Economics and mental health: the current scenario

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Economics and mental health are intertwined. Apart from the accumulating evidence of the huge economic impacts of mental ill-health, and the growing recognition of the effects that economic circumstances can exert on mental health, governments and other budget-holders are putting increasing emphasis on economic data to support their decisions. Here we consider how economic evaluation (including cost-effectiveness analysis, cost-utility analysis and related techniques) can contribute evidence to inform the development of mental health policy strategies, and to identify some consequences at the treatment or care level that are of relevance to service providers and funding bodies. We provide an update and reflection on economic evidence relating to mental health using a lifespan perspective, analyzing costs and outcomes to shed light on a range of pressing issues. The past 30 years have witnessed a rapid growth in mental health economics, but major knowledge gaps remain. Across the lifespan, clearer evidence exists in the areas of perinatal depression identification-plus-treatment; risk-reduction of mental health problems in childhood and adolescence; scaling up treatment, particularly psychotherapy, for depression; community-based early intervention and employment support for psychosis; and cognitive stimulation and multicomponent carer interventions for dementia. From this discussion, we pull out the main challenges that are faced when trying to take evidence from research and translating it into policy or practice recommendations, and from there to actual implementation in terms of better treatment and care.

Key words: Economic evaluation, cost-effectiveness, cost-benefit, cost-utility, return on investment, mental health policy, depression, psychosis, dementia

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Mental health economics has developed rapidly over recent decades. From an earlier "age of innocence", with apparently little recognition of resource scarcity by the research community, to a phase of "unbridled criticism", which rejected economics as having any legitimate role to play in evaluating treatment and care, the field has moved on noticeably[1].

There was perhaps an era of "undiscriminating utilization", characterized by methodological imprecision, poor quality data and over-hasty generalizations, but progress has now been made (in some countries at least) towards a more constructive development of questions and more robust answers. In terms of numbers, the cumulative total of reports on economic evaluation of mental health care and treatment has grown from approximately 100 in 1999 to over 4,000 in 2019.

Changes in mental health economics are far greater than suggested simply by these numbers. Developments are shown, for example, by research focus and journal interest moving beyond the mere parading of cost-of-illness (COI) numbers to a more discerning discussion of findings from cost-effectiveness and other economic evaluations. There are also wider demands for economics, motivated not only by commercial interests (e.g., of pharmaceutical companies) or cost-saving imperatives (e.g., of governments), but also by the need to inform a wide range of strategic, clinical, preventive, purchasing and person-centred decisions. Better data are available to feed into economic evaluations and associated investigations, including from birth cohorts, more ambitious epidemiological surveys, clinical trials with embedded economic components, and from provider or purchaser administrative records.

There are also better evaluative methods. The best-selling book on health economic evaluation has gone through four editions since 1987, more than doubling in size, and capturing the many developments in this area of study[2]. As well as improved empirical techniques, health economic evaluators are showing greater readiness to explore inequalities[3]. Another notable development has been inclusion of different outcomes, such as for dyads and family members and hedonic well-being, as well as more critical interrogation of the validity of quality adjusted life year (QALY) measures. Most importantly, recent years have seen the findings from economic evaluations having greater impacts, and there are now burgeoning opportunities for applying economic evidence to promote mental health policy or practice change in many countries.

These developments warrant a review and reflection on mental health economics. Despite encouraging progress, large evidence gaps still exist regarding the economic case for many areas of mental health treatment and care, with evidence also unevenly distributed globally and transferred sluggishly across health care, social care, and other implicated systems. In this paper, we provide an overview of current knowledge in mental health economics, describe evidence gaps and recent research trends, recommend areas for further research, and set out recommendations for policy and practice.

Economics and mental health are intertwined in multiple ways. We begin by discussing why economics is relevant in mental health, and setting out the main types of economic evaluation appropriate for interventions and their implications. Evidence is arranged according to mental health needs by points on the life course and diagnostic categories of mental, behavioural or neurodevelopmental disorders. This reflects the structure of how most such evidence is currently available and organized, and in using this approach we do not necessarily imply validity of diagnostic categories, as this topic is beyond the scope of this review. We offer a succinct rather than comprehensive summary of

this knowledge base, drawing out a range of issues and identifying both challenges and potential solutions at methodological, policy and practice levels. Throughout, readers will be directed to further readings and recent review papers for specific topics.

Despite rapid growth in cost-effectiveness and related studies in recent years, some areas nevertheless remain unexplored. We conclude by mentioning some of these gaps, and with a wider discussion of the main challenges that often emerge when attempting to move from empirical economic evidence to recommendations for strategic policy and for clinical action. We also set out a few possible responses to these challenges.

WHY ECONOMICS IS RELEVANT

Economics concerns the production, distribution and consumption of goods and services. Its relationship with mental health is bi-directional and complex.

On the one hand, the huge impact of mental ill-health on economics – through its deleterious consequences, such as productivity losses and heavier use of resources for treatment – is increasingly recognized with the help of disease-burden and COI studies. The latter aggregate the direct and indirect costs generated by a condition. These personal and economic consequences could affect the entire life course, and spillover into family and wider community impacts[4]. In 2011, the World Economic Forum projected that, by 2030, mental ill-health will account for more than half of the global economic burden attributable to non-communicable diseases, at US$6 trillion[5].

