to future versions of the reports. Adoption may have the potential to substantially improve the quality of care delivered to patients nationwide, and tracking that progress over time might foster adoption.

With greater adoption, there will also eventually be opportunities to better assess the impact on quality of HIT adoption. The NHQR could play a role in tracking progress in the availability, quality, integration, and "meaningful use" of HIT across inpatient and ambulatory care facilities. Likewise, the NHDR could track equity in these measures by monitoring the relative availability of these capabilities to providers (including safety net providers) serving priority populations.

To further support an effective infrastructure, organizational capacity is needed. Organizational capacity refers to leadership and staff commitment to quality improvement in an organization (whether health plan, hospital, or private practice); policies, procedures, processes, and organizational practices are needed to effectively implement quality improvement for safe, high-quality care (McLaughlin and Kaluzny, 2006); and the implementation of specific care processes designed to optimize quality and the integration of ongoing systems for assessing quality improvement throughout an organization. To date, there are few validated quality measures for organizational capacity, yet measuring the degree to which health care organizations or systems are successful in creating cultures that embrace and encourage continual quality improvement could be an important step for realizing more goals for high-value care (Bodenheimer et al., 2004; Bradley et al., 2005; Corrigan and McNeil, 2009; Singer et al., 2009).

More immediately, examples of measures for care models designed to optimize well-integrated, quality care through system structure include the chronic care model and the patient-centered medical home. The Assessment

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[11] Personal communication, Eric Coleman, University of Colorado at Denver, October 30, 2009.

[12] Personal communication, Susan E. Schow, Maine Health Data Organization, November 2, 2009.

[13] *Medicare Improvements for Patients and Providers Act of 2008*, Public Law 110-275, 110th Cong., 2nd sess. (July 10, 2008).

[14] *American Recovery and Reinvestment Act of 2009*, Public Law 111-5 § 4001(b)(2)(B)(vii), 111th Cong., 1st sess. (February 17, 2009).

TABLE D-3 NQF-Endorsed Measures for Health Information Technology (HIT) Adoption and Use

Measure title	Measure description
Adoption of medication e-prescribing	Documents whether provider has adopted a qualified e-prescribing system and the extent of use in the ambulatory setting.
Electronic health record (EHR) with electronic data interchange prescribing used in encounters where a prescribing event occurred	Of all patient encounters within the past month that used an EHR with electronic data interchange where a prescribing event occurred, how many used electronic data interchange for the prescribing event.
Adoption of health information technology	Documents whether provider has adopted and is using health information technology. To qualify, the provider must have adopted and be using a certified/qualified EHR.
The ability for providers with HIT to receive laboratory data electronically directly into their qualified/certified EHR system as discrete searchable data elements	Documents the extent to which a provider uses certified/qualified EHR system that incorporates an electronic data interchange with one or more laboratories allowing for direct electronic transmission of laboratory data into the EHR as discrete searchable data elements.
The ability to use health information technology to perform care management at the point of care	Documents the extent to which a provider uses a certified/qualified EHR system capable of enhancing care management at the point of care. To qualify, the facility must have implemented processes within their EHR for disease management that incorporate the principles of care management at the point of care which include the following: (a) the ability to identify specific patients by diagnosis or medication use; (b) the capacity to present alerts to the clinician for disease management, preventive services and wellness; and (c) the ability to provide support for standard care plans, practice guidelines, and protocol.
Tracking of clinical results between visits	Documentation of the extent to which a provider uses a certified/qualified EHR system to track pending laboratory tests, diagnostic studies (including common preventive screenings) or patient referrals. The EHR includes provider reminders when clinical results are not received within a predefined timeframe.
Participation in a practice-based or individual quality database registry with a standard measure set	This registry should be capable of the following: (a) generating population based reports relating to published guideline goals or benchmarking data; (b) providing comparisons to the practitioner; (c) providing feedback that is related to guideline goals; and (d) capturing data for one or more chronic disease conditions (i.e., diabetes) or preventive care measures (i.e., U.S. Preventive Services Task Force recommendations) for all patients eligible for the measures. Participation in a systematic qualified clinical database registry involves the following: (a) Physician or other clinician submits standardized data elements to registry. (b) Data elements are applicable to consensus endorsed quality measures. (c) Registry measures shall include at least two representative NQF consensus endorsed measures for registry's clinical topic(s) and report on all patients eligible for the selected measures. (d) Registry provides calculated measures results, benchmarking, and quality improvement information to individual physicians and clinicians. (e) Registry must receive data from more than five separate practices and may not be located (warehoused) at an individual group's practice. Participation in a national or statewide registry is encouraged for this measure. (f) Registry may provide feedback directly to the provider's local registry if one exists.

continued

TABLE D-3 Continued

Measure title	Measure description
Participation by a physician or other clinician in systematic clinical database registry that includes consensus endorsed quality measures[a]	Participation in a systematic qualified clinical database registry involves: (a) Physician or other clinician submits standardized data elements to registry. (b) Data elements are applicable to consensus endorsed quality measures. (c) Registry measures shall include at least two representative NQF consensus endorsed measures for registry's clinical topic(s) and report on all patients eligible for the selected measures. (d) Registry provides calculated measures results, benchmarking, and quality improvement information to individual physicians and clinicians. (e) Registry must receive data from more than 5 separate practices and may not be located (warehoused) at an individual group's practice. Participation in a national or state-wide registry is encouraged for this measure. (f) Registry may provide feedback directly to the provider's local registry if one exists.[b]
Medical Home System Survey[b]	Percentage of practices functioning as a patient-centered medical home by providing ongoing, coordinated patient care. Meeting Medical Home System Survey standards demonstrates that practices have physician-led teams that provide patients with: (a) Improved access and communication (b) Care management using evidence-based guidelines (c) Patient tracking and registry functions (d) Support for patient self-management (e) Test and referral tracking (f) Practice performance and improvement functions

[a] This endorsed measure is currently under review by experts to assess the issues raised by a "Request for Ad Hoc Review."

[b] The Medical Home System Survey was endorsed by NQF as an HIT measure largely because of components (c, e, and f listed here) that refer to HIT factors that enable medical home implementation. The specification of standards for medical homes regarding the use of electronic tools and data are listed in the cited report. The survey is also endorsed by NQF as a care coordination measure.

SOURCE: NQF, 2008.

of Chronic Illness Care measure seeks to evaluate how organizations deliver care for populations with chronic conditions by the degree of system redesign outlined by the Chronic Care Model that they have in place (Bonomi et al., 2002). For gauging the elements of a patient-centered medical home that a practice has adopted, there are two separate validated measures. One is the Medical Home Index, which measures effectiveness of medical homes in pediatric primary care (Cooley et al., 2003). The other is the Medical Home System Survey, which is the survey version of NCQA's Physician Practice Connections-Patient-Centered Medical Home program, which is NQF-endorsed and the most widely used tool for qualifying practices in patient-centered medical home demonstrations (Patient-Centered Primary Care Collaborative, 2009).[15] Beal and colleagues have suggested ways to capture elements that characterize a medical home using MEPS data (2009), as has the California Health Interview Survey, both of which may be accessible to AHRQ (see Chapter 5, Box 5-2). As described in Chapter 3, these care models promote well-coordinated care and help enhance patient experiences by employing interventions targeted at fundamental system practices. Encouraging data reporting from health care settings that employ these care models, or aspects of them, may help establish a stronger evidence base of their effectiveness. Such data would also inform the extent of their adoption in clinical practice, which has been growing nationwide (Coleman et al., 2009; Patient-Centered Primary Care Collaborative, 2008).

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[15] This is the same Medical Home System Survey endorsed as an HIT measure by NQF (see Table D-3 above). The various aspects of care delivery that the medical home addresses (e.g., care coordination, HIT use) allow it to potentially serve as a measure for more than one framework component.

SUMMARY

The updated framework implies looking to areas of measurement that are now underdeveloped and collaborating with other entities to develop measures and data sources. Consideration of priority areas (Chapter 2) and identification of measurement areas with the highest impact on population health, quality, value, and equity may result in the NHQR and NHDR containing a different compendium of measures and data over the next five years. The measures presented in this appendix are meant to be illustrative examples of measurement areas and measures that could be examined in the course of measure selection and development.

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Appendix E

HHS Interagency Workgroup for the NHQR and NHDR

To select the core set of measures used in the NHQR and NHDR, AHRQ staff and the HHS Interagency Workgroup for the NHQR/NHDR applied three basic criteria recommended by the IOM in 2001—importance, scientific soundness, and feasibility (see discussion in Box 4-1 in Chapter 4)—to each individual measure, mapped potential measures to the elements of the earlier quality framework (effectiveness, safety, timeliness, and patient-centeredness), and selected clinically important conditions within effectiveness measures.

In an explanation of its selection process for identifying gap areas and priority areas, AHRQ staff provided the Future Directions committee with a side-by-side comparison of the specific factors considered relative to the criterion of importance in the development of the 2005 NHQR and NHDR (see Table E-1). The factors included: leading causes of death, disability or activity limitation, or principal hospital diagnoses; costly conditions in general and for hospitalizations specifically; areas with Black-White racial disparities in life years lost, educational disparities in life years lost, and other significant racial and ethnic disparities. The HHS Interagency Workgroup for the NHQR/NHDR determined by looking across these lists that the data supported continued inclusion of the same clinical conditions originally chosen from Healthy People 2010.

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NVSS, 2005	SIPP, 2001	NHIS, 1996	MEPS, 2005	HCUP, 2005
Leading causes of death	Main causes of disability	Causes of activity limitation	Most costly conditions	Hospital principal diagnoses
1. Diseases of the heart	1. Arthritis or rheumatism	1. Heart disease	1. Heart conditions	1. Newborn infant
2. Malignant neoplasms	2. Back or spine problem	2. Back problems	2. Trauma	2. Hardening of the heart arteries (coronary atherosclerosis)
3. Cerebrovascular diseases	3. Heart trouble / hardening of the arteries	3. Arthritis	3. Cancer	3. Pneumonia
4. Chronic lower respiratory diseases	4. Lung or respiratory problem	4. Asthma	4. Mental disorders	4. Congestive heart failure
5. Accidents (unintentional injuries)	5. Deafness or hearing problem	5. Diabetes	5. Pulmonary conditions	5. Chest pain
6. Diabetes mellitus	6. Limb / extremity stiffness	6. Mental disorders		6. Trauma to vulva (external female genitals) and perineum (area between anus and vagina) due to childbirth
7. Influenza and pneumonia	7. Mental or emotional problem	7. Disorders of the eye		7. Heart attack (acute myocardial infarction)
8. Alzheimer's disease	8. Diabetes	8. Learning disabilities and mental retardation		8. Cardiac dysrhythmias (irregular heart beat)
9. Nephritis, nephritic syndrome, and nephrosis	9. Blindness or vision problem	9. Cancer		9. Other maternal complications of birth and puerperium (period after childbirth)
10. Septicemia	10. Stroke	10. Visual impairments		
11. Intentional self-harm (suicide)	11. Broken bone/ fracture			
12. Chronic liver disease and cirrhosis	12. Mental retardation			
13. Essential (primary) hypertension and hypertensive renal disease	13. Cancer			
14. Parkinson's disease	14. High blood pressure			
15. Pneumonitis due to solids and liquids	15. Head or spinal cord injury			

NOTE: This table was provided to IOM by AHRQ. The information contained in this table may not correspond with all of the information included in the source documents. The IOM does not take responsibility for any inconsistencies.

IOM, 2003	HHS, 2004	NHIS, 2002	NHIS, 2002	NHIS, 2002	NHQR/NHDR 2005
Priority areas for quality improvement	Major threats to the health and well-being of Americans	Black-White disparity in life years lost	Educational disparity in life years lost	Serious racial and ethnic disparities	Interagency Workgroup Consensus
Cancer screening that is evidence based—focus on colorectal and cervical cancer	Reduce behavioral and other factors that contribute to the development of chronic diseases	1. Hypertension	1. Ischemic heart disease	Infant mortality	Cancer
Children with special health care needs	Reduce the incidence of sexually transmitted diseases and unintended pregnancies	2. HIV	2. Lung cancer	Breast and cervical cancer	Diabetes
Diabetes—focus on appropriate management of early disease	Increase immunization rates among adults and children	3. Diabetes mellitus	3. Cerebrovascular disease	Diabetes	End-stage renal disease
End of life with advanced organ system failure—focus on congestive heart failure and chronic obstructive pulmonary disease	Reduce substance abuse	4. Homicide	4. Congestive heart disease	HIV infections/ AIDS	Heart disease
Frailty associated with old age—preventing falls and pressure ulcers, maximizing function, and developing advanced care plans	Reduce tobacco use, especially among youth	5. Atherosclerotic disease	5. Pneumonia	Child and adult immunizations	HIV and AIDS
Hypertension—focus on appropriate management of early disease	Reduce the incidence and consequences of injuries and violence		6. Lung disease		Maternal and child health
Immunization—children and adults			7. Atherosclerotic disease		Respiratory diseases
Ischemic heart disease—prevention, reduction of recurring events, and optimization of functional capacity			8. Diabetes mellitus		Nursing home and home health care
Major depression—screening and treatment			9. Hypertension		Patient safety
Medication management—preventing medication errors and overuse of antibiotics			10. Colon cancer		Timeliness
Nosocomial infections—prevention and surveillance					Patient-centeredness
Pain control in advanced cancer					
Pregnancy and childbirth—appropriate prenatal and intrapartum care					
Severe and persistent mental illness—focus on treatment in the public sector					
Stroke—early intervention and rehabilitation					
Tobacco dependence treatment in adults					
Obesity (emerging area)					

Appendix F

The Expected Population Value of Quality Indicator Reporting (EPV-QIR): A Framework for Prioritizing Healthcare Performance Measurement

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I. INTRODUCTION

In *"The Opportunity Costs of Haphazard Social Investments in Life-Saving,"* Tengs and Graham (1996) studied the costs and benefits of 185 interventions that reduce the risk of premature mortality to evaluate the allocative efficiency of investment in life-saving opportunities in the United States. According to their estimates, the United States spent approximately $21 billion on life-saving interventions that prevented roughly 56,700 premature deaths. However, reallocating those dollars using cost-effectiveness criteria to maximize the number of lives saved could have avoided an additional 60,200 premature deaths.

Tengs and Graham's analysis provides a cautionary tale for stakeholders in healthcare quality improvement, patient safety, and disparities. There are currently more than 1,400 measures in the U.S. Department of Health and Human Services (HHS) National Quality Measures Clearinghouse (NQMC) and more than 250 measures in the Agency for Healthcare Research and Quality (AHRQ) National Healthcare Quality and Disparities Reports (NHQR and NHDR). Given limited resources and an ever-proliferating set of healthcare measures, Tengs and Graham's analysis reminds us of the importance of asking whether we are maximizing the returns on our investments that seek to improve healthcare quality and safety.

This paper proposes a conceptual and methodological approach to quantifying the population value of efforts to improve quality and reduce disparities, specifically through the selection of quality and disparities indicators such as the AHRQ National Healthcare Quality and Disparities Reports that are the subject of this IOM Committee. To do so, the paper draws upon the literature using measurement approaches from medical cost-effectiveness analysis to prospectively assess the value of research (Claxton and Posnett, 1996; Fenwick et al., 2008; Meltzer, 2001). The result is an approach to estimate the *expected population value of quality indicator reporting* (*EPV-QIR*). Although analytic tools of cost-effectiveness analysis are used, our approach recognizes that "identifying and issuing guidance regarding the use of cost-effective health technologies does not, in itself, lead to cost-effective services provision" (Fenwick et al., 2008). This gap between evidence on the potential cost-effectiveness of an intervention and the cost-effectiveness of its implementation in practice can arise for many reasons. One reason is uncertainty about the costs and benefits of an intervention. In such cases, modeling the expected value of research has led to useful applications in prioritizing research agendas in domains including Alzheimer's disease treatments (Claxton et al., 2001), antipsychotic drugs in schizophrenia (Meltzer et al., 2009), bronchodilators in chronic obstructive pulmonary disease (Oostenbrink et al., 2008), and anti-platelet medications in cardiac care (Rogowski et al., 2009). However, while uncertainty in the effectiveness of interventions is relevant in addressing quality and disparities, quality and disparities reporting is more often targeted at variability in the implementation of available information. Recently, value of research approaches have been adapted to address issues of imperfect implementation (Fenwick et al., 2008; Hoomans et al., 2009).

The expected population value of quality indicator reporting (*EPV-QIR*) we propose is intended to be a useful tool in selecting quality indicators that can produce the largest improvements in population health. Quality indicators can be ranked in terms of their *EPV-QIR* and a set of indicators can be identified that offer the highest expected returns to investing in quality improvement. The *EPV-QIR* depends on several factors:

1. The net health benefit of the appropriate implementation of the intervention, which is the magnitude of the potential health benefit of the intervention (measured in quality adjusted life years (QALYs)) net of the opportunity costs in health when the intervention is fully implemented to maximize its benefit net of costs,
2. The size of the population of persons who should receive the intervention given the standard of care, e.g., those with a positive net health benefit from the intervention,
3. The current state of implementation, which potentially includes both the rate of utilization among parts of the population with positive net health benefits and the rate of use among those parts of the population with negative net health benefits (for whom there are potential gains in net health benefits that can be obtained by eliminating inappropriate use in that population), and
4. The potential for quality improvement, especially as produced by reporting quality indicators. This depends on the probability that providers (or patients) will make choices likely to improve quality when given information on provider performance is provided, and the effectiveness of existing quality improvement interventions to improve outcomes. Because data on these effects may be especially incomplete, our approach also specifically highlights uncertainty in the extent to which quality reporting will stimulate quality improvement action, and quality improvement action will change implementation. This includes both estimating the expected (average) effects of reporting on quality, and bounding estimates of these effects when data on the effectiveness of reporting on quality is especially incomplete. For example, if an intervention is not currently used or at least not used in persons in whom it produces net harms, one such bound would the value of perfect implementation, which is the total benefit that can be achieved in a population if everyone who should receive an intervention receives it and everyone who should not receive an intervention does not receive it.

We explicate our framework in detail in the remainder of this paper, and demonstrate its application in calculating the expected value of quality improvement for selected NHQR measures. We develop our framework in Section II, progressively developing concepts that are critical to the *EPV-QIR* framework. In Section III, we demonstrate the *EPV-QIR* calculations for selected measures in the NHQR, while also paying close attention to opportunities to bound estimates of *EPV-QIR* with more limited data. In Section IV, we discuss the scope of potential application for the *EPV-QIR* method and its limitations and implementation issues. Section V concludes with a discussion of areas for future development.

II. THE *EPV-QIR* FRAMEWORK

Our framework begins with the assumption that all measures are based explicitly or implicitly on some standard of care, which we denote by S. We use O to denote all other alternatives, which could include some other standard of care, or "usual care" or "doing nothing." Our model could easily be generalized to include multiple alternative standards of care (O_i) by indexing groups additionally according to the care they receive currently. For simplicity, however, we develop our theoretical framework in the case in which there is only a single alternative current pattern of care.

Given this single current pattern of care, the incremental benefit of S is the difference between the effectiveness of the standard of care (e_S) and the effectiveness of the alternative (e_O) current pattern. The incremental benefit of

S can be written as $\Delta e = e_S - e_O$. The *incremental cost* of S is the difference between the cost of the standard of care (c_S) and the cost of the alternative (c_O). The incremental cost of S can be written as $\Delta c = c_S - c_O$.

Net Health Benefit (NHB). The net health benefit of the standard of care (NHB_S) relative to O, is the incremental health benefits of the standard of care net of its incremental costs, where costs are denominated in units of foregone health benefits due to the financial costs of the standard of care (Stinnett and Mullahy, 1998):

$$NHB_S = \Delta e - \frac{\Delta c}{\lambda} \qquad \text{[Eq. 1]}$$

In Eq. 1, λ is a society's threshold willingness-to-pay for an additional unit of health benefit, which might be measured in life years or quality-adjusted life years (QALYs).[1] In these cases, λ would be the amount of money that society is willing to pay to save an additional life year or quality-adjusted life year. The term $\Delta c/\lambda$ is in units of health benefits and represents the foregone health benefits that could have been obtained by allocating money to some marginally cost-effective standard of care. In other words, $\Delta c/\lambda$ represents the opportunity costs in terms of health of accomplishing the standard of care. When an intervention is cost-effective, so its incremental cost-effectiveness ratio (ICER) $<\lambda$, the *NHB* will be positive. Conversely, the *NHB* will be negative when an intervention is not cost-effective, because the opportunity cost of the intervention will exceed its health benefits.

