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Original Research Article

Delays in gender affirming healthcare due to COVID-19 are mitigated by expansion of telemedicine

Carmen Kloer [a,1], Holly Christopher Lewis [b,c,1], Kristen Rezak [d,*]

[a] Hansjörg Wyss Department of Plastic Surgery, New York University, New York, NY, USA
[b] Department of Biomedical Engineering, Pratt School of Engineering at Duke University, Durham, NC, USA
[c] General Surgery Residency, Department of Surgery, Duke University Medical Center, Durham, NC, USA
[d] Division of Plastic, Maxillofacial and Oral Surgery, Department of Surgery, Duke University Medical Center, Durham, NC, USA

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ABSTRACT

Background: Gender-affirming healthcare is vital for transgender and gender diverse (TGD) patients, and during the pandemic, accessing healthcare became challenging. Hypothesizing that many had procedures postponed, we sought to characterize the impact of the pandemic on TGD patients.
Methods: A mixed-methods approach was employed, combining surveys and interviews; Duke patients were identified by ICD-10 codes, while non-Duke (national) patients were recruited through online social media.
Results: All specialties increased telemedicine usage during the pandemic. Duke surgical patients reported a nearly three-fold increase in telemedicine access. COVID-19 symptoms were reported by 24% of Duke and 20% of national patients; barriers to urgent care included the fear of discrimination (27%).
Conclusion: Delays were experienced in all domains of care, mitigated in part by telemedicine. Nearly one-third of patients cite discrimination as a barrier to care. Though pandemic-related expansion of telemedicine may be a marker of success, significant barriers still complicate delivery of healthcare.

1. Introduction

The COVID-19 crisis may be the most clinically significant pandemic of the past century; its impact and magnitude has been compared to the Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS), particularly in queer health and global health.[1–4] In the United States, persons at the margins of society including Black, Latinx, lesbian, gay, bisexual, transgender and/or queer (LGBTQ) individuals and persons with inadequate access to food, clothing, shelter or healthcare have been shown to be particularly high risk.[5] As the pandemic began in the spring of 2020, U.S. governors began issuing 'stay-at-home' orders. In North Carolina, this occurred March 30, 2020, mandating all nonessential workers remain at home to mitigate the spread of COVID-19.[6] In the absence of a cohesive federal strategy, significant variation evolved on a municipal and state-by-state basis.[7] For example, although Raleigh and Durham counties issued mask mandates by April 2020, a North Carolina statewide order was not instituted until months later (November 2020).[8] Public health scholars cautioned that policy variations on municipal, county and state levels may contribute to worse spread of disease – particularly in the absence of a cohesive federal strategy.[7] As regulations evolved across the nation, access to diagnostic and therapeutic technologies evolved along lines of race, ethnicity, language, and rural/urban residential status.[5]

The pandemic transformed education, employment and healthcare, forcing most institutions into a teleconferenced economy that found some industries less prepared than others. Healthcare delivery has been no exception, with some sectors responding proactively to develop telemedicine access, whereas other aspects of care (procedural) have been more limited. As one example, the Veterans Administration healthcare system invested $39 million early in the pandemic, increasing telemedicine by 1000% compared to pre-pandemic figures.[9] Oft-beleaguered as inefficient in care delivery,[10] such investment from the VA deserves special commendation, a seminal example of how even large organizations can make agile policy changes when exigent. Other organizations responded by working to triage scarce resources: as part of a national risk-mitigation strategy, the American College of Surgeons (ACS) recommended postponing procedures based on urgency.[11] For

* Corresponding author. Division of Plastic and Reconstructive Surgery, Department of Surgery, Duke University Medical Center in Durham, North Carolina, DUMC 3358, Durham, 27710, USA.
E-mail address: Kristen.Rezak@duke.edu (K. Rezak).
[1] These authors contributed equally to this work.

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Abbreviations

LGBTQ	Lesbian, gay, bisexual, transgender and/or queer
ACS	- American College of Surgeons
ASPS	- American Society of Plastic Surgeons
TGD	- transgender and gender diverse
GIC	- gender incongruence

example, repair of a non-incarcerated inguinal hernia was defined as elective, to be deferred when feasible. As understanding of COVID management improved medical institutions learned to adapt, evolving a tiered system to schedule elective and non-elective cases according to the level of harm that delaying surgery would cause patients. In March 2020, the American Society of Plastic Surgeons (ASPS) joined the ACS to advocate for cessation of elective or non-essential services to reduce the heightened risk of spreading COVID which could lead to thrombotic episodes in patients of all ages.[12] Further, national lack of personal protective equipment required limiting usage, influencing the surgeries being performed and personnel permitted in the hospital.[13] Subsequent guidance from ASPS (August 2020) espoused a triaging system, recognizing "urgency/elective status of a procedure may depend on specific patient circumstances that will necessitate the clinical judgment of the surgeon."[14]

Early in the pandemic, as surgical specialties moved toward triaging operative resources, clinicians in mental health and primary care were also obliged to adapt care delivery models.[15,16] Guidelines for the clinical care of patients with TGD urge an interdisciplinary management team, including medical, surgical and behavioral coordination.[17] A wide variety of specialties comprise these gender affirming interdisciplinary care teams that specialize in behavioral care for gender incongruence, medical care for hormone prescription and monitoring hormone levels, perioperative care and gender affirming surgery. Indeed, COVID-19 presented the capacity to disrupt all aspects of care for transgender and gender diverse (TGD) patients.

