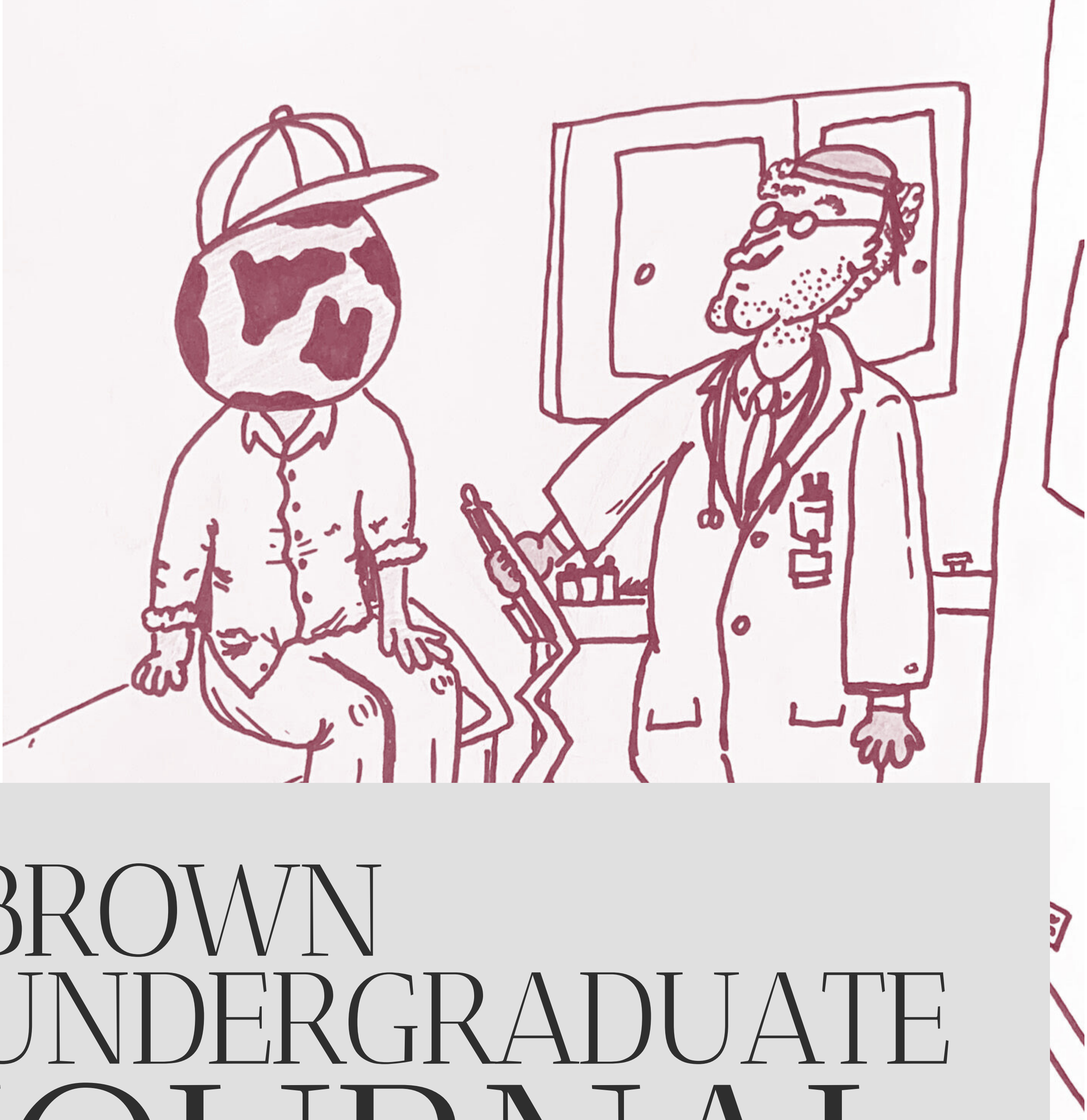

BROWN UNDERGRADUATE JOURNAL OF PUBLIC HEALTH

April 2024 / Issue 3

A School of Public Health Publication

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Editor's *Note*

Welcome to the third annual issue of the Brown Undergraduate Journal of Public Health! Over the past academic year, we have had the absolute honor of working with fantastic authors, reviewers, editors, and artists to compile these pieces. Our goal has always been to provide a platform for undergraduates to write about pertinent public health issues, and we're so excited to be showcasing this cohort's passion.

As we emerge from the COVID-19 pandemic, various facets of public health outside of zoonotic disease prevention have come under focus. We aimed to amplify students' work that shed light on the areas of public health that aren't necessarily popular in the public eye. It's evident from the diversity of authors and submissions that there is space for everyone within the realms of public health, and it is truly heartening to see how the Brown community (and beyond) is continuously working towards enacting positive, equitable change.It has also been a year of learning as we continue to grow as an on-campus publication.

Notably, we expanded our team this year by adding to our general body team, allowing for more opportunities and avenues for on-campus engagement. We also expanded our staff-writing presence, where general body members published shorter pieces on our website. Lastly, we received and accepted a record number of submissions only made possible by the determination and diligence of the general body team. We are excited to announce that we have added sections to this year's edition: Original Investigations & Reviews, Global Health, Social Determinants of Health and Justice, Technology & Interventions, and Opinion. We are honored to have worked with such passionate peers in public health this year, and we are excited to continue this work next year. Every member of our team has poured their heart into helping this Journal come into fruition, and we hope that you enjoy reading these submissions as much as we enjoyed leading this effort.

Sincerely,
Meehir Dixit '24

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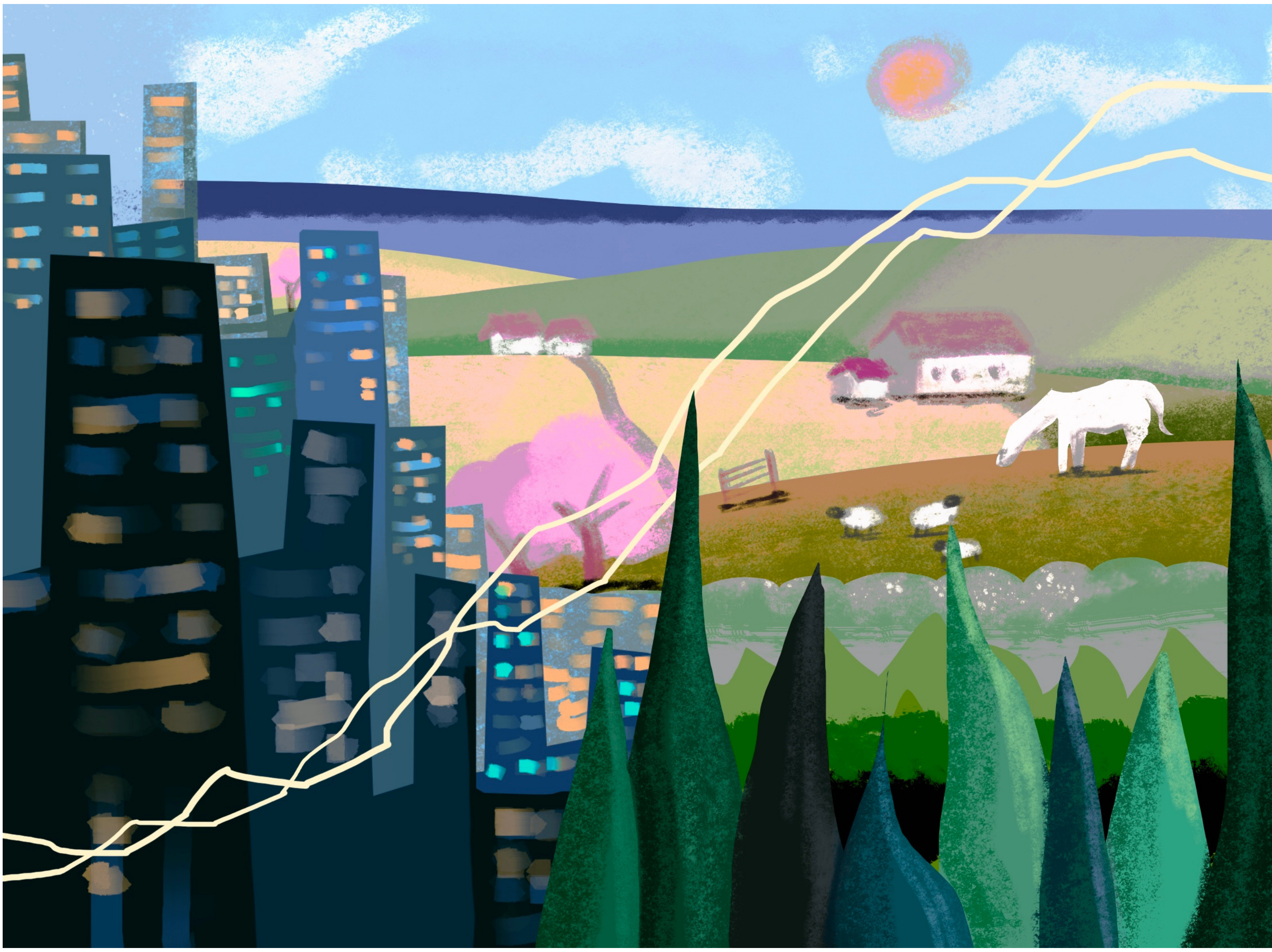

[1] ACCESS, AWARENESS, AND ADVOCACY: THE INTERSECTION BETWEEN HEALTH AND CAMPUS ACCESSIBILITY

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Access, Awareness, and Advocacy: the Intersection Between Health and Campus Accessibility

By Owen Fahey, Gili Schor, Madeline Day, Kaitlyn Chan, Pran Teelucksingh, Isabel Costas, Angelica Mroczek

Illustration by Ella Olea

Abstract

Brown University's campus is composed of approximately 220 structures, some of which date back to 1770. Many of these structures lack the accessibility measures necessary for those living with a disability to thrive. This paper aims to understand Brown University students' perceptions of accessibility at key locations, how collaboration with administration can improve the accessibility of locations such as the entrance of the School of Public Health (SPH), and raise awareness about campus accessibility. Our ultimate purpose is to ensure that all Brown University students have equal access to education and campus resources. Data was collected via a survey on student experience and opinions surrounding accessibility of campus locations. Student perceptions could be grouped into three overarching themes: 1) Brown is seemingly inaccessible for those utilizing mobility aids, 2) Brown's accessibility measures are viewed to be minimally sufficient, and 3) Brown's administration is receptive to improving accessibility measures, but hesitates to prioritize any action. In response, we leveraged our position as students of Brown University's Public Health Project Committee Executive Board and collaborated with professionals at the SPH in an effort to spearhead an initiative to increase accessibility through the installation of an ADA-compliant automatic door opener. Our survey and event results clearly demonstrated that Brown University's accessibility measures on campus have room for improvement, considering that many students found the campus to be inaccessible in some aspects. In the future, we hope to investigate additional campus accessibility initiatives to further increase accessibility for all students.

Introduction

In 1990, the Americans with Disabilities Act (ADA) was written into law, prohibiting discrimination against individuals with disabilities "in all areas of public life, including jobs, schools, transportation, and all public and private places that are open to the general public."[1] Since its establishment, the ADA has undergone one revision, though research indicates that a lack of accessibility on campuses affects student retention rates. In 2005, the American Institutes for Research found that 46% of students with disabilities who had a high school diploma enrolled in postsecondary education, and 40% of those who enrolled in postsecondary education completed their degrees within 8 years.[2] These findings indicate that students with disabilities pursuing postsecondary education still struggle with accessibility-related issues on their campuses. The number of college students with disabilities has also been steadily increasing over time. In 2016, nearly 20% of undergraduate students reported having a disability, and in 2011, 90% of colleges and universities in the United States reported admitting students with disabilities.[3],[4]

Under the ADA, both public and private colleges and universities have the responsibility to provide equal access to education for students with disabilities; however, there is room for interpretation by these institutions. If a college or university can prove that making certain accommodations and modifications "would constitute an undue financial or administrative burden" they can be exempt from making such alterations.[5] These exemptions allow institutions to leave certain accessibility accommodations unaddressed, putting students with disabilities at a disadvantage when navigating their postsecondary education.

Given the age and history of many of Brown University's buildings, the university's 2022 "Accessibility Handbook & Guidelines" unsurprisingly states that "many of these structures lack accessibility that meet today's standards."[6] The age of many structures on the university's campus in conjunction with the topography of Providence's College Hill neighborhood may present many accessibility challenges for students.

This paper aims to understand the perceptions of Brown University students regarding accessibility accommodations at key campus locations, analyze how collaboration with administration can improve or hinder accessibility improvements to locations such as the entrance to the university's School of Public Health (SPH), and raise awareness surrounding campus accessibility measures. The SPH's entrance was selected in particular as our primary structural accessibility goal because the entrance, composed of heavy-set glass doors, was not accessible from the outside and the location is frequented by all students and faculty. Students and faculty reported struggling to handle the doors. To gain an understanding of these concepts, we conducted a short informal qualitative survey through convenience sampling among currently enrolled Brown University students attending school on campus to assess their perceptions of accessibility accommodations. We hope that this project will serve as a foundation to continue improving accessibility for students on Brown University's campus.

Methodology

A survey was released to gather insights on public health and disability. The survey consisted of six questions along with one free-response section. The six questions allowed respondents to reflect qualitatively and quantitatively on Brown's structural environment. To distribute the survey, a QR code was created and shared with students taking public health courses at Brown, posters containing the QR code and project information were displayed at popular campus locations, and students were provided links by various undergraduate concentration departments. Lastly, the survey was sent out to all undergraduate students via university-wide communication through Today@Brown. This approach allowed for a diverse range of perspectives to be collected and a comprehensive understanding of the topic.

A collaboration with members of the PHP 1680I: Pathology to Power class, who held a social awareness event at the entrance of the SPH on December 1st, 2022, allowed us to gauge students' perceptions of campus accessibility. After receiving prior clearance from the school, they approached all students and faculty passing through the entrance and introduced our shared goal of increasing accessibility at the SPH. Participants then attempted to enter and exit the building's main entrance using their choice of mobility aid–a wheelchair, a pair of crutches, or a walker. A post-experience survey was administered to participants, who were asked to reflect on difficulties faced during their attempts to enter. Participants were also prompted to consider how the SPH could improve initiatives regarding accessibility. The event allowed us to improve levels of accessibility awareness among students and faculty walking through the SPH.

We met with multiple Deans and administration at the SPH to discuss the accessibility of the front entrance. During the meeting, we had the opportunity to understand the logistical implications of the proposal, particularly with regard to installing an accessible push-button door. The Deans and administration who work on similar initiatives provided valuable insights and recommendations on how to proceed with the proposal.

Results

The 7-item survey consisted of six closed response questions (e.g. multiple-choice, Likert scale, and select all that apply) and one open response question. Our findings were primarily based on analyses of the results of Likert scale questions. These questions were designed with a range of response values to measure perceptions surrounding accessibility among currently enrolled Brown University students.

Student Perceptions on the Accessibility of Key Campus Locations:

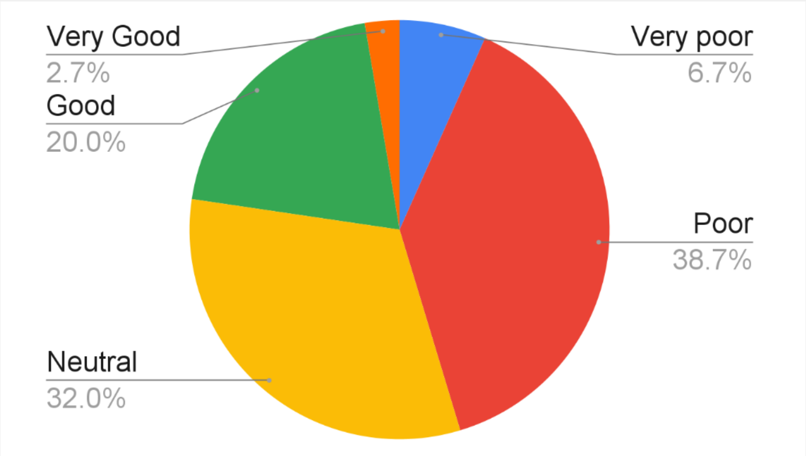

Figure 1: Student perceptions of the accessibility of key campus locations. Using a Likert scale (1-5): Mean = 2.7; SD = 0.95
[Likert Scale: 1= Very Poor, 2 = Poor, 3 = Neutral, 4 = Good, 5 = Very Good]

We sought to gain a better understanding of how Brown students view accessibility on campus. Our survey asked students to answer the following question: How would you rate Brown's accessibility in key locations such as academic buildings, libraries, dining halls, dorms, etc.? Students' average ratings were "Neutral" (using a Likert scale (1-5): Mean = 2.7; SD = 0.95 [Likert Scale: 1= Very Poor, 2 = Poor, 3 = Neutral, 4 = Good, 5 = Very Good]). Less than one quarter of respondents answered that key campus locations are "very good" or "good" in regards to accessibility, whereas 45.4% of respondents characterized the accessibility of key campus locations as "very poor" or "poor." Finally, 45.3% of respondents stated that they, or someone they know, struggle with a lack of campus accessibility measures in key campus locations.

Student Perspectives on the Accessibility of Brown's SPH vs. Main Campus:

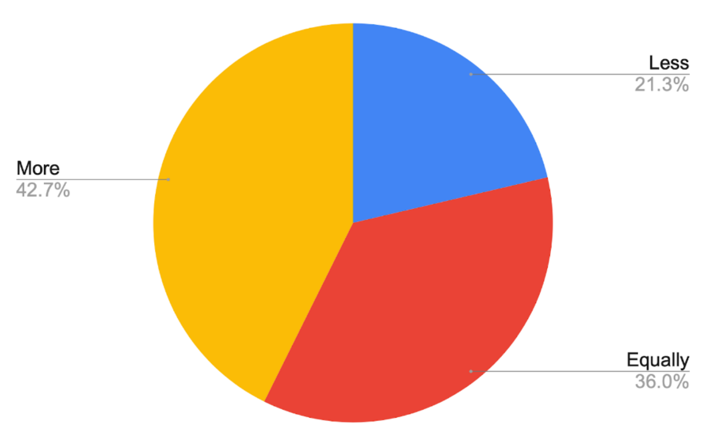

Figure 2: Student perceptions of the accessibility of Brown's main campus vs. Brown's SPH Health. Using a Likert scale (1-3): Mean = 2.2; SD = 0.77 [Likert Scale: 1= Less Accessible, 2 = Equally Accessible, 3 = More Accessible]

Our project aimed to launch an initiative to increase the accessibility of Brown's SPH, particularly the building's front entrance. Therefore, our survey asked students to respond to the following question: "How do you expect the accessibility of Brown's SPH buildings to compare to the accessibility of main campus Brown University buildings? Brown SPH buildings are ____ accessible" Student perceptions also fell toward "Neutral" (using a Likert scale (1-3): Mean = 2.2; SD = 0.77 [Likert Scale: 1= Less Accessible, 2 = Equally Accessible, 3 = More Accessible]). 42.7% of students in this survey indicated that they expected Brown's SPH to be more accessible than its main campus.

Student Perceptions on Accessibility for Individuals Utilizing Mobility Aids:

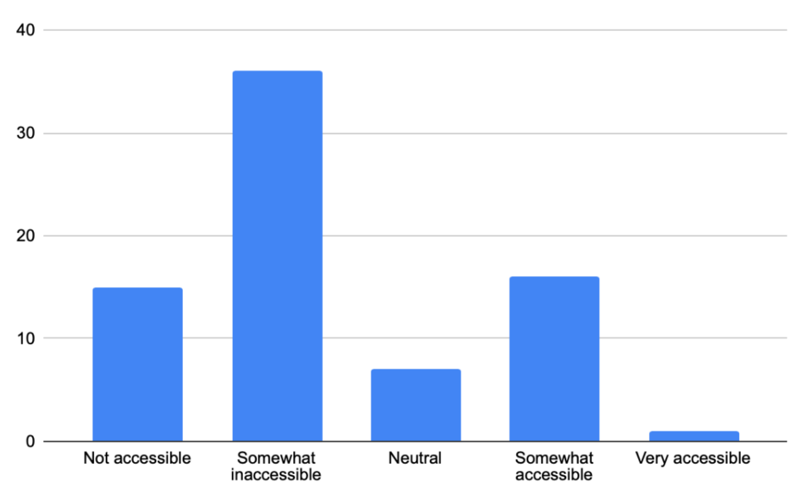

Figure 3: Student perceptions of Brown accessibility for individuals utilizing a mobility aid. Using a Likert scale: Mean = 2.3; SD = 1.1
[Likert Scale: 1 = Not Accessible, 2= Somewhat Inaccessible, 3 = Neutral, 4 = Somewhat Accessible, 5 = Very Accessible]

To further focus on the accessibility of the SPH front entrance, it was crucial for us to understand perceptions regarding the use of mobility aids. We surveyed: "How accessible do you perceive Brown to be for wheelchair users or others utilizing a mobility aid?" The results found similar neutral findings (using a Likert Scale (1-5): Mean = 2.3; SD = 1.1 [Likert Scale: 1 = Not Accessible, 2= Somewhat Inaccessible, 3 = Neutral, 4 = Somewhat Accessible, 5 = Very Accessible]). Results showed that 68% of student respondents perceive Brown's campus to be 'Somewhat Inaccessible" or "Completely Inaccessible" for those utilizing mobility aids. This compares to 22.6% of respondents who perceive the campus to be "Somewhat Accessible" or "Very Accessible".

Hypothesis Tests and Further Analyses of the Data

We aimed to understand whether the mean ratings of accessibility in our responses were dependent on the following personal/interpersonal survey question: "Do you or someone you know struggle with a lack of accessibility in key campus locations?" A series of hypothesis tests were conducted to determine whether the means of the questions highlighted in the previous sections depend on participants' responses to this personal/interpersonal question.

The difference between means for student perceptions on the accessibility of key campus locations was statistically significant when dependent on the responses to the personal/interpersonal experience question (mean student perceptions on the accessibility of key campus locations for those responding "Yes" to personal/interpersonal question = 2.265 vs. 3.122 to those responding "No": p-value = 4.556e-05). Similarly, the difference between means regarding student perspectives on the accessibility of Brown's SPH vs. main campus was also statistically significant when dependent on the personal/interpersonal experience response (mean student perspectives on the accessibility of Brown's SPH vs. main campus for those that responded "Yes" to the personal/interpersonal question = 1.853 vs. 2.78 to those responding "No": p-value = 0.0001). These findings suggest that students who have struggled or know someone who has struggled with mobility impairment on Brown's campus are more likely to rate Brown's accessibility lower.

Discussion

Our results clearly demonstrated that Brown University's accessibility measures on campus have room for improvement, considering that many students found the campus to be inaccessible in some aspects. We demonstrate that students utilizing mobility aids and those who know someone who utilizes one feel significantly stronger regarding accessibility on campus; however, overall consensus showed trends that students perceive campus to be slightly more inaccessible than accessible. Additionally, when comparing key campus locations to Brown's SPH, perceptions leaned towards the SPH being slightly more accessible. A majority of students perceived Brown's campus to be inaccessible for those with mobility disabilities, which demonstrates the need for advocacy and change. Furthermore, 45.3% of respondents know someone who struggles due to inaccessibility, illustrating the scope and impact that campus accessibility has on students' university experience. Student perceptions are a testament to the fact that university administration should place an increased focus on accommodations and accessibility-related policy initiatives. Both our accessibility survey and awareness event indicate that student perceptions of Brown University's current accommodations should be improved.

Our collaboration with administrators from the university's SPH unveiled the bureaucratic difficulties that complicate the process of approving accommodations and expanding accessibility for students with disabilities. The Deans and administration who work on these types of initiatives provided valuable insights and recommendations on how to proceed with the proposal. The meeting proved to be an important step in ensuring that the proposed accessibility improvements are both feasible and effective.

Our project has made significant strides toward improving accessibility on campus. However, there are still various limitations to consider as we enter our next steps. Limiting our analyses were the large number of “Neutral” responses to different survey questions. To better prompt students to provide more valuable information, surveys should be developed without this response choice. Due to our convenience sampling procedure, selection bias may be a concern. Further surveys about students’ perceptions of accessibility at Brown should not only be sent out through email communications but also utilize comprehensive active forms of recruiting. Feedback from our survey suggested that future research should also consider the inclusion of other, non-mobility disabilities in the survey, which could lead to a more accurate representation of Brown’s problems with accessibility on campus.

Acknowledgments:
We would like to thank Professor Sarah Skeels for her guidance and assistance in conducting this survey and hosting our awareness event. In addition, we would like to thank PHP 1680I: Pathology to Power students Katherine Silver, Aleksa Kaye, Myrna Ortiz San Miguel, Haley Seo, Melanie Kim, Kaylah Brown, Melina Tidwell Torres, Elizabeth Ding, Iris Huang, and Jenny Tan for their help in hosting our event as well as in assisting in survey distribution. Public Health Project Committee Executive Board members Gili Schor and Madeline Day were also in PHP 1680I: Pathology to Power and facilitated collaboration between the two groups. We could not have successfully completed the project outlined without coordination between the students and faculty of the School of Public Health.

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Descriptive Analysis of Alcohol and Opioid Use in Rhode Island During the COVID-19 Pandemic

By Infectious Disease Society (Anusha Srinivasan, Meghan Gormley, Ivy Koh, Pierre Jolin)

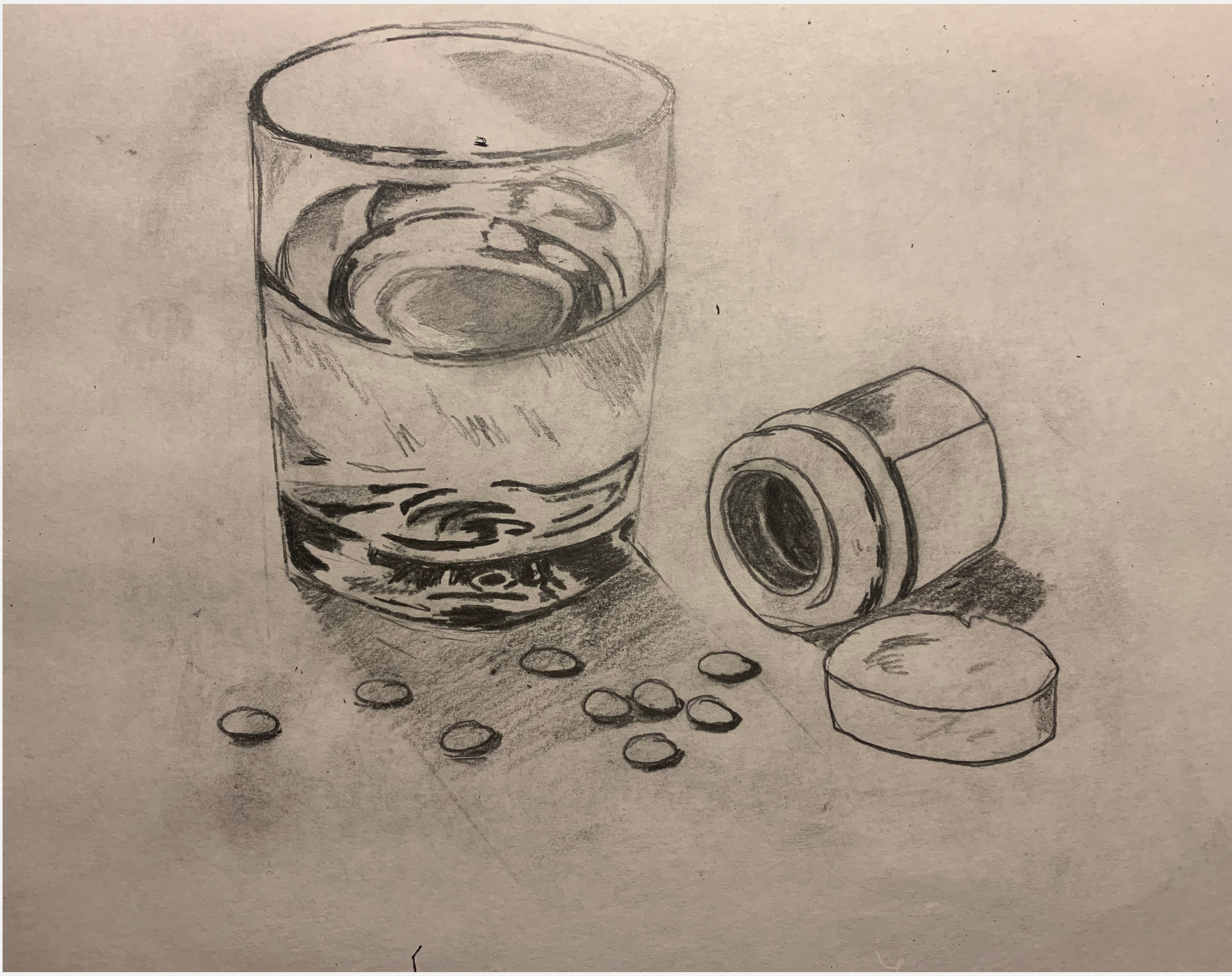

Illustration by Zhao Yan

Abstract

COVID-19 was first reported in the United States in January 2020. By March 2020, most state governments instituted stay-at-home orders. These laws required non-essential businesses to close and prohibited large gatherings as well as the continuation of in-person schooling. R and Google Sheets were used to analyze trends in substance use in Rhode Island before, during, and after these quarantine measures were implemented. Specifically, we examine changes in alcohol and opioid use at a county level and how these trends are correlated with race and income. The results indicate an increase in opioid fatality rate, but no statistically significant differences in metrics of alcohol use. Increases in opioid use were most significant among the African American population. Future research will evaluate these changes in substance use with respect to other demographic factors including ethnicity and education to determine the groups that are most vulnerable and stand to benefit most from public health intervention.

Introduction

The first case of COVID-19 in the United States was first reported in January 2020 and marked the beginning of a global crisis that swiftly led to unprecedented disruptions in daily life. Most state governments in the United States instituted stringent measures, including stay-at-home orders, by March 2020. These laws required non-essential businesses to close and prohibited large gatherings. Students were sent home from school and social distancing measures were enforced in public spaces.[1] These measures were crucial for protecting public health but started a new era of social and personal challenges for all individuals.

COVID-19 quarantine and social distancing measures imposed unique psychological challenges nationwide. Within a short time period, individuals faced unforeseen lifestyle changes and new stressors. Many people experienced challenges such as overseeing their children's remote schooling, concerns for the health of their families and friends, and the anxiety associated with food insecurity. The economic implications of the pandemic further exacerbated stress, contributing to widespread unemployment and financial strain for many Americans. Compounding these challenges was the reduction in access to traditional coping strategies, including social interaction and physical activity. A notable consequence was the negative impact on mental health as reported by many adults in the US. This, in turn, led to unfavorable changes in the use of alcohol and drugs, gambling, and other risky behaviors.[2]

With the social and personal stressors caused by the pandemic, changes in substance use can be expected. Such patterns of behavior during times of national stress have been observed before, as seen in the aftermath of the September 11th terrorist attacks in New York City, where the use of cigarettes, alcohol, and marijuana increased in the months following the tragedy.[1] Beyond the psychological and economic aspects, the pandemic also disrupted access to essential healthcare services, particularly for those with substance use disorders. In-person treatment for conditions like opioid use disorders faced significant limitations at the onset of the pandemic, creating additional hurdles for individuals already grappling with the challenges of addiction.[2]

This paper aims to comprehensively review trends in substance use in Rhode Island before, during, and after the implementation of quarantine measures. Specifically, we will examine changes in alcohol and opioid use at a county level. We will also explore how trends in substance use by county are correlated with demographic factors like race, income, and education level.

Methods

Alcohol

In this study, we leveraged datasets obtained from the Behavioral Risk Factor Surveillance System (BRFSS) administered by the Centers for Disease Control and Prevention (CDC). The BRFSS is a comprehensive survey conducted annually in the US and serves as a valuable source of information for public health research and policy development. The survey is a state-specific telephone survey. We analyzed the reported alcohol consumption and binge drinking rates in Rhode Island from the BRFSS datasets. According to the survey, alcohol consumption is defined as at least one standard drink of alcohol within the past 30 days; binge drinking is defined as more than 5 standard drinks for males and more than 4 standard drinks for females in one occasion. We graphed the alcohol consumption and binge drinking data in two separate graphs using Google Sheets.

Opioids

Opioid prescription data was compiled from the Rhode Island Department of Health into R Studio to analyze prescription rates in Rhode Island. Overdose data, also from the Rhode Island Department of Health, was imported into Google Sheets and trends were analyzed between race and resident municipality.

Results

Alcohol

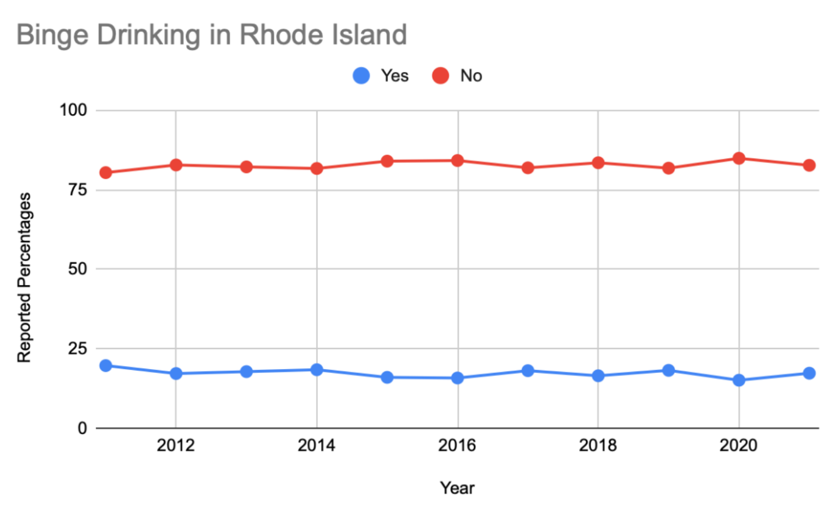

Figure 1. Binge Drinkers (>5 drinks for males, >4 drinks for females in one occasion) in RI

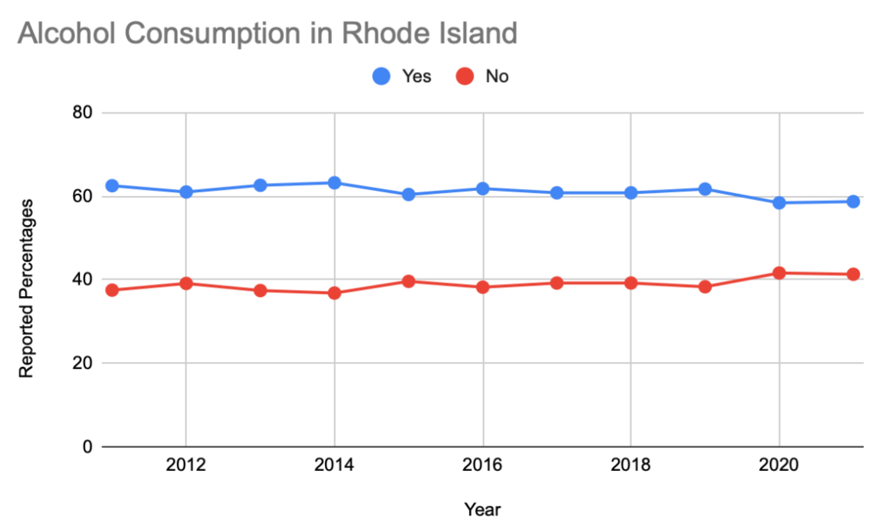

Figure 2. Alcohol Consumers (Adults who have had at least one drink of alcohol within the past 30 days) in RI

The analysis of alcohol consumption and binge drinking patterns in Rhode Island adults throughout the pandemic did not reveal any statistically significant differences. Alcohol consumption was steadily tracked at approximately 60% from 2011-2021. Conversely, adults that did not partake in alcohol consumption during this time period were approximately 40% of the population. Binge drinking was also steadily tracked at approximately 20% for both males and females from 2011 to 2021. Adults who denied binge drinking were constantly at 80% throughout the period. The data for both binge drinking and alcohol consumption suggest that there was no significant change in alcohol drinking trends from pre-pandemic to pandemic years.

Opioid use

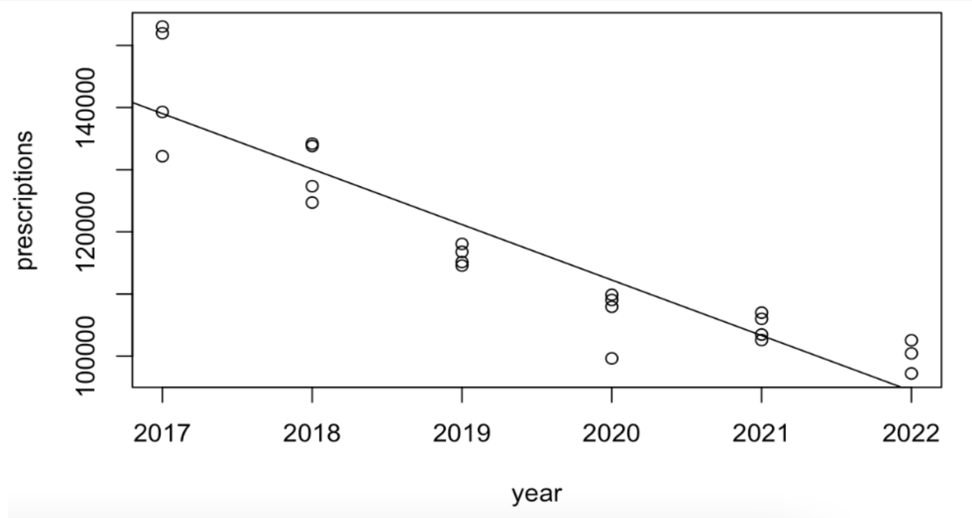

Figure 3. Number of Opioid Prescriptions per Quarter in Rhode Island From 2017-2022

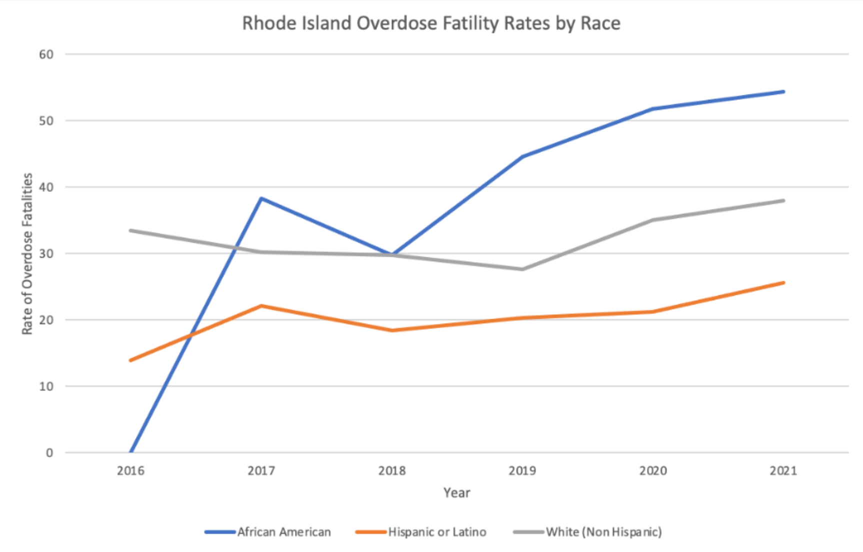

Figure 4. Rhode Island Opioid Overdose Rates by Race From 2016-2021

Prescription data (Figure 3) suggest that from pre-pandemic years through the early years of the pandemic the number of opioid prescriptions decreased in Rhode Island. Thus prescription-based use for opioids decreased in the state since 2017. Furthermore, the downward trend did not appear to be significantly impacted by the pandemic years. Rather it appeared to be a continuation of the downward trends. This data, however, is limited because it only includes numbers of prescriptions for opioids and not numbers from other opioid sources, such as illicit markets. Overdose data (Figure 4) suggests that there was an upward trend in overdoses especially from 2020 to 2021 (during the COVID-19 pandemic). Furthermore, this data suggests that African Americans in Rhode Island are disproportionately impacted by adverse outcomes from opioid overdose. This data is revealing of the trends in negative outcomes of opioid use; however, it is limited in shedding light on the cause of these trends and disparities.

Discussion

Alcohol

The results suggested that alcohol consumption and binge drinking rates were not significantly different when comparing pre-pandemic, pandemic, and post-pandemic rates. This suggests that there were no significant increases or decreases in alcohol-related behavior in adults in Rhode Island. Thus, public health and community-based resources may not be as impactful if directed toward alcohol use in comparison to the challenges posed by opioid use. However, it is important to note some key limitations to these findings. Most importantly, the BRFSS survey was self-reported, which relied on individuals to report their own alcohol consumption accurately. This can be influenced by a variety of factors such as social desirability bias or memory limitations in recalling drinking habits. Regardless of these potential inaccuracies in data collection, reducing overall alcohol consumption and binge drinking is still important for the health of the Rhode Island population. Future research should be focused on understanding the demographic differences in alcohol use to determine if certain populations would benefit from targeted public health interventions.

Opioids

Rhode Island overdose fatality has increased throughout the pandemic compared to prior years. Stratification by race/ethnicity reveals that overdose has increased most among the African American population. In addition, when overdose data was stratified amongst municipalities, most locations have seen an increase in overdose fatality during the pandemic as compared to the years prior. When examining the source of these opioids, prescription opioid data reveals that prescriptions have decreased over the course of the pandemic, which seems to follow the previous years' trends.

Considering the overall overdose fatality trend along with the decrease in prescription opioids, the data suggests that lethality is increasing due to factors external to the misuse of prescription opioids. One possible explanation for this trend is the wider availability of non-prescription opioids, which could be considered a continuation of the rise in deaths due to synthetic opioids, such as fentanyl, observed throughout the U.S. since the mid-2010s.[3] This trend is aligned with CDC data which showed a 41.5% increase in overdose deaths due to synthetic opioids in Rhode Island from 2019 to 2020.[4]

The demographic trends suggest that the Rhode Island African American population is most likely to experience adverse outcomes related to opioid use. This may be explained by factors such as structural racism and decreased access to health resources that may prevent overdose death.

Stratification by municipality demonstrated that Woonsocket, Rhode Island had the highest opioid overdose fatality rate, and U.S. Census Data reveals that the poverty rate of this municipality is 18.7%. A high overdose fatality rate was also observed in Providence which has a poverty rate of 21.5%.[5] The results suggest that more under-resourced populations are at higher risk for adverse outcomes related to opioid use during the pandemic. These effects were exacerbated in lower-income populations.

The findings also suggest that less resourced populations face a higher risk of fatality. The decrease in prescription opioids suggests that the misuse of prescriptions is decreasing; however, coupled with the finding that lethality is increasing due to opioids, it suggests that the source of opioid overdose has shifted to illicit drug sources such as synthetic opioids (e.g. fentanyl) or semi-synthetic opioids (e.g. heroin). Possible policy solutions to be implemented to address this crisis may include widespread distribution of fentanyl test strips, expanding drug checking programs, supervised consumption sites, or increasing access to overdose prevention medication such as Naloxone.[6]

Conclusion

This study suggests that harm reduction measures are likely needed to reduce the fatality of drug use among the Rhode Island population. Resources should especially be directed towards at-risk populations, such as individuals living in poverty and African American communities. The mentioned strategies may help to mitigate some of the adverse outcomes specifically associated with opioid use. Further research and robust policy solutions are needed to evaluate other trends in substance use, including alcohol.