Because the *NHB* depends on how opportunity costs are valued in terms of health, *NHB* depends on the level used for λ. Thresholds of \$50,000 and \$100,000 per QALY have been commonly used in cost-effectiveness studies, but no universally accepted reference value for λ exists (Hirth et al., 2000). More recent literature has scrutinized the validity of these traditional threshold values and general failure to adjust the threshold for inflation (Ubel et al., 2003). Studies have suggested threshold values of: \$109,000-\$297,000 USD_{2003} per QALY (Braithwaite et al., 2008); \$12,500-\$32,200 USD_{2003} per QALY (King et al., 2005); \$24,777-\$428,286 USD_{1997} per QALY (Hirth et al., 2000). Because the net health benefit framework is sensitive to the value used for λ, the *NHB* is traditionally reported over a broad range of values of λ.

Population Value of Perfect Implementation (PVPI). A standard of care should generally be implemented when its expected benefits exceed its expected risks. We define the number of individuals, N_S, in a population who should receive the standard of care as the *measure population*. Assuming that individuals outside the measure population do not receive the care, perfect implementation occurs when all individuals in the measure population receive the standard of care. The *population value of perfect implementation (PVPI)* is the total *NHB* achieved in the measure population when the standard of care is applied to every patient in the measure population. *PVPI* is calculated by multiplying the total number of individuals in the measure population (N_S) by the net health benefit of S (NHB_S):

$$PVPI_S = N_S \times NHB_S \qquad \text{[Eq. 2]}$$

Population Value of Current Implementation (PVCI). Under perfect implementation, all individuals in a measure population receive the standard of care. When a standard is "underused," the rate of current implementation, r_{SC}, is less than 100%. The *population value of current implementation* (*PVCI*) is the total net health benefits achieved from the health intervention given current implementation rates:

$$PVCI_S = N_S \times r_{SC} \times NHB_S \qquad \text{[Eq. 3]}$$

When performance is perfect, every eligible individual in the population receives the standard of care, so *PVPI* = *PVCI*, and no further net health benefits can be gained from improving performance.

Maximum Population Value of Quality Improvement (MaxPVQI). Quality effort improvements can be thought of as interventions to perfect implementation. The *maximum population value of quality improvement* (*MaxPVQI*)

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[1] Quality-adjusted life years (QALYs) are a unit of measurement that is used in quantifying the health benefits or effectiveness of healthcare interventions. QALYs reflect the notion that years of life lived in less-than-perfect health may not be valued as much as years of life lived in perfect health.

is the total net health benefits that can be gained by improving implementation from current rates to 100%. *MaxPVQI* is simply the difference between *PVPI* and *PVCI*, or

$$MaxPVQI_S = PVPI_S - PVCI_S = N_S \times (1 - r_{SC}) \times NHB_S \qquad \text{[Eq. 4]}$$

This *MaxPVQI* defines the maximum population net gain in health from adopting some standard of care relative to the absence of that standard, in essence providing the net health benefits of the intervention to the fraction $(1 - r_{SC})$ of the population who should receive the intervention who are not currently receiving it.

Inappropriate Use and Overuse. As noted above, these same general equations can be used to estimate the value of quality improvement when there are multiple other patterns of care, as in the case in which an intervention is overused or inappropriately used, for example. The adjustments that are needed in such cases are to define the relevant population in terms of their current (inappropriate) treatment and then to measure the net health benefit of the change to the current standard of care relative to that inappropriate care. The net health benefit of *S* implemented within the measure population to which S is meant to apply will not be the same as the net health benefit of implanting *S* in another population. Hence, calculating the *EPV-QIR* of measures of overuse or inappropriate use will require estimates of the costs and health effects of implementing the standard in patients outside the measure population. Because the focus of the AHRQ quality indictors is on increasing appropriate use, we do not focus on overuse in our primary exposition, but we do discuss in Appendix A how our analysis can be extended to incorporate overuse and illustrate one calculation incorporating overuse.

Expected Population Value of Quality Improvement (EPV-QI). The *MaxPVQI* assumes that both the current rate of implementation is known and that quality improvement results in 100% implementation. The *expected population value of quality improvement* (*EPV-QI*) reflects the fact that there may be uncertainty about several aspects of the process by which quality initiatives will improve population outcomes. In particular, both the current levels of implementation and the extent to which quality improvement efforts will improve implementation. Indeed, it is well recognized that quality improvement approaches are generally not 100% effective in raising performance to levels of perfection (Oxman et al., 1995). To characterize the uncertainty in this imperfect implementation both before and after QI efforts, let $r_{SC}^{\mathrm{Pre}QI}$ and $r_{SC}^{\mathrm{Post}QI}$ be the rates of implementation before and after some QI initiative so that $\Delta r_{SC} = r_{SC}^{\mathrm{Post}QI} - r_{SC}^{\mathrm{Pre}QI}$ is the change in implementation before and after the intervention. Because these elements and their change can be uncertain, we reflect this uncertainty by assuming the change in implementation with a quality improvement effort (Δr_{SC}^{QI}) is distributed $f(\Delta r_{SC}^{QI})$ so that the expected extent of quality improvement would be $\int \Delta r_{SC}^{QI} dc$ and the expected population value of quality improvement would be:

$$EPV - QI = \int N_S \times \Delta r_{SC}^{QI} \times NHB_S dc = N_S \times NHB_S \times \int \Delta r_{SC}^{QI} dc \qquad \text{[Eq. 5]}$$

Expected Population Value of Quality Indicator Reporting (EPV-QIR). A crucial element in the consideration of quality reporting and the reporting of other indicators is that they do not themselves change quality but instead depend on some sort of action model by which reporting leads to changes in the behavior of providers or others that can improve quality. Fully specifying such an action model is beyond the scope of this paper, but Figure 1 provides some potentially salient elements of such a model, including that quality reporting would need to produce changes in behavior by either providers or patients in order to produce improvements in quality. Because such changes in behavior are unlikely to completely realize potential quality gains (Schneider and Epstein, 1996), it is important to account for the likelihood that the gain in implementation with quality reporting will generally be less than Δr_{SC}^{QI}. We denote this gain in implementation with quality reporting as Δr_{SC}^{QR}, and for simplicity assume that the uncertainty in how reporting will effect quality can be represented by a probability of undertaking quality improvement action, π_{QI}, so that $\Delta r_{SC}^{QR} = \int \Delta r_{SC}^{QI} dc \times \pi_Q$ is the expected change in implementation with quality reporting and the expected population value of quality reporting is:

$$EPV - QIR = N_S \times NHB_S \times \int \Delta r_{SC}^{QI} dc \times \pi_{QI} \qquad \text{[Eq. 6]}$$

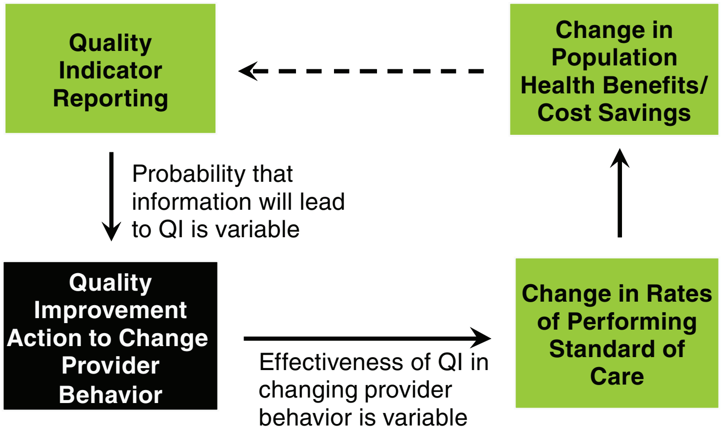

FIGURE 1 Conceptual Model for the Expected Population Value of Quality Indicator Reporting
NOTE: Patients may also change behavior based on quality indicator reporting, for example by selecting high-quality providers, causing changes in the rates at which care delivered meets standards of care.

This equation provides our fundamental framework for developing estimates of the value of quality reporting efforts.

Summary of *EPV-QIR* Framework

The *EPV-QIR* framework provides a method for estimating the expected value of improving quality for existing quality measures, measured in units of net health benefits that can be gained within a specified population. This method can be used to estimate the potential value of improving performance on existing quality measures, which can then be used to prioritize measures for reporting or for other investment in quality improvement. Figure 2 provides a summary of the *EPV-QIR* approach. First, we assume that reporting on a quality measure leads to quality improvement action with probability π_Q. The effectiveness of a quality improvement action is the effect size of that action, or Δr_{SC}. The *population value of perfect implementation* (*PVPI*) is equal to the net health benefit that can be achieved by improving quality on a measure to perfect or 100% levels of performance. The *expected value of quality improvement* (*EPV-QIR*) is the product of the likelihood quality reporting leads to quality improvement efforts, the improvement in implementation that comes from these quality improvement efforts, and the *PVPI*. Thus, the expected value of quality improvement for a specific quality indicator depends on the probability that quality improvement efforts will be undertaken, the effectiveness of those efforts, and the maximum potential gain in population net health benefits that can be achieved by closing the quality gap for that measure.

The *EPV-QIR* will equal the *PVPI* only when reporting a quality measure will result in quality improvement action with certainty *and* that quality improvement action is 100% effective in perfecting performance. Thus the *PVPI* and, if current implementation is known, the *MaxPVQI*, provide bounds on the *EPV-QIR*.

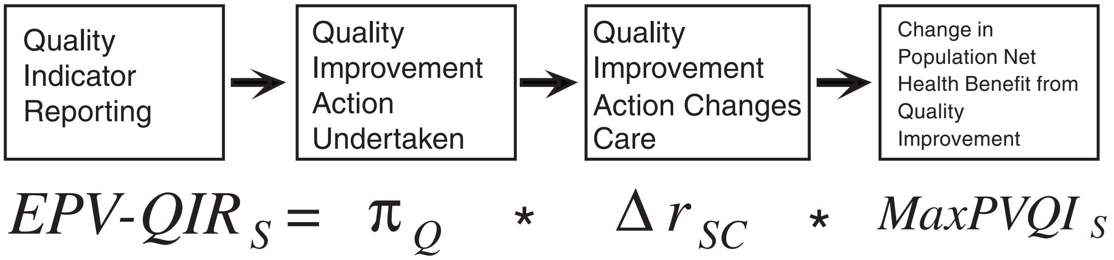

FIGURE 2 Conceptual Summary of the *EPV-QIR* Approach

III. USING THE *EPV-QIR* FRAMEWORK TO PRIORITIZE MEASURES

Using the *EPV-QIR* framework to prioritize measures ideally requires data on all the elements included in Eq. 6. Because all the other elements depend on defining an intervention in terms of its net health benefits, we begin by exploring the data requirements for *NHB* and then proceed to defining the other elements. Along the way, we also elaborate on these opportunities identified above in which it may be possible to bound the *EPV-QIR* using more limited data.

Net Health Benefits. Calculating an estimate of NHB_S requires information on: (1) the total cost of implementing the standard of care per person (or per unit, e.g., per infection avoided); (2) the effectiveness of implementing the standard of care per person (or per unit, e.g., per infection avoided); (3) the total cost of implementing the comparator per person (or per unit, e.g., per infection avoided); (4) the effectiveness of implementing the comparator per person (or per unit, e.g., per infection avoided); and (5) the societal cost-effectiveness threshold. As noted, the societal cost-effectiveness threshold is generally varied across a range of values reflecting the uncertainty in this value from the literature. Items 1-4 may be obtained from published cost-effectiveness studies evaluating the standard of care against the comparator, if such studies exist. Preference should be given to cost-effectiveness studies conducted in a population that is similar, if not the same, as the population defined by the denominator of the measure in question. For example, for the NHQR measure, "Percent of individuals age 65+ who ever received a pneumococcal vaccination," a cost-effectiveness study evaluating the pneumococcal vaccination among adults age 45-55 would be less ideal than a cost-effectiveness study evaluating vaccination among adults age 65-85. Preference might also be given to cost-effectiveness studies conducted in U.S. populations, because difference in healthcare systems might influence total costs of implementing a particular treatment or standard of care. This will affect the validity of net health benefit estimates. It is essential that cost-effectiveness studies publish sufficient data to assess effects on both costs and effectiveness in QALYs for the standard of care/comparator in question. Cost-effectiveness studies that only publish cost-effectiveness ratios (dollars per QALY) are not sufficient to calculate *NHB* because neither costs nor effectiveness is known.

Number of Individuals Eligible for the Standard of Care. In order to calculate these population-based measures, it is necessary to have an estimate of the number of individuals eligible for the standard of care. In other words, it is necessary to have an estimate of the size of the denominator population. If maximizing population health remains the goal, the eligible population is best selected when the population is defined as that within which the intervention is cost-effective, but if another population is chosen for any reason then the size of that population should be used. To use the same example above, calculating the *VPI* for the measure "Percent of individuals age 65+ who ever received a pneumococcal vaccination" requires an estimate of the total number of individuals in the U.S. age 65+. For some public-health population-based measures, estimates of the eligible population may be as simple as obtaining age-group and perhaps sex-specific population estimates from the U.S. Census Bureau. For measures denominated on the basis of healthcare utilization such as hospitalizations, weighted population estimates of services and utilization from national healthcare surveys such as the National Hospital Discharge Survey (NHDS) may be useful. For measures defined on the basis of a specific clinical process of care, estimating the size of the denominator population may require estimates of the prevalence of certain conditions.

Rate of Current Implementation. The rates at which individuals in a population receive indicated standards of care are reflected by quality indicators. The denominator of the measure is equal to the measure population (N_S, as defined above), and the numerator of the measure is equal to the number of individuals in the measure population who received the standard of care within some reporting period—i.e., for whom "the standard was met,"

$$N_{SM} \times M_S = r_{SC} = \frac{N_{SM}}{N_S}.$$

This data would typically be available for existing quality measures that had previously been collected, allowing for efforts to characterize the maximum potential improvements from existing levels of quality (*MaxPVQI*). Sources of data for implementation rates include: the National Healthcare Quality Report (NHQR) itself, the Behavioral Risk Factor Surveillance Survey (BRFSS), and other quality reports. For new measures being considered about which nothing is known, less informative bounds based on the *population value of perfect implementation* (*PVPI*) might be the most informative bound possible.

Expected Quality Improvements. To develop more precise estimates of the *EPV-QIR*, it is necessary to know the probability of quality improvement (π_Q) and the effect size of quality improvement interventions (Δr_{SC}).[2]

Probability of Quality Improvement (π_Q). One key factor is how providers might approach quality improvement when faced with new quality indicators. Understanding the distribution of quality improvement modalities in the provider population is necessary to derive an aggregate estimate of the effect size—i.e., the amount of change in provider behavior and performance rates that can be expected, conditional on a decision to undertake quality improvement. Indeed, studies have pointed to the heterogeneity of quality improvement efforts undertaken at the provider level (Bradley et al., 2005). As a result, information about both the range and potential effectiveness of these quality improvements efforts will very often be lacking.

Indeed, there are several reasons to believe that π_Q is much less than 1, as there is relatively little evidence supporting a strong direct link between public reporting and quality improvement activities (Epstein, 2006; Fung et al., 2008; Matthews et al., 2007; Robinowitz and Dudley, 2006). Part of the weak link may be attributable to the finding that hospitals and physicians often discount report cards on the basis of methodology, suggesting that in some cases performance reporting may have little direct effect on provider propensity to engage in targeted quality improvement efforts (Rainwater et al., 1998; Romano et al., 1999; Schneider and Epstein, 1996). A second issue complicating the link between public reporting of quality indicators and quality improvement action is that public reporting has often been studied in the context of pay for performance, making it difficult to parse out the independent effect of public reporting on provider quality improvement activities and/or outcomes (Lindenauer et al., 2007; Rodriguez et al., 2009). Finally, insofar as the existing literature has primarily focused on state-level or payer-specific reporting programs, it seems unlikely that responses to quality measures reported aggregated to the national level would elicit a stronger response to initiate focused quality improvement initiatives.

Effectiveness of Quality Improvement (Δr_{SC}). There are numerous studies of the effectiveness of quality improvement programs (e.g., systems-based interventions to improve cancer screening [Carney et al., 1992; Carpiano et al., 2003]), general approaches to practice/provider behavior change (e.g., continuing medical education [Davis et al., 1995], educational outreach [O'Brien et al., 2007]), and/or specific tools (e.g., printed educational materials [Farmer et al., 2008]) in the context of specific standards of care or clinical conditions (Arnold and Straus, 2005; Renders et al., 2001). However, even when there is some evidence on the efficacy of these approaches, it is unlikely that they will be equally effective in improving performance across different standards of care.

Summary. The relative paucity of evidence on the likely effectiveness of quality reporting on quality improvement activities and of quality improvement activities on implementation of standards of care suggest that efforts to quantify the *EPV-QIR* will have to rely heavily on bounds implied by estimates of the *EPV-QI* or *MaxPVQI*.

***EPV-QIR* Calculations for Selected NHQR Measures**

Table 1 presents the results of attempts to estimate or bound *EPV-QIR* calculations for 14 NHQR measures for which we were able to obtain information on costs, effectiveness (in QALYs), denominator population, and current implementation rate. Appendix C lists the sources of data elements used in our calculations for each measure. Because of resource limitations, our primary goal in developing these estimates was to illustrate potential issues that could arise in the application of the *EPV-QIR* approach rather than to develop the best possible estimate for any one of these indicators. To facilitate discussion, we assigned a brief mnemonic to each NHQR measure in this report, listed in Column 1 of Table 1. Column 2 provides the measure definition for each NHQR measure. Column 3 shows the denominator population for each measure—i.e., the total number of individuals in the U.S. who should receive the standard of care for a given measure. Column 4 presents the total number of QALYs that can be achieved if all individuals in the denominator population received the standard of care—this is the *population value of perfect implementation* (*PVPI*). Column 5 presents the total number of QALYs *currently* achieved given existing patterns of care in the population—this is the *population value of current implementation* (*PVCI*).

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[2] Quality-adjusted life years (QALYs) are a unit of measurement that is used in quantifying the health benefits or effectiveness of healthcare interventions. QALYs reflect the notion that years of life lived in less-than-perfect health may not be valued as much as years of life lived in perfect health.