Available literature regarding COVID-19 indicates patients with pre-existing comorbidities such as diabetes, cardiovascular disease, liver disease, and immunocompromised persons are at high risk for severe illness from COVID-19.[18] TGD persons are five times more likely to be living with HIV compared to the general population and therefore may have a compromised immune system.[19,20] National data shows 28–30% of TGD people report harassment in medical settings, postponing medical care when sick or injured to avoid discrimination.[19,20] LGBTQ people use tobacco at a rate of 50% higher than the general population; COVID-19 infection causes a respiratory illness that may be especially harmful to smokers.[21] The purpose of this study was to assess the impact of the pandemic on TGD patients, specifically regarding access to telemedicine and delays in gender-affirming healthcare. We hypothesized patients awaiting gender-affirming surgery may have had procedures postponed, and sought to characterize delays while identifying recommended temporizing strategies.

2. Methods

The Duke University Institutional Review Board approved all study materials in June 2020. Eligibility criteria included identifying as a TGD patient, aged 18 years or older and able to read English. The lead authors developed the survey tool in collaboration with LGBTQ members of the medical and nonprofit communities; questions were tested in focus groups to optimize diction. The study was hosted on an encrypted platform (Qualtrics, Seattle, WA) and included demographics (gender identity, race, ethnicity, HIV status), types of gender affirming healthcare pursued, respiratory symptomatology, access to urgent care for COVID-19 concerns, access to telemedicine visits for hormones, surgery and mental health and any postponements of care. Patients were permitted to select multiple options for gender, race and ethnicity. Behavioral information was solicited including whether they used medications to prevent HIV and active tobacco smoking. Patients were asked whether their health insurance permitted telemedicine access to gender-affirming healthcare before the pandemic, and if access was expanded after their state's COVID-19 stay-at-home order. Following the survey, participants were invited to take part in a semi-structured interview.

The survey was sent to all patients within the Duke Health network whose medical records carried an ICD-10 code for gender identity diagnoses: F64.0-F64.9 (gender identity diagnoses) and Z87.890 (history of sex reassignment) after identification using the DEDUCE platform (Duke Health, Durham, NC).[22–24] Patients were notified via MyChart (Epic, Verona WI) in June 2020. Duke colleagues who care for TGD individuals were engaged prior to study rollout, so they could refer any questions to study personnel. These included providers from the Departments of Family Medicine & Community Health, Psychiatry & Behavioral Sciences, Adult and Pediatric Endocrinology, Obstetrics & Gynecology and Plastic & Reconstructive Surgery.

For the national cohort, the survey was advertised via Facebook, Instagram (Menlo Park, CA) and Twitter (San Francisco, CA) beginning in September of 2020 for respondent-driven sampling of TGD communities across the United States (Supplementary Figures S1-S2).[25] Study personnel also advertised the project through communication with nationwide LGBTQ healthcare and nonprofit workers via email, text messages and an IRB-approved website hosted at sites.duke.edu/-transgenderhealthcovid. Survey data collection ended in December 2020. Between December 2020 and January 2021, telephone interviews were conducted by lead authors with participants who indicated in the survey their willingness to be contacted. A semi-structured interview script was developed with advising from LGBTQ researchers; participants were permitted to expound on topics they deemed most important (Supplementary Figure S3). Data was analyzed among the Duke Health cohort with the national cohort, comparing the survey parameters as two distinct groups, but without statistical analyses of variance. The lead authors reviewed the interviews using thematic analysis methodology[26]; data rendered via sunburst diagram, after Moraliyage et al.[27]

3. Results

A total of 253 TGD patients (164 Duke Health, 89 national) responded to the survey. Fig. 1 shows the home location reported by study participants nationwide (Panel A) and within North Carolina (Panel B). Table 1 summarizes the demographic information for the two cohorts. The Duke Health cohort had an average age of 42 years, while the national cohort had an average age of 33 years. Of the Duke Health cohort, 33% identified as trans women, 13% as gender non-conforming/non-binary and 21% as trans men. Of the national cohort, 18% identified as transwomen, 26% as gender non-conforming/non-binary and 25% as transmen. The majority of participants (74% Duke Health, 61% national) identified racially as non-Latinx white. The majority of participants (71% Duke Health, 54% national) had private insurance. Duke Health patients reported higher utilization of all healthcare services (63% medical/hormonal, 55% surgical and 43% behavioral) compared to the national cohort (44% medical/hormonal, 17% surgical and 42% behavioral). For both cohorts, 8–9% reported currently smoking.

Participants reported that all gender-affirming medical providers (medical, surgical, behavioral) had increased availability via telemedicine during the pandemic (Fig. 2). Supplementary Table S1 presents an overview of participants' access to telemedicine before and after the COVID-19 pandemic. Before the start of the pandemic, Duke Health patients reported having fewer telemedicine options when compared to the national cohort. Regarding surgical healthcare, Duke Health patients reported the lowest percentage of access to telemedicine before the pandemic (9%). After the start of the pandemic, Duke Health patients