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Gestational DM and Associated Placental Histopathology: A Narrative Literature Review

By Mal Go

Illustration by Taimi Xi

Abstract

This narrative literature review explores the relationship between Gestational Diabetes Mellitus (GDM) and placental histopathology. The placenta, a crucial fetal organ, plays a vital role in maternal-fetal exchanges during pregnancy. GDM, a common complication affecting 2 to 10 percent of pregnancies in the US, is characterized by glucose intolerance. Placental hormones, particularly lactogen, influence maternal metabolic changes in GDM, leading to insulin resistance. However, the link between placental histopathology and GDM remains unclear. The review employed a narrative approach, searching databases for studies between 2010 and 2023. Sixteen quantitative studies focusing on the influence of GDM on placental histopathology were included. The studies varied in GDM definitions, diagnostic methods, and geographical locations. Placental histopathologic findings in GDM pregnancies included increased placental weight, chorangiosis, villous immaturity, and maternal vascular malperfusion. However, the understanding of these associations is limited, necessitating further research. Research gaps exist with only a few studies conducted in the US and limited exploration of maternal race as a potential risk factor. The need for tailored maternal recommendations and prevention strategies for adverse perinatal outcomes is emphasized. In conclusion, the review highlights the diverse placental histopathological characteristics associated with GDM. Future research should focus on larger prospective studies, exploring social determinants of health, non-clinical factors, and refining strategies for early detection and intervention to improve maternal and neonatal outcomes in GDM pregnancies.

Introduction

The human placenta, a transient fetal organ, serves as the interface between maternal and fetal circulatory systems. Formed from trophoblast cells, it consists of syncytiotrophoblast and cytotrophoblast layers, creating chorionic villi that connect to maternal blood.[1] As pregnancy progresses, cytotrophoblast decreases, facilitating maternal-fetal exchanges. The umbilical cord links to chorionic villi, the tiny, finger-like projections involved in uteroplacental circulation that promote the exchange of nutrients, oxygen, and waste between the mother and fetus.[2] The placenta is vital for a healthy pregnancy, with functions such as implantation, blood circulation, hCG synthesis, hormone production, immune defense, and preventing immune rejection. Limited data on placental functions in fetal development exists, but abnormalities can lead to complications. Placental hormones mediate maternal adaptations, and issues may result in conditions like gestational diabetes and fetal abnormalities. Further research on placental pathology is crucial for a comprehensive understanding.

Gestational diabetes mellitus (GDM), one of the most common pregnancy complications, is defined as glucose intolerance that develops or is first recognized during pregnancy, and affects 2 to 10 percent of pregnancies in the US.[3] The significant amount of the variability in GDM rates and prevalence between states can be attributed to racial/ethnic factors, maternal age, insurance at the individual level, hospital factors (type and bed count), and state-level factors (prevalence of obesity, income levels, poverty rates, etc).[4] The hormone, lactogen, released by the placenta in pregnancy, is crucial for the promotion of maternal metabolic changes that occur during pregnancy to support the development and maintenance of the fetus.[3] However, while lactogen is necessary for fetal nutrition, it is also an antagonist to insulin in pregnancy and promotes maternal insulin resistance. While the role of placental hormones and mechanisms in GDM is still unclear, less is known about the relationship between placental histopathology, specifically placental lesions, in pregnancies complicated with GDM, as well as the adverse pregnancy outcomes that may result from this histopathology.

This paper aims to synthesize current research regarding the placental histopathology of pregnancies complicated by GDM, identify limitations and strengths of current research, and recommend areas of improvement based on the literature. Throughout this paper, gendered language (“maternal”, “women”, etc) and non-gendered language (“people”, “persons”, “individuals”) will be used interchangeably with the intention to be inclusive of all identities while acknowledging that not all people who are pregnant or give birth identify themselves as women.

Search Methodology

Due to the broadness of placenta pathology and quantitative/qualitative gestational diabetes research literature, a narrative review approach was conducted. Systematized database searches were performed on November 30, 2023 for the time period of January 2010 to November 2023 and conducted using the databases Scopus, PubMed, Medline, Embase, and Cochrane for primary studies. Keywords searched included ‘placenta’, ‘placental histopathology’, ‘placenta pathology’, ‘gestational diabetes’, ‘abnormalities’, ‘adverse’, ‘neonatal’, ‘fetal’, and ‘vascular malperfusion’ (a complete list of search terms can be found in the appendix). Search terms were clustered according to the formatting requirements of each database to identify original, peer-reviewed research reports investigating the placental histopathology of gestational diabetes mellitus. Additional references were identified from a manual search of the cited references of research papers that were included from the initial search. The inclusion criteria for the full-text screening were English language or available translation, full-text availability, original research in peer-reviewed journals, published between 2010 and 2023, and described histopathological findings of pregnancies complicated by GDM. Gray literature and studies that did not clearly study the effect of GDM on placental histopathology were excluded. (See Table 1 for full search terms)

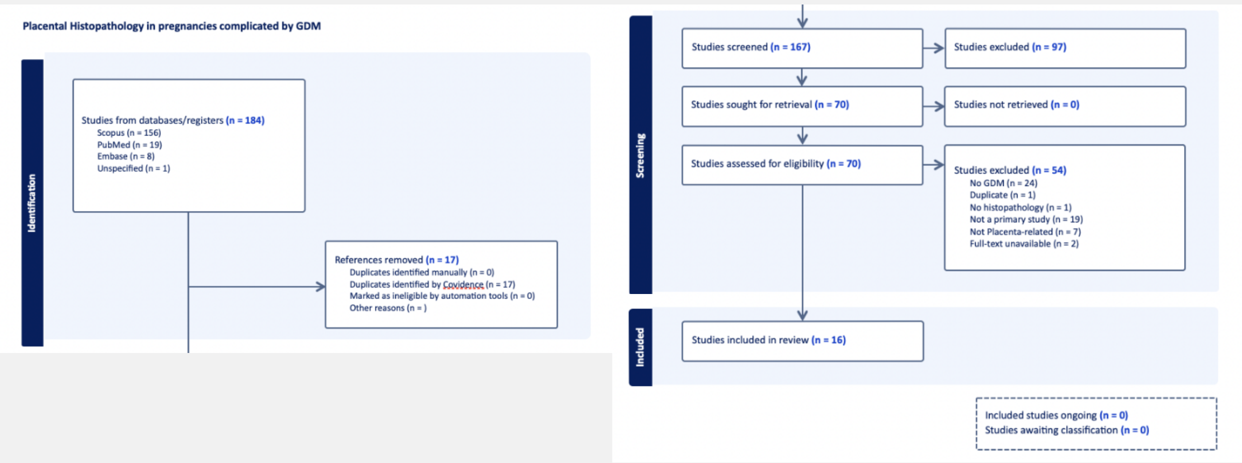
Table 1 Search Terms

Cluster	Search Terms
A	GDM-related terms: Title or Abstract "gestational diabetes" OR GDM OR "perinatal diabetes" OR "maternal diabetes" OR "hyperglycemia in pregnancy" OR "diabetes in pregnancy"
B	placenta-related terms: Title or Abstract Placental pathology OR placenta histopathology OR placenta abnormalities OR placental lesions OR placental dysfunction OR maternal vascular malperfusion
C	neonatal/fetal: Title or Abstract Neonatal complications OR neonatal adverse OR fetal adverse OR fetal complications
D	A, B, C

Search Results

A total of 184 records were identified through database searching, and after removing duplicates 167 articles were screened against the eligibility criteria. Of these, 97 were excluded after screening the study title and abstract, leaving 70 full-text studies assessed for inclusion. A total of 16 quantitative studies that focused on the influence of GDM on placental histopathologic characteristics were eligible for inclusion and data extraction.

Figure 1 PRISMA: Search Flow-chart of identified papers published between 2010 and 2023



Gestational Diabetes Mellitus diagnosis

All studies, except one that relied on medical records and patient charts for GDM diagnosis, used a variation of the oral glucose tolerance test (OGTT) for biochemically confirmed GDM diagnosis. Studies varied by the guidelines and criteria that the OGTT was scored against, including: International Association of the Diabetes and Pregnancy Study Groups (IADPSG), International Federation of Gynecology and Obstetrics (FIGO), American Diabetes Association (ADA), American College of Obstetricians and Gynecologists (ACOG), Carpenter-Coustan, and glucose challenge test (GCT, the UK version of the OGTT), departmental protocol, and Japanese criteria.

Author, Year	Country	GDM definition	Type of Study	Retrospective/Prospective	GDM sample size	Blinding of Pathologist
Aldahmash, 2022	Saudi Arabia	GDM diagnosed at 24–28 weeks of pregnancy according tothe criteria of the International Diabetes and PregnancyStudy Group (IADPSG)	Case-control	Retrospective	n=44	Not mentioned
Al-Ofi, 2021	Saudi Arabia	GDM diagnosed at 24–28 weeks of pregnancy according tothe criteria of the International Diabetes and PregnancyStudy Group (IADPSG)	Case-control	Retrospective	n=10	Not mentioned
Berceanu, 2018	Romania	Clinical diagnosis from medical records	Cohort	Prospective	n=16	Not mentioned
Diceglie, 2021	Italy	GDM diagnosed according to the International Federation of Gynecology and Obstetrics (FIGO) guidelines, by the Oral Glucose Tolerance Test (OGTT-75 g) performed at 24–28 weeks of gestation.	Case-control	Prospective	n=13	Not mentioned
Ganer Herman, 2022	Israel	GDM diagnosed at 24–28 weeks of pregnancy according to OGTT (GDMA1 was defined when sufficient glycemic control was achieved with no medical treatment;GDMA2 was defined as the need for medical treatment to achieve glycemic control during pregnancy) by abnormal value 1 hour after 50g OGTT or two pathological values in the 3 hour 100g OGTT	Cohort	Retrospective	n=668	Yes
Goto, 2022	Japan	GDM was diagnosed at 24–28 weeks of pregnancy according tothe criteria of the International Diabetes and PregnancyStudy Group (IADPSG)	Case-control	Retrospective	n=155	Not mentioned
Huynh, 2015	US	GDM was diagnosed by Carpenter-Coustan criteria by 100g OGTT	Case-control	Retrospective	n=126	Not mentioned
Istrate-Ofițeru, 2020	Romania	World Health Organization (WHO) GDM definition by plasma glucose level	Case-control	Prospective	n=30	Not mentioned
Kleiner, 2020	Israel	Department Protocol by OGTT	Cohort	Retrospective	n=133	Yes
Nataly, 2022	Israel	OAV was diagnosed in one of the last three measurements on the 3 hour 100g OGTT, performed between 24 and 28 weeks of gestation. GDM diagnosed at 24–28 weeks of pregnancy according to OGTT (GDMA1 was defined when sufficient glycemic control was achieved with no medical treatment;GDMA2 was defined as the need for medical treatment to achieve glycemic control during pregnancy)	Case-control	Prospective	n=132	Yes
Pooransari, 2020	Iran	GDM was diagnosed either by 75g or by 100g OGTT	Case-control	Prospective	n=60	Not mentioned
Rudge, 2011	Brazil	GDM was diagnosed at 24–28 weeks of pregnancy according to the American Diabetes Association (ADA) criteria for the 100g OGTT	Cohort	Prospective	n=8	Yes
Scifres, 2017	US	GDM was diagnosed by Carpenter-Coustan criteria by 50g 1 hour OGTT, or two or more abnormal values by the 3 hour 100g OGTT	Cohort	Retrospective	n=1186	No
Siassakos, 2022	UK	All patients according to the local protocol had a random blood glucose (BG) in the first trimester, a glucose challenge test (GCT/OGTT) in the late second trimester and a third trimester 2 hour OGTT with 75g dependent on risk factors.	Case-control	Retrospective	n=80	No
Weiner, 2018	Israel	GDM was diagnosed at 24–28 weeks of pregnancy according to the American College of Obstetricians and Gynecologists guidelines for the 100g OGTT. GDM was defined as at least two pathological values on the OGTT.	Case-control	Retrospective	n=285	Yes
Xu, 2021	China	GDM was diagnosed at 24–28 weeks of pregnancy according to the American Diabetes Association (ADA) criteria for the 100g OGTT	Cohort	Retrospective	n=278 (with PEC)	Not mentioned

Placental histopathologic findings

Prospective cohort studies

Berceanu et al. compared the morphology of placentas of Type 1 diabetes mellitus and GDM complicated pregnancies.[5] Majority of the Type 1 diabetes mellitus and GDM cases presented with placentomegaly, an enlarged or oversized placenta, at the end of the third trimester with 40 percent of GDM cases presenting with immature appearance of the placenta. Villous immaturity, the underdevelopment of placental villi relative to gestational age, was found in 81.25 percent of GDM cases and chorangiosis in 37.5 percent.[5]
Rudge et al. compared the placental histopathology between placentas of pregnancies complicated by mild hyperglycemia (MGH), GDM, and pregestational diabetes.[6] The placentas of GDM pregnancies had characteristics of delayed placental maturation (absence of syncytial nodes, high incidence of dysmaturity), yet 25 percent of neonates were classified as large for gestational age (LGA).[6] Placental characteristics only observed in the GDM placentas included chorial and intimal edemas (lesions of circulatory pathology), Hofbauer cell hyperplasia (enlargement of fetal macrophages), and villitis (inflammatory lesion).[1]

Retrospective cohort studies

Ganer Herman et al. investigated in vitro fertilization (IVF) pregnancies and unassisted complications by GDM and found that IVF neonates were more likely to suffer from one or more adverse outcomes such as respiratory distress syndrome.[7] This was not explained by placental histology as there were no significant differences between IVF and unassisted pregnancies regarding maternal vascular malperfusion (MVM) lesions, abnormalities of the blood vessels supplying the placenta. Nor were there significant differences regarding fetal vascular malperfusion lesions (FVM), abnormalities of the blood vessels within the placenta that supply the fetus. Also, there were no significant differences between groups regarding the prevalence of histological chorioamnionitis, the inflammation of the membranes surrounding the fetus.
Kleiner et al. compared pregnancy outcomes and placental pathology among pregnancies complicated by macrosomia (neonatal birth weight of 4000g or greater), a condition associated with diabetic pregnancies, prolonged labor, shoulder dystocia, and neonatal hypoglycemia.[8] Due to low sample size, GDM placentas and pre-pregnancy diabetes placentas were aggregated under the "diabetic macrosomia" group.[8] The study concluded that the diabetic macrosomia group had mothers of more advanced age and higher BMI and did not differ significantly in terms of neonatal outcomes compared to the non-diabetic macrosomia group, though both groups had high rates of adverse neonatal outcomes (27.5 percent and 29 percent, respectively). Surprisingly, the placentas from the non-diabetic macrosomia group had greater rates of MVM and FVM and higher placental weights compared to the diabetic macrosomia group.

After adjusting for maternal age, race, educational attainment, and pre-pregnancy BMI across 1,186 placentas, Scifres et al. concluded that MVM lesions were the most common placental pathology among women with GDM, with respect to their retrospective cohort study.[9] GDM is associated with excess gestational weight gain. This increases the risk for adverse pregnancy outcomes and may negatively impact various inflammatory processes that may occur in early gestation. While the mechanisms for the association between MVM and early gestational weight gain are unknown, Scifres et al. predicted that the "diminished early placentation seen with MVM" may impact the production of hormones that influence maternal metabolism.[9] For example, the stronger early placentation of pregnancies not associated with any pathology, may lead to the increased production of hormones that are associated with morning sickness (nausea and vomiting) common in early gestation, mitigating early gestational weight gain.
Due to the association between GDM and PEC, Xu et al. explored the placental histopathological effects of preeclamptic pregnancies complicated by GDM (PE+GDM) compared to those without GDM (PE-GDM).[10] PE+GDM placentas had significantly greater incidences of chorioamnionitis, MVM, and increased placenta weight. However, there were no significant differences regarding neonatal outcomes between the two groups.

Prospective case-control studies
Diceglie et al. reported that PHLPP1 (a phosphatase described to be involved in insulin resistance mechanisms) expression in placental tissues was increased in obese women with GDM compared to obese women without GDM.[11] There is a lack of consensus on the role of PHLPP1 in GDM and its potential role as a regulator of an insulin feedback loop absent in diabetes.

Istrate-Ofiţeru et al. investigated the association between common pregnancy morbidities, GDM and gestational hypertension (GHTN) and placental morphopathological changes that influence fetal development.[12] Both GDM and GHTN placentas had greater vascular density compared to placentas unassociated with any pathology, with the presence of chorangiosis slightly higher in GDM placentas than GHTN placentas. This study concludes that chorangiosis, a feature typical of GDM placental pathology, can also occur in pregnancies complicated with GHTN.

Nataly et al. compared pregnancy outcomes and placental pathologies of GDM pregnancies managed by diet-control (GDM1), GDM pregnancies managed by insulin, and cases that had one isolated abnormal value (OAV) regarding the OGTT.[13] The fetal to placental birth weight ratio was lower among the GDMA2 group compared to the other study groups, but there were no significant differences between groups regarding MVM, acute inflammatory, or chronic villitis lesions. Similarly, Pooransari et al. found that well-controlled GDM (by either insulin or diet) had no significant differences in placental gross morphology and pregnancy outcome compared to pregnancies not associated with any pathology.[14]

Retrospective case-control studies
Aldahmash et al. found that the average placental weight of the GDM group was significantly higher than the control group.[15] Within the GDM group, common vasculopathies on the maternal side of the placenta included villous agglutination and retroplacental hemorrhage. On the fetal side, the incidence of villous fibrinoid necrosis and chorangiosis was significantly higher within the GDM group compared to the control group. Chorangiosis is the excess of blood vessels in the placental villi and impacts fetoplacental circulation, compromising placenta function and glucose metabolism.

Al-Ofi et al. discovered that the serum levels of the angiogenic biomarkers VEGF, angiopoietin-2, endoglin, and endothelin-1 were significantly higher in GDM women compared to non-GDM women.[16] The disruption of pro and anti-angiogenic biomarkers directly affect the development of feto-placental vessels and may be associated with GDM pathology. This study found that serum VEGF-A levels in GDM pregnant participants were significantly higher compared to non-GDM participants; these finds may explain the mechanisms underlying the impairments of the placental barrier in GDM that are associated with (abnormal placentation and the subsequent maternal and neonatal complications).[16]

On the other hand, Goto et al. found an increased incidence of fetal vascular malperfusion among GDM placentas than non-GDM placentas.[17] However, this did not apply to maternal vascular malperfusion (MVM). While the exact mechanisms of fetal vascular malperfusion are unknown, the study’s findings suggest that maternal hyperglycemia may result in endothelial injury and dysfunction which results in the development of fetal vascular malperfusion.

Huynh et al. utilized multivariable logistic regression to compare placental pathologic characteristics between pregnancies complicated by T1DM, T2DM, and GDM.[18] While there were no statistically significant differences in fetal thrombotic vasculopathy, GDM placentas had significantly more villous immaturity and T2DM placentas had a significantly higher rate of fetal acute chorioamnionitis. Maturational impairments like villous immaturity are associated with increased risk of perinatal mortality and chronic fetal hypoxia; inflammatory impairments like chorioamnionitis are associated with neonatal morbidities and mortalities and preterm delivery.[19–21]

Siassakos et al. aimed to study placental pathology of GDM as a risk factor of stillbirth by utilizing placental histopathology reports and clinical record analysis and focused on abnormal placental villous maturation, particularly distal villous immaturity (DVI).[22] They discovered that, despite no formal diabetes diagnosis, significantly more women with disorders of villous maturation had at least one abnormal glucose test result compared to women without disorders of villous maturation. The prevalence of a formal GDM diagnosis did not differ significantly between various histopathologies.

Weiner et al. aimed to compare placental histopathological lesions and neonatal outcomes of pregnancies complicated by GDM between singleton and dichorionic diamniotic twin pregnancies.[23] While MVM, villous immaturity, and LGA neonates were associated with singleton pregnancies, twin pregnancies resulted in significantly more NICU admissions.

Strengths and Limitations

The primary strengths of the studies included in this narrative literature review were the biochemical confirmation of GDM diagnoses by OGTT and the novelty of the groups involved such as IVF patients with GDM, PEC pregnancies complicated by GDM, macrosomic pregnancies, women with OAV, and singleton vs twin pregnancies. However, the majority of studies took place at a single center or university-affiliated hospital and acknowledged small sample size (overall and of the GDM subsample) as a limitation. Also, only 5 out of the 16 studies had blinded their pathologists to reduce potential biases, with 11 out of 16 studies either not mentioning the blinding of their pathologists or failing to include this in their methodology.

Gaps in the Research

Only 2 out of the 16 studies were conducted in the US (Scifres et al., 2017; Huynh et al., 2015) and only 2 studies looked at maternal race as a potential risk factor (Scifres et al., 2017; Huynh et al., 2015).[9],[18] However, due to sample size and available data, both studies aggregated maternal races into "White", "Black", and "Other", or "White" and "non-White", respectively. Scifres et al. highlighted the need to better understand placental function in order to tailor and individualize maternal recommendations and prevent adverse perinatal outcomes.[9]

Discussion and Implications for Future Placental Research

This narrative literature review on placental histopathology studies related to gestational diabetes mellitus (GDM) revealed various findings. "The placental histopathological characteristics that were significantly more frequent in pregnancies complicated by GDM included increased placental weight, incidence of chorangiosis, villous/placental immaturity, and MVM."[18] There was variation regarding the placental histopathological characteristics: villous agglutination, retroplacental hemorrhage, villous fibrinoid necrosis, increased angiogenic biomarkers, PHLPP1 expression, FVM, increased vascular density, and chorioamnionitis.

This review reveals a lack of clarity in understanding the link between placental histopathology and GDM, emphasizing the need for further research. The studies, conducted between 2010 and 2023, highlight variations in GDM definitions, diagnostic methods, and geographical locations. Notably, research gaps exist, with limited studies in the US and minimal exploration of maternal race as a potential risk factor. The call for tailored maternal recommendations and prevention strategies arises from the diverse placental histopathological characteristics associated with GDM. Future research should focus on larger prospective studies, considering social determinants of health, non-clinical factors, and refining strategies for early detection and intervention to improve maternal and neonatal outcomes in GDM pregnancies. Social determinants of health and non-clinical factors of interest include maternal ethnicity, culture, socioeconomic status, access to care, and lifestyle factors.

Pathology plays a critical role in public health as the study of disease at the diagnostic and etiologic level. While the studies reviewed were highly laboratory and clinical-based, they provide a critical component of public health by contributing to understanding the mechanisms behind disease, surveillance, and potential strategies for early detection.[24–27] The reviewed studies emphasized the need for further research in the pathological field, particularly larger prospective studies, as well as the significance of prenatal care, perinatal glycemic control, the use of ultrasound to detect potential abnormalities, and lifestyle factors in improving maternal and neonatal outcomes in pregnancies complicated by GDM. The future of placental histopathology research offers an opportunity to investigate the social determinants of health or non-clinical factors that may underlie these histopathological characteristics.[26–30]

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Social Determinants of Type 2 Diabetes in Rural vs. Urban Communities

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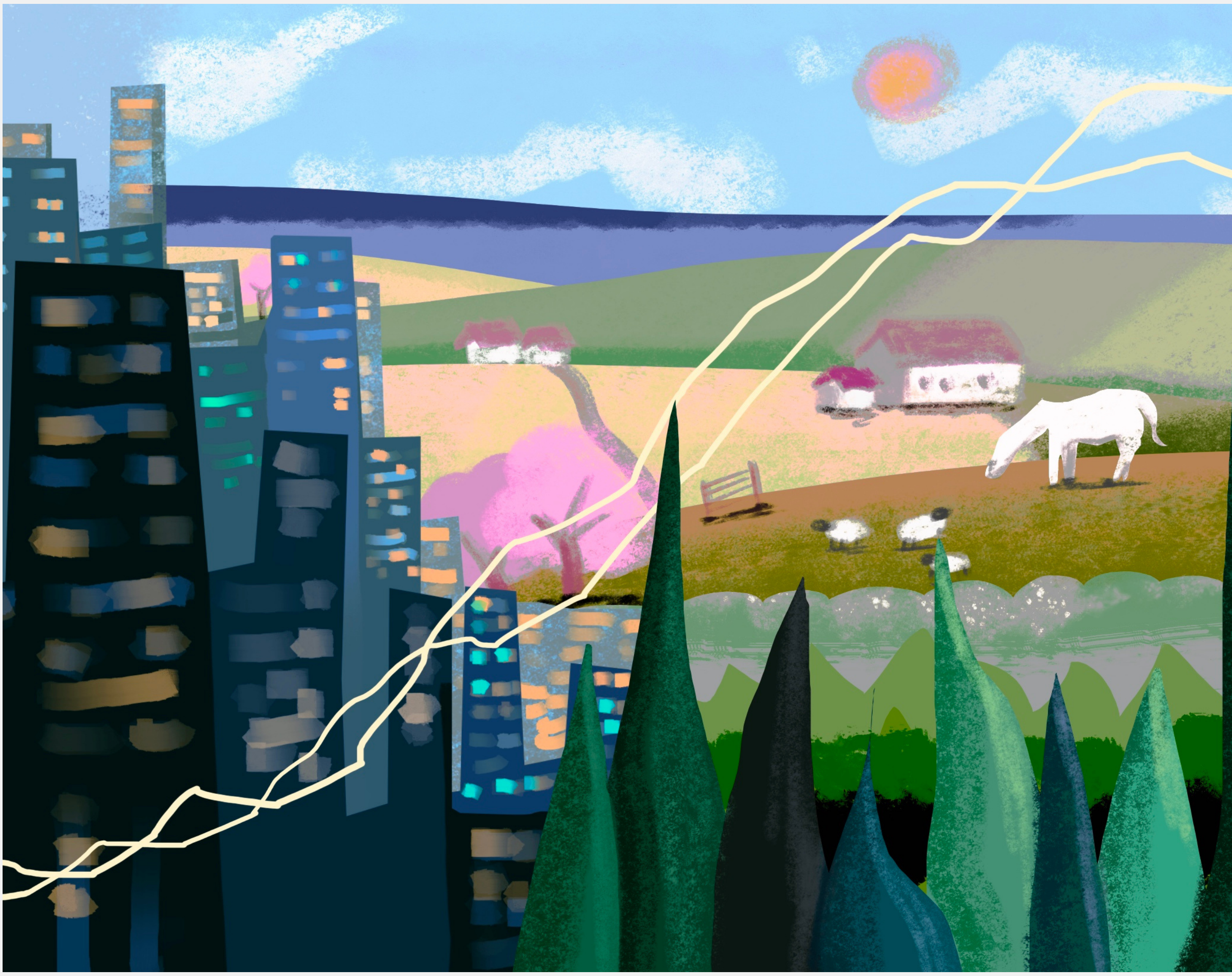

Illustration by Junyue Ma

Introduction and Background

Type 2 diabetes is a chronic immunological disease resulting from the body's inability to process insulin. It affects populations worldwide, with a global prevalence of 537 million adults (age 20-79), which is expected to rise to 783 million by 2045, making up over 10% of the world's total population.[1],[2] This condition is linked to comorbidities including hypertension, liver disease, kidney disease, retinopathy, polycystic ovary syndrome, and obstructive sleep apnea. While the physical afflictions of type 2 diabetes are well documented, its economic implications are often neglected. People living with diabetes are put under an increased financial strain due to the costs of treatment, surgery, dialysis, etc. According to the CDC, people diagnosed with diabetes incur an average of $19,700 in annual medical expenses, which is over two times the medical expenses of a person without diabetes.[3] Living with type 2 diabetes also creates occupational barriers due to disability, which can hamstring a person's income. The effect of disabilities caused by diabetes often bleeds over to the patient's family members who may have to assist them physically and financially.

The most common physical risk factors associated with type 2 diabetes are poor diet, obesity, and family history. Sugar, refined carbohydrates, and processed foods are key dietary drivers of type 2 diabetes because they increase blood sugar levels at such a high rate that glucose cannot be sufficiently stored in the liver, which makes the job of insulin much more difficult.[4] A poor diet, combined with a sedentary lifestyle will also increase the risk of obesity. Excess body weight causes increased insulin resistance in muscle and tissue cells.[5] An individual with a family history of diabetes is more likely to develop the disease due to genetic predisposition, but more so due to the poor habits that may have been learned during the person's formative years, such as an unhealthy diet and little to no exercise. While there is no cure for type 2 diabetes, individuals are usually placed on diet and exercise programs along with regular monitoring of body weight and hemoglobin A1C levels to prevent or treat the disease.

The social determinants of health are the biggest drivers of health disparities globally, playing a massive role in influencing risk factors and the ability to use preventative measures for type 2 diabetes. These determinants are often connected to structural impediments, including delayed diagnosis, failure of therapies, and unaffordable treatment.[6] Poor access to quality healthcare decreases the likelihood of receiving screening, checkups, or adequate treatment after the onset. In addition to the financial strain of utilizing care, individuals with low socioeconomic status are more likely to have limited healthy food options, which creates a compounding burden by subjecting them to an unhealthy diet. Individuals living in low-income communities often experience a hostile lived environment, increasing the levels of stress they endure, which is associated with a higher proclivity toward diabetes or risky behaviors that lead to diabetes. Despite its status as a rich nation, the United States has struggled to decrease the burden of diabetes, as morbidity and mortality rates have climbed over the decades. One of the pitfalls of large, diverse nations like the U.S. is that they are highly susceptible to health disparities among different demographics. Health disparities have been studied extensively with a focus on race, gender, sexual orientation, and income level. However, there may be a residential basis for disparate health outcomes in the U.S. This paper will critically examine peer-reviewed health literature that has determined significant differences in type 2 diabetes between rural and urban communities. This paper will then use this literature and other evidence to address the following question: What factors contribute to the disparities in type 2 diabetes prevalence in rural versus urban communities in the United States?

Methodology

- Background Search → The purpose of this search was to retrieve reputable information on type 2 diabetes for the introduction. Google was used to get certain statistics such as global prevalence, mortality, future projections, and average expenditures of living with diabetes to contextualize the burden of this disease for the introduction. Information on the most current prevalence, mortality, and projection of type 2 diabetes was pulled from Diabetes Atlas. Information on healthcare expenditures and risk factors for diabetes was pulled from the CDC. Since poverty statistics are relevant in this literature, data derived from the USDA reported by the Rural Health Information Hub were referenced. All of these references are not produced from peer-reviewed literature but are from reputable databases, hence their inclusion in the citations. There are a total of seven references that were derived from this background search, one of them being a published review that yielded evidence-based information regarding the structural risk factors that may contribute to type 2 diabetes.
- Targeted Search → PubMed, Wiley Online Library, and Google Scholar were search engines used for my targeted search. Boolean operators were utilized to connect keywords such as "type 2 diabetes", "rural", "urban", "United States," "US," or "America." In total this search yielded 45 results in PubMed, and over 100,000 results in the other two databases To explore literature on social determinants that may contribute to the burden of diabetes in rural communities, the terms "income", "socioeconomic status" "education", "physical activity" and "care" or "access to healthcare" were used, which yielded 23 results in total in Pubmed and over 100,000 in the other two databases. The cut down to 12 sources was determined by eligibility criteria and the elimination of studies that were conducted utilizing similar methods. References used in the results section are represented as AMA citations.
- Inclusions and Exclusions → Literature that met the criteria for use as evidence needed to specifically research diabetes and/or determinants associated with diabetes, cover populations in rural and urban communities in the U.S., and be recent enough to be considered relevant in 2023. Included studies were based on rural and urban areas in the U.S. and covered type 2 diabetes diabetes, obesity, socioeconomic status or income, education, or quality of healthcare. If the study researched any of those topics without researching diabetes directly, it was still included because those are known determinants of diabetes. Eligible articles for review may include cross-sectional, randomized controlled trials, case-control studies, other systematic reviews, or published papers that reference public data. The type of article is not a concern for this evidence synthesis because both qualitative and quantitative data will be used to answer the research question. Due to the nature of the research question, it was anticipated that randomized controlled trials and case-control studies would not be found. Any literature that studies that conducted research outside of the United States was excluded, as the population of interest for this paper is rural and urban residents in the US. The age of what was considered a useful study was limited to three decades, so any research that was conducted before the 1990s was excluded in order to account for any changes to those findings due to interventions.

Results

Evidence indicates that there is a difference in diabetes outcomes between rural and urban communities in the United States and that rural communities are disproportionately affected, independent of predisposing characteristics (race, age, sex). In 2006, a cross-sectional analysis of data taken from a Behavioral Risk Factor Surveillance System (BRFSS) conducted on rural and urban residents from 47 states in the US showed that a higher proportion of rural residents reported diabetes than urban residents among *all* racial/ethnic classifications.[7] According to the BRFSS, diabetes status was determined by responses to the question, "Have you ever been told by a doctor you have diabetes?" Those responding "Yes" were considered to be persons living with diabetes. This presents a limitation to the study, as accurate information can be barred by individuals who have not been diagnosed or have not seen a healthcare provider. Overall, this study suggests that there is merit in researching potential factors that may cause a higher burden of type 2 diabetes in rural communities. Further analysis of health literature denotes three possible risk factors of type 2 diabetes that disproportionately affect rural populations: socioeconomic status, lack of physical activity, and inadequate access to health services.

Socioeconomic Status

The evidence in this systematic review points to socioeconomics as the primary reason for a higher prevalence of type 2 diabetes in rural communities than in urban communities. As previously established, low-income communities create a compounding burden that subjects individuals to an unhealthy diet as well as the financial strains of utilizing care and missing work due to disability. Poverty has a direct impact on type 2 diabetes disparities and is more prevalent in rural residential areas. According to the United States Department of Agriculture (USDA) Economic Research Service, in 2019, 15.4% of people living in rural areas had an income below the federal poverty line, while those living in urban areas had a poverty rate of only 11.9%.[8] As a result of a higher prevalence of poverty among rural communities, their residents are more likely to live in "food deserts", or areas in which it is difficult to buy affordable or good-quality food. These environments are far more likely to contain fast food chains and "convenience" stores that sell cheap processed foods as opposed to grocery stores and high-quality retail markets (i.e. Whole Foods) and fast-casual restaurants (i.e. Chipotle).[19] The high saturation of fast foods combined with the shortage of fresh produce markets hinders the ability to consistently store adequate food in the household, causing uncertainty regarding the availability and quality of the family's next meal. This phenomenon describes food insecurity. Sociologists Joy Rayanne Piontak and Michael D. Schulman explored spatial inequalities in food insecurity in the United States, specifically the problems of hunger and food access in non-metropolitan and rural localities. They found that households in the South, a heavily rural region, have the highest rates of food insecurity. A rather alarming finding from this study was that according to the USDA Food Environment Atlas, rural counties had an average 5.77% decrease in the number of grocery stores from 2007-2011.[9]

In addition to the significant gap in poverty, rural communities have less socioeconomic mobility, further perpetuating their exposure to food insecurity and other type 2 diabetes risk factors. In 2018, Iryna Kyzyma, a researcher at the Luxembourg Institute of SocioEconomic Research and a Research Affiliate at the IZA Bonn, conducted a study to determine the comparative persistence of poverty in rural and urban areas. Results were derived from survey data from over five years (2008-2013) in which participants were asked about their socioeconomic situation every four months. The analysis concluded that rural residents experienced poverty at a higher rate than urban residents, and they also stayed in poverty for a longer time period. She also found that urban residents who rose out of poverty were less likely to fall back into poverty than rural residents who rose out of poverty.[10] Given the nature of the U.S. economy along with the financial crisis of 2008, using survey data that expands beyond five years should make a stronger case. It should also be noted that the participants living in poverty could have experienced a certain level of discomfort in answering the survey questions truthfully. In summary, the eligible health literature covering the socioeconomic status of rural populations indicates that poverty is associated with food insecurity, poverty is more prevalent in rural communities than urban, and poverty persists for a longer duration in rural areas than urban areas. Given the connection between type 2 diabetes, food insecurity, and income, socioeconomic status can be a feasible determinant of residential disparities in type 2 diabetes.

Physical Activity

Low physical activity is a known indicator of obesity and type 2 diabetes. In this review, two articles conflicted on this topic. One study, published by Parks, et al in 2003, was a cross-sectional study that sampled adults of various socioeconomic backgrounds from urban and rural areas (n = 1818) to determine if there is a significant difference in physical activity based on the type of environment they live in. In this study, lower-income residents were less likely than higher-income residents to meet physical activity recommendations. Rural residents were least likely to meet recommendations; suburban residents were most likely to meet recommendations. Suburban, higher-income residents were more than twice as likely to meet recommendations than rural, lower-income residents.[11] The limitation of this study was that the population that was the least likely to meet recommendations was classified as rural and lower income, which could mean that low income is a confounder and that rural residence itself is not indicative of less physical activity.

The other study, conducted by Liu, et al in 2008 was a cross-section of the National Survey of Children's Health (NSCH), a module of the State and Local Area Integrated Telephone Survey, conducted by the National Center for Health Statistics of the US Centers for Disease Control and Prevention. The respondents of this survey were the child's parent (95.7%) or guardian (4.3%) who knew the most about the child's health and health care. The goal of this study was to use the Survey to get data on overweight status and levels of physical activity of children living in rural and urban areas to influence the design of policy interventions. According to the results, rural children (16.5%) were more likely to be overweight than urban children (14.3%). However, it was also found that urban children at 29.1% were more likely to be physically inactive than rural children at 25.2%.[12] These findings indicate that there are possible confounders within rural settings that contribute to being overweight. One can refer to the impact of socioeconomic status as well as access to healthy food options as a differentiator. A notable limitation of this study was its use of parentally reported data on height and weight, which may be inaccurate for children under ten years of age. In brief, physical activity may or may not be a driver of type 2 diabetes disparities in rural and urban areas but obesity may still be a concern. Further context on related factors affecting the populations in each area is necessary.

Access to Health Services and Information

Various health literature suggests that rural populations in America have less access to quality healthcare and health information compared to urban populations. Out of the eligible articles utilized for this paper, one systematic review and two surveys cover this topic. The systematic review, published in 2015, reported significant differences in healthcare access between rural and urban areas. The studies in this review had findings of insufficient public transportation, staffing shortages, poor availability of broadband internet services, and patient reluctance to seek care based on cultural and financial constraints.[13] One limitation when citing other systematic reviews is the reliance on watered-down information from the studies it references. There is always a possibility of biased selection with sources and the omittance of limitations of certain studies cited in the review.

A survey is a more effective measure to use when discussing access to health information and services because it allows individuals to self-report their experience with healthcare access and self-management. Since there is no cure for diabetes, health information and self-management are crucial components of prevention and treatment. Ultimately, practicing self-management and being well-informed of diabetes risk factors can lead to the lifestyle habits that are needed to prevent or reverse the disease. Two studies show evidence of inequitable access or use of health information and self-management among rural and urban populations in the United States. A survey-based study published in 2018 was conducted to determine who claims to have access to health information. Linear regression was utilized to show associations between rurality and health literacy. The findings were: compared to urban residents, rural residents had lower access to health information from sources including primary care providers, specialist doctors, blogs, and magazines, and less use of search engines. After accounting for socio-demographics, rural residents only had lower access to specialist doctors than urban residents.[14] These findings may underscore a need for telehealth services focused on rural populations, including a database of relevant health information and available physicians. Lower employment of specialists in rural areas is a factor that should be considered as well. As for the limitations of this study, it was administered through an online survey that inquired about access to 25 health information sources. There may be a substantial population of urban residents without internet access who may also be lacking access to health information. Furthermore, the study was limited to 25 health information sources, which can exclude local, lesser-known sources. However, local sources may be considered most reliable in rural areas.

Another study analyzed surveys from the North Carolina Behavior Risk Factor Surveillance System (BRFSS) to determine differences in participation in diabetes self-management education (DSME) among urban and rural adults in North Carolina from 2012 to 2017. The results were self-reported by residents. According to the conclusion, there were persistent rural-urban disparities in DSME participation, with rural residents showing lower rates and the gaps widening. The exact rates between rural and urban communities were 52.3% versus 57.8% in 2012, 54.0% versus 56.5% in 2013, 48.8% versus 62.0% in 2015, and 46.7% versus 56.1% in 2017.[15] While the restrictions of self-reported data from subjects must be considered, the results from this study suggest a significant difference between rural and urban participation in diabetes self-management programs within a single U.S. state. Regional/geographic confounders are not applicable in this study, which makes a powerful case for residential disparities on this issue.

Discussion

Rural populations in the United States are more likely to develop type 2 diabetes than urban populations due to a combination of factors. An individual's area of residence can be closely connected to their health outcomes due to the various elements that are experienced in their lived environment. There are connections to be made between the residential disparities in socioeconomic status and the residential disparities in the ability to utilize health information and services. The first connection deals with the geographic nature of rural settings. These communities are generally further away from the big metropolitans that are home to corporations, large health centers, and government buildings. Proximity (or lack thereof) to a revenue-generating city or district influences the "value" of the neighborhood as well as the level of federal investment in that area. Rural areas are also "out of the way" of public transit systems that allow all people in urban areas to travel to facilities without the use of a personal vehicle. That alone can influence someone's willingness to seek care or healthier food options or available healthcare providers , whether they have the funds or not. The other connection between socioeconomic status and health utilization is rural education. While education is not a direct determinant of type 2 diabetes, it is heavily associated with income level, health literacy, and the availability of medical specialists in the area. The USDA reports that in 2017–21, the share of working-age adults (ages 25–64) with at least a bachelor's degree was 37% in urban areas and 21% in rural areas, while the share of younger adults ages 25–44 with at least a bachelor's degree was 40% in urban areas and 22% in rural areas.[16] These statistics represent a drastic disparity between rural and urban communities, which indicates that while low income is an established determinant of high type 2 diabetes, it is just the tip of the iceberg. There are fundamental issues with the rural education system that are possibly contributing to the persistence of poverty as well as the shortage of local medical specialists. In a 2001 paper presented at the Appalachian Rural Systemic Initiative (ARSI) Conference on Understanding Achievement in Science and Mathematics in Rural School Settings, Hobart L. Harmon, a leading expert in public education in rural America outlined the inhibitors of educational advancement in rural areas. Harmon points to a cultural climate of modern education that is better suited for urban schooling. Modern America rewards personal ambition and self-determination[17] and encourages young people to venture out of their parent's homes and make their own societal contributions. Harmon suggests that this concept of individual mobility is less feasible in rural communities because rural school districts cannot generate sufficient local resources to adequately supplement the state school finance programs the way more affluent localities can.[17] His paper further claims that rural schools experience inadequacy of facilities. According to data that was pulled from research done in 1996, 30% of rural and small-town schools have inadequate buildings and 50% of schools have at least one inadequate building feature.[17] Harmon's paper denotes inadequate investment in rural school systems to go along with an educational structure that does not align with rural community values. This suboptimal learning experience can not only lead to lower levels of educational achievement, but it can also cause poor teacher retention, which is supported by a recent article published by Dr. Richard M. Ingersoll in 2023.