TABLE 1 *EPV-QIR* Calculations for 18 NHQR Measures

Mnemonic	NHQR Measure	Denominator Population	Pop. VPI (QALYs)	Pop. VCI (QALYs)	Pop. Max VQI (QALYs)
NHQR_DMHTN	Percent of adults with diagnosed diabetes with most recent blood pressure <140/80 mm/Hg	17,268,973	7,021,537	4,107,599	2,913,938
NHQR_DMCHOL	Adults age 40 and over with diagnosed diabetes with total cholesterol <200 mg/dL	17,268,973	1,828,056	1,003,602	824,453
NHQR_DMFOOT	Adults age 40+ with diagnosed diabetes who had their feet checked for sores or irritation in the calendar year	17,268,973	2,326,165	1,644,599	681,566
NHQR_DMHBA1C	Percent of adults with diagnosed diabetes with HbA1c level >9.5% (poor control); <7.0 (optimal); <9.0 (minimally acceptable)	17,268,973	1,474,394	805,019	669,375
NHQR_HIVEVER	People ages 15-44 who ever received an HIV test outside of blood donation	126,006,034	529,704	241,545	288,159
NHQR_PAP3YR	Percent of women (age 18 and over) who report they had a Pap smear within the past 3 yrs	15,272,448	2,120,558	1,903,757	216,801
NHQR_DMEYE	Adults age 40+ with diagnosed diabetes who received a dilated eye examination in the calendar year	17,268,973	414,132	247,237	166,895
NHQR_CRC50EVERCOLON	Adults age 50 and over who ever received a colonoscopy, sigmoidoscopy, or proctoscopy	14,992,188	366,829	219,454	147,375
NHQR_BRCA2YRMAMM	Percent of women (age 40+) who report they had a mammogram within the past 2 years	60,428,554	1,167,474	1,046,640	120,833
NHQR_CRCBIFOBT	Adults age 50 and over who received a fecal occult blood test (FOBT) in the last 2 years	6,895,908	253,938	152,497	101,441
NHQR_CAPVACC65EVER	Percent of individuals age 65+ who ever received a pneumococcal vaccination	38,869,716	161,291	92,420	68,871
NHQR_BSICVC VQI represents QALYs that can be saved by using chlorhexidine silver sulfadiazine coated catheters (external coat)	Bloodstream infections (BSIs) per 1,000 central venous catheter (CVC) placements	140,000	0	–27,809	27,809
NHQR_BSICVC VQI represents QALYs that can be saved by using silver, platinum and carbon coated catheters	Bloodstream infections (BSIs) per 1,000 central venous catheter (CVC) placements	140,000	0	–27,095	27,095
NHQR_BSICVC VQI represents QALYs that can be saved by using chlorhexidine minocycline and rifampicin coated catheters	Bloodstream infections (BSIs) per 1,000 central venous catheter (CVC) placements	140,000	0	–24,864	24,864
NHQR_BSICVC VQI represents QALYs that can be saved by using chlorhexidine silver sulfadiazine coated catheters (internal + external coat)	Bloodstream infections (BSIs) per 1,000 central venous catheter (CVC) placements	140,000	0	–23,001	23,001
NHQR_AMIBB	Percent of AMI patients administered beta blockers prescribed at discharge	682,699	123,172	109,623	13,549

TABLE 1 Continued

Mnemonic	NHQR Measure	Denominator Population	Pop. VPI (QALYs)	Pop. VCI (QALYs)	Pop. Max VQI (QALYs)
NHQR_HFACE	Percent of hospital patients with heart failure and left ventricular systolic dysfunction who were prescribed ACE inhibitor or ARB at discharge	295,101	64,976	55,359	9,616
NHQR_AMIACE	Percent of AMI patients with LVSD prescribed ACE inhibitor at discharge	185,695	44,830	38,509	6,321

Column 6 presents the total number of QALYs that can be gained by improving performance on a measure to 100% compliance—this is the *maximum population value of quality improvement* (*MaxPVQI*), and it is equal to the difference between *PVPI* and *PVCI*.

Table 2 sorts the 14 NHQR measures by descending order of *PVPI*. Perfect implementation of all 14 measures would yield a total of 17,852,224 QALYs. Nearly 40% of this total can be obtained by achieving perfect implementation of blood pressure control among adults with diagnosed diabetes (NHQR_DMHTN measure). More than half of the total number of QALYs achievable can be obtained by perfecting implementation of both blood pressure control for adults with diabetes and ensuring annual optimal foot care for adults with diabetes. Examining these 14 NHQR measures alone, we see that perfect implementation of the top 7 measures would yield over 90% of total QALYs possible. Moreover, these high-impact measures are all concentrated in public health domains—diabetes, cervical cancer screening, breast cancer screening, and HIV testing.

Table 3 lists the 14 NHQR measures in descending order of *MaxPVQI*. This table provides important complementary insights to Table 2. Whereas Table 2 identifies those measures with the greatest net health benefit at the population level, Table 3 identifies those measures promising the greatest returns to additional quality improvement in terms of net health benefit. For example, as shown in Table 2, biennial mammography is associated with large health benefits; however, additional investment to improve mammography may not be warranted. As shown in Table 3, further improvement on this measure is expected to yield only 120,833 extra QALYs—less than 2% of the total additional QALYs that can be potentially gained from improving quality on the full set of 14 indicators.

IV. SCOPE OF APPLICATION, LIMITATIONS, AND ADDITIONAL AREAS FOR FUTURE DEVELOPMENT

Scope of Application

A key determinant of the value of the *EPV-QIR* approach to selecting and/or prioritizing measures is the extent to which it is applicable across a broad range of measure types. To assess the scope of the approach, it is usual to consider several broad classes of quality indicators:

Process Measures. For process measures defined explicitly on the basis of some standard of care, *EVQI* can be estimated as long as the net health benefit of *S* can be estimated using data from published studies.

Composite Process Measures. The 2008 NHQR/NHDR reports on 10 composite process measures. These composites are constructed as “all-or-none” aggregates of individual process measures that measure whether an individual received *all* standards of care for a given condition. Individuals receiving only some of the enumerated standards are considered to have not received appropriate care, and are scored as such. The *EVQI* of the composite requires an estimate of the NHB_S associated with receiving all components of care in the composite measure. Although *NHB*s may be calculated for each component in the composite, one cannot sum *NHB*s across components

TABLE 2 14 NHQR Measures Ranked in Descending Order of Value of Perfect Implementation

Mnemonic	NHQR Measure	Denominator Population	VPI (QALYs)	Share of Total VQI	Cumulative % VQI
NHQR_DMHTN	Percent of adults with diagnosed diabetes with most recent blood pressure <140/80 mm/Hg	17,268,973	7,021,537	39.33%	39.33%
NHQR_DMFOOT	Adults age 40+ with diagnosed diabetes who had their feet checked for sores or irritation in the calendar year	17,268,973	2,326,165	13.03%	52.36%
NHQR_PAP3YR	Percent of women (age 18 and over) who report they had a Pap smear within the past 3 yrs	15,272,448	2,120,558	11.88%	64.24%
NHQR_DMCHOL	Adults age 40 and over with diagnosed diabetes with total cholesterol <200 mg/dL	17,268,973	1,828,056	10.24%	74.48%
NHQR_DMHBA1C	Percent of adults with diagnosed diabetes with HbA1c level >9.5% (poor control); <7.0 (optimal); <9.0 (minimally acceptable)	17,268,973	1,474,394	8.26%	82.74%
NHQR_ BRCA2YRMAMM	Percent of women (age 40+) who report they had a mammogram within the past 2 years	60,428,554	1,167,474	6.54%	89.28%
NHQR_HIVEVER	People ages 15-44 who ever received an HIV test outside of blood donation	126,006,034	529,704	2.97%	92.25%
NHQR_DMEYE	Adults age 40+ with diagnosed diabetes who received a dilated eye examination in the calendar year	17,268,973	414,132	2.32%	94.57%
NHQR_ CRC50EVERCOLON	Adults age 50 and over who ever received a colonoscopy, sigmoidoscopy, or proctoscopy	14,992,188	366,829	2.05%	96.62%
NHQR_CRCBIFOBT	Adults age 50 and over who received a fecal occult blood test (FOBT) in the last 2 years	6,895,908	253,938	1.42%	98.04%
NHQR_ CAPVACC65EV	Percent of individuals age 65+ who ever received a pneumococcal vaccination	38,869,716	161,291	0.90%	98.95%
NHQR_AMIBB	Percent of AMI patients administered beta blockers prescribed at discharge	682,699	123,172	0.69%	99.64%
NHQR_HFACE	Percent of hospital patients with heart failure and left ventricular systolic dysfunction who were prescribed ACE inhibitor or ARB at discharge	295,101	64,976	0.36%	100.00%
NHQR_BSICVC	Bloodstream infections (BSIs) per 1,000 central venous catheter (CVC) placements—CH/SSD ext	140,000	0	0.00%	100.00%
TOTAL			17,852,224	100.00%	

to calculate the total *NHB* associated with the composite. The reason for this is that one cannot assume additive separability across components. There may be—for example—complementarities across components of care.

Outcomes Measures. A number of intermediate- and final-outcomes measures are reported in the NHQR/NHDR, and vary substantially in the way that they are defined. The primary problem with these measures is the lack of a specific treatment or intervention that can be identified as a target for improvement, which makes it impossible to estimate net health benefits of a standard of care, intervention, or treatment.

Access/Utilization Rates. The NHQR/NHDR includes several measures defined as population utilization rates. A utilization-based measure is intended to track desirable or appropriate use of health services. These measures may be evaluated using the *EVQI* approach if the net health benefit for an appropriate unit of access to care can be constructed. However, if these measures are indirect measures of the failure to provide unspecified interventions or services which then, as a consequence, result in otherwise-avoidable utilization of health services, then these

TABLE 3 14 NHQR Measures Ranked in Descending Order of Value of Quality Improvement

Mnemonic	NHQR Measure	Denominator Population	VQI (QALYs)	Share of Total VQI	Cumulative % VQI
NHQR_DMHTN	Percent of adults with diagnosed diabetes with most recent blood pressure <140/80 mm/Hg	17,268,973	2,913,938	46.62%	46.62%
NHQR_DMCHOL	Adults age 40 and over with diagnosed diabetes with total cholesterol <200 mg/dL	17,268,973	824,453	13.19%	59.81%
NHQR_DMFOOT	Adults age 40+ with diagnosed diabetes who had their feet checked for sores or irritation in the calendar year	17,268,973	681,566	10.90%	70.71%
NHQR_DMHBA1C	Percent of adults with diagnosed diabetes with HbA1c level >9.5% (poor control); <7.0 (optimal); <9.0 (minimally acceptable)	17,268,973	669,375	10.71%	81.42%
NHQR_HIVEVER	People ages 15-44 who ever received an HIV test outside of blood donation	126,006,034	288,159	4.61%	86.03%
NHQR_PAP3YR	Percent of women (age 18 and over) who report they had a Pap smear within the past 3 yrs	15,272,448	216,801	3.47%	89.50%
NHQR_DMEYE	Adults age 40+ with diagnosed diabetes who received a dilated eye examination in the calendar year	17,268,973	166,895	2.67%	92.17%
NHQR_CRC50EVERCOLON	Adults age 50 and over who ever received a colonoscopy, sigmoidoscopy, or proctoscopy	14,992,188	147,375	2.36%	94.53%
NHQR_BRCA2YRMAMM	Percent of women (age 40+) who report they had a mammogram within the past 2 years	60,428,554	120,833	1.93%	96.46%
NHQR_CRCBIFOBT	Adults age 50 and over who received a fecal occult blood test (FOBT) in the last 2 years	6,895,908	101,441	1.62%	98.08%
NHQR_CAPVACC65EVER	Percent of individuals age 65+ who ever received a pneumococcal vaccination	38,869,716	68,871	1.10%	99.18%
NHQR_BSICVC	Bloodstream infections (BSIs) per 1,000 central venous catheter (CVC) placements—CH/SSD (ext)	140,000	27,809	0.44%	99.63%
NHQR_AMIBB	Percent of AMI patients administered beta blockers prescribed at discharge	682,699	13,549	0.22%	99.85%
NHQR_HFACE	Percent of hospital patients with heart failure and left ventricular systolic dysfunction who were prescribed ACE inhibitor or ARB at discharge	295,101	9,616	0.15%	100.00%
TOTAL		349,927,514	6,250,682	100.00%	

suffer the same challenges as mortality-based measures and clinical intermediate outcomes measures in that net health benefits cannot be constructed.

Overuse and Inappropriate Use Measures. As noted above, the *EPV-QIR* approach can be extended to consider overuse. The cervical cancer screening example discussed in Appendix A provides a good example of how overuse might be addressed. As discussed in Appendix A, inappropriate use measures work similarly, with effects applied over the relevant populations in which inappropriate use is occurring.

Patient Experience Measures. Finally, NHRQ/NHDR contains a number of measures of patient experience/satisfaction. If these measures are assumed to reflect interpersonal quality of care, then the *EPV-QIR* approach can be applied if net health benefits can be constructed for dimensions of interpersonal relations between patients and providers. If the motivation for patient experience measures is instead driven by interest in promoting patient-centered or preference-concordant care, then estimating the *EPV-QIR* is more complicated. The *EPV-QIR* for communication will itself depend on the expected value of perfect information in a specific decision-making context, or what Basu and Meltzer (2007) term the *expected value of individualized care* (*EVIC*). Moreover, the expected value of perfect information may vary considerably depending on the amount of financial risk-sharing that a patient faces (Basu and Meltzer, 2007). In general, the *EPV-QIR* for communication will tend to be greater in the context of preference-sensitive care where alternative treatment modalities or plans of care present “significant tradeoffs affecting the patient’s quality and/or length of life” (Dartmouth Center for the Evaluative Clinical Sciences, 2007). Although methods for estimating *EVIC* have been proposed (Basu and Meltzer, 2007), the communication-themed quality indicators in NHQR/NHDR do not measure individualized care, but rather the potential for obtaining individualized care. Valuation of the benefits of communication in this regard will require not only some estimate of the expected value of individualized care in the context of a specific preference-sensitive clinical care context, but also a patient’s willingness-to-pay for communication that will result in preference-concordant care.

Disparities. The *EVQI* approach could be adapted to calculate measures appropriate for the study of disparities. For example, one could evaluate the *value of equal implementation* (*VEI*), or the elimination of disparities across groups. *EPV-QIR* also lends itself to methods for summarizing disparities across discrete groups. The *PVCI* of a standard of care in a population comprised of a certain number of groups, denoted by *G*, can be calculated as the sum of *PVCI* across all *G* groups. Each group’s share of population health benefits can be calculated as the fraction of *PVCI* in the *g*th group, divided by the population total *PVCI*. The level of disparity in a measure might then be measured using a concentration index to determine the extent to which health benefits are concentrated in a single or a few groups within the population.

Limitations and Implementation Issues

The scope of applicability of the *EPV-QIR* framework, delineated in the preceding section, also defines the limitations of our approach. The *EPV-QIR* approach to prioritizing quality indicators may not be feasible for measures where data on costs and benefits of a standard of care within a population (or sub-population) of interest is not available. Practically speaking, it may not be feasible to use *EPV-QIR* for prioritizing some of the outcomes, access/utilization, and patient experience measures.

In our limited efforts to date in applying the *EPV-QIR* framework as we have reviewed the current set of 250+ NHQR quality measures, the main challenges we have observed are: 1) lack of data on costs and effectiveness; 2) multiple standards of care or comparators implicit in the quality measure; 3) undefined standards of care/comparators in the quality measure; and 4) lack of data on the size of the eligible population.

Lack of Data Costs, Effectiveness, and the Value of Health. A large number of NHQR quality measures focus on processes or standards of care for which we have not been able to find published studies providing usable estimates of costs and effectiveness. A prime example of a measure with no known cost or effectiveness data is the NHQR Patient Experience of Care Measure, “Children who had a doctor’s office or clinic visit in the last 12 months whose health providers showed respect for what they had to say.” While we appreciate the intuitive value of this measure, we are not aware of any study measuring the costs and health effects of provider demonstration of respect for patient communication.

Also, the existence of cost-effectiveness studies for a standard or process of care in a measure does not necessarily imply the existence of usable estimates of costs and effectiveness. It is not uncommon for cost-effectiveness studies to publish (incremental) cost-effectiveness ratios only, without a separate table of costs and effects. Unfortunately, cost-effectiveness ratios alone are insufficient inputs into the *EPV-QIR* calculations. Furthermore, the *EPV-QIR* technically requires that effects be measured in QALYs, because the *NHB* calculation involves dividing incremental costs by the cost-effectiveness threshold, which is denominated in units of dollars per QALY.

Also, there may be cost-effectiveness evaluations of a standard or process of care in a measure, but it may not have been conducted in the same population (or a similar population) as that in the denominator of a measure. In these cases, one must judge whether it may be reasonable or valid to use these estimates of costs and effectiveness from dissimilar populations in *EPV-QIR* calculations, if they are the only estimates available.

Finally, uncertainty about how to value health will surely change estimates of the magnitude and even sign of *NHB* calculations and all calculations that rely on them. Given this, the robustness of the results of analyses using this framework must be routinely assessed across a range of estimates of the value of health appropriate to the setting (e.g., at least $50,000 to $200,000 per QALY in the United States).

Multiple Standards of Care/Comparators. The *EPV-QIR* framework requires assigning an estimate of *NHB* to the standard of care as well as the comparator or "non-standard" care. For some measures, a single standard of care and comparator may be identified, but for the majority of measures, there are multiple treatment patterns that may be compliant with the standard of care, and/or multiple comparator treatment patterns that are non-compliant with the standard of care. In theory, all treatment patterns that are compliant and non-compliant should be identified, treatment-specific *NHB*s should be used in the calculations, and the proportion of individuals in the eligible population receiving each treatment pattern needs to be known.

In practice, for measures with multiple standards of care and/or comparators, simplifying assumptions must be made to restrict the analysis to a limited set of treatment patterns that will be considered "compliant" with the standard of care and "non-compliant" with the standard of care. Identification of this set of treatment patterns will hinge on the availability of usable estimates of costs and effectiveness, the prevalence and evidence base for these patterns, and the availability of data on the proportion of the eligible population receiving these different patterns of care. For example, for the NHQR measure, "Percent of women (age 40+) who report they had a mammogram within the past 2 years" any screening occurring at intervals of 2 years or less can be considered compliant with the measure. All other screening schedules—triennial, quadrennial, or intervals of 5 years or longer, in addition to no screening at all, are non-compliant. Each of these non-compliant schedules is associated with different lifetime costs and effectiveness, and thus, a separate *NHB* should be estimated for each screening schedule. Calculations for this measure are discussed in detail in Appendix B, Calculation 2.

Outcomes-Based Measure with No Defined Standard of Care/Comparator. A related problem exists for many outcome measures when there is no explicit standard or process of care referenced in the quality measure. In some cases, it may be reasonable to identify one or a few interventions or standards of care with direct links to the outcomes of interest. *EPV-QIR* calculations can be carried out if cost-effectiveness studies for the identified standards of care exist. An example of a quality measure with undefined standards and comparators is the NHQR measure, "Number of bloodstream infections (BSIs) per 1,000 central venous catheter (CVC) placements." Bloodstream infection rates are influenced only in part by processes of care by healthcare providers, of which there are many. To calculate the *EPV-QIR* of this measure and other outcomes-based measures with no defined standards of care, it is necessary to: identify an intervention or group of interventions to be considered; find estimates of the *NHB* of each intervention and comparator under consideration; and to find estimates of the proportion of the population receiving each intervention/comparator. An example of these calculations is presented in Appendix B, Calculation 3.

Lack of Data on Population Estimates. For some measures, it may be difficult to obtain population estimates of the number of individuals eligible for the standard of care in a measure. For example, for the NHQR measure, "Percent of hospital patients with heart attack and left ventricular systolic dysfunction who were prescribed ACE inhibitor or ARB at discharge," determining the number of individuals eligible for the standard of care requires estimating the number of individuals hospitalized with AMI, as well as the prevalence of LVSD among hospitalized AMI patients. Data from national healthcare utilization surveys can be used to obtain population estimates of the number of discharges for AMI each year; however, information in these surveys may not be sufficient to determine whether a patient had LVSD. Prevalence of LVSD among AMI inpatients may be obtained from reviewing clinical literature. This measure is discussed in detail in Calculation 4, Appendix B.

Uncertainty in Estimates. All the inputs into the above framework may be uncertain and finding ways to reflect this may be important when considering the use of this framework for decision making. When the consequences of a decision are small, a case can be made for making policy based only on expected value (Arrow and Lind, 1970; Claxton, 1999; Meltzer, 2001).

Additional Directions for Future Development

The current formulation of the *EPV-QIR* framework considers expected value of quality improvement based on net health benefits accruing to a single cohort at a given time point. However, quality improvement undertaken at a single point in time will alter the quality of care for succeeding cohorts. A more elaborate model can be constructed that estimates the expected value of quality improvement based on discounted streams of net health benefits that may be realized over a specific time horizon. Prioritization of measures based on such a model would result in selection of measures offering the greatest rate of return on investment over a fixed period. Similarly, analyses could examine the value of quality improvement research in multiple settings, and through numerous diverse strategies for quality improvement, whether through indicator reporting or other mechanisms.

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APPENDIX A

Incorporating Inappropriate Use into the *EPV-QIR* Framework

Incorporating inappropriate use or overuse into the *EPV-QIR* framework requires adjustments to the framework.

If overuse is defined as excessive use of an intervention in a measure population, the primary adjustment is that the *NHB* of current use can be negative compared to no use. Therefore, the *population value of current implementation (PVCI)*, needs to be calculated over the parts of the measure population receiving appropriate and excessive levels of use, and can be negative if the extent and negative net health benefits of overuse exceed the positive net health benefits produced by overuse. Because of the potential to increase overuse, the *maximum population value of quality improvement (MaxPVQI)* with overuse will exceed that if overuse did not exist.