On the other hand, economic disadvantage is associated with a greater likelihood of mental illness, possibly through greater exposure to risk factors (e.g., social exclusion) and poorer access to protective factors (e.g., education), or a complex downward spiral (e.g., entanglement of poverty, treatment costs, employment difficulty; the so-called "drift" hypothesis)[6,7]. The European Psychiatric Association recently issued guidance on mental health and economic crises in Europe[8], based on a review of 350 articles, highlighting the need for policy approaches to tackle the complex, sizeable impacts.

Given that resources are scarce, and with an aim to maximize health and well-being, economic analyses are needed alongside effectiveness evidence for decision-makers to identify the best options in deploying available resources[7]. In some high-income countries, economic evaluation is now an almost obligatory component of any evaluation in health services research[4]. In the UK, for example, health technology appraisal mechanisms require formal cost-effectiveness evaluation to inform reimbursement and coverage, and to develop clinical guidelines such as those issued by the National Institute for Health and Care Excellence (NICE)[4].

Economic analyses commonly used in mental health intervention studies include cost-effectiveness analysis (CEA), cost-utility analysis (CUA), and cost-benefit analysis (CBA). They differ one from another in terms of outcome measures (see Table 1).

CEAs focus on clinical or similar indicators such as specific symptoms or disabilities. Results from CEAs can help decision-makers by providing information on the additional cost of achieving an incremental improvement in an outcome measure (using a so-called incremental cost-effectiveness ratio, ICER). Unless there is clear evidence that an intervention improves outcome and simultaneously reduces cost, however, decisions essentially boil down to empirically-informed value judgements that cannot be solely addressed with economic evidence (or clinical evidence, for that matter).

Results from CUAs, usually expressed in cost per QALY gained, could be used to support such value judgments, with some countries having an agreed QALY threshold (e.g., £20,000 per QALY

Table 1 Main types of health economic evaluation

	Outcome measures	Comments
Cost-minimization analysis	None – Outcomes are assumed equivalent across interventions.	Limited use unless outcome evidence is convincing.
Cost-effectiveness analysis (CEA)	A single ("primary") outcome measured in "natural" units, such as symptoms *or* independence.	Limited by focus on a single outcome, but any recommendations from the study will be unambiguous.
Cost-consequences analysis (CCA)	Multiple outcomes measured in "natural" units, such as symptoms *and* independence *and* health-related quality of life.	Can capture all outcomes. Recommendation not always straightforward because outcomes might point in different directions.
Cost-utility analysis (CUA)	Generic, utility-based measure such as QALYs. Studies using DALYs are similar.	Findings can be used for strategic decision-making in the health sector. QALY or DALY measures might be too generic, and so miss the nuances of intervention effects in the mental health field.
Cost-benefit analysis (CBA)	Monetary values of outcomes, plus any savings in budgets.	Findings can be used for strategic decision-making across all policy sectors, but very difficult to monetize mental health outcomes.
Well-being economic evaluation	Subjective (probably hedonic) well-being.	Findings can be used for strategic decision-making across all policy sectors, but generic indicator (well-being) might miss nuances of intervention effects.

QALYs – quality adjusted life years, DALYs – disability adjusted life years

in the UK[9], and US$50,000 per QALY in the US[10]), although not without controversy. The QALY is an example of a generic outcome measure intended to be relevant across different disorders, and so to support more strategic decision-making within the health system, for example when allocating budgets between clinical specialties or making strategic decisions about priorities within a national health care system. By their very nature, generic measures such as QALYs – or disability adjusted life years (DALYs), which are more commonly used in low- and middle-income country (LMIC) contexts – cannot capture all of the subtleties of an individual condition or its treatment, and so are most usefully employed alongside rather instead of effectiveness measures in economic studies.

CBA requires outcomes to be valued in monetary terms. From a societal and public mental health perspective, it provides results expressed in net benefits (change in the monetary value of effects minus change in costs). CBAs are inherently difficult to do in mental health contexts, since there is no easy way to calculate what a reduction in symptoms or an improvement in independence would be worth in dollars, euros or other currencies.

Return on investment (ROI) analysis has recently being recommended by the World Health Organization (WHO) and the United Nations Development Program (UNDP) for making an investment case for mental health[11]. Many but not all of the "best practice" interventions had previously been subjected to WHO CHOICE (CHOosing Interventions that are Cost-Effective) analysis. ROI is a broad term that covers different types of analysis. The Methodological Guidance Note for this WHO/UNDP approach chooses to recommend a form of CBA: the monetary values attached to mental health outcomes could be seen as somewhat crude, but help to locate discussion of resource allocation to address mental illness in a broader economy-wide context.

Examples of these types of economic evaluations will appear throughout this paper, although we mainly discuss cost-effectiveness and cost-utility studies.

BEYOND DISEASE BURDEN

Evidence on the societal economic burden of mental health issues is instrumental in gaining the attention of policy-makers (especially those in non-health domains), by calculating the scale of the "problem", and in highlighting the mismatch between mental health burden and resource allocation.

Recent analyses using COI and value of statistical life (VSL, valuation based on willingness-to-pay to avoid certain risks) approaches have suggested a global cost of mental, neurological and substance use (MNS) disorders of US$2.5 trillion and US$8.5 trillion in 2010, respectively. Using the value of lost output or economic growth approach, which takes into account DALYs, the cumulative global economic impact of MNS was estimated at US$16.3 trillion between 2011 and 2030[5]. This huge economic impact exceeds cardiovascular disease, chronic respiratory disease, cancer and diabetes in its contribution to global burden of disease.

The current estimate of global median expenditure on mental health, however, is only US$2.5 per person annually (ranging from US$0.1 to US$21.7 across WHO regions), accounting for less than 2% of government health expenditure globally[12]. This low expenditure is a major reason for the wide gap between mental health needs and provision of intervention[4].

