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Health Insurance Scheme: Main Contributor to Inequalities in COVID-19 Mortality in Colombia

Garzón-Orjuela, Nathaly, ND, MSc; Eslava-Schmalbach, Javier, MD, MSc, PhD; Gil, Fabian, MSc; Guarnizo-Herrebo, Carol C, DDS, MSc, PhD

ABSTRACT (ENGLISH)

Objectives. To quantify socioeconomic inequalities in COVID-19 mortality in Colombia and to assess the extent to which type of health insurance, comorbidity burden, area of residence, and ethnicity account for such inequalities. Methods. We analyzed data from a retrospective cohort of COVID-19 cases. We estimated the relative and slope indices of inequality (RII and SII) using survival models for all participants and stratified them by age and gender. We calculated the percentage reduction in RII and SII after adjustment for potentially relevant factors. Results. We identified significant inequalities for the whole cohort and by subgroups (age and gender). Inequalities were higher among younger adults and gradually decreased with age, going from RII of 5.65 (95% confidence interval [CI] = 3.25, 9.82) in participants younger than 25 years to RII of 1.49 (95% CI 5 1.41,1.58) in those aged 65 years and older. Type of health insurance was the most important factor, accounting for 20% and 59% of the relative and absolute inequalities, respectively. Conclusions. Significant socioeconomic inequalities exist in COVID-19 mortality in Colombia. Health insurance appears to be the main contributor to those inequalities, posing challenges for the design of public health strategies. (Am J Public Health. 2022;112(S6):S586-S590. https://doi.org/10.2105/ AJPH.2021.306637)

FULL TEXT

Headnote

Objectives. To quantify socioeconomic inequalities in COVID-19 mortality in Colombia and to assess the extent to which type of health insurance, comorbidity burden, area of residence, and ethnicity account for such inequalities. Methods. We analyzed data from a retrospective cohort of COVID-19 cases. We estimated the relative and slope indices of inequality (RII and SII) using survival models for all participants and stratified them by age and gender. We calculated the percentage reduction in RII and SII after adjustment for potentially relevant factors.

Results. We identified significant inequalities for the whole cohort and by subgroups (age and gender). Inequalities were higher among younger adults and gradually decreased with age, going from RII of 5.65 (95% confidence interval [CI] = 3.25, 9.82) in participants younger than 25 years to RII of 1.49 (95% CI 5 1.41,1.58) in those aged 65 years and older. Type of health insurance was the most important factor, accounting for 20% and 59% of the relative and absolute inequalities, respectively.

Conclusions. Significant socioeconomic inequalities exist in COVID-19 mortality in Colombia. Health insurance appears to be the main contributor to those inequalities, posing challenges for the design of public health strategies.

(Am J Public Health. 2022;112(S6):S586-S590. https://doi.org/10.2105/ AJPH.2021.306637)

The current COVID-19 pandemic has posed significant and unprecedented challenges for nations, which have implemented different strategies to save lives and avoid the collapse of health systems.1 Some ofthose strategies have the potential to widen social and health inequality gaps, especially in low- and middle-income countries where the resources and infrastructure needed to adequately respond to the COVID-19 emergency are scarce.2 Within countries, studies have found differences by socioeconomic position (SEP) and ethnicity in various COVID-19 outcomes, including mortality.3,4 In Colombia, a survival analysis identified inequalities in COVID-19 mortality by age, gender, ethnicity, and SEP.3 Building on that evidence, our analysis aimed to quantify socioeconomic inequalities in COVID-19 mortality in Colombia in both relative and absolute terms, and to assess the potential role of health insurance type, comorbidity burden, area of residence, and ethnicity to explain such inequalities.

METHODS

We carried out a retrospective cohort study of confirmed cases of COVID-19 in Colombia from March 2, 2020, to October 17, 2020. This nationwide cohort was based on individual-level data provided by the National Institutes of Health,5 which published anonymized data of COVID-19 cases up to mid-October 2020. After that, only aggregate information is available.

The primary outcome was mortality, treated as a time-to-event outcome (date of death). We censored participants if no event (death) was observed by October 17, 2020. We measured inequalities by the SEP variable available in the COVID-19 cases data set. This is an area-level SEP measure that classifies zones where people live according to characteristics such as transport roads, access to public services, and commercial value of the land.6 This measure, which is used in Colombia to define the provision of subsidies for public services, goes from 1 (lowest) to 6 (highest). In our analysis, 5 categories were used: lowest (1), low (2), medium-low (3), medium (4), and high/ highest (5). Age and gender were covariates included in all models. Factors that could potentially explain the inequalities were as follows: type of health insurance (contributory, subsidized, special or exceptional [petroleum industry workers, armed forces members, and teachers in the public sector, among others], and uninsured); diabetes; hypertension; other comorbidities (arthritis, disability, cancer, orphan diseases, and HIV); any vulnerability situation (prisoner, former member of an illegal armed group, displaced, migrant, victim ofthe armed conflict); belonging to an ethnic minority; and area of residence (urban or rural).

We explored relative and absolute inequalities through the relative index of inequality (RII) and the slope index of inequality (SII).7 We ran survival models (Cox regression) in which RII was estimated through a log-linear relationship between the hazard rate and the exposure, and the SII was estimated by fitting an additive model for the hazard rate.7 Given the age and gender differences in COVID-19 mortality,8,9 we stratified RII and SII estimates by age groups (< 25, 25-44,45-64, $ 65 years) and, in a separate analysis, by gender (female or male). We ran a crude model, but our base model was adjusted for age and gender. We further adjusted this base model for other covariates-one at a time and then all together. From these results, we used the percentage reduction in the coefficient for RII and SII to calculate the mediation proportion (attenuation) for each adjustment using the formula 100 x (B0 - B1)/B0, where B0 is the coefficient for the SEP variable in the base model and B1 is the coefficient for the SEP variable in a model with the contributory factor. We carried out the analysis in R software, using the commands recommended by Moreno-Betancur et. al.7

RESULTS

We analyzed data from 763 885 confirmed cases of COVID-19 in Colombia that had complete information on the study variables. Of these cases, 50.65% were men and 26 064 (3.41%) resulted in death. Base models showed significant relative and absolute inequalities, both for the whole cohort and by subgroups (age and gender; Table 1 and Table A, available as a supplement to the online version of this article at http://www.ajph.org). Such inequalities were all in the expected direction (i.e., higher mortality at successively lower SEP levels). The magnitude of inequalities was higher among young adults and gradually decreased with age; for example, relative inequalities went from an RII of 5.65 (95% confidence interval [CI] = 3.25, 9.82) in participants younger than 25 years to an RII of 1.49 (95% CI 5 1.41,1.58) in those aged 65 years and older.

Overall, type of health insurance was the single most important factor, accounting for 19.9% and 58.8% ofthe relative and absolute inequalities, respectively. The role of health insurance was equally important for women and men; it was particularly relevant among younger adults, whereas it was significantly lower among those aged 65 years and older. Among those aged 25 to 44 years, health insurance explained 57.5% ofthe relative inequalities; this proportion was 47.9% for the youngest group and 36.8% for those aged 45 to 64 years. In the youngest group, living in an urban area, having hypertension, and belonging to an ethnic minority explained some ofthe relative inequalities (16.4%, 4.7%, and 6.6% lower RII, respectively). We observed a similar pattern for absolute inequalities (SII). The contribution of other factors was either of very low magnitude or not significant (Table 1).

DISCUSSION

Our findings provide evidence that significant socioeconomic inequalities exist in COVID-19 mortality in Colombia, both in relative and absolute terms. This is in line with studies from other settings showing similar social gradients.3,4 Our results agree with those of Cifuentes et al., who provided evidence of differential mortality risk associated with age, gender, ethnicity, and SEP level in Colombia.3 Importantly, our findings showed that type of health insurance was particularly relevant in explaining socioeconomic inequalities in COVID-19 mortality. Although cardiovascular disease was not assessed because of lack of information, we included hypertension as a potentially relevant factor. Moreover, although we could not analyze more up-to-date data, recent higher daily death rates might have deepened inequalities, and the role of health insurance is likely to remain relevant as no structural changes to the health system have occurred in the past few months (at time of writing). Previous analyses have emphasized that the Colombian health insurance scheme does not seem to be helping to address health inequalities, with systematic inequalities affectingthe uninsured and those in the subsidized scheme (a scheme mainly funded through tax revenue for those without formal employment and classified as "poor" based on a proxy means test).10

The Colombian health system has been long recognized as fragmented and segmented. There is fragmentation in the care delivery processes, and coverage is different for those formally employed versus informal workers or those unemployed.11 The COVID-19 pandemic has highlighted inequalities with differential access to preventive and testing measures and quality treatment, causing higher rates of COVID-19 infection and fatality rates among those from lower socioeconomic levels.3

PUBLIC HEALTH IMPLICATIONS

Disadvantaged populations are disproportionately burdened by COVID-19 mortality, and in Colombia, health insurance appears to be the main contributor to those inequalities. This poses a particular challenge for the design of public health strategies, with a structural change ofthe health system (needed for a longtime) being more urgent than ever. Specifically, shifting toward universal coverage and high levels of integration and focusing on primary health care should be prioritized, as these features have been identified as key to developing strategies aimed at controlling emerging diseases and tackling social determinants of health inequalities.12 This aim is crucial in order to make the country more equitable in the context of numerous challenges occasioned by the pandemic and a long-lasting internal conflict. .4JPH

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CONTRIBUTORS

N. Garzón-Orjuela and C.G. Guarnizo-Herreno drafted the article. N. Garzón-Orjuela and J. Eslava-Schmalbach analyzed the data. F. Gil contributed to data acquisition, analysis, and interpretation. All authors conceptualized and designed the study, interpreted the results, contributed to writing the article, gave their final approval, and agree to be accountable for all aspects ofthe work.

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The Colombian National Institutes of Health made data available to conduct this analysis.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

HUMAN PARTICIPANT PROTECTION

The protocol was approved by the Ethics Committee, Medical School, NationalUniversity of Colombia (minutes No. 011-091, June 2021).

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DETAILS

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COVID-19 in Colombia and Venezuela: Two Sides of the Coin

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ABSTRACT (ENGLISH)

Over the past two years the world and its different regions, including Latin America, have been suffering from the enormous burden and impact of the COVID-19 pandemic, which is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Colombia and Venezuela have been greatly affected.1,2 Despite sharing historical and cultural roots and similarities, each nation has entirely different sanitary conditions, especially regarding infectious, tropical, and reemerging illnesses, including vaccine-preventable diseases. Such differences have increased especially during the past two decades.

Major infectious diseases in Colombia, such as tuberculosis, HIV, and malaria, are under reasonable control. Malaria, in particular, has significantly decreased during the past decade.3 Conversely, in Venezuela, all of these diseases are rising, especially malaria, which is shifting the country from being the former leader in vector-borne disease control to the nation with the highest morbidity in the Americas.4 Vaccine-preventable illnesses, such as measles, diphtheria, mumps, pertussis, and hepatitis A, show a similar picture, with high vaccination coverage in Colombia and sustained outbreaks across multiple years in the past decade in Venezuela.5

In addition, the risk and occurrence of imported cases of these diseases in Colombia, Brazil, Ecuador, Panama, and other countries in Latin America and beyond also increased because of critical Venezuelan migration in the region.6-8 The arrival of COVID-19 to Latin America has compounded existing health crises in Venezuela. The COVID-19 pandemic has required different surveillance, diagnostic, and management approaches as well as marked differences in the national vaccination plans. Therefore, the COVID-19 crisis in these two Andean countries shows two different sides of the coin.

FULL TEXT

Over the past two years the world and its different regions, including Latin America, have been suffering from the enormous burden and impact of the COVID-19 pandemic, which is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Colombia and Venezuela have been greatly affected.1,2 Despite sharing historical and cultural roots and similarities, each nation has entirely different sanitary conditions, especially regarding infectious, tropical, and reemerging illnesses, including vaccine-preventable diseases. Such differences have increased especially during the past two decades.

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Colombia and sustained outbreaks across multiple years in the past decade in Venezuela.5

In addition, the risk and occurrence of imported cases of these diseases in Colombia, Brazil, Ecuador, Panama, and other countries in Latin America and beyond also increased because of critical Venezuelan migration in the region.6-8 The arrival of COVID-19 to Latin America has compounded existing health crises in Venezuela. The COVID-19 pandemic has required different surveillance, diagnostic, and management approaches as well as marked differences in the national vaccination plans. Therefore, the COVID-19 crisis in these two Andean countries shows two different sides of the coin.

After the first case in Latin America, reported in Brazil on February 25, 2020, multiple countries in the region rapidly detected SARS-CoV-2 or COVID-19 cases.9 In Colombia, initial cases were noted on March 6, 2020, and in Venezuela, on March 13, 2020.10 Going further, as the pandemic emerged, Colombia was a country with high international air traffic. Alternatively in Venezuela, even before the pandemic, there were significant decreases in the number of international flights, as many airlines left the country and discontinued regular flights to the capital Caracas and other cities. Additionally, Venezuela suffers from long and profound political and economic crises, which contributed to truncating internal mobility because of fuel and electricity shortages and a high percentage of poverty.4,7 Differences in international travel and population mobility likely promoted the rapid spread of COVID-19 in Colombia and a slower spread in Venezuela. It is important to note the paradoxical benefits of the airline crisis and economic challenges in Venezuela.

Furthermore, it was suspected from the beginning that the surveillance and reporting of COVID-19 cases in Venezuela were not accurate, similar to gaps in data collection of multiple other notifiable communicable diseases that were not publicly available. This is in contrast with Colombia and other countries, where the leading epidemiological indicators are online (www.ins.gov.co). Thanks to the long history of public health surveillance for tropical infectious diseases, Colombia has managed the challenge of implementing the key recommendations for COVID-19 surveillance promoted by the World Health Organization via Colombia's National Institute of Health.11 In addition, Colombia rapidly established molecular diagnostic laboratories and was the first to have the reverse transcription-polymerase chain reaction (RT-PCR) test for SARS-CoV-2 available in Latin America. As of October 13, 2021, Colombia had collected 16.5 million samples by RT-PCR for SARS-CoV-2 and 9.5 million samples by antigen testing (available in all the country departments) and had installed 21 laboratories across the country with genome-sequencing capacities. In Venezuela, by November 2020, the molecular diagnosis was available at only five public reference laboratories, limiting the country's diagnosis capacity.12

Another critical aspect to consider is the capacity of the hospital network in these two countries and how it has adapted to deal with the current pandemic. When cases escalated in March 2020 and patients required hospitalizations, Colombia had 43 935 hospital beds and 5346 beds in intensive care units (ICUs). This capacity increased up to 83% in the case of ICU beds in August 2020, turning Colombia into the Latin American country with the highest number of ICU beds per 100 000 inhabitants at that time. Moreover, to support adequate attention to critical COVID-19 patients, Colombia acquired 6313 ventilators and trained 45 000 health care workers in the management of intensive care patients.13 Unfortunately, the situation across the Venezuelan border was dramatically different. At the pandemic's beginning, Venezuelan authorities reported 23 000 hospital beds and 1200 ICU beds for COVID-19 patients, although more realistic estimates reported by health care workers indicated only 80 ICU beds in the entire country.

The Venezuelan government designated 46 hospitals to respond to the crisis. According to the authorities, these hospitals were fully equipped, but this was denied by health workers of these same health centers, indicating that half of them could not meet aseptic and antiseptic conditions and lacked equipment such as gloves, masks, and soap. Besides, 30% and 40% ofthe facilities reported water and electric services problems, respectively.14

Regarding vaccination, Colombia began its program in March 2021, Venezuela in June 2021. Up to October 2021, only 36% ofthe Colombian population have been fully vaccinated with five different available vaccines, whereas only 22% of Venezuelans were inoculated with three vaccines available (Figure 1).

Lastly, it is important to mention that Colombia has been coping with the humanitarian migration crisis generated in

Venezuela before the pandemic. This included a national plan in cooperation with national and international organizations to integrate Venezuelans into the national COVID-19 response through health care access disregarding their migratory status and their inclusion in economic support programs. The plan included the application of biosecurity protocols in human corridors established at the Venezuelan frontier; attention to irregular status immigrants through emergency mechanisms offered by local authorities; the strengthening of cooperation programs to provide housing, shelter, and food to refugees and migrants; and the enrollment of vulnerable migrants in governmental assistance programs with a particular focus on border departments.15

The differences in the COVID-19 situations and responses between Colombia and Venezuela show us two sides of a coin. Colombia has managed so far with international aid and the effort of national health authorities and health care workers to adapt its health system and meet the demands of this crisis. Meanwhile, the situation in its neighboring country has been exacerbated by a government in denial of its internal political and social crises. Reaching conclusions about a more exact state ofthe situation would be risky, as accessing accurate statistics about the COVID-19 pandemic seems impossible. Hopefully, both countries will collaborate more closely in a future health crisis. ÂfPU

Sidebar

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CONTRIBUTORS

A.J. Rodriguez-Morales developed the first draft ofthe editorial and conceptualized the idea. M. E.

Figuera contributed significantly to the editorial in subsequent versions. Both authors approved the final submitted version.

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This editorial is also being published in Spanish in the Pan American Journal of Public Health (doi: https://doi.org/10.26633/RPSP.2022.109).

We would like to dedicate this editorial to the memory of Barbara Bisiacchi, who passed away in February 2022. Bisiacchi was a significant medical educator for multiple generations of physicians at theJose Maria Vargas Medical School, Universidad Central de Venezuela, in Caracas.

CONFLICTS OF INTEREST

A.J. Rodriguez-Morales is the president ofthe Colombian Association of Infectious Diseases. M. E. Figuera is the president of the Venezuelan Society for Infectious Diseases.

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DETAILS

Subject:	Laboratories; Infectious diseases; Health surveillance; COVID-19 vaccines; Severe acute respiratory syndrome coronavirus 2; Hospitals; International organizations; Medical supplies; Immunization; Editorials; Malaria; Cooperation; Migration; Pandemics; Measles; Public health; Coronaviruses; Intensive care; Hepatitis A; Tuberculosis; Surveillance; Morbidity; Human immunodeficiency virus--HIV; Diphtheria; COVID-19; Viral diseases; Migrants; Illnesses; Disease control; Vector-borne diseases; Vaccination; Hepatitis; Bacterial diseases; Vaccines; Regions; Pertussis; Severe acute respiratory syndrome; Crises; Respiratory diseases

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The Fight Against COVID-19: A Perspective From Latin America and the Caribbean

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ABSTRACT (ENGLISH)

Countries in Latin America and the Caribbean (LAC) have made great efforts over recent decades to increase effective coverage of health services although large inequities persist among and within the countries.1 The urban-rural gap is the most notable inequity in this region. However, unlike most of the public health problems that are predominant in LAC,2 COVID-19 has primarily affected urban areas, especially areas of concentrated poverty.3 Managing the pandemic has primarily been an urban challenge that has substantially affected the most marginalized areas of the most densely populated cities and municipalities. In those areas, the COVID-19 crisis has predominantly affected the poorest populations, which is owing to the size of the informal workforce, health service access barriers, and malnutrition.4 Compared with high-income countries, LAC presumed early on that it was relatively protected from COVID-19 because the region is more geographically dispersed and its populations tend to be younger. However, it turned out to be one of the areas that is most vulnerable to the pandemic because of regional disparities in health capacities, weak health authority, and structural and historical inequalities that undergird social determinants of health. The role of health systems has been fundamental, but the structural determinants put the region in a sociohistorical position of vulnerability, particularly for the large metropolitan regions.

The H1N1 (influenza A virus subtype H1N1), Zika, and Chikungunya pandemics provided important lessons.5 However, the lessons learned were insufficient in the face of COVID-1 9, with its magnitude and duration and the deep social complexity of mitigation measures that were to be adopted in highly uncertain contexts-many of which had not been used for several decades. Nonetheless, the region's countries had prepared antipandemic response plans, including improvements in its epidemiological surveillance systems, information systems, and alert and response systems, which made it possible to adapt the response quickly. Although these plans were unevenly executed, the impact undoubtedly would have been worse without these resources, the experience, and the preparation.

FULL TEXT

Countries in Latin America and the Caribbean (LAC) have made great efforts over recent decades to increase effective coverage of health services although large inequities persist among and within the countries.1 The urban-rural gap is the most notable inequity in this region. However, unlike most of the public health problems that are predominant in LAC,2 COVID-19 has primarily affected urban areas, especially areas of concentrated poverty.3 Managing the pandemic has primarily been an urban challenge that has substantially affected the most marginalized areas of the most densely populated cities and municipalities. In those areas, the COVID-19 crisis has predominantly affected the poorest populations, which is owing to the size of the informal workforce, health service access barriers, and malnutrition.4 Compared with high-income countries, LAC presumed early on that it was relatively protected from COVID-19 because the region is more geographically dispersed and its populations tend to be younger. However, it turned out to be one of the areas that is most vulnerable to the pandemic because of regional disparities in health capacities, weak health authority, and structural and historical inequalities that undergird social determinants of health. The role of health systems has been fundamental, but the structural determinants put the region in a sociohistorical position of vulnerability, particularly for the large metropolitan regions.

The H1N1 (influenza A virus subtype H1N1), Zika, and Chikungunya pandemics provided important lessons.5 However, the lessons learned were insufficient in the face of COVID-1 9, with its magnitude and duration and the deep social complexity of mitigation measures that were to be adopted in highly uncertain contexts-many of which had not been used for several decades. Nonetheless, the region's countries had prepared antipandemic response plans, including improvements in its epidemiological surveillance systems, information systems, and alert and response systems, which made it possible to adapt the response quickly. Although these plans were unevenly executed, the impact undoubtedly would have been worse without these resources, the experience, and the preparation.

Unfortunately, during the first months of the pandemic, there was little scientific evidence ofthe effectiveness and applicability of control measures, particularly nonpharmacological measures (e.g., hand washing, mask wearing) in contexts such as LAC. Most ofthe evidence that was initially available came from high-income countries. Opportunely, the evidence base was supplemented by scientific publications led primarily by Chile, Brazil, and Colombia. As decision makers, we were faced not only with developing interventions to protect life and the capacities ofthe health system but also with preventing our decisions from deepening inequalities-inequalities that also determine opportunities for health and well-being for individuals and populations as well as public health over the medium and longterms.

Implementing COVID-19 control measures in LAC has not been easy. It has involved a battle that we knew from the very beginning nobody would win. Historical structural determinants in the region, such as the informal workforce, affected the impact ofthe virus by producingthe incidence of severe cases and a clear socioeconomic gradient of mortality, as we have previously shown in Colombia.3 Garzán-Orjuela et al. (p. S586) drew similar conclusions in their study about the effects of socioeconomic inequalities on COVID-19 outcomes.

Those structural determinants also affected the effectiveness of measures, such as contact-tracing programs, that promised to be less detrimental than general quarantines. Nevertheless, contacttracing depended on isolating suspected cases, which was impossible for some people because of their socioeconomic situation.6 The measures could not be expected to have the same effectiveness as in high-income countries, nor could the implementation be expected to not involve problems with adherence, acceptability, and applicability among a population facing food insecurity, employment insecurity, hopelessness and uncertainty about the future, desperation, and a lack of social well-being.