Example: Cervical cancer screening provides a good example of how overuse might be addressed in this framework. The NHQR process measure for assessing the effectiveness of cervical cancer screening is defined as "the percent of women age 18 and older who report they had a Papaniculaou (Pap) smear within the past 3 years." However, women often receive Pap smears annually rather than triennially although some estimates suggest that more frequent screening is not cost-effective. Below, we demonstrate our calculations of the maximum value of quality improvement that may be attained for a cohort of 18-year-old women.

According to data from the 2005 Behavioral Risk Factor Surveillance System (BRFSS), 94% of women reported ever having a Pap smear. Of those women, 64% reported having a Pap smear less than one year ago; 16.3% reported having a Pap smear between 1 and 2 years ago; 5.9% reported a Pap smear between 2 and 3 years ago; and 13.6% reported having a Pap smear 3 or more years ago. We estimate the rate of women having a Pap smear within 3 years as (0.94) * (0.862) = 0.81.

According to the U.S. Census Bureau, the projected population of women in the 18-24 year age group in the U.S. in 2010 is 15,037,000. We will use 2,148,143 as a rough estimate of the number of women in the 18-year-old cohort in 2010.

Meltzer (unpublished research) has previously estimated that triennial screening increases life expectancy by 70 days or 0.19178 life years (LY) compared to no screening, at a cost of \$500. Biennial screening increases life expectancy by 71 days or adds an additional 0.1945LY compared to no screening at an incremental cost of \$750. Annual screening increases life expectancy by 0.1954LY compared to no screening at an incremental cost of \$1,500. Assuming $\lambda = \$50{,}000$, the net health benefit of triennial screening vs. alternative standards are:

$$NHB_{3vsNo} = 0.19\text{LY} - \frac{\$500}{\$50{,}000} = 0.189\text{LY}$$

$$NHB_{2vsNo} = 0.1945\text{LY} - \frac{\$750}{\$50{,}000} = 0.1795\text{LY}$$

$$NHB_{1vsNo} = 0.1954\text{LY} - \frac{\$1{,}500}{\$50{,}000} = 0.1654\text{LY}$$

Value of Perfect Implementation. If all 18-year-olds received triennial screening, $VPI_3 = 2{,}148{,}143 \times 0.189\text{LY} = 405{,}999\text{LY}$ could be gained.

Using screening rates above, we estimate that 60% of 18-year-olds will receive annual screening, 15% will receive biennial screening, 5.5% will receive triennial screening, and we will assume the rest (20%) will be treated as not screened. Thus the *value of current implementation* (*VCI*) consists of the sum of value over these three groups:

$$VCI_1 = 1{,}288{,}886 \times 0.1654\text{LY} = 213{,}182\text{LY}$$

$$VCI_2 = 322{,}221 \times 0.1795\text{LY} = 57{,}839\text{LY}$$

$$VCI_3 = 118{,}148 \times 0.189\text{LY} = 22{,}330\text{LY}$$

The total value of current implementation is the sum of these values: 293,351LY.

The maximum value of quality improvement in this cohort is equal to 405,999LY – 293,351LY = 112,648LY. Note that this is more than simply implementing triennial screening among the 20% of the cohort who are not screened. By reducing underuse among 20%, and moving that subgroup to triennial screening, one would achieve a maximum of (429,629 women) * (0.189LY) = 81,200 LY. Adding this number to current implementation would equal 374,551LY, which is still 31,448LY short of the maximum potential value achievable in this cohort. The reason for this is that screening more frequently than every 3 years results in negative net health benefits, and such frequent screening constitutes overuse. In this example, if all women in the cohort receiving annual screening received triennial screening instead, 30,418LY could be saved. Similarly, if all women receiving biennial screening received triennial screening instead, 3,061LY could be saved. This example demonstrates the flexibility of our general framework in being able to address quality improvement that reduces underuse, as well as quality improvement that reduces overuse.

Inappropriate Use. If inappropriate use is defined as use in a population in which the *NHB* is negative, then the *EPV-QIR* framework needs to add in the population value of the harms arising from that inappropriate use, which would be calculated by multiplying the number of persons in the population experiencing inappropriate use and multiplying it times the per-capita negative *NHB* in that population. This is easily generalized to multiple populations in which inappropriate use can occur, each of which might have different levels of negative *NHB*. As with overuse, the total benefit of perfect implementation will exceed the benefits of perfect implementation if overuse did not occur. As a result, measures such as the *MaxPVQI* based only the measure population cannot be used to place upper bounds on the benefits of better use in the entire population, and more detailed calculations that reflect effects in the entire population are needed to establish bounds. Because of the net health benefit framework, an intervention can produce negative net health benefits either because it harms health or because its costs exceed the value of the health benefits it produces. As a result, bounds developed would need to reflect potential effects on both health outcomes and costs.

APPENDIX B

Sample *EPV-QIR* Calculations

CALCULATION 1. A Basic Example. Percent of Individuals Age 65+ Who Ever Received a Pneumococcal Vaccination [NHQR CAPVACC65EVER]

Standard of Care. The standard of care in this measure is receipt of at least one pneumococcal vaccination among individuals age 65+. This measure essentially implies at least a one-time vaccination at age 65.

Number of Individuals Receiving Standard of Care and Non-Standard Care. We used data from the U.S. Census Bureau to obtain estimates of the U.S. population age 65+ in 2008. Table A.1.1 provides the distribution of individuals age 65+ in the U.S. by receipt of standard/non-standard care.

TABLE A.1.1 Number of Individuals Receiving Standard and Non-standard Care: CAPVACC65EVER.

Parameter	Estimate	Source
Base Population	38,869,716	U.S. Census Bureau
Current Implementation Rate	57%	NHQR 2008 (2006)
N Receiving Standard of Care	22,272,347	
N Not Receiving Standard of Care	16,597,369	

SOURCE: [Base Population] Table 1: Annual Estimates of the Resident Population by Sex and Five-Year Age Groups for the United States: April 1, 2000 to July 1, 2008 (NC-EST2008-01). Source: Population Division, U.S. Census Bureau. Release Date: May 14, 2009.

Calculation of Net Health Benefit. Table A.1.2 presents the inputs into the calculation of net health benefit (*NHB*) associated with one-time vaccination at age 65, and no vaccination. Estimates of the costs and effectiveness of one-time pneumococcal vaccination at age 65 come from Sisk et al. (1997). This study was chosen because it was conducted in the U.S. population age 65+, and because it evaluated one-time vaccination at age 65. This study was also chosen because estimates of costs and QALYs were provided in the published article for both the standard of care and the comparator (no vaccination). Column 1 shows the vaccination category. Column 2 shows the cost per person in 2009 U.S. dollars, and Column 3 shows the QALYs gained per person under no vaccination and under one-time vaccination at age 65. Columns 4 and 5 show the incremental cost and incremental effectiveness of one-time vaccination at age 65 compared to no vaccination. Column 6 shows the cost-effectiveness threshold value used in this analysis, which is $100,000 per QALY. Column 7 shows the final *NHB* associated with one-time vaccination at age 65.

TABLE A.1.2 Calculation of Net Health Benefits: CAPVACC65EVER

Care Type	Cost per Person in 2009 $USD	Outcomes (QALYs per Person)	Incr. Cost†	Effect'ness† in QALYs	λ ($/QALY)	Net Health Benefit in QALYs
No Vaccination	147	7.88752			100,000	
Vaccination at Age 65	137	7.89157	–10	0.00405	100,000	0.00415

† Incremental cost and effectiveness are relative to baseline care type of no vaccination.
SOURCE: Sisk JE, Moskowitz AJ, Whang W, Lin JD, Fedson DS, McBean AM, Plouffe JF, Cetron MS, Butler JC. Cost-effectiveness of vaccination against pneumococcal bacteremia among elderly people. *JAMA*. 1997;278:1333-39.

EVQI Calculations. Table A.1.3 displays our calculations for the population value of perfect implementation, population value of current implementation, and maximum population value of quality improvement for the CAPVACC65EVER measure. Columns 2-4 display the *NHB* associated with the standard of care and non-standard care (no vaccination), the *NHB* associated with perfect implementation, and the number of persons age 65+ in the U.S. who currently receive non-standard care and the number receiving the standard of care. The *VPI* is given in Column 5, and is calculated by multiplying the *NHB* in Column 2 by the number of persons in Column 4. The sum of *PVPI* ("Total") is equal to the total number of QALYs that can be achieved if all individuals age 65+ received one-time pneumococcal vaccination at age 65. The *VPI* for CAPVACC65EVER is 529,704 QALYs. The *PVCI* is calculated in Column 6 by multiplying the *NHB* associated with perfect implementation (Column 3) by the number of individuals in Column 4. The total *PVCI* is the total number of QALYs that is currently achieved given current patterns of vaccination in this population. The *PVCI* of CAPVACC65EVER is 241,545 QALYs. The gap between perfect implementation and current implementation is quantified by the maximum *value of quality improvement* (*VQI*) in Column 7. The *MaxPVQI* is simply the difference between *PVPI* and *PVCI*, and represents the upper bound on the number of additional QALYs that can be gained by improving quality of care with respect to CAPVACC65EVER. If an intervention that was 100% effective in moving provider behavior toward consistent performance of the standard of care could be costlessly implemented, 288,159 QALYs could be gained.

TABLE A.1.3 The Value of Perfect and Current Implementation, and Quality Improvement: CAPVACC65EVER

Care Type	Net Health Benefit QALYs	*NHB* under Perfect Imp. QALYs	N Persons	Population Value of Perfect Implement'n (VPI) QALYs	PopulationValue of Current Implement'n (VCI) QALYs	Maximum Population Value of Quality Improvem't QALYs
No Vaccination	0.00000	0.00415	16,597,369	68,871	0	68,871
Vaccination at Age 65	0.00415	0.00415	22,272,347	92,420	92,420	0
Total			38,869,716	161,291	92,420	68,871

In the case of CAPVACC65EVER, 54% of individuals age 65+ report ever having received pneumococcal vaccination. However, this rate of implementation has yielded only a 45.6% net health benefit achievement rate.

Limitations. In our calculations for CAPVACC65EVER, we assumed that individuals would be compliant with the measure if they ever had a pneumococcal vaccination from age 65 onwards. As currently defined, however, individuals aged 65+ who received vaccination before the age of 65 could be considered to have received treatment compliant with the measure. This measure may benefit from additional clarification of the numerator and denominator definitions.

CALCULATION 2. The Multiple Standard/Multiple Comparator (MSMC) Problem. Percent of Women Age 50+ Who Report They Had a Mammogram within the Past 2 Years [NHQR BRCA2YRMAMM]

Standard of Care. The standard of care in this measure is lifetime annual or biennial screening mammography among women beginning at age 40.

Multiple Standards. In the case of BRCA2YRMAMM, two screening strategies can be considered to meet the standard of care: annual mammography and biennial mammography. Separate estimates of *NHB* should be used for annual mammography and biennial mammography because the total costs of annual and biennial screening over a woman's lifetime (past age 40) must surely be different, even if there may be less difference in clinical effectiveness.

Multiple Comparators. Women who do *not* receive annual or biennial mammography beginning at age 40 cannot easily be grouped into a single "no screening within 2 years" category. Women who receive non-standard care may never receive screening. Or, they may be screened at intervals other than every one or two years; they may begin screening at an age other than 40 years; and/or they may terminate screening at some point in their lives. All of these alternative screening strategies, including the absence of screening, are non-compliant with the standard of care in the BRCA2YRMAMM measure.

Simplifying Assumptions. For our calculations, we assumed that women age 40+ could be classified into the following mutually exclusive screening categories:

1. Never received mammography
2. Annual mammography
3. Biennial mammography
4. Triennial mammography
5. Mammography at 4-year or greater intervals

As specified, women receiving annual mammography *or* biennial mammography are said to be in compliance with the standard of care in the NHQR measure.

Number of Women Receiving Standard of Care and Non-Standard Care. We used data from the 2005 Behavioral Risk Factor Surveillance Survey (BRFSS) to obtain weighted estimates of the number of women age 40+ in the U.S. population who received a mammogram within the past 2 years.[3] Table A.2.1 provides the distribution of women age 40+ in the U.S. by screening interval.

TABLE A.2.1 Numbers of Women Receiving Standard and Non-standard Care, and Screening Strategy Used for *NHB* Estimates: BRCA2YRMAMM

Care Type	Number of Women Receiving Standard of Care (N_S)	Number of Women NOT Receiving Standard of Care (N_{SN})	Corresponding Screening Strategy from Stout et al. (2006)
Annual Mamm.	5,838,335		Begin age 40, end age 80, 1 y interval
Biennial Mamm.	1,586,308		Begin age 40, end age 80, 2 y interval
Triennial Mamm.		585,818	Begin age 45, end age 75, 3 y interval
Mamm. Interval between 3 and 5 yrs		378,626	Begin age 55, end age 70, 5 y interval
Mamm. Interval 5 yrs or greater		538,696	Begin age 55, end age 70, 5 y interval
Don't know		61,398	No screening
Refused		1,340	No screening
TOTAL	7,424,643	1,565,878	

SOURCES: 2006 BRFSS.

Stout NK, Rosenberg MA, Trentham-Dietz A, Smith MA, Robinson SM, Fryback DG. Retrospective cost-effectiveness analysis of screening mammography. *J Natl Cancer Inst.* 2006;98(11):774-82.

Net Health Benefits. We obtained estimates of costs and effectiveness for each of the five screening strategies from Stout et al. (2006). This study was chosen because of its relative recency, the availability of cost and effectiveness estimates in dollars and QALYs, and because both standards of care (annual and biennial mammography) were evaluated. However, screening strategies in Stout et al. (2006) were not perfectly congruent with implied standards in BRCA2YRMAMM. Whereas BRCA2YRMAMM suggests annual or biennial mammography beginning at age 40 and continuing for the rest of a woman's lifetime, Stout et al. evaluated annual and biennial mammography beginning at age 40 and ending at age 80. Estimates of costs and effectiveness for comparator screening strategies can also be obtained from Stout et al. For triennial mammography, we use estimates of costs and effectiveness associated with triennial screening beginning at age 45 and ending at age 75. For intervals greater than 3 years, we use estimates of costs and effectiveness associated with screening every 5 years beginning at age 55 and ending at age 70. Table A.2.1 provides a crosswalk between observed screening intervals in the BRFSS data, and the screening strategies corresponding to the *NHB* estimates from Stout et al. (2006) that we use in our calculations.

Calculation of Net Health Benefit. Table A.2.2 shows data elements and end-calculation of net health benefits for each screening interval or "screening policy." The first column shows the cost per woman in 2009 U.S. dollars for each screening standard and comparator.[4] The second column shows the effectiveness of each screening standard and comparator in QALYs. The third and fourth columns present the incremental cost and incremental effectiveness of each screening modality relative to a baseline of "no screening." The fifth column contains the cost-effectiveness threshold value that we used in our analysis, which we assumed to be $100,000. This value is roughly equal to the inflation-adjusted 2009 dollar value corresponding to $50,000 in 1982 $USD.[5] The sixth column presents the net health benefit calculated for each screening modality.

As evident in Column 6, the *NHB*s across screening modalities can differ substantially. In our example, the

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[3] We used the Web-enabled Analysis Tool (WEAT) available at www.cdc.gov/BRFSS/ to cross-tabulate the number of years since a respondent's last mammogram by respondent's age.

[4] The original cost data in Stout et al. (2006) were presented for the aggregate cohort of 95 million women studied, and were measured in 2000 $USD. We divided the aggregate cost by 95 million to obtain an estimate of the cost per woman for each screening modality. We then used the Consumer Price Index to adjust for inflation.

[5] A common cost-effectiveness threshold is $50,000. However, this value was first used in 1982, and rarely adjusted in studies to account for inflation.

NHB of mammography ranges from 0.005 QALYs per woman following a 5-year screening strategy, to 0.02039 QALYs per woman following an annual screening strategy. Indeed, the *NHB* accruing to annual screening is 1.25 times larger than the *NHB* accruing to biennial screening, and both annual and biennial screening are considered to be compliant with BRCA2YRMAMM. This illustrates why it can be problematic to use a single estimate of *NHB* for multiple standards and multiple comparators.

TABLE A.2.2 Calculation of Net Health Benefits: BRCA2YRMAMM

Care Type	Cost per Woman in 2009 $USD	Outcomes (QALYs per Person)	Incr. Cost†	Effect'ness† in QALYs	λ ($/QALY)	Net Health Benefit in QALYs
Annual Screening* (begin age 40, end age 80)	3,316	9.9958	1,961	0.04000	100,000	0.02039
Biennial Screening* (begin age 40, end age 80)	2,461	9.9832	1,105	0.02737	100,000	0.01632
Triennial Screening (begin age 45, end age 75)	1,987	9.9726	632	0.01684	100,000	0.01053
5-year Screening (begin age 55, end age 70)	1,592	9.9632	237	0.00737	100,000	0.00500
No screening	1,355	9.9558			100,000	

† Incremental cost and effectiveness are relative to baseline care type of no screening.

* Care Type compliant with quality measure.

SOURCE: Stout NK, Rosenberg MA, Trentham-Dietz A, Smith MA, Robinson SM, Fryback DG. Retrospective cost-effectiveness analysis of screening mammography. *J Natl Cancer Inst*. 2006;98(11):774-82.

EPV-QIR Calculations. Table A.2.3 presents our *population value of perfect implementation, population value of current implementation,* and *(maximum) population value of quality improvement* calculations. Column 1 presents each screening standard and comparator under consideration; Column 2 presents the *NHB* associated with each standard/comparator as computed in Table A.2.2, Column 3 presents the *NHB* associated with the acceptable standards of care (annual, biennial, or an average of the two), and Column 4 presents the number of women currently in each screening category.

TABLE A.2.3 The Value of Perfect and Current Implementation, and Quality Improvement: BRCA2YRMAMM

Care Type	Net Health Benefit QALYs	*NHB* under Perfect Imp. QALYs	N Women (40+) in Screening Category	Population Value of Perfect Implement'n (VPI) QALYs	Population Value of Current Implement'n (VCI) QALYs	Maximum Population Value of Quality Improvem't QALYs
Annual Screening* (begin age 40, end age 80)	0.02039	0.02039	39,244,638	800,384	800,384	0
Biennial Screening* (begin age 40, end age 80)	0.01632	0.01632	10,662,986	173,975	173,975	0
Triennial Screening (begin age 45, end age 75)	0.01053	0.01836	3,937,803	72,279	41,451	30,829
5-year Screening (begin age 55, end age 70)	0.00500	0.01836	6,166,136	113,181	30,831	82,350
No screening	0.00000	0.01836	416,990	7,654	0	7,654
Total			60,428,554	1,167,474	1,046,640	120,833

* Care Type compliant with quality measure.

As shown in Column 5, the *value of perfect implementation* (*VPI*) is the total possible number of QALYs that can be gained by moving all women who are *not* currently receiving the standards of care, to biennial or annual screening. We take the average of the *NHB* associated with annual screening and the *NHB* associated with biennial screening, and then multiply this average by the number of women in each of the comparator screening categories. For women receiving annual or biennial screening, we multiply the number of women in these categories by the *NHB* associated with annual screening and the *NHB* associated with biennial screening, respectively. The *VPI* for the BRCA2YRMAMM measure is the sum of *VPI* across all screening modalities, and represents the total number of QALYs that could be achieved if all women received mammograms annual or biennially.

Column 6 presents the *value of current implementation* (*VCI*), which is the number of QALYs currently achieved given current patterns of mammography. The *VCI* for each screening strategy is calculated by multiplying the number of women in each screening category by the *NHB* associated with that screening strategy (see Table A.2.2). The *PVCI* for the BRCA2YRMAMM is the sum of *PVCI* across all screening modalities and represents the total number of QALYs currently achieved under existing practice.

Column 7 shows the *maximum potential value of quality improvement*, which is the difference *PVPI*, *PVCI*, and *PVQI*. As discussed in Part I, the *maximum potential value of quality improvement* represents an upper bound on the QALYs that can be achieved from improving quality of care if an intervention that was 100% effective in changing provider behavior to comply with standards of care were implemented costlessly.

For the BRCA2YRMAMM measure, the *maximum potential value of quality improvement* (*MaxPVQI*) is 120,833 QALYs. A total of 1,167,474 QALYs can be achieved if all women age 40+ received annual or biennial screening beginning at age 40 and continuing for the rest of their lives. Given present patterns of screening mammography, 1,046,640 QALYs are being achieved. Although 82% of eligible women are receiving annual or biennial mammography, roughly 90% of total possible QALYs are being achieved.