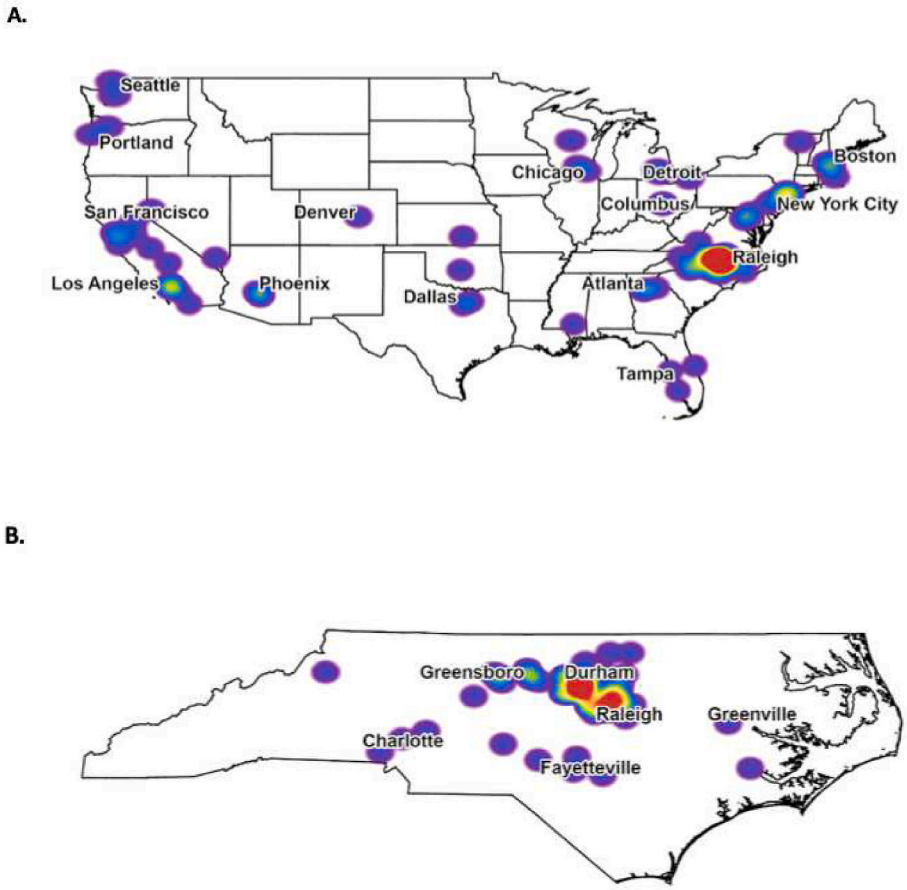

Fig. 1. Geographic distribution of study participants. Study participants were asked "where do you live? Think of the place you stay most evenings. Please provide the 5-digit zip code." Zip codes from all participants (Duke, national cohorts) were deidentified, aggregated and rendered via ArcGIS to build a nationwide scalable heatmap of population density. The names of low-density towns or counties are intentionally omitted to protect the confidentiality of rural queer persons. Panel A is a nationwide perspective and Panel B is focused on the state of North Carolina.

reported increased access to telemedicine for medical and surgical specialties (medical specialties: pre- 27%, post- 68%, 2.5x increase; surgical specialties: pre- 9%, post- 24%; 2.7x increase). Patients in the national cohort and the Duke Health cohort both reported increased availability to telemedicine options for behavioral health (from 36% to 81%, from 36% to 67%, respectively).

A total of 41 Duke patients and 42 national patients reported delays in their care (Fig. 3, Supplementary Table S2). Behavioral health had the highest percentages of delays in care (34% of Duke Health participants, 75% of national participants). For both national and Duke Health cohorts, surgical clinics had the lowest report of delays in care (4% of Duke Health participants, 11% of national participants). In regard to surgical procedures, 17% of Duke Health patients reported delays, while 40% of 15 national patients reported delays. The surgical procedure most sought by the Duke Health cohort was vaginoplasty (35% of Duke Health patients), while the most-frequently sought surgery in the national cohort was chest wall reconstruction/mastectomy (33% of national patients) (Supplementary Table S3). Delays in medical/hormonal therapies were reported by 7% of Duke Health patients, whereas 36% of national patients reported delays in gender-affirming hormonal therapy.

Participants were asked if they had experienced COVID-19 symptoms in the preceding two weeks (fever, cough, dyspnea, fatigue, loss of taste/smell); symptoms were reported by 24% of Duke participants and 20% of national participants (Supplementary Table S4). Patients were asked if they knew of an urgent care facility to seek medical attention; 90% of participants in both Duke Health and national cohorts responded affirmatively. However, when asked about specific barriers to accessing care at these urgent care facilities, 27% of patients described discrimination as a factor that might impede their medical care.

The most common barriers nationally and at Duke Health to seeking medical care included financial strain (32% at Duke Health, 27% nationally), fear of discrimination (27% at Duke Health, 27% nationally), and uncertainty on where to seek care (23% at Duke Health, 27% nationally) (Supplementary Table S5). When asked about the influence of the pandemic on their lives, the most common concern for Duke Health and national cohorts was that COVID-19 might delay aspects of their gender healthcare (23% at Duke Health, 18% nationally). In interviews, Duke Health patients were concerned about losing insurance due to job insecurity, delayed surgical visits and being discriminated against at medical facilities if feeling acutely ill (Fig. 4). Other common themes included the unexpected but welcomed privacy that quarantining and work-from-home had provided some "a small silver lining of getting to hide from society as their body changes," in the words of one interviewee.

4. Discussion

In our study, healthcare delays were reported by patients in all domains of gender-affirming care, however, these challenges were mitigated in part by improved telemedicine access. This is laudable, reflecting the response of healthcare and LGTBTQ nonprofit workers nationwide, including urban, suburban and rural regions (Fig. 1). Our data shows delays in gender-affirming medical care were most commonly-reported for behavioral health, consistent with descriptions by Holmes et al., (2020)[28] of mental health disease burden due to COVID. The global uptick in mental illness during COVID paired with the overall lack of gender-affirming behavioral health professionals and access to specialized care perhaps led to this finding of behavioral health having the greatest delays.[29] This is concerning, as various studies have shown pandemic-related stresses play a role in unmasking subclinical disease and destabilizing patients with mood disorders, anxiety or other neuropsychiatric conditions.[28,30] For already-marginalized populations,

Table 1
Demographics of study participants.
Patients were asked to self-identify their demographics, and permitted to select multiple options for gender, race and ethnicity. Patients were asked to select one option for their primary health insurer. They were asked to select which types of gender-affirming healthcare they were currently pursuing (medical/hormones, surgical or behavioral/mental). Behavioral information was solicited including whether they used medications to prevent HIV or currently were smoking tobacco.