As mentioned, the socioeconomic conditions in the LAC region influenced the effectiveness of the measures and intensified their indirect consequences. Compared with high-income countries, the social cost of restrictions on mobility was more significant, the resources available to mitigate their impacts were fewer, and citizens were less willing or able to comply with the measures. Closing airports, businesses, educational institutions, and other entities had a greater impact on deepening inequalities and on economic growth in our countries. Furthermore, with an economy that was less resilient and less able to recover,7 the impact of the measures in our context had more weight. Another difference was owing to the model of the state in most LAC countries versus the impositions and control of measures by authoritarian governments. Although these can be effective in terms of temporarily suppressing transmission, they have a high social cost and are incompatible with the principles and guarantees of modern democracies.

The COVID-19 pandemic and its measures have had a large impact on health systems throughout LAC countries. In one notable example, Cuadrado et al. (p. S591) examined the impact of the pandemic on access to cancer care in Chile. Additionally, health personnel have had to take on heavy workloads, which both puts them at risk for COVID-19 and affects their mental health, as shown by Paniagua-Avila et al. in their study in Guatemala (p. S602).

Today, more than two years since the first case of COVID-19 was reported in LAC, it is clear that the restrictions on mobility in the LAC region had high social, human, and economic costs. The decision of some countries, such as Colombia, to open their economy early, just when cases began to decrease, likely saved thousands of lives, decreased the impact on inequalities, and contributed to the future quality of life of the most vulnerable. Proof of this is that Colombia quickly recovered thousands of jobs and income increased when the economy opened, although the country has not yet been able to reach 2019 levels.8

When the vaccines were approved for emergency use, they quickly became precious and scarce, and market logic imposed by high-income countries spread to the LAC region, outstripping international cooperation capacities. Existing mechanisms were insufficient for ensuring earlier access for countries that were less able to sign bilateral agreements-such as Haiti, Jamaica, Bolivia, Paraguay, and Nicaragua, where vaccination started to ramp up between the second and the third quarters of 2021 (with the exception of Haiti, where, to date, coverage with the full scheme still does not rise above 1 %). In the end, those agreements ensured early access for most middle- and highincome countries but were never a good alternative for low-income countries. Donations of vaccines were valuable, being the only source of vaccines in some countries, and arrived during the most critical vaccination times for others. However, for certain nations, donations were not enough, and they have suffered more from the limitations ofthe well-intentioned multilateral COVAX (COVID-19 Vaccines Global Access) cooperation mechanisms, as well as from noncompliance by some ofthe laboratories. A reflection of these facts is the global inequity that is currently observed, particularly that which was seen during the first quarter of 2021 when saving lives was more urgent.9

In high-income countries, nationalism displaced global health principles of solidarity and equity, creating excessive vaccine concentrations in those countries and diminishing the effectiveness of multilateral mechanisms. Additionally, although there is more inequity on the global scale than in the LAC region, inequity threatens the LAC region's ability to reactivate commercial activities; it clearly should be a political priority for the global health ofthe region now and over the coming years.

Today, the pandemic clearly cannot be controlled across the world, and low vaccination coverage and the circulation ofthe virus through the poorest regions are obviously not safe for highincome countries themselves, because globalization processes necessarily determine that transmission in an affected country will inevitably affect others. Likewise, the pandemic's economic ramifications for one country have regional and global effects. For this reason, it is ethical and fair to control the pandemic throughout the world, and there is no controlling it without global action.10

It is necessary to continue to strengthen basic public health capabilities, epidemiological surveillance, local capacity to produce vaccines, health information systems, health authority, and health governance. Under this framework, the digital transformation of the health sector is one of the most important challenges in the LAC region, as discussed in this supplement by García Saisó (p. S621).

Over the coming decades, there is still much to be understood and to work toward, including redressing the other impacts that the pandemic has had on public health. As Bóscolo et al. discuss in this supplement (p. S615), the future agenda needs to prioritize improving structural elements while strengthening the stewardship capacities of health authorities and developing institutional structures to achieve universal health care coverage in the LAC region.

COVID-19 has been a trial by fire for global health, especially for the LAC region. It is evident that the response to new pandemics requires stronger international cooperation within and outside the region, cooperation that moves beyond discourse and translates into effective mechanisms to achieve equity in health. .4JPH

Sidebar

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How We Faced the Challenge of COVID-19 in Antioquia, Colombia

Correa, Aníbal Gaviria

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ABSTRACT (ENGLISH)

Before COVID-19 reached Colombia and the World Health Organization (WHO) declared the pandemic, in Antioquia, Colombia, we were already strengthening our capacity to face it. Seeingthe experiences in other countries, we took this threat seriously from the onset. Our departmental government declared a health emergency and public disaster to provide better tools to tackle the situation. We created a first-level management structure that was pioneered in Colombia. A professional with proven experience over a long career and the necessary social sensitivity and organizational ability to coordinate staff led this response with a clear mandate to protect life.
We made difficult political decisions. In Colombia, the first lockdowns were ordered and protocols such as the use of face masks were implemented before WHO recommended them. The pandemic showed us that we needed to be united, so we invited citizens to practice physical distancing and change their habits-but to stay united. Our premise was that together we are more powerful than the disease. By caring for ourselves, we care for others.

FULL TEXT

Before COVID-19 reached Colombia and the World Health Organization (WHO) declared the pandemic, in Antioquia, Colombia, we were already strengthening our capacity to face it. Seeingthe experiences in other countries, we took this threat seriously from the onset. Our departmental government declared a health emergency and public disaster to provide better tools to tackle the situation. We created a first-level management structure that was pioneered in Colombia. A professional with proven experience over a long career and the necessary social sensitivity and organizational ability to coordinate staff led this response with a clear mandate to protect life.
We made difficult political decisions. In Colombia, the first lockdowns were ordered and protocols such as the use of face masks were implemented before WHO recommended them. The pandemic showed us that we needed to be united, so we invited citizens to practice physical distancing and change their habits-but to stay united. Our premise was that together we are more powerful than the disease. By caring for ourselves, we care for others.
We quickly understood that the priority was to ensure health system capacities and increase the number of intensive care units. With the support of the national government and the private business sector, we managed to go from 480

intensive care beds to 1474. This 308% increase required an investment of US $26 million from the public sector and US $10 million from the private sector.

There were many expressions of solidarity, and we were unified as we advanced, but this has not been enough. We still have social debts, such as imbalances in vaccination: whereas 60% of the world's population has received at least one dose of the COVID-19 vaccine, only 10% of people in low-income countries have received a dose. The pandemic has clearly been a wake-up call showing us that the world has many gaps to close.

On the positive side, science has played a key role. We were aware of its importance in everyday life, and the dedication of scientists to developing a vaccine and producing scientific data helped us in the most complex periods. More global resources will need to be devoted to scientific research and to the development of technologies that allow us to inhabit the planet in more intelligent and balanced ways. Technological tools were fundamental in offsetting the downsides of physical distance: Web platforms, public radio, and television, among other media, were helpful vehicles for information, education, and companionship, offering meeting places and social movement.

But although science and technology made important contributions, they also revealed risks in how information is handled, threats to privacy, and opportunities for social control and manipulation. The ethical challenge today is to ensure connectivity without invading private spheres while managing information in a transparent manner.

There are many challenges, and technology has gradually allowed a certain balance between development in urban areas and outside cities. For more than 5000 years, since social agglomerations in cities began, great advances have been made on all fronts, but development has concentrated on urbanization that has transformed villages inhabited by dozens of people into metropolitan areas that are home to millions. The pandemic and the challenges of climate change are two major forces that will help balance development in urban and nonurban areas, moderating the frenzy of crowding.

It is too early to talk about a trend toward deurbanization, but the speed of urbanization has slowed for the first time, and it will continue to do so. The pandemic has given us a warning. It is an alarm we need to heed if we are to correct our course and steer toward the equitable protection of life. ,4jPH

Sidebar

Aníbal Gaviria Correa is the governor of Antioquia, Colombia, and the president of Cities Alliance, Colombia.

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Contributions of the New Framework for Essential Public Health Functions to Addressing the COVID-19 Pandemic

Báscolo, Ernesto, PhD; Houghton, Natalia, MS; Del Riego, Amalia, MS; Fitzgerald, James, PhD; Jarboe, Rachel, MPH

ABSTRACT (ENGLISH)

This article uses a health stewardship perspective to Interpret the strengths of and challenges to national health authorities' capacities to respond to the COVID-19 pandemic through the renewed essential public health functions (EPHF) framework. Based on a literature review, this article argues that the institutional capacities required by countries to respond to the COVID-19 pandemic in the Americas included all 4 stages of the new EPHF policy cycle: assessment, policy development, allocation of resources, and access. While health authorities provided these key functions (e.g., data analysis, intersectoral policy dialogues, allocation of additional funds), the interventions implemented depended on each country's own institutional structures. Health authorities faced significant challenges including fragmentation and the lack of institutional and personnel capacities, thus compromising the delivery of an effective and equitable response. In addition, the response to the pandemic has been uneven because of weaknesses in central leadership and coordination capacity, the politicization of the response, and differences in the capacity to respond at subnational levels. Such challenges reflect structural weaknesses that existed before the onset of the pandemic, as well as the low prioritization of public health in agendas for health systems strengthening. A future agenda should prioritize improving structural elements while strengthening the stewardship capacities of health authorities and developing institutional structures that guarantee access to and universal coverage of health services. (Am J Public Health. 2022;112(S6): S615-S620. https://doi.org/1 0.21 05/AJPH.2022.306750)

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ountries in the World Health Organization's Region of the Americas have been hit the hardest by the coronavirus disease 2019 (COVID-19) pandemic. This can be attributed to the structural deficiencies of health systems in the Region, including segmentation, limited resources, and the fragmented organization and delivery of health services, all of which are aggravated by high levels of informal labor and social inequities.1-5 In addition, health authorities have lacked sufficient capacities to lead a comprehensive and integrated response, meaning that the Region has experienced delayed response measures, disruptions in the continuity of essential public health services, exacerbations of barriers to access, and low rates of COVID-19 vaccination.1-3,6 This situation has brought into question the scope of functions that countries should assume to influence the determinants of health and to guarantee health as a fundamental human right. Gaining a better understanding of which institutional capacities are needed to ensure coordinated actions by countries, and especially by health authorities, is crucial to building an agenda to strengthen public health and meet the health needs of the population.7,8

Within this context, the renewed essential public health functions (EPHF) framework serves as a useful tool for understandingthe underlying institutional capacities that countries need when responding to disruptive health crises.7,9,10 To this end, this article interprets the strengths and challenges of national health authorities' capacities to respond to the pandemic through the new EPHF framework.

RENEWING THE ESSENTIAL PUBLIC HEALTH FUNCTIONS IN THE AMERICAS

In December 2020, the Pan American Health Organization launched a renewed EPHF approach that considers institutional capacities of health authorities as conditions necessary to guarantee a comprehensive and integrated response to the health needs of a population.9 Rather than providing a list of public health interventions to be promoted, the new approach defines the EPHF as capacities to be used by health authorities to strengthen a health system's ability to meet the health needs of the population, including ensuring access to a broad range of public health interventions, such as population-based interventions and individual health services.9,11

Therefore, the framework emphasizes the need to expand the stewardship role of health authorities to ensure that a coordinated response is taken by strengthening the institutional capacities necessary to support the process of formulating and implementing public health policies.11 These capacities are embedded in 4 stages that are part of the policy cycle (Figure 1): an assessment of the health conditions of the population and their causes, the development of policies to address problems identified by the assessment, the provision and regulation of the necessary resources to carry out the interventions, and the management of interventions to ensure access to health services for the population.9

PUBLIC HEALTH RESPONSES TO THE PANDEMIC IN THE AMERICAS

A literature search was performed using PubMed and Google Scholar. Selection criteria included any publicly available peer-reviewed publications that analyzed health systems' and governments' responses to the COVID-19 pandemic in multiple countries in the Region of the Americas. The 6 documents selected were analyzed to identify the responses and intervention approaches used by each country, and these were categorized within the 4 stages of the policy cycle. The countries for which information was available that met the selection criteria were Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Ecuador, Honduras, Mexico, Panama, Paraguay, Peru, and Uruguay. The literature reviewed the interventions used by countries at different moments during the pandemic, some assessing measures taken within the first few months and others assessing measures taken several months into the pandemic. However, all of the included literature addressed the period before the development of effective COVID-19 vaccines.

Countries' responses were grouped into 3 types of interdependent strategies: prevention, prioritization, and mitigation. The first strategy sought to reduce or prevent transmission of the disease, while the second sought to prioritize resources to improve and ensure the service capacity to manage COVID-19 cases. At the same time, it was necessary to apply other types of interventions to mitigate the negative socioeconomic effects of mobility restrictions and social distancing.9,11-15

Strategies to prevent or reduce the spread of the pandemic, or both, included interventions such as encouraging voluntary or compulsory isolation, encouraging remote work, implementing a national curfew, closing borders, providing free testing, undertaking epidemiological and health surveillance activities, case reporting, and increasing the delivery of emergency assistance. These interventions were part of a central strategy that should have been carried out collectively by the country. Such interventions not only addressed behavioral changes and individual responsibility but also implemented logistical measures to monitor patients during their isolation, as well as instituted regulations that altered forms of consumption and production in the economic and social systems.

Prioritization strategies were implemented to address bottlenecks affecting a health service's capacity to respond to the pandemic. These strategies included interventions that increased the capacity to provide medical care (e.g., the number of beds in intensive care units, the building and operating of modular hospitals, the delivery of emergency assistance), provided guidelines for the management of suspected cases, and allocated and prioritized critical human resources for health. These interventions aimed at ensuring that services provided at the first level of care had the capacity to manage COVID-19 cases and any potential increases in the demand for critical services. Strategies to mitigate or compensate for the negative effects of these prevention strategies included implementing economic stimulus measures, providing economic relief to the most vulnerable populations, increasing social assistance, providing food baskets, and ensuring labor protection.

The degree of effectiveness of these strategies depended on the public health capacities ofthe health authorities.1 In this way, the EPHF framework was used to identify the capacities that support the interventions included in such strategies (Table 1). First, capacities related to assessment, including surveillance and knowledge management, were needed to provide scientific evidence to design mitigation strategies. Capacities related to policy development allowed the scope of COVID-19 response measures to be defined and responsibilities to be assigned to different institutions, structures, and agencies. The effectiveness of these measures was then ensured by allocation ofthe necessary human resources, health technologies, and financial support. Finally, institutional capacities were necessary for ensuring that the population had access to COVID-19 response measures and other health services.4,5,12-15

The literature review also allowed for the identification of important challenges countries in the Region faced in trying to achieve a comprehensive and equitable response. These challenges, shown in Table 2, were exemplified by fragmentation among the different levels of decision-making and a lack of institutional and staff capacities. In addition, the response to the pandemic has been uneven because of weaknesses in leadership and coordination capacity at the central level, the politicization of the response in many countries in the Region, and differences in the response capacity at the subnational levels.

An example of coordination challenges can be seen through Mexico and its federal Traffic Light System. This system was intended to assess the risk from COVID-19 and determine the type of nonessential businesses that needed to be closed by using the colors red, yellow, and green as indicators. According to the authors who reported on the system, it faced challenges in terms of adherence to the closures because of a fragmented and inconsistent response by the different states at the subnational level.14

Similarly, Brazil initially lacked the central coordination ofthe health sector necessary to execute a consistent response, as it did not have a federal policy to enforce measures such as social distancing and isolation, and there were delays in distributing guidelines to the subnational-level states. The case of Brazil highlights the need to have established and coordinated plans, committees, or response systems that allow for the development of decisive policies.5 For example, Argentina, Mexico, and Peru have made efforts to respond to health and other needs in a more collaborative and communicative manner through intersectoral and subnational interstate meetings held to discuss COVID-19 response strategies.13

A common challenge for many ofthe countries was resource scarcity related to health supplies and human resources. Peru, for example, had only limited supplies of personal protective equipment and ventilators. To address this challenge, the government used a local procurement strategy to manufacture masks and personal protective equipment.5,13 Likewise, at the beginning of the pandemic, Chile struggled with poor management of case tracking because of a lack of personnel and the unavailability of tests. As the pandemic continued to grow, the country relied on primary health care workers to conduct contact tracing and used pool testing to combat limits on resources while low-cost tests were being developed.5 However, these strategies resulted in unintended disruptions to continuity of access to other essential health services not related to COVID-19.5

To overcome access barriers to health services that arose during the pandemic, some communities in Brazil encouraged workers at the first level of care, in coordination with community health workers, to conduct home visits to ensure the continuity of care. This, however, was not implemented at a state or national level because in part ofthe delay in agreeing a national COVID-19 strategy among national authorities. This left states without guidelines for managing COVID-19.5,13 The challenges in responding to the pandemic experienced by countries in the Region reflect the structural weaknesses that existed before its onset, as well as the low prioritization of public health in agendas for strengthening health systems in the Region ofthe Americas.1-3,15-18

FUTURE AGENDA TO STRENGTHEN THE STEWARDSHIP FUNCTION IN THE AMERICAS

The renewal ofthe EPHF offers a comprehensive and integrated approach for analyzing the capacities of health authorities that are necessary for ensuring an effective response to COVID-19. The comprehensive part of the approach allows for inclusion of all interventions needed to meet a population's health needs and to address the determinants of health, while the integrated part of the approach emphasizes the capacities needed to coordinate the 3 types of strategies, which depend on the particular characteristics of each context: prevention, prioritization, and mitigation.7,9,11

The analysis ofthe public health responses that were implemented in the Region shows that although most countries sought to deliver a comprehensive response to the pandemic, one ofthe most important challenges involved the coordination ofthat response in the context of fragmentation and a lack of essential health care resources. The success of such coordination depended on the political and institutional capacities ofthe health authorities to implement EPHF as they relate to the 4 stages ofthe policy cycle: analysis, policy development, resource allocation, and access.

One ofthe most important challenges in responding to the pandemic was related to difficulties in guaranteeing sustained access to public health interventions, including individual, collective, and intersectoral services.

In this regard, the stewardship role of the health authorities is a fundamental political and institutional dimension of an intersectoral agenda to promote resilient health systems. This agenda must both respond to the public health interventions that have been recommended to address the COVID-19 crisis, as well as tackle existing deficiencies in health systems and the capacities of health authorities.4,5,7,12,13

In addition, the response to the challenges ofthe pandemic brought to the forefront 2 structural factors that should be included in future agendas to sustain resilient health systems. First,

strengthening social protection systems is indispensable for guaranteeing conditions of social inclusion and reducing the vulnerability of populations. Second, institutional capacities to assess the social determinants of health in different crisis contexts must be strengthened while implementing response activities with existing mechanisms and resources.

Both factors foster a country's roles of stewardship and governance ofthe health system, and strengthening the resilience of health systems provides conditions for ensuring access to and universal coverage of health care,19 as well as a comprehensive and integrated response to health emergencies.7,11

Finally, this work was based on information from publications that addressed a limited part ofthe response to the COVID-19 pandemic-that is, before the campaigns that aimed at promoting herd immunity through ensuring access to effective COVID-19 vaccines. Although the topic of COVID-19 vaccination was not included in the literature review, and, thus, an assessment of global inequity in access to vaccines was not incorporated, vaccination has been crucial to the effectiveness ofthe pandemic response. The lack of technological innovation to ensure the mass production of safe and effective COVID-19 vaccines has been a critical factor in the evolution ofthe pandemic in Latin American and Caribbean countries.4,5,11-13,20 Future studies should consider this issue, recognizing the institutional capacities that need to be strengthened in a future agenda.6,7

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E. Bascolo conceptualized the study with the support of N. Houghton. R. Jarboe carried out the desk review with the support of E. Báscolo and N. Houghton. E. Báscolo took the lead in writing the article with the support of N. Houghton and R. Jarboe and in consultation with all authors. Overall direction and planning were overseen by A. DelRiego andJ. Fitzgerald. All authors provided critical feedback and helped shape the research, analysis, and article. All authors reviewed and approved the final version ofthe article.

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Emergency Preparedness: A Shared Effort

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ABSTRACT (ENGLISH)

The COVID-19 pandemic has exposed gaps and weaknesses in health care systems worldwide, but it has also highlighted countries' capacity to respond and provided valuable lessons for the future. The pandemic has highlighted the need for countries to work together on scientific evidence production and vaccine development and elucidated the commonality of pandemic-related challenges, such as personal protective equipment unavailability and supply chain disruptions. International cooperation has been key to tackling COVID-19 and continues to be a fundamental pillar of emergency preparedness and response in circumstances when synergy among countries is more important than individual efforts.

In a context of cooperation, the American Public Health Association (APHA) and the Pan American Health Organization (PAHO) have collaborated for more than 100 years to promote health and address emerging public health threats. This year, APHA celebrates its 150th anniversary, and PAHO its 120th. This joint special issue produced by AJPH and the Pan American Journal of Public Health (PAJPH) commemorates the achievements of our partnership.

FULL TEXT

The COVID-19 pandemic has exposed gaps and weaknesses in health care systems worldwide, but it has also highlighted countries' capacity to respond and provided valuable lessons for the future. The pandemic has highlighted the need for countries to work together on scientific evidence production and vaccine development and elucidated the commonality of pandemic-related challenges, such as personal protective equipment unavailability and supply chain disruptions. International cooperation has been key to tackling COVID-19 and continues to be a fundamental pillar of emergency preparedness and response in circumstances when synergy among countries is more important than individual efforts.

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A JOINT SPECIAL ISSUE

The supplement focuses on Latin America (i.e., the cultural region of the Americas in which Romance languages are spoken, generally comprising South America, Central America, and the Caribbean islands). Although it is not possible to present research from all countries in the region, the articles offer a representative perspective of emergency preparedness from different parts of Latin America. The articles cover three main topics: the pandemic's impact on countries, the essential public health function response, and the digital transformations needed to improve the resilience of health care systems. To facilitate access to the information in the supplement, all articles are published in English in AJPH and in Spanish in PAJPH.

Impact of the Pandemic

Health insurance scheme in Colombia.

To quantify socioeconomic disparities in COVID-19 mortality, Garzón-Orjuela et al. (p. S586) analyzed factors in a Colombian cohort in relative and absolute terms and found that type of health insurance is by far the main contributor to inequalities among both genders and especially among young adults. Urgent structural changes are required in the Colombian health care system to confront future public health challenges and inequality.

Cancer care access in Chile. Although directly affecting millions around the world, COVID-19 also has had an enormous indirect impact, particularly on health care. Cuadrado et al. (p. S591) evaluated the impact of the pandemic on cancer care access in Chile. Oncology services suffered a sharp drop in March 2020, when Chile was most affected. After March, oncology services utilization improved slowly but did not completely recover in 2020. The pandemic has put health care systems under pressure and has had a profound impact on cancer and overall care, especially among women and state-insured populations. Cancer care programs should secure financial mechanisms to compensate for the impact of the pandemic and to prepare for future disruptions.

Guatemalan health care workers' mental health. In a groundbreaking study named HEROES (COVID-19 Health

Care Workers Study), Paniagua-Avila et al. (p. S602) describe the prevalence of mental health conditions and associated exposures during the COVID-19 pandemic in a Guatemalan cohort of health workers. Among participants, mental distress (59%) and moderate or severe depressive symptoms (23%) were highly prevalent. Additional surveillance and attention are warranted to preserve the mental health of these essential workers.