The gap is particularly wide in LMICs. In a recent analysis of data from 30 countries in the WHO Region of the Americas, for example, a ratio between mental health burden and expenditure ranging from 3:1 to 435:1 was reported[13], which was correlated with gross domestic product (GDP) after adjusting for purchasing power parity, with lower-income countries particularly affected by the imbalance.

There are a few successful examples in which these types of evidence on disease burden and COI have been used to raise public awareness and to lobby policy-makers in prioritizing resources to advance mental health care. For example, estimates of the global economic impact of dementia[14] were pivotal in recognition of the problem as a public health priority in 2012[15], and the subsequent G8 Dementia Summit, government policy briefs[16], and the creation of the World Dementia Council in 2013.

From a decision-maker perspective, however, evidence on disease burden and costs alone has limited use. It can certainly raise awareness of overall impact, but it does not offer recommendations of what needs to be done in response, whether in terms of treatments, care services, prevention and so on. Decisions need to be based on affordability, for example (requiring budget impact studies or cost-offset studies) and "value-for-money" information to guide public spending (requiring economic evaluation studies that consider both cost and outcomes).

Full economic evaluation, in this sense, is essential to help decision-makers understand how to make more efficient use of available resources, and is the primary focus of this paper. Wider issues regarding financing mental health care, such as tax-funded, universal health care provision, are complex, requiring strategies that involve trade-offs between affordability, targeting, access, equity and efficiency[4]. Again, therefore, there is a role for cost-effectiveness and associated evidence.

CURRENT ECONOMIC EVIDENCE AND KEY EVENTS IN MENTAL HEALTH CARE

Maternal mental health

Perinatal mental health is a good illustration of the potential "spillover" and "external" effects, and thus the wider economic impacts, of treatment and care in mental health. A recent review on cost-effectiveness of perinatal interventions for depression and/or anxiety looked at studies published between 2000 and 2017[17]. All eight studies reviewed targeted depression in postnatal mothers, while only one study included anxiety and fathers in the evaluation. Only four studies reported cost-utility findings to allow broader strategic comparison.

The authors concluded that screening-plus-treatment pro-

grammes are likely to be seen as cost-effective, with a cost per QALY ranging from £8,642[18] to £15,666[19]. These figures compare well with the cost-per-QALY threshold associated with NICE (£20,000), suggesting that the approach would be seen as representing value for money in the use of health care resources in England. Indeed, these findings probably underestimate the economic impacts of perinatal mental health care and treatment: the studies reviewed had a maximum time horizon of 2 years, and mostly only looked at health and social care costs rather than a wider societal perspective.

It is well known that perinatal depression can significantly affect child development up to 16 years of age[20]. These consequences are associated with substantial costs. An economic modelling study in the UK showed that 72% of the total costs of perinatal mental health problems is related to the child, and health and social care costs accounted only for £0.5 billion of a total annual cost of £8.1 billion[21]. Many of the costs are associated with productivity losses, education, criminal justice and quality of life deficits. Estimated total cost of one case of perinatal depression was the substantial sum of £73,822[21]. Economic evaluations that also consider the effects on the child would therefore provide further justification of treatment and care. These wider effects are, however, seldom included in current studies[4].

Economic evaluations of preventive strategies are emerging[22]. In a 2016 report on preventing postnatal depression[23], the authors concluded that midwifery-redesigned postnatal care may be cost-effective for universal prevention; and person-centred approach (PCA)-based and interpersonal psychotherapy (IPT)-based interventions for indicated prevention. More recently, health visitor training for women at risk of depression[19] has been evaluated for lower-risk women, with results suggesting high cost-effectiveness in preventing postnatal depressive symptoms[24]. Research into these promising areas is needed for more conclusive recommendations.

Other economic evidence gaps in this area include perinatal anxiety, antenatal depression, and interventions for fathers[17], as well as interventions in lower-resource settings. The latter is particularly needed, given that economic evidence generated in high-income areas is often not applicable. For example, although screening-plus-treatment programmes were shown to be cost-effective[17], this was based on evidence from high-income countries.

Routine screening in LMICs may overwhelm a weak health system and not represent the best use of resources[25]. Different service models, such as task-shifting, may also be needed. For example, psychosocial interventions delivered by non-specialists in antenatal health care facilities have demonstrated effectiveness in LMICs, although cost-effectiveness data are lacking[26].

Child and adolescent mental health

Mental health problems in childhood and adolescence are similarly associated with wide and enduring clinical and economic impacts. Progress in economic evidence development in this area remains slow. More evidence is available on psychosis early intervention[27], which often also covers an adult population and is reviewed later in this paper.

A 2014 review[28] noted a publication rate of all cost-related papers of approximately 10 per year between 2009 and 2014, with most studies coming from the US or UK. The author concluded that most questions concerning the economic implications of care and treatment for child and adolescent mental health (what, when, where, to whom, and how) remain unanswered, leaving stakeholders with insufficient information to support resource allocation decisions. The lack of cost-effective evidence is similarly noted in another recent review[29] and a report in 2016 on new economic evidence around the potential impact of youth mental health services[30].

Economic evidence is available for depression treatment in adolescents, although it remains inconclusive whether selective serotonin reuptake inhibitors (SSRIs) alone or SSRI plus cognitive behavioural therapy (CBT) is more cost-effective[28], with two earlier randomized controlled trials (RCTs) providing conflicting evidence[31,32]. In another review, the authors noted that, in children and adolescents, CBT is unlikely to be cost-effective compared with medication[33]. When CBT is used as second-line intervention for depressed young people declining antidepressants, a recent RCT has suggested dominance of CBT over treatment as usual by the end of 24 months, but not 12 months[34].