	DUKE PATIENTS (N = 164)		NATIONAL PATIENTS (N = 89)	
Self-identification	N	PERCENT	N	PERCENT
Average age, years	42	–	33	–
Agender	1	1%	2	2%
Female	25	15%	6	7%
Gender non-conforming, non-binary	22	13%	16	18%
Genderqueer	14	9%	9	10%
Male	10	6%	7	8%
Trans female/trans woman	54	33%	16	18%
Trans male/trans man	34	21%	22	25%
Other	4	2%	4	4%
TOTAL	164	100%	89	100%
Self-Identified Race				
African American, Black	6	4%	2	3%
East Asian	4	3%	1	1%
Hispanic, Latinx or Spanish	10	7%	8	10%
Multiracial	7	5%	8	10%
Native American, American Indian	4	3%	5	6%
South Asian	1	1%	0	0%
White	104	74%	47	61%
Other, self-described	5	4%	6	8%
TOTAL	141	100%	77	100%
Health Insurance Provider				
Military (VA, TRICARE)	3	2%	4	7%
Private (Aetna, Anthem, etc.)	89	71%	32	54%
Public (Medicare, Medicaid, etc.)	22	18%	13	22%
Uninsured	11	9%	10	17%
TOTAL	125	100%	59	100%
Healthcare Modality				
Behavioral/Mental health	71	43%	37	42%
Medical/Hormone provider	104	63%	39	44%
Surgical provider	91	55%	15	17%
Health Behaviors				
Currently smoke tobacco	13	8%	8	9%
Taking PrEP	11	7%	0	0%

such impact is amplified through the experience of intersectionality—systems of oppression that together negatively impact the health outcomes for multiply-minority populations, such as Black and Latinx transgender women (the group of TGD individuals most-likely to die by homicide in 2020).[31,32]

With the development of COVID-19 vaccines, our patients report looking forward to a post-pandemic world, eager to return to previous modes of working, traveling and socialization. However, experts urge caution as the distribution of vaccines, their efficacy, vaccine hesitancy and the prevalence of immunocompromised persons may delay herd immunity.[33,34] Several authors have shown such issues are magnified by extant health disparities; in the Global South, marginalized racial and ethnic groups have been shown to have less access, and more hesitancy to, available vaccines.[35] Similar issues will likely impact marginalized groups within the United States, including TGD persons; it will be important to keep all such at-risk patients engaged in the healthcare system to improve vaccine uptake and reduce morbidity and mortality due to COVID-19.

Nearly one-third of patients surveyed in the present study cited discrimination as a barrier to accessing urgent care facilities, which is in keeping with pre-pandemic reports of TGD health.[20] While pandemic-expansion of gender telemedicine is encouraging, significant barriers still complicate healthcare delivery. In "*An Epidemic of Violence: Fatal Violence Against Transgender and Gender Non-Conforming People In the U.S. in 2020*" the Human Rights Campaign reported that 2020 was one of the deadliest years on record, with 44 TGD individuals dying due to anti-transgender violence, an almost two-fold increase from the 25 violent deaths in 2019.[32,36,37] Several months into the pandemic, the U. S. federal government revoked protective healthcare rights for members of TGD communities.[38] The year's highest-volume of crisis calls per month to the Trans Lifeline were reported following that revocation.[39] The survey for the present manuscript was dispersed in the weeks

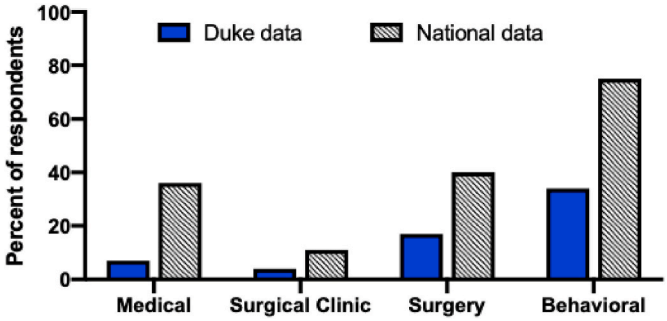

Fig. 3. Pandemic delays in gender-affirming care. Patients were asked whether they had to miss, postpone or cancel a planned clinic visit for hormones or to see their behavioral/mental health therapist. They were asked whether they had to miss, postpone or cancel a planned clinic visit with a surgical provider or if they had to postpone or cancel a planned surgical procedure.

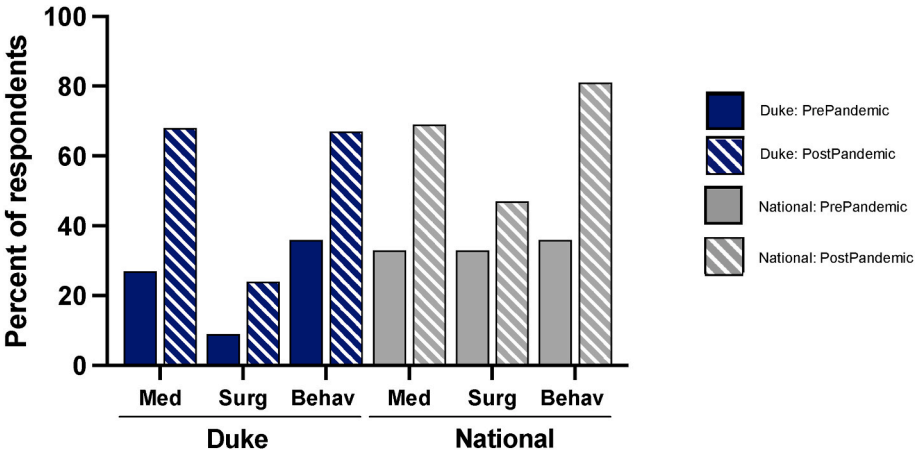

Fig. 2. Before & after: Gender-affirming telemedicine. Patients were asked whether their health insurance allowed them access to their gender-affirming healthcare provider in a telemedicine format before the pandemic, and if that access was expanded after their home state's COVID-19 stay-at-home order.