Response

The role of essential public health functions in addressing the challenges of the COVID-19 pandemic are also considered in this issue. Through the lens ofthe renewed essential public health functions framework, Bascolo et al. (p. S615) reviewed the institutional capacities of several health authorities in Latin American countries to respond to the needs of their populations during the COVID-19 pandemic before vaccination programs started. Responses were grouped into prevention, prioritization, and mitigation strategies, and challenges were identified to propose an agenda to strengthen the stewardship function of the health authorities.

Strengthening the System

Digital transformation is essential for more equitable and sustainable public health in the age of digital interdependence. In their article, García Saisó et al. (p. S621) emphasize the importance of digital connectivity as a tool to improve health care access and coverage and to better prepare for future health crises. They consider eight guiding principles for the digital transformation of the health care sector, identifying their relationship with the COVID-19 pandemic in Latin America, where 30% of the population has no access to the Internet.

NEW EVIDENCE FOR DECISION-MAKING

The COVID-19 pandemic will not be the last. Latin America's health systems will face future health emergencies, including the reemergence of infectious diseases, the effects of climate change on health, and the spread of health misinformation. To address these threats, public health decision-makers require appropriate, relevant, and timely information to devise measures that can influence tangible changes at the population level.

This new scientific evidence will guide public health preparedness for future emergencies, which will affect health care systems and population health in an increasingly interconnected and interdependent world.

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Health Emergency Preparedness and Response Capacity in Latin America and the Caribbean

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FULL TEXT

Latin America emerged as one ofthe epicenters of the COVID-19 pandemic. As ofMarch 2022, the region, representing only8.4% ofthe world's population, had more than 65 million confirmed cases, or 15% ofcases worldwide, and more than 1.6 million deaths, or 28% of deaths worldwide. Latin America's gross national product contractions resulting from the pandemic are estimated to be between 7% and 10%; these contractions have increased unemployment and poverty and exacerbated income inequality. Moreover, as in other countries, the disease has disproportionately affected the poorest and most vulnerable populations.

In the past 50 years, Latin America has experienced more than 4500 disasters that have caused the death ofalmost 600 000 people and injured more than 3 million, in addition to causing significant economic losses. The COVID-19 pandemic has increased these figures and hasfurtherchallenged health systems' capabilities in various settings. Researchers have had to rapidly study diagnosis, treatment, and immunization for a new pathogen. Health care personnel have had to cope with a large and prolonged emergency, which has involved a shortage ofventilators, intensive care unit beds, and personal protective equipment at differenttimes.

Health authorities have needed to frequently issue updated guidelines in a context of rapidly changing scientific evidence. It has been necessaryto communicate key information to the population and counter misinformation and social movements opposed to preventive care orvaccination. Diagnostic tests have had to be manufactured in sufficientquantity, and laboratory capacity has had to be increased, and the integration of mechanisms atthe global, regional, and national levels was required to guarantee the availabilityofbasic medical, diagnostic, and therapeutic supplies and vaccines, among others.

At the international level, sharing health information, resources, and vaccines in a broad, transparent, and timely manner has become a priority. National health systems' performance and, ultimately, the global population's health, morbidity, and mortality have resulted from the complex interactions between interdependent systems, such asthose described. However, the COVID-19 pandemic has also exacerbated preexisting gaps in social protection strategies. The response to and mitigation ofthe COVID-19 pandemic have been uneven, varyingdramatically by social and economicconditions and governments' actions. Almost 60% ofemployment in Latin America is "informal, with 140 million people who must report to work to earn a living, making social distancing nearly impossiblefor many. Goingfurther, 21% ofpeople live in urban slums, informal settlements, or precarious housing,with overcrowdingand lack ofbasicsemces such as clean water and sanitation. These conditions have facilitated the spread ofthe disease, aswell asthe accompanyingtraumas oflife and service interruption, interpersonal violence, and mental health challenges.

Goingfoward, addressingthe current health care crisis and preparingforfuture emergencies will requirethat each government build resilience by implementing structural reforms to improve fiscal sustainability and strengthen the infrastructures required for public health, communications, and social programs. These include universal health care coverage and access. Digital tools can provide a helpful solution to access to care provision for remote populations while improving education and health literacyaswell as tackling misinformation and disinformation spread among the Scientists and health care professionals must also take a proactive role in communication and providing information and evidence to the public, limitingthe distance between professionals and other members ofsociety. Finally, the improvementofregional infrastructure and the preparednessfor health crises are fundamental to Latin America's abilityto improve its preparation for future health challenges. This will require generating the required infrastructure for health care, research, and medicine production and improving health care professionals' education and working environment and the conditions affectingtheirwell-being.

These initiatives will be costly and require political will. We hopethisjoint AJPH and Pan American journal ofPublic Health supplement will contribute to shedding light on Latin America's emergency preparedness and its experience with the COVID-19 pandemic and will aid us in identifying solutions to its complex challenges.

Sidebar

This editorial is also being published in Spanish in the Pan American Journal ofPublic Health (doi: 10.26633/RPSP.2022.99).

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Mental Health of Guatemalan Health Care Workers During the COVID-19 Pandemic: Baseline Findings From the HEROES Cohort Study

Paniagua-Avila, Alejandra, MD MPH; Ramirez, Dorian E, MD MSCE; Barrera-Pérez, Aida, MD MSCE; Calgua, Erwin, MD MSCE; Castro, Claudia; Peralta-Garcia, Ana, MD; Mascayano, Franco, MPH; Susser, Ezra, MD DrPH; Alvarado, Rubén, MD PhD; Puac-Polanco, Victor, MD DrPH MSCE

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ABSTRACT (ENGLISH)

Objectives. To assess the baseline prevalence of mental health conditions and associated exposures in a cohort of health care workers (HCWs) in Guatemala. Methods. We analyzed baseline information from the 2020 Web-based COVID-19 Health Care Workers Study (HEROES)-Guatemala. Outcomes included mental distress and depressive symptoms. Exposures included COVID-19 experiences, sociodemographic characteristics, and job characteristics. We used crude and adjusted Poisson regression models in our analyses. Results. Of the 1801 HCWs who accepted to participate, 1522 (84.5%) completed the questionnaire; 1014 (66.8%) were women. Among the participants, 59.1% (95% confidence interval [CI] = 56.6, 61.5) screened positive for mental distress and 23% (95% CI = 20.9, 25.2) for moderate to severe depressive symptoms. COVID-19 experiences, sociodemographic characteristics, and job characteristics were associated with the study outcomes. Participants who were worried about COVID-19 infection were at higher risk of mental distress (relative risk [RR] = 1.47; 95% CI = 1.30, 1.66) and depressive symptoms (RR = 1.51; 95% CI = 1.17, 1.96). Similarly, the youngest participants were at elevated risk of mental distress (RR = 1.80; 95% CI = 1.24, 2.63) and depressive symptoms (OR = 4.58; 95% CI 5 1.51, 13.87). Conclusions. Mental health conditions are highly prevalent among Guatemalan HCWs. (Am J Public Health. 2022;112(S6):S602-S614. https://doi.org/10.2105/AJPH.2021.306648)

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Headnote

Objectives. To assess the baseline prevalence of mental health conditions and associated exposures in a cohort of health care workers (HCWs) in Guatemala.

Methods. We analyzed baseline information from the 2020 Web-based COVID-19 Health Care Workers Study (HEROES)-Guatemala. Outcomes included mental distress and depressive symptoms. Exposures included COVID-19 experiences, sociodemographic characteristics, and job characteristics. We used crude and adjusted Poisson regression models in our analyses.

Results. Of the 1801 HCWs who accepted to participate, 1522 (84.5%) completed the questionnaire; 1014 (66.8%) were women. Among the participants, 59.1% (95% confidence interval [CI] = 56.6, 61.5) screened positive for mental distress and 23% (95% CI = 20.9, 25.2) for moderate to severe depressive symptoms. COVID-19 experiences, sociodemographic characteristics, and job characteristics were associated with the study outcomes. Participants who were worried about COVID-19 infection were at higher risk of mental distress (relative risk [RR] = 1.47; 95% CI = 1.30, 1.66) and depressive symptoms (RR = 1.51; 95% CI = 1.17, 1.96). Similarly, the youngest participants were at elevated risk of mental distress (RR = 1.80; 95% CI = 1.24, 2.63) and depressive symptoms (OR = 4.58; 95% CI 5 1.51, 13.87).

Conclusions. Mental health conditions are highly prevalent among Guatemalan HCWs. (Am J Public Health. 2022;112(S6):S602-S614. https://doi.org/10.2105/AJPH.2021.306648)

C OVID-19 was first detected in Guatemala on March 13, 2020, 2 days after the World Health Organization declared it a pandemic.1,2 One year after the pandemic, evidence on the extent and severity of mental health conditions among health care workers (HCWs) coming from Latin American and low-and middle-income countries is scarce and limited by issues such as low response rates, nonprobabilistic samples, selection bias, and lack of prepandemic and pandemic comparisons.3,4

Guatemala's health system, with among the lowest public health investments (1% of gross domestic product) and HCW densities (12.5 per 100 000 population) in the Latin American region, had limited capacity to respond to the COVID-19 pandemic.5-7 Guatemala's category as an upper-middleincome country masks marked inequalities in income distribution and human development across the population.8,9 Multiple surges of COVID-19 cases have overburdened HCWs, and their opportunities to seek mental health services are reduced.10 There is only 1 report to our knowledge regarding Guatemalan HCWs' mental health, a government-led cross-sectional survey showing that 25% of HCWs screened positive for depressive symptoms during a peak in COVID-19 cases.11

Similar to the general population, HCWs responding to COVID-19 are exposed to multiple stressors, including lockdowns, economic instability, and uncertainty.5 Also, HCWs experience job-specific stressors such as fear of infecting themselves or their loved ones, isolation, increased workload stress, stigma, and harassment.12 Recent country-specific studies have shown that COVID-19 is already affecting the mental health of HCWs.13-16 According to a review of the literature, most HCWs had reported adverse psychological experiences during previous epidemics, and a significant subset exhibited mental health sequelae after the emergency.12 Considering all of the characteristics related to the current pandemic, including generalized lockdowns and economic effects, an understanding of the frequency and severity of mental health issues among HCWs, as well as their long-term mental health, is essential.

More research is needed to close the gap in knowledge about the mental health status of HCWs during the COVID-19 pandemic in countries with vast health inequalities (e.g., countries of the Latin American region).17 In this cross-sectional study, we analyzed baseline findings from the COVID-19 Health Care Workers Study (HEROES)Guatemala, part of a larger investigation assessing the mental health of HCWs during the COVID-19 pandemic in 26 countries.18

METHODS

We used Guatemalan baseline data collected between July and September 2020 from a multicountry prospective cohort study assessing the mental health of HCWs at baseline, 6 months, and 12 months. Participants were recruited through health care institutions and union organizations with contact information (e-mail addresses or telephone numbers) databases of affiliates or employees working in health care settings across the country. The study team contacted each entity about the study objectives, design, and procedures. After authorization had been obtained, each entity sent out online invitations to potential participants via e-mail or social media. Invitations contained information about the study objectives and informed consent along with a self-administered Web-based survey. Approximately 2 to 3 weeks after the initial invitation to participants, reminders were sent to nonresponders in an attempt to achieve a higher participation rate.

Participants

Eligible individuals included adult HCWs (aged 18 years or older) affiliated with institutions serving patients suspected of having or diagnosed with COVID-19; these individuals were contacted through entities that agreed to participate in the study. All HCWs were eligible to participate, including health care professionals, technicians, support staff, and administrative personnel. Participants did not need to be deployed as frontline COVID-19 workers to be eligible to enroll, although we targeted entities involved in the COVID-19 response. Recruitment sites included public and private health services such as clinics, health posts, health centers, and hospitals (department, national, and specialized).

Sample Size

We used a nonprobabilistic purposive sampling approach to recruit participants. We calculated our target sample size with the formula N = Za 2P(1 - P)/d.2 Following the study conducted by Lai et al., we computed a as 0.05, Za as 1.96, and a percentage of participants (P) with mental health conditions of 35% and calculated an estimated acceptable margin of error for proportion d ±3%.15 Accounting for 75% follow-up, we needed a total of at least 1423 completed questionnaires. Although this study was designed to be longitudinal, we report only on the first assessment here.

Measurements

The primary exposures were experiences with COVID-19 at work and outside work. Specifically, exposures included contact with patients with COVID-19 at work (yes, no, does not know), availability of personal protective equipment (PPE) at work (sufficient, insufficient), having a severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) test result (if available; negative, positive, unknown result), concerns about contracting COVID-19 (not worried, somewhat worried, very worried), and experiencing the death of a relative from COVID-19 (yes, no).

We also explored associations of our outcomes with sociodemographic and job characteristics and previous mental health disorders. With respect to sociodemographic and job characteristics, participants provided information about their age (continuous and 5 categories), sex (male or female), education (4 categories), and number of people living at home (total number, minors, adults older than 65 years, people with disabilities). The questionnaire also asked about the participant's job sector (private or public), job location, and occupation. Questions on previous mental health disorders focused on prior mental disorder diagnoses (yes, no, prefers not to answer) and use of psychotropic medications (yes, no, prefers not to answer).

Outcomes

We assessed mental distress via the General Health Questionnaire (GHQ12) and severity of depressive symptoms through the Patient Health Questionnaire (PHQ-9).

Developed by Goldberg in 1972, the GHQ is a widely used screening instrument for recognizing and measuring mental distress.19 The GHQ-12 is a short version comprising 12 items (6 phrased positively and 6 phrased negatively), each scored from 0 to 3. We used the 0 to 12 scale and the bimodal scoring method whereby "less than usual" and "no more than usual" are scored as 0 and "rather more than usual" and "much more than usual" are scored as 1.20 Items are summed to estimate a total score between 0 and

12. To our knowledge, there have not been previous validations of the GHQ-12 cut-off points in Guatemala. We used the standard two thirds cut-off point validated in multiple Spanish-speaking countries to classify individuals as having mental distress.20-23 Our survey's 12 items had high internal consistency, as revealed by a Cronbach a value of 0.86 (95% confidence interval [CI] = 0.85, 0.87; Appendix A, available as a supplement to the online version of this article at http://www.ajph.org).

The PHQ-9 is a 9-item self-report instrument that screens for depressive symptoms and focuses on the preceding 2 weeks.24 Items are rated on a Likert-type scale ranging from 0 (not at all) to 3 (nearly every day). Total scores range between 0 and 27. Total scores for depression are as follows: 0 to 4, minimal or none; 5 to 9, mild; 10 to 14, moderate; 15 to 19, moderately severe; and 20 to 27, severe. To our knowledge, no study has evaluated the optimal PHQ-9 cut-off points in Guatemala. As recommended in other Latin American surveys, we used a cut-off of 10 or more to classify individuals as having depressive symptoms.24-26 The 9 items in our survey had high internal consistency, as shown by the Cronbach a value of 0.90 (95% CI = 0.89, 0.91; Appendix B, available as a supplement to the online version of this article at http://www.ajph.org).

Statistical Analysis

We collected data on participants' sociodemographic and job characteristics, COVID-19 experiences, and previous mental disorders. We examined the distributions between people who did and did not complete the survey. Item mean values for both outcome scales were examined for the overall sample and selected group categories. We performed unadjusted bivariate Poisson regression analyses with robust error variance to estimate relative risks (RRs) between predictors, COVID-19 exposures, mental distress, and depressive symptoms. Multivariable Poisson regression analyses with robust error variance were used to examine relative risks between each predictor and study outcomes adjusted for age, sex, education, and occupation. The sample of completed surveys was used in both unadjusted and adjusted models. (For details on the item-scale analyses, see Appendixes A and B. Appendixes C and D, available as supplements to the online version of this article at http://www.ajph.org, show the prevalence and distribution of the 2 study outcomes across the different sociodemographic and predictors.)

We assessed study outcomes with different cut-off thresholds and COVID-related exposures (Appendix E, available as a supplement to the online version of this article at http:// www.ajph.org). We used a threshold wherein a score of 2 or above signifies risk for mental distress. This threshold has been recommended if the goal is to screen for psychiatric disorders in primary care settings. In contrast, the more stringent threshold of 3 points or above is preferred to discriminate between mood disorders and anxiety disorders.27,28 We used Stata version 14 to conduct our statistical analyses.29 Statistical significance was set at P <.05, and all tests were 2-tailed.

RESULTS

Of the 1801 individuals who agreed to participate, 1522 (84.5%) completed the online questionnaire. Table 1 shows distributions of sociodemographic characteristics, previous mental disorders, and COVID-19 experiences amongthe overall sample of participants, those who completed the survey, and those who agreed to participate but did not complete the survey. With the exception of job location, no differences were found between respondents who did and did not complete the survey.

Sociodemographic and Job Characteristics

Participants in the analytical sample (n 5 1522) were mostly aged 49 years or younger (n 5 1273; 87.2%), female (n = 1014; 66.8%), and highly educated (professional or postgraduate degree; n 5 1146; 75.3%); most worked in public health institutions (n = 1114; 73.2%), and half worked in Guatemala City (n 5 765; 50.3%). The most frequent occupations were physician (n 5 566; 37.2%) and nurse (n 5 326; 21.4%). Only 4.5% of participants (n 5 59) reported having a diagnosis of a previous mental disorder, and 6.3% (n 5 83) reported having taken psychotropic medications.

COVID-19 Experiences

Regarding COVID-19 experiences, almost two thirds of participants reported having had contact with patients diagnosed with COVID-19 in the previous week (n 5 954; 62.7%), and more than half reported insufficient PPE at work (n 5 792; 53%). Approximately three quarters reported being very worried about contracting COVID-19 (n 5 1010, 73.2%), and around a quarter reported having experienced the death of a relative from COVID-19 (n 5 141; 24.8%). Of those who reported having been tested for SARS-CoV-2 (n = 627; 41.2%), 23.3% (n 5 146) had a positive result.

Outcomes

Table 2 shows mean scores for GHQ-12 items, overall and by gender, occupation, health care sector, and whether HCWs reported having had contact with patients diagnosed with COVID-19. Positive screens for mental distress were common, with 899 (59.1%; 95% CI = 56.6, 61.5) participants scoring 3 or more on the GHQ-12. Participants' mean GHQ-12 score was 3.88 (interquartile range [IQR] 5 1-6), higherthan the cut-off for positive mental distress screening. The most common negative mood symptom was feeling under stress (mean 5 1.75). The most common positive mood symptom was being able to enjoy day-to-day activities (mean 5 1.8). Mean tests for each GHQ-12 item revealed differences within all group categories. For example, physicians reported higher distress than nurses and those employed in other occupations (e.g., administrative staff, dentists, nutritionists) on all GHQ-12 items. HCWs who reported contact with patients diagnosed with COVID-19 had higher distress scores with the exception of the usefulness, making decisions, worthlessness, and happy feelings items.

Table 3 shows means for the PHQ-9 items, also by group characteristics. Depressive symptoms were prevalent among HCWs, with 22.9% (95% CI 5 20.9, 25.2) reporting moderate, moderate to severe, or severe depression. The average PHQ-9 score for the sample overall was 6.11 (IQR 5 1 -9). The most common depressive symptom was feeling tired or having little energy (mean 5 1.17). Mean tests also revealed differences for PHQ-9 items, with the prevalence of differences being highest for occupation and contact with patients diagnosed with COVID-19.

Appendix C shows the mean values and percentages of positive mental distress (GHQ-12) and moderate to severe depressive symptoms (PHQ-9) for the total sample of participants and by each exposure. Appendix D displays the distribution of depressive symptoms by severity category for each COVID-19-related exposure. Percentages of moderate to severe depressive symptoms were higher among those who had contact with COVID-19 patients, an unknown COVID-19 test result, and insufficient PPE and those who worried about being infected with COVID-19. In contrast, percentages of moderate to severe depressive symptoms were similar among those who had and had not experienced the death of a relative from COVID-19.

Associations Between Exposures and Outcomes

Table 4 shows crude and adjusted relative risks for the associations between exposures (sociodemographic characteristics, job characteristics, and COVID-19 experiences) and mental health conditions (mental distress and depressive symptoms).

Crude relative risks for mental distress and moderate to severe depressive symptoms were higher among participants 18 to 34 years of age (vs those aged 60 years or older), those with a postgraduate degree (vs those with a high school degree), physicians (vs administrative HCWs), and those working in the public sector (vs private sector workers). After adjustment, associations of mental distress and depressive symptoms with younger age (mental distress RR 5 1.80; 95% CI 5 1.24, 2.63; depressive symptoms RR 5 4.58; 95% CI 5 1.51,13.87), holding a postgraduate degree (mental distress RR 5 1.45; 95% CI 5 1.16,1.83; depressive symptoms RR 5 2.31; 95% CI 5 1.31,4.07), being a physician (depressive symptoms RR 5 1.58; 95% CI 5 1.16, 2.16), and being a hospital technician (mental distress RR 5 1.33; 95% CI 5 1.10,1.60) were attenuated but remained significant.

Associations between mental health conditions and being 35 to 49 years old, being a hospital technician, having an unknown SARS-CoV-2 test result, having a central region job location, experiencing the death of a relative from COVID-19, and taking medication for a mental disorder moved away from the null after adjustment. No associations were found with respect to sex, private versus public health care sector, number of people living at home, job location, or mental health conditions after adjustment.

In terms of COVID-19-related experiences, crude relative risks for mental distress and moderate to severe depression were higher among participants who reported contact with patients diagnosed with COVID-19 during the preceding week, those with insufficient PPE, and those who reported feeling somewhat or very worried about acquiring COVID-19 infection. After adjustment for age, sex, education, and occupation, relative risks for mental health conditions among those who reported contact with patients with COVID-19 (mental distress RR 5 1.30; 95% CI 5 1.13,1.51; depressive symptoms RR 5 1.96; 95% CI 5 1.34, 2.87), insufficient PPE (mental distress RR 5 1.25; 95% CI 5 1.14,1.36; depressive symptoms RR 5 1.24; 95% CI 5 1.02, 1.51), and feeling somewhat or very worried about acquiring COVID-19 infection (mental distress RR = 1.47; 95% CI 5 1.30,1.66; depressive symptoms RR 5 1.51; 95% CI 5 1.17,1.96) moved toward the null but remained significantly higher than risks among those who did not report COVID-19-related experiences.

The risk of mental distress, but not depression, was lower among those with a positive SARS-CoV-2 test result (RR 5 0.82; 95% CI 5 0.69, 0.97) than among those with a negative result. Depression was associated with experiencing the death of a relative from COVID-19 (RR 5 1.49; 95% CI 5 1.09, 2.03). Finally, adjusted models showed that mental distress was associated with having a prior mental health diagnosis (RR = 1.26; 95% CI 5 1.11,1.44) and taking medication for a mental disorder (RR = 1.40; 95% CI 5 1.24,1.58). Depressive symptoms were also associated with a prior mental health diagnosis (RR 5 1.44; 95% CI 5 1.02, 2.03) and medication for a mental disorder (RR 5 1.92; 95% CI 5 1.45, 2.54).

Examinations of 2 cut-offs for classifying positive and negative cases revealed consistent associations between mental distress and COVID-19-related exposures (Appendix E). With respect to depression, mild and moderate cases were more consistent in being associated with COVID-19-related exposures.

DISCUSSION

We assessed the mental health ofa cohort of Guatemalan HCWs during the height of the COVID-19 pandemic in Guatemala. Two important findings emerged from our baseline assessment. First, mental disorder symptoms were highly prevalent among Guatemalan HCWs, with close to 60% of the participants screening positive for mental distress and 23% for moderate to severe depressive symptoms. Second, mental distress and depressive symptoms were associated with sociodemographic and job characteristics such as younger age, higher education, and being a physician, as well as COVID-19 experiences such as potential exposure to COVID-19, concerns related to COVID-19 infection, and insufficient PPE. Having a history of a mental health disorder also was associated with mental distress and depression symptoms.