What can be noted from these studies is again the importance of time horizon, especially as economic evaluations embedded within RCTs usually have short follow-up periods. In one of these studies with follow-up at 12 and 36 weeks, the cost-effectiveness findings reversed between the two time-points: the shorter follow-up suggested SSRI treatment was more cost-effective, whereas the longer follow-up showed that SSRI plus CBT was more cost-effective[32,35]. An illustrative example of the enduring impact of childhood mental health problems is the long-term consequences of bullying that can be observed in adulthood, requiring long-term follow-up to understand the economic aspects of interventions on these consequences[36,37].

A recent literature review of economic evaluations published between 1997 and 2014 in the UK National Health Service (NHS) Economic Evaluations Database and other sources focused on attributes of care systems (i.e., excluding pharmacological or individual psychological therapies). Forty studies with both costs and outcomes of youth mental health care were identified[27]. These interventions targeted a wide range of mental health problems, including anxiety, depression, eating disorders, psychosis, substance use disorders, unspecified mental health problems, forensic mental health, and suicide and self-harm. Common attributes of interventions with favourable economic evidence were timely assessment strategies (including screening) and family-based interventions, although for the latter some variations existed as to whether there were other more cost-effective alternatives. Methodological problems in the literature were highlighted, including a narrow evaluation perspective, with none of the reviewed studies taking both a societal and a health care perspective[27].

A narrow health care perspective would miss a large part of the overall cost implications in addressing child and adolescent

mental health needs, which include impacts in the education and justice systems, and on families and employment[28]. For example, in a 2017 UK report that included 15 studies, the 3-year mental health-related costs in young people aged 12 to 15 years averaged £1,778 per individual per year; 90% of this cost fell to the education sector[30]. The spillover effects of child and adolescent mental health on carers and family, given the evolving dependency relationship between the child and family members, is also significant yet understudied[38].

Some recent developments can be noted to address the paucity of economic evidence in this area. In 2017, the Greenwich Expert Group proposed directions for future research focusing on LMICs, to make suggestions for "a cost-effective mental health care system that optimally improves the future outcomes of children and adolescents"[39].

Economic evaluation can now be seen as an integral component in major youth mental health initiatives, such as headspace (the National Youth Mental Health Foundation) in Australia[40]. Recognizing the cost implications of childhood mental health problems in adulthood, managed transition from child and adolescent to adult mental health service is being evaluated in the UK, with an embedded CUA as the primary economic analysis, in an ongoing nested cluster RCT[41].

Depression and other common mental disorders

As one of the most well-studied interventions for depression and anxiety, CBT has been frequently evaluated in economic analyses. In a systematic review of CUA from 22 studies published between 2004 and 2012 on CBT for major depressive disorder, the authors concluded that most studies showed "acceptable incremental cost-utility ratios"[33].

More specifically, the review suggested that individualized CBT is likely to be cost-effective both in combination with medication compared with medication alone and as standalone therapy compared with usual care, community referral, or bibliotherapy. Individualized CBT is also not inferior to medication (SSRIs and tricyclic antidepressants, TCAs), with interventions involving individualized CBT either being dominant or showing an ICER ranging from US$1,599 to US$46,206 per QALY.

For group CBT, similar results were suggested, with group CBT being cost-effective compared with SSRIs, TCAs, usual care, and bibliotherapy. Results for computerized CBT were more mixed. One of the limitations highlighted is the relatively short time horizon in the reviewed studies (average 19 months), bearing in mind that time to recovery in depression could be much longer[33].

More recently, research has suggested behavioural activation (BA) as a potential alternative to CBT that is less dependent on the skills of the therapist, which would be important for implementation in settings where mental health human resources are particularly scarce (e.g., many LMICs). In a recent trial comparing the cost and outcome of BA versus CBT, the authors found BA to be more cost-effective[42]. In their sensitivity analyses, with both wider societal perspectives (e.g., including productivity losses) and narrower perspectives (e.g., mental health service) considered, BA had a high probability of dominating and of being cost-effective at a willingness-to-pay threshold of £20,000-30,000 per QALY.

An issue related to better use of resources, especially highly skilled specialist human resources, is the cost-effectiveness of stepped care[43] or (stepped) collaborative care[44]. These have recently been reviewed, although evidence remains inconclusive, due partly to methodological issues (e.g., use of QALY as outcome measure, and a wide range of time horizons, from 6 to 24 months) and partly to the heterogeneity of these models.

In the review of studies on cost-effectiveness of stepped care for the prevention or treatment of depression and/or anxiety, four studies focused on treatment. The pooled analysis suggested cost-effectiveness of stepped care over care as usual in the treatment of anxiety but not depression[43]. In the review of 19 studies of (stepped) collaborative care for depressive disorders, cost-effectiveness ranged very widely: from dominance to an ICER of US$874,562 per QALY[44].

In 2016, Chisholm et al[45] published an ROI analysis on scaling up treatment for depression and anxiety in 36 countries between 2016 and 2030. The authors used projection modelling to investigate the treatment effects of depression and anxiety disorders, taking into consideration the economic outcomes of returning to work, absenteeism, and presenteeism rates, and suggested a benefit-to-cost ratio of 2.3-3.0 to 1, or 3.3-5.7 to 1 when the value of health returns (monetized healthy life years gained) was also considered. Not all benefits have been captured in this analysis, however, such as reduced welfare support, treatment and adherence for related physical health problems (e.g., coronary heart disease), and improved outcomes for family members and others who may be affected[45].