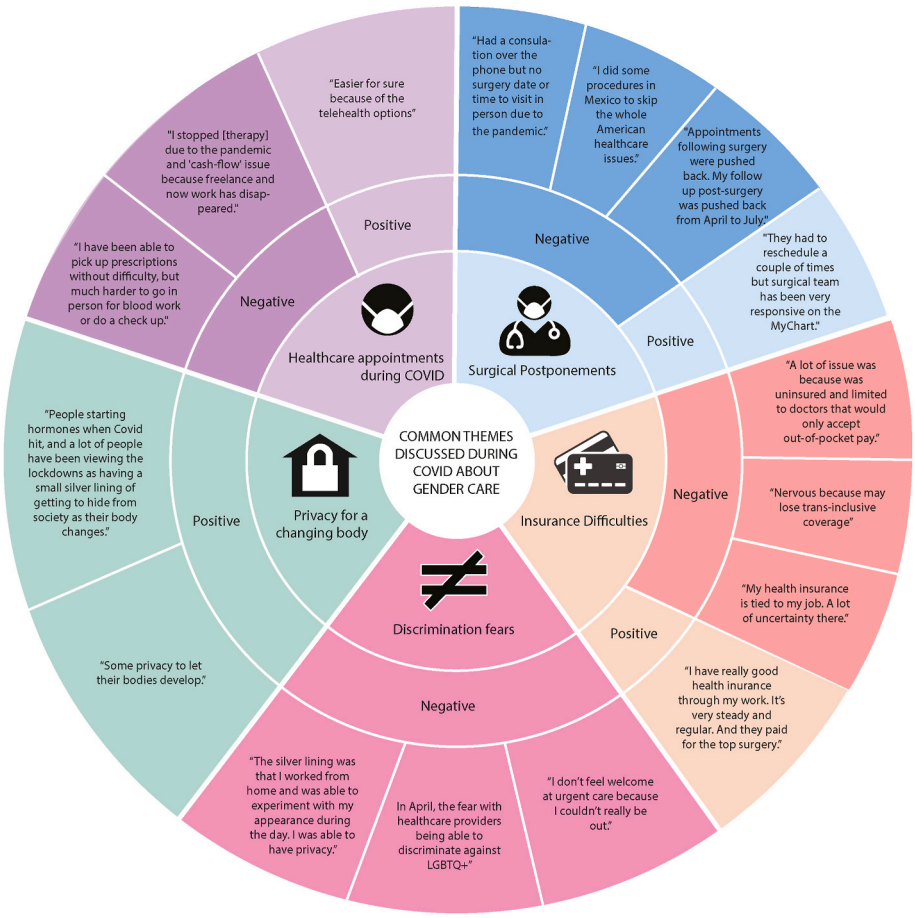

Fig. 4. Qualitative analysis of participants' interviews. Participants were interviewed during a 45-min telephone call, using a semi-structured interview guide developed in concert with LGBTQ researchers and community members. Typed notes were taken by the authors during interviews, but no audio recording was performed. Data were analyzed according to the method of Kloer et al. Common themes included healthcare access during the pandemic, postponements of surgical procedures, difficulties accessing insurance, fears of discrimination and privacy for a changing body. Salient quotes, selected to represent common themes, and graded from negative to positive.

following that federal announcement, which was cited by interviewees as an issue of concern. Such reports highlight vulnerabilities of marginalized populations and the importance of risk-mitigation strategies, including improving access to gender-affirming telemedicine.

As gender-affirming surgical interventions occur in a planned ("elective") setting, these procedures were among procedures cancelled/postponed due to the pandemic. Healthcare providers in gender affirming care have raised concerns with delaying care for patients of TGD experience.[40] Treatment for gender incongruence (GIC) requires a multidisciplinary approach, including mental healthcare, medical and surgical providers in various specialties, and GIC, when untreated or undertreated, has the potential to lead to increased suicidality and self-harm.[19,20,40,41] Delays in treatment can be dangerous as suicidality remains a high risk during treatment. For some of the most vulnerable TGD patients, gender affirming surgery has shown to improve adherence with HIV treatment and decreased viral loads.[42] Furthermore, lack of surgical clinic follow-up care prevents appropriate assessment of wound complications; a paucity of research limits the understanding of the negative effects of abrupt cessation of hormonal therapy.[43–45] Flaherty et al. (2020) weighed the ethics of delaying "elective" procedures, concluding that due to the unique characteristics of GIC and threatened stigma against TGD, gender affirming surgeries should not be delayed during the pandemic.[46]

The fact that a procedure is classified as elective does not necessarily mean it can be delayed indefinitely without negative health consequences. One class of elective procedures that were curtailed during the pandemic included screening colonoscopies.[47] Recent oncology studies have shown the impact of pandemic-cancellations of screenings for breast and colorectal cancer (which together account for about one-sixth of all cancer deaths).[47–49] Estimates project an increased mortality by 1% over the next decade or 1 million more deaths from these diseases.[48] These data demonstrate at-risk individuals with delayed access to care are being diagnosed with disease later, and with higher staging due to pandemic-disruptions. The lack of national data linking delays in gender-affirming healthcare and the development of negative outcomes should be considered as a call-to-action, advocating for more research on the health effects of delayed care for TGD patients due to the pandemic (and/or other stressors).