Using the Schools and Staffing Survey (SASS) and the National Teacher Principal Survey (NTPS) collected by the Census Bureau for the National Center for Education Statistics, nine cycles of data collection from 1987 to 2018 were recorded. Their results yielded that from two time periods: 1999-2004 and 2007-2018, the number of schools in urban areas increased by 26%, the number of students by 25%, and the number of teachers by almost a third. The number of schools in rural communities has decreased by over 28%, the number of students by 24% and the number of teachers by 19%. The study also found that rural schools have had more difficulties filling vacancies.[18] Lack of teacher retention in these communities will only worsen the outcomes of educational attainment, income, health literacy, and professional development in healthcare, which will certainly worsen the outcomes of type 2 diabetes.

In the discussion of type 2 diabetes in rural populations, the impact of rural geography and the rural education system cannot be overlooked because they are so closely associated with socioeconomic status and the ability to utilize health resources. Residential disparities in type 2 diabetes may not have much to do with differences in physical activity. Poorer facilities in rural schools may have an impact on physical education courses for children, but that doesn't indicate that they are inactive outside of school. Overall, the disparate burden of type 2 diabetes is driven by general differences in income, education, and spatial barriers.

Conclusion & Future Considerations

To conclude, the evidence presented in this systematic review not only indicated that there may be significant differences in the proportion of type 2 diabetes outcomes between rural and urban populations in the U.S., but it also referenced potential factors contributing to the disparity, including differences in socioeconomic status, physical activity, and access to health services and information. Of the 19 references utilized in this review, eight were cross-sectional studies, seven were findings derived from facts taken directly from a website or database, one was a paper presented at a conference, one was a mixed methods approach, and two were evidence-based systematic reviews. The limitations of each study were briefly explained throughout the results section. Randomized controlled trials and case-control studies were not found for this topic because this paper required studies in which urban and rural populations were surveyed and their area of permanent residence was an independent variable. No tests needed to be run and observational studies were more intuitive to answering my research question.

A multilevel and tailored approach needs to be considered to address type 2 diabetes in rural areas. If transportation and telecommunication are immediate barriers to the reception of care or participation in diabetes self-management education, then it should be addressed at the local level. Complex transportation systems may be impractical in rural areas, but telehealth interventions should continue to be a priority within communities. Leveraging community values, such as faith can also be instrumental. Focus groups and DSME training can be held at local churches and schools to garner engagement. Fresh food initiatives such as Meals on Wheels should continue to expand in rural communities as well. Agricultural programs for residents should be encouraged wherever applicable, as there is evidence that they can be an effective alternative when grocery stores are not available or affordable.[19] At the federal level, there needs to be dialogue regarding the inequitable funding of rural areas compared to urban areas, as well as the standardization of public schooling. Rural kids live almost entirely different lives than urban kids, and that needs to be reflected in the style of education they receive throughout their formative years. If the standard public education system is to be maintained, rural districts will require more subsidies to be better equipped to prepare their students. Efforts to improve diabetes care and staff retention in hospitals and schools should also be funded and supported politically.

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The Relationship Between the Opioid Epidemic and the Transmission of Hepatitis C in Rural Areas and Prisons

By Manav Musunuru

Introduction

The United States has been battling multiple waves of the opioid epidemic since the mid-1990s.[1] In 2021, almost 26 deaths out of every 100,000 Americans were attributed to some type of opioid — whether it be prescription, heroin, or synthetic — a sharp rise from 3 deaths per 100,000 in 1999.[1] Furthermore, Wang, Zhang, and Ho explain that people who inject drugs (PWID) are one of the largest reservoirs of hepatitis C (HCV) in the United States.[2] This means that alongside a rise in opioid-related deaths, the United States is also battling a concurrent HCV epidemic spurred by the increasing use of opioids across the country. This conclusion is supported by a study conducted by Des Jarlais and others, who note that, while political will and publicization have led to a decrease in human immunodeficiency virus (HIV) cases among PWID, HCV cases continue to rise across the United States, especially among PWID affected by the opioid epidemic.[3] This rising transmission rate has been flagged by researchers from the Centers for Disease Control and Prevention (CDC), who found that, between 2010 and 2016, rates of HCV transmission had tripled and there could have been over 2.4 million Americans unknowingly living with HCV in the late 2010s.[4] Many of those affected may still be untreated and untested in the present day, potentially leading to higher rates of transmission in the future. This high transmission risk is likely compounded in high-risk areas, notably rural communities and prisons. However, to investigate the current pitfalls of the medical system in those high-risk areas, the mechanism of transmission of HCV between PWID and possible treatments must be discussed first.

Needle-sharing leads to HCV transmission among PWID using opioids

According to the CDC, HCV can be transmitted when the blood of an infected person enters the body of someone who is uninfected.[5] HCV can also be transmitted through unprotected sex; however, this is a more uncommon transmission mechanism.[5] Surratt, Kurtz, and Cicero report that around a quarter of opioid users are PWID.[6] Furthermore, many PWID who use opioids, especially those who are younger, tend to share injection equipment, such as syringes.[6],[7] These used syringes are likely to have traces of HCV-infected blood, which can then infect PWID who use those syringes and then contaminate their own injection equipment as well, perpetuating the risk of transmission through needle-sharing.[5] The CDC reports that HCV is 10 times more transmissible than HIV among PWID, further exacerbating the risk of transmission.[8] Additionally, among PWID aged 18-30, around one-third are infected with HCV.[8] This number may be as high as 90 percent among older PWID who shared needles in the 1970s and 1980s before adequate research surrounding bloodborne pathogens was conducted.[8]

The possibility of transmission through needles coupled with the high transmissibility of HCV prevents the inhibition of its transmission. A study by Mateu-Gelabert and others further adds that PWID, such as prescription opioids, assume that the people they frequently share injection equipment with are uninfected.[7] On the contrary, the numbers above indicate that a high proportion of people are infected with HCV with an overwhelming majority of older PWID being infected, meaning that the aforementioned assumption only exacerbates the risks those who share injection equipment face and could expose them to HCV. Injection as a method of administration though, with its high risks of HCV transmission and infection, is starting to decline in popularity among opioid users due to the creation of therapy programs to help PWID. Tsui and others report that the use of opioid agonist therapy (OAT) helps combat opioid use disorder (OUD) overall, therefore decreasing the frequency of users injecting drugs and inhibiting the spread of HCV among PWID.[9] Unfortunately, therapy methods such as these may be hard to find in high-risk areas, specifically rural communities and prisons, increasing the possibility of HCV transmission in those locations.

Rural communities have insufficient resources to combat the opioid epidemic and HCV

Schranz and others observe that the opioid epidemic has shifted from urban areas into rural communities in the United States.[10] This is potentially devastating to these areas, as these rural communities likely have limited access to materials that combat the spread of the opioid epidemic and, in turn, the transmission of HCV. The University of Washington School of Medicine reports that only 3 percent of rural hospitals can prescribe buprenorphine,[11] while Havens and others find that programs that prescribe methadone are not located in rural areas.[12] These are the 2 main medications used in OAT13 and the absence of these prevention methods facilitates the rise of the opioid epidemic, perpetuating the transmission of HCV through needle-sharing in these areas, and putting people at a higher risk of contracting the disease.

A study from the University of Michigan about rural physicians complements this information by stating that only 9 percent of physicians feel comfortable treating patients with chronic HCV regardless of whether or not they are opioid users.[14] Furthermore, only 15 to 30 percent of HCV-infected persons are symptomatic,[10] creating a more dire situation in an area that is already medically disadvantaged, as people may be unaware they have HCV and unknowingly spread it through needle-sharing. In addition to rural areas already having high rates of needle-sharing (44.4 percent) and equipment sharing (62.2 percent), they also have a higher percentage of people at high risk of contracting HCV (due to behaviors or other factors) compared to non-rural areas (38.5 percent vs. 15.5 percent).[15] This has the potential to exacerbate outbreaks of HCV, as PWID infected with HCV may perpetuate the spread of the disease to others through needle-sharing and sexual intercourse.[5] This further exemplifies how rural areas are inadequately equipped to combat the opioid epidemic and, in turn, are also unprepared to prevent the transmission of HCV between PWID.

The incarceration of PWID has increased the risk of HCV transmission

Prisons are another location associated with high-risk opioid usage and HCV transmission. Similar to rural areas, prisons exacerbate the opioid crisis and HCV epidemic by offering inadequate care for those with OUD, while also being a location for opioid usage and HCV transmission. Josiah D. Rich from Brown University and others report that, in the United States, the number of people incarcerated for drug-related offenses has increased from 40,000 to 450,000 between 1985 and 2005 and people with OUD comprise around 20 percent of state prison populations.[16] Furthermore, more recent data suggest that 85 percent of the total prison population in the United States either has an active substance use disorder or was incarcerated for a crime concerning substances and substance use.[17]

Although there is an increasing number of people with OUD in prisons, there has not been any substantial improvement in the treatments they are provided. Although 90 percent of state prison systems, according to a study conducted by Chestnut Health Systems, have some type of medication for OUD (MOUD) available in at least one prison in the system, the distributions of MOUD among individual prisons reveal gaps in coverage.[18] Naltrexone was the most prevalent MOUD, with 36 percent of prison systems offering it, while 15 percent offered buprenorphine, 9 percent offered methadone, and all 3 by only 7 percent.[18] Additionally, buprenorphine and methadone were primarily only given to those who were pregnant or were already receiving the medication before being incarcerated,[18] meaning that those with untreated OUD continued to be untreated while incarcerated. The National Academy of Sciences expanded on this information by stating that only about 5 percent of those with OUD in prisons receive medication treatment and those who do not, only receive behavioral therapy or detoxification without any follow-ups.[17] Therefore, upon release, many people with OUD will return to using opioids. Similar to those with OUD without any involvement with the criminal justice system, those released from prison with untreated OUD may also be PWID, making them vulnerable to the same HCV transmission risks.[19] However, those involved with the criminal justice system are especially vulnerable due to the aforementioned lack of adequate OUD treatment and care in prison settings.[19]

Furthermore, interactions between people within prison settings may also spark HCV outbreaks. Unsafe practices in prisons, such as "injection drug use, tattooing, and unprotected sex" cause the risk of HCV infection and transmission to be disproportionately higher among those who are incarcerated.[20] Additionally, some people who are incarcerated begin to inject substances, such as opioids, to cope with the violent environments in prisons, while those who were PWID at the time of incarceration continue to inject throughout their time in prison.[21] Combined with the scarcity of injection equipment within prisons, this leads to widespread needle-sharing[21] and, in turn, a heightened risk of exposure to HCV. This is worsened by the lack of widespread HCV testing in U.S. prisons,[22] which leads to the underreporting of HCV cases within prisons. Nevertheless, the current prevalence of HCV infections in U.S. prisons is estimated to be at least 23 percent.[20] The prevalence of HCV within U.S. prisons is estimated to be around 10 times greater than the prevalence of HCV in the general population[23] but may be even higher. This further illustrates the disproportionately high risks of HCV transmission within prison populations, a matter that is only worsened by the lack of adequate screening for HCV and appropriate treatment options for OUD.

Conclusion

The opioid epidemic has helped foster the transmission of HCV across the United States. The main mechanism of HCV transmission is through contact with the blood of an infected person, which occurs when PWID share needles when using injecting equipment. However, this method of transmission is declining in some areas due to the use of OAT which helps PWID treat their OUD and inhibits the spread of HCV. However, there are still high-risk areas where OAT is not or cannot be effectively utilized. Rural areas are inadequately prepared for HCV outbreaks and opioid epidemics, as many clinics do not have the resources to treat OUD or hinder HCV transmission. Prisons are dealing with increasing numbers of PWID being incarcerated, but are unable to offer them adequate treatments for their OUD. Therefore, when these PWID are released from prison, they are likely to use opioids again and needle-share, making them especially vulnerable to HCV. There must be more done to combat the opioid epidemic and the concurrent HCV outbreaks, directly.

Fortunately, there have been some recent changes surrounding methadone dispensing guidelines that make it easier for patients to receive their medications. These February 2024 revisions allow for an increased amount of take-home medication, more frequent care after telehealth appointments, and enable nurses and physician assistants working at opioid treatment programs (OTPs) to order methadone.[24] However, the major barrier hindering the effectiveness of these new rules is that methadone will still only be available at the 2,000 federally approved OTPs nationwide, failing to expand access into underserved areas adequately.[24]

To truly close the gaps in opioid care, both federal and state governments must do more to expand coverage for everyone. Pew suggests that state governments should reduce legal restrictions, such as zoning, to enable the establishment of new OTPs across the country.[25] Additionally, Medicaid does not cover all MOUD in all states. For example, although buprenorphine is widely covered by Medicaid programs in all states, methadone is only covered under the programs of 80 percent of states, while the extended-release buprenorphine injection is covered by just over 60 percent of state Medicaid programs.[26] Both Congress and state governments can remedy this issue, however, by expanding coverage for different types of MOUD under the Medicaid program.[25]

Prisons and jails, on the other hand, should shift their focus to rehabilitation and expand access to MOUD to those with OUD. Pew recommends that state health agencies should combat this issue by establishing medication units and extending OTPs into underserved areas, such as prisons and rural communities..[25] Altogether, the recommended changes above will help combat OUD in the United States, therefore decreasing the transmission of HCV among people with OUD. Furthermore, federal and state governments should also increase the funding of rural and prison healthcare systems to allow them to access essential resources and respond to HCV outbreaks when they happen. For this to happen, however, the stigma surrounding drugs and opioids must be challenged and there must be a focus on helping people rather than punishing them, from both the general public and elected officials

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Examining Non-Communicable Diseases in Morocco: A Close Look at Cardiovascular Health

By Samiyra F. Afife

Introduction

Non-communicable Diseases - Looking at Cardiovascular Disease in Morocco

In global public health, the rise of non-communicable diseases (NCDs) has become a difficult challenge—fundamentally altering the narrative of healthcare worldwide. These conditions, encompassing a diverse spectrum, including cardiovascular diseases (CVDs), cancer, chronic respiratory ailments, and diabetes, now constitute a staggering 70 percent of all deaths globally - a concerning statistic.[1]

One region facing its battle with the NCD epidemic is Morocco, where the impact of these diseases on cardiovascular health is particularly pronounced. Cardiovascular NCDs, such as heart disease and stroke, are not only the leading causes of death globally but have also become a prevalent concern in Morocco. Cardiovascular diseases, comprising conditions like coronary heart disease and stroke, are strongly influenced by avoidable behaviors like poor dietary choices, physical inactivity, tobacco use, and excessive alcohol consumption. These behaviors can result in adverse health outcomes such as high blood pressure, elevated blood glucose levels, abnormal lipid levels, and weight-related problems.[2]

Cardiovascular health poses a significant challenge in many regions, with Morocco being no exception. The prevalence and awareness of hypertension and cardiovascular diseases, which affect even youth, remain pivotal issues.[3] Notably, it was reported in the findings that these NCDs account for a staggering 38 percent of the overall 80 percent mortality rate in Morocco (*Figure 4*).[4] The underdiagnosis of hypertension within sampled populations raises questions about the broader extent of undiagnosed cases within the country. These concerns underscore the necessity for public health initiatives aimed at raising awareness and understanding these non-communicable diseases.

NCDs significantly burden both the Arab region and Morocco's healthcare system, adding to the issue's complexity.[5] The strain on healthcare resources and the financial implications are pressing matters that call for comprehensive strategies to address NCDs effectively. Despite remarkable progress in enhancing healthcare access for mothers and children in Morocco,[6] challenges persist: notably socioeconomic disparities and health inequities. Recognizing these disparities is essential to ensure that improved healthcare access equitably benefits all Moroccan population segments.

Following the idea of socioeconomic disparities in Morocco’s regions, findings from research on Moroccan immigrants in the Netherlands present an intriguing finding that obesity is more common in Moroccan migrant groups in Europe than among the populations of the countries they have emigrated to.[7] However, Moroccan immigrants exhibit lower rates of hypertension and cardiovascular diseases, which may be attributed to the accessibility and quality of the Dutch healthcare system compared to Morocco's. These findings prompt a broader examination of healthcare accessibility and quality as a crucial factor in addressing cardiovascular diseases and health disparities.

Morocco, like many nations, aspires to achieve Sustainable Development Goal 3 - ensuring a healthy life and well-being for all.[8] According to a Sustainable Development Report for Morocco, considerable challenges persist in achieving this goal, largely due to the widespread impact of cardiovascular NCDs. It was revealed that over 80 percent of deaths in Morocco are attributed to NCDs, with cardiovascular diseases at the forefront.[9]

The intricate interplay between the high prevalence of cardiovascular NCDs and the inadequacies within Morocco's healthcare system becomes all too apparent. The nation finds itself at a critical juncture necessitating a comprehensive examination of its readiness to confront the cardiovascular NCD epidemic. Moreover, an essential aspect of this exploration will be the evaluation of healthcare inequities and accessibility, as these factors play a pivotal role in bridging the divide and reinforcing Morocco's primary care framework.

This paper focuses on Morocco's unique struggle with cardiovascular NCDs and their intricate interplay with the nation's healthcare system. More specifically, this paper will examine the prevalence and impact of cardiovascular diseases in Morocco, the readiness and capacity of Morocco's healthcare system, and the exploration of potential interventions and health inequities. Through this, there is an aim to better understand the dynamics of cardiovascular NCDs and contribute to the discourse on strengthening healthcare systems to address this alarming public health challenge in Morocco.

Methods

To conduct my literature search, I utilized Bruknow and the PubMed Database. In the search for viable resources and literature, the keywords: “Morocco”, “Cardiovascular Disease”, “Healthcare System”, “Healthcare”, “Education”, and “Non-communicable Diseases”, “NCD” were utilized. With searching “Morocco Cardiovascular Disease”, there were 624 results on the BruKnow database. Most of the peer-reviewed articles that arose from the results were viable resources that highlighted one or more of the following: prevalence and impact of cardiovascular diseases in Morocco, the readiness and capacity of Morocco's healthcare system, and the exploration of potential interventions and health inequities. However, many of the non-peer-reviewed resources referred to inapplicable information (unrelated publications, scientific information regarding the human body, etc.) pertaining to my research question.

In conducting my literature search on the PubMed Database, the same keywords were utilized. With searching “(Morocco[Title]) AND (Cardiovascular Disease[Title/Abstract])”, there were 14 results on the PubMed database. Regarding literature selection, I excluded publications that focused on specific research questions and concerns regarding those specific questions. I selected publications that highlighted cardiovascular disease in Morocco, Morocco's healthcare system, and initiatives to address health concerns (specifically cardiovascular disease and NCDs) in Morocco. Most of the selected articles and publications were published in the past thirteen years due to the lack of research initiatives regarding NCDs in Morocco. The findings from these sources were synthesized, critiqued, and analyzed to reflect and respond to my research question. The entirety of my methods and selection process is available in Figure 1.

Results

With the vast amount of varying information from the articles, navigation support is provided in Figure 2. This overview figure includes each reference utilized, a title, purpose, and methods for each reference. In this section, each reference will be developed in reference to the results and overall synthesis of each article. Across all articles, the trends are distinguished into three categories: the burden of cardiovascular NCDs in Morocco, challenges in Morocco's healthcare system and education, and socioeconomic and health inequalities that progress CVD burden, in conjunction with Morocco's progress in achieving its Sustainable Development Goals.

The Burden of Cardiovascular Disease (and NCDs) in Morocco

Cardiovascular Disease and Risk Factors Contribute to a Substantial Proportion of Mortality

The burden of cardiovascular diseases (CVDs) within Morocco constitutes a critical element of the country's public health landscape. Several articles underscore this pressing concern shedding light on how cardiovascular diseases stand as a key driver behind a substantial proportion of NCD-related fatalities. The literature presents that ischaemic heart disease (IHD) was the top cause of death in the Arab world in 2010, which contributed to 14.3 percent of deaths.[10] Through Mokdad's method of dividing twenty-two Arab countries into low-income, middle-income, and high-income countries, they were able to estimate causes of death, disability-adjusted life years (DALYs), DALY-attributable risk factors, years of life lived with disability (YLDs), years of life lost due to premature mortality (YLLs), and life expectancy. Mokdad's analysis of the burden of diseases, injuries, and risk factors in Morocco explains that since 1990, NCDs that directly impact cardiovascular health (ischemic heart disease (IHD), high blood pressure, obesity, etc.) have worsened.

Similarly, a comprehensive analysis of CVDs and associated risk factors in the Moroccan population reveals a staggering 38 percent mortality rate attributable to CVDs within Morocco.[9] This analysis was conducted by a comprehensive literature review approach - delving into existing research and data, drawing insights from studies conducted in the Arab world, particularly within the context of Morocco's evolving health landscape. IHD and stroke emerge as the primary risk factor - collectively responsible for over half of these fatalities.[9] The prevalence of key risk factors within the studied population, notably tobacco smoking, physical inactivity, elevated hypertension rates, and even depression, signifies a complex interplay of lifestyle, socioeconomic factors, and health indicators contributing to this burden.[9] Elyamani's systematic review results align with Mokdad's research reinforcing the substantial impact of cardiovascular diseases on Morocco's public health landscape. The combination of broad-spectrum analysis, as seen in Mokdad's study, and the precision and depth afforded by systematic review techniques in the second study, enriches the overall comprehension of the multifaceted aspects of CVDs and their implications for public health in Morocco. IHD maintains its significant presence authenticating Mokdad's earlier findings that it is a leading cause of mortality in Morocco. Moreover, the identification of similar risk factors such as high blood pressure (although with varying prevalence rates) serves as a thread connecting the two studies.[9],[10] The systemic challenges mentioned in the epidemiological review such as high illiteracy rates, socioeconomic status, and inadequacies within the healthcare system concur with Mokdad's analysis, hinting at potential catalysts fueling the exacerbation of CVDs and NCDs in Morocco over time.[9]

Results also suggest the concerning prevalence of risk factors among a cohort of young individuals, hinting at potential future implications for the broader cardiovascular health landscape in Morocco.[3] The adoption of the STEPwise approach in Loukili's study, endorsed by the WHO for monitoring NCD risk factors, highlights the commitment to standardized data collection, enabling strong comparability with similar global studies. Regarding the cardiovascular disease risk factors among young adults in Moroccan university setups, undiagnosed hypertension was prevalent (with a reported rate of 8.54 percent), diabetes (3.31 percent), and obesity (6.17 percent).[3] The study's identification of obesity as a significant concern mirrors the evolving trends in cardiovascular risk factors observed across various demographics in Morocco.

Conversely, the systematic review of Turkish and Moroccan migrant groups in Europe, employing a systematic search spanning 1950 to 2010 across peer-reviewed journals, highlighted a similar incidence of high obesity and diabetes rates among these populations compared to Western European demographics.[7] The alignment of these findings from various demographic groups and geographical locations resulted in continuity in the prevalence of cardiovascular risk factors among Moroccan populations.[7] This is irrespective of age or location. Both studies contribute findings on the prevalence and patterns of CVD risk factors. Loukili's study among Moroccan young adults elucidates the early emergence of undiagnosed risk factors among a potentially influential and educated segment of the population, while Ujicic-Voortman's systematic review highlights similar trends among migrant communities. This convergence of results underlines the importance of tailored interventions and proactive measures to address the observed risk factors within Moroccan populations. Both Loukili and Ujcic-Voortman assert that further research must delve into the underlying determinants and potential interventions to mitigate the burden of cardiovascular diseases among various demographic groups within Morocco and its migrant communities in Europe.

Across all studies, there is a resounding consensus that the Moroccan population confronts a significant array of cardiovascular risk factors that directly contribute to overall mortality rates and impact the quality of health. The convergence of findings from Mokdad's comprehensive analysis, Elyamani's literature review, Loukili's examination of young adults in Morocco, and Ujcic-Voortman's systematic review of migrant populations in Europe reveal a striking pattern. Ischemic heart disease consistently emerges as a leading cause of mortality (Figure 3).[8] The shared risk factors such as high blood pressure, obesity, and diabetes intertwine these studies, showcasing the pervasiveness of these health challenges across different demographics and locations. The collective findings underscore a complex interplay of socioeconomic factors, lifestyle behaviors, and healthcare system nuances that contribute to the exacerbation of cardiovascular diseases and NCDs in Morocco.

The Challenges in Morocco's Healthcare and Education System

Limited Access to Care and Disparities in Resource Allocation Contribute to Barriers

Editorials and publications address the limited access to quality medical care and disparities in resource allocation in Morocco (Figure 5).[4-11] These challenges are seen as barriers to managing and reducing the burden of cardiovascular NCDs.[11] Morocco's escalating prevalence of NCDs further strains its healthcare system with factors like tobacco use, poor diets, and sedentary lifestyles significantly contributing to this burden, suggesting a need for comprehensive interventions to address lifestyle-related health risks.[11] An unequal distribution of healthcare resources, particularly between urban and rural areas, emerges as a prominent issue leading to disparities in access to healthcare infrastructure, medical equipment, and specialty care.[11] Mahdaoui's findings display that financial constraints pose a substantial hurdle limiting essential medication access and impeding necessary improvements in healthcare infrastructure nationwide. The shortage of healthcare personnel, especially doctors and nurses, contributes to prolonged wait times for patients and limits access to specialized care in rural regions.[11]

As previously mentioned, a study revealed that Moroccan immigrants in the Netherlands exhibited lower rates of hypertension, cardiovascular disease, and mortality.[7] This contrast could potentially be associated with the differential accessibility and quality of healthcare systems between the Netherlands and Morocco. The discrepancy in healthcare access and system preparedness between these regions may contribute to varying levels of disease detection, management, and subsequent mortality rates among immigrant groups.[7] This disparity draws a line regarding the influence of healthcare infrastructure and accessibility as contributing factors in determining cardiovascular health outcomes among different populations.

Mahdaoui and Ujcic-Voortman's findings can be attributed to the health education model in Morocco. In Morocco, the predominant emphasis within the health education curriculum remained aligned with the biomedical model.[12] However, over the past decade, subtle inclusions from the social health model emerged, though these remained unnamed within the curriculum.[12] The slow integration of aspects from the social health model within health education signals a potential move toward a more comprehensive understanding of health beyond the traditional biomedical framework—potentially offering avenues for addressing the diverse challenges of Morocco's healthcare system.[12]

Concurrently, Morocco's participation in global efforts to combat NCDs through a national multisectoral strategy signifies proactive engagement.[11] However, NCDs constitute a staggering 80 percent of deaths in Morocco, with mortality rates among the highest in the region (Figure 4).[4] It is necessary to reflect on the challenges listed with consideration in the educational model as one way to alleviate this predominant issue.

Socioeconomic and Health Inequalities and Progress Towards Sustainable Development Goals

Inequalities Exacerbating the Burden of Cardiovascular Diseases and Reaching SDG 3

The references mentioned highlight the presence of socioeconomic and health inequities in Morocco's healthcare system exacerbating the burden of cardiovascular NCDs. However, many articles present findings that Morocco is slowly making progress toward achieving some of the SDG 3 targets.[13] Examining how Morocco is implementing solutions may help with addressing the NCD burden (Figure 5).

Results from national surveys, government documentation, and information from UNICEF, WHO, United Nations Development Program, United Nations Population Fund, UNESCO, and the World Bank outline substantial strides in healthcare access and outcomes across the Moroccan population, particularly for mothers and children.[6] Advancements in addressing health disparities and socioeconomic status were unevenly distributed across demographics and regions. [6] This publication highlights disparities between advantaged and disadvantaged areas, literate and illiterate women, rural and urban locales, as well as affluent and impoverished segments of the population.[6] The main point from W. Boutayeb's analysis is that socioeconomic and health inequalities are unfairly distributed between varying populations. These are the factors that exacerbate the burden of diseases like CVD and risk factors within Morocco.[9]

Regarding the costs associated with the management of NCDs in Morocco, a systematic search found that NCDs in countries that had higher healthcare costs for their government (Morocco), made it extremely difficult for families and individuals to afford quality healthcare.[5] Although the findings had limitations in quantifying accurate costs, they demonstrate there is a substantial burden in accessing quality healthcare and preventing the progression of NCDs in Morocco.[5-6] The diverse array of studies portrays a consistent narrative of persistent socioeconomic disparities in Morocco's healthcare system. While advancements in healthcare access for certain mothers and children have been evident, these gains remain unevenly distributed across regions and population segments.[13-6]

This unequal distribution significantly exacerbates the burden of cardiovascular NCDs within Morocco.[6] The strain of managing NCDs, coupled with high healthcare costs, impedes equitable access to quality healthcare.[5] However, amidst these challenges, there has been research and investigation of gradual progress toward achieving Sustainable Development Goal targets. This offers a potential pathway to address the burden of NCDs by mitigating socioeconomic disparities in healthcare access and outcomes.

Morocco's Progress in Reaching Goal 3: Good Health and Well-Being (UNICEF)

In a study that looked at SDG 3 health targets in six Arabic countries in North Africa, results indicated many challenges in achieving health targets across the Arabic North African countries.[13] This is related to NCDs (which are reported to account for two-thirds of all deaths in low and middle-income countries), and suicide rates.[13] While several nations faced challenges in achieving SDG 3 NCDs and suicide targets, Algeria and Morocco showed relative exceptions to these concerns.[13] It is proposed that Morocco has done this by implementing radical changes such as the Riyadh Declaration in 2012. The progress toward SDG 3 emphasizes variations in health outcomes and highlights areas where specific countries, including Morocco, may demonstrate more promising trajectories in certain health indicators.[13]

Conclusions, Reflections, and Future Directions

Reflecting on the research question regarding the prevalence and impact of cardiovascular diseases in Morocco, the readiness and capacity of Morocco’s healthcare system, and potential interventions alongside health inequities, it is evident that cardiovascular diseases pose a substantial burden in Morocco. Studies by Mokdad and Elyamani highlighted the prevalence of ischemic heart disease and stroke, emphasizing the retrospective nature of the research methodologies. This calls for a more holistic approach blending qualitative and quantitative methods to capture real-time changes in lifestyle and socioeconomic factors impacting cardiovascular health. Moreover, exploring Morocco's healthcare system readiness and capacity brought attention to disparities and limitations. Mahdaoui’s study underlined the barriers to access to quality medical care, emphasizing the unequal distribution of resources, while Ujcic-Voortman’s research shed light on healthcare disparities among Moroccan migrant groups. Despite progress, these studies highlighted the need for more nuanced analyses to capture contextual dynamics and ongoing interventions' real-time impacts.

While the synthesis underscores the urgent need for tailored interventions and integrated healthcare strategies, it also highlights the importance of continued research to address the burden of cardiovascular diseases and healthcare disparities in Morocco. Adopting a multidimensional approach is critical to fostering a more equitable and resilient healthcare system, improving health outcomes, and reducing disparities among the Moroccan population.

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Appendix

Figure 1: Methods Process

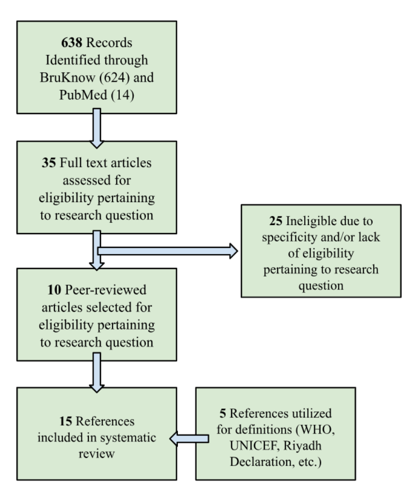
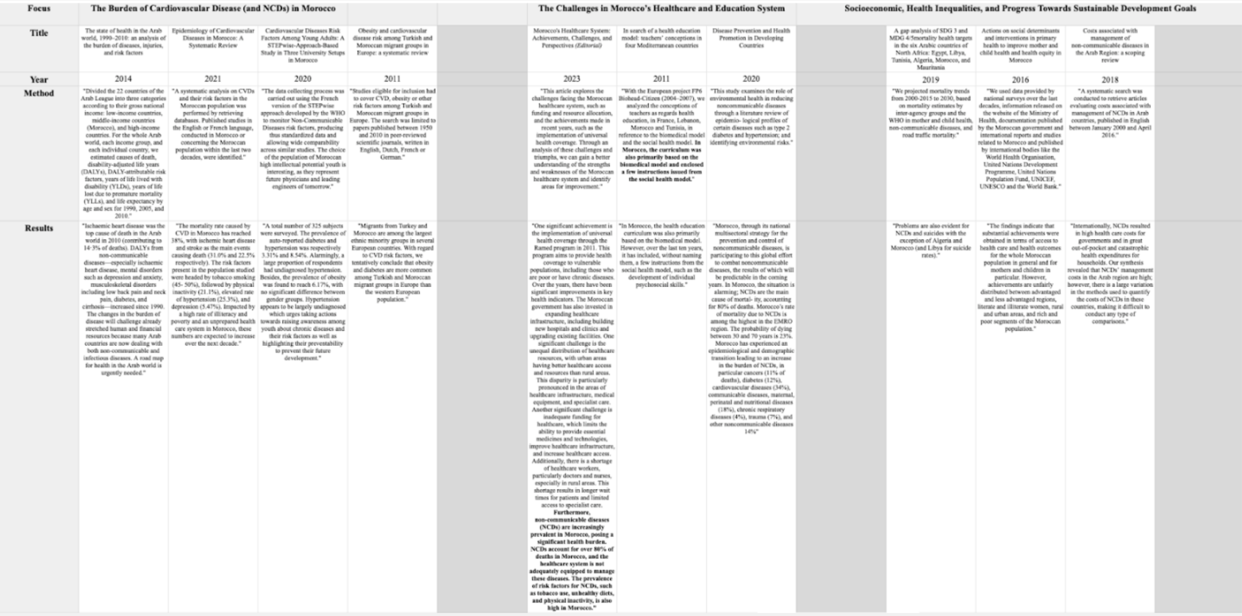
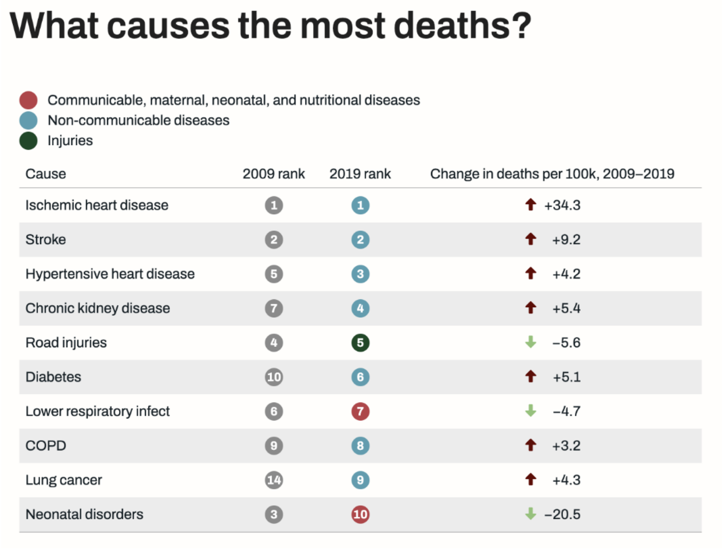


Figure 2: Overview of Sources



Focus	**The Burden of Cardiovascular Disease (and NCDs) in Morocco**				**The Challenges in Morocco's Healthcare and Education System**			**Socioeconomic, Health Inequalities, and Progress Towards Sustainable Development Goals**		
Title	The state of health in the Arab world, 1990–2010: an analysis of the burden of diseases, injuries, and risk factors	Epidemiology of Cardiovascular Diseases in Morocco: A Systematic Review	Cardiovascular Diseases Risk Factors Among Young Adults: A STEPwise-Approach-Based Study in Three University Setups in Morocco	Obesity and cardiovascular disease risk among Turkish and Moroccan migrant groups in Europe: a systematic review	Morocco's Healthcare System: Achievements, Challenges, and Perspectives *(Editorial)*	In search of a health education model: teachers' conceptions in four Mediterranean countries	Disease Prevention and Health Promotion in Developing Countries	A gap analysis of SDG 3 and MDG 4/5mortality health targets in the six Arabic countries of North Africa: Egypt, Libya, Tunisia, Algeria, Morocco, and Mauritania	Actions on social determinants and interventions in primary health to improve mother and child health and health equity in Morocco	Costs associated with management of non-communicable diseases in the Arab Region: a scoping review
Year	2014	2021	2020	2011	2023	2011	2020	2019	2016	2018
Method	"Divided the 22 countries of the Arab League into three categories according to their gross national income: low-income countries, middle-income countries (Morocco), and high-income countries. For the whole Arab world, each income group, and each individual country, we estimated causes of death, disability-adjusted life years (DALYs), DALY-attributable risk factors, years of life lived with disability (YLDs), years of life lost due to premature mortality (YLLs), and life expectancy by age and sex for 1990, 2005, and 2010."	"A systematic analysis on CVDs and their risk factors in the Moroccan population was performed by retrieving databases. Published studies in the English or French language, conducted in Morocco or concerning the Moroccan population within the last two decades, were identified."	"The data collecting process was carried out using the French version of the STEPwise approach developed by the WHO to monitor Non-Communicable Diseases risk factors, producing thus standardized data and allowing wide comparability across similar studies. The choice of the population of Moroccan high intellectual potential youth is interesting, as they represent future physicians and leading engineers of tomorrow."	"Studies eligible for inclusion had to cover CVD, obesity or other risk factors among Turkish and Moroccan migrant groups in Europe. The search was limited to papers published between 1950 and 2010 in peer-reviewed scientific journals, written in English, Dutch, French or German."	"This article explores the challenges facing the Moroccan healthcare system, such as funding and resource allocation, and the achievements made in recent years, such as the implementation of universal health coverage. Through an analysis of these challenges and triumphs, we can gain a better understanding of the strengths and weaknesses of the Moroccan healthcare system and identify areas for improvement."	"With the European project FP6 Biohead-Citizen (2004–2007), we analyzed the conceptions of teachers as regards health education, in France, Lebanon, Morocco and Tunisia, in reference to the biomedical model and the social health model. **In Morocco, the curriculum was also primarily based on the biomedical model and enclosed a few instructions issued from the social health model.**"	"This study examines the role of environmental health in reducing noncommunicable diseases through a literature review of epidemio- logical profiles of certain diseases such as type 2 diabetes and hypertension; and identifying environmental risks."	"We projected mortality trends from 2000-2015 to 2030, based on mortality estimates by inter-agency groups and the WHO in mother and child health, non-communicable diseases, and road traffic mortality."	"We used data provided by national surveys over the last decades, information released on the website of the Ministry of Health, documentation published by the Moroccan government and international reports and studies related to Morocco and published by international bodies like the World Health Organisation, United Nations Development Programme, United Nations Population Fund, UNICEF, UNESCO and the World Bank."	"A systematic search was conducted to retrieve articles evaluating costs associated with management of NCDs in Arab countries, published in English between January 2000 and April 2016."
Results	"Ischaemic heart disease was the top cause of death in the Arab world in 2010 (contributing to 14·3% of deaths). DALYs from non-communicable diseases—especially ischaemic heart disease, mental disorders such as depression and anxiety, musculoskeletal disorders including low back pain and neck pain, diabetes, and cirrhosis—increased since 1990. The changes in the burden of disease will challenge already stretched human and financial resources because many Arab countries are now dealing with both non-communicable and infectious diseases. A road map for health in the Arab world is urgently needed."	"The mortality rate caused by CVD in Morocco has reached 38%, with ischemic heart disease and stroke as the main events causing death (31.0% and 22.5% respectively). The risk factors present in the population studied were headed by tobacco smoking (45- 50%), followed by physical inactivity (21.1%), elevated rate of hypertension (25.3%), and depression (5.47%). Impacted by a high rate of illiteracy and poverty and an unprepared health care system in Morocco, these numbers are expected to increase over the next decade."	"A total number of 325 subjects were surveyed. The prevalence of auto-reported diabetes and hypertension was respectively 3.31% and 8.54%. Alarmingly, a large proportion of respondents had undiagnosed hypertension. Besides, the prevalence of obesity was found to reach 6.17%, with no significant difference between gender groups. Hypertension appears to be largely undiagnosed which urges taking actions towards raising awareness among youth about chronic diseases and their risk factors as well as highlighting their preventability to prevent their future development."	"Migrants from Turkey and Morocco are among the largest ethnic minority groups in several European countries. With regard to CVD risk factors, we tentatively conclude that obesity and diabetes are more common among Turkish and Moroccan migrant groups in Europe than the western European population."	"One significant achievement is the implementation of universal health coverage through the Ramed program in 2011. This program aims to provide health coverage to vulnerable populations, including those who are poor or have chronic diseases. Over the years, there have been significant improvements in key health indicators. The Moroccan government has also invested in expanding healthcare infrastructure, including building new hospitals and clinics and upgrading existing facilities. One significant challenge is the unequal distribution of healthcare resources, with urban areas having better healthcare access and resources than rural areas. This disparity is particularly pronounced in the areas of healthcare infrastructure, medical equipment, and specialist care. Another significant challenge is inadequate funding for healthcare, which limits the ability to provide essential medicines and technologies, improve healthcare infrastructure, and increase healthcare access. Additionally, there is a shortage of healthcare workers, particularly doctors and nurses, especially in rural areas. This shortage results in longer wait times for patients and limited access to specialist care. **Furthermore, non-communicable diseases (NCDs) are increasingly prevalent in Morocco, posing a significant health burden. NCDs account for over 80% of deaths in Morocco, and the healthcare system is not adequately equipped to manage these diseases. The prevalence of risk factors for NCDs, such as tobacco use, unhealthy diets, and physical inactivity, is also high in Morocco.**"	"In Morocco, the health education curriculum was also primarily based on the biomedical model. However, over the last ten years, it has included, without naming them, a few instructions from the social health model, such as the development of individual psychosocial skills."	"Morocco, through its national multisectoral strategy for the prevention and control of noncommunicable diseases, is participating to this global effort to combat noncommunicable diseases, the results of which will be predictable in the coming years. In Morocco, the situation is alarming; NCDs are the main cause of mortal- ity, accounting for 80% of deaths. Morocco's rate of mortality due to NCDs is among the highest in the EMRO region. The probability of dying between 30 and 70 years is 23%. Morocco has experienced an epidemiological and demographic transition leading to an increase in the burden of NCDs, in particular cancers (11% of deaths), diabetes (12%), cardiovascular diseases (34%), communicable diseases, maternal, perinatal and nutritional diseases (18%), chronic respiratory diseases (4%), trauma (7%), and other noncommunicable diseases 14%"	"Problems are also evident for NCDs and suicides with the exception of Algeria and Morocco (and Libya for suicide rates)."	"The findings indicate that substantial achievements were obtained in terms of access to health care and health outcomes for the whole Moroccan population in general and for mothers and children in particular. However, achievements are unfairly distributed between advantaged and less advantaged regions, literate and illiterate women, rural and urban areas, and rich and poor segments of the Moroccan population."	"Internationally, NCDs resulted in high health care costs for governments and in great out-of-pocket and catastrophic health expenditures for households. Our synthesis revealed that NCDs' management costs in the Arab region are high; however, there is a large variation in the methods used to quantify the costs of NCDs in these countries, making it difficult to conduct any type of comparisons."