Most participants in this study were young, female, highly educated, and affiliated with a public health institution. Physician, nurse, and administrative staff were among the most common professions. Our sample comprised a more diverse health care workforce, including administrators, dentists, and hospital technicians, than most studies on this topic conducted in Asia, Europe, and the United States.3'4'30-33 Moreover, whereas most studies have enrolled participants involved in the COVID-19 response at hospitals and emergency services, ours enrolled any HCW and included large and small health care facilities.

Our findings share similarities with those of systematic reviews and meta-analyses assessing the mental health of HCWs during COVID-19, despite methodological differences such as measurement scales, locations, and sampling strategies.3'4 First, our prevalence estimates were somewhat similar to those found in pooled analyses, especially for depression (with a range of 24% to 30%).3'4'31 Second, meta-analyses and systematic reviews have consistently shown that COVID-19-related exposures such as having contact with COVID-19 patients, having a COVID-19 infection, and having insufficient PPE seem to increase a broad spectrum of mental health conditions, including mental distress and depressive symptoms.4'30'32 Our findings also revealed associations between mental health conditions and COVID-19-related exposures.

Third, regarding sociodemographic characteristics, Serrano-Ripoll and colleagues' meta-analysis revealed that younger HCWs seem especially vulnerable to depression and mental distress. We also found that younger populations were at higher risk of mental health conditions. Contrary to our results showing higher risks of mental health conditions among physicians and similar risks according to sex, other studies generally reveal that nurses and female HCWs fare worse than their counterparts.4,30,32 This suggests that Guatemalan physicians may have other risk factors for mental health conditions in addition to COVID-19-related exposures. Contextual risk factors for mental health conditions such as low compensation or recognition for work during the pandemic, lack of support from government authorities, unequal allocation of resources, and nonexistence of mental health treatment options may play a role in these associations.

Studies from previous epidemics showed that HCWs with prior mental disorders were at increased risk of exhibiting severe and long-lasting mental health symptomatology during and after crises.12 Reports of having prior mental diagnoses or taking psychotropic medications were associated with mental distress and depressive symptoms among Guatemalan HCWs. Although estimates were significant, less than 7% of participants reported having a history of a mental health disorder or taking medication, a result that warrants precaution when interpreting our findings.

To our knowledge, no prior study has documented the mental health of HCWs in Guatemala; thus, we compared our findings with those of previous Guatemalan studies focusing on other populations to shed light on the burden of mental health conditions. For example, the prevalence of depressive symptoms among HCWs during the COVID-19 pandemic was 12 times that of the general population.34 Interestingly, our estimate of depressive symptoms was also 1.4 times higher than that shown among Guatemalan civil war refugees.35 Although the general and refugee populations of Guatemala do not represent an accurate comparison with HCWs working during the pandemic, they provide a reference to understand the potentially severe effects of COVID-19 on the health care workforce's mental wellbeing.

Limitations

Our results must be considered within the context of several limitations. First, we used a nonprobabilistic sampling technique for the enrollment of participants, meaning that oursample may not be representative ofthe universe of HCWs in Guatemala. However, given the pandemic's rapid evolution from week to week, the decision was made to sample HCWsviaa nonrandom approach. A comparison ofthose who did and did not complete the survey revealed that only 1 variable differed between the 2 groups. While a generalization of our results to the universe of Guatemalan HCWs may be inaccurate, our findings shed light on the pandemic's potential mental health consequences.

Second, the cross-sectional design of this initial analysis limits our ability to assess time-variant associations between exposures and outcomes. However, 1500 participants will be followed at 6 and 12 months, and we will examine associations with longitudinal data methods.

Third, given that participants were recruited through academic institutions, union organizations, and associations, we did not have access to estimates ofthe numbers of HCWs who received the invitation to participate, preventing us from calculating a response rate. However, there was an 84% survey completion rate among those who received the invitation and agreed to participate in the study.

Fourth, the screening tools and cut-off points for the GHQ-12 and PHQ-9 have not been validated for Guatemala. However, both instruments and their cut-off points have been previously validated for many Latin American countries and Spain and have shown good psychometric properties.20-26 According to our estimations, items in both scales had high internal consistency, as revealed by the Cronbach a values of 0.86 for the GHQ-12 and 0.90 for the PHQ-9

(Appendixes A and B).

Finally, despite our use of robust error variance, associations for depression models, especially the models for age categories, still showed wide 95% confidence intervals, which may indicate low precision and weak power. This limitation warrants caution when interpreting our depression results.

Public Health Implications

This report sheds light on mental health conditions and COVID-19related factors among HCWs during the pandemic in Guatemala. Our estimates ofthe prevalence of mental health conditions among HCWs were higher than previous estimates among the Guatemalan general population and civil war refugees. Our descriptions ofthe characteristics ofthe most affected groups may guide surveillance efforts and direct psychological interventions to preserve HCWs' mental well-being. Á¡PU

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CONTRIBUTORS

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CONFLICTS OF INTEREST

The authors report no conflicts of interest.

HUMAN PARTICIPANT PROTECTION

This study was approved by the Health Research Bioethics Committee ofthe Facultad de Ciencias Médicas, Universidad de San Carlos de Guatemala, and the Pan American Health Organization's Ethics Review Committee. All participants provided informed consent.

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DETAILS

Subject:	Pandemics; Heroism &heroes; Mental health; Public health; COVID-19; Severe acute respiratory syndrome coronavirus 2; Regression analysis; Regression models; Health care; Mental disorders; Questionnaires; Mental health services; Medical personnel; Mental depression; Risk; Confidence intervals; Statistical analysis; Workers; Sociodemographics; Cohort analysis; Income distribution; Gross Domestic Product--GDP; Coronaviruses; Health services; Occupational exposure; Psychological distress; Symptoms; Job characteristics
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Lessons From the COVID-19 Pandemic in Latin America: Vulnerability Leading to More Vulnerability

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ABSTRACT (ENGLISH)

The COVID-19 pandemic struck the world in 2020 and was particularly harsh in Latin America, where a combination of social disparities and vulnerabilities led to unprecedented health and economic crises.1 One remarkable impact is the exceedingly high death toll in the region, especially given the "excess mortality rate," which is probably the measure that best reflects the total numbers of direct and indirect deaths during the COVID-19 pandemic.2,3 When the pandemic hit Latin America, there was a misconception that its effect in the region would be lighter than that in Europe, considering the younger Latin American population. However, after accounting for the population age difference, the infection fatality rates were worse in Latin America and in low- and middle-income countries compared with higher-income European nations.2,4 Although age is an objective measure, different life course stressors could mean that individuals (and populations) with the same biological age will have extremely different health risks.5,6 Vulnerable individuals in low- and middleincome countries are commonly exposed to hazardous nutritional, environmental, and occupational factors and suffer from social marginalization, structural racism, and poverty. Therefore, comparing countries with large inequities with those with much less inequity based solely on age addresses the life course history and risks of populations facing COVID-19 only superficially. The implementation of social protection systems is a way to tackle vulnerabilities in the region. A governmental commitment to fiscally support such efforts and actively work with vulnerable populations to solve constraints and disparities is critical for Latin American states to adequately respond to future health crises.

FULL TEXT

The COVID-19 pandemic struck the world in 2020 and was particularly harsh in Latin America, where a combination of social disparities and vulnerabilities led to unprecedented health and economic crises.1 One remarkable impact is the exceedingly high death toll in the region, especially given the "excess mortality rate," which is probably the measure that best reflects the total numbers of direct and indirect deaths during the COVID-19 pandemic.2,3 When the pandemic hit Latin America, there was a misconception that its effect in the region would be lighter than that in Europe, considering the younger Latin American population. However, after accounting for the population age difference, the infection fatality rates were worse in Latin America and in low- and middle-income countries compared with higher-income European nations.2,4 Although age is an objective measure, different life course stressors could mean that individuals (and populations) with the same biological age will have extremely different health risks.5,6 Vulnerable individuals in low- and middleincome countries are commonly exposed to hazardous nutritional, environmental, and occupational factors and suffer from social marginalization, structural racism, and poverty. Therefore, comparing countries with large inequities with those with much less inequity based solely on age addresses the life course history and risks of populations facing COVID-19 only superficially. The implementation of social protection systems is a way to tackle vulnerabilities in the region. A governmental commitment to fiscally support such efforts and actively work with vulnerable populations to solve constraints and disparities is critical for Latin American states to adequately respond to future health crises.

Unequal health care access clearly plays an important role in the increased COVID-19 mortality rates seen in vulnerable populations.7 However, the coexistence ofthis new, unexpected pandemic and other chronic diseases, has worsened this scenario, resulting in what is referred to as a "syndemic."8,9 Poor nutritional status probably contributes to this problem10 in low- and middle-income countries, where obesity and malnutrition (both associated with COVID-19 severity) frequently coexist.11-13 As a component of social protection strategies, the transformation of health systems toward universal coverage is warranted. Additionally, a health care shift from disease treatment to health promotion and illness prevention in the near future would allow the regional states to save money that can be reinvested in implementing additional social and equitable policies.

Children and adolescents also comprise a vulnerable population that has been disproportionately affected by the COVID-19 pandemic in Latin America, and they are affected by life factors related to the disease.14-16 The United Nations Children's Fund estimates that, for nearly a year, more than 168 million children were out of school because of closures related to the COVID-19 pandemic. Two thirds of the countries where schools were fully closed during this period were located in Latin America.16 These closures affect not only learning and development but also nutrition, as many families in low- and middle-income countries rely on schools to provide daily meals to children. Expectedly, several reports have highlighted a decrease in the overall food quality among poor individuals during the pandemic,13,15,17 which may lead to increased malnutrition and childhood obesity rates, with long-lasting consequences.

Reopening schools while monitoring children's and educators' health status is an urgent need for all the countries in the region to minimize the impacts mentioned earlier. Therefore, education and health systems must work collaboratively to develop plans for a safe and healthy return to onsite schools. Moreover, future health crises such as the current pandemic may again occur; hence, governments should plan for future disruptions and invest in social programs that benefit students and the educational community.

Finally, another important lesson from the pandemic is that medical schools urgently need to improve evidencebased science and statistics education. Dangerous misinformation regarding "early treatment" for COVID-19 in Latin America was widespread18 by individuals with large communication platforms and economic conflicts of interest. Furthermore, a large portion ofthe medical community broadly adopted clinical practices that were not based on evidence, unveiling these practitioners' poor scientific backgrounds. Medical and other health sciences schools must be made aware ofthe importance of well-designed studies, notions of probability, and behavioral biases in clinical practice.

We believe that the misinformation spread is another symptom of "vulnerability leading to more vulnerability." By communicating the false idea that COVID-19 was easily treatable with drugs, millions of people were unnecessarily exposed to the virus (increasingthe transmission rate and, consequently, the total burden of COVID-19 in the region), not to mention the potential health consequences ofthe drugs themselves and the economic costs of ineffective treatments. In addition, misinformation created vaccine hesitancy in Latin America, a region that has historically had high vaccine uptake.19 The public health sector should coordinate action that focuses on training to improve communication and supporting it during health crises, which might lead to broader public trust in science and adherence to effective public health measures.

Sidebar

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We are grateful to all health care workers for their impressive efforts to tackle the COVID-19 pandemic in Latin America.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

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DETAILS

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Cancer Care Access in Chile's Vulnerable Populations During the COVID-19 Pandemic

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ABSTRACT (ENGLISH)

Objectives. To examine the COVID-19 pandemic's impact on cancer care access in Chile, analyzing differential effects by insurance type, gender, and age. Methods. We conducted a quasi-experimental study using interrupted time series analysis. We used multiple data sources for a broad evaluation of cancer-related health care utilization from January 2017 to December 2020. We fit negative binomial models by population groups for a range of services and diagnoses. Results. A sharp drop in oncology health care utilization in March was followed by a slow, incomplete recovery over 2020. Cumulative cancer-related services, diagnostic confirmations, and sick leaves were reduced by one third in 2020; the decrease was more pronounced among women and the publicly insured. Early diagnosis was missed in 5132 persons with 4 common cancers. Conclusions. The pandemic stressed the Chilean health system, decreasing access to essential services, with a profound impact on cancer care. Oncology service reductions preceded large-scale lockdowns and supply-side disruptions. Importantly, not all population groups were equally affected, with patterns suggesting that gender and socioeconomic inequalities were exacerbated. (Am J Public Health. 2022;112(S6):S591 -S601. https://doi.org/10.2105/AJPH.2021.306587)

FULL TEXT

Headnote

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Methods. We conducted a quasi-experimental study using interrupted time series analysis. We used multiple data

sources for a broad evaluation of cancer-related health care utilization from January 2017 to December 2020. We fit negative binomial models by population groups for a range of services and diagnoses.

Results. A sharp drop in oncology health care utilization in March was followed by a slow, incomplete recovery over 2020. Cumulative cancer-related services, diagnostic confirmations, and sick leaves were reduced by one third in 2020; the decrease was more pronounced among women and the publicly insured. Early diagnosis was missed in 5132 persons with 4 common cancers.

Conclusions. The pandemic stressed the Chilean health system, decreasing access to essential services, with a profound impact on cancer care. Oncology service reductions preceded large-scale lockdowns and supply-side disruptions. Importantly, not all population groups were equally affected, with patterns suggesting that gender and socioeconomic inequalities were exacerbated. (Am J Public Health. 2022;112(S6):S591 -S601. https://doi.org/10.2105/AJPH.2021.306587)

Over 1.3 million COVID-19 cases and 37 000 COVID-related deaths were confirmed in Chile by May 2021.1 The pandemic has deepened existing health inequalities, with evidence of a strong association between socioeconomic status and COVID-19-related mortality.2

Health service utilization has decreased during the pandemic, even for serious conditions. The main drivers of this trend are fear of contracting COVID-19 and disruptions caused by diversion of resources to address the pandemic.3,4 The countries most affected are those with persistent community transmission,4 such as the majority of Latin American nations, including Chile.

Cancer produces a substantial disease burden globally and is the second-leading cause of death in Chile.5 Survival outcomes remain poor, with little improvement over the last decade.6 Therefore, cancer care disruptions are worrisome, particularly in communities such as low-income groups that face access barriers.

A growing body of literature is beginning to evaluate the pandemic's impact on cancer care.3,7 A systematic review reported up to 26.3% reductions in cancer treatment and up to 30% decreases in hospitalizations compared with prepandemic figures; although there were no country restrictions, most of the studies included took place in North America and Europe, with a few from India and Indonesia.3 Breast and colorectal cancer screening rates fell by 86% to 94% in April 2020 in the United States,8 and cancer diagnoses decreased by 33% in Denmark9 by May 2020. Although this research focused on a single phase of the care continuum, it provides some evidence of an unequal impact of the pandemic, especially among disadvantaged populations.10,11 However, it is important to note that most studies to date have analyzed only the early effects of the pandemic, and few have considered later stages of the pandemic.12,13 Additionally, there is scarce evidence from Latin America,3,7 one of the regions worst hit by COVID-19.14This region suffered from highly unequal health systems15 and large gaps in cancer care access before the pandemic.16 The most recent regional studies reported 1-year comparisons, limited to a small sample of health care centers, and did not include cancer diagnoses.17,18

This study aimed to examine the impact of the SARS-COV-2 (severe acute respiratory syndrome coronavirus 2) pandemic on cancer care access, analyzing disruption of health service utilization, diagnostic confirmations, and cancer-related sick leave in Chile, a country with a highly unequal health system and low cancer care performance. This setting is comparable to the realities of other low- and middle-income countries in Latin America and other regions with scarce evidence on the impact of the pandemic on cancer care. We used several data sets to assess whether effects have varied by insurance type-a proxy of socioeconomic status in Chile-or demographic characteristics such as gender and age.

METHODS

We conducted a quasi-experimental study using an interrupted time series analysis approach to examine changes in cancer service access attributable to the pandemic, including outpatient care, laboratory and imaging tests, diagnostic confirmations, and sick leave. The next sections provide an overview of the study setting, data sources, and statistical analysis.

Study Setting

Chile has a fragmented health care system, with public and private actors serving as payers and providers. Around

78% ofthe population is enrolled in public health insurance (Fondo Nacional de Salud, or FONASA), with private insurance companies (Instituciones de Salud Previsional, or ISAPREs) covering another 17%.19 FONASA beneficiaries are mainly lowand middle-income groups, whereas ISAPRE beneficiaries tend to have a higher income.19 Hence, insurance type can be used as a proxy of socioeconomic status in the context of health care access.20

In 2005, Chile implemented a health reform known as GES (Garantías Explícitas en Salud) that ensures timely, affordable, and quality access for 80 prioritized health conditions, including several cancers.20 Case reports for these conditions are mandatory for public and private providers, but submissions were suspended during the pandemic for all but the 7 cancers included in this study.

Data

We used 3 data sets containing anonymized administrative records with national coverage for individual-level data. The digital health platform IMED shared data on outpatient services (10 873 188 individuals, 7 031 064 cancer-related service claims) and sick leaves (2 903 956 individuals, 111 758 cancer-related sick leaves) from January 1,2018 to December 31,2020. IMED handles 82.2% of private outpatient service claims for publicly and privately insured persons and 58.6% of sick leaves issued forformal workers under FONASA or ISAPREs. Further details on data coverage are available in Part 1 of the Appendix (available as a supplementto the online version ofthis article at http://www.ajph.org). We obtained other data sets from FONASA, including the GES database of confirmed cases (187 343 records) for the publicly insured population from January 1, 2017 to December 31,2020. We also used 2 aggregate data sets. The first was provided by the health regulatory agency21 and includes aggregate quarterly GES diagnostic confirmations via public and private insurers (see the Appendix, Part 2 for details), as the latter was unavailable at the individual level. Finally, because sick leave figures are applicable only to the economically active population, we used official employment data22 to explore whether changes in sick-leave patterns could be explained by unemployment levels.

We grouped the data into 3 categories:

1. oncology health services,
2. sick leaves, and
3. diagnostic confirmations.

We analyzed the pandemic's impact on each of these factors for

1. all cancers,
2. colorectal,
3. cervical,
4. stomach,
5. breast, and
6. prostate cancer.

We also assessed other cancer sites when data were available. More information on case definitions is available in Part 3 ofthe Appendix.

Statistical Analysis

Our outcome variable was the number of outpatient health services performed, diagnostic confirmations reported, and sick leaves issued per week, aggregated by service or cancer type. We fit generalized linear models with a negative binomial distribution using a log link function based on a segmented regression analysis approach23 (Appendix, Part 1). The pandemic starting date, defined as the intervention or exposure event, was March 15 (week 11), when the first public health interventions were implemented.

Our complete model included variables for time (weeks since the start of the study); a dummy variable for the pandemic period, to capture the level change immediately following pandemic onset; the interaction between pandemic and number of weeks since intervention onset (to assess the slope change following pandemic onset); gender; insurance (public or private); age by decade; and variables to adjust for seasonal trends. Because of data limitations, we used counts per quarter as outcomes and did not include gender or age when analyzing diagnostic confirmations by insurance type.

We ran separate models for the aggregated series and by cancer or service type, stratifying for gender, age, and insurance to test for heterogeneity. Models stratified by gender did not include gender-specific cancers. We also ran an aggregated model for newly issued sick leaves. More information about models and assumptions can be found in Parts 1 and 2 ofthe Appendix.

To complement our main analysis, we measured the effect of COVID-19 on formal employment, to rule out the hypothesis that changes in sick leave could be completely explained by reduced numbers of formal workers, the only group eligible for this benefit (Appendix, Part 4). We used screening test detection rates to estimate missed cancer diagnoses because of reduced screening and diagnostic capacity24-27 (Appendix, Part 5).

For all regression models, we report incidence rate ratios (IRRs), cumulative absolute (counts), and relative effects with 95% confidence intervals (CIs). Goodness-of-fit statistics are reported in Appendix, Part 6. We conducted the health service, sick-leave, and employment analyses in R 4.0.2. We performed the diagnostic confirmation analysis in Stata version 16.0 (StataCorp LP, College Station, TX). We followed the RECORD statement for reporting28 (Appendix, Part 7).

RESULTS

A significant decrease in access to outpatient services (Table 1) occurred immediately after pandemic onset (IRR 5 0.23; 95% CI =0.21,0.25), followed by a significant recovery slope over the rest ofthe year (IRR =1.05; 95% CI =1.04,1.05). The recovery in service delivery duringthe final months was insufficient to compensate for the initial loss. The abrupt reduction in cancer service utilization was related to school closures (March 16) and preceded stay-at-home mandates (March 26), supply-side interventions (April 9), and national lockdowns (May 13; Figure 1). We estimated that over 819 941 consultations, diagnostic tests, and other outpatient services were not performed in 2020 by private providers, equivalent to a 34.87% reduction from expected numbers of cancer-related services (Table 1).

Similarly, we identified a large reduction in diagnostic confirmations (Table 1) by public providers for 7 cancers immediately after initiation ofthe outbreak (IRR =0.33; 95% CI =0.29, 0.37). Even with a slow but significant recovery slope over the following weeks (IRR =1.03; 95% CI =1.02,1.03), cancer diagnoses at the end ofthe year remained below expected numbers for 2020 in a normal-year scenario. We estimated a cumulative decrease of 22 838 diagnostic confirmations, equivalent to a 34.82% reduction from expected figures (Table 1).

We found a significant decrease in cancer-related sick leaves (Table 1) attributable to the pandemic as well (IRR =0.81; 95% CI =0.73, 0.90), although the reduction was not as abrupt as that for outpatient services and diagnostics. There was no observable recovery over the year for this variable (IRR =0.99; 95% CI =0.99, 0.99). We estimated that 6071 persons in the employed population with incident cancers went undiagnosed because ofthe pandemic, equivalent to a 30.83% reduction from the expected number of cancer-related sick leaves (Table 1). The pandemic also affected formal employment, and it should be noted that sick leave after cancer diagnosis is only applicable to formal workers. However, our results cannot be completely explained by this phenomenon, suggesting that an actual reduction in access to cancer services occurred for patients in the early phases of their disease (Appendix, Part 4).

Although the peak of service reductions preceded the peak of COVID-19 cases, reactivation ofthe health care provision was closely related to reduced COVID-19 incidence (Figure 2). Interestingly, at the beginning ofthe second epidemic wave in Chile, later in 2020, service provision dropped again, reinforcing the close link between the magnitude of COVID-19 case incidence and reduction in the utilization of cancer-related health services.

Differential Impact by Population Subgroup

The impact of the pandemic on utilization of cancer-related services was heterogeneous across population subgroups (Table 1). The reduction was more pronounced among females, leading to a reduction of 43.65% (95% CI =42.92%, 44.37%), compared with 38.94% (95% CI =38.19%, 39.68%) for males. Effects on diagnostic confirmations were also greater in females (females: 38.34%, 95% CI =38.17%, 38.48%; males: 30.15%, 95% CI =9.38%, 30.75%). We found no significant differences by gender for sick-leave claims.