APPENDIX C

Data Sources Used in EVQI Calculations Presented in This Report

[NHQR_DMHTN] Percent of adults with diagnosed diabetes with most recent blood pressure <140/80 mm/Hg.

Costs and Effectiveness

- The CDC Diabetes Cost-Effectiveness Group. Cost-effectiveness of intensive glycemic control, intensified hypertension control, and serum cholesterol level reduction for Type 2 diabetes. JAMA. 2002; 287(19):2542-2551.
- *Note—this study evaluated an intervention involving the use of ACE-I or Beta-blocker to achieve a blood pressure of <144/82 mmHg compared to "usual care."*

Population

- Table 1: Annual Estimates of the Resident Population by Sex and Five-Year Age Groups for the United States: April 1, 2000 to July 1, 2008 (NC-EST2008-01). Source: Source: Population Division, U.S. Census Bureau. Release Date: May 14, 2009.
- Centers for Disease Control and Prevention, National Center for Health Statistics, Division of Health Interview Statistics, data from the National Health Interview Survey. U.S. Bureau of the Census, census of the population and population estimates. Data computed by the Division of Diabetes Translation, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention.

Current Implementation Rate

- NHQR 2008 (Data from 2003-6).

[NHQR_DMCHOL] Adults age 40 and over with diagnosed diabetes with total cholesterol <200 mg/dL.

Costs and Effectiveness
- The CDC Diabetes Cost-Effectiveness Group. Cost-effectiveness of intensive glycemic control, intensified hypertension control, and serum cholesterol level reduction for Type 2 diabetes. JAMA. 2002; 287(19):2542-2551.
- *Note—this study evaluated an intervention involving the use of Pravastatin to achieve a serum cholesterol level < 200mg/dL compared to "usual care."*

Population
- Table 1: Annual Estimates of the Resident Population by Sex and Five-Year Age Groups for the United States: April 1, 2000 to July 1, 2008 (NC-EST2008-01). Source: Source: Population Division, U.S. Census Bureau. Release Date: May 14, 2009.
- Centers for Disease Control and Prevention, National Center for Health Statistics, Division of Health Interview Statistics, data from the National Health Interview Survey. U.S. Bureau of the Census, census of the population and population estimates. Data computed by the Division of Diabetes Translation, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention.

Current Implementation Rate
- NHQR 2008 (Data from 2003-6).

[NHQR_DMFOOT] Adults age 40+ with diagnosed diabetes who had their feet checked for sores or irritation in the calendar year.

Costs and Effectiveness
- Ortegon MM, Redekop WK, Niessen LW. Cost-effectiveness of prevention and treatment of the diabetic foot: a Markov analysis. Diabetes Care. 2004;27:901-907.
- *Note—this study evaluated an intervention involving a program of "optimal foot care" designed to achieve a 90% reduction in foot lesions compared to "usual care."*

Population
- Table 1: Annual Estimates of the Resident Population by Sex and Five-Year Age Groups for the United States: April 1, 2000 to July 1, 2008 (NC-EST2008-01). Source: Source: Population Division, U.S. Census Bureau. Release Date: May 14, 2009.
- Centers for Disease Control and Prevention, National Center for Health Statistics, Division of Health Interview Statistics, data from the National Health Interview Survey. U.S. Bureau of the Census, census of the population and population estimates. Data computed by the Division of Diabetes Translation, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention.

Current Implementation Rate
- NHQR 2008 (Data from 2005).

[NHQR_DMHBA1C] Percent of adults with diagnosed diabetes with HbA1c level <9.5% (poor control); <7.0 (optimal); <9.0 (minimally acceptable).

Costs and Effectiveness
- The CDC Diabetes Cost-Effectiveness Group. Cost-effectiveness of intensive glycemic control, intensified hypertension control, and serum cholesterol level reduction for Type 2 diabetes. JAMA. 2002; 287(19):2542-2551.
- *Note—this study evaluated an intervention involving the use of insulin/sulfonylurea to achieve a glycemic level < 108mg/dL or 6mmol/L compared to "usual care."*

Population

- Table 1: Annual Estimates of the Resident Population by Sex and Five-Year Age Groups for the United States: April 1, 2000 to July 1, 2008 (NC-EST2008-01). Source: Source: Population Division, U.S. Census Bureau. Release Date: May 14, 2009.
- Centers for Disease Control and Prevention, National Center for Health Statistics, Division of Health Interview Statistics, data from the National Health Interview Survey. U.S. Bureau of the Census, census of the population and population estimates. Data computed by the Division of Diabetes Translation, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention.

Current Implementation Rate

- NHQR 2008 (Data from 2003-6).

[NHQR_HIVEVER] People ages 15-44 who ever received an HIV test outside of blood donation.

Costs and Effectiveness

- Sanders GD, Bayoumi AM, Sundaram V, Bilir SP, Neukermans CP, Rydzak CE, Douglass LR, Lazzeroni LC, Holodniy M, Owens DK. Cost-effectiveness of screening for HIV in the era of highly active antiretroviral therapy. NEJM. 2005;352:570-85.
- *Note—this study evaluated HIV testing at age 43 in a population with a 1% prevalence of HIV. We used estimates of the costs and health benefits accruing to the individual tested, and ignore costs and benefits due to spillover to the individual's partner.*

Population

- Table 1: Annual Estimates of the Resident Population by Sex and Five-Year Age Groups for the United States: April 1, 2000 to July 1, 2008 (NC-EST2008-01). Source: Source: Population Division, U.S. Census Bureau. Release Date: May 14, 2009.

Current Implementation Rate

- Kaiser State Health Facts, 2001.

[NHQR_PAP3YR] Percent of women (age 18 and over) who report they had a Pap smear within the past 3 years.

Costs and Effectiveness

- The CDC Diabetes Cost-Effectiveness Group. Cost-effectiveness of intensive glycemic control, intensified hypertension control, and serum cholesterol level reduction for Type 2 diabetes. JAMA. 2002;287(19):2542-2551.
- *Note—this study evaluated an intervention involving the use of insulin/sulfonylurea to achieve a glycemic level < 108mg/dL or 6mmol/L compared to "usual care."*

Population

- Table 2: Annual Estimates of the Resident Population by Sex and Selected Age Groups for the United States: April 1, 2000 to July 1, 2008 (NC-EST2008-02). Source: Source: Population Division, U.S. Census Bureau. Release Date: May 14, 2009.

Current Implementation Rate

- BRFSS 2005

[NHQR_DMEYE] Adults age 40+ with diagnosed diabetes who received a dilated eye examination in the calendar year.

Costs and Effectiveness

- Vijan S, Hofer TP, Hayward RA. Cost-utility analysis of screening intervals for diabetic retinopathy in patients with Type 2 diabetes mellitus. JAMA. 2000;283(7):889-896.

Population

- Table 1: Annual Estimates of the Resident Population by Sex and Five-Year Age Groups for the United States: April 1, 2000 to July 1, 2008 (NC-EST2008-01). Source: Source: Population Division, U.S. Census Bureau. Release Date: May 14, 2009.
- Centers for Disease Control and Prevention, National Center for Health Statistics, Division of Health Interview Statistics, data from the National Health Interview Survey. U.S. Bureau of the Census, census of the population and population estimates. Data computed by the Division of Diabetes Translation, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention.

Current Implementation Rate

- NHQR 2008 (Data from 2005).

[NHQR_CRC50EVERCOLON] Adults age 50 and over who ever received a colonoscopy, sigmoidoscopy, or proctoscopy.

Costs and Effectiveness

- Frazier AL, Colditz GA, Fuchs CS et al. Cost-effectiveness of screening for colorectal cancer in the general population. JAMA. 2000;284(15):1954-1961.
- *Note—this study evaluated annual FOBT in a population representative of the population of adults age 50+ in the U.S., but the study data come from white males age 50+.*
- *Note—this study evaluated one-time colonoscopy at age 55.*

Population

- Table 1: Annual Estimates of the Resident Population by Sex and Five-Year Age Groups for the United States: April 1, 2000 to July 1, 2008 (NC-EST2008-01). Source: Source: Population Division, U.S. Census Bureau. Release Date: May 14, 2009.

Current Implementation Rate

- BRFSS 2005.

[NHQR_BRCA2YRMAMM] Percent of women (age 40+) who report they had a mammogram within the past 2 years.

Costs and Effectiveness

- Stout NK, Rosenberg MA, Trentham-Dietz A, Smith MA, Robinson SM, Fryback DG. Retrospective cost-effectiveness analysis of screening mammography. J Natl Cancer Inst. 2006;98(11):774-82.
- *Note—this study evaluated biennial screening beginning at age 40 and ending at age 80.*

Population

- Table 1: Annual Estimates of the Resident Population by Sex and Five-Year Age Groups for the United States: April 1, 2000 to July 1, 2008 (NC-EST2008-01). Source: Source: Population Division, U.S. Census Bureau. Release Date: May 14, 2009.

Current Implementation Rate

- BRFSS 2005.

[NHQR_CRCBIFOBT] Adults age 50 and over who received a fecal occult blood test (FOBT) in the last 2 years.

Costs and Effectiveness

- Frazier AL, Colditz GA, Fuchs CS et al. Cost-effectiveness of screening for colorectal cancer in the general population. JAMA. 2000;284(15):1954-1961.
- *Note—this study evaluated annual FOBT in a population representative of the population of adults age 50+ in the U.S., but the study data come from white males age 50+.*

- *Note—this study evaluated two types of FOBT—rehydrated FOBT (RFOBT) and unrehydrated FOBT (UFOBT). We used an averaged the NHBs associated with RFOBT and UFOBT in our calculations.*

Population
- Table 1: Annual Estimates of the Resident Population by Sex and Five-Year Age Groups for the United States: April 1, 2000 to July 1, 2008 (NC-EST2008-01). Source: Source: Population Division, U.S. Census Bureau. Release Date: May 14, 2009.

Current Implementation Rate
- BRFSS 2005.

[NHQR_CAPVACC65EVER] Percent of individuals age 65+ who ever received a pneumococcal vaccination.

Costs and Effectiveness
- Sisk JE, Moskowitz AJ, Whang W, Lin JD, Fedson DS, McBean AM, Plouffe JF, Cetron MS, Butler JC. Cost-effectiveness of vaccination against pneumococcal bacteremia among elderly people. JAMA. 1997;278:1333-1339.

Population
- Table 2: Annual Estimates of the Resident Population by Sex and Selected Age Groups for the United States: April 1, 2000 to July 1, 2008 (NC-EST2008-02). Source: Source: Population Division, U.S. Census Bureau. Release Date: May 14, 2009.

Current Implementation Rate
- NHQR 2008 (2006).

[NHQR_BSICVC] Bloodstream infections (BSIs) per 1,000 central venous catheter (CVC) placements.

Costs and Effectiveness
- Halton KA, Cook DA, Whitby M, Paterson DL, Graves N. Cost-effectiveness of antimicrobial catheters in the intensive care unit: addressing uncertainty in the decision. Critical Care. 2009;13(2):R35.
- *Note—costs were presented in 2006 Australian Dollars. We converted costs to 2006 U.S. Dollars using a historical currency exchange table, and then adjusted costs to 2009 U.S. Dollars using the Consumer Price Index.*

Population
- Maki DG, Stolz SM, Wheeler S, Mermel LA. Prevention of central venous catheter-related bloodstream infection by use of an antiseptic-impregnated catheter: a randomized, controlled trial. Annals of Internal Medicine. 1997;127(4): 257-66.

Current Implementation Rate
- NHQR 2008 (2004).

[NHQR_AMIBB] Percent of AMI patients administered beta blockers prescribed at discharge.

Costs and Effectiveness
- Phillips KA, Shlipak MG, Coxson P, Heidenreich PA, Hunink M, Goldman PA, Williams LW, Weinstein MC, Goldman. Health and economic benefits of increased beta-blocker use following myocardial infarction. JAMA. 2000;284:2748-2754.

Population
- 2005 National Hospital Discharge Survey. Available at: www.cdc.gov.
- Population-weighted estimates of hospital discharges with 3-digit ICD-9-CM code = 410 as primary diagnosis.

Current Implementation Rate
- NHQR 2008 (2004).

[NHQR_HFACE] Percent of hospital patients with heart failure and left ventricular systolic dysfunction who were prescribed ACE inhibitor or ARB at discharge.

Costs and Effectiveness
- Boyko WL Jr, Glick HA, Schulman KA. Economics and cost-effectiveness in evaluating the value of cardiovascular therapies. ACE inhibitors in the management of congestive heart failure: comparative economic data. Am Heart J. 1999;137(5):S115-9.

Population
- 2005 National Hospital Discharge Survey. Available at: www.cdc.gov.
- Population-weighted estimates of hospital discharges with 3-digit ICD-9-CM code = 428 as primary diagnosis.
- Prevalence of LVSD among patients with HF: Senior R, Galasko G. Cost-effective strategies to screen for left ventricular systolic dysfunction in the community—a concept. *Congestive Heart Failure.* 2007;11(4):194-211.

  Also see:
  - Kelly R, Staines A, MacWalter R, Stonebridge P, Tunstall-Pedoe H, Struthers AD. The prevalence of treatable left ventricular systolic dysfunction in patients who present with noncardiac vascular episodes: a case-control study. *J Am Coll Cardiol.* 2002;39(2):219-24.

Current Implementation Rate
- NHQR 2008 (2004).

[NHQR_AMIACE] Percent of hospital patients with heart failure and left ventricular systolic dysfunction who were prescribed ACE inhibitor or ARB at discharge.

Costs and Effectiveness
- Tsevat J, Duke D, Goldman L, Pfeffer MA, Lamas GA, Soukup JR, Kuntz KM, Lee TH. Cost-effectiveness of captopril therapy after myocardial infarction. JACC. 1995;26(4):914-919.

Population
- 2005 National Hospital Discharge Survey. Available at: www.cdc.gov.
- Population-weighted estimates of hospital discharges with 3-digit ICD-9-CM code = 410 as primary diagnosis.
- Prevalence of LVSD among patients with AMI—we use an estimate of 27.2% in all patients hospitalized patients with AMI. This estimate was taken from the SOLVD Trial, as summarized in: Weir R McMurray JJ, Velazquez EJ. Epidemiology of heart failure and left ventricular systolic dysfunction after acute myocardial infarction: prevalence, clinical characteristics, and prognostic importance. *Am J Cardiol.* 2006;97[suppl]:13F-25F.

Current Implementation Rate
- NHQR 2008 (2005-2006, all payers).

CALCULATION 3. Outcomes-Based Quality Measure—Standard of Care Not Specified. Bloodstream Infections (BSIs) per 1,000 Central Venous Catheter (CVC) Placements [NHQR BSICVC]

Standard of Care. This is an outcomes measure that tracks an adverse event during hospitalization, namely, bloodstream infection resulting from a central venous catheter. The standard of care is not defined. There are multiple processes of care that can reduce bloodstream infections associated with central venous catheter placements: for example, hand-washing, skin cleaning, and the use of antimicrobial dressing and antimicrobial-coated catheters. Because cost-effectiveness studies have investigated the use of coated catheters in reducing CVC-related BSIs, we use coated catheters as our standard of care in calculating the value of quality improvement with respect to reducing the number of CVC-related BSIs.

Number of Individuals Receiving Standard of Care and Non-Standard Care. We could not find data on the number of catheter placements in the U.S., so for our calculations, we used an estimate of the number of CVCs sold in the U.S. each year from Maki et al. (1997). This is likely to be an overestimate of the number of CVC placements in the U.S. Based on infection rates published in the 2008 NHQR, there were approximately 140,000 CVC-related BSIs in the U.S. (3% infection rate applied to a base denominator of 5 million catheters). We make an implicit assumption that an infection rate of zero is possible and desirable. Table A.3.1 shows our estimates of the denominator population and number of infections for the CVCBSI measure.

TABLE A.3.1 Number of Individuals Receiving Non-standard Care: CVCBSI

Parameter		Source
Base Population	5,000,000	# of CVCs sold annually in U.S. Maki et al. (1997)
Current Infection Rate	3%	NHQR 2008 (2006) Rate of BSI in CVCs
N Infections	140,000	

SOURCE: Maki DG, Stolz SM, Wheeler S, Mermel LA. Prevention of central venous catheter-related bloodstream infection by use of an antiseptic-impregnated catheter: a randomized, controlled trial. *Annals of Internal Medicine.* 1997;127(4): 257-66.
NHQR 2008.

Calculation of Net Health Benefit. We use data from Halton et al. (2009) that compares the costs and effectiveness of various antimicrobial catheters compared to uncoated catheters in preventing infections. Although this study was conducted in Australia (and focused on the cost-effectiveness of antimicrobial catheters in intensive care units), this was the only study with usable, published estimates of costs and effectiveness in QALYs for uncoated catheters (comparator) as well as coated catheters (standard of care). Halton et al. evaluated four different types of coated CVCs relative to uncoated CVCs: chlorhexidine/silver sulfadiazine externally coated catheters; chlorhexidine/silver sulfadiazine internally and externally coated catheters; silver, platinum, and carbon-coated catheters; and minocycline and rifampicin-coated catheters. We calculated the *NHB* of each type of catheter relative to uncoated catheters. Table A.3.2 presents the components of the *NHB* calculation for the CVCBSCI measure for each catheter type, as shown in Column 1. This study only published the incremental cost and the incremental effectiveness of each coated catheter relative to uncoated catheters. Columns 2 and 3 present these numbers. We again assume a value of $100,000 for the cost-effectiveness threshold (Column 4). Column 5 presents our calculation of the *NHB* given incremental costs and effectiveness published in the study. Column 6 presents data from Halton et al. (2009) on the number of infections that use of each catheter type can prevent. We divided the *NHB* (Column 5) by the number of infections avoided (Column 6) to estimate the net health benefit per infection avoided, as shown in Column 7.

TABLE A.3.2 Calculation of Net Health Benefits: CVCBSI

Care Type	Incr. Cost†	Effect'ness in QALYs†	λ ($/QALY)	Net Health Benefit in QALYs	N Infect. Avoid'd	*NHB* QALYs per Infect. Avoid'd
Chlorhexidine silver sulfadiazine catheters (external coat)*	–75,856	0.91000	100,000	1.66856	8	0.19864
Chlorhexidine silver sulfadiazine catheters (internal+external coat)*	–41,576	0.80000	100,000	1.21576	7	0.16429
Silver, platinum and carbon catheters*	–97,634	1.23000	100,000	2.20634	11	0.19354
Minocycline and rifampicin coated catheters*	–105,951	1.64000	100,000	2.69951	15	0.17760
Uncoated central venous catheter (Baseline)			100,000			

† Incremental cost and effectiveness are relative to baseline care type of uncoated central venous catheter utilization.
* Care Type compliant with quality measure.
SOURCE: Halton KA, Cook DA, Whitby M, Paterson DL, Graves N. Cost-effectiveness of antimicrobial catheters in the intensive care unit: addressing uncertainty in the decision. *Critical Care.* 2009;13(2):R35.

EPV-QIR Calculations. Our *EVQI* calculations for the NHQR_CVCBSCI measure are shown in Table C.3. Again, each catheter type is displayed in Column 1 of Table A.3.3. We reason that *NHB*s gained per infection avoided, can also be viewed as the net health benefit *lost* for every infection that occurred. Thus, Column 2 presents the *NHB*s lost per infection under different catheter "regimes." Column 3 reports the *NHB* lost per infection under perfect implementation. This column is zero because under perfect implementation, we assume that there would be no bloodstream infections associated with central venous catheters. Column 4 reports the number of infections, which is 140,000 (Table C.1). The value of perfect implementation is zero, because this measure pertains to an adverse outcome that should not occur under perfect implementation. Thus, the only "gains" are losses averted. These losses are shown in Column 5. Compared to a regime where externally coated chlorhexidine silver sulfadiazine catheters are used exclusively, current implementation results in a loss of 27,809 QALYs. Compared to a regime in which minocycline and rifampicin-coated catheters are used exclusively, current implementation results in a loss of 24,864 QALYs. The value of quality improvement—which, in our analysis, implies switching regimes from uncoated catheters to a coated catheter, is equal to the absolute value of the QALYs currently lost. For example, the maximum *value of quality improvement* resulting from a switch from uncoated catheters to chlorhexidine silver sulfadiazine externally coated catheters is 27,809 QALYs.