The monetary values attached to healthy life years might also generate some discussion. While savings in public finances from increased productivity and healthy life years when treating these common mental disorders may not be the primary concern of the mental health service sector that finances these treatments (i.e., silo mismatch, in which interventions may have impacts in multiple sectors, leading to a need to find cross-agency compensation arrangements – see below), there are probably large enough health care savings to cover the intervention costs.

Based on England's Improving Access to Psychological Therapies (IAPT) experience, which costs a one-off £650/person on average, Layard and Clark[46] argued that it "costs nothing" to the government. This argument was based on the consideration that 1% of the working age population is on disability benefits (and therefore paying reduced taxes) due to anxiety and depression, costing the government £650 per person-month, and, if they also require physical health care, the extra health care cost would be £750 per person-year for those not on IAPT. Scaled-up evidence-based psychological therapies would therefore, they argue, pay for themselves even if account was only taken of welfare benefits and health care costs[46].

Psychosis and other severe mental illnesses

Since deinstitutionalization in many countries dating back to the 1970s, to the introduction of early intervention services (EIP) around the 1990s, and the more recent recovery movement, severe mental illnesses (SMIs) have been at the forefront of major developments in mental health care and treatment, as well as a focus of economic evaluation. The complexity and chronicity of SMIs, however, pose challenges in both clinical and economic research, with large evidence gaps remaining with regard to the cost-effectiveness of these services.

Several meta-analyses have shown EIP to be effective in reducing costly outcomes such as hospitalization, bed-days and relapse rate, and in improving school or work involvement, as compared with treatment as usual[47-49]. A 2014 report published by Rethink Mental Illness[50] suggested that EIP and community-based interventions generate economic gains mainly by their effects on relapse, reduced need for expensive care, and wider recovery outcomes (e.g., employment, housing, and physical health).

Using analytical models to compare EIP with care as usual for people with first-episode psychosis[51], results showed that EIP could save around £2,000 per person over 3 years because of improved employment and education outcomes, and approximately £1,000 per person over 4 years because of reduced suicide rates. More recently, a systematic review of 16 studies found consistent evidence of cost-effectiveness of EIP in people with first-episode psychosis or clinical high risk for psychosis, compared with care as usual[52].

However, the authors cautioned that the evidence was of moderate methodological quality, with significant heterogeneity, and came mainly from high-income countries. In LMICs, for example, it remains unknown whether specialist EIP would be practicable and similarly cost-effective. There are also unanswered questions regarding service duration, delivery, and other parameters[53] of this complex intervention that could have clinical and cost implications.

Some economic evidence is available on interventions with more specific treatment targets, such as CBT for psychosis, medication adherence interventions, and supported employment. In a recent Health Technology Assessment report that included a systematic review on the cost-effectiveness of individual or group CBT for psychosis[54], six RCTs with economic evaluation were identified, which covered both people with first-episode psychosis and chronic or treatment-resistant psychosis.

Compared with treatment as usual (interventions that typically involve medication, counselling, community care, and case management), adding CBT for psychosis dominated for symptom or functional improvement. Two of the studies that included QALY as an outcome found an ICER ranging from £1,455 to £18,844 per QALY gained. However, the time horizons of these studies were short: between 9 and 18 months only. The authors of the report, therefore, conducted a microsimulation modelling study using a decision analytic model, with a time horizon of 5 years, concluding that adding CBT to usual treatment for people with psychosis again appeared to be a cost-effective option.

Among interventions that promote antipsychotic medication adherence, a strategy involving financial incentive has been evaluated favourably for cost-effectiveness. In a cluster RCT, people with schizophrenia, schizoaffective disorder or bipolar disorder were paid a modest financial incentive of £15 per depot injection. Results showed a cost of £982 to achieve a 20% increase in medication adherence and £2,950 for achieving "good" adherence, suggesting that this is likely to be seen as a cost-effective intervention[55].

For supported employment, the model with most economic evidence is Individual Placement and Support (IPS). In an RCT with CEA across six European countries, IPS led to better outcomes in terms of both days worked in competitive settings and percentage of people who worked at least 1 day, with results suggesting it to be almost certainly more cost-effective than standard vocational rehabilitation services[56].

In a review of 15 RCTs on the generalizability of IPS within and outside of the US[57], while noting a higher rate of competitive employment rate in the US than non-US studies (62% vs. 47%), the authors concluded that there are consistent positive outcomes that strongly favour IPS internationally. One of the economic considerations is the enormous costs associated with developing and maintaining non-competitive job programmes, which are usually borne by governments. Together with tax-exemption arrangements, these alternative supported employment programmes are often unsustainable economically.

Employment is an important target not only for the economy but also for a personal recovery goal or outcome. A recent paper on recovery and economics[58] reviewed the economic evidence for a range of recovery-focused approaches, including peer support, personal budgets, self-management, welfare and debt advice, joint crisis plans and advance directives, supported housing, and recovery colleges. Albeit patchy in terms of methodological robustness, available economic evidence does consistently support a recovery-focused approach.

This movement towards personal recovery poses questions about meaningful outcome measures, from clinical, economic and policy perspectives. In a systematic review of 59 studies on economic models and utility estimation methods in schizophrenia[59], the majority of models used QALYs or DALYs as value drivers, while others used Positive and Negative Syndrome Scale (PANSS) scores as the basis of utility estimations.