There were significant differences by insurance type. The publicly insured population suffered a greater impact in terms of diagnostic confirmations and cancer-related sick leaves, suggesting that the pandemic imposed steeper access barriers for lower- versus higher-income groups. The relative decrease in diagnostic confirmations amongthe publicly insured was 3 times the reduction observed for the privately insured group, for all cancer sites (Table 1). Similarly, we found a larger reduction in cancer-related sick leaves amongthe publicly insured (34.15%; 95% CI =32.77%, 35.51%) than among private insurance beneficiaries (26.85%; 95% CI =25.65%, 28.03%). Nevertheless, reductions in utilization of private outpatient services (data for public providers not available; see Methods) were greater for the privately insured, at 42.95% (95% CI =41.86%, 44.01%) versus 26.01% (95% CI = 24.44%, 27.54%; Table 1) for the publicly insured. This seemingly contradictory finding could be explained by increased demand for private care amongthe publicly Insured. We found evidence of a substantial growth in the number of publicly insured persons seeking care at private providers since the beginning of the pandemic (Appendix, Part 8).

A U-shaped effect by age was observable for outpatient health services and sick leaves, with a greater impact on the youngest and oldest age groups (Table 1). In contrast, more significant reductions in diagnostic confirmations occurred in the middle-aged population (40-60 years), with a 37.7% reduction, which suffered the highest number of missed diagnoses.

Heterogeneity Across Specific Cancers

The absolute and relative reductions in health care access by cancer type are shown in Table 2 for selected cancers (see Appendix, Part 9 for other cancer sites). The greatest impact was for cervical cancer. Cervical cancer diagnostic confirmations, including for premalignant lesions, fell by 42.84% in 2020. Rates for diagnostic tests such as Papanicolaou smear tests, colposcopies, and cervical biopsies were reduced by 33.84%, 28.30%, and 15.06%, respectively. The milder impact on biopsies compared with smear tests could suggest that low-risk individuals decreased access to screening more sharply than high-risk women, or that the health system adequately fast-tracked more severe clinical cases to biopsy. The impact on diagnostic and treatment initiation among middle-aged women (active workers) measured using sick-leave data were equivalent to a 24.63% drop.

We found that there was a minor- but still sizable and significant- pandemic-related reduction in access to diagnostic and treatment services for cancers that often have an acute clinical presentation in younger populations, such as leukemia, lymphoma, or testicular cancer. Additionally, we observed substantial differences in diagnostic changes for colorectal, cervical, and gastric cancers between publicly and privately insured populations. This unequal impact was as great as a 9-fold difference for reductions in colorectal cancer diagnoses and a 3-fold difference for stomach cancer (Table 2). Similar patterns were observable for sick leave in terms of the most markedly affected cancer types.

On the basis of the observed reduction in diagnostic and screening services, we estimated 848 breast, 300 cervical, 1784 stomach, and 2200 colorectal cancers could have been missed because of limited access to cancerscreening services in privately and publicly insured populations during 2020 (Appendix, Part 5). Considering the expected incidence for the Chilean population during 2020, we projected a 33.54% (95% CI =31.17%, 34.83%) reduction in diagnoses for these 4 cancers duringthe 2020 pandemic period.

DISCUSSION

Our study confirmed a large reduction in oncology health service utilization, diagnostic confirmations, and sick leaves because of COVID-19. The number of services not provided, a proxy of unmet need, was 33.9% to 35.8%, suggesting that a substantial number of cancer patients faced disruptions in access to essential services. The reduction in new sick leaves (related to incident cancers) was similar, at 32.1% to 34.1%, as well as the reduction in diagnostic confirmations, at 34.8%. Moreover, on the basis of GLOBOCAN's projected number of incident cancers in Chile for 2020,29 we estimated a 33.54% reduction in incident cancer diagnoses. These consistent findings underline the magnitude of the problem, which could exact long-standing effects on morbidity and mortality for cancer patients who missed timely diagnoses and early treatment. The findings are particularly worrisome in the context of a health system with low baseline levels of early detection and treatment, leading to poor cancer survival outcomes.6

In this study, oncology health service utilization dropped precipitously in the middle of March, when the first control measures were established. Interestingly, the response preceded the stayat-home mandates (March 26) and lockdowns (May 13). Furthermore, supply-side interventions (human resource diversion and surgery suspension, among others) that could reduce access to non-COVID-19 health services were implemented later, on March 24. Therefore, at least in the very early phase of the pandemic, the abrupt reduction in service utilization could be attributed largely to demand-side factors such as fear of contagion. This idea is compatible with data from Chilean surveys.30

Importantly, these data confirmed an unequal impact of the pandemic. Effects on diagnostic confirmations and sick leaves revealed a major impact on public insurance beneficiaries. The milder impact on private outpatient service utilization among the publicly insured could be a consequence of migration to private care attributable to diminished availability in the public sector. Although there was some limited migration from private to public insurance affiliation duringthe pandemic,31 our data suggest that the publicly insured also sought care in the private sector in the face of inadequate access to public providers. Decreased service availability was more pronounced in publicly insured populations, who were more likely to experience cancelled appointments compared with privately insured groups.30

Women were another group especially affected, suffering more severe reductions in cancer care access than men. This finding could be a consequence of measures adopted to control the pandemic, such as school closures, which increase caregiving responsibilities that disproportionately fall on women, combined with higher unemployment rates and greater reductions in income.32 Both mechanisms could explain decreased access to health services.

The age groups most affected by the reductions in outpatient service and sick-leave utilization were the youngest and oldest; however, the opposite occurred for diagnostic confirmations. This divergent impact could be linked to patterns of clinical presentation at diagnosis. Diagnostic confirmations for severe symptomatic cases are less prone to be disrupted, potentially explaining a more pronounced drop in diagnostic tests that did not translate into a similar effect on cancer detection in the older age group.

Our findings on the early impact of the pandemic on outpatient services are on the higher end of estimates in other contexts. For example, previous studies found that mammogram rates dropped by 32% to 98%12-17 and colonoscopies 55% to 95%12'33 in March and April 2020, whereas we identified early effects of 85.2% and 69.0%, respectively. Studies in the United States and the Netherlands found that cancer services returned to normal rates byJune or July 2020,12'13 which we did not see in our data. COVID-19 cases in Chile were at the highest levels of 2020 at that time, with lockdowns in place, unlike countries in the Northern Hemisphere, which could explain the discrepancies. The longer period of disruption in Chile compared with high-income countries suggests a greater burden from cancer in the foreseeable future.

Relatedly, we found a greater decrease in overall cancer diagnoses in the early phases of the pandemic than other studies. The average reduction between March and May was 64.8% for our publicly insured population, whereas previous analyses found effects of 24% to 51%.9-11 The same pattern was observed by cancer type. For instance, we found a greater impact for breast cancer than other reports (30%-51 % decrease in prior studies9,10 vs 61.8% in our population). The greater impact observed in Chile could be attributed to the relatively higher levels of SARS-CoV-2 transmission compared with other countries,34 producing a more profound disruption on health service access.

Strengths and Limitations

Among the strengths of our study are the consistent results obtained from multiple information sources. Furthermore, the robust empirical strategy was supported by access to individual-level data with a sample size large enough to perform subgroup analyses by cancer type, gender, insurance, and age. However, it should be noted that because the data come from administrative sources, coverage for some population groups was incomplete. In addition, because ofthe observational nature of the data, we cannot rule out significant residual confounding. Nevertheless, the consistency and robustness of our results suggest that the limitations were properly mitigated, and our conclusions are unlikely to change substantially. Our estimates of potentially missed diagnoses should be interpreted cautiously, as our cancer incidence and missed screening test figures may differ from those of population samples from previously published studies. Finally, we were not able to include data on inpatient services. This area may have suffered significant disruptions, even for previously diagnosed patients, limiting access to surgeries and other cancer therapies. Future research to analyze the impact ofthe pandemic on the continuum of care for cancer patients after diagnosis is needed.

Public Health Implications

The pandemic stressed the Chilean health care system, reducing access to cancer services. It is likely that the same issues affected other chronic diseases, with fear of contagion and resource diversion to cope with COVID-19 patients as the most likely drivers. Supply-side factors, which are potentially modifiable and could amplify inequities between population subgroups, require special consideration. We found that public insurance beneficiaries increased their utilization of private providers, incurring out-of-pocket expenses. Policy responses must address these issues, vis-a-vis ongoing efforts to mitigate the pandemic. We recommend regular surveillance of cancer and other chronic disease services disaggregated by age, gender, and insurance (or other proxies for socioeconomic status) during the pandemic. Not all groups are equally affected, and the response must take these differential consequences into account.

Developing a strategic plan for reintroducing activities for early detection of cancer should be a priority.17 Primary and specialist oncology care should be included in this effort, allocating the appropriate resources to expand capacity. Offering cancer screenings in community settings whenever possible could make these services more easily accessible to those most affected. In addition, a robust communication campaign could be implemented to address fear of contagion and provide information about the risks of delayed cancer diagnosis. In the long term, the National Cancer Control Program should consider this new public health context, providing the financing mechanisms and flexibility both to address the backlog of cancer patients and prepare for future disruptions.

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Statistical code and aggregated data used in this study are available indefinitely for anyone who wishes to access them at https://github.com/ CoV-IMPACT-C/cancer-impact-covid.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

HUMAN PARTICIPANT PROTECTION

Because we used anonymized administrative data available upon request to the responsible institutions or publicly available, we did not require institutional review board approval.

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Digital Transformation for More Equitable and Sustainable Public Health in the Age of Digital Interdependence

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ABSTRACT (ENGLISH)

This article describes 8 guiding principles for the digital transformation of the health sector and identifies their relationship with the COVID-19 pandemic, as well as highlights their importance to countries undergoing digital transformation processes. In the Region of the Americas, among other gaps, 30% of people do not have access to the Internet, which is why it is mandatory to develop policies and actions to deliver public health interventions equitably and sustainably to ensure that no one is left behind. The 8 principles focus on the 4 areas of a sustainable health system-human, social, economic, and environmental-and highlight the broader possibilities for using digital technology to have an impact on the sustainability of health systems.

FULL TEXT

Headnote

This article describes 8 guiding principles for the digital transformation of the health sector and identifies their relationship with the COVID-19 pandemic, as well as highlights their importance to countries undergoing digital transformation processes. In the Region of the Americas, among other gaps, 30% of people do not have access to the Internet, which is why it is mandatory to develop policies and actions to deliver public health interventions equitably and sustainably to ensure that no one is left behind. The 8 principles focus on the 4 areas of a sustainable health system-human, social, economic, and environmental-and highlight the broader possibilities for using digital technology to have an impact on the sustainability of health systems. (AmJ Public Health. 2022;112(S6):S621 - S624. https:// doi.org/10.2105/AJPH.2022.306749)

The current coronavirus disease 2019 (COVID-19) pandemic has exposed structural deficiencies in health, social, and economic leadership globally and especially in the World Health Organization's Region ofthe Americas, highlighting the lack of resilience of health systems and societies. In this context, information exchange and information systems have proved crucial to the delivery of care at all levels ofthe health care system: the patient, the care team, the health care organization, and the encompassing political and economic environments. Overlooked for decades, information exchange and information systems have now emerged as a cornerstone for providing universal access to health care and ensuring continuity of care, drastically changing the way we think about the delivery of health services.

A more holistic approach is needed in public health to ensure effective responses to current and new threats. Putting information systems at the center ofthe game so they act as both an orchestrator and catalyst of responses will enable us to successfully engage and have greater possibilities for dealing with health emergencies by using modern tools that complement the traditional approaches epidemiologists have used for centuries. A truly digital society can enable a remarkably better understanding of people's health through real-time epidemiological surveillance, as well as provide precise data registration and disaggregation, all without neglecting particularly vulnerable at-risk populations.

The objective of this article is to describe the 8 guiding principles for the digital transformation ofthe health sector and identify their relationship with the COVID-19 pandemic, as well as highlight their importance for countries undergoing digital transformation processes.

DIGITAL TRANSFORMATION AND PUBLIC HEALTH

Implementing digital transformation for health means standing at the vanguard ofthe age of digital interdependence. This new approach to public health is fully aligned with the United Nations Secretary-General's Roadmap for Digital Cooperation.1 This report reinforces a series of regional and global commitments made by the Pan American Health Organization, the World Health Organization, and the United Nations.2-4 Interdependence among stakeholders becomes essential in the digital age, given that no single entity has all the required knowledge, creativity, or human, financial, or technological resources.

ENSURING NO ONE IS LEFT BEHIND OR DISCONNECTED

In a region where 30% of people do not have access to the Internet, it is crucial to ensure that no one is left behind by ensuring that public health interventions are equitable and sustainable.5 The path to a truly digital society requires a sensitive balance between state-of-the-art technology and striving to connect the unconnected. It will also require global agreements on new indicators that will allow progress toward an inclusive digital transformation to be measured.6

EQUITABLE AND SUSTAINABLE DIGITAL TRANSFORMATION IN HEALTH

Frequently, those who need the most from the health system are those who have the least access to it. In digital health, this is amplified because the vulnerability of the population and their lack of connectivity usually go hand in hand, and a nonequitable approach could end up being counterproductive, pushing vulnerable populations into an even more precarious situation, thus increasing the generational, economic, and geographical gaps for entire population groups. We are proposing an equitable approach to digital inclusion that has a strong focus on connecting the 250 million unconnected inhabitants in our Region. This approach can also help accelerate the reach of universal health access and coverage through faster, cheaper, and more efficient health processes, from the use of teleconsultations in primary care facilities to the automation of drug manufacturing and the delivery and logistics of health services.

GUIDING PRINCIPLES FOR THE DIGITAL TRANSFORMATION OF HEALTH

The proposed principles focus on the 4 areas of a sustainable health system- human, social, economic, and environmental-and these highlight the broader possibilities for using the digital transformation to have an impact on the sustainability of health systems. This approach specifically focuses on building local capacity in digital public health goods and human resources through continuing professional development and local training. New societal capabilities must be developed to capitalize on the full potential of these digital tools. However, today in health informatics we lack the shared goals and common language that we take for granted in other spheres. Table 1 describes the proposed guiding principles and their relationship with the COVID-19 pandemic.7

CONCLUSIONS

The potential of the digital transformation for health during this and future public health emergencies is indisputable, yet it is essential that it is accompanied by digital inclusion and the goal of ensuring that no one is left behind. Agile digital systems are essential to facilitate cocreation and cooperation among all relevant actors regarding the development, evaluation, and safe adoption of innovative technologies. Sustainable strategies are key to strengthen information services and to ensuring the analysis of critical real-time and disaggregated data during a health emergency, especially in the areas of interoperability, data exchange, and the use of nontraditional data sources. Some challenges are associated with ensuring privacy and confidentiality, as well as the secondary use of data for which consent has not been obtained; thus, it is crucial to develop appropriate regulatory frameworks. A critical factor for success is the establishment of digital public health goods that support and promote technological development, including regulatory frameworks, to ensure an equitable distribution of these positive interventions. It is imperative to incorporate rapidly, but safely and ethically, open-source technologies to accelerate research, collaboration, and innovation in the public health sector as a whole. Finally, given current developments and looking ahead, the development of new public health digital competencies should be part of an ongoing educational strategy through continuing professional training for anyone who decides to work in this field.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

HUMAN PARTICIPANT PROTECTION

No human participant protection review was required because no human participants were involved.

Sidebar

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Perceived Effects of the COVID-19 Pandemic on Female Genital Mutilation and Child and Other Forced Marriages

Anonymous

ProQuest document link

FULL TEXT

Kenya, Uganda, Ethiopia, Senegal

Between October and December 2020, Esho et al. conducted household surveys and 38 key informant interviews with program implementers and policymakers to determine the perceived effect of the COVID-19 pandemic on female genital mutilation and cutting and child and other forced marriages in Kenya (n = 312), Uganda (n = 278), Ethiopia (n = 251), and Senegal (n = 208). The pandemic was perceived to increase the occurrence of female genital mutilation and cutting and child and other forced marriages in Kenya and Uganda, but not in Senegal and Ethiopia. The reason for this may be that the pandemic reduced the interventions of the justice system, health care system, and civil societies. Esho et al. call for innovative approaches to reduce the prevalence of female genital mutilation and cutting and child and other forced marriages during the pandemic, such as using call centers, radio talk shows, and local influencers to communicate the risk associated with such practices, even in times of pandemic.

Sidebar

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Government Patent Use to Promote Public Health in the United States: Overcoming Nonpatent Exclusivities

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ABSTRACT (ENGLISH)

The costs to public health that patented prescription drugs present are widely discussed. Patents, by design, facilitate high prices as a reward to inventors of novel products by providing a temporary right to prevent other manufacturers from copying the product. For new drugs, taxpayers or patients ultimately underwrite this reward either directly or through higher insurance costs, sometimes preventing or hindering access to life-preserving medications. Patents, however, are not the sole legal barrier to accessing these drugs in the United States. New medications are often additionally protected by nonpatent exclusivities under other statutes, such as the Hatch-Waxman Act (1984, Drug Price Competition and Patent Term Restoration Act, Pub L No. 98417). Although a statutory regime governs remedies for government use of patented medications without a patent holder's authority, the extent to which US law allows the government to deal with nonpatent exclusivities is unclear. Given that access to high-value medications is a matter of public health importance, we analyze four potential pathways that could permit government patent use for new drugs in the service of public health even before nonpatent exclusivities expire. We argue that of these options, legislative reform is arguably the most desirable long-term solution. Yet, although each of these pathways is available to meet public health needs, each involves a largely reactive intervention and confronts challenges. For this reason, it would also be beneficial to have a greater emphasis on innovation policy levers through which the government could retain greater control over resulting products' accessibility or preempt concerns about exclusivities altogether.

FULL TEXT

The costs to public health that patented prescription drugs present are widely discussed. Patents, by design, facilitate high prices as a reward to inventors of novel products by providing a temporary right to prevent other manufacturers from copying the product. For new drugs, taxpayers or patients ultimately underwrite this reward either directly or through higher insurance costs, sometimes preventing or hindering access to life-preserving medications.

Patents, however, are not the sole legal barrier to accessing these drugs in the United States. New medications are often additionally protected by nonpatent exclusivities under other statutes, such as the Hatch-Waxman Act (1984, Drug Price Competition and Patent Term Restoration Act, Pub L No. 98417). Although a statutory regime governs remedies for government use of patented medications without a patent holder's authority, the extent to which US law allows the government to deal with nonpatent exclusivities is unclear. Given that access to high-value medications is a matter of public health importance, we analyze four potential pathways that could permit government patent use for new drugs in the service of public health even before nonpatent exclusivities expire. We argue that of these options, legislative reform is arguably the most desirable long-term solution. Yet, although each of these pathways is available to meet public health needs, each involves a largely reactive intervention and confronts challenges. For this reason, it would also be beneficial to have a greater emphasis on innovation policy levers through which the government could retain greater control over resulting products' accessibility or preempt concerns about exclusivities altogether.

GOVERNMENT PATENT USE

One way to facilitate public access to high-cost medications is through government patent use.1 Given sovereign immunity-a legal doctrine immunizing the government from being sued without its consent-the federal government and its agents, such as generic drug manufacturers, have the ability to make or use patented inventions without the permission of the patent holder; in other words, protected by sovereign immunity, the federal government could use inventors' US patents without legal consequence (US patent rights do not apply overseas). In 1910, Congress sought to protect patent holders from government use without authorization, ultimately enacting 28 USC 1498. This statute allows patent holders to bring a lawsuit against the United States for "reasonable and entire compensation." Injunctions are unavailable.

Government patent use without patent holder permission was employed for military purposes in the 1950s and 1960s (e.g., for the antibiotic tetracycline). Some have suggested that this model could be more broadly applied in the civilian context for today's patented drugs (e.g., naloxone for opioid drug overdoses, or direct-acting antivirals for hepatitis C) to help lower prices and improve access. It is expected that any compensation awarded under 1498 would be lower than the prices set by drug companies.

Yet government manufacture of patented drugs without a license faces numerous potential hurdles-both legal and political. One of the greatest legal challenges is that for the newest drugs, other barriers to generic competition exist besides patents. Among these are nonpatent exclusivities that other statutes grant to drug manufacturers.

Nonpatent exclusivities include exclusivity under the Hatch-Waxman Act for new formulations of existing products (three years) or new chemical entities (five years), seven years of exclusivity under the Orphan Drug Act (1983, Pub L No. 97-414) for drugs treating rare diseases, and 12 years of exclusivity under the Biologics Price Competition and Innovation Act of 2009 for new biologic drugs.

These periods generally start at the date of Food and Drug Administration (FDA) approval of new drugs and run concurrently with any patent protection. Unlike patents, which allow patent holders to sue infringing competitors, nonpatent exclusivities prevent the FDA from receiving or approving generic or biosimilar drug applications. Although some might question whether the government must obtain FDA approval for drugs that it manufactures and distributes, this analysis proceeds on the premise that nonpatent exclusivities are potential barriers to government use.

Nonpatent exclusivities arose decades after 1498 was enacted and create uncertainty for government manufacture and procurement of new drugs. For example, after sofosbuvir (Sovaldi), an extremely effective directacting antiviral for the hepatitis C virus, was first approved in 2013, its initial price was set at $84 000 for a 12-week course of treatment. At the time, some suggested that the government could procure the medication more cheaply from a generic manufacturer and then pay only a reasonable royalty to the originator manufacturer for its infringed patents if sued under 1498. The government thereby would address a pervasive condition afflicting a large patient population for which the manufacturer's high price was blocking access. (By 2016, competition led the prices that US private payors negotiated for drugs in this class to decline by up to 85%.) Similar discussions arose after the FDA approved remdesivir (Veklury) for COVID-19 in October 2020, and the price was set at $3120 for a five-day course of therapy. (ByJanuary 2022, alternative COVID-19 medicines became available at lower costs.)

In both cases, operation of the fiveyear new drug Hatch-Waxman exclusivity was a possible sticking point if the government had decided to manufacture or procure products in the absence ofthe patent holder's authorization.

More recently, access concerns have surfaced relating to Merck's new COVID-19 antiviral drug molnupiravir, which received FDA emergency use authorization in December 2021. The US government agreed to an approximately $700 price tag despite substantial public investment in its development and a cost of production of closer to $20. Although the relevant contract limits government use of molnupiravir to the United States, Merck has taken steps to facilitate broad international access in other countries by entering into a licensing agreement with the Medicines Patent Pool. Ifit is eventually FDA approved, and if domestic access became a concern, nonpatent exclusivity likely could prove a relevant issue to any government patent use conversations.

OVERCOMING NONPATENT EXCLUSIVITIES

When negotiations for voluntary agreements fail, at least four potential strategies are available to pursue government use even before nonpatent exclusivities expire. First, nonpatent exclusivities generally prohibit the approval of competing products only if they rely on data generated by another manufacturer. Thus, the government or any third party could submit full new drug applications with original data.1,2 This strategy would not be able to circumvent Orphan Drug Act exclusivity for rare disease drugs because that act blocks the FDA from approving the "same drug" for the same disease or condition if it is a generic; however, because full trials would be needed, it might be feasible to pursue approval of a chemically distinct but therapeutically identical drug. Furthermore, most diseases of substantial enough public health importance to merit considering government patent use may be unlikely to count as "rare" under the Orphan Drug Act.