Figure 3: Morocco's SDG Progress.[15]



What causes the most deaths?

- ● Communicable, maternal, neonatal, and nutritional diseases
- ● Non-communicable diseases
- ● Injuries

Cause	2009 rank	2019 rank	Change in deaths per 100k, 2009–2019
Ischemic heart disease	1	1	↑ +34.3
Stroke	2	2	↑ +9.2
Hypertensive heart disease	5	3	↑ +4.2
Chronic kidney disease	7	4	↑ +5.4
Road injuries	4	5	↓ −5.6
Diabetes	10	6	↑ +5.1
Lower respiratory infect	6	7	↓ −4.7
COPD	9	8	↑ +3.2
Lung cancer	14	9	↑ +4.3
Neonatal disorders	3	10	↓ −20.5

Figure 4: Causes of Death in Morocco from NCDs.[4]

Figure 5: Chronic Diseases and Risk Factors in Morocco.[4]

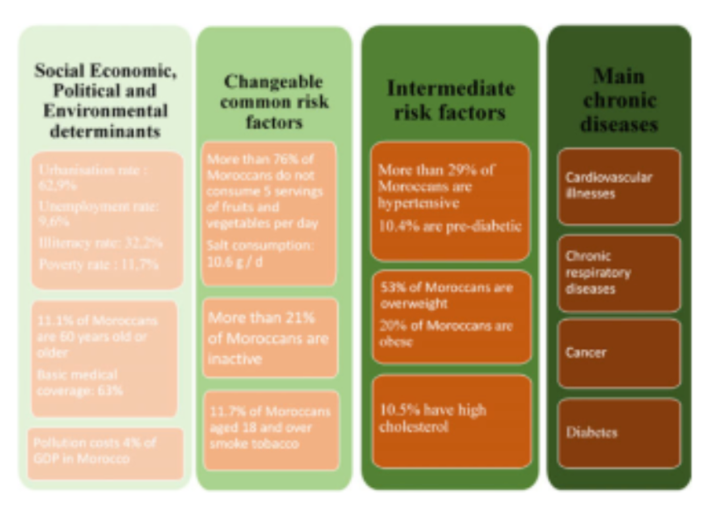
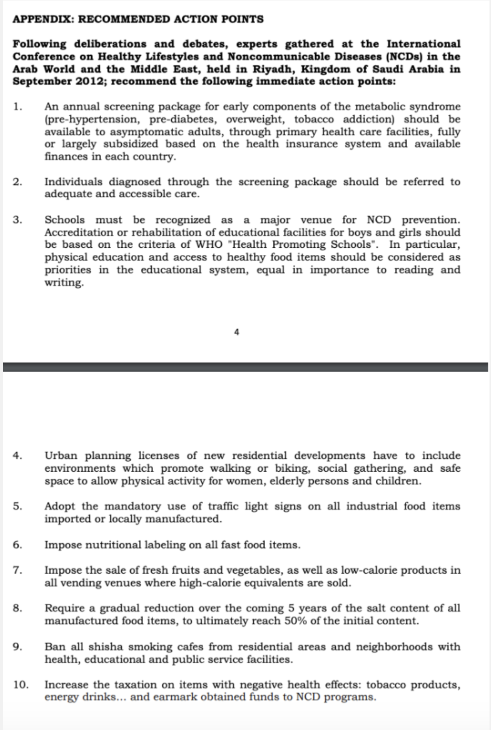


Figure 6: The Riyadh Declaration - 2012.[14]



APPENDIX: RECOMMENDED ACTION POINTS

Following deliberations and debates, experts gathered at the International Conference on Healthy Lifestyles and Noncommunicable Diseases (NCDs) in the Arab World and the Middle East, held in Riyadh, Kingdom of Saudi Arabia in September 2012; recommend the following immediate action points:

1. An annual screening package for early components of the metabolic syndrome (pre-hypertension, pre-diabetes, overweight, tobacco addiction) should be available to asymptomatic adults, through primary health care facilities, fully or largely subsidized based on the health insurance system and available finances in each country.
2. Individuals diagnosed through the screening package should be referred to adequate and accessible care.
3. Schools must be recognized as a major venue for NCD prevention. Accreditation or rehabilitation of educational facilities for boys and girls should be based on the criteria of WHO "Health Promoting Schools". In particular, physical education and access to healthy food items should be considered as priorities in the educational system, equal in importance to reading and writing.

4. Urban planning licenses of new residential developments have to include environments which promote walking or biking, social gathering, and safe space to allow physical activity for women, elderly persons and children.
5. Adopt the mandatory use of traffic light signs on all industrial food items imported or locally manufactured.
6. Impose nutritional labeling on all fast food items.
7. Impose the sale of fresh fruits and vegetables, as well as low-calorie products in all vending venues where high-calorie equivalents are sold.
8. Require a gradual reduction over the coming 5 years of the salt content of all manufactured food items, to ultimately reach 50% of the initial content.
9. Ban all shisha smoking cafes from residential areas and neighborhoods with health, educational and public service facilities.
10. Increase the taxation on items with negative health effects: tobacco products, energy drinks… and earmark obtained funds to NCD programs.

Adolescent Pregnancy In India: A Critical Review Of The Contributing Structural Determinants And The Impact Of Government Health Programs

By Megna Srinivasan

Introduction

The World Health Organization defines adolescent pregnancy (AP) as "pregnancy in young women aged 10–19 years".[1] Although the global adolescent birth rate has decreased by 23.2 births per 1000 women over the past two decades, low- and middle-income countries (LMICs) still have around 21 million adolescent pregnancies annually.[1] According to Sustainable Development Goals 3.1 & 3.7, reducing adolescent fertility is an essential step in meeting sexual and reproductive health targets of global significance.[2]

The Burdens of Adolescent Pregnancy

In LMICs, the leading cause of mortality amongst adolescent girls is pregnancy and childbirth-related complications.[3] AP is associated with unsafe abortion, pregnancy-induced hypertension, puerperal endometriosis, and eclampsia.[4] Babies born to adolescent mothers are more likely to be premature and have low birth weight, congenital anomalies, neonatal issues, and a higher risk of being stillborn or dying within the first 7 days of life.[4] As adolescent mothers are "more likely to leave school for childcare compared to other females," they are less likely to be financially independent with limited education and employable skills. Financial strain, social stigma, and a lack of community support culminate in higher suicidality among young mothers.[3]

Adolescent Pregnancy in India

According to a 2010 UNFPA report, India had the highest number of women who had a live birth by 18 years of age.[5] In 2017, estimates from the 4th National Family Health Survey (NFHS-4) cite that there were 11.8 million adolescent pregnancies in India.[6] With 253 million adolescents aged 10-19, India has the largest adolescent population in the world.[6] However, Indian adolescent reproductive health needs are poorly understood.[7] The proportion of adolescent maternal deaths to total maternal deaths remains high, around 10 percent, despite substantial improvements in maternal mortality in India over the last two decades.[8] Considering this, it is important to unpack the issue of AP in India. The purpose of this paper is to understand the social determinants of adolescent pregnancy in India and evaluate if current government health programs are effective.

Methodology

I conducted this review using the PubMed, BruKnow Search, The Lance, and BMJ Global Health databases. Keywords of the search included "adolescent pregnancy", "teenage pregnancy", "maternal mortality" and "India". I sorted results by the relevancy feature and selected articles depending on publishing date and how specific they were to India, adolescents, pregnancy, and maternal mortality. I conducted backward citation searches where the references in the identified papers were scanned for more relevant articles. This paper also seeks to evaluate interventions. I conducted an additional search using specific keywords like "National Health Mission" or "Adolescent Education Program" to find intervention-specific literature. Finally, 11 papers were chosen to evaluate, along with 8 supplementary papers, and 5 web pages. It is important to note that these search strategies limited results to studies written in English.

Determinants of Adolescent Pregnancy

Structural determinants of health are the societal, economic, and political contexts that produce health. The following section of this paper will look into the cultural and socioeconomic determinants of AP in India. Although this paper separates determinants into categories and discusses them in terms of their independent contribution to AP, it is important to note that socioeconomic and cultural determinants are highly intersectional.

Cultural Determinants

i) Early Marriages & Age-Based Hypergamy

In The Prohibition of Child Marriage Act of 2006, India raised the minimum age of marriage to 18 years for females. However, 47 percent of all marriages in India in 2013 were between adolescents under 18.[9] AP is socially condoned within marriages.[10] Along with early marriages, there is a cultural norm of age-based hypergamy (ie. age-gap marriages). It is believed that husbands should be older than their wives. The spousal age gap between men and women in India is around 5 years. This pattern has remained stable over decades, with some regions experiencing an increase in spousal age gaps.[11]

Shri et al.'s (2023) study depicts how entrenched marital values contribute to adolescent pregnancies in two highly affected Indian states, Uttar Pradesh and Bihar. Using data from the Population Council's "Understanding the Lives of Adolescents and Young Adults" (UDAYA) survey, the study sampled 4897 married adolescent girls between the ages of 15 to 19. The study found that "adolescents who married before the age of 18 years were 1.79 times more likely to experience pregnancy and 3.21 times more likely to experience motherhood". Adolescents with a spousal age gap of 5 to 10 years were "52 percent more likely to be pregnant", with the odds of pregnancy and motherhood rising with a greater spousal age gap.[6] The study establishes the strong relationship between early marriage, age-hypergamy, and AP with a large sample size from both rural and urban localities. There are a few limitations to the study. Firstly, the study does not look at data on adolescents aged 10-14. Additionally, the study looks only at two states where adolescent pregnancies are particularly concentrated. Whilst this allows the researchers to account for confounding factors, it calls into question whether we can generalize the results to the rest of the Indian subcontinent.

ii) Caste & Religious Systems

While legally discontinued, the caste system exerts a lingering influence on Indian society and is a notable determinant of health outcomes. In India, "socially backward classes" are socioeconomically marginalized populations that encompass groups like scheduled castes (SC), scheduled tribes (ST), and other backward castes (OBC).[12] Beyond economic poverty, these communities grapple with cultural and geographical marginalization. In India, religion is intertwined with the caste system. 40.7 percent of the Muslim community is categorized as part of the 'other backward castes' (OBC) and 43 percent of Muslims live below the official poverty line, with a lower average literacy rate.[12]

Shukla et al.'s study explores the predictors of AP among girls in Maharashtra, India (2023). Maharashtra is a relevant state to analyze the intersection of caste and religion on AP as 55.2 percent of the population belongs to lower castes (SC/ST/OBC) and 11.2 percent of the population is Muslim. With a sample of 3049 girls aged 13–18 from urban and rural areas, the study employed a mixed-methods approach. The researchers analyzed the sample's vulnerability to AP by considering household characteristics, behavioral aspects, societal factors, and the COVID-19 pandemic. The study found a significant association between being lower caste and experiencing AP. Conversely, the study found a significant association between being non-Muslim and experiencing AP. Although caste and religion align in the context of cultural marginalization, the study displayed that the two factors can influence AP outcomes differently.[13] This study is one of the first of its kind to account for the COVID-19 pandemic. However, the research is limited because the authors did not conduct interviews with high socioeconomic-status families, who tend to be from higher castes, to make a robust comparison.

iii) Sexual Violence and Sex Work

There is evidence that the state of sexual violence and sex work in India is a determinant of adolescent pregnancies. The NFHS-4 reveals that the "prevalence of sexual intimate partner violence is significantly higher when the age of marriage is under 19 years".[14] The Ministry of Health & Family Welfare Government of India (MoHFW), found that "31 percent of ever-married female adolescents aged 15–19 reported having experienced physical, sexual or emotional violence perpetrated by their spouse" in the third round of NFHS.15 Furthermore, a 1998 study on adolescent sexual behaviors in India cites that "almost 25 percent of rape victims are reportedly aged under 16 and 20 percent of all sex workers are adolescents".[7] Forced sexual activity, sexual violence, and sex work can lead to unwanted adolescent pregnancies. The literature on sexual violence, sex work, and Indian adolescent health outcomes is sparse. More research is needed to inform policy decisions on how to reach sexually marginalized adolescent groups in India.

Socioeconomic Determinants

i) Sexual & Reproductive Health (SRH) Education

A literature review by Panda et al. (2023) examined 40 studies on perception, practices, and understanding related to teenage pregnancy among adolescent girls in India. The paper reveals the importance of sexual and reproductive health (SRH) knowledge on improved adolescent fertility outcomes. In India, it is taboo to discuss reproductive health, pregnancy, and conception-related information with adolescents in school. Safe sex information among Indian adolescents primarily comes from friends or media, and to a lesser extent, parents, health workers, and school teachers. Inadequate education and access to contraceptives resulted in insufficient contraceptive knowledge and use. This trend was prominent among married adolescent women. Limited understanding of pregnancy, intercourse, and abortion led to unwanted pregnancies, sexual health complications, and delays in abortion.[16] Whilst this paper does not consider SRH knowledge amongst adolescent men, it is equally important to understand when it comes to AP.

Kumar et al.'s paper on adolescent students in Chandigarh helps to reconcile the gap in understanding of male SRH knowledge and build upon the body of evidence from Panda et al.'s paper (2017). By surveying a sample composed of 57.2 percent males and 42.9 percent females from eight government schools and four private schools, the study explores the state of SRH knowledge amongst adolescents. Awareness of condoms, oral contraceptives, and emergency contraceptive methods was 83.4 percent, 67.1 percent, and 65.3 percent respectively. A majority of students sampled have an awareness of contraception, but "69.4 percent of respondents displayed the need for more sex education in schools" .[17]

Saha et al. (2022) found that SRH knowledge is linked to years of education in school. Girls with higher education were more knowledgeable about "sexual intercourse, pregnancy, contraceptive methods, and HIV/AIDS when compared with illiterate girls".[18] This study presents the impact of social media on SRH knowledge in India. The study collected data from participants of the UDAYA survey and cross-referenced information on social media usage and pregnancy status. Although only 28 percent of participants had access to social media channels, "social media was associated with knowledge of sexual intercourse, pregnancy, contraception, and HIV/AIDS". Social media access was also found to be higher amongst female adolescents who were from educated, wealthy, and urban communities. The authors recommend that education interventions involving social media should be conscious of differential access to technology in India.[18]

ii) Socioeconomic Status (SES)

A study by Nguyen et al. (2019) collated data from 14,107 adolescent mothers in India's NFHS-4 to uncover the relationship between AP and socioeconomic status (SES). Rates of women who gave birth during adolescence were more prevalent in households characterized by lower SES. The findings suggest that AP perpetuates cycles of intergenerational poverty, where women who gave birth during adolescence were less likely to have paid jobs or have agency over household money.[19] The study presents the limitation of cross-sectional design, where it is hard to disentangle whether AP leads to reduced SES or if pre-existing SES conditions contributed to AP. Nevertheless, the study was bolstered by its strict consideration of teenage mothers who have only had one birth, which helped the authors avoid biases on other explanatory factors like birth spacing.

iii) Rural vs. Urban Living

Bhakat and Kumar conducted a comprehensive analysis of all five rounds of the NFHS, aiming to elucidate more factors that contribute to AP in India.[20] Their findings reveal that women residing in rural areas exhibit a higher probability of AP than their urban counterparts. The study describes rural areas as more "pronatalist", or encouraging the practice of having children, which drives elevated rates of adolescent pregnancies in rural areas. The article emphasizes the imperative of educating parents and communities in rural regions about the burden of AP.[20] Due to the study's use of all NFHS data, it was unable to capture data on young girls aged 10-14. This compounds evidence of a systematic research gap on AP in younger girls.

Government Interventions Addressing Adolescent Pregnancy

One of the three main programmatic components of India's National Health Mission is Reproductive, Maternal, Neonatal, Child, and Adolescent Health, or RMNCH+A. The main National Adolescent Health Programme, Rashtriya Kishor Swasthya Karyakram (RKSK) lies under RMNCH+A. RKSK was remodeled in 2014 from the previous program called Adolescent Sexual & Reproductive Health Strategy (ARSH) (2005-2014).[21] While these programs tend to focus broadly on adolescent health, components of the programs are intended to improve SRH and AP. The next section of this paper will evaluate the implementation of RKSK and ARSH.

ARSH and RKSK: Implementation Challenges

Established in 2005, ARSH marked India's inaugural adolescent health program, offering a spectrum of SRH services for adolescents, adopting a clinic-based approach, and emphasizing the establishment of adolescent-friendly health centers (AFHCs) within existing public health facilities.[22] Barua et al. (2020) conducted a rapid program review comparing ARSH and the new RKSK program, aiming to identify lessons learned. The study, encompassing semi-structured interviews with 70 stakeholders at national, state, and local levels, field visits, and reviews of third-party studies, policy documents, and reports from MoHFW, assessed both programs in governance, implementation, monitoring, and linkages.

ARSH faced challenges in program planning, resource deployment, and integration into the broader health system. Limited adolescent involvement in AFHC governance and a narrow focus on SRH were noted. Cultural resistance and insufficient community-level follow-up hindered progress, keeping ARSH in "project mode" until its termination in 2014.[22] The RKSK Program, a departure from ARSH's clinic-centric approach, embraced community-based interventions engaging adolescents in schools, families, and communities.[23] Although RKSK improved resource planning and program organization, challenges in vacant positions, budget, and coordination persisted. Despite expanding AFHCs across healthcare levels, adolescent involvement and accessibility remained problematic. RKSK introduced community counseling services, adolescent health days, and peer education but encountered difficulties in implementation and monitoring.

Both programs faced challenges in linkages, such as partnerships and interdepartmental collaboration. The research concludes that RKSK has learned from ARSH by adopting better programmatic approaches, yet challenges persist in all domains.[22]

A study in Gujarat's Sabarkantha district[24] delves into RKSK's implementation. The RKSK provides three main services to adolescents in Sabarkantha: weekly iron-folic acid supplementation (WIFS), AFHCs, and menstrual hygiene assistance. Utilizing a cross-sectional mixed-methods approach, the study involved interviews with health personnel and adolescents and a desk review of reports. While RKSK excelled in services like WIFS, weaknesses were identified in counseling and education services at AFHCs, particularly at secondary and tertiary levels. Peer educators faced challenges in finding educational materials, and discussions primarily focused on contraception during sessions. The study highlighted a lack of promotion for follow-up sessions and identified privacy concerns hindering open sexual health conversations. Stakeholders expressed the need for refresher training and greater awareness about RKSK among adolescents, potentially involving non-governmental organizations.[24]

Solutions: Using Community-Based Interventions for Adolescent Pregnancy in India

A scoping systematic review by Pattathil & Roy (2023) sheds light on ways to make adolescent sexual health programs more successful. The researchers express how SRH education has been notoriously hard to establish in India with the example of the national Adolescent Education Program (AEP). The AEP sought to teach adolescents “culturally relevant information regarding sexual health, gender, sexuality, communication skills, and relationships”. Unfortunately, after mass outrage on teaching youth about sexuality, the AEP was banned in five states with highly variable implementation, monitoring, and follow-up. The paper's findings establish that the most successful programs are those that are created to be socially condoned. The study stresses the importance of involving parents, community members, local experts, and organizations in program design and implementation to garner lasting support and engagement. The authors emphasize the significance of addressing program participation barriers, such as the stigma and discrimination youth may face if they openly discuss SRH issues.[25] The study acknowledges its limitations such as its limited capacity to effectively compare programs and populations across India’s diverse settings.

The success of community-based initiatives is evidenced in a study conducted by Mehra et al. (2018). The researchers implemented Youth Information Centers (YICs) where students were taught an adapted AEP course in Uttar Pradesh and Bihar. They engaged the community by enlisting “local young people, parents, religious leaders, opinion makers, and elected members from local governance” to discuss issues surrounding adolescent pregnancy. The intervention involved training peer educators, who conducted meetings at the family, community, and government levels to address early marriage, education retention, and AP. The study concluded that significant improvements in school retention, delaying early marriages, and first pregnancy were seen upon using YICs.[9] This study serves to show the effectiveness of community-based interventions for AP in India.

Discussion: Summary and Critique

The literature presents the key cultural and socioeconomic determinants that drive AP in India, including a culture of early marriages, belonging to socially backward castes or tribes, being non-Muslim, a lack of SRH education and social media access, lower SES, and residing in rural areas.[9] These key determinants have been observed to influence the level of maternal healthcare services utilized by pregnant adolescents, thereby also playing a crucial role in determining the postnatal outcomes and maternal mortality of adolescents.[26]

There are notable gaps in the literature. There is a need to explore how experiences of sexual harm contribute to AP in India to inform better policy decisions. Most of the literature focuses on youth aged 15-19. It is important to understand more about AP in younger demographics (10-14), as it may be driven by different determinants. There is an insufficient consideration of male adolescents in the literature. Including male adolescents in research and SRH intervention efforts like their female counterparts is important to addressing and understanding the issue.

Existing studies often rely on the same surveys for data, primarily the NFHS19,20 and, to a lesser extent, the UDAYA survey.[6] ,[18] Although the NFHS in India is a strong source of data over time, supplementing NFHS data with other independent surveys would provide a less biased understanding of the issue of AP. The UDAYA survey focuses on two states, Uttar Pradesh and Bihar, so finding similar information from other states would help the literature become nationally representative. Additionally, most of these studies are cross-sectional. Cross-sectional studies offer the advantage of providing a cost-effective method to identify current trends in a population. However, they do not allow researchers to establish causation. Longitudinal studies, although more resource-intensive, should be conducted on AP in India to explore the causal and long-term effects of these key determinants.

National Health Programs that are concerned with adolescent sexual health, like the RKSK, have been strengthened over time by learning from prior programs like ARSH. Given that SRH education is an important determinant of AP, counseling and education services offered via AFHCs in the RKSK program are the most relevant interventions for preventing AP. It seems like there should be a restructuring of how AFHCs are conducted to offer adolescents more privacy in discussing their sexual health questions. This will allow educators to effectively counsel adolescents on matters influencing AP, like sexual behavior, contraceptives, school retention, and early marriage. Interestingly, it seems like the Indian government has placed less of a priority on adolescent SRH by remodeling RKSK to include action on broader adolescent health issues such as “nutrition, injuries, violence, non-communicable diseases, mental health, and substance misuse”.[23] Research should be conducted into whether expanding the scope of the RKSK has diminished the government’s focus on adolescent SRH and AP.

Conclusions and Future

This paper aimed to understand the factors that contributed to AP in India and how effective government public health interventions have been. Key determinants, rooted in cultural and socioeconomic factors, include early marriages, age-based hypergamy, caste and religious systems, sexual violence, sex work, limited SRH education, lower SES, and rural-urban disparities. The state of AP in India, marked by a large adolescent population and substantial teenage pregnancies, necessitates urgent and effective interventions. This paper critically evaluated the evolution from ARSH to RKSK under the National Health Mission. Persistent challenges in education and counseling services make current government programs ineffective in tackling adolescent pregnancy. Community-based interventions, such as Youth Information Centers, have emerged as effective strategies, displaying the importance of culturally sensitive programs involving local stakeholders. While progress has been made, there is a need for continued research and policy refinement. Future research should focus on addressing literature gaps, such as the relationship between sexual harm experiences and AP. Future government efforts should offer local partners and community members a larger role in the facilitation of larger systematic health programs.

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Midwifery and Maternal Health in Indonesia

By Camille Leung

Illustration by Junyue Ma

Introduction

Half a million women around the world die every year in pregnancy, childbirth, or the six weeks following delivery; 99 percent of these deaths occur in low- and middle-income countries (LMICs).[1] The World Health Organization's Sustainable Development Goal 3 targets a reduction in the maternal mortality rate (MMR) to less than 70 per 100,000 live births by 2030.[2] Additionally, by 2030, no country should have an MMR greater than 140–double the global target.[3] This proves to be a daunting task for Indonesia, whose maternal mortality rate sits at 173 maternal deaths per 100,000 live births as of 2020 – a rate that is higher than the target goal for individual nations stated in the SDG 3.4

Indonesia, home to over 270 million people, is the world's fourth most populous nation.[5] Broadly dispersed over an archipelago of more than 13,000 islands, it is estimated that about half of the Indonesian population live in rural areas of the country.[5] Considering the country's geographic dispersion, access to skilled maternal care can be hindered, leaving expectant mothers with limited options for safe assistance during childbirth. A large number of Indonesian births occur at home, with most attended by either midwives or traditional birth attendants.[6] ,[7] Challenges in achieving a consistently safe birth process include lack of training for midwives or traditional birth attendants, inability to transport patients experiencing an emergency in a timely manner, decentralized governance and complex financing, and diverse local belief systems that cause pregnant women to often rely on fate and God's will for a healthy pregnancy and birth.[5] Midwifery is one form of birth assistance with the goal of reducing maternal mortality in both formal and informal settings. Traditional midwifery often includes practices specific to the local culture; some broad categories of care include herbal remedies, body work and movement, or spiritual routines and practices.[8] In Indonesia, there is a clear local distinction between skilled midwives (bidan) and traditional birth assistants (dukun), with skilled midwives having gone through formal education to provide evidence-based care.[5],[8] This education is provided under the Rapid Training Program, established in 1998, a three-year midwifery program eligible for student enrollment at the end of their senior year of high school.[5] Dukun often learn their skills through apprenticeship, often to a close female relative. They learn birth assistance skills, as well as ascetic practices that entail spiritual healing powers.[8] Their services are utilized and respected due to trust and cultural practices in the community.[9]

Legal efforts have been made to formalize midwifery practices in the country, integrating them into the health care system. Local primary health centers headed by a doctor or public health official, called puskesmas, are responsible for providing antenatal and postnatal care at the sub-district level; each puskesmas may have three to five associated sub-health centers.[9] At the village level, health facilities include posyandu (integrated service post), polindes (village maternity post), or poskesdes (village health post).[9] To improve direct access to trained health providers, Bidan di Desa (translates to "midwife in the village") was established in 1989, placing a trained midwife in each village along with a village birth facility (polindes).[5]

This evidence synthesis aims to understand and assess midwifery practices in Indonesia. It will investigate governmental programs that formally attempt to integrate midwives into the healthcare system, evaluate perceptions of different forms of midwifery (skilled and traditional), and explore the different ways in which traditional birth assistants (dukun) provide care that is influenced by local cultural practices and beliefs. In identifying gaps in knowledge and context for birthing practices in Indonesia, this paper hopes to suggest perspectives and solutions that can guide future studies or interventions that improve the nation's maternal health.

Methods

In conducting a literature review, PubMed was utilized to search for relevant papers on this topic. Selected literature was managed using Zotero. The search string used is found in the Appendix. Keyword selection involved several considerations. Running a search containing just "Indonesia", as opposed to "in Indonesia", yielded many irrelevant results, including any and all papers that mentioned the country. Limiting the search using "in Indonesia" ensured that reviewing literature that investigated midwifery was specific to Indonesia. To capture any papers discussing traditional midwifery practices, the keywords "midwif*" and "traditional" were searched with. Two filters were used to refine the search: one to include papers written in English and another to focus on publications from the year 2000 onwards. The time constraint retains more recent data, providing insights into the current status of maternal mortality in the country. The PubMed search generated 16 results, 12 of which were retained. three results were excluded due to lack of focus on midwifery practices, and one study was excluded for having a focus on midwifery practices at the global level. One additional search with the same filters was done to gather more information on traditional antenatal care, which generated 16 results. Of the 16 results, 7 studies were excluded for having no relation to the topic, and an additional 7 studies were excluded for redundancy. Two studies were retained in this second search. A review of the studies selected for review is found in the Appendix (Figure 1).

Results

The overview of studies selected for synthesis in Figure 1 showcases each study's design, population, and methods. This should serve as background context that frames the general findings that will be discussed in this section. Much of the literature contains personal interviews and accounts of mothers' experiences with antenatal care, childbirth, and postnatal care to better understand local perceptions and traditions as it relates to maternal care.

This paper will discuss select notable trends in the literature: perceptions of childbirth, safety, and cultural practices, barriers to maternal care, characteristics of traditional antenatal care, and challenges to integrative care between skilled and traditional midwives.

Perceptions of childbirth, safety, and cultural practices

In Indonesia, especially in rural areas of the country, childbirth occurring at home is incredibly prevalent.[6],[7],[10] The government has made attempts to lower the country's maternal mortality rate by covering pregnant women under the national health insurance that would allow them free access to local health centers staffed by skilled birth assistants; additionally, initiatives such as Bidan di Desa aim to foster partnerships between skilled and traditional midwives.[11],[12] Despite this, freebirth continues to occur at high rates, largely with traditional birth attendants or untrained family members; the complications and maternal outcomes associated with these births often go unrecorded due to weak vital registration systems.[11] A study from rural West Java interviewed mothers who voiced that pregnancy and delivery are viewed as natural processes that would occur with or without assistance; as such, danger signs were not anticipated or monitored.[1]

Several factors contribute to a mother's choice in location of birth. Many mothers interviewed considered the home a safe location for birth, in contrast to the "threatening" demeanor of a health facility.[7],[11],[13] Additionally, the home is perceived to be a spiritually nourishing location –an idea passed down through generations– guaranteeing a successful birth.[7],[11] Factors that increased the likelihood of a mother to seek out birth assistance from a trained provider included having a maternal education, having a higher income, living in an urban area, and having over four antenatal visits.[7],[10],[14] When mothers choose between skilled and traditional methods of birth assistance, several factors play a role. Women who had less education, were multiparous, lived in an area with higher density of traditional birth assistants, and had a lack of health insurance were likelier to select a traditional birth assistant.[10],[14] Family members, particularly the mother's husband or mother-in-law, have a strong influence in a woman's choice to seek maternal care.[14] The study led by Agus, Horiuchi, and Iida in 2018 found that nearly half of the mothers who sought birth assistance from a traditional birth assistant were encouraged by their mothers to do so.[14] Many of these country-wide trends were reflected in the smaller case study of the rural Riau Province, but with additional language and religious barriers that led mothers to feel alienated by surrounding communities; these mothers also felt desires to keep with their local traditions that only their family members and traditional birth assistants understood – one example being the washing and wrapping of the mother's placenta after birth.[11]

Barriers to maternal care

The country's geographic dispersion, as mentioned earlier, poses a large barrier in the government's ability to sponsor equitable, accessible healthcare. The Indonesian Ministry of Health serves as the country's main health policymakers, with local governments given the responsibility of managing their own health policies.[12] This decentralization of healthcare governance was studied by Pardosi et al. in 2016, where it was found that many remote villages had either a shortage or complete absence of midwives and other childbirth-related staff.[12] Many mothers reported having to walk long distances –one or two hours worth of walking– in order to reach the nearest healthcare facility.[9],[15],[16] The Ministry of Health requires that there be at least four facilities per district that can provide obstetric services; as of 2011, only 61 percent of districts met this minimum requirement.[15]

A mother's financial status proves to be a significant barrier in her ability to seek care. Low-income mothers expressed finding traditional birth assistants to be a cheaper alternative, and had a general hesitancy to pay additional costs for transportation.[8],[9],[15] Additionally, misconceptions about eligibility for coverage and services provided under insurance programs like Jamkesmas (a government-run public insurance program that covers the country's poor) led women to not only have false understanding of where the coverage could be used, but also to believe that the best services would only be provided from facilities where payment was necessary.[9],[15] Though one study showed that women who had Jamkesmas were 19 percent likelier to deliver in a health facility, it was noted that many other barriers such as sociocultural beliefs and accessibility of care must be addressed to make a significant difference in lowering the country's MMR.[15]

There exists a lack of maternal health education and trained health staff, ultimately affecting quality of care. Accreditation of healthcare facilities, which would guarantee a national standard of care, is not a fully implemented system in Indonesia.[15] Health staff have incomprehensive training, leaving them with inadequate skills and knowledge to provide hygienic and safe support during delivery.[12],[15] When maternal healthcare staff were available, plenty of examples were shown where midwives and nurses would refuse to provide services to mothers in need at late hours, or because they simply did not have a close relationship to the mother.[12] Mothers themselves did not hold informed views on their own health, and would not seek out antenatal or postnatal care so long as they felt healthy.[9],[16] Some of the literature advocates for women to be fully informed of the danger signs during pregnancy, especially as almost half of primary or secondary-educated women reported not receiving information about pregnancy during their education.[1],[16]

Social factors can affect a mother's ability to seek care. It is mentioned earlier that family members have a say in determining a mother's method of birth assistance.[14] This is in line with findings that recognize gender inequity issues in the country that keep women in a submissive position relative to their husbands.[1],[16] Additionally, women who participated in traditional antenatal practices, whether by choice or by social pressure, were less likely to seek out antenatal care from formal health facilities.[9],[16]

Characteristics of traditional antenatal care

Many mothers prefer assistance from a traditional birth assistance due to the trust that is built by local respect, speaking the local language, and sharing similar cultural backgrounds.[1],[9],[15] Additionally, higher numbers of traditional birth assistants in especially rural areas often makes it the more accessible and preferred method of birth assistance.[6],[10],[16]

Traditional birth assistants receive training that is passed down from generation to generation.[11],[13] It is said that this knowledge lives and dies with the midwife until the practices are passed on to an apprentice.[13] One study in 2016 interviewed traditional birth assistants (belian) in the Lombok region, and each belian had reported being an apprentice to a senior belian in their bloodline in their training.[13] The study investigated the experiences of belians who underwent government-based midwife training programs, with the majority participating. However, it was discovered that the training was somewhat irrelevant to traditional midwifery, as participants were already familiar with certain aspects of the education provided (e.g., signs of high-risk pregnancies); there was additionally a noted absence of a consistent supply of modern medical tools recommended for use.[13]

The traditional practices involved come in many forms ranging over a large variety of modes, including diet, body movement, remedies, and more.[9],[17] Vegetables were believed to be better for a pregnant woman's diet because they freshen the taste of breastmilk.[17] It was warned that the discouragement of eating meat could be dangerous, as meat promotes iron absorption, which can offset risks for anemia.[17] Massages were mentioned as an important ritual for mothers, occurring at different points during a woman's pregnancy.[9],[13] These massages were sometimes used to determine aspects of the medical condition of the pregnancy–for example, to determine the baby's position – to overcome infertility, or to maintain a mother's general health during pregnancy.[9],[13] Herbal remedies, perceived to be more "natural" than modern medicine and without side effects, are also used to keep mothers healthy; one paper discussing herbal remedies was unable to clarify the justification for the herbal remedies as their purpose was kept secret and exclusive to the belians.[13],[17] In terms of attitudes, women expressed both an internal and external locus of control, indicating a willingness to follow recommended health practices while recognizing that the ultimate fate of their delivery and baby would be determined by God.[1],[17],[18]

Challenges in integrative maternal care

Given the different approaches to maternal health that coexist in the country, there are differing opinions on the effectiveness of traditional methods. The dangerous sentiments surrounding practices celebrated by dukun have ties that run back as far as Dutch colonists' attempts to modernize medicine.[8] Dukun are respected in their local communities but are underappreciated by biomedical and public health professionals.[8] The government views dukun as a threat to medicalization of birth, but simultaneously recognizes that dukun allows for access to care in remote villages.[8] Efforts such as Bidan di Desa have been used by the government to formalize midwifery access and quality of care, and to establish a working partnership between bidan and dukun.[5],[8] Under this program, the bidan's role had no need to take on new responsibilities; the dukun, however, was asked to take on more of an "assistant" role to the bidan by encouraging mothers to use services provided by bidan, assist the bidan with pre-natal checkups and birthing, and perform healthy ritual services when requested.[8] This effectively formalized the inferiority of the dukun to the bidan in both knowledge and power, and recognized spiritual exercises as a secondary focus of care, only given upon request.[8]

The literature presents mixed accounts regarding satisfaction with care. A study examining perceived satisfaction with care revealed that women who chose midwives reported significantly higher satisfaction scores compared to those who opted for traditional birth assistants.[14]

This study also noted that more than 70 percent of women in Indonesia experience delays in seeking and receiving care; when such interruptions occurred, traditional birth assistants were called.[14] This is in agreement with the observation that a higher density of traditional birth assistants in an area decreases the chances that a woman will receive maternal care or services.[10] Several studies have suggested that traditional birth assistants are characterized by greater tolerance, patience, and experience compared to midwives.[1],[8],[14] In other interviews, some women emphasized the importance and sense of security associated with the medical professionalism of midwives over that of traditional birth attendants.[1]

Discussion

The available literature presents various perspectives on the role of midwifery in addressing Indonesia's maternal mortality rate with SDG 3 in mind. Diverse cultural practices and varying levels of access to care make approaches to this goal challenging. Four main themes arise from the literature: structural barriers when it comes to access to and quality of care, the coexistence and tensions between skilled and traditional birth assistants and the push for skilled midwifery to be a primary mode of maternal healthcare when possible, and competing arguments for and against traditional birth assistant utilization.

Costs, geographic dispersion, and perceptions of care all influence healthcare utilization choices. Though more superior in its medical quality, skilled midwifery can be inaccessible and pricey for low-income mothers. Additional considerations, such as transportation costs and safety, make services provided by skilled medical professionals further out of reach. Traditional birth assistants are often the more affordable and accessible option, especially in remote areas. Skepticism of the hospitality offered by medical facilities, coupled with the personalized nature of the services given exclusively by traditional birth assistants can push mothers towards selecting a traditional birth assistant over a skilled one. These barriers are intertwined and reinforce one another, and require a multifaceted approach in overcoming them.

Tensions between skilled midwives and traditional birth assistants extend beyond the pure differences between their approaches to maternal care; they are delineated and exacerbated through legislative and behavioral undercurrents. This is evident in the literature, whereas traditional birth assistants are not granted the official term of "midwife" in multiple papers. Even moreso, the Indonesian language uses "bidan" and "dukun" to separate these two forms of midwifery, with the latter translating to "witch doctor" in English. Traditional birth assistants have garnered much respect in their local communities for their ancestral wisdom and birth rituals. As the government makes pushes to establish training programs for midwives, traditional birth assistants are left to find roles that are subordinate to the midwife. The rise of the medical professionalization of the midwife serves as a threat to the livelihood of traditional birth assistants. The coexistence of these two groups necessitates a balance; there is a need to respect and understand the traditions led by traditional birth assistants, while also ensuring that childbirth is a safe process–a task that skilled midwives are more equipped to handle.

The literature showcases some competing opinions on whether traditional midwifery should be utilized to a greater extent to battle the MMR. Some papers more clearly advocated for increasing the number of births occurring in a health facility with skilled midwives and trained health workers.[10],[11] Other authors were more empathetic in understanding the importance and accessibility of traditional birth assistants.[8],[13],[17] It is found that while traditional birth assistants are more affordable, patient and comforting, and more accessible, they also do not guarantee the better quality of care, maternal health outcomes, and better training that are associated with skilled midwives. A nuanced approach should be taken when comparing these two options for maternal care. A push for all births to occur in health facilities, while ideal and effective in guaranteeing a standard quality of care, may not be feasible for the considerable proportion of the population that lives in rurality. In a country where healthcare access is unequal across the population, there ought to be consideration on how to better utilize the abundance of traditional birth assistants operating in the country's most remote areas.

There are several limitations to address in this synthesis. Because traditional midwifery practices are carried through generations, these practices may not have been comprehensively documented or accurately preserved, especially within the search's selected time range. Moreover, several studies that involved interviews with traditional birth assistants noted the secrecy of some of their beliefs and practices; as such, there are further gaps in the working knowledge of traditional practices.[13],[17] On a broader scale, traditional practices in midwifery remain understudied, with limited literature exploring this topic. During the initial literature search, several articles describing traditional practices written in Bahasa, without translation; additional limitations arise when considering that the synthesis was restricted to literature written in English.

Gaps in the literature still persist in this area. There is still much to be learned about the practices involved in traditional midwifery. Efforts to discern the underlying reasons for specific practices proved futile, as traditional birth assistants were determined to safeguard their healing secrets.[13],[17] Consequently, delving into research aimed at unraveling these traditions would provide new insights to consider in evaluating traditional methods. Additionally, it is still not fully understood whether programs like Bidan di Desa have been effective in integrating care between bidan and dukun, as well as improving maternal health outcomes. These findings would be crucial in knowing whether these efforts are worth scaling up in its enforcement country-wide.

Conclusion

This synthesis hopes to help bridge a gap in knowledge regarding traditional and skilled approaches to midwifery in Indonesia. The advocacy and use of skilled midwifery to combat the maternal mortality rate is seen through government-led training modules and programs like Bidan di Desa. Traditional methods of midwifery are deeply rooted in cultural beliefs and are driven by accessibility, affordability, and trust. However, challenges such as geographical dispersion, financial constraints, limited access to education, and gender inequities persist, complicating the pursuit of improved maternal health. Competing opinions regarding the value of care that traditional birth assistants provide further complicates options for what an ideal path forward might look like.

In looking towards recommendations for future research, it should be investigated whether the empowerment of traditional midwifery, when medically safe, backed by scientific evidence, and culturally sensitive, can improve maternal health outcomes for women living in areas that do not have ready access to proper healthcare facilities. The increased utilization of traditional birth assistants has potential to be particularly impactful, as they are already trusted figures in their local communities.[1],[9],[15] Interventions should be practiced in a community-led manner, involving collaborative efforts between researchers and local stakeholders to ensure the effectiveness and sustainability of such initiatives. If it is determined that enhancing the skills and education of traditional birth assistants is effective, there could be significant implications for improving access to maternal care that is trustworthy, high quality, and accessible to all. While Indonesia has made strides in improving maternal health through midwifery, there remains significant room for improvement. A balanced approach that respects traditional practices while promoting evidence-based healthcare will be instrumental in further reducing maternal mortality rates in Indonesia.

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HIV in the Philippines: A Persisting Public Health Crisis Closely Tied To Social Stigma

By Emily Mrakovcic

Illustration by Ella Olea

Introduction

Human immunodeficiency virus, also known as HIV, is present in several regions around the world. Although the virus has the same transmission mechanisms and symptoms regardless of its locality, HIV is experienced very differently across the globe.[1] This is due to several cultural and social factors impacting how HIV is viewed and treated. The Philippines is one country where the way individuals view HIV heavily impacts its transmission and treatment.[2] Due to stigma and discrimination surrounding HIV, the Philippines is currently experiencing the fastest-growing HIV epidemic in the Western Pacific.[3] Specifically, stigma and discrimination against men who have sex with men (MSM) and HIV-positive MSM have significantly boosted the proliferation of the virus.[4] MSM with HIV in the Philippines face an intersection of stigma: on the one hand they experience stigma toward their sexual orientation, and on the other hand, they experience stigma toward their HIV status.[4] Because of the stigma MSM encounter, they face several barriers to HIV prevention, testing and treatment.[5] Approximately 70 percent of HIV cases in the Philippines are among MSM,3 yet over three-quarters of MSM in the Philippines have never obtained an HIV test.[2] Not only do MSM feel discouraged from seeking care, but healthcare facilities are failing to provide adequate services for this at-risk population.[4] Understanding the social determinants of HIV transmission in the Philippines is needed to provide insight as to why MSM are disproportionately infected with the virus.