As noted in another systematic review on EIP, indicators that are more valued and relevant to people, health and care systems, and policy makers – such as social recovery, budget impact analyses, and equity measurements – are beginning to be included in the research agenda[52], although issues such as non-cashable savings and silo mismatches would be some of the foreseeable challenges with these outcome measures (see below).

Mental health in older persons: dementia and depression

Dementia care and intervention strategies are wide-ranging, including those targeting the person and/or the family or other

unpaid carers. Although cost-effectiveness studies were once considered "rare"[60], economic evidence is beginning to flourish. There is now good economic evidence concerning anti-dementia medications, antipsychotics and antidepressants. With cholinesterase inhibitors becoming available at generic price, more recent analyses show that they are more cost-effective as monotherapy than placebo ("best supportive care"), and probably also cost-saving for people with mild-to-moderate Alzheimer's disease (AD)[61].

For people with moderate-to-severe AD, a recently published trial offered new economic evidence. The cost-effectiveness of donepezil continuation compared to discontinuation was demonstrated when looking at each of a number of outcomes – cognition, functioning (activities of daily living), and QALYs – and whether costs measured only health and social care service use or additionally unpaid care[62]. It also reduced the risk of nursing home placement after 1 year (but not 4 years)[63].

There is very little other economic evidence on the cost-effectiveness of combinations of medications for treating AD. There is no economic case for using antidepressant medication to treat people with AD who have comorbid depression. The most thorough study of antidepressant medication for people with probable or possible AD and comorbid depression was the Health Technology Assessment Study of the Use of Antidepressants for Depression in Dementia (HTA-SADD) trial[64]. The economic evaluation embedded within the trial found no significant differences in costs for any hospital-based or community health or social care services between the groups over 39 weeks[65]. There were also no differences in QALYs over this period.

Similarly, there is no economic case for using antipsychotic medications to treat the psychological and behavioural symptoms of dementia. The strongest evidence comes from the Clinical Antipsychotic Trial of Intervention Effectiveness-Alzheimer's Disease (CATIE-AD) study, conducted across 42 US sites. This trial looked at the clinical and economic case for three widely used antipsychotics (olanzapine, quetiapine and risperidone) compared to placebo using a double-blind RCT design that included people with AD who experienced hallucinations, delusions or agitation. Costs over a 9-month period were lower for the placebo group than for any of the groups treated with antipsychotics[66]. The only outcome difference found in the trial was that placebo was better than olanzapine in relation to activities of daily living. In other words, antipsychotic treatment was not cost-effective.

The 2018 NICE guidelines[67] on interventions to promote cognition, independence and well-being recommended offering "a range of activities to promote well-being that are tailored to the person's preferences" and "group cognitive stimulation therapy to people living with mild to moderate dementia". Relevant economic evidence for these two recommendations is available from studies on cognitive stimulation therapy (CST) and tailored activity program (TAP).

Economic evaluations of group CST[68] and maintenance CST[69] found that the intervention is good value for money, as the improvements in cognition and quality of life were large enough, while the additional cost for providing CST is relatively modest. The latter appears to be most cost-effective in those living alone and/or having better cognition[70]. Cholinesterase inhibitors enhance the effects of maintenance CST and improve its cost-effectiveness[69].

Using simulation modelling, NICE conducted an economic analysis of CST, with results showing an ICER under £20,000 per QALY[71]. For TAP, an earlier cost-effectiveness analysis suggested an ICER of US$2.37 per day for the carer to save one hour in doing things for the person with dementia, and US$1.10 per day to save one hour in being "on duty".

Good evidence is also available for multicomponent carer support programmes, such as the STrAtegies for RelaTives (START) in the UK and the Resources for Enhancing Alzheimer's Caregiver Health (REACH, and the newer REACH II) in the US.

Carers in the START programme used fewer services in the first 8 months, which offset the cost of the programme. When considered together with other positive outcomes, START is cost-effective in the short term[72]. The long-term follow-up results have just become available. At 6-year follow-up, carer mental health outcomes were better in the intervention group, but neither patient-related nor carer-related costs were different between groups[73]. START is therefore clinically effective for at least 6 years without increasing costs.

Findings from the REACH II programme have similarly suggested effectiveness and cost-effectiveness, with ICER analysis showing a US$5 per day for one hour saved from caregiving[74]. Despite these cost-effectiveness findings, some authors have raised concerns about the lack of funding to support wider implementation[75].

The (cost-)effectiveness of dementia care management (DCM) remains inconclusive, due to protocol and research methodological differences (e.g., short observation period, different definition of DCM). In a recent RCT investigating a DCM model involving primary care physicians (Dementia: Life- and Person-Centered Help, DelpHi)[76], results suggested that DCM is cost-effective (dominant) compared with usual care, especially among people with dementia living alone. Reduced hospitalization and delayed institutionalization are likely contributors to this cost-effectiveness finding. The authors, however, noted that their positive findings differed from some previous trials, which could be attributable to the milder cognitive impairment in their sample[76], suggestive of better cost-effectiveness with earlier intervention.

Several studies provide evidence on the cost-effectiveness of care home intervention programmes, including two major trials from the UK: the Managing Agitation and Raising Quality of Life (MARQUE)[77] and the Well-being and Health for people with Dementia (WHELD)[78]. The MARQUE study demonstrated cost-effectiveness in terms of QALY gained, but it was not efficacious in managing agitation[77]. The WHELD intervention, person-centred care that incorporated antipsychotic review, showed benefits in both agitation and quality of life, suggestive of a cost-saving

model even with a relatively small effect size[79]; with the additional cost of the programme offset by the higher health and social care costs in the treatment as usual group[78].