Second, many agency actions are judicially reviewable under the Administrative Procedure Act (1946, Pub L No. 79-404)-a statute that waives the federal government's sovereign immunity. Agency enforcement discretion, however, has long been considered presumptively unreviewable under the Administrative Procedure Act.3,4 Thus, the government could introduce a generic version of a drug (or contract with a third-party manufacturer to do so) without seeking FDA approval by relying on FDA enforcement discretion. The FDA has long exercised enforcement discretion in a variety of circumstances, such as when individuals import limited amounts of unapproved drugs for personal use. Although agency discretion has its limits, the Supreme Court has upheld the FDA's broad use of such discretion, and in light of this precedent an aggrieved manufacturer ofthe FDA-approved product would likely be unable to compel the FDA to act because of a presumption that agency enforcement discretion is not judicially reviewable.3,5

Third, during emergencies, the US president possesses authority under the Defense Production Act (1950, Pub L No. 81 -774) to compel owners of patents covering key treatments to prioritize and accept government contracts, such as a contract to produce and sell drugs or vaccines.6,7 Reliance on Defense Production Act authority could overcome barriers that patent and nonpatent exclusivities alike pose by directing the patent-holding entity to increase production. During the COVID-19 pandemic, for example, the Defense Production Act has been used in several ways. A priority rating for vaccine contracts with Pfizer, for instance, helped the company procure raw materials for expanded production by forcing others in the supply chain to prioritize fulfilling Pfizer's needs.

Fourth, Congress could amend the Federal Food, Drug, and Cosmetic Act (1938, Pub L No. 75-717) and the Public Health Service Act (1944, Pub L No. 78-410) to carve out exceptions to existing nonpatent exclusivities for government use.1,8 Although an exception exists for biologics the Public Health Service prepares when the biologic is unavailable from the license holder,9 this kind of authority could be expanded in terms of both to whom and to what it applies as well as under what conditions. Exceptions to intellectual property rights for purposes of public health are widely recognized in international agreements. For instance, a key global treaty on intellectual property rights, the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) as well as some US free-trade agreements,10 allow countries to provide exceptions to data exclusivity rights when necessary to protect the public. More recently, to address the COVID-19 pandemic, several countries have proposed broadly waiving certain TRIPS provisions, including protections of undisclosed data submitted to governments for the approval and marketing of pharmaceuticals. Even if such a waiver is enacted, new national legislation generally would be required for actual implementation.

Under US precedent, it is unclear whether a remedy (e.g., a reasonable royalty) for government use of data protected by nonpatent exclusivity is constitutionally required, and it likely depends on a new proposed law's specifics.11,12 Nevertheless, if Congress wanted to take a more conservative approach, it could require that the government engage in good faith negotiations with drug manufacturers before use, with some exceptions, including in cases of emergency. It could also provide a reasonable royalty to the patent holder, consistent with its obligations underTRIPS.13 Drafters of recently proposed federal legislation, the Make Medications Affordable by Preventing Pandemic Price Gouging Act of 2020, adopted a related approach.14This bill, if enacted, would have required reasonable pricing for drugs during a public health emergency and provided that if prices were "excessive," nonpatent exclusivities would be waived and nonexclusive licenses granted freely.14 Holders of a nonexclusive license, however, would have had to pay a reasonable royalty to any holder of an FDA exclusivity that was terminated.14

These four approaches involve largely (but not exclusively) post hoc interventions. None is without challenge. Collecting trial data to support a duplicative new drug application is costly, is inefficient, and raises ethical concerns for humans participating in research generating little new knowledge.1 Relying on enforcement discretion to introduce a drug without FDA approval would be a departure from the agency's standard procedures and could undermine public trust in the intervention. Defense Production Act powers apply only during emergencies and need to consider potential adverse repercussions if nonprioritized contracts are delayed. Furthermore, although it appears to retain the right to do so, the Department of Health and Human Services indicates it will not require the fulfillment of prioritized contracts if the price terms are inconsistent with those of nonprioritized contracts.15-17

Congressional action is susceptible to political headwinds. Even if enacted, reasonable pricing requirements can be difficult to define, depending on their specifics; potentially create uncertainties for manufacturers when making investment decisions; and may be challenging for an implementing agency to enforce. Regarding agency involvement, for example, "march-in rights" provisions included in the Bayh-Dole Act (1980, Pub L No. 96-517) related to government use oftaxpayer-funded health care-related inventions have lain largely dormant, and a National Institutes of Health reasonable pricing policy was, controversially, rescinded.18

It is the government's role to protect and promote public health, particularly in times of crisis. Although the government can use privately held patented inventions without permission subject to the requirement that it provide reasonable compensation, nonpatent exclusivities for drugs also potentially constrain the government's ability to address emerging threats to public health related to newly approved products. Of the four options considered, legislative reform arguably offers the most desirable solution to address accessibility issues posed by nonpatent exclusivities. It would create a longstanding resolution to the unanticipated barrier that now exists for modern government patent use and 1498. Change brought through legislative reform would be more resilient to administration changes. Ideally, It should clearly lay out expectations while being carefully crafted to address a variety of circumstances.

Yet, all pathways discussed face challenges, and their underlying mechanisms remain reactive. Therefore, the federal government should also consider prospective Interventions that promote new drug development while retaining greater control over resulting products' accessibility or preempting accessibility Issues generated by all exclusivities. Although political hurdles may exist, such proactive Interventions could avoid the limitations of the four approaches described while blunting the near-term costs to public health that patent and nonpatent exclusivities pose.

Most ambitiously, the government should consider placing greater emphasis on conducting In-house the research and manufacturing activities needed to produce Interventions most likely to be of Importance during future global pandemics. In addition to drug development, the government could Increase Investment In the platform technologies (as It did for the widely used COVID-19 vaccines) needed to allow rapid customization and deployment of Infectious disease products when urgent public health emergencies unexpectedly arise. Because private Industry Is less likely to be Interested In pursuing drugs that may be needed only In times of public health crises, the timing and nature of which are difficult to predict,19 the government could develop these products through production20 with potentially less resistance from the drug Industry. This approach permits the government Itself to obtain any patents and nonpatent exclusivity rights, circumventing these hurdles altogether.

Alternately, the US government could expand the model of advance purchase commitments for new drug development In the service of public health. Advanced purchase commitments were used, arguably effectively, for COVID-19 vaccines-broader concerns about their equitable International distribution notwithstanding. Although advance purchase commitments would require congressional funding, they are a logical extension of current government procurement practices, In which the government describes the products or services It requires and allows private contractors to fulfill those needs; Industry players presumably are unlikely to oppose greater funding to purchase their products. Commitments could be offered for needed products on prespecified price and volume terms and on the condition that defined safety, efficacy, and other criteria are satisfied. This approach would better accommodate the need for revenue predictability when Investment decisions are made.

In sum, Important new medications are often protected by not just patents, but nonpatent exclusivities. Government patent use to address pressing public health needs therefore often requires consideration of supplemental tools to meet these additional challenges for the newest medicines. If the government decides to pursue one of the alternatives we have noted (e.g., reliance on FDA enforcement discretion or legislative amendment) or to Invest more generally In Innovation and procurement strategies to address the Issue upstream, It can ensure that nonpatent exclusivities do not prevent access to products essential for public health, particularly during times of urgent need.

Sidebar

CORRESPONDENCE

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CONFLICTS OF INTEREST

The authors have no conflicts of Interest to declare.

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The Opioid Industry Documents Archive: A Living Digital Repository

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ABSTRACT (ENGLISH)

After 20 years and more than one million deaths, the overdose epidemic continues to take a major toll on communities across the United States.1 Although many drugs are implicated in the crisis, opioids have played a central role, and nearly half of opioid-related deaths between 1999 and 2019 involved prescription opioids. A number of factors have contributed to the opioid epidemic, including aggressive marketing of pharmaceutical opioids, misleading claims about their potential to cause physical dependence or opioid use disorder, and lax monitoring and control of pharmaceutical distribution and dispensing by wholesalers and pharmacies.

The magnitude of harms, as well as the role of defendants in causing them, has generated thousands of lawsuits against manufacturers, distributors, pharmacies, and others. The lawsuits argue that pharmaceutical manufacturers engaged in deceptive marketing while distributors and pharmacies failed to identify or stop suspicious shipments of controlled substances through the pharmaceutical supply chain, drivingthe opioid crisis.2 The evidence uncovered in these lawsuits has revealed startling shortcomings in how prescription opioids have been marketed, promoted, and managed throughout the pharmaceutical supply chain.

Following the precedent of state and federal litigation against the tobacco industry in the 1990s,3 recent and proposed settlements against defendants in opioid litigation, including Insys, Mallinckrodt, McKinsey, and Purdue, have included requirements that documents produced during legal discovery be made public.4To make such documents public requires a system to ingest, process, curate, and host the documents to facilitate their use and impact. We report on an undertaking by the University of California, San Francisco (UCSF) and Johns Hopkins University to consolidate these materials into a free, accessible Opioid Industry Documents Archive (OIDA). Ultimately, the archive is designed to maximize the generation of fundamental new knowledge regarding the opioid overdose epidemic that can inform policies and practice changes to prevent future harms. The archive may also serve a number of additional purposes, ranging from providing the bereaved with greater accountability to supporting historical scholarship that generates fundamental new insights regarding systematic factors that have driven the opioid epidemic.

FULL TEXT

After 20 years and more than one million deaths, the overdose epidemic continues to take a major toll on communities across the United States.1 Although many drugs are implicated in the crisis, opioids have played a central role, and nearly half of opioid-related deaths between 1999 and 2019 involved prescription opioids. A number of factors have contributed to the opioid epidemic, including aggressive marketing of pharmaceutical opioids, misleading claims about their potential to cause physical dependence or opioid use disorder, and lax monitoring and control of pharmaceutical distribution and dispensing by wholesalers and pharmacies.

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BUILDING ON TRUTH TOBACCO INDUSTRY DOCUMENTS ARCHIVE

The OIDA is the newest addition to the UCSF Industry Documents Library (IDL), a digital repository that provides access to millions of documents from the tobacco, chemical, drug, food, and fossil fuel industries. In addition to supporting in-depth explorations of specific industries, the IDL allows users to search across industries to find common threads. The IDL originated with UCSF's Truth Tobacco Industry Documents Archive, a digital portal to more than 15 million internal tobacco industry documents, with most funding supporting the archive coming directly or indirectly from litigation against the tobacco companies.

The tobacco documents reveal industry strategies to question science, cast doubt about the health harms of its products, delay public health regulation, and increase profits by marketing to targeted groups, including youths, women, African Americans, Latinx communities, and the LGBTQ (lesbian, gay, bisexual, transgender, queer) population. Scholarship usingthe Truth Tobacco Industry Documents Archive6 has driven transformative public policy governing tobacco products-most notably, state and local ordinances mandating smoke-free public spaces and workplaces7-as well as the adoption of the World Health Organization (WHO) Framework Convention on Tobacco Control, the first global health treaty negotiated under the auspices of the WHO.8

The ability to search across industries in the UCSF IDL has enabled researchers to identify links among alcohol, chemical, drug, food and drink, fossil fuel, and tobacco companies in terms of their strategies and political influence, as well as shared corporate ownership. Each ofthese industries has pursued similar efforts to undermine regulations regarding the use of unhealthy products.9-11 The opioid industry has used many of these approaches, including racially and ethnically targeted marketing.12,13 Collectively, these strategies provide compelling examples of the "commercial determinants of health"14 and highlight the often-overlooked influence of private-sector companies on population and individual health outcomes.15 The archive also builds upon growing interest in the digital humanities. Sometimes called "public humanities" or "translational humanities," it is an emerging field that is based on the application of computational methods to explore difficult-to-discern patterns, insights, or themes within large corpora of materials.16

WHAT DOES THE OPIOID INDUSTRY DOCUMENTS ARCHIVE CONTAIN?

As of May 2022, the OIDA contained 1 526 747 documents (7 842 493 pages; Table 1). With new settlements in the coming months, the archive is likely to continue to grow. Current documents have been contributed from US District Court records, several state attorneys general investigations, journalists, plaintiff and defendant exhibits and depositions, bankruptcy cases (e.g., Insys, Mallinckrodt), and legal settlements (McKinsey and Co). The collections contain e-mails, memos, presentations, sales reports, budgets, audit reports, Drug Enforcement Administration briefings, meeting agendas and minutes, expert witness reports, and depositions by pharmaceutical company executives. The exhibits in Table A and the Appendix (available as a supplement to the online version of this article at http://www.ajph.org) are examples that illustrate the range of materials in the OIDA.

WHAT QUESTIONS CAN THE ARCHIVE SUPPORT?

Appendix Table B lists questions, varied in nature and scope, that the documents from the archive can help answer. For example, materials related to pharmaceutical distributors speak to the methods that they used to monitor the opioid supply chain, and the degree to which indicators of potential high-risk opioid distribution were acted upon. Policy analyses might examine how manufacturers engaged with advocacy organizations to achieve their policy objectives and strategies that manufacturers may have used to respond to regulatory concerns regarding opioid safety. The varied nature of the documents, which include corporate e-mail chains and internal company documents in connection with brochures and pamphlets, allow researchers to compare internal marketing strategies against the claims of safety and due diligence presented to practitioners and regulatory bodies. Because the litigation also includes a focus on abatement, the documents also contain extensive information regarding howto best prevent further harms, and at what cost.

A DYNAMIC COLLECTION

The OIDA is a dynamic, growing repository that is likely to add several million documents over the next 18 months. Based on the successful tobacco model, future opioid settlements and judgements, including those arising from distributors and pharmacies rather than manufacturers alone, should make discovered materials public and support their accessibility and use in perpetuity.

As the archive expands, nonlitigation materials can also be included, some of which are already in the public domain yet difficult to identify, access, and analyze in context, such as state and national public health policies, professional society activities and guidelines, Food and Drug Administration regulatory reviews, white papers, and other gray literature. Future additions to the archive may also help to ensure awareness of how morbidity and mortality from opioid use have been intertwined with harms arising from heroin, illicit fentanyls, and other substances.17 The archive might also support the preservation of information from advocacy groups, as well as individuals and family members directly affected by the epidemic, as part of communities' efforts to preserve the history of those with lived experience of the crisis. The information the archive contains may be of interest not only to those personally affected, but also to researchers, journalists, policymakers, and the general public, as it can be used to generate fundamental new knowledge regarding the opioid epidemic that informs policies and practice changes to prevent future harms.

industry as well as plainti††s in opioid litigation, tor whom he has served as a paid expert witness; and is a past member ot OptumRx's National P&T Committee. This arrangement has been reviewed and approved byJohns Hopkins University in accordance with its conflict of interest policies. D. Ciccarone serves as a paid scientific advisor to Celero Systems and is a plainti††s expert in opioid litigation. He has served as a Special Government Employee at the behest o†the FDA on the Drug Safety and Risk Management Advisory Committee. M.A. Steinman was an unpaid expert witness in United States ofAmerica ex rel. David Franklin v Parke-Davis, Division of Warner-Lambert Company and Pfizer, Inc, and assisted in the creation o†the UCSF Drug Industry Documents Archive.

Sidebar

CORRESPONDENCE

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CONTRIBUTORS

G.C. Alexander, L.A. Mix, S. Glantz, and K. Tasker conceptualized the study. G. C. Alexander, L.A. Mix, M. Mooghali, A. Fan, S. Glantz, and K. Tasker drafted the report. Allremaining authors made substantive and iterative revisions to the draft to improve its clarity, precision, and breadth. All authors approved of the finalmanuscript version.

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CONFLICTS OF INTEREST

G. C. Alexander is past chair and a current member of the Food and Drug Administration's (FDA's) Peripheraland CentralNervous System Advisory Committee;is a co-founding principaland equity holder in Monument Analytics, a health care consultancy whose clients include the life sciences

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DETAILS

Subject:	Pharmaceutical industry; Drug stores; Narcotics; Marketing; FDA approval; Public health; Witnesses; Humanities; Pharmacy; Archives &records; Supply chains; Tobacco industry; Litigation; Epidemics; Shipments; Tobacco; False advertising; Opioids; Drug abuse; Distributors; Documents; Pharmaceuticals; Overdose; Crises; Defendants; Fatalities; Drug overdose
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Potential Impact of Telemedicine for Medication Abortion Policy and Programming Changes on

Abortion Accessibility in the United States

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ABSTRACT (ENGLISH)

Objectives. To quantify the impact of telemedicine for medication abortion (TMAB) expansion or ban removal on abortion accessibility. Methods. We included 1091 facilities from the 2018 Advancing New Standards in Reproductive Health facility database and Planned Parenthood Web site, among which 241 did not offer abortion as sites for TMAB expansion. Accessibility was defined as the proportion of reproductive-aged women living within a 30-, 60-, or 90-minute drive time from an abortion-providing facility. We calculated accessibility differences between 3 scenarios: (1) facilities offering abortion in 2018 (reference), (2) the reference scenario in addition to all facilities in states without TMAB bans (TMAB expansion), and (3) all facilities (TMAB ban removal). We also stratified by state and urban-rural status. Results. In 2018, 65%, 81%, and 89% of women lived within a 30-, 60-, or 90-minute drive time from an abortion-providing facility, respectively. Expansion and ban removal expanded abortion accessibility relative to the current accessibility scenario (range: 1.25-5.66 percentage points). Women in rural blocks experienced greater increases in accessibility than those in urban blocks. Conclusions. TMAB program and policy changes could expand abortion accessibility to an additional 3.5 million reproductive-aged women.

FULL TEXT

Headnote

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Methods. We included 1091 facilities from the 2018 Advancing New Standards in Reproductive Health facility database and Planned Parenthood Web site, among which 241 did not offer abortion as sites for TMAB expansion. Accessibility was defined as the proportion of reproductive-aged women living within a 30-, 60-, or 90-minute drive time from an abortion-providing facility. We calculated accessibility differences between 3 scenarios: (1) facilities offering abortion in 2018 (reference), (2) the reference scenario in addition to all facilities in states without TMAB bans (TMAB expansion), and (3) all facilities (TMAB ban removal). We also stratified by state and urban-rural status.

Results. In 2018, 65%, 81%, and 89% of women lived within a 30-, 60-, or 90-minute drive time from an abortion-providing facility, respectively. Expansion and ban removal expanded abortion accessibility relative to the current accessibility scenario (range: 1.25-5.66 percentage points). Women in rural blocks experienced greater increases in accessibility than those in urban blocks.

Conclusions. TMAB program and policy changes could expand abortion accessibility to an additional 3.5 million reproductive-aged women.

Public Health Implications. Our findings can inform where to invest resources to improve abortion accessibility. (Am J Public Health. 2022;112(8):1202-1211. https://doi.org/10.2105/AJPH.2022.306876)

Obtaining a wanted abortion is a determinant of psychological, physical, social, and economic well-being among US women and of social and economic well-being amongtheir children.1-9 (Not all individuals who seek abortion care identify as women. To date, much ofthe abortion literature has focused on the experience of "women." When citing past literature reported as including "women," we use that language. Similarly, the US census data we used included the population of US "women." When referring to people who received abortion care, we use the term "client.") Furthermore, abortion is legal, safe, and supported by major medical organizations.10

However, many state-level restrictions on abortion access and provision create barriers to care.11 -19 Given these barriers, measuring access to abortion care in the United States is important for public health decision making. One component of access, accessibility (defined by Penchansky and Thomas as "the relationship between the location of supply and the location of clients"20(p128)), is often operationalized as how far people are from health services, regardless of their immediate need forthose services. Studies in the United States indicate that implementation of antiabortion policies can decrease abortion accessibility.13,18

In 2008, to overcome a state-imposed physician medication abortion dispensing regulation, Planned Parenthood of the Heartland in Iowa launched a site-to-site telemedicine for medication abortion (TMAB) care delivery model. Under this model, clients visit a health center where an abortion provider is not physically present and meet with a remote clinician via videoconference. As in an in-person medication abortion visit, the clinician answers the client's questions and may watch as the client is given the first dose of abortion medication. Relative to in-person medication abortion, TMAB is equally or more safe, effective, and acceptable to clients and providers.21-23 Furthermore, in comparison with clients seen at this clinic network before TMAB implementation, those seen after implementation traveled slightly shorter distances.24

Although Planned Parenthood has expanded use of TMAB since 2008 to additional states where the service is not banned, as of 2018 nearly half of Planned Parenthood health centers did not offer any abortion services.25 Furthermore, because ofthe politicization of abortion, use of telemedicine to deliver medication abortion, including via TMAB services, has been banned in 19 US states.26 We sought to expand on the existing literature by quantifying the potential impact of TMAB expansion, or removal of TMAB bans, on abortion accessibility among all US women of reproductive age.

METHODS

Abortion-providing facility addresses were obtained from the 2018 Advancing New Standards in Reproductive Health (ANSIRH) facility database, which collected data in the same manner as previous databases.27 The database included 925 facilities operating in 2018. We excluded facilities that were not open (n 5 83). We then abstracted the addresses of all Planned Parent-hood health centers operating in 2018, both those providing abortion care and those that did not offer abortion care, from the Planned Parenthood Federation of America Web site25 (n = 600). Health centers that did not offer abortion care were included as sites to which TMAB could be expanded in the exposure scenarios described subsequently. After removing duplicate addresses (n 5 351), we included 1091 facilities.

Outcome

Abortion accessibility was operationalized as the proportion of US women 15 to 44 years of age who lived within a 30-, 60-, or 90-minute drive time of 1 or more abortion-providing facilities. The range of driving times considered here reflects differences in acceptable driving distances across the country owing to geography, rurality, or culture (e.g., abortion stigma or attitudes toward abortion). For example, 30 minutes is commonly used to define network adequacy for primary care,28 and 90 minutes may be more realistic forthose living in rural settings or preferable for abortion seekers who prefer to travel further to protect their anonymity.

Initially, we geocoded facilities' addresses using the ggmap package in R (R Foundation, Vienna, Austria).29 Before ggmap geocoding, all "&" instances were removed from addresses to improve the process.30 All addresses were successfully geocoded. Latitudes and longitudes for all addresses not geocoded at the rooftop level and a random sample of 50 addresses geocoded at the rooftop level were manually checked with GoogleMaps, and the 3 inaccuracies (none of which were geocoded at the rooftop level) were corrected and geocoding was rerun.

To calculate abortion accessibility, we used R's osrm package31 to calculate 30-, 60-, and 90-minute drive time isochrones (i.e., polygons created by connecting all points along a road network that were a 30-minute drive time from that facility) for each facility. We assumed no barriers to interstate travel, so isochrones could cross state lines. To identify the population living within a given drive time to an abortion-providing facility, we used census block shape files and block-level population data from the 2010 US census obtained via the IPUMS (Integrated Public Use Microdata Series) National Historical Geographic Information System.32 Census blocks are the smallest geographic unit used by the US census (n 5 11 078 297). For each census block, we calculated the number of women of reproductive age by summing the counts of women in age categories inclusive ofthe ages 15 through 44years. Using the sf package in R,33 we identified the intersection between census blocks and isochrones (i.e., the fraction of each census block's area included within the boundary). For each census block, we calculated the number of women 15 to 44 years of age who lived 30 minutes or less, 60 minutes or less, and 90 minutes or less from at least 1 abortion-providing facility, respectively, by multiplying the intersection fraction by the total number of women 15 to 44 years old residing in that census block (similar to the approach used by Pollini et al.34).

We then determined the fraction of reproductive-aged US women in each state and in the United States overall who lived within the drive times of interest in each of the 3 scenarios by dividing the number of women 15 to 44 years old within the specified drive time across all census blocks in the area of interest (i.e., country or state) by the total number of women 15 to 44 years old in that area. Accessibility was defined as being within a set drive time of at least 1 abortion-providing clinic (regardless of whether cross-state travel was required). Thus, women who had access only to an abortion clinic in a neighboring state contributed data to the state where they lived.