Our method of using an electronic health record cohort (Epic) for Duke patients, paired with a social media-targeting was designed to generate local- and national-level data. Whereas our Duke Health cohort was chosen prospectively by machine learning techniques (identifying individuals already 'out' in medical records), our nationalized data system relied on voluntary self-reporting by TGD-identifying persons who use social media. Of note, 'Duke patients' were recruited through Duke MyChart messages; the cohort of 'national' patients was accrued via social media, and did include some locally-residing patients in North Carolina who got their healthcare at non-Duke entities. Therefore, issues of recall bias and selection bias may be limitations. As such, we have deferred performing statistical analyses, in favor or descriptive and qualitative analysis. A limitation of our study is the racial diversity of our cohorts, which contained 3–4% self-identified Black persons and 7–10% self-identified Latinx/Hispanic persons. These numbers are significantly lower than North Carolina (22% Black, 9.8% Latinx/Hispanic) and national (13% Black, 18.7% Latinx/Hispanic) averages.[50] Despite efforts at targeted recruitment (collaborations with community leaders and activists in those groups) we were not able to accrue sufficient numbers for subgroup analyses. Our national and Duke sample sizes are smaller than many cross-sectional study surveys. This can be attributable to the difficulties outlined by Hughes et al. (2016) of

sampling and adequate sample size acquisition, in which TGD patients tend to be underrepresented in research due to stigmatization.[51] The sample size does reduce the power of the study, yet despite these limitations, our data provides an important perspective on pandemic-era TGD health issues.

While the pandemic has led to global hardship, there are a few unpredicted and positive findings, such as the benefits of telemedicine in rural areas and the body-transitioning privacy afforded by quarantine. This is tempered by the reality that the privilege to work-from-home correlates with socioeconomic status, and is a privilege not uniformly available to those most at-risk for poor COVID-19 outcomes (such as Black and Latinx TGD persons).[52] Additionally, although some procedures must be in-person, mental health services and routine follow-ups were successfully performed. Following the resolution of the COVID-19 pandemic, we advocate for a continuation of this "blended--care" model for TGD patients as an effort to increase accessibility.

Both brick-and-mortar and telemedicine gender clinics greatly expanded their catchment areas since the pandemic, with some including access across state lines.[53] Early in the pandemic, state licensure requirements were eased to permit access to interstate telehealth including Medicare. However, at the time of writing, those easements have expired in several states, including Alabama, Mississippi, Louisiana, Florida and Georgia.[54] One recent analysis shows that reinstatement of limits on out-of-state practice may disproportionately affect healthcare access in rural areas,[55] which we posit could be compounded for multiply-marginalized populations, such as TGD persons in the rural south. However, that study did not include subgroup analyses for gender-affirming healthcare, and a limitation of our own study is we did not use Medicare claims to analyze interstate gender affirming telehealth. Nonetheless, based on that work,[54] our data and the principles of intersectionality,[31] we hypothesize that loss of telemedicine access for TGD persons in the rural south will have disproportionately negative effects. Indeed, in our own gender-affirming surgical practice we are already encountering out-of-state patients unable to secure insurance coverage due to these changes. Access to telehealth can be life-changing for patients outside of urban centers where there is limited gender affirming medical care. We will continue to advocate for maintaining telehealth access for rural and/or TGD individuals with limited local options, and call on our colleagues for further scholarship in the emerging, intersecting fields of telemedicine, TGD studies and health disparities.

When COVID-19 forced the world to shut down, our study reveals that TGD individuals were obliged to change their expectations of healthcare and their life-priorities. This exists alongside the intersectional threats to their health, wellness, and very existence. Thankfully, the data shows that healthcare systems in North Carolina and nationwide are shifting towards more telemedicine, and urgency-based triaging in surgical scheduling. At Duke, gender affirming surgery has returned to the same volume as before the pandemic, albeit with new precautions (masking, rapid testing, visitor screening) that also apply to patients undergoing any other surgery. Equal access to healthcare remains elusive for marginalized populations nationwide, whether cisgender/transgender, rural/urban, non-native English speakers or undocumented immigrants; yet our study presents important leading indicators that better healthcare delivery is possible when unified actions are taken, even during a global pandemic.

5. Conclusion

Delays were experienced in all domains of gender care; however, these challenges were mitigated in part by improved telemedicine access. Nearly one-third of patients cite discrimination as a barrier to accessing urgent care facilities, which is in keeping with pre-pandemic reports of TGD health outcomes.[20] Although the pandemic-related expansion of gender telemedicine may be a marker of success, significant barriers still complicate delivery of healthcare to TGD patients.

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Précis

In this national cross-sectional cohort survey study of 253 TGD patients, telemedicine options increased between 14 and 48% at Duke Health and nationally due to the COVID-19 pandemic, yet 34–75% of nationally surveyed patients reported delays in treatment from gender affirming healthcare providers in Behavioral, Medical and Surgical specialties.

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Appendix A. Supplementary data