In a country where discrimination is still legal in some contexts, and only 73 percent of Filipinos say society should accept homosexuality,[6] discrimination against MSM is not uncommon. Homosexuality is legal, but LGBTQ+ individuals cannot adopt children, conversion therapy is not banned, and gay marriage is not recognized.[6] Overall, Philippine views of homosexuality reflect an attitude that is tolerant, but not accepting, of LGBTQ+ individuals. This view often results in discrimination within workplaces and social circles.[3] Attitudes toward HIV-positive individuals are also stigmatized, as HIV infection is often equated to sin and immorality.[5] Strong roots in Catholicism coupled with poor HIV education are some of the main drivers of both HIV and sexual orientation-related stigma.[4] Together, this array of stigma and discrimination solidify as barriers to HIV testing and treatment within the health care system.

Individuals with HIV have viral loads, which are measurements of the amount of virus present inside the body.[7] A high viral load indicates a large amount of HIV in the blood. When an individual has a high viral load, they are very contagious. Conversely, when an individual has a low viral load, they have a low amount of HIV in their blood and are unlikely to transmit the virus.[8] In the Philippines, where treatment services such as antiretroviral therapy (ART) are not sufficiently provided and made accessible, a failure to treat is also a failure to prevent. When treatment services do not successfully suppress the viral loads of affected populations, not only do infected individuals become sicker, but they also have the potential to spread the virus.[7]

The research question I will address in this paper is: How do stigma and discrimination toward MSM in the Philippines impact their access to prevention, testing, and treatment services for HIV? Through this question, two general ideas can be explored through peer-reviewed literature. Firstly, the question will explore how the desire of MSM to seek prevention, testing, and treatment is affected by experiences of stigma and discrimination in multiple capacities. The question will also explore how discrimination within healthcare facilities, in addition to the failure of healthcare facilities to accommodate for discrimination experienced outside of the healthcare setting, contributes to the lack of appropriate HIV care for MSM.

Methods

When conducting a literature search, I used the PubMed and Embase search engines. Through these search engines, I accessed peer-reviewed articles from the Multidisciplinary Digital Publishing Institute, National Library of Medicine, Guilford Journals, BMC Public Health, and Taylor & Francis Online. Keywords I used to search for material were "HIV/AIDS," "HIV," "MSM" and "the Philippines." Generally, I looked for articles published in the last five years to capture the most recent updates on the epidemic.

HIV Infection Incidence Among MSM

For the past two decades, the Philippines' HIV epidemic has been driven by sexual transmission among MSM.[9] However, the incidence of HIV infection among MSM was not extensively evaluated until a study titled "HIV incidence among men who have sex with men (MSM) in Metro Manila, the Philippines: A prospective cohort study 2014-2018" was conducted by Rossana Ditangco and Mary Lorraine Mationg. The purpose of this study was to determine the incidence of HIV infection and its associated risk factors among MSM in Metro Manila, the largest metropolitan area in the Philippines. By understanding the epidemiology of the outbreak, Ditangco and Mationg hoped to assist in the formulation of relevant biomedical and socio-behavioral interventions. Participants were 18 or older, Metro Manila residents, and confirmed HIV-negative. All participants had anal or oral sex in the past 12 months. The researchers administered in-person questionnaire interviews and HIV tests every 3 months to all 708 participants. Data was collected on participant knowledge, attitudes, and practices regarding HIV and AIDS. During the follow-up period, 56 new cases were recorded, resulting in an incidence rate of 2.7 cases per 100 patient years.[9] The study found that having two or more sexual partners and having anal sex without a condom in the past 3 months were factors significantly associated with HIV infection.[9] High incidence was also recorded among the 18-24 year age range;[9] Ditangco and Mationg hypothesized that this may reflect the sexually active nature of young MSM. Overall, there was a high HIV incidence rate among Filipino MSM.[9] The findings from this study highlight the need for effective HIV prevention, surveillance, and treatment strategies. Additionally, based on these findings, younger MSM aged 18-24 should be a focus of interventions. Although this study provides limited insight into the stigma and discrimination faced by MSM, baseline effects of certain risk factors, such as sexual activity and condom use, were established. Understanding HIV incidence among this key population provides a strong epidemiological foundation to build upon with social and cultural context.

Drivers and Experiences of Stigma and Discrimination

At a time of explosive HIV transmission in the Philippines, there was little understanding of MSM experiences with HIV-related stigma.[10] In 2017, a study titled "'An Evil Lurking Behind You': Drivers, Experiences, and Consequences of HIV-Related Stigma Among Men Who Have Sex With Men With HIV in Manila, Philippines" was conducted by Alexander C. Adia et al. to understand MSM experiences with HIV-related stigma and how these experiences subsequently influence their behaviors and qualities of life. The study consisted of 21-hour-long interviews of both MSM living with HIV and community-based organization workers. Participants resided in Manila and were required to be able to communicate in English. The interviews were designed to capture specific patterns of stigma that MSM living with HIV experienced and internalized. Stigma resulting in mental health issues, delays in HIV testing, and avoidance of health services were the main points qualitatively measured during the interviews. The study found that a majority of MSM participants were affected by an intersection of HIV-related stigma and sexual orientation-related stigma.[10] These stigma were often rooted in ideas of morality, dirtiness, and sin.[10] Participant #4 reported difficulty seeking treatment due to peers blaming them for their diagnosis and labeling them as promiscuous, and a sex addict, because of their serostatus and sexual orientation. Participant #16 mentioned that, due to being HIV-positive, they were ostracized from communities they were formerly a part of. Additionally, several participants expressed signs of internalized stigma, stating that they deserved to get HIV as a consequence of their wrongdoings, such as identifying as gay.[10] Overall, the study identified three main ways that stigma serves as a barrier to HIV treatment: detering MSM from seeking treatment despite its availability, creating attitudes that reduce the urgency to take HIV medication, and impeding disclosure of HIV status, thus resulting in HIV-positive MSM not promptly receiving the treatment they need.[10] The study concluded that public health strategies must be developed to address discrimination at both societal and individual levels to reduce stigma-related harms.

Law and policy are powerful tools capable of improving the lives of people facing discrimination due to a diagnosis. Attempting within the law to reform existing structural inequalities may have a positive impact on societal attitudes toward HIV-positive individuals.[11] However, before this study, there was minimal research on the role legal protections in the Philippines play in improving the well-being of people living with HIV (PLHIV).[11] In 2019, Alexander C. Adia et al. conducted a study titled "Sword and Shield: Perceptions of law in empowering and protecting HIV-positive men who have sex with men in Manila, Philippines" that aimed to examine how MSM living with HIV perceive HIV-related legal protections, and how these protections subsequently influence their lives. Currently, the Philippines has a law, Republic Act 11166, that contains several anti-discrimination provisions.[11] The study conducted one hour-long semi-structured interviews with 21 participants to gauge how MSM living with HIV experience the impacts of Republic Act 11166. The participants were HIV-positive MSM living in Metro Manila, aged 18 years and above, and able to communicate in English. The study identified two overarching feelings experienced by participants as a result of the law: empowerment and protection.[11] Participants reported that the law helped them feel normal in social settings they previously felt disconnected from.[11] Additionally, participants derived empowerment from the law because it displayed government commitment to deterring discrimination.[11] The law also allowed for more positive and beneficial discussions regarding HIV to occur among MSM living with HIV.[11] However, the interviews also highlighted some participant concerns, such as the efficacy of the aforementioned legal protections. They worried that companies and local governments may only treat the law as a suggestion.[11] Additionally, concerns were raised about the law lacking the authority to counter social discrimination in the workplace or social circles.[11] Overall, however, the findings show that Republic Act 11166 has alleviated internalized stigma and feelings of powerlessness among MSM in the study. The necessity of legal justice and human rights advocacy in HIV treatment highlights the role stigma plays in shaping the HIV epidemic in the Philippines.

Although HIV is mainly transmitted through MSM, HIV testing uptake among this demographic remains low.[12] This is mainly due to poor coordination of care within the Philippines' health care system.[12] A study conducted by Jan W. de Lind van Wijngaarden et al., titled "'I am not promiscuous enough!': Exploring the low uptake of HIV testing by gay men and other men who have sex with men in Metro Manila, Philippines," aims to explain why a significant proportion of Metro Manila-based MSM lacked access to HIV testing and treatment services. The goal of collecting this data was to reform health services to be more accessible, effective, efficient, equitable, and MSM-friendly.[12] 48 MSM from Metro Manila were recruited by their level of engagement with the HIV care cascade. The HIV care cascade consists of four levels: diagnosis, linkage to care, receipt of care, and retention of care.[12] Case series interviews were designed to explore barriers to the uptake of HIV services. The study found that the main reasons to postpone treatment were higher socioeconomic class, feelings of moral superiority to other gay-identifying men, lack of proximity to the testing facility, fear of what will happen once infected, fear of stigma pertaining to serostatus or sexual orientation, fear of ART side effects, and fear of high health care expenses.[12] Misconceptions regarding HIV and ART were also observed. Some participants believed that feeling physically fit meant that they could not be sick.[12] Additionally, if a potential sexual partner appeared healthy, participants reported feeling less inclined to use a condom. Social stigma excludes HIV from health education conversations, thus contributing to the aforementioned misconceptions. However, other concerns expressed by participants were not misconceptions, but striking realities. Participants feared loss of support from friends or family upon receiving an HIV diagnosis.[12] Additionally, fear of discrimination often translated into concerns regarding testing confidentiality,[12] which was of the utmost importance to most participants. The data overall shows that most participants did not see a need to get tested, despite significant risk. Even participants who acknowledged their high-risk status did not feel compelled to get tested.[12] A major determining factor in this choice was fear of what would happen upon testing positive.[12] Potential solutions outlined by the researchers were increasing testing locations, hiring non-medical outreach workers to enhance service delivery, and providing cost-free knowledge of HIV to help tackle commonly held misconceptions. All of these solutions aim to bridge existing gaps within the current healthcare system, thus enhancing the transition from one level of the HIV care cascade to the next.

The HIV Health Care System

Healthcare providers are essential to curbing any epidemic, and the way providers structure their delivery of care can have lasting effects on the healthcare system as a whole. The purpose of Arjee J. Restar's study, "Prioritizing HIV Services for Transgender Women and Men Who Have Sex With Men in Manila, Philippines: An Opportunity for HIV Provider Interactions," was to examine healthcare provider attitudes, perceived competencies, and abilities to prioritize the provision of HIV-related services to MSM. One-on-one qualitative interviews examined factors that may have impacted HIV prevention and treatment services for MSM. 15 HIV providers residing in Manila were interviewed. All providers were over the age of 18 and had a history of serving MSM. Restar et al. found that a majority of providers had overall positive attitudes toward all patients in their practices. Most providers valued equality for all of their patients but reported that despite their willingness to provide care to MSM, their actual competencies to provide context-specific care were not up to par.[13] This lack of competency was often due to one of three main reasons: not knowing the health needs of MSM, having little training with HIV, or having difficulty being sensitive to patient gender and sexual orientation.[13] Some providers expressed interest in learning more about LGTBQ+ individuals in their practices but lacked knowledge of the lived experiences of these patients.[13] Additionally, some providers reported that their facilities did not offer training specifically tailored to providing HIV services to MSM.[13] The study conveys an overall lack of preparedness among many providers regarding delivering MSM and HIV-specific care. The findings of this study also indicate the importance of not just patient-focused interventions, but provider-focused interventions as well. Healthcare providers require cultural competence to deliver HIV-sensitive services. This study indicates the need for a shift to more specific interventions tailored to meet the needs of key populations.

The HIV care cascade, designed to examine the engagement of PLHIV with medical care, previously lacked sufficient data on non-heterosexual populations, despite MSM being disproportionately affected by the epidemic.[14] A study conducted by Marisse Nepomuceno et al., titled "A descriptive retrospective study on HIV care cascade in a tertiary hospital in the Philippines," sought to describe the HIV care cascade at the tertiary level in a hospital-affiliated HIV clinic after the adoption of the test-and-treat strategy. The test-and-treat strategy screens patients for HIV infection and provides treatment soon after a positive test result, thus bridging the gap between testing and treatment.[14] A descriptive, retrospective cohort study was conducted. Researchers reviewed the medical records of patients enrolled at the University of the Philippines' Philippine General Hospital in Manila. Demographic and clinical data relevant to each stage of the HIV care cascade were collected in order to understand the linkage to care, ART initiation, retention in care, and virologic suppression. 584 participants were included; all were receiving treatment from the Philippine General Hospital and were aged 18 or older. Ninety one percent were male, and 55.6 percent contracted HIV from male-male sex.[14] Ninety-nine point five percent of patients were linked to care following diagnosis, 95 percent of patients initiated ART, 78.[8] percent of patients were retained in care and maintained ART, 47.9 percent of patients had their HIV viral load tested in follow-up, and 45.5 percent of patients achieved viral suppression.[14] Additionally, of the 99.5 percent of patients who were linked to care, 10 percent of these patients were linked to care more than 12 months following their diagnosis.[14] This is especially concerning with HIV, as failure to achieve viral suppression allows for further transmission. Overall, this study captured the substantial loss of patients throughout the HIV care cascade. The study concluded that many gaps are remaining in the cascade. Nepomuceno et al. suggested the use of outreach programs and telemedicine to enhance adherence to ART and viral load testing. Traditional medical facilities may lack the capacity to fulfill all medical needs of MSM living with HIV, but these needs can still be met if some responsibility for care is shifted to informal care settings, such as community-based programs.

The Intersection of Health Care and Stigma

Structural, social, and behavioral factors all impact HIV service uptake among MSM.[15] Understanding these factors is critical when developing culturally competent care models. A study conducted by Arjee J. Restar et al., "Differences in HIV risk and healthcare engagement factors in Filipinx transgender women and cisgender men who have sex with men who reported being HIV negative, HIV positive or HIV unknown," aimed to understand HIV risk and health care engagement among at-risk individuals. An online cross-sectional survey examined the structural, social, and behavioral factors impacting HIV service uptake among cisgender MSM. The survey assessed factors typically associated with HIV status, such as demographics, social marginalization, HIV risk, healthcare engagement, and substance abuse.[15] The study found that the most prominent barriers to healthcare engagement were discrimination by healthcare workers, clinic wait time, inconvenient location, and concerns about disclosing HIV status.[15] Roughly a third of participants reported sexual orientation, gender identity, or a lack of anti-LGBT discrimination policies as reasons for avoidance of HIV services.[15] The study also found that only 16 percent of cis-MSM participants had ever received an HIV test and knew of their HIV status.15 Concurrently, MSM are more likely to engage in HIV-risk behaviors including drug and alcohol use, condomless sex, and sex work.[15] Restar et al. suggest harm reduction services, testing outreach, and community partner involvement to increase MSM engagement with HIV services. These solutions, both inside and outside the healthcare setting, acknowledge the social determinants responsible for MSM behaviors that increase their risk of HIV and decrease their odds of healthcare engagement.

Testing rates among MSM, especially young MSM, remain low despite high rates of transmission.[16] The main model of HIV testing, facility-based testing, has proven to be unsuccessful in providing sufficient means of testing to MSM.[16] HIV self-testing (HIVST) is an alternative strategy to address this gap in testing. HIVST allows individuals to conduct their own rapid diagnostic tests and maintain result confidentiality.[16] So far, HIVST has successfully increased testing in other Asian countries, including China, Hong Kong, and Vietnam.[16] Jesal Gohil et al. conducted a study titled "Is the Philippines ready for HIV self-testing?" to measure perceived acceptability, feasibility, and challenges of HIVST among key informants and target users. Semi-structured interviews qualitatively assessed potential barriers, opportunities, and challenges regarding HIVST policy and regulation. Focus group discussions took place with 42 target users and 15 individuals involved with the provision of HIV testing programs. All participants resided in Metro Manila. The study found that MSM were receptive to HIVST due to its elements of convenience and privacy.[16] Linkage to HIV care following a positive test result was a point of concern for participants, but they also worried about stigma-related barriers they would face within the health care system upon initiation of care.[16] The study also found that pharmacies and community-based facilities, not traditional medical facilities, were popular choices for picking up tests.[16] Based on these findings, the study concluded that one of the largest problems associated with HIVST is not MSM willingness, but HIV-related stigma within the health care system. While HIVST allows individuals to take responsibility for their testing, they still lack control over what they will experience within the healthcare system following a positive diagnosis.

A key principle to treating HIV, U=U, asserts that if HIV is undetected, it is also untransmittable.[17] If an HIV-positive individual adheres to their ART regimen, then their viral load will remain low enough to prevent transmission.[17] This idea highlights the importance of viewing treatment as prevention. Thus, supporting adherence to ART is crucial to managing HIV. Cara O'Connor et al. conducted a study titled "Risk factors affecting adherence to antiretroviral therapy among HIV patients in Manila, Philippines: a baseline cross-sectional analysis of the Philippines Connect for Life Study" to measure treatment adherence and to identify whether ART adherence requires additional interventions to increase its effectiveness. Such an analysis would provide the groundwork for adherence interventions specifically tailored to MSM. A cross-sectional analysis was conducted using a framework that gathered information on HIV-related risk behaviors and adherence to ART. To guide data collection, questions were framed around demographics, clinical characteristics, HIV knowledge, risk behaviors, and adherence or lack thereof.[17] All 426 participants were HIV-positive and attending a clinic in Metro Manila that was a part of the Connect for Life Cohort Study. All participants were required to speak English and have a mobile phone. The study found that 100 percent adherence in the last 30 days was only achieved by 52.1 percent of participants.[17] Longer time on treatment, inconsistent condom use, and injection drug use were all associated with reduced adherence.[17] The most common reasons for missing medication were being too busy, forgetting, falling asleep, being away from home, or having a change in their daily routine.[17] Additionally, 44 percent of patients who skipped a pill at some point did so because they did not want to be seen taking their medication.[17] On the other hand, being in a relationship with an HIV-negative partner was associated with increased adherence.[17] These findings indicate a similarity between HIV-risk behaviors and nonadherence behaviors. The data also indicates a positive association between HIV knowledge and ART adherence. The data collected from this study underscores the need for interventions addressing treatment fatigue and social stigma. Interventions may accomplish this through the implementation of social support and harm reduction programs centered specifically around the struggles of MSM.

Pre-exposure prophylaxis (PrEP) is the primary prevention mechanism for HIV.[18] To be effective, the pill must be taken once a day. Although PrEP has proven to be extremely successful in preventing HIV transmission, the uptake of HIV prevention services among MSM in the Philippines remains low.[18] Awareness and interest in PrEP are key determinants of successful uptake, but current levels of these feelings among MSM were unknown[18] until a study was conducted by Arjee Restar et al., titled "Characterizing Awareness of Pre-Exposure Prophylaxis for HIV Prevention in Manila and Cebu, Philippines: Web-Based Survey of Filipino Cisgender Men Who Have Sex With Men." The purpose of this study was to examine levels of PrEP awareness and interest among cisgender MSM in the Philippines. The results of this study have the potential to guide the future rollout of PrEP programs. A quantitative web-based survey was designed to examine the relationship between PrEP awareness/interest and factors such as socioeconomic status, healthcare experiences, and access to HIV services. The study found overall high levels of awareness and interest in taking PrEP. While only 56.4 percent of participants had high HIV knowledge, 74.9 percent of participants were aware of PrEP, and 88.8 percent of participants were interested in taking the medication.[18] PrEP knowledge was more common than a high level of HIV knowledge.[18] The most frequently recorded reasons for lack of interest in PrEP were needing to know more information first and not liking medication in the form of pills.[18] Factors associated with greater odds of PrEP awareness were a college education or higher, having had an HIV test in the past, high HIV knowledge, and having discussed PrEP among friends.[18] Factors associated with lower odds of PrEP awareness were being straight-identified, experiencing health care discrimination due to sexual identity, and avoiding HIV services due to cost, sexual identity, or a lack of LGBT anti-discrimination policies.[18] Restar et al. concluded that there is a growing demand for PrEP in the Philippines. However, those who were less aware of PrEP either came from poorer, less educated backgrounds or encountered barriers in the HIV health care system.[18] To increase the likelihood of successful PrEP interventions, future actions must be taken to provide HIV education and reduce discrimination within the healthcare system.

Discussion

Limitations: Assessment of the studies reveals some flaws among study designs and collected data. All of the studies were based in urban areas, primarily Manila. The lack of regard for rural areas may result in conclusions not entirely representative of all MSM in the Philippines. HIV knowledge and risk behaviors may vary among urban and rural areas depending on what resources and funding are available. Additionally, legal protections of Republic Act 11166 may be weaker in regions with less government oversight. Another weakness of some studies was that participation requirements potentially favored the participation of individuals from a higher socioeconomic class. Having to speak English or possess a phone may deter some individuals from partaking in the study, thus failing to assess the entirety of the target population. Bias could have also occurred in the studies that used self-reporting surveys and questionnaires, as participants may have misremembered information or been untruthful to avoid judgment. A final critique of many of these studies is a lack of specific, thorough solutions. After conducting extensive analyses of the HIV epidemic in the Philippines, many of the studies provided only brief and general descriptions of potential interventions.

Strengths: A significant strength of the research in this field is the high volume of qualitative studies conducted. When examining stigma and discrimination, no statistic can accurately capture the unique experiences of MSM pertaining to their serostatus and sexual orientation. The use of interviews and informal questioning provides a space for participants to openly share their experiences without being confined to black-and-white, yes-or-no questions. Additionally, the interviewing of healthcare providers by Restar et al. provided an alternative perspective that was beneficial to comprehensively understanding the HIV healthcare system.

Conclusion

The HIV epidemic among MSM in the Philippines continues to be a pressing public health issue, despite the growing body of research working to understand HIV in this specific context and provide potential solutions. Overall, the studies addressed in this synthesis had similar findings, thus reinforcing the idea that MSM in the Philippines receive inadequate HIV health care due to stigma and discrimination surrounding serostatus and sexual identity. I believe the studies in this synthesis provide sufficient, relevant data and evidence that adequately answer my research question. Stigma and discrimination are encountered by MSM among family, friends, peers, coworkers, and health providers alike.[11] All of these experiences of discrimination summate into trends of hesitancy to seek HIV health care, including but not limited to PrEP,[18] facility-based HIV testing, HIVST, ART, and follow-up viral load testing.[14] Additionally, just as MSM experience discrimination that deters them from seeking treatment, there are also factors within the health care system limiting MSM engagement with HIV services. Inadequate skills and knowledge of providers,[13] insufficient anti-discrimination policies,[18] and gaps of continuity within the HIV care cascade[14] are all shortcomings of the HIV health care system that serve as barriers to care for MSM. Stigma and discrimination may result in avoidance of testing, avoidance of treatment, nonadherence to treatment, or a lack of knowledge of available preventative and treatment services.[10] Additionally, several misconceptions resulting from HIV stigma further contribute to the aforementioned behaviors.[12]

Context-specific and community-based interventions that put patient-centeredness, convenience, and confidentiality at the forefront of their work have the potential to successfully reach a larger scale of MSM who are in need of preventative, testing, and treatment services. Future directions should incorporate these elements of care into both traditional medical facilities and outpatient clinics, community-based organizations, and educational programs. Stigma and discrimination toward these individuals are deeply rooted within Filipino culture, thus requiring solutions that are dispersed among a variety of support outlets accessible to MSM. Restructuring views toward MSM and PLHIV within both society and the health care system are critical for enacting meaningful change. Future research efforts may benefit from using already collected data to propel implementation-focused studies that aim to craft interventions specifically centered around both at-risk MSM and HIV-positive MSM.

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Public Health Perspectives on Queer Liberation & the Necessity of Abolition

By Emilie Lum

Illustration by Junyue Ma

Why is it important to talk about abolition in the context of public health? I argue that to be a health advocate for health equity necessitates being an advocate for abolition. Abolition is the coalition of many movements to end all systems of oppression and to transform our society into a place of liberation for everyone. Abolitionist frameworks are rooted in transformative justice practices, which seek to find alternative approaches to both preventing harm and holding others accountable for harm they have inflicted. One of the primary goals for abolitionists is the removal of policing and incarceration systems. As public health professionals who advocate for the health and well-being of all people, it is essential to understand and mitigate the physical, emotional, and mental harm imposed by the prison-industrial complex. Policing, surveillance, and the incarceration system perpetuate harm to people who are facing oppression conditions based on their identity. Those who are BIPOC (Black, Indigenous People of Color), poor, disabled, LGBTQIA+, or work as sex-workers are most disproportionately harmed by the incarceration system: the harm that these communities experience is a matter of health equity. Those who are faced against several axes of oppression can be subjected to more extreme kinds of violence reproduced within the incarceration system. This paper highlights the experiences of the LGBTQIA+ community and the hopes for Queer liberation, especially those of color, who are particularly at risk to demonstrate the pressing necessity of abolitionist frameworks in public health care approaches. However, it is essential to note how this community is just one example of how different communities of people navigate the violence and oppression imposed by the incarceration system.

In her own op-ed published in 2021, Ashley Diamond– a Black trans woman from Georgia– narrates her experiences with violent sexual abuse and rape while being transferred across several different men's prisons for three years. Not only was she denied protection and could not move to a facility where she would be safe, but she was also repeatedly refused the hormones and gender-affirming care she needed. Correctional officers and fellow inmates have relentlessly subjected her to harassment because of her trans identity.[1] While one story cannot be representative of the entire community, Ashley's narrative is testament to the ways that the LGBTQIA+ community face particular kinds of challenges before, during, and after incarceration. For example, in 2013, Ashely was placed into solitary confinement solely on the basis of "'pretending to be a woman.'"[1] Once released on early parole, Ashley continued to face multiple barriers and challenges as a result of being a Black trans woman under strict parole supervision in her hometown: this included facing harassment by the Ku Klux Klan, repeated home vandalization, and consistent targeting by the police. She was eventually sent back to prison in 2019 for breaking her parole by visiting a treatment center in Florida to manage her PTSD. While in prison, the repeated denial of gender-based healthcare triggered gender dysphoria for Ashley– resulting in a severe deterioration of her mental health, threatening her well-being and safety.[1]

Ashley's story is one of the countless experiences of Black transgender folks facing particularly cruel treatment while incarcerated. According to the National Library of Medicine, "Transgender women, especially those of color, experience disproportionate rates of incarceration, high rates of victimization while incarcerated, and associated negative health-related indicators."[2] Hyperincarceration systematically targets transgender people and transgender people of color, subjecting them to state-sanctioned violence once imprisoned. About one in every six transgender people have been incarcerated, while the rate for Black transgender folks increases to one in every two people.[3] As the Sylvia Riveria Law Project describes it: "'Over-policing and profiling of low-income people and of trans and gender-nonconforming people intersect, producing a far higher risk than average of imprisonment, police harassment and violence for low-income trans people.'"[3] Transgender women incarcerated are at risk for significant health disparities and are in the most need of comprehensive medical services.[3] Additionally, trans folks need access to gender-affirming care, which is typically extremely difficult for them.[4] Prisons frequently deny gender-affirming care– which can include "puberty suppression, hormone therapy, and gender-affirming surgeries"– to transgender folks.[4] This kind of care is a basic necessity for trans folks and is also crucial to treating gender dysphoria. Left untreated, gender dysphoria can cause folks to experience heightened anxiety and depression, putting them at much greater risk for self-harm and suicide.[4] The lack of adequate healthcare for trans people jeopardizes their well-being and their safety. The violence inflicted upon transgender communities– particular trans women of color– is the cumulative result of an overwhelming number of social, economic, and political factors that are a product of our current state.

Across the board, solitary confinement has been considered a torturous and inhumane practice. Yet, queer and transgender folks, especially trans women of color, are disproportionately forced into solitary confinement.[5] A study done by an LGBTQIA+ abolitionist group called Black and Pink reported that 85 percent of incarcerated LGBTQIA+ folks had been placed in solitary confinement. Correctional staff will use the gender identity of gender non-conforming folks to justify solitary confinement under the guise of safety.[5] The damage from solitary confinement is irrevocable. Recent research reveals that solitary confinement shortens lives and causes other forms of irreversible emotional, physical, and mental damage.[6] This type of punishment is one of several causes why prisons further exaggerate pre-existing mental health struggles for folks who are incarcerated. While only 6 to 8 percent of the prison population is in solitary confinement, about half of suicides are committed by those in solitary confinement.[6] Folks in solitary confinement often are unable to receive proper treatment for their mental health conditions. Additionally, entering solitary confinement can make someone predisposed to developing a mental health condition due to the compounding effects of isolation.[6] Solitary confinement is a practice that is considered torture, and a practice that disproportionately impacts trans and LGBTQIA+ folks.

There is a violent history of the criminalization of Queerness alongside the targeting of Queer bodies and spaces. The Stonewall Uprising of 1969– one of the most prominent Queer protests against state-sanctioned violence and surveillance– was led by trans women in the wake of repeated NYPD raids targeting gay bars across the city.[7] LGBTQIA+ communities have had to operate and exist under centuries of laws prohibiting homosexuality as well as social stigma against queer and gender non-conforming practices. For example, laws promoting the criminalization of HIV– which still exist in 33 states to this day– disproportionately targets gay and trans people of color.[8] Therefore, it is not surprising to learn that LGBTQIA+ community members are disproportionately overrepresented in the incarceration system in the United States. And when incarcerated, they are subjected to unique violence and treatment because of their identities. LGBTQIA+ youth and adults are overrepresented in incarcerated populations in the juvenile justice system.9 Furthermore, LGBTQIA+ folks who are people of color are disproportionately criminalized. Sixteen percent of transgender people, and 47 percent of Black transgender people, are incarcerated. 12 Black transgender folks are incarcerated at a rate that is ten times higher than the general population, according to the National Center for Transgender Equality.[5]

Not only does the incarceration system criminalize mental health struggles, but it continues to exacerbate mental health issues for those incarcerated. People struggling with mental illness are at much higher risk for experiencing incarceration. They are vastly overrepresented in U.S. prisons in comparison to the country's mental health hospitals: again, this is intricately connected to the criminalization of poverty, substance abuse, homelessness, over-policing, being a person of color, being LGBTQIA+, and a lack of accessible mental health care. The incarceration system is at odds with the mental health of people struggling with mental health conditions. The available mental health treatment available in prison systems is inconsistent, unreliable, and lacking in quality and quantity.[10] Prisons face understaffing and are simply unequipped to properly treat people and their mental health. Not only are prisoners disproportionately composed of people living with mental health struggles, they only continue to heighten the severity of the mental health struggles of those incarcerated.[10] Punitive disciplinary measures– such as solitary confinement– can only further facilitate the deterioration of a person's mental health.

Thus, mental health is a crucial factor to consider when analyzing the full complexities of queerness and the incarceration system. For a breadth of reasons, the LGBTQIA+ community is disproportionately at risk for mental health struggles. According to a 2013 survey, about 40 percent of LGBT adults have experienced rejection from a family member or a close friend. LGBTQIA+ individuals have to confront homophobia, transphobia, identity-based shame and hate crimes. They face several forms of discrimination and are targets of hate crimes. LGBTQIA+ people have a 120 percent higher chance of experiencing homelessness. These are all experiences that can most certainly attribute to a deterioration in mental health and overall well-being for queer individuals. LGB adults are more than twice as likely than heterosexual adults to experience mental health struggles, such as depression and anxiety.[11] Transgender individuals are four times as likely as cisgender people to experience a mental health condition.[11] They are also twice as likely to experience depression, contemplate suicide, and attempt suicide.[11] Forty percent of transgender adults have attempted suicide in their lifetime, while less than 5 percent of the general U.S. population has.[11] Additionally, the LGBTQIA+ community faces many barriers to receiving proper mental health care treatment. Especially when considering other compounding factors like race and economic status, the quality of care that LGBTQIA+ community members receive is far from adequate.[11] Because the incarceration system targets people who have mental illness, understanding the relationship between mental health and the well-being of queer communities is crucial in analyzing the oppressive nature of carceral systems against queer communities.

Queer, trans, and gender non-conforming communities have faced continued ruthless violence and harm from policing, the incarceration system, and other systems of violence that are interconnected to them. In November of 2022, the LGBTQIA+ community was targeted in a massive shooting at Club Q in Colorado Springs on the eve of Trans Day of Remembrance. The incarceration system is just one link of an entire system that has oppressed and afflicted violence against LGBTQIA+ communities, especially those of color. The incarceration system ever has, and its current state never will, protect the LGBTQI+ community. A challenge when addressing the impacts of the incarceration system is the overwhelming number of interconnected struggles that underpin most, if not all, the health inequities visible in different populations who are incarcerated. One cannot properly have a discussion about the harm inflicted by the LGBTQIA+ community without discussing the violence that the incarceration system perpetuates amongst those who are poor, people of color, disabled, those struggling with mental illness, or those who fall into more than just one of these categories. Carceral systems cannot keep us safe. Punitive measures and locking people up fail to provide proper mental health treatment, affordable housing, living wage jobs, or increase our safety. The incarceration system is a system of intolerable violence that continues to maintain hegemony at the expense of communities that have always been systematically targeted by the state.

Struggles against oppression are directly connected to the health and well-being of all people. To be a health advocate is to also advocate against racism, patriarchy, transphobia, homophobia, ableism, etc. Our incarceration system is oppressive and an extension of systemic violence within our society. What more evidence will it take to persuade the public of the inherent violence of the prison-industrial complex in the United States? Abolition practices and activism pushes us to consider how we can foster cultures of resistance where safety and community is built in struggle as opposed to relying on the state. The causes for the higher rates of mental health crises, higher rates of incarceration, higher rates of homelessness, and the criminalization of LGBTQ+ communities are all one and the same. I would argue that the hyperincarceration of trans and queer folks, especially those of color, are not symptoms of a broken system. Rather, I would argue that these are the direct outcomes of a system that is functioning the way it was created to. The construction of systems and culture that criminalize queerness is deliberately fabricated and is dependent on racism, patriarchy, classism, and transmisogyny to continue to perpetuate these cycles of violence. A system that has historically and repeatedly functioned to criminalize queerness, mental health struggles, poverty, and being a person of color is a system that cannot be reformed. The incarceration system inflicts intolerable and violent injustices against people of color, queer, low-income, and vulnerable communities.

This community– our community– protects each other. If we want to advocate for the safety, health, and well-being of the Queer community and other marginalized groups, we must seek to dismantle the prison-industrial complex. Healthcare cannot be apolitical. Liberation cannot be achieved without abolition. Seeking liberation, which necessitates health equity for all people, demands critical reimagining of what is possible and thinking expansively about alternative modes of existing, being, and living freely without state-sanctioned violence.

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We Call Mass Incarceration an Epidemic. Let's Treat it like a Disease.

By Joseph Kahn

Illustration by William Sellmayer

Epidemic: *"An increase, often sudden, in the number of cases of a disease above what is normally expected in that population of that area."*[1]

Introduction

The term "epidemic" evokes imagery of field hospitals, masks, and ventilators. It inspires urgency. Epidemics force the government to action, making it issue executive orders, pass legislation, and develop response plans. Funds are expeditiously funneled into vaccines, therapeutics, and medical research. Survival is a powerful motivator for even the most deadlocked of government institutions. However, to the roughly two million individuals directly afflicted by the "epidemic" of mass incarceration and the millions more with an increased risk of entry into the criminal legal system, this urgency is absent.[2] The United States has an incarceration rate that is five times greater than any other country: roughly 716 people per 100,000 people.[3] Compared to other countries, the United States has an incarceration rate drastically above what would be expected, placing America firmly in the middle of an epidemic. To combat mass incarceration, we must treat it like the disease it is and utilize social epidemiology to achieve a more focused and effective intervention for this epidemic.[4] Social epidemiology focuses on mapping social networks to study patterns of disease and can be applied to the case of mass incarceration.[1] Using social epidemiology to inform public health interventions, in conjunction with addressing the most impactful structural sources of mass incarceration, presents the best method of controlling America's carceral epidemic.

Past Failures

Creating new interventions utilizing social epidemiology requires looking at how America has mishandled crime interventions in the past. The standard practices of the American criminal legal system have long hinged on punitive measures and the threat of incarceration as sufficient deterrents to the incidence and transmission of crime. One such example of failure and thus the necessity to implement more epidemiologic interventions is the case of 'broken-windows policing.' Broken-windows policing, formulated by criminologists George Kelling and James Wilson, operates under the assumption that targeting minor crimes such as vandalism or jaywalking improves the appearance of communities and decreases crime.[5] In theory, this recognized the role socioeconomic conditions play in perpetuating crime. In practice, it took physical indicators of poor socioeconomic status, such as "panhandling" or "street-level prostitution," as reasons to increase the police presence through stop-and-frisk policies.[5] Though it correctly recognizes which communities possess the determinants of the disease of incarceration, the intervention did not seek to eliminate the root cause. Instead, it penalized the symptoms: minor crimes of necessity. This exemplifies the absence of a public health approach that targets the core reasons for crime and incarceration. The intervention of expanded policing and stop-and-frisk policies increased the racial disparity in the criminal legal system, as a vast majority of arrests made were of racial minorities.[6] Furthermore, all the consequences of interactions with the criminal legal system, such as diminished job opportunities and voter disenfranchisement, were given greater traction.[7] Punitive measures furthered the epidemic of incarceration and showed the need for an alternative public health approach. Such an alternative approach requires using epidemiological methods to target non-punitive and upstream interventions.

Epidemiological Framework

For an effective social epidemiology intervention, establishing a case definition and a comparison to mass incarceration is necessary. A public health disease framework considers a mixed epidemic to include a common source exposure followed by community transmission. Mass incarceration can be characterized as a mixed epidemic. Consider the 1988 outbreak of shigellosis, a bacterial infection that targets the gastrointestinal system, at a Michigan music festival: over a period of five days, 3,175 people fell ill.[8] The outbreak was eventually traced to a specific dish that was served to festival-goers.[8] In the days following the festival, "Several state health departments detected subsequent generations of Shigella cases propagated by person-to-person transmission from festival attendees."[8] Contact with a source in a mixed epidemic has an impact beyond just the individual: it creates the conditions for others in a community to have similar exposures.

In the case of mass incarceration, the source exposure of this mixed epidemic stems from the legal framework of the US. Sentencing laws, prosecutorial discretion, policing, and many more structural phenomena constitute the source (the dish from the music festival), as exposure to the criminal legal system is the principal mode of entry into the carceral system. Eliminating the exposure would entail legislating structural change to overhaul existing sentencing guidelines, prosecutorial conduct, and police actions. Though eliminating every source for exposure to the criminal legal system is beyond the scope of this piece, considering the most impactful mitigation measures presents an opportunity to considerably weaken the source. If exposure to the source cannot be eliminated, then lowering the 'virulence' is prudent. One such change that could lower the 'virulence' would be abolishing mandatory minimums. Between 1980 and 2010, half of the 222 percent increase in the American prison population was due to increased mandatory minimums, which are required minimum sentences for a specific crime.[9] While alarming, such a large proportion of incarceration being due to a singular cause simplifies the focus of intervention. Mandatory minimums are created by Congress and state legislatures, meaning they are ultimately subject to the will of the people.[10] Like any progressive change, grassroots organizing to draw attention to the injustices of sentencing guidelines must be paired with publicity and political power. Established social movements that focus on issues relating to the criminal legal system, such as Black Lives Matter, should increasingly elevate reforming mandatory minimums to a focal point of their mission. This would increase public awareness of the need for this intervention and limit exposure to one source of mass incarceration.

Community spread, the second component of a mixed epidemic, can be attributed to the vectors by which incarceration affects its communities and creates a positive feedback loop of negative interactions with the criminal legal system. In the shigellosis outbreak, this would be the reproduction and transmission of the bacteria that causes the disease. This framing allows for the utilization of concrete epidemiological processes to resolve these outbreaks of mass incarceration. Epidemiological tools that already exist present new ways to prevent the conditions for crime to arise in communities and concurrently mitigate exposure to the criminal legal system.

Social Epidemiology in Practice:

Social epidemiologists can assess socioeconomic status through welfare dependency and employment, mental illness, past convictions, and drug use. These variables describe the increased risk of incarceration for those facing a shortage of psychiatric and economic resources.[11],[12] This epidemiologic process would start with a coordinated and continuous data collection effort, involving outreach to community leaders and government officials. This would build upon existing institutional connections between universities, health agencies, and local governments. The data collection process will require public records requests under the Access to Public Records Act (APRA). Social epidemiologists and their teams could search arrest records and employment databases, and then link those names with a database of individuals' requested addresses to provide a tool to geographically connect past and present suspected criminal activities and socioeconomic status. Furthermore, the Drug Abuse Warning Network (DAWN), which monitors the "demographic and geographic distribution" of drug-related emergency department visits, should share their data with social epidemiologists to add another important variable to the collected metrics.[13] This dataset could be converted to a GIS (Geographic Information System) map, a software which overlays data inputs with their geographic location. This would provide a hub for public health workers to localize interventions and could be regularly updated and distributed to organizations that work at the community level. Mapping the social networks of those with the most risk factors resorting to crime can help organizations target implementations of further social safety nets, such as vocational opportunities, mental health care, food stamps, Head Start, and safe injection sites. Crucial community efforts such as transition clinics will use this information to better focus their resources, diminishing the incidence of recidivism. Food stamp programs would know which areas need a secure source of food and could target promotion for the program with precision. Safe injection sites could be set up in areas with the most drug-related emergency department visits according to DAWN, lowering the incidence of non-violent drug arrests and drug-related violence. Any social determinant of mass incarceration can be addressed; in practice, this social epidemiology tool functions similarly to the P.C.R. testing for COVID-19. Through regular data collection and updating, this geographic tool can provide the information to facilitate the most efficient public health response in the highest-risk areas. Unlike the American policy of the past, this new method would seek to address the factors that make incarceration propagate, not the propagation of crime, an important distinction.

Limitations

This proposal is not without its drawbacks. Nina Wallerstein, director of the Center for Participatory Health at the University of New Mexico, notes that social epidemiology and community-engaged interventions, as would be necessary to target determinants of incarceration, remain "separated in practice."[14] Informing interventions and informing the creation of those interventions are two distinct entities. Testing for a disease and confirming its prevalence means nothing without a well-funded and evidence-based approach to control it. In the 1988 shigellosis outbreak described earlier, health departments contacted physicians, informing them of the epidemic, the best treatment practices, and the timeline of transmission.[15] Concertgoers were informed and aware of the disease occurring, and thus could seek treatment. Information was used effectively. Effective use of the information provided by the social epidemiologists would require more sophistication than the shigellosis outbreak, but in framing mass incarceration as a disease those physicians can be viewed as the community leaders and public health officials, and the medical treatment they provided can be viewed as the interventions that target social determinants of mass incarceration. However, there must be a larger emphasis on connectivity between public-facing institutions and the academics and epidemiologists providing the information.

The most valid counterargument to using social epidemiology to combat mass incarceration as described in this piece would be concerns about epidemiological tools being used to increase individuals' interactions with the criminal legal system. If a tool is an accurate predictor and mapper of who is most at risk of entering the criminal legal system, then those who do not view incarceration as a treatable disease will want to use it to incarcerate rather than intervene. It could serve as a justification to reinstitute broken-windows policing and stop-and-frisk policies if misused and misinterpreted. If this tool stays in the hands of epidemiologists at universities and health departments, whose primary focus is health and not incarceration, then misuse is not an issue that presents much risk. Additionally, there are concerns about the extent to which certain data can be collected and what information the data may provide. For example, drug-induced Emergency Department visits may not be the most accurate variable to represent overall drug usage or the incidence of potential drug-related crime, but data on drug use may not be publicly available or as well collected as the DAWN data. Furthermore, there are additional variables that could further pinpoint areas of high risk for incarceration, such as incidence of mental health issues and adverse events, that may be protected, and rightly so, under HIPAA. However, the strength of the variables that can be accounted for is sufficient in painting a picture of where interventions should be targeted to curb the spread.