TABLE A.3.3 The Value of Perfect and Current Implementation, and Quality Improvement: CVCBSI

Care Type	*NHB* QALYs (Lost) per Infection	*NHB* QALYs (Lost) per Infection Under Perfect Imp. QALYs	N Infections	Population Value of Perfect Implement'n (VPI) QALYs	Population Value of Current Implement'n (VCI) QALYs	Maximum Population Value of Quality Improvem't QALYs
Chlorhexidine silver sulfadiazine catheters (external coat)*	–0.19864	0.00000	140,000	0	–27,809	27,809
Chlorhexidine silver sulfadiazine catheters (internal+external coat)*	–0.16429	0.00000	140,000	0	–23,001	23,001
Silver, platinum and carbon catheters*	–0.19354	0.00000	140,000	0	–27,095	27,095
Minocycline and rifampicin coated catheters*	–0.17760	0.00000	140,000	0	–24,864	24,864
Uncoated central venous catheter (Baseline)			140,000			

* Care Type compliant with quality measure.

CALCULATION 4. Complex Denominator Populations. Percent of hospital patients with heart attack and left ventricular systolic dysfunction who were prescribed angiotensin converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) at discharge [AMIACE]

Standard of Care. The standard of care in this measure is the receipt of a prescription for ACE/ARB at discharge among patients hospitalized for acute myocardial infarction (AMI).

Number of Individuals Eligible for the Standard of Care. We used the 2005 National Hospital Discharge Survey to obtain population-weighted estimates of the number of hospital discharges in the U.S. in 2005 that had a primary diagnosis of acute myocardial infarction (AMI),[6] by age group. Age groups were defined on the basis of the cost-effectiveness study from which we obtain our estimates of costs and effectiveness, as we describe in the following section. Because the AMIACE measure applies only to hospital discharges with heart failure *and* left ventricular systolic dysfunction (LVSD), we assumed an LVSD prevalence of 27% among patients with AMI also based on data from the Valsartan in Acute Myocardial Infarction Trial (VALIANT) (Weir et al. 2006).

According to the 2008 NHQR, the current rate of implementation for ACE/ARB at discharge for patients with AMI and LVSD is 86% in the overall population of patients with AMI and LVSD. Rates stratified by age group are not reported. Thus, we made the assumption that current implementation rates did not differ by age group. Table A.4.1 reports our estimates of the number of patients receiving the standard of care in each age group.

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[6] We identified hospital discharges with AMI based on the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) code recorded under primary diagnosis (ICD-9-CM = 410).

TABLE A.4.1 Number of Individuals Receiving Standard and Non-standard Care: AMIACE

Parameter		Source
Base Population—Age < 60	51,054	NHDS 2005 (AMI Discharges, age < 60), 27% LVSD
Base Population—60 ≤ Age < 70	39,171	NHDS 2005 (AMI Discharges, 60 ≤ age < 70), 27% LVSD
Base Population 70 ≤ Age	95,470	NHDS 2005 (AMI Discharges, age ≥ 70) 27% LVSD
Current Implementation Rate	86%	NHQR (2008) (2003-2006, All Payers)
N Receiving Standard of Care—Age < 60	43,855	
N Receiving Standard of Care—60 ≤ Age < 70	33,648	
N Receiving Standard of Care—Age ≥ 70	82,008	
N NOT Receiving Standard of Care—Age < 60	7,199	
N NOT Receiving Standard of Care—60 ≤ Age < 70	5,523	
N NOT Receiving Standard of Care—Age ≥ 70	13,461	

SOURCE: 2005 National Hospital Discharge Survey.
Weir RAP, McMurray JJV, Velazquez EJ. Epidemiology of heart failure and left ventricular systolic dysfunction after acute myocardial infarction: prevalence, clinical characteristics and prognostic importance. *American Journal of Cardiology*. 2006;97[suppl]:13F-25F).

Calculation of Net Health Benefit. Data on the costs and effectiveness of ACE/ARB come from a cost-effectiveness study by Tsevat et al. (1995) on the use of Captopril (an ACE inhibitor) among survivors of AMI in three age groups: 50-60, 60-70, 70-80, and 80+ year-olds. We used figures from the “limited-benefit” model estimated by Tsevat et al., which assumes that ACE-I does not confer survival benefits beyond 4 years post-AMI. Table A.4.2 provides the inputs and final *NHB* calculations for ACE therapy in each age group (Column 1). Columns 2 and 3 report the costs and effectiveness of ACE-I and no ACE-I in each age group, and Columns 4 and 5 report the incremental costs and effectiveness. Note the much larger incremental difference in the effectiveness of ACE-I in the oldest age group compared to the youngest age group.

TABLE A.4.2 Calculation of Net Health Benefits: AMIACE

Care Type	Cost per Person in 2009 $USD	Outcomes (QALYs per Person)	Incr. Cost†	Effect’ness† in QALYs	λ ($/QALY)	Net Health Benefit in QALYs
Age 50						
No Captopril	47,983	8.10000			100,000	
Captopril*	50,715	8.13000	2,732	0.03000	100,000	0.00268
Age 60						
No Captopril	38,629	6.33000			100,000	
Captopril*	41,282	6.51000	2,653	0.18000	100,000	0.15347
Age 70						
No Captopril	30,176	4.72000			100,000	
Captopril*	32,899	5.07000	2,722	0.35000	100,000	0.32278

† Incremental cost and effectiveness are relative to baseline care type of no Captopril (no ACE/ARB).
* Care Type compliant with quality measure.
SOURCE: Tsevat J, Duke D, Goldman L, Pfeffer MA, Lamas GA, Soukup JR, Kuntz KM, Lee TH. Cost-effectiveness of captopril therapy after myocardial infarction. *Journal of the American College of Cardiology.* 1995;26(4):914-19.

Table A.4.3 shows the final *EVQI* calculations for ACEAMI. For each age group in Column 1, Column 2 of Table A.4.3 shows the *NHB* of ACE-I after AMI in that age group. Column 4 shows the number of patients in each age group who currently receive ACE-I, and the number who do not currently receive ACE-I after AMI. The value of perfect implementation is reported in Column 5, and represents the maximum *NHB* that would be obtained if all patients in each age group received ACE-I after AMI. Column 6 shows the value of current implementation, given extant rates of prescribing ACE-I at discharge. Column 7 shows the maximum potential *NHB* that can be gained from improving ACEAMI to 100% from current levels of implementation.

TABLE A.4.3 The Value of Perfect and Current Implementation, and Quality Improvement: AMIACE

Care Type	Net Health Benefit QALYs	*NHB* under Perfect Imp. QALYs	N Persons	Population Value of Perfect Implement'n (VPI) QALYs	Population Value of Current Implement'n (VCI) QALYs	Maximum Population Value of Quality Improvem't QALYs
Age 50						
No Captopril		0.00268	7,199	19	0	19
Captopril*	0.00268	0.00268	43,855	118	118	0
Age 60						
No Captopril		0.15347	5,523	848	0	848
Captopril*	0.15347	0.15347	33,648	5,164	5,164	0
Age 70						
No Captopril		0.32278	13,461	4,345	0	4,345
Captopril*	0.32278	0.32278	82,008	26,470	26,470	0
Total			185,694	36,964	31,752	5,212

* Care Type compliant with quality measure.

Appendix G

IOM Subcommittee on Standardized Collection of Race/Ethnicity Data for Healthcare Quality Improvement: Recommendations

The IOM formed the Subcommittee on Standardized Collection of Race/Ethnicity Data for Healthcare Quality Improvement to examine approaches to the standardization of data on race, ethnicity, and language. In the 2009 report of the subcommittee, *Race, Ethnicity, and Language Data: Standardization for Health Care Quality Improvement*, the IOM recommends collection of more granular ethnicity and language need according to national standards in addition to the Office of Management and Budget (OMB) race and Hispanic ethnicity categories (IOM, 2009).[1] The presence of race, ethnicity, and language need data does not, in and of itself, guarantee subsequent actions in terms of analysis of quality data to identify health care needs, or actions to reduce or eliminate disparities in health care. The absence of data, however, essentially guarantees that none of those actions will occur. The subcommittee's recommendations are presented below.

Recommendation 3-1: An entity collecting data from individuals for purposes related to health and health care should:

- Collect data on granular ethnicity using categories that are applicable to the populations it serves or studies. Categories should be selected from a national standard list (*see Recommendation 6-1a*) on the basis of health and health care quality issues, evidence or likelihood of disparities, or size of subgroups within the population. The selection of categories should also be informed by analysis of relevant data (e.g., Census data) on the service or study population. In addition, an open-ended option of "Other, please specify:__" should be provided for persons whose granular ethnicity is not listed as a response option.
- Elicit categorical responses consistent with the current OMB standard race and Hispanic ethnicity categories, with the addition of a response option of "Some other race" for persons who do not identify with the OMB race categories.

Recommendation 3-2: Any entity collecting data from individuals for purposes related to health and health care should collect granular ethnicity data in addition to data in the OMB race and Hispanic ethnicity categories and should select the granular ethnicity categories to be used from a national standard set. When respondents do not self-identify as one of the OMB race categories or do not respond to the Hispanic ethnicity question, a national

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[1] The full text of *Race, Ethnicity, and Language Data: Standardization for Health Care Quality Improvement* is available online: http://www.nap.edu/catalog.php?record_id=12696.

scheme should be used to roll up the granular ethnicity categories to the applicable broad OMB race and Hispanic ethnicity categories to the extent feasible.

Recommendation 3-3: To determine the utility for health and health care purposes, HHS should pursue studies on different ways of framing the questions and related response categories for collecting race and ethnicity data at the level of the OMB categories, focusing on completeness and accuracy of response among all groups.

- Issues addressed should include use of the one- or two-question format for race and Hispanic ethnicity, whether all individuals understand and identify with the OMB race and Hispanic ethnicity categories, and the increasing size of populations identifying with "Some other race."
- The results of such studies, together with parallel studies by the Census Bureau and other agencies, may reveal the need for an OMB review across all agencies to determine the best format for improving response among all groups.

Recommendation 4-1: To assess patient/consumer language and communication needs, all entities collecting data from individuals for purposes related to health and health care should:

- At a minimum, collect data on an individual's assessment of his/her level of English proficiency and on the preferred spoken language needed for effective communication with health care providers. For health care purposes, a rating of spoken English-language proficiency of less than very well is considered limited English proficiency.
- Where possible and applicable, additionally collect data on the language spoken by the individual at home and the language in which he/she prefers to receive written materials.

Recommendation 4-2: The choice of response categories for spoken and written language questions should be informed by analysis of relevant data on the service area (e.g., Census data) or service population, and any response list should include an option of "Other, please specify:__" for persons whose language is not listed.

Recommendation 4-3: When any health care entity collects language data, the languages used as response options or categories for analysis should be selected from a national standard set of languages in use in the United States. The national standard set should include sign language(s) for spoken language and Braille for written language.

Recommendation 5-1: Where directly collected race and ethnicity data are not available, entities should use indirect estimation to aid in the analysis of racial and ethnic disparities and in the development of targeted quality improvement strategies, recognizing the probabilistic and fallible nature of such indirectly estimated identifications.

- Race and ethnicity identifications based on indirect estimation should be distinguished from self-reports in data systems, and if feasible, should be accompanied by probabilities.
- Interventions and communications in which race and ethnicity identifications are based on indirect estimation may be better suited to population-level interventions and communications and less well suited to use in individual-level interactions.
- An indirectly estimated probability of an individual's race and ethnicity should never be placed in a medical record or used in clinical decision making.
- Analyses using indirectly estimated race and ethnicity should employ statistically valid methods that deal with probabilistic identifications.

Recommendation 6-1a: HHS should develop and make available national standard lists of granular ethnicity categories and spoken and written languages, with accompanying unique codes and rules for rollup procedures.

- HHS should adopt a process for routine updating of those lists and procedures as necessary. Sign languages should be included in national lists of spoken languages and Braille in lists of written languages.
- HHS should ensure that any national hierarchy used to roll up granular ethnicity categories to the broad OMB race and Hispanic ethnicity categories takes into account responses that do not correspond to one of the OMB categories.

Recommendation 6-1b: HHS and the Office of the National Coordinator for Health Information Technology (ONC) should adopt standards for including in electronic health records the variables of race, Hispanic ethnicity, granular ethnicity, and language need identified in this report.

Recommendation 6-1c: HHS and ONC should develop standards for electronic data transmission among health care providers and plans that support data exchange and possible aggregation of race, Hispanic ethnicity, granular ethnicity, and language need data across entities to minimize redundancy in data collection.

Recommendation 6-1d: The Centers for Medicare and Medicaid Services, as well as others sponsoring payment incentive programs, should ensure that the awarding of such incentives takes into account collection of the recommended data on race, Hispanic ethnicity, granular ethnicity, and language need so these data can be used to identify and address disparities in care.

Recommendation 6-1e: HHS should issue guidance that recipients of HHS funding (e.g., Medicare, the Children's Health Insurance Program [CHIP], Medicaid, community health centers) include data on race, Hispanic ethnicity, granular ethnicity, and language need in individual health records so these data can be used to stratify quality performance metrics, organize quality improvement and disparity reduction initiatives, and report on progress.

Recommendation 6-2: HHS, the Department of Veterans Affairs, and the Department of Defense should coordinate their efforts to ensure that all federally funded health care delivery systems collect the variables of race, Hispanic ethnicity, granular ethnicity, and language need as outlined in this report, and include these data in the health records of individuals for use in stratifying quality performance metrics, organizing quality improvement and disparity reduction initiatives, and reporting on progress.

Recommendation 6-3: Accreditation and standards-setting organizations should incorporate the variables of race, Hispanic ethnicity, granular ethnicity, and language need outlined in this report and associated categories (as updated by HHS) as part of their accreditation standards and performance measure endorsements.

- The Joint Commission, NCQA, and URAC should ensure collection in individual health records of the variables of race, Hispanic ethnicity, granular ethnicity, and language need as outlined in this report so these data can be used to stratify quality performance metrics, organize quality improvement and disparity reduction initiatives, and report on progress.
- NQF should review and amend its recommendations on the collection and use of data on race, Hispanic ethnicity, granular ethnicity, and language need to accord with the categories and procedures outlined in this report.
- Medical societies and medical boards should review and endorse the variables, categories, and procedures outlined in this report and educate their members on their use for quality improvement.

Recommendation 6-4: Through their certification, regulation, and monitoring of health care providers and organizations within their jurisdiction, states should require the collection of data on the race, Hispanic ethnicity, granular ethnicity, and language need variables as outlined in this report so these data can be used to stratify quality performance metrics, organize quality improvement and disparity reduction initiatives, and report on progress.

REFERENCE

IOM (Institute of Medicine). 2009. *Race, ethnicity, and language data: Standardization for health care quality improvement.* Washington, DC: The National Academies Press.

Appendix H

Additional Assessments of Data Presentation in the NHQR and NHDR

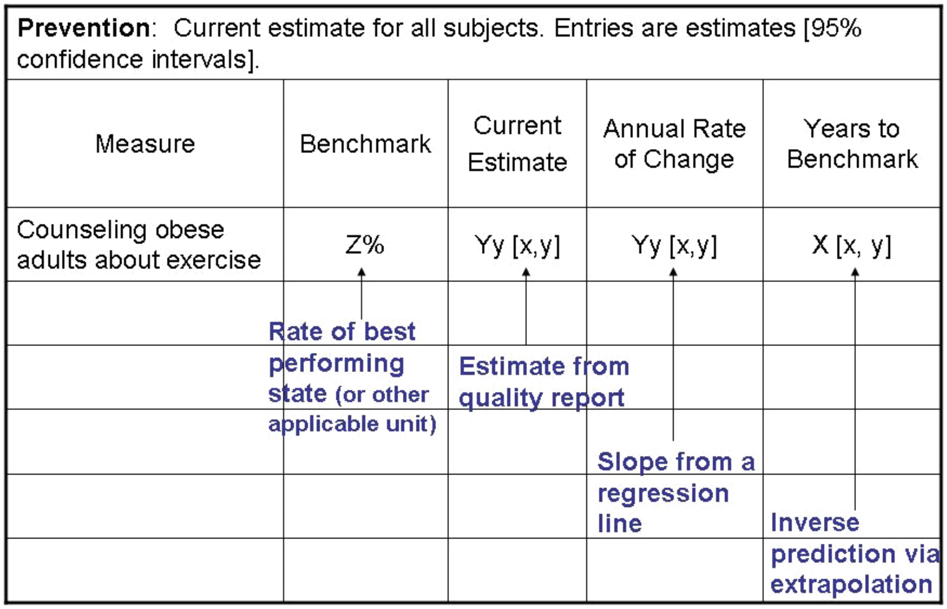
While the NHQR and NHDR monitor a large number of measures, there is no sense from the report findings that the nation is improving or worsening its performance in the areas that matter most or in areas that can make the greatest difference. The significance of the findings is not relayed in a manner that evokes action from its readers. This led to the committee's conclusion regarding the importance of telling a story through the NHQR and NHDR.

With so many measures, population groups, and years of information presented in the national healthcare reports, the task of summarizing the most important findings of the reports is challenging. As discussed in Chapter 6, the committee identified three pieces of information that if reported for each measure (whether individual, composite, or summary) would tell a better story and enhance actionability:

1. The nation's current level of performance on a given measure (expressed using means and standard errors);
2. How the nation has achieved the current level of performance (expressed by the annual rate of change and standard error of the estimated change); and
3. How far the nation has to go to close the performance gap between current practice and the recommended standard of care (goal or benchmark)—the number of years to achieving the desired performance level based on the historical annual rate of change and the corresponding interval estimate.

These pieces of data could be presented in several ways. The committee presents the following examples as one succinct mode of concisely conveying such information; these templates could be used to convey progress toward benchmarks or goals if they have been set for individual measures.

QUALITY TEMPLATE



Prevention: Current estimate for all subjects. Entries are estimates [95% confidence intervals].

Measure	Benchmark	Current Estimate	Annual Rate of Change	Years to Benchmark
Counseling obese adults about exercise	Z%	Yy [x,y]	Yy [x,y]	X [x, y]

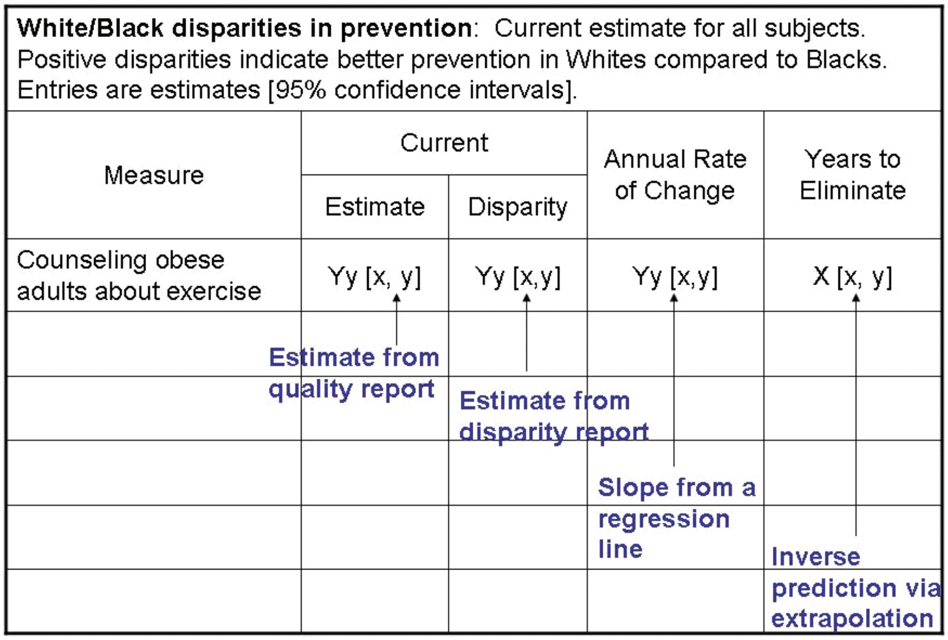
Rate of best performing state (or other applicable unit)

Estimate from quality report

Slope from a regression line

Inverse prediction via extrapolation

DISPARITY TEMPLATE



White/Black disparities in prevention: Current estimate for all subjects. Positive disparities indicate better prevention in Whites compared to Blacks. Entries are estimates [95% confidence intervals].