Exposures

The reference (unexposed) scenario was abortion accessibility based on the ANSIRH facility database and Planned Parenthood health centers that offered abortion care in 2018 (i.e., existing levels of provision; n 5 850), referred to as the "current" scenario. We examined 2 exposure scenarios: (1) expansion of TMAB services to all Planned Parenthood health centers that did not offer abortion in 2018 in states where TMAB was legal (programmatic change; referred to as the "TMAB expansion" scenario) and (2) removal of all state-level TMAB bans (policy change; referred to as the "TMAB ban removal" scenario).

TMAB expansion assumes that, in 2018, TMAB was expanded in states where it was legal (i.e., the current level of provision along with Planned Parenthood health centers in states that did not have a TMAB ban), for a total of 996 abortion-providing facilities. TMAB ban removal assumes that, in 2018, statelevel TMAB bans were removed so that in addition to the current level of provision, all Planned Parenthood health centers in all states offered TMAB (i.e., the TMAB expansion scenario along with all Planned Parenthood health centers in states with a TMAB ban), for a total of 1091 abortion-providing facilities (i.e., all facilities).

We used publicly available 2018 data on state TMAB bans from the Guttmacher Institute to identify facilities that met these criteria.26 In our analyses, we considered expansions of TMAB care only within the Planned Parenthood network given that site-to-site TMAB has been implemented within that network and there are many existing Planned Parenthood health centers that do not offer abortion care.

Analyses

We calculated the differences in the proportions of US women 15 to 44 years old residing within 30-, 60-, and 90-minute drive times of an abortion-providing facility, respectively, between each exposure scenario and the reference scenario. To assess effect measure modification by population density, we calculated estimates stratified by census block urban versus rural status.35 All geographies were visualized and processed via the North America Albers Equal Area Conic projection, and analyses were conducted in R version 4.0.236

RESULTS

Of the 241 health centers operating in 2018 that did not offer abortion care, 95 (39.4%) were located in states that banned TMAB services (Table 1). As shown in Figures 1 through 3 and Table 1, TMAB bans were common in states in the Southeast and the middle portions ofthe United States (Table A, available as a supplement to the online version ofthis article at https://www.ajph.org).

The drive time isochrones for all 3 drive time measures of accessibility (i.e., 30 minutes or less, 60 minutes or less, and 90 minutes or less) across the 3 provision scenarios (i.e., current, TMAB expansion, and TMAB ban removal) are depicted in Figures 1 through 3. In the United States in 2018, 65.3%, 80.5%, and 88.9% of women 15 to 44 years old lived within 30, 60, and 90 minutes of an abortion-providing facility, respectively. Under the TMAB expansion scenario, 68.3%, 82.6%, and 90.1% of women lived within a 30-, 60-, and 90-minute drive time, respectively. In the TMAB ban removal scenario, 70.9%, 84.7%, and 91.7% of women lived within a 30-, 60-, and 90-minute drive time, respectively.

Across all scenarios and drive times, a greater proportion of women living in urban census blocks than rural census blocks were within the given drive time (Table A, available as a supplement to the online version ofthis article at http://www.ajph.org). Abortion accessibility across all 3 scenarios and drive times varied widely between states and regions ofthe country (Figures 1 -3 and Table A). For example, in the TMAB expansion scenario for a 30-minute drive time, accessibility ranged from 3.9% in Wyoming to 100% in the District of Columbia.

Both TMAB expansion and ban removal resulted in expanded abortion accessibility among US women 15 to 44 years old relative to the current accessibility scenario. The smallest percentage point increase in accessibility was a 1.25 percentage point difference between the current and TMAB expansion scenarios at a 90-minute drive time, meaning that an estimated 781 556 additional US women 15 to 44 years old who did not live within a 90-minute drive time in the current scenario would live within that drive time given this programming change. The largest percentage point increase in accessibility was 5.66 for the difference between the current and TMAB ban removal scenarios at a 30-minute drive time, meaning that an estimated 3 530423 additional US women 15 to 44 years old who did not live within a 30-minute drive time of an abortion-providing facility would live within that drive time given this policy change (Table 1). Across all drive times and scenarios, women in rural census blocks had greater increases in accessibility than those in urban census blocks.

Generally, in states with TMAB bans, TMAB expansion resulted in little if any change in accessibility, and in states without TMAB bans the expansion and ban removal scenarios resulted in very similar if not the same accessibility. However, there were exceptions for specific states. For example, in Virginia, Illinois, Kentucky, and Ohio, states without bans that border states with bans, the TMAB ban removal scenario resulted in increases in 30-minute accessibility relative to the TMAB expansion scenario. Similarly, in North Dakota, Oklahoma, West Virginia, Michigan, Indiana, and Wisconsin, despite the TMAB bans in these states, the TMAB expansion scenario resulted in a 30-minute accessibility increase. In both cases, these increases that contradict the state's ban status were due to accessibility increases in nearby states with the opposite ban status (Figures 1 -3 and Table 1).

DISCUSSION

In this study, which involved the smallest geographic unit available through the US census, assumed no barriers to interstate travel, and examined a variety of potentially acceptable drive times, we found that changes to TMAB programming and policy could expand abortion accessibility in the United States. Removing all state TMAB bans and expandingTMAB services to all Planned Parenthood health centers that did not offer abortion care in 2018 would result in more than 3.5 million additional US women 15 to 44 years old living within 30 minutes of an abortion-providing facility. Our findings are consistent with results demonstrating increased access in one clinic network after the implementation of a TMAB program24 and further illustrate how TMAB could affect accessibility among all reproductive-aged women In the United States.

Although the policy and programming changes we considered would universally increase abortion accessibility, there was variation in the magnitude of the increase, with some states seeing little effect. This variation appeared to be a result of a combination of factors including current accessibility, whether the state or neighboring states have a TMAB ban, the number of health centers offering care, state size, and rural versus urban census block classification. Our findings suggest that TMAB programming or policy changes could have larger benefits for rural communities. These results are in line with a large body of research indicating that rural US residents face many health disparities relative to urban US residents, in part as a result of poor access to health care.37 Furthermore, because changes to provisions in one state can affect accessibility in another and TMAB bans are concentrated in the Southeast and middle areas of the United States, future research should estimate changes in abortion accessibility assuming policy or programming changes in only certain states or regions. Such studies would help to determine where changes could have the most dramatic impact on accessibility.

The TMAB programming expansion we considered could help ensure that a range of highly acceptable abortion provision options are accessible to abortion seekers, including those who wish to visit a clinic in person. However, even in a scenario in which all Planned Parenthood health centers offered abortion care, in some states less than half of the female population 15 to 44 years of age lived within 90 minutes of an abortion-providing facility. In other words, these changes alone do not ensure accessibility for all US women.

There is growing use ofdirect-toclient telemedicine abortion services in the United States.38 In December 2021, the Food and Drug Administration made policy changes that permanently allow for remote provision of the medication abortion drug mifepristone. As a result, direct-to-client telemedicine abortion services that arose during the COVID-19 pandemic are likely to remain available to abortion seekers in some settings. Although these services are an important addition to the abortion care provision landscape, it is vital that in-clinic options remain available for interested clients. Our study thus focused on inclinic abortion care provision. Because TMAB bans also apply to direct-to-client telemedicine models, the policy changes we considered are relevant not only for TMAB expansion but for the expansion of other telemedicine in medication abortion provision models, including those that do not require clients to visit a facility. As a result, ban removal could result in greater increases in accessibility than those reported here.

Limitations

A major limitation of our study is possible misclassification of abortion accessibility; the study is susceptible to the ecological fallacy, as a population-level measure of accessibility stands in for an individual-level measure. Our analyses assumed that women had access to a vehicle at their home location and traveled to abortion care from that location. In addition, we used 3 dichotomous drive times (30 minutes or less, 60 minutes or less, and 90 minutes or less) to represent a range of reasonable distances.

Misclassification of accessibility may also arise because we calculated accessibility using data from the ANSIRH facility database. Although the combination of the ANSIRH facility database and Planned Parenthood data represents an attempted census of abortion providers in the United States, the facility database may not be a complete census of abortion-providing facilities and could result in an undercount of facilities and, consequently, accessibility. However, because the database was constructed through Internet search terms mimicking those of people seeking services,27 we believe that our definition of accessibility closely represents the lived experience of US women of reproductive age.

Our analyses also considered only a single element of access, accessibility operationalized as driving time, which alone cannot ensure access to abortion care. Other factors that influence abortion access include hours of operation, out-of-pocket cost of care, and the cultural competency of staff and providers. Accessibility alone likely misclassifies abortion access; however, the population did not change across the 3 scenarios, and thus the estimates of percentage point changes in population access should have been unbiased.

Furthermore, in the United States, medication abortion is approved for use up to 10 weeks' gestation, although some providers offer care at later gestational ages through off-label use of the medications. Although nearly 80% of abortion care is provided at or before 9 weeks' gestation,39 our measure of accessibility was misclassified for pregnancies beyond 10 weeks' gestation. Similarly, some abortion seekers, even if within the gestational age limit for medication abortion, have contraindications for medication abortion or prefer procedural abortion and cannot or would not use medication abortion.40 Our accessibility measure was also misclassified for these individuals.

Finally, we considered only 2 changes in abortion provision scenarios, programming and policy changes that resulted in care expansions to additional Planned Parenthood health centers. Given resource constraints and laws that target abortion provision (i.e., targeted regulation of abortion provider laws), it is unlikely that one provider network would expand services so dramatically, even in response to policy changes. Furthermore, other abortion providers, including independent providers, might choose to establish additional clinics should these changes occur. Also, given the politicization of abortion in the United States, it is unlikely that all states with TMAB bans would remove these bans simultaneously.

Our analyses estimated the upper limit of expansion if only Planned Parenthood made service changes; however, other program and policy changes (e.g., clinic openings and closures) over time within and outside the Planned Parenthood system are likely and would affect the exact proportion of the population with access to abortion care. Our estimates serve as an example of how policy and program shifts could affect accessibility.

Public Health Implications

Our findings point to areas where increased abortion provision in the form of TMAB would have the greatest impact on one domain of abortion access, accessibility, as defined by the number of reproductive-aged women within a given drive time of an abortion-providing facility. These increases in accessibility could have meaningful public health effects given that obtaining wanted abortion care is a determinant of health and well-being.1-9 For abortion seekers in states with mandatory preabortion counseling or waiting periods between counseling and the abortion visit, TMAB expansion that included TMAB options for counseling (either direct to client or site to site) could further reduce barriers to care. However, even with these changes, large numbers of women would remain without adequate abortion accessibility according to our measures. Our data can be used by health care advocates and funders as they consider where to invest policy- and program-specific resources to improve abortion accessibility in the United States.

We used a broadly applicable framework to measure abortion accessibility. Our study design can easily be adapted to assess the effects of different abortion service expansions or restrictions on the same measure of accessibility. In addition, rather than the road networks used for our drive time analysis, future studies could employ public transportation networks to assess accessibility among populations without access to a car. In the future, both projections that are reactive to policy changes and those that proactively assess the effects of policy changes may be particularly useful to help determine resource and funding allocation as the abortion provision and policy landscape shifts. Furthermore, such measures of accessibility must be incorporated into future studies that consider multiple domains of access simultaneously. Doing so will help ensure that access is accurately measured and that results inform a multifaceted response to improve abortion access in the United States.

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J.W. Seymour conceptualized the study, implemented the analyses, and wrote the article. T.-A. Thompson, L.A. Wise, and A.E. Rudolph provided study oversight. D. Milechin and A.E. Rudolph supported the analyses. Allof the authors provided criticalfeedback and helped shape the research, analyses, and article.

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CONFLICTS OF INTEREST

After the completion of this study, J.W. Seymour served as a consultant to an independent US abortion provider. In this capacity, she provided technicalassistance with data analyses regarding the effects of implementation of a telemedicine for medication abortion care modelon service delivery patterns. The authors report no other conflicts of interest.

HUMAN PARTICIPANT PROTECTION

In consultation with the Boston University Medical Campus and Boston MedicalCenter institutional review board staff, it was determined that this study did not involve human participants and therefore did not require institutionalreview board oversight.

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Midwives Helping Deliver Reproductive Care in Developing Countries

Anonymous

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FULL TEXT

Indonesia

Improving maternal and child health is an important public health goal, and in developing countries with strained health care systems midwives can help deliver family planning services. Lai et al. analyzed data from 17 216 current users of modern contraceptive methods from 8 waves of the Indonesia Demographic and Health Survey. They found that midwives in Indonesia delivered contraceptives to 53% of modern method contraceptive users. Predictors of obtaining contraceptive methods from midwives were age, parity, urban versus rural location, region, education, wealth, exposure to family planning, and method type. Midwives could help reduce doctors' workload in developing countries and ensure equitable access to family planning services.

Sidebar

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Challenging Health Inequities in Tuberculosis Elimination

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ABSTRACT (ENGLISH)

Tuberculosis (TB) in correctional settings remains an unaddressed health disparity in the United States.1 Although inmates historically contribute only three to five percent of all TB cases reported in the United States, TB incidence in correctional settings is up to 10 times higherthan in the general US population.2,3 The contribution of incarceration to the perpetuation of structural racism and health disparities has been well described.4 "Structural racism" refers to the cumulative effect of racial injustice resulting from mutually reinforced discriminatory systems of housing, employment, education, media, health care, and criminal justice, among others.5 To confront structural racism in the prevention and control of TB, knowledge of the higher burden of TB in inmates is insufficient. It becomes a public health imperative to better understand the role of TB transmission within correctional settings to address existing health inequities. In this issue of AJPH, Stewart et al. (p. 1170) provide the first national survey of TB outbreaks in US state prisons, made possible through national surveillance reports enhanced with genomic analysis of Mycobacterium tuberculosis isolates from inmates. Genomic analysis provides information on the number of accumulated changes in the genetic code of M. tuberculosis isolates. An increase in genetic changes represents a decreasing likelihood that two reported cases of TB are linked through recent transmission.6 In the study, the authors reviewed both TB clusters (three or more TB cases that were likely attributable to recent transmission) and TB outbreaks (six or more TB cases likely attributable to recent transmission).

FULL TEXT

Tuberculosis (TB) in correctional settings remains an unaddressed health disparity in the United States.1 Although inmates historically contribute only three to five percent of all TB cases reported in the United States, TB incidence in correctional settings is up to 10 times higherthan in the general US population.2,3 The contribution of incarceration to the perpetuation of structural racism and health disparities has been well described.4 "Structural racism" refers to the cumulative effect of racial injustice resulting from mutually reinforced discriminatory systems of housing, employment, education, media, health care, and criminal justice, among others.5 To confront structural racism in the prevention and control of TB, knowledge ofthe higher burden of TB in inmates is insufficient. It becomes a public health imperative to better understand the role of TB transmission within correctional settings to address existing health inequities.

In this issue of AJPH, Stewart et al. (p. 1170) provide the first national survey of TB outbreaks in US state prisons, made possible through national surveillance reports enhanced with genomic analysis of Mycobacterium tuberculosis isolates from inmates. Genomic analysis provides information on the number of accumulated changes in the genetic code of M. tuberculosis isolates. An increase in genetic changes represents a decreasing likelihood that two reported cases of TB are linked through recent transmission.6 In the study, the authors reviewed both TB clusters (three or more TB cases that were likely attributable to recent transmission) and TB outbreaks (six or more TB cases likely attributable to recent transmission).

STRUCTURAL RACISM AND TUBERCULOSIS PREVENTION

The findings by Stewart et al. are both reassuring and troublesome. The positive finding was that between 2011 and 2019, TB outbreaks were rare in state prisons. Only five were identified in two states, Alabama and Texas. When reviewing for TB clusters, which could be viewed as a preoutbreak stage, two thirds of patients with TB in state prisons were likely unrelated, reflecting TB acquired elsewhere that then developed into detectable disease in prison. This is an affirmation that current TB screening policies and infection control practices are generally effective, at least in most state prisons. A troublesome finding was that one third of patients with TB in state prisons were indeed clustered or, in other words, represented likely recent person-to-person transmission events in the prisons. Clustered cases in prisons reflect systemic failures in policy and practice to protect the health of a vulnerable population from an airborne communicable disease. The additional findings that clustered patients with TB were predominantly US-born persons and more likely to be nonHispanic Black persons than nonclustered patients are sobering and support the assertion that TB transmission in correctional settings should still be viewed as a form of structural racism.7

The study by Stewart et al. improves our understanding of TB disparities in our correctional systems. Yet, many unanswered questions remain. Stewart et al. report on TB clusters and outbreaks in state prisons, which represent only a segment ofthe carceral system. In any given year, approximately 25% of patients with TB who were in a correctional facility were in state prisons at the time of diagnosis. The other 75% were in local jails, federal prisons, and a variety of other correctional institutions.2 With respect to the two types of carceral facilities with the highest TB incidence-local jails and federal prisons1,3-what data systems are in place to facilitate complete contact investigations after a diagnosed case? Partially because ofthe rapid turnover of persons in the local jails, complete contact tracing and preventive treatment follow-up have been exceedingly difficult to conduct. We lack reliable systematic data on contact investigation completion and follow-up outcomes at these types of facilities. Without complete contact investigation data to characterize linkages between previously incarcerated individuals who now are in the general community, local transmission rates for Incarcerated Individuals cannot be determined accurately. A study in Atlanta, Georgia, indicated that 43% to 46% of US-born patients with TB had a history of being in jail or prison, including 16% in the year before diagnosis.8 It is very likely that the impact of our carceral system on TB inequities is grossly underestimated. We need improved data collection, data sharing, better integration across social and public health systems, and continued studies to fill these knowledge gaps.

TUBERCULOSIS ELIMINATION AND HEALTH EQUITY

In 1984, the director of the Centers for Disease Control and Prevention, Dr. James Mason, challenged the public health community to develop a plan to eliminate TB from the United States. The TB Elimination Strategy, first issued in 1989, aimed to decrease TB incident cases to less than one per 1 000 000 population.9 In the more than three decades since its inception, marked improvement in HIV diagnosis and treatment of coinfected persons, new TB diagnostics and treatment options, as well as renewed vigor in federal funding and global support from the World Health Organization have contributed to significant strides in decreasing TB incidence in the United States. However, recent plateaus in progress indicate that we will not reach the TB elimination goal by 2035 or perhaps even in this century unless new interventions are devised.

The elusive goal ofTB elimination has fueled the public health and scientific communities to rethink strategies once again forTB prevention work. TB has long been a disease of marginalized communities, heavily tied to poverty and social and racial inequities such as those experienced by isolated immigrant communities, inmates in correctional settings, and people experiencing homelessness. Although new mathematical models are helping to redirect TB elimination efforts,10,11 the study by Stewart et al. is a critical reminder to continue to evaluate the impact of these efforts on all our structurally marginalized communities, lest the existing health disparities persist or widen. As TB becomes further concentrated into more vulnerable and harder-to-reach populations in the United States, those of us persevering in efforts toward TB elimination must not lose sight of the equally important national goal of achieving health equity. >4JPH

Sidebar

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DETAILS

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Rapid Antigen Screening of Students and Staff for SARS-CoV-2 in Rural School Districts, Pierce

County, WA, 2020

Stutman, Daniel R, MPH; Tergliafera, Julie K, MPH; Black, Morgan E, MPA; Chen, Anthony L T, MD MPH; Karnes, Lori L, BS; Turner, Nigel A, MPH; Wagner, Gregory R, BA; Thompson, Jennifer M, MPH

ProQuest document link

ABSTRACT (ENGLISH)

During fall 2020 in rural Pierce County, Washington, school districts and the county health department offered weekly rapid antigen screening to students and staff. Asymptomatic screening identified 42.5% of confirmed cases from the population. Parents reported it was a positive experience for their children. The program supported decisions to return to in-person learning, but screening ended because of resource and technical limitations. When planning in-school screening, stakeholder engagement and resource sustainability are important factors to consider. (Am J Public Health. 2022;112(8):1134-1137.

FULL TEXT

Headnote

During fall 2020 in rural Pierce County, Washington, school districts and the county health department offered weekly rapid antigen screening to students and staff. Asymptomatic screening identified 42.5% of confirmed cases from the population. Parents reported it was a positive experience for their children. The program supported decisions to return to in-person learning, but screening ended because of resource and technical limitations. When planning in-school screening, stakeholder engagement and resource sustainability are important factors to consider. (Am J Public Health. 2022;112(8):1134-1137.

In spring 2020, the State of Washington paused in-person learning in K-12 schools because of the COVID-19 pandemic. By fall, educational, social, health, and safety concerns and a lack of local data prompted a pilot for school testing and transmission to inform decision-making about returning to school.

INTERVENTION AND IMPLEMENTATION

In fall 2020, Tacoma-Pierce County Health Department (TPCHD) partnered with three rural school districts to test for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) using Abbott BinaxNOW COVID-19 Ag Card (Abbott Diagnostics Scarborough, Inc., Scarborough, ME) rapid antigen tests donated by the State of Washington Department of Health. Modeling suggests there are more surveillance benefits of rapid antigen tests than of slower conventional tests.1,2 Public health staff and contractors tested students, teachers, and staff from the three rural school districts. These health care workers collected anterior nares samples from each nostril, and results were available in 15 minutes. Those who tested positive were offered confirmation testing via onsite polymerase chain reaction (PCR) tests. Antigen-positive individuals and their close contacts were excluded from school.

Starting a month before implementation, public health staff prioritized stakeholder engagement and met with each district one to three times per week to coordinate goals, logistics, and public messaging. Public messaging about screening was provided to local communities through school districts and local news. At the encouragement of school district leadership, TPCHD hosted public forums so families and staff could voice concerns and receive information about the screening model. The health officer and TPCHD staff addressed concerns empathetically and directly. Questions focused on the safety oftesting in schools, the reliability of results, the safety of in-person learning, logistics, and COVID-19.

Screening took place over three weeks. Participants consented using paper forms, and we verified identities before collection. Pierce County hired more than 60 contractors to conduct the pilot, including testing site staff. During the pilot, to understand community perceptions about screening, districts distributed separate online surveys for staff and faculty and for parents and guardians. After screening concluded, we matched testing records, demographic data, and geographic data from district rosters with TPCHD case data to assess participation, retention, and case rates.

PLACE, TIME, AND PERSONS

We offered three rural school districts In Pierce County, Washington, weekly antigen screening at schools in November and December 2020 of students, teachers, and staff served or employed by the districts. Participation was voluntary and we obtained consent before testing. Symptomatic participants were uncommon because testing occurred at schools where those with symptoms were excluded from in-person learning. The student population included kindergarten through 12th grade (K-12) students residing in or near the district's geographic borders. Students in the three districts were 75% to 82% White, 9% to 12% Hispanic/Latino, 6% to 11% two or more races, and less than 5% any other race. Low-income students comprised 20%, 28%, and 43% of students in each district, respectively, according to the Office of the Superintendent of Public Instruction.

PURPOSE

Local elected officials expressed concerns about students' declining mental health and rural families' physical and economic barriers to accessing testing services. They felt students struggled with distance learning during the COVID-19 pandemic, but logistical and safety questions remained among many school leaders, parents, and staff. Setting public health policy requires balancing the educational and social needs of students, balancing the health of students and staff, and controlling community spread of disease. In response, TPCHD piloted a screening program to gather data in support of local policy development for safe K-12 in-person learning. At that time, there were no similar efforts in Washington State K-12 schools.