Conclusion

Mass incarceration is a multifaceted phenomenon, with systemic changes needed at all levels, including policy reform, decriminalization of substances, rehabilitation, and many more. However, one of the most impactful methods of decreasing the number of Americans entering the prison system is to improve their material conditions. Social epidemiology presents a tool by which we can alleviate the largest comorbidities of incarceration with surgical precision. An inception of this tool could also spawn a new area of focus in the epidemiologic community and place evidence-based and scientific approaches to curing mass incarceration at the forefront of progressive movements for prison reform and in the minds of governing officials. Additionally, tools of this nature could provide a means for further research into the social determinants of incarceration, which would inform public health and community leaders of increasingly effective ways to address mass incarceration. Rewriting America's role in mass incarceration will not be simple, but framing it as a disease places needed social reform within a practical apparatus for stopping this epidemic.

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Racial Disparities in Urban City Planning: “Environmental Racism”

By Zill Patel

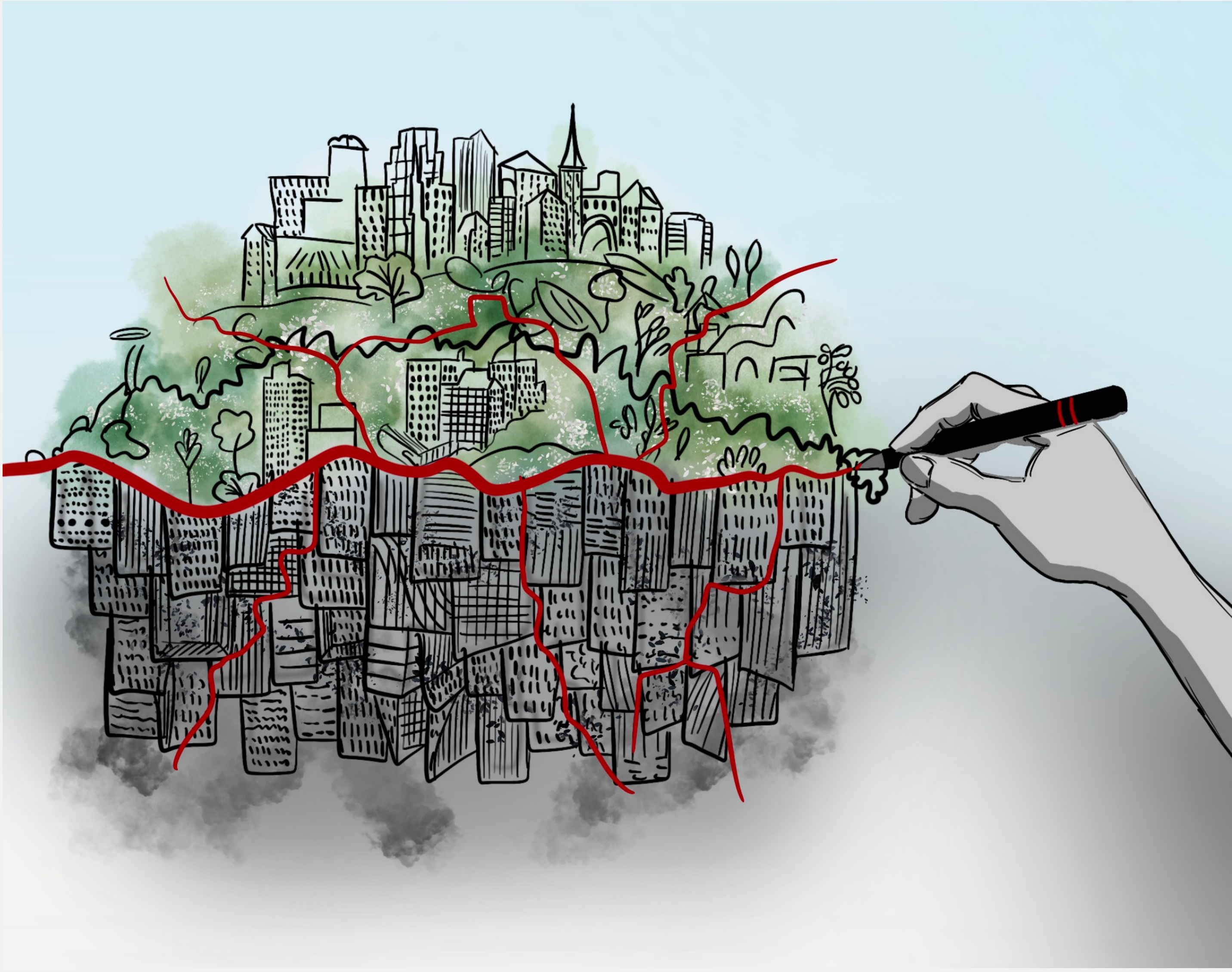

Illustration by Rhea Rasquinha

Introduction

What do Flint, Michigan and Centreville, Illinois have in common? Both are examples of cities with significant proportions of people of color (POC) with major environmental crises that have affected the health of their residents. From the lead poisoning in Flint's water to raw sewage backing up into homes in Centreville, all of these are examples of "environmental racism", a term defined by the intentional placing of polluting and waste facilities in communities that are disproportionately made up of POC.[1] Today, many studies conducted in these areas show that these communities have disproportionately been victims of hazardous pollutants, causing a plethora of health issues. However, the impact of urban planning on these communities does not stop here.

Another term, "geographic racism," has been coined to encompass the observation that individuals who live in low-income neighborhoods (predominantly POC) have minimal access to parks, grocery stores, and other public structures that are key to healthy living. This access issue, in conjunction with the pre-existing issues of a lack of access to healthcare and the environmental racism described above, has caused huge health disparities for these neighborhoods.

Key findings in the fields of environmental racism, urban planning, and climate change will be examined to demonstrate the scope of this issue. This will be followed by demonstrating how the negative health impacts of these systemic issues remain unresolved due to inadequate and unaffordable access to healthcare.

Environmental Racism

Environmental racism has manifested itself in multiple ways across the US, resulting in detrimental effects. Dorceta Taylor, author of *Toxic Communities: Environmental Racism, Industrial Pollution, and Residential Mobility,* states that fines resulting from violations of environmental laws tend to be lower in communities of color, making it cheaper for corporations to pollute in those communities and thus resulting in a disproportional buildup of pollution.[2] These trends have historical implications dating back to the early 1900s, when communities were being redlined and segregated from the white population at the time. While redlining was banned in 1968, the impacts of these housing practices are still felt today.[3]

In a 2001 study that examined whether or not minorities moved into communities with toxic facilities in Los Angeles, researchers found that demographic variables mattered in "future sitings" of treatment, storage, and disposal facilities (TSDFs), leading to the conclusion that "minorities attract TSDFs but TSDFs do not generally attract minorities."[4] This dispels a popular belief : a high correlation between TSDF sites being in locations of minority neighborhoods is because POC were choosing to move to TSDF sites due to the low property value in those areas. The same trends are seen two decades later; in a 2022 study, researchers determined that previously redlined neighborhoods had nearly twice the density of oil and gas wells.[5] These findings add to the already extensive amount of literature that all draw similar conclusions: there is a historical practice of corporations targeting marginalized communities as sites of toxic waste disposal. These practices are rooted in racism and still carry heavy impacts today, especially regarding the health of residents in these communities.

Numerous studies have investigated the association between residing in polluted areas and the increased risk of developing lung disease, cancer, and other ailments.[6] Therefore, it is plausible that individuals in marginalized communities, where the likelihood of exposure to these pollutants is higher, will exhibit higher rates of these diseases. Furthermore, some studies exemplify how living in industrialized areas also negatively impacts mental health. Authors of a 2005 study published in the Journal of Health and Social Behaviour found that due to the negative perception of industrial activity as a health threat or indicator of neighborhood disorder, living in these areas is psychologically harmful.[7] This is also supported by a 2007 study from Social Science Research showing that perceived and objective exposure are significant predictors of both psychical and psychological well-being.[8]

Environmental racism has had long-lasting effects on the structure of American cities today. Historical segregation, decades-long practices of disposing toxic waste near these communities, and the lack of substantial government action to protect residents of these areas leave residents of these areas reeling with negative health repercussions. Without the financial means to move away from these areas, low-income families are stuck in a cycle that prevents them from escaping the hazardous environment that surrounds them.

Systemic Racism in Urban Planning (Geographic Racism)

Low-income neighborhoods face further disparities when there is a lack of access to healthy foods, parks, gyms, and other aspects of a neighborhood that promote good health. There is plenty of recent research that shows neighborhood design plays a big role in the health of its residents, shedding light on the issue that there is an unequal distribution of resources between high- and low-income residential areas. Low-income neighborhoods do not often have a built environment that promotes health which contributes to public health issues like obesity, diabetes, and high blood pressure in low-income areas.[9] In a 2012 study, researchers reviewed literature that found that low-income neighborhoods are offered greater volumes of food sources that promote unhealthy eating such as fast food outlets and convenience stores as opposed to grocery stores where healthy foods can be purchased. The researchers found that the impacts of intentionally poor neighborhood design have led to residents facing substantial challenges in making healthy dietary and exercise choices to maintain healthy body weights.[10]

In a 2014 study, researchers studied the impact of disparities in community recreation facilities and programs in the form of a meta-analysis literature review.[11] While there are inconsistencies in whether or not there are fewer recreational facilities in low-income neighborhoods, all of the study results agree that ratings and usage for these facilities are much lower in low-income neighborhoods. The researchers found that the conditions of facilities and amenities were related to neighborhood income and that the impact of these poor facilities (leading to the theorized perception of unsafety of these facilities) could potentially be the reason for their low use. While there are few details on the lack of recreational facilities (gyms/parks/etc), the conclusion from many of these studies is the same: disparities in recreational activities contribute to inactivity among low-income communities. These disparities can cause generational health issues.[12] Children who live in these areas do not get healthy foods or the physical activity that is crucial to their development. Adults also lack these basic nutritional needs. The vicious cycle of unhealthy eating which is perpetuated by the disproportionate allocation of food sources, accompanied by the lack of promotion for physical exercise is a public health issue that introduces a burden of disease that can be felt for generations.

New Challenges: Climate Change

As climate change has caused global temperatures to rise in the past decades,[13] the structural inequalities present in minority communities continue to be a disadvantage. Some of the impacts are already being observed today.[14] Studies have found that the racist redlining housing practices from the 1930s are linked to neighborhoods having increased temperatures today. In a study of 108 American cities conducted in 2022, researchers found that a vast majority of residents who live in formerly redlined neighborhoods experience significantly hotter temperatures, with some cities experiencing an increase of nearly 13 degrees. This is likely due to the lack of green spaces and increased amount of heat-absorbing concrete/asphalt surfaces in these neighborhoods.[15] As the prevalence of heat waves is increasing, extreme heat will affect these areas much more significantly. Residents of these communities, as stated, are predominantly low-income minority individuals. Currently, there has been a “dramatic [increase] in the rates of emergency calls during dangerous heat waves” and “low-income patients in the city's hot spots visited the hospital more.”[9]

Additionally, climate change will inevitably impact water resources, causing a more downstream impact. Several low-income areas may not have the infrastructure to support the heavier and longer rains contributing to flooding along with rising sea levels, all characteristics of climate change.[16] This will result in these areas being more susceptible to water quality issues since many of them already house toxic pollutants in their air and water.[17]

Climate change only exacerbates the pre-existing issue of poor infrastructure in these communities. As the negative impacts from climate change have already been observed in neighborhoods that were victim to racist housing practices from the 1900s, we will only see these negative impacts increase in the future as temperatures and sea levels continue to rise while little to nothing is being done to resolve the present disparities.

Lack of Accessibility to Health Care

As a result of these systemic issues discussed above, residents of minority and low-income communities often carry a higher burden of disease. Exacerbating this issue, they lack the accessibility to healthcare. A 2013 study found that racial and ethnic compositions of communities affect healthcare utilization, which is caused by the resources that members of these communities lack. They hypothesize that "racial and ethnic composition of zip codes is a proxy for the impact of segregation on the availability of healthcare resources" and that there are trends that predominantly Hispanic neighborhoods have lower availability of healthcare resources compared to predominantly white neighborhoods.[18] This, coupled with the low rates of health insurance, leads to residents not being able to receive the basic healthcare they need. While the creation of free clinics has mitigated some of these negative impacts, barriers to care beyond lack of insurance still prevent individuals from utilizing these resources. Affordable/free healthcare is not enough to ensure attendance at clinics because of barriers of care such as transportation and other unique-to-the-patient barriers in care.[19] Some recommendations to overcome these barriers are taking the burden off of patients and families and coming up with ways that can bring healthcare to the homes of these patients. Overall, there are increased efforts currently to close the bridge of healthcare accessibility but even so, there is no one-size-fits-all solution. There needs to be increased efforts to continue to eliminate these barriers so that individuals in these areas can get the care they need.

Conclusion

These are all systematic issues that have been present for years in the US. Decades of pollution stemming from the use of these areas as disposal sites for toxic waste, coupled with intentionally poor neighborhood design that fails to promote a healthy lifestyle, have had and will continue to impact generations of residents in these areas, especially with the threat of climate change looming. That being said, some governmental policies are attempting to reverse some of the damage done by harmful practices in these neighborhoods. For example, the "Justice40 Initiative" aims to "provide 40 percent of the overall benefits of Federal investments relating to climate change, clean energy, and other areas to disadvantaged communities who are marginalized, underserved, and overburdened by pollution."[20] However, states have been pushing back against several federal initiatives that combat environmental racism and against initiatives that decrease this overbearing burden of pollution for communities of color; some states redefine what counts as discrimination as "decisions by federal funding recipients that systematically harm people of color [could] be fine, as long as there was no explicitly racist intent behind it.[21] Ideologies like this prevent action to improve the quality of life in these communities in several states around the nation.

While these issues are beginning to get addressed at the policy level, there is still a substantial amount of work that needs to be done and several challenges that disrupt the implementation of these issues. In addition to the general climate policy and health policy that the entire nation needs, these predominantly POC neighborhoods targeted by poor urban planning specifically need to be the focal point of these policies to undo the generational damage that was done.

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FDA v. Alliance for Hippocratic Medicine: A Threat to Mifepristone Access and Women’s Reproductive Rights

By Catherine Kawaja

INTRODUCTION

The mifepristone-misoprostol regimen is the most common form of medication abortion in the United States. It is highly effective, often considered easier than surgical abortion, and can be less expensive. Mifepristone, when added to the misoprostol regimen, causes few side effects and increases the efficacy of medication abortion. Mifepristone makes medication abortion a more feasible and desirable option for women.[1] After the Supreme Court held that there is no constitutional right to an abortion in *Dobbs v. Jackson Women’s Health Organization* in 2022, many states have passed abortion bans and restrictions. Mifepristone has become even more essential given the limited access to surgical abortion treatment in the post-*Roe v. Wade* era.

Mifepristone access is currently at risk because Alliance for Hippocratic Medicine (AHM) (an anti-abortion advocate group of medical professionals) is challenging the FDA’s approval of mifepristone. If the Supreme Court decides to take this case, a potential ruling in favor of the plaintiffs could create a massive, negative impact on women’s health and autonomy in the United States. In this paper, I will first examine the rates of use, satisfaction, and complications of mifepristone to understand the public health implications of the *FDA v. Alliance for Hippocratic Medicine* case. I will review the current FDA guidelines for mifepristone and how different state laws impact mifepristone access. I will then consider the progression of the case through the lower courts. Next, I will analyze the AHM’s likelihood of success in the Supreme Court. I will consider how the Supreme Court may perceive AHM’s alleged injury as well as the AHM’s standing and request for preliminary injunctive relief. Finally, I will conclude by addressing policies for improving mifepristone access as it currently stands and actions that could be taken to mitigate the impact of a Supreme Court ruling in favor of the AHM.

A. USE OF MIFEPRISTONE IN THE UNITED STATES

A. 1 Rates of Use

Abortion is a widespread practice in high demand in the United States.[2] Twenty-five percent of women will have an abortion within their lifetime, and 60% of abortions in 2017 occurred before 10 weeks (the maximum gestational period allowed to be eligible for medication abortion).[5] Seventy five percent of women seeking abortion care are poor or low-income, and 60% are women of color.[26] In 2020, 54% of all US abortions were medication abortions.[13] From an international perspective, mifepristone is approved in 60 countries.[13]

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[1] Disclaimer: Although not every person who wants or has an abortion identifies as a “woman,” this is the term I used in this paper to remain consistent with the majority of the studies I found, which for the most part used the terms “women” and “patients” to describe individuals eligible for abortion care.

[2] *Dobbs* has drastically limited abortion access. The majority of the studies discussed in this section are limited because they only examine pre-*Dobbs* use of medication abortion. Many expect *Dobbs* to decrease medication abortion use, but this data has not been adequately collected in the short timeline since the ruling.

A.2 Choosing Medication Abortion

Women choose medication abortion over surgical abortion for a variety of reasons. Some women do not want a procedural intervention, believe medication abortion is safer, and consider it "more natural."[5] Some perceive medication abortion to be more private.[5] Cost also plays a role: medication abortion is often less expensive than surgical abortion. However, patients must weigh the fact that medication abortion is slightly less effective and takes more time than uterine aspiration (surgical abortion).[5] These factors can often overlap in influencing the patient's decision.

A.3 Eligibility for Medication Abortion

The FDA has approved the mifepristone-misoprostol regimen for medication abortion up to 70 days of gestation.[14] The American College of Obstetricians and Gynecologists recommends that clinicians confirm a patient's pregnancy and estimate gestational age when evaluating patients for medication abortion.[5] If patients have regular menstrual cycles, report their last menstrual period within the last 56 days, and show no indications or risk factors for ectopic pregnancy, ACOG advises that clinical or ultrasound examination are not required for a prescription for medication abortion.[5]

Medication abortion is preferable to surgical abortion when patients have specific health conditions.[1] These conditions include uterine fibroids causing significant cervical canal distortions, congenital uterine anomalies, and intoital scarring due to infibulation.[5] Medication abortion is not recommended when patients have certain risk factors, such as ectopic pregnancy or an intrauterine device in place.[5] ACOG indicates that doctors can still prescribe medication abortion to patients with "significant comorbidities," but they will likely require more monitoring.[5] Providers may not prescribe medication abortion when patients seem unwilling or unable to follow the medication abortion instructions, want a faster abortion process, or are unavailable for follow-up.[5]

A.4 Mifepristone Efficacy

Misoprostol can be used on its own for medication abortion, but the combined mifepristone-misoprostol regimen is much more effective. The two trials supporting mifepristone's approval found 97% and 96% of patients respectively had a complete medical abortion taking the regimen in the first seven weeks.[31] More recent data from 2019 found similar complete abortion rates of 95% of women up to 63 days of gestation and 93% at 64-70 days.[21] In contrast, only 78% of women taking misoprostol alone had complete abortions without surgery.[21]

A.5 Medication Abortion Regimen and Follow Up

Patients take 200 mg of mifepristone orally followed by misoprostol taken within 24-48 hours either vaginally (most effective), orally, buccally, or sublingually.[5] The regimen can be taken safely at home. Medication abortion causes heavier bleeding and more severe cramping than menses.[5] Although adverse effects may occur following mifepristone ingestion, they are more common after misoprostol.[5] These include: "nausea (43-66%), vomiting (23-40%), diarrhea (23-35%), headache (13-40%), dizziness (28-39%), and thermoregulatory effects such as fever, warmth, hot flushes, or chills (32-69%)."[5]

ACOG contends that follow-up assessment is unnecessary if patients experience no complications.[5] However, the FDA recommends that patients follow up with their healthcare provider 7-14 days after taking mifepristone.[27] Remote assessment via phone or telehealth appointment can be sufficient. Patients and clinicians are correct 96-99% of the time when they use symptomatology to conclude that medication abortion has been successful.[5] Clinical follow-ups typically use transvaginal ultrasonography to check for the presence of the gestational sac.[5]

A.6 Mifepristone Complications

Medication abortion has a low risk for serious complications. In over 10,000 medication abortions, mifepristone had a 0.3% rate of adverse events and a 0.2% rate of hospitalization for abortion-related reasons.[5] Studies have shown no evidence of association between prior medication abortion and subsequent preterm births.[5] If patients report an incomplete medication abortion or ongoing pregnancy, they can be given a second dose of misoprostol or be treated with uterine aspiration.

A.7 Satisfaction

Most women have positive experiences with medication abortion. Grossman et al. (2021) found that 84.4% of women surveyed were "very (65.4%) or somewhat (19%) satisfied with their medication abortion experience."[14] 67.9% of women reported that they would recommend the mifepristone-misoprostol regimen to friends in similar situations.[14]

B. FDA APPROVAL

B.1 FDA Guidelines

Mifepristone has been subject to more regulation by the FDA than most prescription drugs since its approval in 2000. This scrutiny is especially abnormal given mifepristone's low risk for complications. Originally, mifepristone's FDA approval was predicated on a safety program, which allowed only physicians with the capacity to perform certain abortion and pregnancy-related procedures to offer mifepristone.[31] These physicians were required to be able to diagnose ectopic pregnancies and estimate pregnancy duration. Mifepristone could only be given in-person by clinics, medical offices, and hospitals within the first 7 weeks of gestation.[31] By 2011, mifepristone had an official Risk Evaluation and Mitigation Strategy (REMS) that officially described this safety program.

In 2016, the FDA revised the REMS to extend mifepristone's approved use to 10 weeks.[31] The 2016 revision also altered the required number of in-person visits from three to one and allowed non-physician health care providers licensed by state law "to prescribe and dispense drugs [other than mifepristone], such as nurse practitioners, to prescribe and dispense mifepristone."[20] The 2016 changes also lowered the dosage of mifepristone from 600 mg to 200 mg and removed a prior requirement that mifepristone prescribers had to report non-fatal adverse events. The FDA deemed this requirement unnecessary due to mifepristone's low complication rate and because mifepristone's sponsor could submit annual reports of non-fatal adverse events instead.[20]
In April 2021, the FDA announced that they would not be enforcing the in-person dispensing requirement. The FDA now allows the drug to be dispensed by pharmacies as long as pharmacies and health care providers hold a certification requirement and patients are given counseling.[20] In January 2023, the FDA officially altered the REMS to include this new rule.[27] Under the current REMS, patients are also required to review and sign a Patient Agreement Form.

C. ACCESSIBILITY

C.1 State Restrictions

Mifepristone is difficult to access and even unavailable in many parts of the United States. Since Dobbs, thirteen states (Alabama, Arkansas, Idaho, Kentucky, Louisiana, Mississippi, Missouri, North Dakota, Oklahoma, South Dakota, Tennessee, Texas, and West Virginia) have imposed a "near-total ban on [any form of] abortion."[18] Fifteen states limit access to medication abortion by mandating medication abortion provision by a physician (rather than a non-clinician health provider as allowed by the FDA).[18] Some of these states require patients to take mifepristone in a physician's presence, impose arbitrary gestational age limits, and prevent mailing medication abortion pills to patients.[18]

C.2 Barriers to Access

Women also face geographical, financial, and societal barriers to obtaining medication abortion. In 2018, only 65% of women lived within a 30-minute drive to an abortion-providing facility.[22] This number rose to 89% for a 90 minute drive-time.[22] Since Dobbs, these driving times have likely increased drastically due to the concentrated number of states in the Midwest and Southern United States with abortion bans.[22] Patients are impacted by limited hours of operation of abortion clinics and pharmacy staff and providers' cultural competency.[22] Women struggle to take time off work or find childcare for in-person appointments.[11] Even since the FDA allowed pharmacist-dispensed mifepristone, patients still experience long wait times, inadequate pharmacist knowledge of medications, and failures by pharmacists to dispense all prescribed medications.[4] Costs also prevent women from attending clinical appointments. Transportation to clinics can be a financial burden, and out-of-pocket costs for medication abortion exceed $500.[6] For many women, choosing a medication abortion can mean sacrificing essential needs such as rent, food, and childcare.

Abortion stigma makes it more difficult for women to access medication abortion. Women are often reluctant to ask providers extensive questions about the types of abortion care available to them (or even about abortion care in general).[23] Women seek extensive privacy to ensure that they do not face judgment from their communities. Providers can create barriers by not providing medication abortion or having a negative attitude toward abortion care. Grossman et al. (2019) found that physicians do not provide medication abortion most commonly due to personal beliefs (34%) and practice restrictions (19%).[15] Women also reported negative pharmacist attitudes when acquiring pharmacist-dispensed mifepristone.[14]

D. FDA v. ALLIANCE FOR HIPPOCRATIC MEDICINE

The FDA v. Alliance for Hippocratic Medicine case currently being decided by the Supreme Court is the greatest threat to mifepristone access in the United States today. The AHM, the leading plaintiff, filed their lawsuit against the FDA in federal district court in Amarillo, Texas in November 2022. This district court was an ideal location for the AHM's suit because it has only one judge: the highly conservative Judge Kacsmaryk. The AHM sought preliminary injunctive relief from multiple administrative actions of the FDA. The AHM asked the Court to order the FDA to withdraw or suspend "1) FDA's 2000 Approval and 2019 Approval of mifepristone tablets, 200 mg, thereby removing both from the list of Approved Drugs; 2) FDA's 2016 Changes and 2019 Generic Approval [of mifepristone as Mifeprex]; and 3) FDA's April 12, 2021, Letter and December 16, 2021 [...] concerning the in-person dispensing requirement for mifepristone."[3]

D.1 Alliance for Hippocratic Medicine Argument

The AHM argued that the FDA's approval and subsequent actions violated the Administrative Procedure Act by "overlook[ing] important safety risks."[4] The Administrative Procedure Act gives federal courts the power to "hold unlawful and set aside agency action, findings, and conclusions found to be arbitrary, capricious, an abuse of discretion or otherwise not in accordance with the law."[4] The AHM's alleged injury was specifically related to the impact of mifepristone's complications. When AHM's doctors treat individuals who are experiencing complications from mifepristone, they claim that they are required to take part in the process of either performing or facilitating an abortion. This practice violates their "sincerely held moral beliefs," interferes with the time and resources needed for their other patients, creates "substantial mental and emotional distress," and creates a higher risk for malpractice and insurance costs.[4]

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[4] **On Preliminary Injunctive Relief:** The standard for preliminary injunctive relief requires "1) a substantial likelihood of success on the merits, 2) a substantial threat of irreparable harm, 3) that the threat of injury outweighs any harm than an injunction would cause, and 4) that the public interest is not disserved by an injunction" (*Garcia v. Jones*, 910 F.3d 188, 190 (5th Cir. 2018)).

D.2 District Court Ruling and Subsequent Stay Proceedings

Although Judge Kacsmaryk found that the AHM had standing to file their suit and satisfied all the conditions required for preliminary injunctive relief, he instead issued a stay under §705 of the Administrative Procedure Act. Under §705, the Court can postpone the challenged FDA's mifepristone actions pending judicial review.[3] This ruling blocked the FDA's original approval of mifepristone in 2000.[2] Before the stay went into effect, Judge Kacsmaryk stayed the applicability of his own decision to provide the federal government seven days to seek emergency relief from the Fifth Circuit Court of Appeals. On April 12, 2023, a panel of the Fifth Circuit issued a ruling that reversed the district court's stay of the 2000 approval but reverted mifepristone access to pre-2016 FDA restrictions. However, the Supreme Court issued a stay on the decision pending their own review of the case.

D.3 Fifth Circuit Ruling

In August 2023, after further briefing and oral argument, the Fifth Circuit issued an opinion largely similar to the Fifth Circuit stay panel's decision. The Fifth Circuit found that the AHM had standing to challenge the FDA's actions and had satisfied the requirements for a preliminary injunction on the 2016 and 2021 requirements. The Fifth Circuit thus affirmed the district court's stay of the 2016 Amendments and of the 2021 non-enforcement of the in-person dispensing requirement.

D.4 Current Status

The Supreme Court agreed to review the case on December 13, 2023. Until the Supreme Court issues their decision (expected in summer 2024), Mifepristone remains accessible under current REMS requirements.

E. CONSIDERATIONS FOR POTENTIAL SUPREME COURT RULING

E.1 Likelihood of an Unfavorable Ruling For The FDA

In the post-Dobbs era, many are concerned that there may be no abortion restriction too extreme for the current 6-3 conservative majority on the Supreme Court. The Court's recent prioritization of religious freedoms over other fundamental rights suggests they would be sympathetic to the AHM's claim of moral injury.[5] Even though the Alliance case concerns the Administrative Procedure Act (which makes the case about the Court's review of FDA actions, not abortion), anti-abortion sentiment could influence the Supreme Court's approach to the case in the same way it did the lower courts. Instead of the correct term for the mifepristone-misoprostol regimen (medication abortion), both lower-court opinions used the term "chemical abortion," which ACOG explains is a "biased term" that makes medication abortion seem like a more dangerous procedure.[1] Both rulings also described fetuses as "unborn babies" or "unborn humans" and emphasized how mifepristone "kill[s] the unborn human."[34] This biased characterization of abortion has no place in what should be the Court's "careful" review of agency action under the Administrative Procedure Act.[4] The Court's recent Dobbs opinion was also full of terms such as "abortionist" and "unborn child" that ACOG describes as prejudiced.[10]

E.2 Argument For A Favorable Ruling For The FDA

AHM and Other Associations Lack Standing[6]

AHM and the other associations challenging the FDA lack standing because their risk of future injury is incredibly low and relies on "a series of contingencies."20 Mifepristone's adverse complication rate is 0.3%, and it results in a complete end of pregnancy 96%-97% of the time.[31,5]

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[3] **On Standing:** The AHM's suit first relied on the court ruling in their favor on a key legal standard: standing. Article III of the Constitution's case-or-controversy requirement means that AHM must have standing to sue the FDA. Specifically, the AHM must have a clear injury traceable to the FDA's conduct and redressable by the Court's decision.[4] Furthermore, the AHM needed to prove associational standing to sue on behalf of their members.

[5] As exemplified by Burwell v. Hobby Lobby, 573 U.S. 682 (2014),7 (finding for-profit companies could not comply with the ACA's contraceptive coverage requirement for their employees if it violated the company's religious beliefs), Masterpiece Cakeshop v. Colorado Civil Rights Commission, 138 S. Ct. 1719 (2018),17 (finding "religious and philosophical objections to gay marriage are protected views and in some instances protected forms of expression" by the Free Exercise Clause of the First Amendment), and 303 Creative v. Elenis, 600 U.S. 570 (2023)32 (finding that public accommodations could not be required to comply with anti-discrimination law in their expression if it violated their religious beliefs).

[6] See citation 9 on standing.

The AHM's stated future injury thus assumes that 1) enough women will have a complication to be seen by multiple doctors part of these associations; 2) the women experiencing incomplete abortions will require surgical abortion rather than another dose of misoprostol; 3) the women will go to the emergency room instead of the provider who prescribed the mifepristone; and 4) "despite federal conscience protections," the doctors part of the AHM will be "forced to provide the care rather than referring the woman to a non-objecting doctor."[20] Standing based on a "speculative chain of possibilities" (Clapper v. Amnesty Int'l USA (2013))[8] and "unfettered choices made by independent actors" (Lujan v. Defenders of Wildlife (1992)) 16 has been rejected by the Court.[20] There is also no "substantial risk" of future injury to establish associational standing because only some members of these associations may be injured.[20] Prospective relief cannot be based simply on their stated "past injur[ies]" (Summers v. Earth Island Institute (2009).[25] After more than 23 years of mifepristone use, the Fifth Circuit only cited three doctors who had experienced conscience injuries. The AHM's risk of future injuries is thus speculative at best and insufficient to establish standing.

Furthermore, the FDA did not impose direct injury on the AHM. The FDA's actions do not force emergency room doctors to prescribe the drugs or to take care of patients with post-mifepristone complications.[20] The FDA's changes also do not require patients to take mifepristone or to go to the emergency room if they experience a complication or incomplete abortion.[20] Thus, the AHM also does not have standing because their risk of future harm is not "fairly traceable" to the FDA's mifepristone REMS changes.[20]

Even if the Supreme Court Were To Find That The AHM Has Standing, The AHM Fails to Meet The Requirements for Preliminary Injunctive Relief[7]

The FDA's actions were not "arbitrary and capricious," and thus the AHM is not likely to succeed on the merits.[20] The FDA's changes to their mifepristone REMS were based on extensive data from the US and other countries over more than twenty years. The FDA examined studies that took into account the impact of their proposed changes on an individual basis and grouped together. Mifepristone was shown to be safe in every study. The lower courts' disregard for the FDA's expertise in conducting scientific research and drug trials reflects an overly-activist approach. The Court has recognized that when parties disagree about public health matters, ""courts owe significant deference to the politically accountable entities with the 'background, competence, and expertise to assess public health" (FDA v. American Coll. of Obstetricians & Gynecologists (2021), Roberts concurring).[12] Instead of following this logic, the lower courts ignored the clear facts showing the FDA's careful reasoning for their mifepristone changes. Reverting mifepristone access back to pre-2016 restrictions would create a substantial harm to "the government, mifepristone's sponsors, women seeking medication abortions, and the public" that outweighs the AHM's potential injury.[20] The FDA and drug sponsors would be forced to re-label all mifepristone to pre-2016 conditions, so current "extant" mifepristone could no longer be offered.[20] Women and physicians would be forced to comply with requirements (such as reducing eligibility to 7 weeks and requiring multiple in-person visits) that the FDA has found unnecessary.[20] The "disruptive alteration of the status quo" of the last seven years would not serve the public interest.[20] Instead, the 54% of women who use medication abortion to terminate their pregnancies would experience further barriers to accessing an effective and safe drug.[13]

F. POLICY PROPOSALS TO MITIGATE AN UNFAVORABLE RULING

If the Supreme Court rules in favor of the AHM, Congress could take action to mitigate the reduced access to mifepristone. The Protecting Access to Medication Abortion Act (S. 237 and H.R. 267) would codify the current FDA REMS by mandating that the FDA allow patients to obtain mifepristone from telehealth and certified pharmacies.[29]

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[7] See footnote 10 on preliminary injunctive relief.

The Protecting Reproductive Freedom Act would limit states' authority to restrict the mailing of medication abortion across state lines or to impose requirements for in-person dispensing or prescribing.[24] The Freedom to Decide Act would codify the DOJ's interpretation of the Comstock Act (an archaic law criminalizing mailing of medications used for abortion materials and invoked by the district court in the Alliance case) as not prohibiting the sending of medication abortion when the sender does not know whether the recipient will use the medication abortion regimen unlawfully.[28] Although these proposals all effectively target clear implications of the Alliance case, their biggest problem is their odds of success. Although 69% of Americans believe abortion should be legal in the first trimester (thus encompassing the period of medication abortion eligibility), the intense political polarization in Congress suggests that a bill protecting medication abortion is unlikely to succeed.[30]

Certain states have taken action to protect medication abortion access. State governors in Massachusetts, Washington, and New York requested that their states stock doses of mifepristone to avoid the risk of potential shortages should a ruling disrupt the pharmaceutical industry. California governor Newsom announced plans to buy "up to 2 million doses of misoprostol" to be used in case mifepristone access is restricted.[19] Illinois governor Pritzker announced that the state is offering "providers Medicaid advances for both mifepristone and misoprostol to ensure they have abortion medication."[19]

G. POLICY RECOMMENDATIONS TO IMPROVE CURRENT MIFEPRISTONE ACCESS

Increasing the availability of medication abortion will mitigate women's privacy, cost, and logistical concerns. Ensuring more pharmacies are certified to stock mifepristone and misoprostol is key. 74.3% of women would recommend receiving medication abortion from pharmacies, and 62% would rather have it available at pharmacies through prescriptions by primary care clinics.[14] ACOG and other medical groups have called for the Biden administration to end their pharmacy certification requirement, which would allow all pharmacies to dispense mifepristone like any other drug. Telemedicine is another potential solution. Seymour et al (2022) found that removing all state bans on telemedicine for abortion and expanding telemedicine services would significantly improve abortion accessibility.[22]

H. LEGAL STRATEGY TO CHALLENGE STATE RESTRICTIONS ON MIFEPRISTONE

By limiting mifepristone in a manner inconsistent with the FDA's REMS, states "thwart FDA's mission to promote public health through helping to ensure the availability of safe and effective drugs."[31] Zettler, et al. (2022) explains that courts could find states' authority to regulate medicine does not extend to the "power to regulate medical practice in ways that make compliance with FDA requirements impossible."[31] However, if challenges fail in the courts, they could create a precedent that undermines the FDA's power to regulate mifepristone and other drugs. On the other hand, a successful challenge could have unintended negative implications on states' role in regulating other drugs, such as opioids.

CONCLUSION

Mifepristone is a widely used, highly efficacious, favored, and low-risk drug for medication abortion. A Supreme Court ruling limiting mifepristone would only exacerbate existing disparities in abortion care. Patients will have to resort to misoprostol-only medication abortion, which will cost more (due to more rounds) and be less effective.[9] Women will experience more pain when repeated doses of misoprostol are necessary. Women may have to wait longer to have abortions due to these limitations, leading to riskier second-trimester abortions. The FDA has a strong legal argument against the AHM, and the Court's restriction of access to mifepristone based on the AHM's speculative injury would be unprecedented.

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Hunger After Crisis: Exploring Post-Pandemic Trends in Food Insecurity

By Leeah Chang

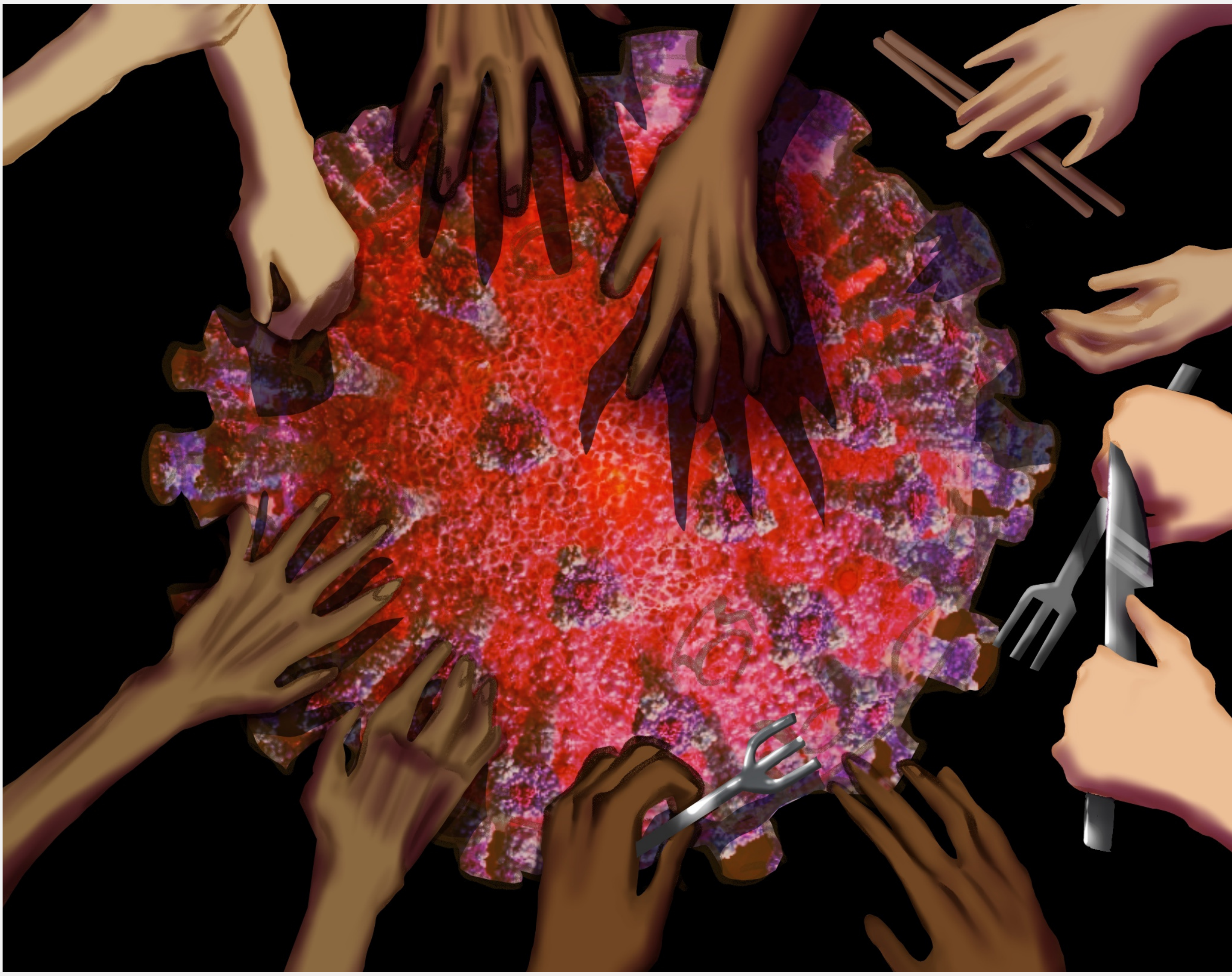

Illustration by Junyue Ma

It is without a doubt that COVID-19 had major socioeconomic and health implications for the nation and the world. One of the pandemic's most prominent effects was on food insecurity, particularly for certain ages and minority populations. Though it is a global problem, the matter of hunger is often an indicator of socioeconomic status in the United States, particularly as it pertains to significant issues such as homelessness and lack of access to healthcare. In this regard, it is becoming increasingly evident that current midstream interventions in America, which focus on broader approaches for only specific vulnerable populations, are not sufficient to meet the various needs of a growing food-insecure population.

Food insecurity is and has been a prevalent and ongoing problem in America as were several other determinants of health at the time. It was drastically increased by the global pandemic with many already-food-insecure households being unable to obtain an income to support consistent food support when the work industry abruptly locked down for the national health crisis. Temporary federal aid in the form of a 15 percent increase in SNAP (Supplemental Nutrition Assistance Program) benefits was extended to said households during this emergency period to provide financial support for obtaining essential nutrition.[1] Many households benefited from the emergency benefits, including 88,000 Rhode Island households.[2] While it may have helped sustain some households at that time, once the increased support was stripped away with federal legislation passed on September 30, 2021, it was incredibly difficult for families to adapt to increasing food and housing costs post-pandemic.[1] Considering the state of Rhode Island, the reduction in food assistance had detrimental effects, with a 32 percent decrease in SNAP benefits to the state at the same time that there was an 11 percent and 14 percent increase in prices of food and housing/rent, respectively.[2] This left families struggling to not only reenter the workforce for income but also keep up with an influx of increased essential living expenses. While it is true that the severity of the COVID-19 pandemic was greater in some areas of the U.S. over others—partially due to larger minority communities in certain states —national data collection via CPS-FSS (or Current Population Survey Food Security Supplement) shows that food insecurity levels were on average 2.12 times what they were prior to 2020. Across the board, food insecurity rates post-pandemic experienced a dramatic increase in every state; the most dramatic changes being found in Georgia and Rhode Island, both of which saw food insecurity rates more than triple.[3] In Rhode Island, the trends of food security indicate that an increase in the percentage of food insecure Rhode Islanders is correlated with nationwide socioeconomic conditions such as the Great Recession in 2008 and more recently in 2020 with the COVID pandemic.[4] The recovery time from a high percentage of food-insecure households to a lower one following the Great Recession was over 4 years, so there is an indication of an eventual decrease in Rhode Island's current elevated food-insecure population.