Measure	Current		Annual Rate of Change	Years to Eliminate
	Estimate	Disparity		
Counseling obese adults about exercise	Yy [x, y]	Yy [x,y]	Yy [x,y]	X [x, y]

Estimate from quality report

Estimate from disparity report

Slope from a regression line

Inverse prediction via extrapolation

Alternately, these data can be transformed into graphic displays that illustrate the nation's current performance on each measure and estimate how long it would take to reach desired goal levels, whether defined as an aspirational goal or one grounded in benchmark levels of attained performance for a given measure. These would likely be line graphs showing projections, but other useful displays could be derived as well. It is anticipated that presenting the data in such a way that quantifies and brings attention to the extent of a quality or disparity gap will focus the attention of the reports on changes the nation can make and aspires to achieve, rather than focusing on past performance. Going forward, these types of messages are what the committee would like to see.

Because benchmarks could potentially move from one reporting year to another (indeed, benchmarks will ideally improve as quality improves rather than remains stagnant even among the highest performers), the question arises as to how to indicate progress when a benchmark is a not a fixed target. One could compare national average performance to the benchmark in the baseline year and then indicate that expectations have risen over time since the best attained performance is now set at a higher level. For example, the average national performance level in the baseline year might be 70 percent, the benchmark of best attained performance 80 percent, and the estimate is that it will take 10 years for the nation to achieve the 80 percent level. In year three, the national performance is now 75 percent, the benchmark of best attained performance has risen to 85 percent, and it may again be estimated that it will take 10 years for the nation to achieve the newly established benchmark. In year three, progress can be reported compared with the baseline year (movement from 70 to 75 percent), the curve of a trend line can be noted to have improved, and higher expectations can be set because some entity has shown that is possible to achieve 85 percent. Alternately, when and if specific goals are set, they are likely to be more fixed targets, and progress could be assessed against those fixed targets and computations of how long to reach the targets could be provided to that threshold.

The Future Directions committee thought it wise to set goal levels of performance for states or other entities that were informed by actual achievement so that they are not dismissed as unrealistic. Benchmarking units could be states, hospitals, health plans, population groups, amongst other units (see Chapter 6 for further discussion).

Assessments of Current Presentation of Statistics in Select Sections in the 2008 NHQR and NHDR

The Future Directions committee had a statistical expert review portions of the NHQR and NHDR; the commentary follows. Presentation in the reports will have to balance the needs of a variety of users for simpler exposition and statistical clarity and precision; some of the statistical information would add to the clarity of the exposition, and more detailed statistical information might be presented in online appendixes.

National Healthcare Quality Report, 2008, Chapter 2. Effectiveness (Heart Disease)

- *Page 52:* In this overview of statistics for this condition, it is unclear whether the number of deaths listed is the number of deaths due to heart disease or the number of people who had heart disease and died.
- *Figure 2.15 (Adult current smokers with a checkup in the last 12 months who received advice to quit smoking, 2000-2005):* Separate estimates are graphed here for each year and connected with solid lines. It appears that there is an attempt to infer longitudinal patterns without actually going to the trouble of the estimation process. A statistical model that links the annual estimates could supply more information than simply connecting the dots. Additionally, it would be useful to know the sample sizes examined—it should be noted.
- *Page 53:* In the supporting text of Figure 2.15, it is not clear whether the statement regarding the 18-44 age group is a statistically significant finding or if it is based on observation of the point estimates alone. A statistical test or estimate would be helpful. Without knowing the sample sizes, it seems that the trend is non-linear and this may be additional information worth noting.
- *Figure 2.16 (Adults with obesity who were told by a doctor they were overweight, 2002-2006):* In this figure, data are aggregated over the period 2003-2006. It is not clear why the data are not reported annually—either a rationale for aggregating would be helpful for the reader, or simply presenting the latest data year of

information would be sufficient. Additionally, the number of adults contributing to each stratum (overall, and by age group) should be reported.

- *Figure 2.17 (Adults with obesity who ever received advice from a health provider to exercise more, 2002-2005):* There are several comparisons made in this graphic: temporal changes and age group differences. There are no measures of uncertainty for the various point estimates and these could easily be incorporated (sufficient statistics are the point estimates and the standard errors; the barplot really only shows the point estimates).
- *Figure 2.19 (Hospital patients with heart attack who received recommended hospital care: overall composite and six components, 2002-2004 (Medicare) and 2005-2006 (all payers)):* The denominator indicates patients hospitalized with a principal diagnosis of acute myocardial infarction (AMI) but the denominator should change depending on eligibility criteria. For example, the sample sizes for the angiotensin converting enzyme (ACE) inhibitor measure should only include those who are eligible for ACE.
- *Figure 2.20 (Deaths per 1000 adult hospital admissions with acute myocardial infarction, 1994, and 2000-2005):* As with other figures in this chapter, point estimates should be accompanied by estimates of error. Again, the connecting lines imply a desire to examine trends over time; a statistical model that smooths the estimates across time would be useful. The title should indicate "in-hospital deaths;" length of stay should be reported given it has changed over time, and, because the dependent variable is in-hospital mortality, this change in exposure period may confound any observed differences.
- *Figure 2.21:* Similar comments to those for Figure 2.19.
- *Figure 2.22 (State variation: Hospital patients with heart failure who received recommended hospital care, 2006):* In this figure, it is unclear what messages are intended to be conveyed. If the main message is about geographic variation in receipt of recommended hospital care by state, then it is unclear as to what constitutes an "above average" measure of variation by looking at the figure alone. The national average and some range of values for state performance should be noted on the figure itself, not just stated in the supporting text. The supporting text for this figure on page 61 reports observed variation of 74.3% to 94.5% across the states. However, the denominators in the calculations vary across states, and this fact should be addressed in any inferential (comparative) statement. From the figure, because the states have different sizes (areas), the shading may distort the message. Additionally, as discussed in Chapter 6, the color coding is not as intuitive as may be expected (green usually means "go" or "good"; black is often associated with "bad" results; but that is not the meaning here). In terms of estimation, it is not clear how the data were analyzed (e.g., simply aggregated the number of met measures divided by the number of opportunities within a state; or averaged the hospital-specific opportunity scores within a state; or did something different). Finally, the choice of "average" deserves some justification.

National Healthcare Quality Report, 2008, Chapter 6. Efficiency

- *Page 135:* The term "expenditure" should be defined for the reader.
- *Figure 6.1 (Average annualized percentage changes in national health care expenditures and quality for general population and people with selected conditions, 2001-2005):* Text indicates quality and expenditures are "two very different measures" (p. 136) yet they are included on the same graph in the figure. This sends a confusing message. If the two aspects are very different, and the reader is subsequently cautioned in the supporting text not to draw conclusions regarding the relationship between the two, then they should not be presented together in the same graphic.
- *Page 137:* The term "cost" should be defined for the reader.
- *Figure 6.2 (National trends in potentially avoidable hospitalization rates, by type of hospitalization, 1997 and 2000-2005):* Because data points for years 1998 and 1999 are not available, the graphic should start at 2000. While the graphic includes several time points, the statistical test on page 139 utilizes only two time points (either the difference between 2000 and 2005 or the difference between 1997 and 2005). It is unclear why the report does not use regression modeling to estimate the actual trends rather than testing

the difference between two time points given all the data that are available. The number of hospitals used in the calculations should be reported.

- *Figure 6.3 (Total national costs associated with potentially avoidable hospitalizations, 1997 and 2000-2005):* Because data points for years 1998 and 1999 are not available, the graphic should start at 2000. The number of hospitals used in the calculations should be reported. The statement in the supporting text on page 139 indicates that costs due to avoidable hospitalization were 35 percent greater than in 1997. If this is a statistically significant finding, it should be noted. And if it is a statistically significant finding, then the type of test used should be noted. Some measure of accuracy in costs per year in the figure should be reported (the number of avoidable hospitalizations changed across the years and this should be reflected in the graphic).
- *Table 6.1 (Rehospitalizations for congestive heart failure, per 1,000 initial admissions for CHF, 9 States, 2004 and 2005):* The information in this table is somewhat perplexing. For example, the standard errors that are reported are either 0 or 1, which are suspicious for two reasons. First, the errors of two orders of magnitude are smaller than the rates, which may mean they are not reported on the same scale as the rates (the rates are per 100,000 admissions). Second, it seems that some rounding errors must have occurred, as a standard error of 0 is unlikely. If none occurred, then some explanation for this value in the results would be informative. Important information from the table is missing such as the sample sizes (number of initial congestive heart failure [CHF] admissions) per state (and the number of hospitals per state). The text (page 142) indicates an overall rate (210 per 100,000 admissions)—inclusion of the overall rate in the table would be helpful. Additionally, it appears that no covariates were included in these calculations. For clarity, define the outcome more explicitly: is it re-hospitalization for CHF within 3 months of discharge of an initial CHF hospitalization?
- *Figure 6.4 (Average estimated relative hospital cost efficiency index for a selected sample of urban general community hospitals, 2001-2005):* This figure reports estimated relative hospital cost efficiency indices for 1,368 general community hospitals. The numbers in this figure are challenging to interpret mainly due to the lack of a clear explanation of what each number means. Specifically, what is 100.03 (reported in 2002), and is 110.48 a clinically meaningful increase? Because each number is estimated based on data, the standard errors (or confidence intervals) should be displayed so the reader is not misled by measurement error. Finally, it is not clear at all how the index accounts for quality (page 142) as it appears to be based on costs and not on quality.
- *Table 6.2 (Correlates of hospital cost efficiency):* This table reports correlates of hospital cost efficiency for the 1,368 general hospitals. However, the sample sizes are not reported in the table for either the number of hospitals or the number of discharges; the interpretation of the estimates is unclear (for example, what is an operating margin?); and the table reports standard deviations presumably among the hospitals falling into each quartile, but not the standard error of the actual estimates.

Case Study 3: National Healthcare Disparity Report, 2008, Chapter 2. Quality of Health Care (Heart Disease)

- *General note on this chapter:* Because of the importance of the specific subgroups of interest, data completeness and comparability for race, income, and education variables are important to report. For example, some states that contribute to the HCUP data may have large proportions of missing race/ethnicity data. Moreover, some states ask patients to identify their race and ethnicity, and some determine race and ethnicity from observation.
- *Page 54:* Similar to the observation raised for the overview of statistics for this condition in the NHQR, it is unclear whether the number of deaths listed here is the number of deaths due to heart disease or the number of people who had heart disease and have died. It is also unclear why the format for this overview is different from that in the NHDR. It would make most sense for the statistical overviews for the same conditions were the same in both reports.
- *Figure 2.13 (Adults with obesity age 20 and over who were told by a doctor they were overweight, by race/ethnicity, income, and education, 1999-2002 and 2003-2006):* The number of observations in each

category should be reported or the point estimates need to be accompanied by confidence intervals. There are many comparisons listed on page 58, and it is not clear if each is statistically different. This lack of clarity arises as the word "significantly" is only stated for Blacks. The committee is not pushing for many statistical tests, rather clarity on the findings as stated.

- *Figure 2.14 (Adults with obesity who ever received advice from a health provider to exercise more (top left), ethnicity (top right), income (bottom left), and education (bottom right), 2002-2005):* As with other figures, the standard errors or the sample sizes should be reported in order for readers to attempt to eliminate sampling variability.
- *Page 60 (Last Paragraph):* It is stated that the goal is to identify the independent effects of the various factors on quality of health care. It is highly unlikely that "independent" effects were estimated for the specific factors considered (race, income, education) as these factors are highly correlated.
- *Figure 2.15 (Adults with obesity who ever received advice from a health provider to exercise: Adjusted odds ratios, 2002-2005):* Because these odds ratios are estimates, the standard errors of each should be displayed. For example, is the odds ratio for females different from 1.0? There are many comparisons in the single barplot, and some of the main messages get lost.
- *Figure 2.16 (Composite measure: Hospital patients with heart failure who received recommended care, Medicare only by race/ethnicity, 2002-2004 (left) and all payer 2005-2006 (right)):* As with the other figures displaying point estimates over time, either the sample sizes or standard errors should be included. By connecting the lines, there is an implication that trends over time are important, yet these are not estimated.

Appendix I

An Illustrative Funding Example

When Congress mandated the production of the national healthcare reports in 1999, it did not provide dedicated funding to the Agency for Healthcare Research and Quality (AHRQ) for this purpose. Currently, the report-related effort is funded within AHRQ at an annual cost of approximately $3.7-$4.0 million. The Future Directions committee has recommended numerous improvements to the NHQR, NHDR, and their related products. The committee is cognizant of federal fiscal restraint and exercised diligence when weighing recommendations that would require additional funding. The committee concluded, however, that monitoring health care quality and disparities is an essential part of improving the nation's health care system, and that such monitoring should be done well. Therefore, the committee recommends (in Chapter 7) that although some of its recommendations can be implemented with existing funds, additional funds are needed to support the expanded activities in this report. Although the committee was not tasked with providing specific budgetary amounts, in this appendix, the committee provides one illustrative example of how its recommendations might be funded.

To implement the improvements for the NHQR, NHDR, and related products, the committee's illustrative funding scenario proposes a $5.5 million increase in AHRQ funds (Table I-1). The committee recognizes that this would be a substantial increase over current funding, but discusses how this increase would be used to transform the report products, engage national and state policy makers and other actors, strengthen performance metrics, improve data, and support the processes the committee has described.

The committee provides this estimate to convey the scale of the overall increase thought necessary. The committee developed this estimate by considering the major tasks to be accomplished and assessing the potential costs based on AHRQ's current expenditures and the committee's own experience with activities of a similar scope. An increase of this amount would give AHRQ a total budget of approximately $9.5 million for report-related activities. In the FY 2009 omnibus appropriations bill, AHRQ's budget was $372 million, and the request for AHRQ in FY 2010 is the same. Thus, an increase in funding for AHRQ of this amount represents about a 1.5 percent increase in the overall AHRQ budget.

The speed of implementation will determine if all funds enumerated in the proposed example would be required in the initial year, and progress on activities thereafter would determine whether each increase would be required annually and indefinitely. As an example, the National Advisory Council for Healthcare Research and Quality (NAC) Technical Advisory Subcommittee for Measure Selection might complete the bulk of the prioritization analyses on measures within a couple of years calling for less frequent meetings and/or the sub-

TABLE I-1 Example of New Funding for AHRQ Related to the National Healthcare Report Endeavor

New Funding for AHRQ	
Additional staff and resources for upgrades to reports and State Snapshots	$0.75
Online updates and new products (e.g., fact sheets, mini-reports on special topics, User Guide), user tools for direct data access and customizing reports, and dissemination planning	1.25
Convening the Technical Advisory Subcommittee for Measure Selection to AHRQ's National Advisory Council for Healthcare Research and Quality (NAC)	1.0
Contracting related to applying quantitative techniques to measures	1.0
Developing measures and data sources	1.0
Evaluation of the report effort	0.5
TOTAL new annual funds for AHRQ	$5.5 million

committee may benefit from prioritization analyses conducted by other funded groups such as the National Quality Forum and thus may require less funding to contract for services.

In calendar year 2010, with a modest increase in staffing and resources ($750,000), AHRQ could include numerous upgrades in the 2010 NHQR, NHDR, and State Snapshots (which would be released in early 2011). While a major portion of this may go toward reconfiguring the reports themselves in the initial year, in subsequent years, a greater portion would be available for data acquisition and analysis, including substate analyses and more in-depth analyses related to priority populations. AHRQ at present spends about $1.6 million of its $3.7-$4.0 million budget on data acquisition and analysis.[1] Another $1.25 million may be required for upgrades to Web-based resources, additional products, and enhanced dissemination activities.

It is estimated that $1 million would be required to staff the Technical Advisory Subcommittee for Measure Selection within the existing structure of AHRQ's NAC. As indicated in Chapter 7, this technical advisory subcommittee should be established in calendar year 2010 to begin planning for the assessment of measures. In addition, AHRQ may need additional funds ($1 million) specifically dedicated to hiring staff or for contracting for the systematic review and analyses required to apply quantitative techniques to assess how much closing gaps in performance would benefit the overall health of the nation and of specific population groups. Funds should be dedicated to measure and data source development; the $1 million suggested is a relatively small investment given the costs of developing data systems, and the committee discusses in Chapter 7 the need for multiple partners to support the development of the health care data infrastructure. Finally, $500,000 may be needed by AHRQ to ensure an adequate evaluation of report-related efforts.

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[1] Personal communication, Ernest Moy, Agency for Healthcare Research and Quality, November 8, 2009.

Appendix J

Committee Member and Staff Biographies

COMMITTEE BIOGRAPHIES

Sheila P. Burke, M.P.A., R.N. (*Chair*), is a faculty research fellow at the Malcolm Weiner Center for Social Policy, John F. Kennedy School of Government, Harvard University, as well as a senior public policy advisor for Baker, Donelson, Bearman, Caldwell & Berkowitz. Having received her M.P.A. from the Kennedy School in 1982, she returned in 1996 to serve as executive dean through June 2000. She was chief of staff to former Senate Majority Leader Bob Dole (1985 to 1996) and deputy staff director of the Senate Committee on Finance (1982 to 1985), having previously been a professional staff member of the committee (1979 to 1982). Ms. Burke holds a B.S. in nursing from the University of San Francisco and worked as a staff nurse in Berkeley, California. She is a member of the Institute of Medicine of the National Academy of Sciences, as well as a fellow of the National Academy of Public Administration and the American Academy of Nursing. Ms. Burke serves on the adjunct faculty at Georgetown University, on the board of trustees of the Kaiser Commission on the Future of Medicaid and the Uninsured, the board of directors of the Association of American Medical Colleges, the board of directors of the Bipartisan Policy Commission, and on a number of corporate boards. She previously served as a member of the Medicare Payment Advisory Commission, as a member and chair of the board of the Kaiser Family Foundation, and as a member of a number of corporate boards.

Ignatius Bau, J.D., is a program director at the The California Endowment, a private statewide health policy foundation. He focuses on issues of language access, cultural competency, health workforce diversity, reduction of health care disparities, and health information technology and currently oversees grants to national quality, health care accreditation, and health professions educational organizations, as well as to hospitals and health systems, health plans, physician organizations, community health centers, health professions educational institutions, and community-based organizations throughout California. Mr. Bau previously worked as a program manager and policy director at the Asian and Pacific Islander American Health Forum (APIAHF) and as a staff attorney at the Lawyers' Committee for Civil Rights of the San Francisco Bay Area. Mr. Bau and the APIAHF led community efforts that resulted in the creation of the White House Initiative on Asian Americans and Pacific Islanders, and Mr. Bau was the principal author of the first report from the President's Advisory Commission on Asian Americans and Pacific Islanders. Mr. Bau has served on the board of directors of numerous organizations, including Funders for Lesbian and Gay Issues, the National Minority AIDS Coalition, the Northern California Coalition for Immigrant and Refugee Rights, the Asian and Pacific Islander Wellness Center, and the California Budget Project. He has served on several government committees, including the President's Advisory Council on HIV/AIDS, the Centers for Disease Control and Prevention's National HIV Prevention Planning Group, and the California Department of Health's Task Force on Multicultural Health. He has been a member of the Institute of Medicine's Forum on the Science of Health Care Quality Improvement and Implementation, the Joint Commission Public Advisory Group, the National Quality Forum Work Group on Minority Healthcare Quality Measurement, and several technical advisory committees for the California Health Interview Survey.

Anne C. Beal, M.D., M.P.H., is president of the Aetna Foundation. Previously, she was assistant vice president for The Commonwealth Fund's Program on Health Disparities. That program seeks to improve quality and reduce disparities in health care for low-income and racial/ethnic minority patients by promoting quality improvement innovations and addressing barriers to quality improvement adoptions that would benefit the underserved. Dr. Beal is also the chair of the New York State Minority Health Council. Prior to joining The Commonwealth Fund, Dr. Beal was a health services researcher at the Center for Child and Adolescent Health Policy at Massachusetts General Hospital. In addition, she was associate director of the Multicultural Affairs Office, an attending pediatrician within the division of General Pediatrics, and an instructor in pediatrics at Harvard Medical School. Dr. Beal's research interests include social influences on preventive health behaviors for minorities, racial disparities in health care, collection of race/ethnicity data, and quality of care. Dr. Beal serves on the advisory boards for many organizations, has been a reviewer for the Health Systems Research study section of the Agency for Healthcare Research and Quality, and was recently appointed as co-chair of the Healthcare Disparities Technical Advisory Panel for the National Quality Forum's Ambulatory Care Measures Project.