Very few studies have looked at cost-effectiveness of interventions targeting later-life depression. A recent review noted that cost-effectiveness data were available from two stepped care prevention studies, with one study suggesting that stepped care prevention is not cost-effective compared with care as usual, whereas the other showed that the incidence rate of depression and anxiety in older persons was cut by half with the prevention programme, increasing depression/anxiety-free life years at an affordable cost.

The authors noted that, in older populations, economic evaluations would disregard productivity loss, with the assumption that it is irrelevant[43]. With population ageing and the associated increase in prevalence of mental health problems in old age, this raises the question of affordability – even when interventions are cost-effective and potentially worth investing – and more value-laden issues such as inequalities and parity between mental health and physical health[80].

CHALLENGES AND RESPONSES

Challenges

Economic evidence cannot make decisions, but it can make decisions better informed. However, challenges emerge when attempting to move from evidence to recommendations to action to impact (see Figure 1).

The first of these is simply gaps in the evidence base. Despite rapid growth in cost-effectiveness and related studies in recent years, some areas remain unexplored. For example, we have limited understanding beyond the short term of the economic consequences of mental illness or of treatments for it. There are few economic evaluations of ways to protect individual rights or support recovery. Prevention and early intervention also remain relatively neglected[81].

Economics research on families is rare, despite the parts they play in aetiology, support and recovery. There is also little on efforts to address wider societal aspects of mental illness, such as poor awareness, discrimination and stigma[82]. Most glaring of all, of course, is the scarcity of economic evidence in LMICs, as we pointed out in many of the condition-specific sections above.

Even when evidence exists, it may not be robust enough to build reliable policy or practice recommendations. Relatedly, the available evidence may not be transferable from the context in which it was gathered to other contexts (especially to other countries): cost-effectiveness evidence "travels less well" than most clinical evidence.

A second challenge is where an intervention is cost-effective (i.e., generating outcomes considered sufficient to justify the higher costs of achieving them) but is unaffordable because there is no money left in the budget or no suitably skilled staff available to deliver it. This is why strategic decision-makers are always keen to hear about new interventions that achieve equiv-

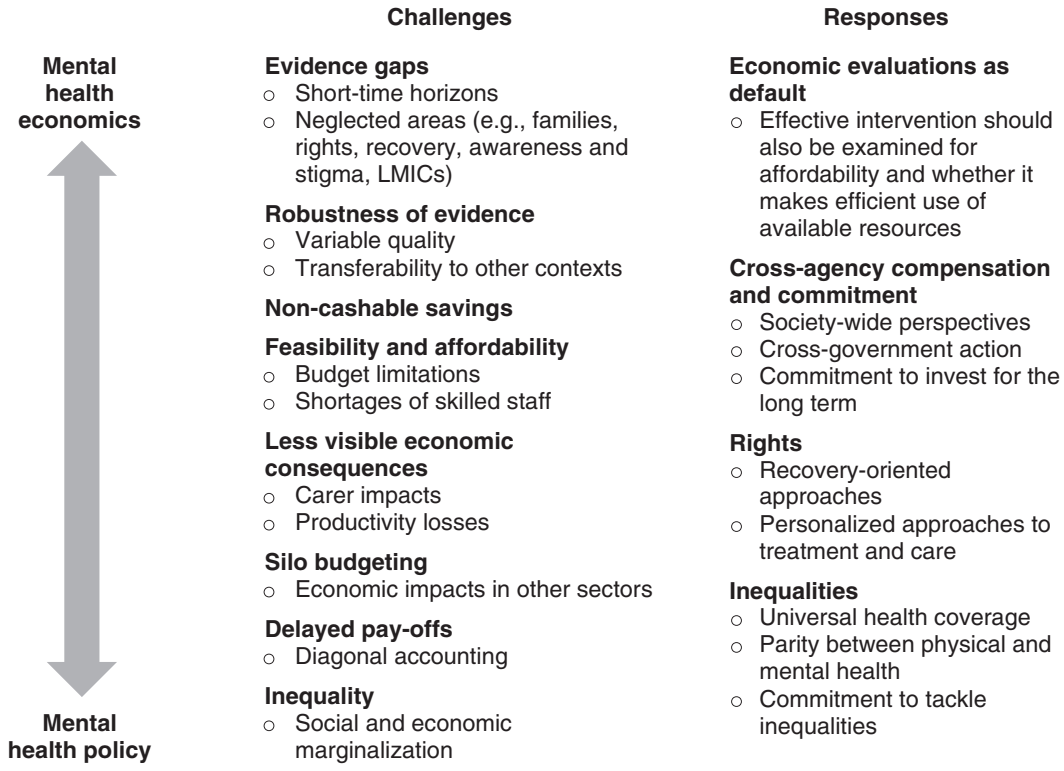

Figure 1 Challenges and responses in mental health economics. LMICs – low- and middle-income countries

alent or better outcomes compared to standard care but at lower cost: hence, for example, interest in BA rather than CBT for depression[42], and the recent finding of cost-savings with DCM, especially among people with dementia living alone[76]. Therapeutic breakthroughs (e.g., medications with new modes of action) may promise disease modification, fewer symptoms or better quality of life, but if they are not simultaneously cost-reducing they put added pressure on already over-stretched health care budgets.

A related challenge is that apparent savings found in a research study might not prove "cashable" in the real world. Early intervention psychosis teams might shorten inpatient stays[47], but will not generate actual savings unless inpatient beds close or staff are shed. Effective support for carers might reduce their time inputs (to which an evaluation might attach costs) or stress levels[73], but might not release resources transferable to other uses.