Furthermore, one of the most common health disparities caused by limited access to food is that the highest percentages of households experiencing food insecurity are Black and Hispanic families. Data from the Rhode Island Community Food Bank in 2023 found that communities of color were still struggling post-pandemic with both financial and health stability.[2] Additionally, of all BIPOC (not White) individuals in the state, almost half of them live in low-income/low-access Rhode Island neighborhoods.[4] This goes to show that not only are minority populations more at-risk for food insecurity, but they are also more likely to have lower quality housing and overall decreased access to grocery stores, schools, green spaces, and likely healthcare establishments. The burden of hunger in Rhode Island falls heavily on the Latino and Black households, with 2023 survey results noting that 51 percent of Latino and 48 percent of Black households were food insecure compared to only 23 percent of White households.[5] Some of these disparities may be rooted in cultural differences, especially seeing as how families of color are more likely to reside in multi-generational households that include grandparents and children. Both age classifications are considered to be dependents with respect to retirement, unemployment, and simply the matter of age; hence, there are varying factors in play that are contributing to a greater burden of food insecurity for these minority families.

Furthermore, a more overlooked health disparity lies in the worsened effects of food insecurity that exist for women, especially mothers—and even more prominently among mothers of color. A cross-sectional study for women via a national survey found that there was approximately a 34 percent increase in perceived food insecurity from July to August 2020 (post-pandemic) compared to pre-pandemic. The study went on to discover a greater odds ratio for Hispanic mothers over non-Hispanic mothers, indicating that even within the subset of women and children, the prevalence of vulnerability to food insecurity was greater for women of color.[6] It is evident that regardless of where women live, they are at high risk of experiencing hunger; while geographic regions of the U.S. may vary in the prevalence of food insecurity, it is a fact that in all these regions, there are food-insecure women. Additionally, this vulnerability was found to present negative health consequences for expecting mothers and mothers in postpartum, especially regarding appropriate nutrition and well-being of newborns.[7],[8]

Proper nutrition is one of the most important determinants of a healthy pregnancy, which ties into both the well-being of the mother and the baby. Thus, food insecurity at any point during pregnancy can expose mothers to an increased risk of pregnancy complications and birth defects.[8] Food insecurity can present itself as simply a lack of access to healthy food, which often results in individuals eating highly processed, low-nutrient foods that are less expensive.[7] This type of diet is incredibly damaging to pregnant women—who are supposed to be consuming a lot of nutrient-dense foods–when this type of eating was coupled with the stress and financial uncertainty brought about by the COVID-19 pandemic. In addition to being at a heightened risk for pregnancy and delivery complications, there were also increased nutritional deficiencies that were found in children born during/or immediately following the pandemic. Then, following childbirth, food-insecure mothers were determined to be less likely to be able to consistently breastfeed during the baby's critical development time, which led to worsened health outcomes from childhood: namely, childhood obesity and/or signs of malnutrition through early adulthood.[9]

Alternatively, one of the most driven national initiatives for combating food insecurity is based on assisting younger individuals, namely kids from impoverished and/or food-insecure living situations. This is commonly known as the "reduced-price or free lunch" system as part of the National School Lunch Program (NSLP) in which school systems across the country adhere to alleviating some of the financial burden that parents face at home to put food on the table. Congress allowed for a continuation of this through the pandemic. Still, the program officially expired in June 2022.[2] For many states, the end of the federal program did not pose a huge dilemma in some states like Massachusetts, in which they increased free meal participation for students under a new state-funded plan.[5] Rhode Island adopted a tiered version, but the problem lies in the fact that with increased inflation of basic necessities but a static federal poverty line, it is becoming more difficult for families to qualify for RI free meals. These families are not financially stable enough to afford school meals but are also not financially unstable enough to participate in the free lunch program; this has led to a sharp 12 percent decrease in the school meal program participation in general since June 2022.[2],[5]

Moreover, the pandemic further aggravated many of the nation's issues regarding supporting individuals who are at higher risk for food insecurity. An integral consideration when crafting and implementing these efforts is the targeted at-risk populations, namely children and seniors on a generalized level. On any scale, the proportion of food-insecure individuals from these two age groups (< 18 years and > 60 years) is highest within any racial/ethnic demographic.[7] While extensive small-scale efforts by various regional organizations have been formed with the central mission of reducing the number of food-insecure individuals and families, hunger remains. Following the pandemic, local food banks have become more specialized in addressing local food insecurity as a part of the national strategy, and most of these establishments are heavily run as non-profits and/or are dependent on community volunteerism.[3] In this regard, the U.S. takes a more gradual approach towards prevention and support efforts across the nation to essentially make each of these local food banks responsible for the households of a certain region as part of Feeding America protocols. In addition, local food banks like the Rhode Island Community Food Bank have become the greatest advocates for increased federal assistance and legal action to support food insecurity in their respective communities and regions.[5]

Relating to efforts being made by food banks, other local stakeholders in food insecurity include government agencies such as Women Infant & Children (WIC) state offices and state-specific Health and Human Services Departments that propose new policies or feeding programs that are tailor-made for at-risk demographic groups whether that be through notable services like Meals on Wheels or lesser-known ones like Backpack Buddy.[10] Additionally, donation programs at child/youth & family services like YMCA or even faith-based organizations are critical for ongoing community support. The issue of food insecurity is not only an issue in and of itself but is also a social determinant of health—in other words, a standard for health equity across various socio-demographic groups.[8] A recent study by Pak et al. (2021) conducted with older adults found that there is an association between food insecurity and allostatic load in terms of how it can lead to more health-related problems and “increased morbidity risk” when it comes to chronic conditions.[11] Furthermore, as noted in the 2023 study on COVID-19 impact by Azevedo et al., there is also a heightened risk of delayed child development and “nutritional deficiencies in mothers and children” caused by food insecurity during pregnancy.[6] The parallels between various age group health risks delineate the unfortunate reality that food insecurity can have detrimental health effects on individuals at any point from birth to death. Thus, it is essential that going forward, policymakers work with not only the local leaders in food insecurity alleviation (in Rhode Island and nationally), but also with local health and hospital systems in order to approach the issue of food insecurity from several upstream regulatory outlooks.

Ultimately, mothers, children, seniors, and minorities are all among the groups that have become increasingly more vulnerable to the negative effects of food insecurity, and the extent of said vulnerability was only further aggravated by the repercussions of the COVID-19 pandemic. National initiatives have commonly been integral for promoting nationwide local efforts. Still, considering new socioeconomic and political issues that arose post-pandemic, the needs of a growing food-insecure population are being unmet. With the most instances of food insecurity being present in single-parent households, households with dependents (children or seniors), and—above all—minority households, there is a clear public health inequity that is affecting appropriate nutrition in various age and social groups, and subsequently is impacting the health and wellbeing of these individuals and families.

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Analyzing Technology-Supported Acceptance and Commitment Therapy for Obesity

By Zoey Dangleman

Technology-Supported Acceptance and Commitment Therapy for Obesity
The obesity epidemic in the United States has become increasingly concerning in recent years. Approximately 34 percent of American adults are obese and with that comes an increased risk for numerous chronic conditions.[1] Current efforts to address this issue include healthy lifestyle changes, behavioral weight loss programs, medication, medical devices, and surgery.[2] However, there has been difficulty in producing and maintaining substantial weight loss with current methods.[1] However, one emerging method that has yielded promising results is Acceptance and Commitment Therapy (ACT).

ACT is a mindfulness-based behavioral therapy that combines experiential exercises and values-guided behavioral interventions in order to “create a rich and meaningful life” while managing the unpleasant private experiences (urges, thoughts, memories, etc) that will inevitably accompany it.[3] This challenges principles of Western psychology, which often attempts to “cure” individuals of such experiences through the pursuit of healthy normality, or the concept that humans are by nature psychologically healthy. ACT instead aims to shift how one perceives these experiences, teaching that they are harmless and transient events. This approach has been successful in achieving symptom reduction, unlike traditional or Western methods that attempt to suppress such symptoms, which actually results in more negative experiences.[4] Other mindfulness-based interventions, like Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT), are manualized treatment protocols that are designed for the treatment of specific symptoms like stress and depression. ACT is more dynamic and can be individualized to the needs and preferences of those being treated. Traditionally, ACT is administered in person and includes group sessions, as well as individual or personal instruction.[3]

As mentioned previously, ACT is effective in addressing obesity, along with other clinical conditions. There have been several systematic reviews that have explored the current findings concerning ACT's effects on weight management, as well as the psychological well-being of obese individuals. Iturbe et al. solely analyzed randomized controlled trials and found that ACT was able to enhance overall psychological well-being through improvements in quality of life and reductions in psychological distress, weight-related stigma, body dissatisfaction, and self-criticism.[5] ACT’s effect on actual weight loss is more limited, with several reviews finding a mixture of results regarding differences in weight between ACT and non-ACT groups.[5],[6] There were inconsistencies in whether the intervention resulted in significant weight loss, both in immediate and long-term follow-up. However, across all studies there was a reduction in weight-related psychological difficulties,[5] which has been shown to be significantly correlated with weight changes.[7] Overall, ACT has been found to be effective in treating psychological aspects of obesity and partially in addressing weight loss. However, more studies are necessary in order to meet Hill’s criteria of strength and consistency for establishing causal inference.

Recently, there have been attempts to explore technology-supported ACT (i.e. ACT delivered either entirely or partially through technology, such as the telephone, internet, or smartphone) to increase the accessibility of the intervention. This has come both as a result of the COVID-19 pandemic, which exacerbated the need for virtual healthcare delivery,[8] and also because the traditional in-person delivery of ACT can be a treatment barrier for those unable to attend weekly clinic appointments. Technology-supported ACT has the potential to be an effective treatment option for the obese as those with chronic health conditions often have difficulty making necessary behavioral modifications,9 struggle with poor overall well-being,[10] and are often limited in terms of mobility and time due to their conditions.[11] This literature review hopes to explore the measures and methods by which technology-supported ACT can influence obesity and its related issues, discuss the strengths and weaknesses of existing studies, and consider potential avenues for future research.

Discussion

There have been several preliminary studies on technology-supported ACT, but the interventions, presented and examined in these studies, have all differed. A pilot study of a web-based intervention that combined intuitive eating and ACT was conducted in a single-arm intervention study measuring eating behavior, psychological flexibility, quality of life, BMI, as well as the usage and acceptability of the intervention.[12] The intervention “Mind, Body, Food” was web-based and included intuitive eating principles[13] and ACT-based skills. Questionnaires were used to collect data on all outcomes besides BMI, which was measured by a trained research assistant. While BMI is commonly used in most studies related to obesity research,[14] it is not necessarily the most reliable measurement as it fails to distinguish between body fat and lean body mass, nor does BMI account for differences in body fat percentages between genders.[15] The questionnaires used (EDE-S for disordered eating, IES-2 for intuitive eating, AAQ-II for ACT, SF-12v2 for quality of life), however, were all reported to have strong reliability and validity. The findings of this study illustrated that it was effective in stopping or preventing binge eating, decreasing psychological inflexibility, and increasing general mental health by the 3-month follow-up. There were no significant changes in BMI, although there was an inverse relationship between changes in intuitive eating and changes in BMI ($r=.43$, $P=.03$). This reflects the findings of another study which determined ACT encouraged intuitive eating by enhancing one's ability to continue with valued activities even through negative private experiences related to weight.[16] This study by Boucher et. al also found an inverse relationship between psychological inflexibility and intuitive eating scores.[12] While this study was strengthened by the fact that it observed mechanisms by which ACT was able to influence obesity – such as through increasing intuitive eating – there were numerous limitations: lack of a comparison group, lack of a long-term follow-up, and a small non-diverse sample (40 females). Future research that explores this program should do so in a randomized-controlled trial RCT with a wider sample size and longer follow-up periods to address Hill’s criteria of consistency and biological gradient for causal inference.

Another pilot study of a different intervention, ACT telephone coaching, compared the intervention to standard behavioral therapy (SBT) in a randomized control trial, examining weight (both scale-reported and self-reported), treatment satisfaction and quality, and mediators of weight loss.[17] The ACT telephone coaching was adapted to have the same number (25) and timing of sessions as the group program, which had previously been found to be an effective intervention for weight loss.[18] A preliminary diary study with interviews was conducted with a sample of 10 to examine the receptivity of this beta intervention, and its findings showed that the ACT exercises were believed to be helpful, specifically with accepting cravings and focusing on values-driven food choices and physical activity. After making minor adjustments based on diary feedback, the primary study of the intervention was conducted. Results from the primary study indicated that ACT was more effective than SBT, with 38 percent of the ACT group experiencing 10 percent or more scale-reported weight loss versus 32 percent at the 12-month outcome (similar differences were also seen at the 3 and 6-month outcomes). Both treatments scored similarly in satisfaction with assigned treatment (90 percent for ACT v. 36 percent for SBT) and perception that assigned treatment was useful for weight loss (96 percent v. 87 percent) although ACT scored slightly higher in both categories. As for mediators, there was a significant effect on valued living in ACT compared to SBT (57 percent v. 35 percent) and the percentage of those who lost 10 percent or more body weight was higher for those above the median in acceptance of food cravings than those below (22 percent v. 18 percent). This aligns with the theoretical model of ACT for weight loss that has been observed in other studies.[18],[19] The results of this study are strengthened by a relatively diverse sample (106 participants from 32 states, 42 percent male, 34 percent minority, 52 percent had some college education or less), and its inclusion of objective measurements such as scale-reported weight. Furthermore, it accounted for confounding variables by time-matching the interventions and double-blinding the study. The reliability of the study is also relatively high as its findings are consistent with prior randomized controlled trials RCTs of in-person ACT. Limitations of this study are consistent with those of most pilot trials, which is a lack of power, as well as a lack of long-term follow-up which would be useful in understanding the impact on weight loss relapse. Future research could include diet and physical activity measures as process data that predict weight loss outcomes. The author of this study, Bricker, is currently working on a study that addresses limitations in a fully powered RCT with a longer-term follow-up.

Despite differences in delivery, the mechanisms by which technology-supported ACT can potentially affect obesity are the same as traditional ACT. A study done by Reijonen et al.[20] analyzed an RCT that compared ACT in-person, ACT via mobile, and a no-intervention control.[21] The rationale behind this study was that the core principles of ACT would influence eating behavior through intuitive eating, cognitive restraint, eating competence, and motivation regulation. Eating behavior was measured using several scales (IES, TFEQ-R18, HTAS, ecSI 2.0, REBS) that have all been validated thoroughly, and food intake and diet were similarly measured using the Index of Diet Quality. Perceived stress was measured with the Perceived Stress Scale, another validated measure. The findings of this study illustrated that the ACT-based interventions were effective in bringing positive changes to eating behavior with reductions in emotional eating and reward-based eating behaviors. These results were more prominent in the face-to-face group than in the mobile group. However, there were no subsequent changes seen in the participants' diet, which led to suggestions for the inclusion of nutrition education in ACT interventions aimed at addressing obesity. Perceived stress has previously been associated with poor eating behaviors,[22] and both ACT interventions improved several features associated with such behavior regardless of baseline stress level. While the ACT in-person intervention consistently performed better than the mobile intervention, that could be because the in-person intervention demands more accountability due to the nature of its delivery. A major strength of this study is that it is solely focused on ACT without the inclusion of other interventions (such as intuitive eating education), allowing for the examination of mechanisms solely associated with ACT. The study also had a relatively long follow-up (9 months) which allows for a greater understanding of the lasting impacts of ACT. The generalizability of the study is limited due to the primary female sample size and the fact that it focused on obese individuals with psychological distress. This study also didn’t measure weight changes, although the outcomes measured are often found in studies on obesity and are associated with weight change. Further studies are necessary to examine the effects of ACT-based skills specifically focused on diet.

Conclusion

Preliminary research has shown promising results for technology-supported ACT in addressing obesity and related behaviors. Many of the studies are in the pilot stages, and there have been none that have examined the same intervention. More fully powered RCTs are necessary in order to establish a consistent association and determine a causal relationship. However, it is important to note that there has been a relatively significant amount of research that has found in-person ACT to be favorable in addressing obesity, and so this paper is simply meant to explore whether such results can be translated to technology-supported ACT. Further studies must be conducted in order to determine which form of technology-supported ACT (telephone, web-based, mobile app, etc) is most effective. These studies should include larger, more diverse sample populations, as well as longer follow-up times and more sophisticated measures of weight. Future research should also focus on which mode is most accessible and cost-effective, as one of the primary drivers for technology-supported ACT is to address gaps in healthcare access.

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Gene Editing for Rare Genetic Diseases: Is An Equitable Future Possible?

By Sai Chamarthi

“The pain I would feel in my body was like being struck by lightning and hit by a freight train all at once,” Victoria Gray remarks.[1] She recounts her experience living with sickle cell disease (SCD) in front of more than 500 leading scientists, policymakers, and enthusiasts at the Third International Summit on Human Genome Editing.

Gray was only three months old when she was diagnosed with SCD, a rare genetic blood disorder characterized by misshapen red blood cells and bouts of extreme pain.[2] The defective cells either prematurely die, causing anemia, or obstruct the bloodstream, preventing oxygen circulation and resulting in painful episodes known as “crises”. Gray has primarily experienced the latter.3

Growing up, this meant that playtime was replaced by doctor visits, school with extended hospital stays, and meaningful life milestones with a blur of constant trauma. But Gray maintained hope and control where she could, getting married and raising four children, pursuing college to fulfill her dreams of becoming a nurse (though she eventually had to drop out due to health limitations), and celebrating life’s small wins.[2]

For patients like Gray, treatment options were limited. She was constantly administered a slew of potent pain medications along with blood transfusions, but these reactive therapies expectedly didn’t resolve the underlying etiology, nor did they provide sufficient long-term symptomatic relief.[4] Until recently, the only available cure–a bone marrow transplant–was solely available from eligible sibling donors. Narratives like this sadly reflect the lives of many with rare diseases.

A Beacon in the Shadows

SCD is just one of approximately 10,000 known rare diseases, which are classified in the United States as conditions that affect fewer than 200,000 individuals.[5] Together, they impact an estimated 25 to 30 million Americans (i.e. 10 percent of the population) and present individuals with a spectrum of functional limitations, oftentimes positioning them on the brink of death.[6] The cumulative economic burden is no less significant, with US healthcare spending on these diseases totaling nearly $966 billion in 2019.[7] Regardless, over 90 percent of rare diseases still lack viable interventions.[7]

Instead, the beacon of hope stems from the fact that almost 80 percent of rare diseases are genetically rooted.[7] Recent advancements in genomic sequencing and gene editing have uniquely ushered in an era of precision medicine that can innovate diagnostics and therapeutics, respectively. By discovering the genetic underpinnings of a specific condition, gene editing technologies such as CRISPR/Cas9 systems can be employed to offer targeted interventions and improve clinical outcomes.

Gray's story is recognized because she was the first SCD patient to be successfully treated with an experimental CRISPR-based therapy called Casgevy. Her red blood cells were extracted, genetically edited in vitro to produce more fetal hemoglobin, and reintroduced into her bloodstream following four days of chemotherapy.[2] It's particularly notable that she volunteered for the clinical trials despite the uncertainties linked with the novel therapeutic. For all she knew, CRISPR could have exacerbated her condition, but even the slight prospect of a painless future was enough to push her to enroll.

Since Gray's success story in 2019, the clinical trials jointly conducted by CRISPR Therapeutics and Vertex Pharmaceuticals have published promising results in more than 75 other patients.[8] In fact, the United Kingdom approved the commercial use of Casgevy in late 2023 for treating sickle-cell disease and beta thalassemia, making it the first CRISPR-based treatment on the market.[9] Other clinical trials are in progress and are projected to follow suit.

Yet with these technological advancements bringing us closer to what was thought to be only possible far in the future, an often forgotten implication lies in equitable access to care. When the disproportionate access to treatment improves the lives of some populations but leaves others to unjustly endure a treatable condition, existing health disparities are amplified along multiple facets. In fact, academics such as Anya Prince, Associate Professor of Law at the University of Iowa College of Law, argue that these novel therapeutics may lead to "dwindling social support and limited resources for patient populations with diseases that can be cured" as society adapts to newer modalities of care.[10] Therefore, conversations must happen to ensure these communities aren't neglected in implementation.

Inclusivity in Research and Distribution

The CDC defines health equity as "the state in which everyone has a fair and just opportunity to attain their highest level of health".[11] Inequities can then be extrapolated as the differentials in acquiring these opportunities.

Namely, one necessary component is ensuring that the research backing CRISPR-related technologies represents its end users. Though millions of Americans collectively cope with rare genetic diseases, the number of people impacted by any one of these conditions is far fewer. As such, diseases with "smaller, more diffuse, or less empowered" patient populations are less prioritized than those with greater public attention and funding.[7]

On the one hand, the commercial viability of solutions to these under-prioritized genetic diseases is questionable, perhaps justifying this observation. For instance, an effective gene therapy called Strimvelis was developed to target a genetic disorder of the immune system, but was eventually pulled from the market due to net financial losses incurred by the distributing company.[12] In these instances, the lack of a sufficient market rationalizes why research for rare diseases may be limited.

On the other hand, such an approach undermines the humanistic component of disease by painting each condition as merely an opportunity to profit. This should not be the standard if minority communities, who generally comprise these under-prioritized populations, are to access these treatments. In Strimvelis' case, a European nonprofit company recently acquired the license to manufacture and market the therapy, highlighting a novel distribution channel that can potentially balance these tradeoffs.[12]

Nonetheless, even for rare genetic diseases that are relatively more prevalent, inherently racist agendas exist and raise concerns of access and efficacy. For one, racial and ethnic minority populations are underrepresented in the genomic sequencing studies that prelude genetic discoveries. One study found that despite more than 76 percent of the world's population residing in Asia or Africa, 72 percent of sequencing is conducted with participants from just three locations: the US, the UK, and Iceland.[13] This incomplete understanding of diverse genetic architectures may impede the accurate detection of disease-causing mutations in underrepresented populations and their subsequent clinical translation into necessary gene editing solutions.

A clear example is the distinction between treatment options in the US for two rare genetic diseases: cystic fibrosis and sickle cell disease treatment. Though SCD is a more prevalent disease, there has only been one FDA-approved drug targeting it since 1996, while cystic fibrosis has had nine.[14] Among these cystic fibrosis therapies, many are more effective in treating Euro-American patients than Hispanic patients, despite the latter experiencing higher mortality rates.[7] Treatment centers for cystic fibrosis also receive greater funding and have more locations throughout the country.[15] The most glaring difference is that cystic fibrosis predominantly impacts white populations, while SCD primarily affects African Americans.

In the case of the SCD-treating therapy Casgevy being the first commercially available CRISPR system, additional concerns are raised with African American patients like Gray being the pilot subjects for medical technologies with significant uncertainties in clinical outcomes. This falls in line with a history of demonstrated exploitation of minority communities in public health research and continued discrimination in treatment access following development (e.g. Tuskegee syphilis study, the case between Havasupai Tribe members and Arizona State University, etc.).[15],[16]

In discovering gene editing solutions, society must pay careful attention to ensure we ethically incorporate marginalized groups back into research and development. When systems are designed to solely address the needs of higher socioeconomic classes who generally exercise greater voice, power, and education, an imbalance of care is created. On the one hand, people who possess enough resources can ameliorate their living conditions. On the other hand, people who are under-resourced will be forced into a lifetime of suffering, despite the possibility of a cure. Ultimately, the question becomes not whether we will create these gene editing therapeutics, but which ones will be prioritized, and who will benefit from these decisions?

Fundamental Cause Theory

In the context of medical technologies, there is a perspective known as fundamental cause theory. It postulates that socioeconomically advantaged communities disproportionately benefit from innovations when compared to disadvantaged communities, causing health inequities to linger in society.[15] This can result from previously raised concerns of inclusivity, but it can also be a consequence of the greater educational and financial resources available to the advantaged populations. Such assets enable them to become early adopters of these technologies and proactively access treatment options without significant hurdles.

Financial Barriers

Cost is one of the critical barriers to care. For instance, Casgevy's commercialization has recently prompted discussions of its market value. Since it potentially offers a one-time cure for SCD, which has a $4-6 million lifetime treatment cost, Casgevy is projected to exceed the price of non-CRISPR gene therapies, raising the concern of health justice.[15] In Gray's case, she was able to access Casgevy due to research funding backing the clinical trials, but this may not have been possible for her outside the context of drug development.

In response, insurance companies have been searching for methods to cover these treatments, but this may not entirely be feasible with current healthcare infrastructure. According to one study, if an SCD therapy like Casgevy were to cost $1 million per patient, it would "cost Medicaid $55 billion or roughly 85 percent of Medicaid's total spending on outpatient drugs in 2017".[17] Even if larger insurance companies and state Medicaid programs developed a way to manage this burden, underserved medical populations, who are either commonly covered by smaller insurance companies or are uninsured, may still be sidelined. This calls for innovative pricing and payment plans to parallel the advances in medical technology innovations.

Additionally, the standard of care is dynamic, and healthcare norms are constantly evolving to accommodate societal changes. For instance, cardiac pacemakers have become a steady option of care for cardiac maladies nowadays despite their cost, so it is possible that gene editing solutions will follow suit.[18] Regardless, this demonstrates an example of longer-term stabilization, and economic disparities must still be accounted for in early implementation stages.

Geographic Barriers

Rare genetic diseases also oftentimes go undiagnosed or misdiagnosed for long periods of time, which, in turn, delays the correct treatment. This is even more common in hospitals in low-income neighborhoods where personnel are less likely to have the specialized disease expertise to accurately diagnose, meaning drugs and treatments may be inaccurately prescribed to patients.[6]

Even in instances where a diagnosis is possible, newer treatments follow a trickle-down schema, meaning healthcare centers in wealthier areas will gain access to them before those in poorer areas.[19] This can be partially attributed to the differences between the workforces in these locations. For treatments such as gene editing, proper infrastructure and special training are required for the procedures.[20] Therefore, patients from locations where gene editing is introduced later may find themselves spending more money on traveling to other locations or simply being left untreated during the initial stages of the technology rollout.

Another aspect that's commonly ignored is the environmental contributions to disease manifestation, which are heavily shaped by one's place of residence. A prime example lies with those who may be genetically predisposed to skin cancer.[13] Their risk of contracting the disease is significantly greater if they live in areas with greater sunlight exposure, so it is difficult to conceive of how a technology as precise as CRISPR could tackle such a variable phenomenon.

For point mutations like those that cause SCD, the etiology is heavily based on genetics, contributing to its early success.[15] But for others where the environment plays a bigger role, the answer may lie in greater representation of genomic sequencing to more comprehensively identify positions of mutations. Not only does this mean more representation in terms of racial and ethnic minority groups, but also geographically with rural and low-income communities, and with regard to various age groups.

Final Thoughts

In the end, if healthcare is not representative of or is withheld from these communities, existing disparities will further generate what Jennifer Doudna, one of the co-founders of CRISPR, calls the "gene gap," where only certain groups can access this "boutique technology".[21] Therefore, as meaningful narratives like Gray's are considered, this is a gentle reminder that though dismantling systemic health inequities may be a Herculean task, micro-level avenues for advocacy exist to work towards ensuring medical innovations don't leave anyone behind.

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Mindfulness Training as a Tool to Combat Acute-to-Chronic Pain Transition in Predisposed Populations

By Alexis Peetz Alio

Illustration by Mena Kassa

Abstract

The transition from acute to chronic pain involves changes in neural circuits associated with learning and emotion. This study explores the potential of mindfulness training as a preventive measure to combat the acute-to-chronic pain transition in predisposed populations. Longitudinal studies have uniquely revealed the predictive power of functional connectivity within specialized circuits that incorporate the medial prefrontal cortex (mPFC), nucleus accumbens (NAc), amygdala, and anterior cingulate cortex (ACC) in the persistence of pain. Stress mechanisms driven by cortisol also play a significant role in pain perception and hypersensitization linked to chronic pain. Mindfulness training, which aims to promote non-reactive and non-judgmental awareness of the present moment, has been shown to produce promising therapeutic effects in managing chronic pain. Studies have demonstrated changes in key limbic and prefrontal regions following such practices. Meditating has also been associated with reduced pain unpleasantness, low anticipatory cortisol reactivity, and increased connectivity between emotion-regulating and sensory-related brain areas, such as the dlPFC and NAc. While mindfulness interventions have been studied extensively in the context of chronic pain management, their potential as a preventative measure remains largely unexplored. This review summarizes the therapeutic effects of mindfulness training on the neural mechanisms involved in the transition from acute to chronic pain. It aims to provide a framework to encourage future clinical trials to consider novel approaches to combat the chronic pain epidemic.

Key words: Chronic pain, Acute-to-chronic pain transition, Mindfulness, Meditation, Medial prefrontal cortex, Nucleus Accumbens, Anterior cingulate cortex, Cortisol reactivity

Conflict of Interest declaration: The author declares that they have NO affiliations with or involvement in any organization or entity with any financial interest in the subject matter or materials discussed in this manuscript.

Introduction

Chronic pain is an extremely prevalent condition among adults worldwide; however, owing to its complex nature, its underlying mechanisms are not fully understood. Pain-related disabilities can manifest in different ways. More than 8 percent of US adults suffer from chronic back pain, while tension-type headaches affect approximately 1 to 3 percent of adults on the basis of more than 15 days out of every month.[1],[2] Serious injuries, illness, or surgical operations can often lead to lifelong suffering, with 5 to 10 percent of patients exhibiting acute back pain progressing to a chronic state.[3] The body can become hypersensitized as a result of repetitive or traumatic pain through a protective process called central sensitization. This occurs when excitability is increased or inhibitory influences are suppressed in peripheral and dorsal horn neurons through a combination of intracellular changes involving calcium concentration and NMDA receptor trafficking. These changes can become pathological as a result of transcription-related modifications when a pain-eliciting stimulus or reactive inflammation persists.[4] Interestingly, it has been shown that higher-level perceptual functions and emotions associated with activity in the brain are also highly involved in modulating our experience of pain; even the chronification of pain seems to be linked to changes in mental states and neuropsychological factors, rewiring the brain to further exacerbate a person's perception of painful and non painful stimuli.[5] Patients suffering from long-term headaches, arthritis, back pain, and other related conditions have begun to turn to cognitive therapy and mindfulness-meditation-based regimens to manage their symptoms. These practices are now widely implemented in parallel with medications and lifestyle changes with extremely positive outcomes, backed by a growing pool of literature emphasizing the beneficial effects of meditation on brain regions associated with emotion, perception, learning, and addiction. Treatment options for chronic pain are still limited, however, to short-term solutions – such as pills, operations, and therapy – while actual cures are rare, unless the specific cause can be pinpointed and addressed.[6] The next step would be to consider the implementation of preemptive treatments. As an alternative to symptom management, a focus on prevention might provide an effective solution to deal with the chronic pain epidemic.

Current studies suggest that in contrast to acute pain, which occurs at the level of somatosensory pathways, persistent abnormal pain processes disproportionately engage reward evaluation and stress pathways associated with emotion and learning in the central nervous system. Inherent measurable differences in these neural circuits may represent risk factors involved in the transition from acute to chronic pain. Mindfulness meditation, which is widely studied for its profound therapeutic influence across the brain and body, targets some of these preliminary elements of chronic pain and thus may prove to be a useful clinical tool in pathologically predisposed populations.

Neural Mechanisms Underlying the Predictive Nature of Chronic Pain

The mPFC-NAc pathway has recently been recognized as a dominant predictor and amplifier of chronic pain. The medial prefrontal cortex (mPFC) is important for context-dependent memory formation and emotion-driven self-reflection.[7],[8] Various other neural systems work in conjunction with this region to invoke meta-processing of both internal and external inputs. The nucleus accumbens (NAc) is a major component of the reward system of the brain and is responsible for modulating dopamine secretion; it contains cells that bind various neurotransmitters including endogenous opiates.[9] This ‘pleasure center’ of the brain evaluates a wide range of inputs to reinforce learning; in turn, the mPFC generates perceptual and emotional feedback and relays this information to memory centers to assign lingering qualities to future analogous inputs. Synchronized activity in these regions has been observed during spontaneous pain spurs in patients with chronic back pain, implying that the chronification of pain may stem from emotional or reflexive processes.[7] One of the pioneering MRI experiments profiling the transition from acute to chronic pain tracked temporal changes in the brains of patients following a short-term episode of subacute back pain. This study, published by Baliki et al. (2012), was the first to reveal that subjects with greater initial mPFC-NAc functional connectivity were more likely to develop chronic symptoms. Compared to those who returned to a healthy state, subjects who fell into the ‘persisting’ group exhibited stronger functional connectivity in their initial scan, which was administered within 13 weeks of the onset of their symptoms, and in their final scan, which occurred approximately one year later. Functional imaging results from the first trial predicted the probability of self-reported pain persistence at the final visit with 83 percent accuracy. Pain persistence was also characterized by progressive decreases in gray matter density in both the NAc and insula across the 4-scan period.[10] These findings have major implications for chronic pain research, establishing the first significant biomarker with high predictive power, and presenting a stronger and more up-to-date mechanistic model of its functional origins: the role of corticostriatal neurons could suggest that chronic pain is learned, and the involvement of limbic circuitry may render this type of pain more emotional.[7]

This model incorporates a number of prefrontal and limbic systems, which together modulate and distort the suffering of noxious experiences. A subsequent longitudinal study conducted in 2016 by Vachon-Presseau et al. expanded upon previous results by following a similar procedure conducted over three years. Reduced amygdala volume was implicated as a risk factor, along with increased white matter volume and functional connectivity within a specialized circuit incorporating the dorsal medial PFC, NAc, and amygdala.[11] The amygdala is central to the aforementioned model; it plays a role in emotion and stress, potentially amplifying the negative evaluation of pain within this circuit. Three more important limbic structures are present: the hippocampus, insula, and anterior cingulate cortex (ACC). The ACC is directly involved in pain, emotional evaluation, and attention.[12] A recent investigation used patients following traumatic injury as a result of motor vehicle injury to assess the predictive power of the dorsolateral segment of the ACC. The dACC, which also communicates strongly with the mPFC, is considered to be a type of ‘neural alarm system’, encoding distress in both physical and social domains.[13],[14] Along with the insular cortex, it jointly commands the salience network of the brain, which directs attention to behaviorally relevant stimuli.[15] The study concluded that dACC functional connectivity predicted long-term pain symptoms in 11 patients. Pain lasting beyond six months was most strongly predicted by weakened connectivity between the dACC and the precuneus – a part of the DMN that operates conjunctively with the mPFC and is highly involved in the individual subjective awareness of pain.[16] The findings provide support for the previously specified framework underlying the systemic precursors of chronic pain, although the small sample size may warrant replication. Further insight into this neural model of chronic pain can help establish targets for intervention in at-risk patients.

Cortisol Reactivity and Stress Mechanisms

Cortisol-driven stress mechanisms have also been shown to be highly involved in abnormal pain perception and hypersensitization, and contribute to unique predictive neuropathological pain models. In addition to mediating functional neuroplastic changes in corticolimbic circuitry associated with pathological pain, cortisol reactivity plays a role in anticipatory sensitization mechanisms linked to chronic stress and chronic pain.[17] Turan et al. found that the initial cortisol response to a stimulus predicts progressive anticipatory sensitization in women. Larger cortisol responses (>.8 mg/mL) to an initial stressor were correlated with increasingly elevated cortisol levels before subsequent exposures. A smaller initial cortisol reactivity (< .77 mg/mL) preceded a negative trend in cortisol reactivity.[18] Anticipatory stress and cortisol responses can also warp the perception and evaluation of pain stimuli; for example, both cortisol levels and subjective pain ratings intensify during the anticipation and active experience of uncontrollable electric shocks.[19],[20] This knowledge supports the fear-avoidance model of pain, which suggests that worsening or persisting pain symptoms develop through learned negative associations between pain and its context.[21],[22] A similar effect can be achieved via central sensitization, which may also play a role in chronic pain; however, its link to chronic pain is less understood. The upregulation of brain-derived neurotrophic factor by cortisol simultaneously contributes to the formation of a fear-based memory associated with pain while enhancing long-term potentiation of pain sensitivity mediated by the central nervous system, which becomes sensitized and easily activated, and manifests as chronic pain.[23] Reducing stress levels and suppressing cortisol release during episodes of acute pain may decrease the sensitivity of the central nervous system to pain signals. This, in turn, may help to prevent the progression of acute to chronic pain. Taken together, these findings highlight the specialized role of hormonal stress factors in facilitating learning, negative evaluation, and sensitization in the context of chronic pain development.

The current understanding primarily implicates emotional processes rather than sensory mechanisms in the pathogenesis of chronic pain. According to Vachon-Presseau and his colleagues, the strongest predictor and amplifier is what they call the ‘emotional brain’ – namely, the corticolimbic system.[24] The classical viewpoint suggests that central sensitization due to peripheral injury is the main factor that contributes to the development of chronic pain.[25] A decade-old study titled OPPERA sought to reevaluate this hypothesis. This study followed thousands of healthy subjects for five years to track the development of first-onset persistent temporomandibular pain disorder (TMD). The results of psychophysical assessments contradicted the central sensitization hypothesis, as the authors found that pre-existing pressure pain thresholds poorly predicted the incidence of TMD.[26] Similar findings were also observed in studies on chronic tension-type headaches, low back pain, and widespread pain.[24] This suggests that the predictability of chronic pain based on brain parameters differs significantly from that of peripheral sensitivity. The underlying nature of chronic pain lies predominantly in perceptual factors arising from the mental catastrophization of noxious experiences.[27] The learned aspects of chronic pain are heavily influenced by fear and other emotions. Consequently, chronic pain can most effectively be understood as a learned disruption in the subjective perception of pain over time. This is evident through the impact of reflexive, emotional processing in the mPFC and dACC, as well as the evaluative and anticipatory engagement of the NAc and cortisol.

Mindfulness as a Preventative Measure

Mindfulness practice has become a trending topic in chronic pain research, but its potential as a preventative measure remains unexplored. Mindfulness, defined as non-reactive and non-judgmental awareness of the present moment, plays a crucial role in preventing the escalation of negative emotional reactions and judgments of pain.[28],[29],[30] Further insight into the therapeutic effects of meditation on neural mechanisms specifically relevant to the transition from acute to chronic pain presents an alternative solution to existing treatments for chronic pain, which tend to be costly and ineffective. Several studies have noted significant changes in key limbic and prefrontal regions as a result of short-term meditative practice. Just four 20-minute sessions of Samatha meditation mitigated mPFC response while bolstering ACC activity during pain.[31] Increased pain-related ACC activation might be reflected in the predictive dACC – precuneus pathway. Multiple large-scale studies indicate that meditation and dispositional mindfulness are both negatively associated with amygdala volume, a feature noted in the findings of Vachon-Presseau as a positive predictor of chronic pain.[11],[32],[33] A recently published, non-reviewed paper revealed that after a brief savoring meditation program, a significant increase in activation in the right NAc and deactivation in the right dlPFC were observed as a result of thermal stimulation during active meditation.[34] The functional distinction between the dlPFC and the neighboring mPFC is still debated, although it is clear that the two are extremely interconnected and tend to function in unison.[35] Inhibition of the dlPFC may reflect reduced emotional elaboration of the pain, while increased NAc recruitment during pain suggests an enhanced sensory experience perhaps through improved attention towards the stimulus itself. This aligns with findings that experienced meditators often report reduced unpleasantness, but not intensity, of pain.[36] Increased connectivity between these two regions was also observed in participants who were asked to complete two weeks of at-home compassion-meditation training.[37] Considering that a similar effect in the mPFC-NAc pathway has been shown to predict the persistence of pain, it would seem that enhanced functional connectivity within such a closely related network could likewise contribute to an increased predisposition to chronic pain. However, an alternative interpretation emerges when examining the distinction between the roles of the dlPFC and the mPFC in emotional processing. A recent study found that while the mPFC is involved in the arousal aspect of emotional stimuli, the dlPFC is important for balancing the value of emotions.[35] While these two processes are certainly interwoven, it is worth considering that the mPFC may indiscriminately amplify pain signals with emotional valence, while improved dlPFC connectivity might correspond to an increased ability to manage the emotion associated with pain. Although the implications of some of these results vary by interpretation, they ultimately lend promise to the efficacy of short-term mindfulness training as a prescribed intervention method for use in clinical pain management.

Analysis of long-term changes in pain-related circuits found in experienced meditators proved to be more complicated. Overall, meditation seemed to affect activation and improve cortical thickness in the ACC and mPFC.[38],[39] Baseline activity in the amygdala and in the anterior midcingulate cortex (aMCC)–a region hosting the dACC–was negatively correlated with experience.[40] During noxious stimulation, meditators show decoupling between the dACC and insular regions along with increased activation in the aMCC.[40],[41] Enhanced activity in the thalamus and insula and reduced activation in the mPFC and OFC are associated with lower reported pain.[42] Individuals who scored higher on the Five Facet Mindfulness Questionnaire also exhibited increased pain thresholds explained by weaker connectivity between the central nodes of the default mode network – which include the mPFC, precuneus, and posterior parietal cortex – and stronger connectivity between the precuneus and somatosensory cortices.[42] The majority of these findings were observed during a non-meditative state, indicating that long-term meditation training leads to sustained alterations in the subjective assessment of pain. However, conflicting evidence impedes the certainty of whether long-term meditation can reduce the risk of chronic pain. Though some improvements include a reduction in pain-related activation within the mPFC and decreased connectivity within the DMN, there is an observed elevation in baseline cortical density and activity in the mPFC. Reduced baseline activity in the dACC and amygdala are both implicated in the transition to chronic pain, and the simultaneous decoupling between the dACC and insula along with increased aMCC activity during pain further complicates previous conclusions. The literature on the neuroanatomy of long-term practitioners thus seems to contradict many of the potentially prescribable benefits of short-term mindfulness training.

The stress mechanisms underlying acquired fear of chronic pain are distinctly influenced by mindfulness-based interventions. Chronic pain is thought to be conditioned by fear, which is partially mediated through anticipatory sensitization. Turan et al. demonstrated that initial cortisol reactivity strongly predicted long-term trends in anticipatory cortisol levels in a series of stress-inducing tasks dispersed across several months. Higher initial pre-stressor cortisol values were correlated with significant progressive increases in pre-stressor cortisol values in controls compared to controls with low pre-stressor cortisol levels. Meditation and emotional skills training seemed to mitigate this effect in the second phase of this study. Between the first and second trials, subjects in the meditation group received 42 hours of training supplemented by optional at-home practice. The third trial took place five months after the training was completed. Subjects who displayed high anticipatory cortisol reactivity pre-meditation showed only marginal, non-significant increases across sessions, similar to the meditators with low pre-stressor cortisol. No initial differences were observed in pre-stressor or peak cortisol levels at Session 1 between the control and training groups.[18] A reduction in baseline salivary cortisol at rest was also observed following a four-week regiment of transcendental meditation.[44] These two lines of evidence demonstrate the potential implications of meditation on cortisol-related negative pain appraisal, as well as on the sensitization and chronification of pain.[44],[45] Moreover, these outcomes support the notion that mindfulness practice can inhibit the emotional learning effect of stress and aligns with research indicating that inadequate top-down inhibition contributes to the development of chronic pain, whereas enhancing inhibition protects against it.[46],[47] Stress and learning in the context of pain may thus be regulated by proper cognitive training.