E. Richard Brown, Ph.D., is the founder and director of the UCLA Center for Health Policy Research and a professor at the UCLA School of Public Health. He received his Ph.D. in sociology of education from the University of California, Berkeley. Dr. Brown has studied and written extensively about a broad range of issues and policies that affect the access of disadvantaged populations to health care. His recent research focuses on health insurance coverage, the lack of coverage, and the effects of public policies, managed care, and market conditions on access to health services, particularly for disadvantaged populations, ethnic minorities, and immigrants. Dr. Brown and the UCLA Center for Health Policy Research's studies of health insurance coverage, uninsurance, and eligibility for public programs have been used by California's governors, legislators, and advocates in crafting health insurance legislation and programs. Dr. Brown is the principal investigator for the California Health Interview Survey (CHIS), one of the nation's largest ongoing health surveys. CHIS uniquely provides statewide and local-level estimates for California's diverse population and covers a broad range of health issues, including health status and conditions and access to health care.

Marshall H. Chin, M.D., M.P.H., F.A.C.P., a professor of medicine at the University of Chicago, is a general internist with extensive experience improving the care of vulnerable patients with chronic disease. Dr. Chin is director of the Robert Wood Johnson Foundation's (RWJF's) Finding Answers: Disparities Research for Change National Program Office, a major effort to reduce racial and ethnic disparities in health care. In addition, he is associate director of Chicago's National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)-supported Diabetes Research and Training Center; associate chief and director of research in the Section of General Internal Medicine; and co-director of the John A. Hartford Foundation Center of Excellence in Geriatrics. Over the past 10 years, Dr. Chin and his partners from the MidWest Clinicians' Network consortium of community health centers have engaged in a series of studies funded by AHRQ, NIDDK, and the RWJF to improve the quality of diabetes care in health centers that serve the indigent. These multifactorial, community-based interventions include rapid quality improvement, chronic disease management, provider training in behavioral change, and patient empowerment interventions. Dr. Chin performed a national evaluation of the federal Health Resources and Services Administration Bureau of Primary Health Care's Health Disparities Collaboratives, the most comprehensive effort to improve the quality of care in health centers yet to be undertaken. He was a member of the Institute of Medicine Forum on the Science of Health Care Quality Improvement and Implementation. Currently, Dr. Chin is leading the evaluation of a Commonwealth Fund project that is implementing the patient-centered medical home in safety net clinics across five states. He is also improving diabetes care and outcomes on the South Side of Chicago through health care system and community interventions. Dr. Chin is a graduate of the University of California at San Francisco School of Medicine and completed residency and fellowship training in general internal medicine at Brigham and Women's Hospital, Harvard Medical School.

José J. Escarce, M.D., Ph.D., is a professor of medicine at the David Geffen School of Medicine at UCLA and a Senior Natural Scientist at RAND. Dr. Escarce graduated from Princeton University, earned a master's degree in physics from Harvard University, obtained his medical degree and doctorate in health economics from the University of Pennsylvania, and completed his residency in internal medicine at Stanford University. Dr. Escarce has served on the National Advisory Council for Health Care Policy, Research, and Evaluation of the U.S. Department of Health and Human Services, and he currently serves on the National Advisory Committee of the Robert Wood Johnson Foundation Minority Medical Faculty Development Program. He was a member of the Institute of Medicine Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care, and the IOM Committee on Envisioning the National Health Care Quality Report. Dr. Escarce's research interests include racial and ethnic disparities in health care, access to care, provider, and patient behavior under economic incentives, technological change in medicine, and the impact of managed care on costs and quality. Away from health care, Dr. Escarce is vice president of the board of education of the public school district in Santa Monica, California, a small urban district in which more than one-third of the students are Hispanic.

Kevin Fiscella, M.D., M.P.H., is a tenured professor of family medicine and community & preventive medicine at the University of Rochester School of Medicine and associate director of the Rochester Center to Improve Communication in Health Care. Most of his research has focused on racial/ethnic and socioeconomic disparities in health and health care. He is currently directing major projects sponsored by the National Institutes of Health, the National Institute of Child Health and Human Development, and the Robert Wood Johnson Foundation (RWJF) related to racial/ethnic disparities in health care or health. His work relates to the development and implementation of quality measures to assess health care for vulnerable populations and the use of quality improvement to address these disparities. Mr. Fiscella was a member of the Institute of Medicine committee that developed the framework for the *National Healthcare Disparities Report,* and he now serves on advisory groups for the American Medical Association, the RWJF, Aetna, the National Committee for Quality Assurance, the National Council on Interpretation in Health Care, and the Minority Health Institute. He has prepared commissioned reports on disparities in health care and use of quality measures for the Agency for Healthcare Research and Quality, the National Quality Forum, the RWJF, Physicians for Human Rights, and the Harvard Civil Rights Project.

Elliott S. Fisher, M.D., M.P.H., is professor of medicine and community and family medicine at Dartmouth Medical School and director of the Center for Health Policy Research in the newly established Dartmouth Institute for Health Care Policy and Clinical Practice. He has recently taken over leadership of the Dartmouth Atlas of Health Care, which provides national and regional information on the performance of the U.S. health care system. He is a member of the Institute of Medicine (IOM), served on the IOM committee that recently released reports on performance measurement and pay for performance, and is currently co-chair of the National Quality Forum committee developing recommendations for a national framework for measuring and improving the efficiency of U.S. health care.

Dawn M. Fitzgerald, M.Sc., M.B.A., is chief executive officer of QSource. She began her tenure at QSource in 1999 as a consultant and held various leadership positions, including vice president/director of the Underserved Quality Improvement Organization Support Center before her appointment as chief operating officer in 2001. She has served on several National Quality Forum panels, the most recent being the 2006 Technical Advisory Panel on Ambulatory Measures of Healthcare Disparities. Ms. Fitzgerald has served on the America for Healthcare Quality Association's e-Health Advisory Panel and the Centers for Medicare and Medicaid Services' QIO Evaluation Committee. Ms. FitzGerald has coauthored more than a dozen articles on quality improvement efforts and analysis of Medicare data and received numerous awards recognizing her leadership capacities. She holds an M.B.A. from the University of Memphis and an M.S. in developmental psychology and gerontology from the University of Florida.

Foster Gesten, M.D., is medical director for the Office of Health Insurance Programs in the New York State Department of Health. Dr. Gesten provides clinical direction and leadership for a team of professionals engaged in quality oversight, performance measurement, and clinical improvement in New York. Major initiatives include the development of statewide public reporting systems for commercial, Medicaid, and child health managed care programs on quality, access, and satisfaction. Dr. Gesten is a co-investigator for a Centers for Disease Control and Prevention grant addressing asthma from a public health perspective, and he developed a state-initiated program directed at improving the delivery of prevention services to adolescents. He serves on the Managed Care Technical Advisory Group for the Centers for Medicare and Medicaid Services, and he is a member of the National CAHPS Benchmarking Database Advisory Group, the Committee on Performance Measurement at the National Committee for Quality Assurance, and the Ambulatory Care Performance Measures Steering Committee at the National Quality Forum. Dr. Gesten was trained in general internal medicine at Brown University.

Brent C. James, M.D., is the vice president for medical research and the executive director of the Institute for Healthcare Delivery Research, Intermountain Healthcare. Dr. James is known internationally for his work in clinical quality improvement, patient safety, and the infrastructure that underlies successful improvement efforts, such as culture change, data systems, payment methods, and management roles. He is a member of the Institute of Medicine (IOM) and participated in many of that organization's seminal works on quality and patient safety. He holds faculty appointments at the University of Utah School of Medicine (Family Medicine and Medical Informatics), Harvard School of Public Health (Health Policy and Management), Tulane University School of Public Health and Tropical Medicine, and the University of Sydney, Australia, School of Public Health. Intermountain Healthcare is an integrated system of 23 hospitals, almost 100 clinics, a 450+ member physician group, and an HMO/PPO insurance plan jointly responsible for more than 450,000 covered lives serving patients in largely rural states (Utah, Idaho) and, at a tertiary level, seven surrounding states.

Jeffrey Kang, M.D., M.P.H., is the chief medical officer for CIGNA Corporation. CIGNA's mission is to improve the health, well-being, and security of the members it serves. Dr. Kang is responsible for clinical strategy and policy, coverage policy, quality measurement and improvement, value-based purchasing and design of CIGNA's Health Advocacy programs. Dr. Kang is an internist and geriatrician whose career began as the executive director of the Urban Medical Group, a nonprofit, private group practice specializing in the care of the frail, elderly, and disabled. From 1994 to 2002, he worked for the federal government, first as a White House Fellow and then as the chief medical officer and director of the Office of Clinical Standards for the Centers for Medicare and Medicaid Services (formerly the Health Care Financing Administration). In addition to working at CIGNA, Dr. Kang is currently the president of the eHealth Initiative, based in Washington, DC.

David R. Nerenz, Ph.D., is the director of the Center for Health Services Research at the Henry Ford Health System, Detroit, Michigan. He is also the director of outcomes research at Henry Ford's Neuroscience Institute. Dr. Nerenz received his doctorate in social psychology from the University of Wisconsin-Madison in 1979. From 1980 to 1984, he did research at the Wisconsin Clinical Cancer Center and was coordinator of health services research for the William S. Middleton Veterans Hospital in Madison. From 1984 to 1986, he was director of the Veterans Administration's Great Lakes Regional Health Services Research and Development Service Field Program in Ann Arbor. He has been at the Henry Ford Health System since 1987. For the past 10 years, Dr. Nerenz has led a series of demonstration projects on health plans' collection and use of data on race and ethnicity to eliminate disparities in quality of care. His areas of expertise include performance measures for health care organizations; racial/ethnic disparities in quality of care; and use of patient-reported outcomes data to assess and compare health care providers.

Sharon-Lise T. Normand, Ph.D., is professor of health care policy (biostatistics) in the Department of Health Care Policy at Harvard Medical School and in the Department of Biostatistics at the Harvard School of Public Health. Her research focuses on the assessment of quality of patient care through causal inference, provider profiling, meta-analysis, and latent variable modeling. Dr. Normand has developed analytic approaches for comparing providers using outcomes and process-based measures, and for determining the appropriate unit of analysis (e.g., hospital-level or physician-level analysis). She is the director of Mass-DAC, the data-coordinating center responsible for collecting, analyzing, and reporting on the quality of care for adults discharged following a cardiac procedure from all nonfederal hospitals in Massachusetts. Dr. Normand earned her A.B. and M.S. degrees in statistics from the University of Western Ontario and her Ph.D. in biostatistics from the University of Toronto. She is a fellow of the American Statistical Association, the American College of Cardiology, and the American Heart Association.

Christopher Queram, M.A., is president and chief executive officer of the Wisconsin Collaborative for Healthcare Quality. As president and CEO, he is responsible for the development of the strategic direction and a sustainable business model for a multi-stakeholder consortium of organizations dedicated to improving the quality and cost-effectiveness of health care for the people of Wisconsin. The Wisconsin Collaborative's core value proposition emphasizes the development and public reporting of comparative performance information and the design and sponsorship of quality improvement initiatives for its member organizations. Previously, he was CEO at the Employer Health Care Alliance Cooperative (The Alliance), where he was responsible for establishing the strategic direction and operating plan for a health care purchasing cooperative owned by more than 160 member companies. Major functions of The Alliance include provider contracting, data management and reporting, consumer education, and employer/provider quality initiatives. Mr. Queram is also responsible for fulfilling the public policy and community education mission of the Wisconsin Collaborative for Healthcare Quality.

Sarah Hudson Scholle, M.P.H., Dr.P.H., is responsible for overseeing the development and implementation of the research agenda of the National Committee for Quality Assurance (NCQA). Dr. Scholle is a health services researcher and previously served as associate professor of psychiatry at the University of Pittsburgh. Her research interests focus on assessing quality of health care, addressing cultural competence and disparities, and evaluating practice systems and patient experiences of care. At NCQA, Dr. Scholle has led a variety of projects to understand disparities in health care and opportunities for addressing cultural competence and disparities in quality measurement and the evaluation of health care organizations. Her projects have developed standards for health plans related to culturally and linguistically appropriate services (CLAS), identified innovative efforts by health plans to address health care disparities and CLAS, provided technical support and financial assistance to small practices undertaking quality improvement efforts related to CLAS/disparities, and examined the feasibility of reporting Healthcare Effectiveness Data and Information Set cardiovascular disease measures stratified by gender and race/ethnicity. Dr. Scholle has led NCQA's efforts to adapt programs for assessing the patient-centered medical home and is leading performance measurement efforts in child health and depression. At the University of Pittsburgh, she helped initiate the Magee-RAND Women's Health Initiative, developed a tool for assessing women's satisfaction with primary care, and helped develop interventions in care management for postpartum depression and a motivational interviewing program for domestic violence victims. Dr. Scholle has published papers on a variety of topics in leading health care journals and serves as chair of a scientific merit review committee for the Veterans Administration Health Services Research and Development Program. Dr. Scholle received her bachelor's degree in history and master's degree in public health from Yale University and her doctorate in public health from the Johns Hopkins University School of Hygiene and Public Health.

Paul M. Schyve, M.D., is the senior vice president of The Joint Commission and is knowledgeable of requirements for language access in hospitals and disability issues. Prior to joining The Joint Commission in 1986, Dr. Schyve was the clinical director of the Illinois Department of Mental Health and Developmental Disabilities. Dr. Schyve received his undergraduate degree (Phi Beta Kappa) and his medical education and residency in psychiatry at the University of Rochester. He has held a variety of professional and academic appointments in the areas of mental health and hospital administration, including director of the Illinois State Psychiatric Institute and clinical associate professor of psychiatry at the University of Chicago. Dr. Schyve is certified in psychiatry by the American Board of Psychiatry and Neurology and is a distinguished life fellow of the American Psychiatric Association. A founding advisor of Consumers Advancing Patient Safety, the chair of the Ethical Force Oversight Body of the Institute of Ethics at the American Medical Association, a former trustee of the United States Pharmacopeial Convention, and a former member of the board of directors of the National Alliance for Health Information Technology, he has published in the areas of psychiatric treatment and research, psychopharmacology, quality assurance, continuous quality improvement, health care accreditation, patient safety, the role of language, cultural competence, and health literacy in communication, and health care ethics.

STAFF BIOGRAPHIES

Michelle Bruno, M.P.P., was a senior program associate of the Institute of Medicine's Board on Health Care Services until February 2010. She joined the IOM in 2007 and contributed to a range of significant reports, including *Resident Duty Hours: Enhancing Sleep, Supervision, and Safety; Retooling for an Aging America: Building the Health Care Workforce*; and *Opportunities for Coordination and Clarity to Advance the National Health Information Agenda*. Prior to joining the IOM, Ms. Bruno completed her master's degree in public policy with a dual concentration in health policy and public and nonprofit management at the Georgetown Public Policy Institute.

Cassandra L. Cacace, B.S., is a research assistant for the Board on Health Care Services, who has assisted on a variety of projects, including the Subcommittee on Standardized Collection of Race/Ethnicity Data for Healthcare Quality Improvement, the Committee on Planning a Health Care Continuing Education Institute, the Committee on Optimizing Graduate Medical Trainee (Resident) Hours and Work Schedule to Improve Patient Safety, and the Forum on the Science of Health Care Quality Improvement and Implementation. She graduated cum laude from the George Washington University in May 2006 and is currently pursuing her master's degree in public health with a concentration in health policy from the George Washington University School of Public Health and Health Services.

Roger C. Herdman, M.D., is the director of the Institute of Medicine's Board on Health Care Services. He was born in Boston and graduated from Phillips Exeter Academy, 1951; Yale University, magna cum laude, Phi Beta Kappa, B.S., 1955; Yale University School of Medicine, MD, 1958. He interned at the University of Minnesota and served as a medical officer in the U.S. Navy, 1959-1961; thereafter, he completed a residency in pediatrics and continued with a medical fellowship in immunology/nephrology at Minnesota. Between 1966 and 1979, Dr. Herdman held the positions of assistant professor and professor of pediatrics at the University of Minnesota and the Albany Medical College. In 1969, he was appointed director of the New York State Kidney Disease Institute in Albany. From 1969 to 1977, he served as deputy commissioner of the New York State Department of Health, with responsibility for research, departmental health care facilities, and the Medicaid program. In 1977, he was named New York State's director of public health. From 1979 until joining the U.S. Congress's Office of Technology Assessment (OTA) in 1983, he was a vice president of the Memorial Sloan-Kettering Cancer Center in New York City. In 1983, Dr. Herdman was named assistant director of OTA; he was subsequently named acting director and director of OTA from January 1993 to February 1996. After the closure of OTA, Dr. Herdman joined the National Academy of Sciences' Institute of Medicine as a senior scholar, and subsequently served as director of the National Cancer Policy Board (from 2000 to 2005) and the National Cancer Policy Forum (from 2005 to 2007). Dr. Herdman was appointed director of the Board on Health Care Services in October 2007.

Bernadette McFadden, M.Sc., joined the Institute of Medicine as a research associate in November 2008. Since that time, she has staffed projects on the redesign of continuing education for health professionals; the qualification of biomarkers in chronic disease; and the standardization of race, ethnicity, and language data. She currently works with the Committee on Future Directions for the National Healthcare Quality and Disparities Reports. Prior to joining the IOM, she completed a master's degree in social research at Trinity College Dublin and worked for Dublin City Council's Homeless Agency, where she edited a volume of essays on homelessness in Ireland and authored a report on how the city's management of public space impacts homeless persons. She graduated summa cum laude, Phi Beta Kappa, from Dickinson College in Carlisle, Pennsylvania. While in central Pennsylvania, she conducted research on local effects of implementing Medicare Part D and the state's long-term care policies, interned with the Executive Policy Office of the Pennsylvania Department of Health, and served as a board member on the United Way of Cumberland County. Her interests in health policy developed while serving as an AmeriCorps teacher in an Atlanta public school.

Cheryl Ulmer, M.S., is a senior program officer for the Board on Health Care Services in the Institute of Medicine. She served as co-director of the *Resident Duty Hours: Sleep, Supervision and Safety* project and director of *Race, Ethnicity, and Language Data for Health Care Quality Improvement*. Before joining the IOM, she worked as an independent consultant on a wide-ranging set of health care issues, but with a primary focus on the delivery and content of health care services, disparities in health status and quality of care across populations, and options for financing and insurance. Previous consulting work for the IOM included surveying chief executive officers of state Quality Improvement Organizations and providing writing/editing services on the *Pathways to Quality* and the *Consequences of Uninsurance* series. Other illustrative independent consulting projects include: *Serving Patients with Limited English Proficiency: Results of a Community Health Center Survey* (National Association of Community Health Centers [NACHC], The California Endowment and National Health Law Program, 2007); *Giving Back and Moving Forward: Finding a Future Through Service in Community Health Corps* (NACHC, 2006); *Changing Lives through Service to Medically Underserved Communities* (NACHC and Corporation for National Service, 2005); *Assessing Primary Care Content: Four Conditions Common in Community Health Center Practice—Hypertension, Diabetes, Otitis, Asthma* (Health Resources and Services Administration [HRSA], 2000); *The Role of Behavioral Factors in Achieving National Health Outcomes* (Robert Wood Johnson Foundation, 2004); *Schools as Health Access Points for Underserved Children and Adolescents: Survey of School-based Programs* (NACHC, Centers for Disease Control and Prevention, and HRSA, 2003). Ms. Ulmer has served as a senior associate with MDS Associates, a health care consulting firm with public and private sector clients, as well as in various positions within the U.S. Department of Health and Human Services, including the Office of the Secretary, Assistant Secretary for Planning and Evaluation/Health; the Health Services Administration; the Health Resources Administration; Medicaid Services; and the National Institutes of Health. She has a master's degree from Georgetown University and a B.S. from Mary Washington College of the University of Virginia.