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References

1. Byanyima W. HIV or COVID-19, inequity is deadly. *Nat Human Behav*. 2022;6(2):176.
2. Adugna A, Azanaw J, Sharew Melaku M. The effect of COVID-19 on routine HIV care services from health facilities in Northwest Ethiopia. *HIV AIDS (Auckl)*. 2021;13:1159–1168.
3. Logie CH, Turan JM. How do we balance tensions between COVID-19 public health responses and stigma mitigation? Learning from HIV research. *AIDS Behav*. 2020;24(7):2003–2006.
4. Catlin J. When does an epidemic become a 'crisis'? Analogies between Covid-19 and HIV/AIDS in American public memory. *Mem Stud*. 2021;14(6):1445–1474.
5. Cheng KJG, Sun Y, Monnat SM. COVID-19 death rates are higher in rural counties with larger shares of blacks and hispanics. *J Rural Health*. 2020;36(4):602–608.
6. Governor's Office NC. Executive order No. 121: stay at home order. March 30. https://governor.nc.gov/documents/executive-order-no-121; 2020. Accessed June 26, 2022. Accessed.
7. Haffajee RL, Mello MM. Thinking globally, acting locally — the U.S. Response to Covid-19. *N Engl J Med*. 2020;382(22):e75.
8. Governor's Office NC. Executive order No. 180: increasing face covering requirements to prevent the rapid spread of Covid-19. November 23. https://governor.nc.gov/documents/files/eo180-face-coverings-requirements; 2020. Accessed June 26, 2022. Accessed.
9. VA Office of Public, Affairs Intergovernmental. VA Video Connect visits increase 1000% during COVID-19 pandemic. *June*. 2020;12. https://www.va.gov/opa/pressrel/pressrelease.cfm?id=5467. Accessed June 26, 2022. Accessed.
10. O'Hanlon C, Huang C, Sloss E, et al. Comparing VA and non-VA quality of care: a systematic review. *J Gen Intern Med*. 2017;32(1):105–121.
11. American College of Surgeons. COVID-19: guidance for triage of non-emergent surgical procedures. https://www.facs.org/covid-19/clinical-guidance/triage; March 17, 2020. Accessed June 26, 2022. Accessed.
12. Jeffers L. *ASPS Guidance Regarding Elective and Non-essential Patient Care*. American Society of Plastic Surgeons; 2020. March 24 https://www.facs.org/covid-19/clinical-guidance/elective-case/plastic-surgery. Accessed May 18, 2021. Accessed.
13. Rebmann T, Vassallo A, Holdsworth JE. Availability of personal protective equipment and infection prevention supplies during the first month of the COVID-19 pandemic: a national study by the APIC COVID-19 task force. *Am J Infection Control*. 2021;49(4):434–437.
14. American Society of Plastic Surgeons. Important update to considerations for the continuation or resumption of elective surgery and visits. December https://www.