Discussion

Given the novelty of this field, little research has provided a concrete understanding of the precursors and potential solutions for chronic pain development. Despite these limitations, the findings suggest that inhibition of cortisol-based fear conditioning as well as reduced activity in the medial prefrontal cortex as a result of meditative practice may contribute to a less negative appraisal of pain, thereby mitigating pathogenesis. Due to a lack of work specifically pertaining to the effects of meditation on the established predictive neurocircuitry, no direct link was found between meditation and functional connectivity in the dACC-precuneus or mPFC-NAc pathways. This evidence supports the need for further research to investigate the longitudinal effects of mindfulness training in preventing chronic pain and to better understand its underlying mechanisms. It is crucial to determine the exact timing of transition to chronic pain. As advances in medicine aim to enhance population immunity through vaccine design, the well-being and physical health of the broader population could be significantly improved through the implementation of mindfulness-based interventions. Thus, further research should target the direct neural effects of mindfulness-based interventions in clinically at-risk populations to establish a connection between meditation and the persistence of pain. By shedding light on newly emerged biological markers of chronic pain within the context of meditation, this review seeks to encourage continued investigation into the potential benefits of mindfulness in preventing the development of chronic pain.

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Unlocking Access: The Impact and Implications of Methadone Take-Home Policy Changes during the COVID-19 Pandemic

By Alison Lu

More than 400,000 people with opioid use disorders (OUD) receive effective methadone treatment (MT). However, federal regulations of methadone take-home flexibilities have always been incredibly strict, requiring patients to engage in daily in-person MT for at least one or two years to receive up to 14 methadone take-home doses (MTHD) or 28 MTHD, respectively.[1] This restriction proved to be a significant inconvenience and time barrier that prevented people who use drugs (PWUD) from being able to access and engage in MT for a long time. Research showed that before the COVID-19 pandemic, retention in MT was low, with national estimates placing the retention rate at less than 50% six months after treatment initiation.[1] However, the COVID-19 pandemic led to policies that reduced virus transmission and promoted social distancing. This initiated a shift from in-person visits to virtual ones and decreased the restrictions on take-home flexibilities.[1] On March 16, 2020, the Substance Abuse and Mental Health Services Administration (SAMHSA) issued guidelines that allowed states to request an exception to the previously stringent requirements regarding methadone take-home privileges, which 34 states did.[3] This exception allowed "stable" patients in those states to receive up to 28 days of MTHD and "less stable" patients to receive up to 14 days of MTHD automatically.[2] Instead of take-home eligibility being determined by federal guidelines of how long a patient had been in treatment, the opioid treatment program (OTP) was allowed to make stability determinations based on patients' urine toxicology screening results and appointment adherence. This allowed many PWUD to receive more MTHD faster.[1] The policy change also allowed PWUD to continue MT without risking exposure to COVID-19. Moreover, the policy had extra benefits for PWUD, increasing the effectiveness it had in maintaining MT engagement among PWUD during the height of the pandemic. However, this policy change is not permanent, as it has only been extended one year after the COVID-19 public health emergency officially ended, meaning that the policy change will expire by May 11, 2024, unless extended.[3] SAMHSA has not announced whether they will make this policy change permanent, despite an extensive number of research studies demonstrating the effectiveness of this policy change.

In addition to being successful at reducing COVID-19 transmission among patients, making MTHD more accessible had many positive benefits for the patients. Several extensive research studies have demonstrated the benefits that this policy change has brought for PWUD. A study conducted in Nashville, Tennessee aiming to describe PWUD's experiences with the MTHD policy change found that 94.1% of the patients prefer having MTHD over daily in-person visits, and 91.2% cited that MTHD has had a positive effect on their quality of life.[4] This was due to the alleviation of prior inconveniences that daily in-person visits had on patients' abilities to hold a job, find childcare, or commute if the OTP was too far. As such, the methadone take-home flexibilities introduced by the policy change during COVID-19 have had a significant positive impact on reducing barriers to MT adherence and retention, allowing patients to engage with

MT, reduce their use of illicit opioids, and maintain a good quality of life. These statistics demonstrate the significant preference that patients have for this policy change and the effectiveness it has on improving their quality of life because they no longer have to schedule their lives around treatment. It also allows PWUD to have the autonomy to choose when in the day to take their MTHD.[4] Another study in Connecticut looking at the number of methadone-involved overdose fatalities from April to August 2020 after the policy change to the same period in the years 2015 to2019 before the policy change found that there was no significant increase in methadone-involved overdose fatalities or severity in methadone poisoning exposure.[5] This demonstrates that increased take-home doses do not lead to increased methadone-involved doses and suggests that patients can be responsible with their daily MTHD even though they are at home and not under the supervision of OTP staff. Even some OTP directors were pleasantly surprised by the level of responsibility that patients showed regarding their methadone take-homes with a study reporting that 64% of staff members expressed a positive view towards methadone take-home flexibilities.[6] Interviews with OTP directors reported that the majority of patients were doing very well with their MTHD with one respondent saying "Patients we never would have put on once a month…have done really well with this."[6] Similar sentiments were expressed by other OTP staff members around the US interviewed, who emphasized the effectiveness that this policy change has had in allowing patients to receive more MTHD earlier than the previous SAMHSA federal regulations would have allowed.

Moreover, one of the main reasons for the strict MTHD policies before COVID-19 was the fear of PWUD diverting their methadone and methadone-related overdoses. However, several studies have been conducted since show that in the time that the MTHD policy has been changed, there has been minimal diversion of methadone and no increases in methadone-related overdoses.[7] For example, one study focusing on OTP in North Carolina found that only 7% of participants reported diverting their methadone doses.[8] The small percentage of PWUD who are diverting their methadone is relatively insignificant, challenging the notion that PWUD cannot be trusted with their MTHD. The percentage of PWUD diverting their methadone is minimal and has not significantly changed since before the methadone-take-home policy change. Another study looking at the change in methadone-involved overdose deaths before and after COVID-19 found that they remained stable with the percentage of methadone-involved overdose deaths actually declining from 4.5% in January 2019 to 3.2% in August 2021.[9] This underscores the positive impact that the methadone take-home policy change had on PWUD and refutes the notion that increased deaths involving methadone would occur because of the policy change. The exact opposite happened with methadone-involved deaths decreasing, suggesting that this policy is beneficial in many different factors beyond improved quality of life for PWUD, and should be permanent.

Despite the extensive research conducted focusing on the benefits that the methadone take-home policy change has had on PWUD's lives in terms of their MT, there is a significant lack of research regarding the quality of telehealth during the pandemic and potential interventions to reduce barriers that PWUD experienced when accessing telehealth services. OTPs not only provide patients with MTHD but also psychosocial counseling that is crucial to helping PWUD recover. SAMHSA's policy change expanded both MTHD flexibility and telehealth services to continue counseling for PWUD, though research primarily focused on MTHD.[3] Though there have been studies demonstrating the many barriers to telehealth implementation on the patient side (e.g., lack of internet access, data, or even a smartphone) and on the OTP side (e.g.,s lack of infrastructure and issues with HIPAA compliance on some telehealth platforms), few studies have been conducted to find innovative solutions to these barriers to improve the access to and quality of telehealth counseling.[10] Studies aiming to understand the utilization of OTP telehealth counseling among PWUD during the pandemic have identified the lack of research on possible solutions to address these barriers as a limitation and researchers have called for further research on implementing telehealth services after the methadone take-home policy change.[10] This lack of research regarding potential solutions to the barriers underscores the importance of continuing research to understand the effectiveness of the methadone take-home policy change beyond the MTHD benefits and address the already established barriers to telehealth implementation to ensure that PWUD has access to quality telehealth counseling services.

The benefits of this policy change allowing for methadone take-home flexibilities has had significant positive impacts on PWUD in general but it has had an exceptionally positive impact on PWUD who live in rural or remote areas. Even before the pandemic hit, extensive research indicated that geographical distance to OTPs negatively impacted PWUD's ability to engage in MT. One study found that only 4% of OTPs are located in rural areas.[11] Another research study from before the COVID-19 pandemic found that in the US, there are significant disparities in drive times when comparing rural and urban census tracts.[12] The study found that the median drive time to OTPs increased from 16.1 minutes in urban census tracts to 48.4 minutes in rural census tracts, decreasing MT engagement and retention among rural PWUD.[12] This underscores the significant barriers that PWUD living in rural areas experienced before this policy change, disproportionately affecting rural PWUD in their recovery. Various studies focusing on the impact that the methadone take-home policy change during the pandemic has had on rural PWUD found many positive effects in different aspects of PWUD's lives.[13],[14] A qualitative thematic analysis found that PWUD in rural areas significantly appreciated having increased take-homes after the policy change because they were able to spend less time in the OTPs with potentially unstable patients. They also did not have to go through confusing processes to get extra take-homes and were instead able to spend more time at home with their family and friends, which helped in their recovery.[13] Other patients also noted that after the methadone take-home policy change was enacted, they no longer had to spend time and money traveling to the OTPs daily when those resouces could be better spent with family or doing daily house tasks. They described long commutes and increased gas prices as significant barriers to engaging in MT prior the policy change.[13] Another qualitative study found that PWUD appreciated the increased sense of responsibility, normalcy, and dignity they were given to take care of their own doses.[14] These themes highlight the many benefits that the methadone take-home policy change has had on the lives of rural PWUD, who already experience significant barriers to MT engagement with the disproportionately low percentage of OTPs in rural areas. The research also illuminates the numerous benefits that this policy change has had on rural PWUD in helping them improve their quality of life, increasing their satisfaction with and likelihood of continuing MT treatment.

As the scientific literature has shown, the policy change allowing PWUD to have increased methadone take-home flexibilities has had significant positive effects on PWUD, particularly among rural PWUD. As rural PWUD face more barriers to engaging with MT due to the lack of OTPs in rural areas, the policy change had a greater positive impact on this population by decreasing the need to commute daily and allowing PWUD to have more time to spend with their friends and family. Despite the extensive number of research studies describing the effectiveness of this policy, the positive impact it has had on improving the quality of life among PWUD and little to no negative effects on PWUD as demonstrated by the low percentage of diversion and decrease in methadone-involved overdose deaths, SAMHSA has not yet decided whether or not it will make this policy change permanent. SAMHSA must consider the substantial benefits this policy change has had since its implementation in improving different aspects of PWUD lives, increasing MT engagement, retention, and satisfaction among PWUD. Another factor to consider is the significant lack of literature focusing on telehealth counseling services that were offered as a part of their MT, especially because research identified many barriers to telehealth implementation, and very few studies looked at interventions to combat these barriers. Future research needs to be conducted to understand how telehealth, a crucial part of MT, can be better implemented to help guide PWUD in their recovery and improve provider-patient relationships.

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The suicide crisis among medical providers—and how healthcare leaders are combatting it

By Deeya Prakash

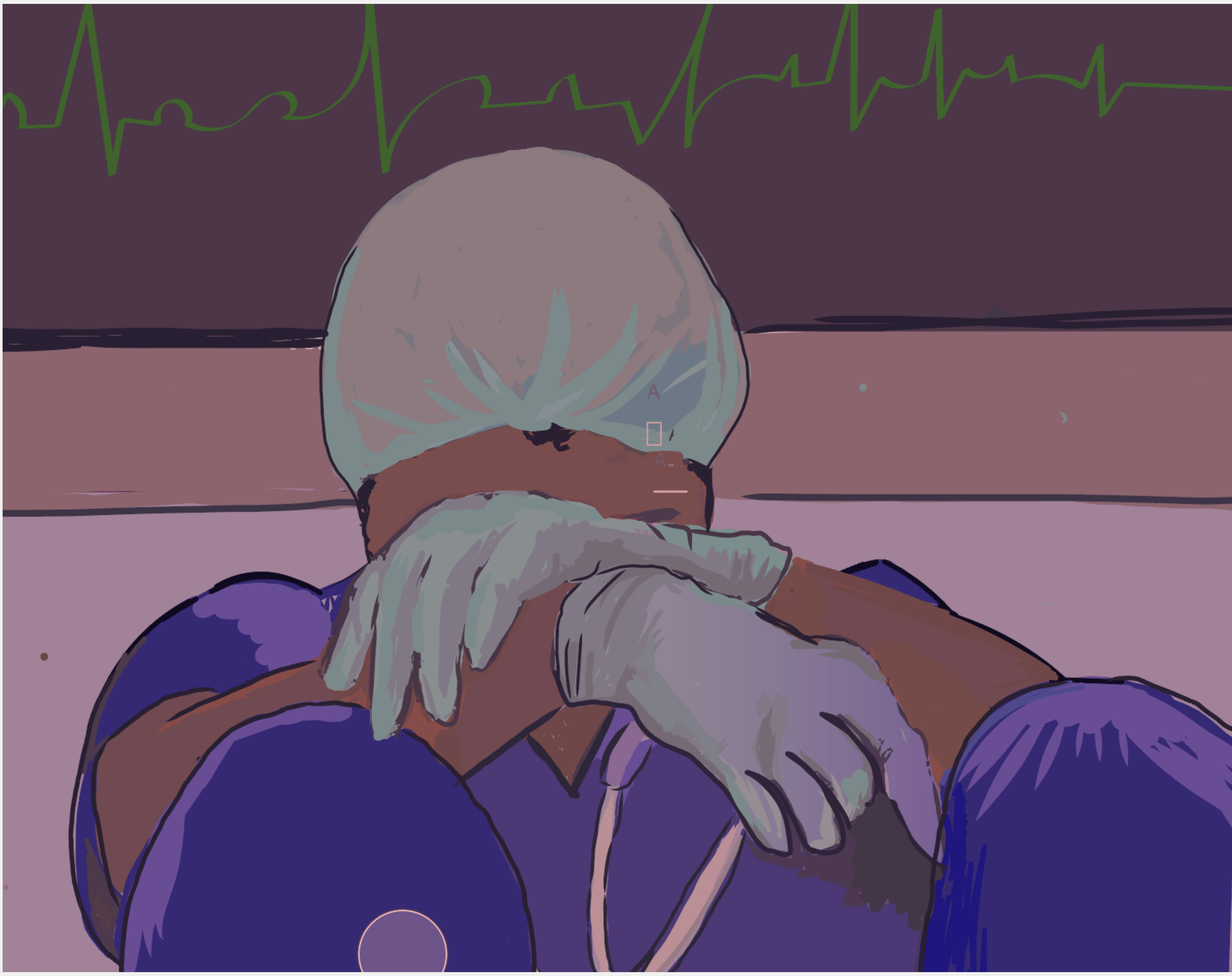

Illustration by Mena Kassa

“This is not going to end until I die”

The suicide crisis among medical providers—and how healthcare leaders are combatting it.

Silence envelops Dr. Michael Ivy’s cozy office.[1] He has neatly folded the sleeves of his striped button-down and adjusts them as he moves to fiddle with his bright orange tie. Behind him, a bookcase overflows with books and memorabilia; framed photographs squeeze into the gaps. Ivy pauses for several moments before inhaling sharply. “At some point,” he says, “you have this thought, ‘It wouldn't be so bad if I died.’”

The doctor fiddles again with his tie and looks away before he speaks again. “I'd seen a lot of people die. I was a trauma surgeon. So it wasn't hard to figure out a way,” he says. Eventually, his mindset evolved to a chilling assessment: “This isn’t going to end until I die.”

Ivy, deputy chief medical officer at Yale New Haven Health, says his personal experience with physician suicide is “unfortunately all too common.” According to the American College of Emergency Physicians, roughly 300 to 400 physicians die by suicide each year in the U.S., and more than half of physicians know a colleague who has considered, attempted, or died by suicide.[2]

This rate has been on a steady rise and has skyrocketed due to the COVID-19 pandemic. An increasing number of physicians and medical students report feeling stressed, burned out, depressed, or suicidal. At the end of 2021, the American Medical Association (AMA) reported that nearly 63 percent of healthcare professionals reported symptoms of burnout and depression,[3] and the American Association of Medical Colleges found that almost 30 percent of medical students and residents suffer from depression, with 10 percent saying they have suicidal thoughts.[4] These statistics beg the question: how come those who prioritize helping others are finding it difficult to help themselves?

The cultural dilemma

The answer to this question can be summed up in one word: culture. The American Psychiatric Association states that medical professionals will often forgo treatment or even acknowledgment of their own mental health or suicidal ideation due to “the medical subculture,” which encourages denial and self-reliance and are at least partly learned implicitly during training.[5] Ivy fondly remembers his mentor Dr. John Hansbrough, director of the University of California San Diego Burn Center and a “phenomenal physician.” After Hansbrough’s death, Ivy spoke to Hansbrough’s wife about the medical community’s attitudes towards mental illness, especially the culture surrounding receiving care. “My husband didn't die from suicide,” Ivy remembers her saying. “My husband died from untreated chronic depression—and the culture the medical community refuses to acknowledge exists.’”

The medical culture stigmatizes mental illness, advocates say, and hampers the willingness to seek care when it is most needed. The AMA reported that 79 percent of physicians agree that there is a stigma surrounding seeking help,[6] and about eight out of 10 medical students and residents believe there is a stigma surrounding mental health care, according to a report by Healio, a medical news reporting site.[7]

Dr. Lauren Allister knows this cultural stigma well.[8] An associate professor of emergency medicine at Brown University’s Warren Alpert Medical School, Allister has encountered—and says she empathizes with—the pre-physician/physician attitude of “‘I can do everything.” Physicians are encouraged, she says, to think, “‘I'm perfect at everything. I can handle everything. Getting help is weak.’”

Ivy echoes this sentiment. Had he shared his experience of depression during his medical training, he says, “Somebody probably would have told me ‘You shouldn't be a surgeon.’”
In response to this culture, certain healthcare administrations have created leadership positions dedicated to addressing the epidemic of mental illness and the stigma around it. Administrators across medical schools and hospitals have taken on positions such as Chief Wellness Officer and Director of Wellbeing, with the goal of reducing stigma, implementing change, and changing professional and educational cultures. As they enforce strategies to address the growing physician suicide rate, it is important to understand their approach's efficacy; through this paper, several solutions are examined and explored in the hopes that they can provide insight into future endeavors.

An individual, opt-out approach

To begin, several different institutions have adopted the “opt-out approach” to mental health checks. A study published in Mayo Clinic Proceedings took a longitudinal look at 10 primary care clinics across the country, focusing on wellness check-ins with physicians.[9] Of the cohorts analyzed, one showed markedly lower levels of employee emotional exhaustion and burnout. The secret to this group’s wellness, the study found, was something none of the other cohorts had established: leader-employee check-ins in which leaders listen, acknowledge, and address work stressors.

Dr. Kelly Holder, chief wellness officer of the Warren Alpert Medical School, specializes in this individualistic approach.[10] Within the four walls of her bright office, Holder offers medical students one-on-one attention within their first few weeks of training. Dubbed “wellness checks,” these meetings are mandatory, although students can opt-out. At the sessions, Holder checks in with first-year students and provides them with a “friendly face” to whom they can later turn as needed.

The appointment shows up automatically on every student’s calendar. Later, meeting with Holder, many of them comment that they don't remember scheduling it, Holder says. They sit at the small round table in her brightly lit office, feet resting on its dandelion-yellow rug. “I put the session on their schedule,” Holder says. “They’re not required to attend, but they have to cancel if they don't want to.”

Holder asks students a few questions about how they’re adjusting to medical school. She provides each student with resources and assures them that she is a resource as well. Meetings range, she says, from general discussions to deep conversations, depending on the student’s engagement and background.

Holder says that she has received positive feedback from first-year students regarding the wellness checks, reporting that they probably wouldn't have made an appointment and are glad they had the meeting.

Other institutions, from hospitals to medical schools, have also implemented opt-out wellness meetings. Initial research has supported the method’s effectiveness. In a study done by the Journal of Graduate Medical Education, researchers analyzed the efficacy of an opt-out wellness check-in within an internal medicine residency cohort.[11] They found that 93% of physicians attended their meeting, and those who attended reported high “convenience” and low “embarrassment.”[11] Opt-out appointments minimize the discomfort that physicians face when scheduling their appointments. The study also found that physicians were likely to return for future visits if they had concerns about depression, anxiety, and burnout.

A match-based approach to finding support

Just a few miles from Holder's office lies another approach, one championed by Dr. Lauren Allister. Associate professor of emergency medicine, Allister is also the Director of Wellness for the emergency medicine department, a new position created by Brown which she filled a few years ago. According to the AMA, 38 percent of hospitals have established well-being committees, with 10 percent assigning "chief wellness officers" or similar positions.[12]

Still, Allister believes that committees and wellness officers are not enough. The root of the crisis, she says, lies in the sheer number of steps clinicians need to take to seek help. Allister experienced this process herself when she was going through medical school. She places a hand over her face as she remembers her mental health challenges, and the hoops she had to jump through: For anyone at her school to meet with a mental health provider, they first had to find a primary care physician who would provide a referral. "You can do the legwork yourself" to find a doctor, she says, but many find that the doctor doesn't accept your insurance. Often, healthcare professionals "have to keep looking until they find someone who does," Allister says, "or find a provider to pay out of pocket, which is incredibly expensive."

In a survey by the National Alliance on Mental Illness, 55 percent of respondents who had looked for a new mental health provider in the last year contacted psychiatrists who were not accepting new patients.[13] Fifty-six percent found providers, but those clinicians didn't accept their insurance. And, 33 percent reported difficulty finding *any* mental health provider who would accept their insurance, either in- or out-of-network. Along with long hours, heavy caseloads, and a high level of burnout, many physicians have difficulty navigating the very care system they work in. This is a massive deterrent to finding help.

Even when it proves semi-successful, Allister says, "You have to call a number, speak to someone. Call another number. Stay on hold. Transfer. Call another number. It's just many, many steps," Allister says, sighing. "I think the administrative burden of that, even in a well person, is probably prohibitive." This is why Allister formed Physicians Helping Physicians, a one-step care-match program for physicians in her department. With her program, emergency medicine physicians at Warren Alpert Medical School who require mental health support can simply call one of two psychiatrists designated to the staff, explain their reason for calling, and indicate their insurance plan. Within 24 to 48 hours, a psychiatrist will match them with a provider in their area, whom they can call to set up an appointment.

Allister expanded the program at residency orientation for Emergency Medicine physicians, and she saw a "huge uptick in signups." Proud of its impact, Allister says that she has received nothing but positive feedback from the more than 10 percent of physicians and residents who have taken advantage of the program.

NAMI emphasizes the importance of programs like this, writing on its website that people's difficulties finding a provider, "may lead to them seeking less care—or going without any care at all." Allister continues to expand and publicize her efforts. She hopes that her program will become "the norm" nationally."Physicians shouldn't have to go through all that just to see someone. It should be easy, and I hope to make it easy," she says.

A system-based approach to reducing stress

Others in wellness leadership place more emphasis on the system. To promote wellness for his network, Dr. Jonathan Ripp, senior associate dean for well-being and resilience and chief wellness officer at Icahn School of Medicine at Mount Sinai, works to assess specific stressors of the physician experience.[14] Such priorities encompass technology and electronic records, two facets of the physician process that "prove increasingly frustrating" according to Ripp.
As per the Journal of Community and Public Health, electronic health records are a significant source of burnout.[15] As medicine has relied more and more on technology, "technoburnout" has

increased. Physicians struggle with how much time they spend at a computer entering information and ordering medication, rather than seeing and interacting with patients.
Though electronic records have improved physician administrative duties, such as simplifying the scheduling of patient appointments and providing remote access to patients' charts, these duties have consumed the profession, with physicians often spending extra time outside of work entering notes and orders.[16] U.S. physicians who use electronic health records spend an average of 1.84 hours a day completing documentation outside work hours, according to research published in the Journal of American Medical Association (JAMA) Internal Medicine.[17] The researchers found that long work days turn into consuming professions, cutting into personal time and increasing levels of burnout.

Ripp focuses on the stress of electronic records-keeping as a way to reduce physician burnout, thereby improving mental health."A lot of the specific areas that we focus on, when it comes to efficiency, have to do with technology," he says. He hopes to improve physicians' "interactions with the electronic healthcare record and the ordering systems. So we spend a lot of time trying to influence how those technologies are used, so that the electronic health record works for the healthcare worker, and not the other way around," Ripp says.

But Ripp also says that technology as a cause of stress is just one factor he wants to address. Solving the medical community's mental health crisis, he says, "is about creating a community and system where people feel valued." Modifying and improving the medical records system is just one area for reform, and he is hoping to utilize physician feedback to explore more opportunities for growth. Improving the system in which clinicians work can help them, Ripp says, to "derive meaning and fulfillment from their profession."

Focusing on the system, Ripp argues, encourages individuals to value others and their well-being. "We create a space where physicians can efficiently and effectively do their work, and at the end of the day, they have the resources to do what they're trained to do."

An advocacy approach

Dr. Ivy adjusts in his seat as he prepares himself to reply to a question. "I'm happy to talk about my experience," he says, but warns that it "gets a little gloomy."

Ivy's personal experience with suicide came in 2002 when he was serving as chief of trauma at Bridgeport Hospital, juggling an abrupt increase in administrative work, taking on "six trauma cases a week" and experiencing "intense troubles at home." He was shouldering too much work, and recalls feeling "incredibly burned out."

He was tired and irritable, he says. "I'm not normally irritable." He found himself becoming "very cynical. I started blaming myself for the things that weren't going well," and he felt like he was "letting everyone down." These factors, plus missing important family events and suffering other health problems, were "all it took."

After reaching out to a supervisor and spending months in therapy, Ivy remembers feeling better, but not back to normal. What really helped him turned out to be helpful for others: advocacy. "I think the language needs to change from 'if you need help, seek these resources' to 'when I needed help, this is what I did.'"

Ivy shares his story whenever he can, whether it's with his residents during rounds or at large college panels. Each time he tells his story, he believes, is a step towards a solution. Sharing mental health struggles with other physicians, he hopes to eradicate the stigma, to normalize seeking help.

Ivy says he’s received many “heartbreaking and relatable” emails in response to his personal struggle with mental health in his position. He says he’s had many conversations with people who have been moved by what he has to share. He talks with two types of people: those who have never experienced depression and need to hear what it’s like, and those who have and need to hear that they are not alone.

“I try to help physicians understand what it can be like for a person who's depressed and why they might want to end their life. But also, more importantly, I'm talking with people who are struggling and trying to help them feel not alone, give them the sense that it can be okay. And that it's okay to get help,” he says.

“I think in my ideal world, people would understand they should treat mental health illness or struggles like you would asthma. You gotta go get seen. You can’t treat it yourself. That’s the bottom line.”

In the aftermath of the COVID-19 pandemic, the Mayo Clinic writes that physician burnout jumped nearly 65 percent, with many instances manifesting as depression, anxiety, and suicidal thoughts.[18] In the aftermath, medical institutions are combating the issue in their own ways. Allister and others say that, ultimately, the problem is cultural. There is no catch-all solution. It will also likely be years before efforts to address the problem can be assessed. Allister and others believe that, ultimately, solutions lie in changing the culture of medicine. “I am just happy that I get to help move the cultural needle,” she says.

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Addressing Healthcare Inequities: Improving Specialty Care for Transgender and Gender-Diverse Patients

By William Borges

In recent years, transgender and gender-diverse healthcare has been brought to the forefront of public discourse. Discussions have shed light on the unique challenges faced by the transgender and gender-diverse (TGD) community. Some progress has been made in addressing these challenges but there are still critical gaps in our healthcare system. While mental health and primary care are often discussed as major gaps in TGD care, his article will focus on the gaps that exist in specialty care affecting the community. Low-quality urological and gynecological care poses a risk to the health and well-being of TGD individuals. To guarantee adequate urological and gynecological care for TGD patients, experts should focus on improving medical education and training, research on health disparities, TGD-focused clinics, standardized national clinical protocols, TGD provider and patient representation, and integration with emerging technology platforms.

According to data from national surveys, approximately 1 in every 250 adults in the United States is transgender.[1] Despite comprising a substantial number of Americans, TGD individuals have reported negative experiences in healthcare settings. Around 33 percent of TGD patients have reported at least one negative experience with medical providers related to gender identity and around 23 percent avoided seeking care due to fear of mistreatment.[2] TGD patients can often be made to feel neglected and invisible in critical aspects of their healthcare, such as urological and gynecological care. Such experiences can foster distrust of healthcare providers among TGD individuals and lead to negative health outcomes.

Distrust in providers has been experienced by TGD patients historically experiencing discrimination in healthcare settings. Prior research has explored the negative encounters TGD patients report, such as being refused care due to their gender identity or facing insensitivity from staff.[2] This discrimination relates to the minority stress model, which posits that stigma, prejudice, and discrimination create a hostile social environment that causes excess stress and health problems for minority groups. The chronic experiences of discrimination and hypervigilance in healthcare settings have severe psychological impacts and act as barriers to TGD patients seeking necessary medical care.

This year, the American Cancer Society (ACS) released its annual Statistics Report, which included, for the first time, a section on cancer in people who identify as Lesbian, Gay, Bisexual, Transgender, Queer, or Gender Nonconforming. This section highlighted the available data on prostate and gynecological cancer disparities impacting the TGD population but concluded that the disparities remain inadequately studied and addressed.[3] Cancer disparities encountered by populations with intersectional identities, e.g., TGD patients of color are particularly understudied.

The ACS report highlighted the available data on prostate cancer disparities in the TGD population. Researchers hypothesize that estrogen-based gender-affirming hormone therapy (GAHT) may play a role in preventing prostate cancer development in transgender women.[4] In 2023, the University of California, San Francisco, and Cedars-Sinai conducted the most extensive retrospective study to date. Published in the Journal of the American Medical Association, their research revealed that transgender women undergoing gender-affirming hormone therapy (GAHT) had notably lower rates of prostate cancer diagnosis compared to cisgender men.[5] However, the results suggested a higher prevalence of aggressive prostate cancer in transgender women, potentially attributable to transgender women on GAHT having delayed prostate cancer diagnosis.[5] Another study published in European Urology found that transgender women have a lower prevalence of PSA screening, which was likely attributed to a lack of prostate cancer risk awareness, stigma, and inadequate inclusion of the transgender male population in prostate cancer screening guidelines.[6] More research is needed to determine the true extent of the underlying disparities in prostate cancer among transgender women. Importantly, future research should isolate the likely intersectional causes of disparities, such as language barriers, lack of insurance, poverty, structural racism, and medical stigma, and develop interventions to address the causes.

The ACS report also highlighted the available data on gynecological cancer disparities in the TGD population. Transgender men remain at risk for gynecological cancers as evidenced by reports of endometrial, ovarian, and cervical cancers.[7] While it has been theorized that testosterone-based GAHT increases the risk of hormone-responsive endometrial and ovarian cancers because it can get converted to estrogen in the body, population-based incidence data including transgender individuals is unavailable to support this.[7] The American Cancer Society data reveals that transgender men have a lower rate of cervical cancer screening compared to cisgender women, which may leave transgender men at a higher risk for cervical cancer.[3] This disparity in cervical cancer screening rates could be explained by TGD discrimination by providers, discomfort with female sex organs, and fear of receiving a gynecological exam, although more epidemiological data is needed for a definitive answer. Fears of disclosing sensitive medical information and being mistreated may mean that transgender men delay diagnosis, leading to worse health outcomes.

In addition to gynecological cancers, disparities in outcomes among TGD patients may extend to other urological malignancies such as bladder, kidney, and testicular cancer. To date, there is little data exploring population-level cancer disparities among TGD patients with these other urological malignancies. It is important to keep in mind that the evidence for prostate and gynecological cancer disparities among TGD patients is also limited, and more substantial research is needed before making any definitive population-level conclusions. Future research efforts should identify cancer disparities among TGD patients, determine their intersectional causes, and propose interventions to address the disparities.

Urologic and gynecological problems, including cancers, grow as populations age, increasing the demand for relevant specialists. Worryingly, only 38 percent of American counties have practicing urologists and there is a projected 46 percent shortage of urologists by 2035.[8] It is also projected that there will be a similar 40 percent shortage of gynecologists by 2030.[9] With the increasing disease burden, TGD specialty care will likely be sidelined as the limited number of providers deal with the increasing volume of non-TGD urological and gynecological issues. Without proper advocacy efforts to improve the current and future state of TGD specialty care, TGD patients will be severely negatively impacted. A significant effort is necessary to increase the supply of medical specialists available to adequately address the future population’s urological and gynecological needs, particularly within the TGD population. Various models are available to address provider shortages including increasing incentives for medical students to specialize in urology and gynecology, integrating emerging technologies like artificial intelligence to extend provider reach, and training more cost-effective mid-level providers like certified nurse assistants and physician assistants.

Most medical providers do not feel well-equipped to provide TGD specialty care, despite expressing interest in providing such care. Medical specialists in Urology and Gynecology must be prepared to address transition-related genitourinary procedures (e.g., vaginoplasty, phalloplasty, and orchiectomy), fertility, urinary and sexual function, urinary tract infections/sexually transmitted infections, lifestyle medicine, and malignancies like prostate cancer and gynecological cancers. However, according to a 2018 multi-specialty survey published in the Canadian Journal of Medical Education, 100 percent of urology residents surveyed would not feel competent enough to provide urology-specific TGD care by the end of their residency and 100 percent felt their training was inadequate to provide care for this population.[10] Moreover, more than 50 percent of residents in psychiatry, endocrinology, and family medicine indicated an interest in providing TGD care in their future practice, whereas only 29 percent of residents in urology felt the same way.[10] A cross-sectional survey of obstetrics and gynecology residents published in Transgender Health revealed that overall, residents felt an intermediate level of comfort and competency in caring for patients who identified as TGD.[11] Despite inadequate preparation, the residents expressed a high level of interest in caring for TGD patients.[11] Providers reporting low confidence in their ability to address the needs of TGD patients highlights the need for improved cultural competency training across specialties. Incentives should also be implemented to increase trainees' interest in providing care to TGD patients.

The lack of preparedness for TGD specialty care may be traced back to medical school. Based on a study published in the Journal of Primary Care Community Health in 2023, only 27 percent of medical students surveyed in the US reported confidence in their knowledge of the health needs of transgender patients.[12] Based on the data, this lack of provider preparedness for providing TGD care has to be addressed starting in medical school. Without confronting gaps in education regarding TGD health, intersectional factors, and care standards, providers will remain ill-equipped to deliver compassionate care.

Plenty can be done to improve TGD specialty care access and delivery. The following are some material policy recommendations:

- Medical school curricula should be redesigned to include more information about TGD patients. Redesigned curricula should include education on historical barriers to access for TGD patients, intersectionality, minority stress, risk factors, pronouns, gender identity, and standards of care for common TGD procedures.
- Governments and healthcare systems should invest in clinics and community health centers that deliver high-quality, specialized care tailored to the needs of TGD patients. This may help address provider limitations in TGD-competent care.
- More large-scale research should be conducted to evaluate the true extent of health disparities among TGD patients, especially in cancer. It is imperative that research also addresses the root causes of disparities so that follow-up studies can propose and validate interventions to address identified disparities.
- TGD patients should be proportionally included in standardized national clinical protocols, such as screening protocols for prostate and cervical cancer, to minimize negative health outcomes from inadequate or discriminatory treatment.
- Representation of TGD providers should be increased in medical education and leadership positions. This would combat stigma while improving cultural understanding of TGD communities.
- TGD patient advocates should be engaged by healthcare systems to provide input on improving TGD patient experiences and reducing discrimination. Involving more TGD patient advocates would likely help normalize a broad range of patient backgrounds, including TGD patients of different disability statuses, races, income levels, and sexual orientations.
- Emerging technology platforms, such as those being developed by startups like Plume and Folx,[13] should be promoted. These platforms can achieve substantial scale and help improve patient access to TGD-competent navigation, resources, and telehealth services.

Policies such as the ones proposed above are a positive first step but should be evaluated as to whether they reduce discrimination-induced stresses experienced by TGD patients in healthcare settings and empower providers to deliver compassionate and competent care to TGD patients. In a time where it is legal for medical providers to refuse care to TGD patients in nine US states based on gender and sexual identity, leaders in medicine should consider work to safeguard adequate care for vulnerable TGD patient populations.[14] Negative experiences, structural barriers, and a lack of navigation support or TGD-competent providers have historically led TGD patients to delay or avoid specialty care. Specialized clinics, advocacy services, and technology platforms are urgently needed to help TGD patients overcome discrimination and access appropriate urological or gynecological care. Most importantly, medical providers must work together with policymakers and institutional leaders to ensure the healthcare system is addressing the healthcare needs of TGD patients.

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Beyond Borders: A Glimpse into Uganda's Healthcare Challenges and Solutions

By Kyoko Saito

I walk into an ICU located in the heart of Uganda’s capital city of Kampala. I am shocked to see hundreds of hospital beds, all full, shoved together in a single room the size of a small lecture hall. Family members stand squeezed between the beds, and physicians and nurses run around, apologizing for bumping into patients’ legs. I turn to the doctor that I am interviewing in bewilderment, but he proudly boasts, “This is one of the most spacious ICUs in all of Uganda, and many wealthy patients pay extra to come here.”

Over winter break, I had the opportunity to assist on a research trip to Uganda with a team of researchers, leaders of non-profit organizations, and students, all with a diverse array of expertise and interests. In my role as a public health student, I researched Uganda’s health systems and the issues with it, interviewing healthcare workers and visiting hospitals and public health organizations. Uganda faces major challenges due to a shortage of healthcare workers and a lack of affordable healthcare services, but the country is making remarkable progress in infectious disease and community health.

Located in East Africa, Uganda is one of the poorest countries in the world with a young and rapidly growing population.[1] Uganda has been heavily impacted by infectious diseases, and the leading causes of death are malaria, tuberculosis, human immunodeficiency virus (HIV), and neonatal conditions.[2] Major social determinants of health for Uganda include poverty, with 30 percent of the population living below the poverty line, as well as poor air and water quality brought about by rapid population growth and urbanization.[3],[4],[5]

The first major issue I saw with Uganda's healthcare system was the lack of healthcare workers and medical education. Uganda has one of the lowest doctor-to-patient ratios in the world with only one doctor available for every 25,000 people.[6] This ratio is below the World Health Organization (WHO) recommendation of 1 doctor per 1,000 people. An emergency physician I interviewed mentioned that he is one of only 15 emergency physicians in all of Uganda, a country with a population of 45 million. The lack of medical education is also an issue as a majority of physicians and nurses do not receive sufficient training. I had the opportunity to speak with an intern doctor who stressed that improving the medical education system is the most important factor to improve Ugandan healthcare. He is planning to complete his training in South Africa so that he can learn diagnosis and treatment methods that Ugandan healthcare workers have no exposure to. After training in South Africa, he has no plans to return to Uganda to practice. Growing up in poverty, he always dreamed of providing a better life for himself and his family, and he believes it necessary to permanently emigrate out of Uganda to do so. This sentiment exemplifies a larger societal trend within Uganda of educated and skilled individuals leaving the country in search of better opportunities. Efforts must be made to provide a more comprehensive medical education to healthcare providers while simultaneously creating incentives to retain them.

The second major issue I saw was the lack of affordable healthcare. At a hospital I visited, an inpatient stay costs about $20 a night with additional fees for any procedures or medications provided. This is not affordable for most people in Uganda, considering that the average monthly income is around $78.[7] Additionally, if medical equipment breaks down or medications run out of stock, patients are responsible for locating and purchasing the replacement equipment or medications themselves. Similarly, if an ambulance breaks down or runs out of gas while transporting a patient, which occurs frequently, the patient is responsible for paying for the repairs. If they are unable, these services are denied. In Uganda, patients' financial status is the biggest determinant of what, if any, care they can receive. When patients walk into the emergency room, they are immediately interviewed about their financial means and asked to pay a consultation fee as a deposit. According to a physician, many of the assumptions made about a patient's ability to pay is based on their clothing and race. If they are unable to pay the consultation fee or are deemed unfit to pay for the cost of care, patients are turned away from the hospital. Although health insurance exists, only well-educated individuals who have been taught the benefits of insurance are able to purchase it. Thus, most of the population lacks any financial protection against medical fees, and as many as 20 percent of Ugandan households incur catastrophic health expenditures each year.[8] When I asked about the prospect of universal health coverage, the physician cited corruption within the government and a lack of understanding about insurance as major barriers.

On the other hand, an area in which Uganda's healthcare system excels is in communicable diseases. In recent years, Uganda has experienced remarkable progress in the prevention of infectious diseases like HIV and tuberculosis. The reduction in infectious diseases is partly due to various initiatives by the government, including free condoms being distributed to combat HIV. Moreover, countries in Africa have a long history of dealing with deadly viruses such as Ebola, Middle East respiratory syndrome (MERS), severe acute respiratory syndrome (SARS), and HIV. As a result, they are among the most advanced nations in the field of infectious diseases and are highly equipped to deal with them. Despite the highly contagious nature of Ebola, a 2022 Ebola outbreak in Uganda was contained in just two months with only 164 individuals affected.[9] Similarly, during the COVID-19 pandemic, Uganda imposed very strict guidelines, faring much better than countries like the US.[6] As the prevalence of infectious diseases decreases, illnesses seen at hospitals are now predominantly non-communicable conditions like diabetes, hypertension, and stroke. As Uganda becomes wealthier and the middle class grows, more people gain the ability to indulge in processed foods, making obesity and diabetes more pressing issues.

Despite an insufficient healthcare system, many passionate individuals have come up with creative solutions to meet their community's needs. For example, I visited a nonprofit organization that teaches web design and video editing to students who cannot afford secondary school. After noticing that many students were dropping out due to STIs, pregnancies, mental health issues, and alcoholism, the organization started implementing health education into their curriculum, inviting local physicians to teach students about safe sex practices and mental health. I also met a mural artist who uses his art to inspire positive change in his community. There is a strong stigma against autism in Uganda, so he paints murals of autistic children on their houses for free. In Uganda, having your face painted on a wall is associated with wealth and fame, causing the community to respect and engage with the autistic kids and their families. Lastly, the intern doctor that I interviewed taught himself how to conduct research to assess and meet refugees' healthcare needs. There is very limited focus on academic research in Uganda, with not a single physician having a PhD, but he still found a way to contribute to research that would improve his community.

In Uganda, I saw and heard heartbreaking stories about patients who could not afford basic healthcare services.Exacerbating the issue, healthcare workers are prevented by systemic inequities from meeting their community's health needs. Despite this, I met incredibly inspiring healthcare professionals and community leaders who are passionate and relentless in their pursuit to improve Uganda's public health. As a student passionate about health equity, I hope to apply what I have learned and experienced to continue thinking about how I can work collaboratively with healthcare workers and public health leaders around the world to create more sustainable and equitable healthcare systems.

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