Effective treatments for mental illness might have substantial consequences outside the immediate treatment setting. There might be cost reductions in other clinical areas if treatment of a mental illness helps patients manage their comorbid conditions better, for example[83]. If different specialties then have separate budgets, it might be hard to align costs and benefits so as to make the treatment appear economically attractive.

More complicated still is when good mental health treatment has its greatest impacts (economic or other) outside the health sector. The highest public sector costs of childhood mental illness are in schools[84], yet treatment is mostly a health care sector responsibility. The biggest cost consequences of perinatal maternal mental illness stem from the risks of long-term emotional, behavioural and cognitive damage to the child[20]. Effective depression treatment has bigger effects on employment-related costs than health care costs[85]. By far the largest long-term cost consequences of childhood conduct disorder are linked to criminality[86]. None of these is surprising, but each generates the potential "silo budgeting" disincentive to choose the most efficient overall course of action.

Some economic effects of mental illness and treatment may be missed. Mental illness may interfere with an individual's ability to complete his/her education, participate in family life, or be fully productive in the workplace. It may impact, as just noted, on the health and wealth of family members and unpaid carers. Although less "visible" in some sense, these effects may nevertheless be pivotal in shaping lives and generating well-being. The challenge is to ensure that economic evaluations measure these wider impacts (i.e., take a societal perspective), and (especially) that users of evaluation findings take these impacts into account in decision-making. For example, ignoring the often considerable economic and other burdens faced by carers could undermine community models of care, whilst ignoring productivity losses in research and policy could harden employer attitudes to mental illness.

The chronicity of many mental illnesses means that their economic consequences could be long-term, and equivalently the full pay-offs from better treatment might not be seen for some years. This makes it harder not only to demonstrate the economic case for prevention, but also to persuade decision-makers working to shorter time-scales (linked, perhaps, to election cycles) to invest now even though the gains eventually could be substantial[87,88]. Together, the challenges of this timing and "silo budgeting" create the pernicious complication of "diagonal accounting": the double disincentive that spending on an intervention by one sector now generates savings (or other benefits) mainly in other sectors and mainly in future years.

The final set of challenges emerging from the growing body of economic evidence relates to the interconnected issues of diversity, disadvantage and discrimination. Published results from research are dominated by what happens on average: mean improvement in the primary outcome, mean cost difference, overall cost-effectiveness ratio, for instance. Those published studies will, of course, also report variations around those averages, yet rarely will there be much discussion of what happens on the margins of the study sample, and even more rarely will there be replicated or reported analyses for subpopulations.

What might be effective or cost-effective on average might be ineffective (perhaps even damaging) or inaccessible for certain cultural or social groups. Economically disadvantaged individuals generally do not have the same access to services as wealthier individuals, especially if payment is required. This is particularly important given that mental illness is strongly linked to social and economic marginalization[89,90]. Yet inequalities – between socioeconomic, religious, cultural, ethnic and other groups, between genders and linked to age – simply do not get the attention they deserve in the economics literature, just as they tend to be ignored in large swathes of the clinical literature.

Responses

What, then, should be the responses? One obvious recommendation to the research community is to build up the evidence base. Indeed, it is pertinent to ask: in what circumstances would it make sense to conduct a clinical trial or other treatment effectiveness study and to *exclude* an economic evaluation component? Somewhere down the track a decision-maker is surely going to want reassurance that an effective intervention is affordable and makes good use of available resources. Given the tiny cost of adding an economics element into (say) a clinical trial, it should be the default option to include a cost-effectiveness or similar analysis, and not the exception.

Mental illness is very much an individual experience and certainly a health sector responsibility, yet it needs society-wide attention and cross-government action. The multiple impacts of mental illness – which could be felt across many aspects of an individual's life – lead to numerous challenges. Different medical specialties need to be better at coordinating their treatments, given that many mentally ill people have other long-term conditions[91]. Different parts of government should not merely be aware of mental illness, but active in its prevention and appropriately responsive when it emerges. This applies to policy in the fields of education, employment, social care, housing, criminal justice, poverty alleviation, social security (welfare) benefits,

community development, immigration and beyond.

Moreover, across different policy domains, efforts need to be made to ensure that individuals do not "fall between the cracks"[92]. This is especially germane with respect to population groups that are already socially or economically marginalized. Mental health policy must include strategies for tackling unacceptable inequalities in ill-health, education and employment-related opportunities, access to treatment and quality of life[89]. In the wider context, this surely argues for universal health coverage and (within it) parity between physical and mental health. Moreover, the heterogeneity of circumstances, experience, outcomes and costs argues for policy frameworks and treatment programmes that recognize and respond appropriately to individual strengths, needs and aspirations[93]. Inter alia, this lends support to recovery-oriented approaches, particularly given the economic evidence in support of them[50], and other modes of devolved decision-making such as personal budgets[94].

Coordination of action across different entities (individuals, families, communities and organizations) as well as across sectors (both public and private) is never easy and may require some form of cross-agency compensation: the "gainers" (those who enjoy short- or long-term savings or other benefits) compensating the "losers" (those whose budgets are used to pay for effective treatment or care). More challengingly, the "gainers" and "losers" need to find ways to overcome the "diagonal accounting" challenge: encouraging investment not only across budgets but for the long term. This is exactly the kind of situation where government needs to step in, playing a strong leadership role in bringing different areas of public policy together and emphasizing (indeed, possibly financing) those investments whose pay-offs are mainly some way into the future.

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