plasticsurgery.org/for-medical-professionals/covid19-member-resources/resumption-of-elective-surgery; 2020. Accessed June 26, 2022. Accessed.
15. Tu K, Sarkadi Kristiansson R, Gronsbell J, et al. Changes in primary care visits arising from the COVID-19 pandemic: an international comparative study by the International Consortium of Primary Care Big Data Researchers (INTRePID). *BMJ Open*. 2022;12(5), e059130.
16. Hewitt KC, Block C, Bellone JA, et al. Diverse experiences and approaches to tele neuropsychology: commentary and reflections over the past year of COVID-19. *Clin Neuropsychol*. 2022;36(4):790–805.
17. Coleman E, Bockting W, Botzer M, et al. Standards of care for the health of transsexual, transgender, and gender-nonconforming people, Version 7. *Int J Transgenderism*. 2012;13(4):165–232.
18. CDC COVID-19 Response Team. Preliminary Estimates of the prevalence of selected underlying health conditions among patients with coronavirus disease 2019 - United States, February 12-March 28, 2020. *MMWR*. 2020;69(13):382–386.
19. Grant J, Mottet L, Tanis J, et al. Injustice at every turn: a report of the national transgender discrimination survey. National center for transgender equality. https://transequality.org/sites/default/files/docs/resources/NTDS_Report.pdf; 2011. Accessed June 26, 2022. Accessed.
20. James S, Herman J, Rankin S, et al. *The Report of the 2015 U.S. Transgender Survey*; 2016. https://transequality.org/sites/default/files/docs/usts/USTS-Full-Report-Dec17.pdf. Accessed June 26, 2022. Accessed.
21. National Center for Transgender Equality. The Coronavirus (COVID-19) Guide: Trans People and COVID-19. Updated February 17, 2022. Accessed 06 26, 2022. https://transequality.org/covid19.
22. UniCare – An Anthem Company. *Gender Reassignment Surgery Clinical Guidelines*; 2021. May 20 https://www.unicare.com/dam/medpolicies/unicare/active/guidelines/gl_pw_a051166.html. Accessed June 26, 2022. Accessed.
23. Centers for Medicare & Medicaid. *ICD-10 Resources*; 2020. April 27 https://www.cms.gov/Medicare/Coding/ICD10/ICD-10Resources. Accessed June 26, 2022. Accessed.
24. Horvath MM, Winfield S, Evans S, et al. The DEDUCE Guided Query tool: providing simplified access to clinical data for research and quality improvement. *J Biomed Inf*. 2011;44(2):266–276.
25. Heckathorn DD. Respondent-driven sampling: a new approach to the study of hidden populations. *Soc Probl*. 1997;44(2):174–199.
26. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77–101.
27. Moraliyage H, De Silva D, Ranasinghe W, et al. Cancer in lockdown: impact of the COVID-19 pandemic on patients with cancer. *Oncol*. 2021;26(2):e342–e344.
28. Holmes EA, O'Connor RC, Perry VH, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *Lancet Psychiatr*. 2020;7(6):547–560.
29. Puckett JA, Cleary P, Rossman K, Newcomb ME, Mustanski B. Barriers to gender-affirming care for transgender and gender nonconforming individuals. *Sex Res Soc Pol : journal of NSRC : SR & SP*. 2018;15(1):48–59. https://doi.org/10.1007/s13178-017-0295-8.
30. Vindegaard N, Benros ME. COVID-19 pandemic and mental health consequences: systematic review of the current evidence. *Brain Behav Immun*. 2020;89:531–542.
31. Crenshaw K. Mapping the margins: intersectionality, identity politics, and violence against women of color. *Stanford Law Rev*. 1991;43(6):1241–1299.
32. Human Rights Campaign. *A National Epidemic: Fatal Anti-transgender Violence in the United States in 2019*; November 2019. https://www.hrc.org/resources/a-national-epidemic-fatal-anti-trans-violence-in-the-united-states-in-2019. Accessed June 29, 2022. Accessed.
33. Dooling K, Marin M, Wallace M, et al. Advisory committee on immunization practices' updated interim recommendation for allocation of COVID-19 vaccine — United States, December 2020. *MMWR*. 2021;69(5152):1657–1660.
34. Daniel CL, Williams J, Legg R, et al. Factors associated with COVID-19 vaccination intentions among adults in the deep South. *Vaccine*. 2022;40(6):841–853.
35. Skegg D, Gluckman P, Boulton G, et al. Future scenarios for the COVID-19 pandemic. *Lancet*. 2021;397(10276):778. -778.
36. Human Rights Campaign. *Dismantling a Culture of Violence: Understanding Anti-transgender Violence and Ending the Crisis*; 2018. https://reports.hrc.org/dismantling-a-culture-of-violence. Accessed June 26, 2022. Accessed.
37. Human Rights Campaign. *Fatal Violence against the Transgender and Gender Non-conforming Community in 2020*; 2021. https://www.hrc.org/resources/violence-against-the-trans-and-gender-non-conforming-community-in-2020. Accessed June 26, 2022. Accessed.
38. Office of the Secretary, Department of Health and Human Services. Nondiscrimination in health and health education programs or activities, delegation of authority. https://www.federalregister.gov/documents/2020/06/19/2020-11758/nondiscrimination-in-health-and-health-education-programs-or-activities-delegation-of-authority; June 19, 2020. Accessed June 26, 2022. Accessed.
39. Fowers A, Wan W. *'The Volume Has Been Turned up on Everything': Pandemic Places Alarming Pressure on Transgender Mental Health*; 2020. Washington Post. August 18 https://www.washingtonpost.com/health/2020/08/18/coronavirus-transgender/. Accessed June 26, 2022. Accessed.
40. van der Miesen AIR, Raaijmakers D, van de Grift TC. "You have to wait a little longer": transgender (mental) health at risk as a consequence of deferring gender-affirming treatments during COVID-19. *Arch Sex Behav*. 2020;49(5):1395–1399.
41. T'Sjoen G, Arcelus J, De Vries ALC, et al. European society for sexual medicine position statement "assessment and hormonal management in adolescent and Adult trans people, with attention for sexual function and satisfaction. *J Sex Med*. 2020;17(4):570–584.
42. Rodriguez-Hart C, Obeng B, Radix A, et al. Improving data on the NYC HIV epidemic by identifying transgender people on medicaid. In: *Presented at: Conference on Retroviruses and Opportunistic Infections; Boston, MA, USA. Session HIV IN TRANSGENDER WOMEN and MEN*; 2020. https://www.croiconference.org/abstract/improving-data-on-the-nyc-hiv-epidemic-by-identifying-transgender-people-on-medicaid/. Accessed June 26, 2022. Accessed.
43. Wiepjes CM, den Heijer M, Bremmer MA, et al. Trends in suicide death risk in transgender people: results from the Amsterdam Cohort of Gender Dysphoria study (1972-2017). *Acta Psychiatr Scand*. 2020;141(6):486–491.
44. van der Sluis WB, Bouman MB, de Boer NK, et al. Long-term follow-up of transgender women after secondary intestinal vaginoplasty. *J Sex Med*. 2016;13(4):702–710.
45. Nguyen HB, Chavez AM, Lipner E, et al. Gender-affirming hormone use in transgender individuals: impact on behavioral health and cognition. *Curr Psychiatr Rep*. 2018;20(12):110.
46. Flaherty AJ, Sharma A, Crosby DL, et al. Should gender-affirming surgery Be prioritized during the COVID-19 pandemic? *Otolaryngol Head Neck Surg*. 2020;163(6):1140–1143.
47. Patel S, Issaka RB, Chen E, et al. Colorectal cancer screening and COVID-19. *Am J Gatroenterol*. 2021;116(2):433–434.
48. Sharpless NE. COVID-19 and cancer. *Science*. 2020;368(6497):1290.
49. Samani SA-O, Mir N, Naumann DA, et al. COVID-19 and endoscopic services: the impact of delays in therapeutic colonoscopies on patients. *Gut*. 2021;70(10):2019–2020.
50. US Census Bureau. 2021. Accessed 06 18, 2022, https://www.census.gov/quickfacts/NC.
51. Hughes JP, Emel L, Hanscom B, et al. Design issues in transgender studies. *J Acquir Immune Defic Syndr*. 2016;72(Suppl 3):S248–S251.
52. Heslin K, Hall J. Sexual orientation disparities in risk factors for adverse COVID-19–related outcomes, by race/ethnicity — behavioral risk factor surveillance system, United States, 2017–2019. *MMWR*. 2021;70:149–154.
53. Critchfield H. *Telehealth Offers Transgender People a New Way to Receive Hormone Therapy, during the Pandemic and beyond*. North Carolina Health News; 2020. July 8 https://www.northcarolinahealthnews.org/2020/07/08/telehealth-gives-transgender-patients-new-way-for-care/. Accessed June 26, 2022. Accessed.
54. Federation of state medical boards. U.S. States and territories modifying requirements for telehealth in response to COVID-19. June 15 https://www.fsmb.org/siteassets/advocacy/pdf/states-waiving-licensure-requirements-for-telehealth-in-response-to-covid-19.pdf; 2022. Accessed June 26, 2022. Accessed.
55. Andino JJ, Zhu Z, Surapaneni M, et al. Interstate telehealth use by Medicare beneficiaries before and after COVID-19 licensure waivers, 2017-20. *Health Aff (Millwood)*. 2022;41(6):838–845.