EVALUATION AND ADVERSE EFFECTS

Participation and retention among students and staff differed by district and corresponded to the level of in-person learning at the time. Of 14867 individuals, 4019 students and staff registered for screening, with 4012 (99.8%) testing at least once. Highest participation occurred in the district that produced and distributed a video of local students taking the test (Table 1).

We registered 9884 antigen tests: 28 (0.3%) resulted positive, 9753 (98.7%) resulted negative, 23 (0.2%) refused at point of care, and 80 (0.8%) were inconclusive. All antigen-positive individuals agreed to confirmatory PCR tests. We confirmed 19 (67.9%) antigen-positive tests with PCR collected onsite.

We computed crude, age-adjusted, and community rates of COVID-19 per person-year. Crude case rates include all students and staff identified from district-provided potential participation lists regardless of whether testing occurred at schools or in communities. After age adjustment, districts B and C approached the community rates corresponding to their district geographic regions. We calculated community rates from mandatory reporting to the department. District A had the lowest proportion of eligible individuals tested, potentially resulting in selection bias in results.

In participating districts, we confirmed 40 cases. Screening identified 17 asymptomatic cases (Table 1). District C had the largest proportion (66.7%) of asymptomatic cases and the highest participation and retention rates. District A, with limited onsite learning and few community testing sites, had the lowest participation (12.3%) and retention rates (30.9%). The higher age-adjusted rate may indicate that accessibility is an added value of in-school testing for this community. Low positivity rate found by this screening model increased local decision-maker confidence and supported policies to expand in-person learning.

During one week of the program, the health department opened a survey to all parents in the three districts. We asked parents who consented to their child's participation to explain what worked well and what could be improved. All parents were asked ifthe testing program changed their feelings about in-person schooling during winter 2021. Process questions were open response, and questions regarding changing feelings used a 5-point Likert scale.

Parent and guardian survey results reflected the success of stakeholder engagement done before pilot testing. In district C, with the highest participation and retention rates, almost 24% of parents said their child's experience was positive in open-response questions. Some parents (32.7%) agreed that screening changed their minds about in-person learning. Of those who agreed, 58% wanted their child tested at school. The remainder chose other reasons or did not provide a reason, and 19% of parent survey respondents said result notification time could be improved. The use of paper forms slowed notifications.

SUSTAINABILITY

Although asymptomatic screening identified 42.5% of the known cases in this population and stakeholder support was high, the program could not be sustained in its implemented form owing to resource constraints. Districts were unable to access the required volume of tests and staff without help from TPCHD. Because of federal funding structures, TPCHD could not pay for the contractors and test kits outright.

Paper forms increased staffing needs while also increasing notification time. We explored digital reporting and found it would have required increased staff capabilities, costs, and planning time to implement. Subsequent changes in regulations (i.e., medically authorized staff no longer required for antigen collection) and technology (i.e., efficient digital reporting solutions) have streamlined several ofthe bottlenecks identified.

PUBLIC HEALTH SIGNIFICANCE

As children commonly experience mild tono symptoms,3,4 asymptomatic screening is likely an important intervention to reduce SARS-CoV-2 spread in schools5 and increase the safety of in-person K-12 school instruction and extracurricular activities, when deployed in conjunction with recommended school mitigation measures.6 Although schools may employ multiple mitigation measures to reduce in-school spread, asymptomatic cases can spur outbreaks, resulting in large numbers of quarantines, school closures, and vulnerable individuals being exposed. Regular asymptomatic screening can identify SARS-CoV-2-infected individuals7 missed by symptom screening or attestations, perhaps reducing introduction and spread in the school setting. With increased transmissibility of the subsequent viral variants,8,9 screening may be more valuable to maintain safe inperson learning. However, we must consider potential resource constraints for screening models in rural school districts. For school districts considering regular in-school screening programs, adequate preparation, stakeholder engagement, and sustainable funding are critical. AJPH

Sidebar

ABOUT THE AUTHORS

All authors were with the Tacoma-Pierce County Health Department, Tacoma, WA, at the time of the program.

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CONTRIBUTORS

D. R. Stutman designed and performed analyses of participation and case rates. D.R. Stutman and J.K. Tergliafera contributed significantly to drafting and revising the article. J. K. Tergliafera designed the survey tooland analyzed the survey answers. M. E. Black, G. R. Wagner, andJ. M. Thompson drafted sections ofthe article. M. E. Black and J. M. Thompson contributed to the concept and design of the program. A. L-T. Chen contributed substantially to the conceptualization, design, and implementation ofthe research project and approved the finalversion of the article. L. L. Karnes developed testing plans with school districts, met with and engaged stakeholders, and established and modified testing process and methods as needed during the testing model. N. A. Turner provided input on study design and results interpretation. G. R. Wagner contributed to the concept and design ofthe testing pilot. J.M. Thompson compiled the sections ofthe article. All authors reviewed and revised the article.

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CONFLICTS OF INTEREST

A.L-T. Chen has long-term stock holdings in Abbott, the manufacturer ofthe BinaxNOW tests used in this testing model. We have no other potential or actual conflicts ofinterest to disclose.

HUMAN PARTICIPANT PROTECTION

We are a local public health department and were responding to a declared public health emergency. We took steps to protect the privacy of participants in accordance with their Health Insurance Portability and Accountability Act rights. We obtained written consent for all participants and parents.

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Reproductive Justice Matters: A Public Health of Consequence, August 2022

Kapadia, Farzana, PhD, MPH [1] [1] the deputy editor of the AJPH and is an associate professor of epidemiology at the School of Global Public Health, New York University, New York

ProQuest document link

ABSTRACT (ENGLISH)

At this critical moment, with the Supreme Court's ruling on Dobbs vJackson Women's Health Organization overturning 50 years of a constitutional right to abortion care, reaffirming our commitment to reproductive justice is imperative. Since Roe v. Wade was decided in 1973 and then Planned Parenthood v. Casey (505 US 833) in 1992, a long, steady, and calculated stream of attacks on women's legal right to abortion has been waged by conservative legislatures at state and federal levels, culminating in the overturning of Roe v Wade. REPRODUCTIVE HEALTH AND HEALTH CARE Unlike other high-income countries that have invested in maternal and child care as well as comprehensive reproductive and sexual health care, the US health care system has failed to provide women adequate and appropriate health care. [...]according to a recent March of Dimes survey, 34.8% (1095/3139) of counties in the United States are maternity care deserts-where timely access to quality pre- and postnatal care is unavailable or cost prohibitive (https://bit.ly/3LCbS63). In Georgia, implementation of a 22-week gestational age limit on abortion decreased access to abortion services in Georgia as well as in neighboring states.6 With the US Supreme Court's decision to strike down Roe v Wade on June 24, 2022, nine states have already banned abortion care (i.e., Alabama, Arkansas, Kentucky, Louisiana, Missouri, Oklahoma, South Dakota, Utah, and Wisconsin). (https://bit. ly/3NvNhkI).

FULL TEXT

In the summer of 1994, a group of 12 Black women convened a meeting in Chicago, Illinois, to discuss the reproductive healthcare needs of Black and Brown women as well as the disparities in care that were being ignored in discussions of health care reform. The group named itselfthe Women of African Descent for Reproductive Justice1 and drafted a new framework-the Reproductive Justice framework- grounded in an intersectional approach and a human rights framework. Published in a full-page ad in the Washington Post on August 16,1994, the new Reproductive Justice framework called for broader recognition of contraception and abortion not only as key components of reproductive health but also as critical to ensuring reproductive autonomy and self-determination.

The Reproductive Justice framework called for women to have the right to

1.decide if and when she will have a baby and the conditions under which she will give birth,
2.decide if she will not have a baby and her options for preventing or ending a pregnancy, and
3.parent the children she already has with the necessary social supports in safe environments and healthy communities and without fear of violence from individuals or the government.

Atthis critical moment, with the Supreme Court's ruling on Dobbs vJackson Women's Health Organization overturning 50 years of a constitutional right to abortion care, reaffirming our commitment to reproductive justice is imperative. Since Roe v. Wade was decided in 1973 and then Planned Parenthood v. Casey (505 US 833) in 1992, a long, steady, and calculated stream of attacks on women's legal right to abortion has been waged by conservative legislatures at state and federal levels, culminating in the overturning of Roe v Wade. Yet these attacks on abortion care and reproductive justice, both in the United States and across the world, have not stopped and will not stop women from seeking or obtaining abortions. Rather, these attacks have undermined the health and well-being of women, children, and families as well as the economic, political, and social fabric of our society. The social, economic, and health-related evidence ofthese realworld impacts is ignored in the majority opinion of the six conservative Supreme Court justices who overruled Roe v Wade and, for that matter, in most legislation that seeks to limit access to safe abortion. Continuing to ignore the depth and breadth of health-related harms that women, children, and families will face by restricting abortion access will undermine the essential tenets of the reproductive justice framework. Here, we employ a reproductive justice lens to understand how curtailing access to abortion will ultimately undermine efforts to achieve health equity.

REPRODUCTIVE HEALTH AND HEALTH CARE

Unlike other high-income countries that have invested in maternal and child care as well as comprehensive reproductive and sexual health care, the US health care system has failed to provide women adequate and appropriate health care. The most glaring indicator of this failure is the 2020 maternal mortality rate of 23.8 per 100,000-the highest maternal mortality rate among all high-income countries.2 In the United States, the maternal mortality rate among Black mothers is almost three times higher that of White mothers: 55.3 deaths for every 100 000 live births among Black women compared with 19.1 deaths per 100 000 births among White women.2 Factors underlying this racial and ethnic disparity include lack of adequate and culturally competent pre- and postnatal care as well as poor quality of care for handling complications that develop or worsen during pregnancy. In fact, according to a recent March of Dimes survey, 34.8% (1095/3139) of counties in the United States are maternity care deserts-where timely access to quality pre- and postnatal care is unavailable or cost prohibitive (https://bit.ly/3LCbS63).

Another potential driver of the heightened maternal mortality rate in the United States is restrictive abortion policies. As shown by Vilda and colleagues, states with more restrictive abortion policies-particularly ones where the only health care professional allowed to perform an abortion is a board-certified obstetriciangynecologist-are likely to see higher maternal mortality.3

In addtion, a study conducted in Wisconsin found that 91% of physicians believed that overturning Roe v. Wade (410 US 113 [1973]) would worsen health care for women.4 Similarly, the overwhelming majority of physicians in this study were worried that overturning Roe v. Wade would make it difficult to provide good reproductive health care for women. In states with abortion restrictions and policies that allow civil lawsuits against any clinician providing support to a woman seeking an abortion, recruiting and hiring physicians-not just obstetrician-gynecologists but also primary care physicians-will become harder. And this loss will hit states where the medical and health care infrastructure is already woefully inadequate to meet the needs of women.

ABORTION RIGHTS ACROSS THE UNITED STATES

The health status of women, children, and their families is, on average, worse among those residing in rural areas than among those residing in urban areas. Underinvestment in health care infrastructure coupled with higher unemployment, lower educational attainment, and greater concentrated poverty are all drivers of the poor population health status for women and children. For women and children of color in rural areas, these health outcomes are starker, and health disparities even more pronounced. What does this have to do with abortion rights? Against the backdrop of these already existing sociostructural disparities, states with larger rural populations have enacted some of the harshest abortion restrictions and bans. In Ohio, more than 15 abortion-restricting laws became effective between 2010 and 2018.5 Women living in rural counties were hit hardest by Ohio's new abortion laws and experienced greater delays in abortion care and declines in abortions. In Georgia, implementation of a 22-week gestational age limit on abortion decreased access to abortion services in Georgia as well as in neighboring states.6 With the US Supreme Court's decision to strike down Roe v Wade on June 24, 2022, nine states have already banned abortion care (i.e., Alabama, Arkansas, Kentucky, Louisiana, Missouri, Oklahoma, South Dakota, Utah, and Wisconsin). (https://bit. ly/3NvNhkl).

These wide-sweeping abortion bans and further restrictions will result in severe consequences for the health and well-being ofthe more than 30 million women of reproductive age who live in these states. Women and families in rural areas, those living in poverty or on the margins of poverty, and women of color are likely to further lose whatever tenuous access to abortion care they currently have (https://nyti.ms/3a9BsCl). Medication abortion via telemedicine could expand access to abortion services for women in rural areas, as reported in this issue of AJPH by Seymour et al. (p. 1202). However, this would necessitate overturning laws restricting telemedicine provision, which in the current political climate is unlikely to happen. Recognizing the deleterious effect of this loss on such a significant portion of our populations is a clarion call for protecting the right to abortion care.

SAFE ENVIRONMENTS FOR FAMILIES

"There is no such thing as a singleissue struggle because we do not live single-issue lives."

-Audre Lourde

Reflecting on this powerful quote by Audre Lorde, the loss of abortion rights will auger a cascade of harmful outcomes that will take generations to undo. A recent study by Foster et al. showed that women are more likely to live in poverty after being denied abortion.7 This is a setback for women and a harsh lived reality that is compounded by being less likely to find full-time employment and therefore being more likely to require public assistance. These economic setbacks described by Foster et al. are inextricably tied to greater food insecurity for families, greater likelihood of delayed or missed preventive health care for adults and children, housing insecurity, poor educational outcomes for children, damaged relationship quality, and poorer parenting ability. The layering of social and structural disadvantages is not a negligible occurrence for women denied abortions or for their families. Rather, it undermines the very fundamental social determinants of health and well-being that affect population health. These compounded disadvantages perpetuate and deepen health disparities for women, particularly women living in poverty and women of color, who bear the disproportionate burdens of abortion restrictions.

At this writing, the overturning of Roe v Wade after 50 years of having the Constitutional right to abortion care has become a rallying cry for advocates of reproductive justice. The stakes are high: access to safe abortions as part of comprehensive, holistic, and culturally competent sexual and reproductive health care hangs in the balance for more than 30 million women. The right to such care, in conjunction with economic, social, and political power, will improve the health and well-being of women, their children, their families, and their communities. Abortion rights, as part of the reproductive justice framework, must be recognized as human rights and must be recognized regardless of which political party is in power and at every level of government. yflPU

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Social Vulnerability and Safe Building Recertification Violations in Miami, Florida, 2013–2018

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ABSTRACT (ENGLISH)

Objectives. To determine whether an association exists between Social Vulnerability Index (SVI) scores and 40-year recertification violation within the City of Miami, Florida. Methods. A cross-sectional, observational secondary data analysis of social and housing vulnerability, including the Centers for Disease Control and Prevention's SVI overall themes, estimated median year a housing unit was built, and 40-year recertification code violation data. We conducted the study using data sets from 2013 to 2018 at the census tract level in response to the collapse of Champlain Tower South in Surfside, Florida. Results. Every 1-unit increase in a census tract's SVI score yielded a 21-fold increase in the odds of being a census tract with high 40-year recertification violations. Census tracts within the third quartile for SVI scores had approximately 9 times the odds, and tracts within the fourth quartile had 11 times the odds of being tracts with high 40-year recertification violations. Conclusions. Findings demonstrate that inequitable conditions exist among the City of Miami's most socially vulnerable residents, through greater exposure to risky housing environments. (Am J Public Health. 2022;112(8):1217-1220. https://doi.org/10.2105/AJPH.2022.306890)

FULL TEXT

Headnote

Objectives. To determine whether an association exists between Social Vulnerability Index (SVI) scores and 40-year recertification violation within the City of Miami, Florida.

Methods. A cross-sectional, observational secondary data analysis of social and housing vulnerability, including the Centers for Disease Control and Prevention's SVI overall themes, estimated median year a housing unit was built, and 40-year recertification code violation data. We conducted the study using data sets from 2013 to 2018 at the census tract level in response to the collapse of Champlain Tower South in Surfside, Florida.

Results. Every 1-unit increase in a census tract's SVI score yielded a 21-fold increase in the odds of being a census tract with high 40-year recertification violations. Census tracts within the third quartile for SVI scores had approximately 9 times the odds, and tracts within the fourth quartile had 11 times the odds of being tracts with high 40-year recertification violations.

Conclusions. Findings demonstrate that inequitable conditions exist among the City of Miami's most socially vulnerable residents, through greater exposure to risky housing environments. (Am J Public Health. 2022;112(8):1217-1220. https://doi.org/10.2105/AJPH.2022.306890)

Champlain Towers South, in Surfside, Florida, made global headlines as a catastrophe rarely witnessed in the developed world, when the building partially collapsed on June 24, 2021, killing 98 people.1 Preliminary reports point to a combination of poor design, construction, leadership, and maintenance.1 The events prompted calls for building code reform and scrutiny of the 40-year recertification process required by Miami-Dade County, which the building was in the process of completing at the time of the collapse.1 The 40-year recertification process requires all aging buildings, except single-family homes, duplexes, and minor structures, to undergo reinspection after 40 years, and every 10 years thereafter.2 Recertification exists to confirm that buildings are safe for continued use and to mitigate disasters. In communities where vulnerability is high, however, preventing these occurrences and dealing with the aftermath present additional challenges.3,4The capacity to identify these communities is available through the Centers for Disease Control and Prevention (CDC)/Agency for Toxic Substances and Disease Registry (ATSDR) Social Vulnerability Index (SVI), which evaluates risk factors that might affect a community's ability to respond to external stressors like the Surfside tragedy.3 Taking into account recent events, exploration of linkages between the SVI and housing quality, as measured by violations of failingto complete 40-year recertification, might be used to identify areas of the City of Miami with particular vulnerability to hazardous housing conditions and impaired capacity for emergency preparedness.

METHODS

To determine whether an association exists between higher SVI and higher 40-year recertification violations, we conducted a cross-sectional, observational secondary data analysis of measures from the 95 census tracts within the City of Miami. We used census tract data from the CDC/ATSDR's SVI,5 parcel data aggregated to the census tract level from the Florida Department of Revenue real property roll,6 and building code violation folio data aggregated to the census tract level from the City of Miami Building Department.7 Our study population consisted of the 95 census tracts contained within the City of Miami.

Measures

Our measures of social and housingvulnerability included SVI themes overall, estimated median year a housing unit was built, and 40-year recertification code violation data. SVI themes overall indicates the relative vulnerability of census tracts in terms of 15 indicators categorized by 4 themes: socioeconomic status, household composition and disability, minority status and language, and household type and transportation.3 We used census tract-level data available in the 2018 SVI data sets to analyze information relevant to data collection years across folio and parcel data. We also created a dichotomous high-low SVI variable by splitting SVI themes overall at its median. The estimated median year a housing unit was built consists of the median year housing units were constructed within census tracts.6 The 40-year recertification process involves building owners receiving a Notice of Required

Inspection, giving them 90 days to hire a registered engineer or architect to examine the building and submit a report.2 A 40-year recertification violation consists of a property failing to obtain the required 40-year recertification as established by the City of Miami Building Code.2 We calculated the percentage of folios with recertification violations in each census tract to compute our 40-year recertification violation variable. We also dichotomized the 40-year recertification violation variable into high and low by splitting it at its median.

Analysis

We performed statistical analyses using SPSS version 27.0 (IBM Corp, Armonk, NY). Statistical significance was defined as P< .05. For bivariate analyses, we analyzed census tracts' average SVI scores, average estimated median year a property was developed, and average percentage of 40-year recertification violation scores between high and low 40-year recertification violations via independent sample ttests. To determine an association between SVI quartile and high or low 40-year recertification violations, we used Pearson's x2 2-tailed tests. We included variables associated with high and low 40-year recertification violations at the P <.05 level in a logistic regression model. The variables included in the final models were (1) SVI and 40-year recertification violations and (2) SVI quartiles and 40-year recertification violations. Using ArcGIS 2.8 (Esri, Redlands, CA), we developed a choropleth map to demonstrate the spatial distribution of SVI and 40-year recertification violations among census tracts.

RESULTS

Our analysis involved the 95 census tracts of the City of Miami. The average SVI score for the census tracts was 0.73 (SD 5 0.29). The average percentage of 40-year recertification violations was 44.28% (SD 5 17.08). The average estimated median year a housing unit was built was 1969 (SD 5 17.66). When we compared high and low 40-year recertification violation tracts, tracts with high rates of recertification violations had significantly higher SVI scores (0.84, on a scale of 0 to 1; SD 5 0.24) than low tracts (0.62; SD 5 0.30; P <.001) and significantly higher 40-year recertification violations (57.63%; SD 5 9.94%) than low tracts (30.66%; SD 5 10.93%; P <.001). There was no significant difference in average estimated median year built. Additionally, when considering SVI quartiles, we found that higher quartile SVI scores were more likely to correspond with high 40-year recertification violations (P <.001). In logistic regression analysis, every 1-unit increase in a census tract's SVI score yielded a 21-fold increase in the odds of being a census tract with high 40-year recertification violations (odds ratio [OR] 5 20.52; 95% confidence interval [CI] 5 3.63,116.20). Additionally, census tracts within the third quartile for SVI scores had approximately 9 times the odds (OR 5 8.50; 95% CI 5 2.29, 31.55) and tracts within the fourth quartile had 11 times the odds (OR 5 10.77; 95% CI 5 2.77, 41.75) of being tracts with high 40-year recertification violations (Table 1). The choropleth map confirms that census tracts with high SVI scores overlapped with census tracts with high percentages of 40-year recertification violations (Figure A, available as a supplement to the onlineversion of this article at http://www.ajph.org).

DISCUSSION

Natural and anthropogenic hazards are not distributed randomly across communities.8 Communities with higher social vulnerability experience greater concentrations and magnitudes of environmental hazards.8 Findings from our study indicate that census tracts with higher SVI scores are more likely to be census tracts with increased amounts of 40-year recertification violations. Given the additive effect of increasing SVI within tracts, residents of census tracts identified as particularly vulnerable disproportionately appear to be exposed to risky housing environments. In addition to increased exposure to risks, communities experiencing higher levels of social vulnerability have reduced abilities to recover from disasters.9 The survivors of the Champlain Towers South collapse continue their journeys of managing life and property loss and acquiring new housing. When communities with higher and lower social vulnerability experience equivalent damage and loss, the communities with higher social vulnerability have a more difficult and slower recovery time than other communities, exacerbating inequities.9

Research addressing social vulnerability has found associations between higher social vulnerability and property destruction and loss,9-11 extreme heat exposure,9 fire outbreaks,9 and physical hazards.9,10 Associations have also been found between lower social vulnerability and healthier built environments.12 Our research aligns with past findings, and it expands the existing body of research by addressing social vulnerability and risky housing structures, as operationalized by SVI and 40-year recertification violations.

PUBLIC HEALTH IMPLICATIONS

Difficult lessons have been learned in the aftermath of the Champlain Towers South collapse. Given the ways in which hazard exposure, structural vulnerability, and social vulnerability overlap,11 and considering the ways in which communities experiencing such conditions tend to have fewer social, political, and economic resources to ameliorate the consequences of natural and anthropogenic disasters,8 ample opportunities exist for policymakers and building code enforcement to identify and assist vulnerable communities in cases of unsafe housing structures.

To prevent future tragedies, our findings identify census tracts particularly vulnerable to exposure to risky housing environments. Policies that strictly enforce code compliance and penalize violators could improve inequitable exposures to hazardous housing conditions among populations with greater social vulnerability. To keep responses to 40-year recertification notifications prompt, code compliance officials could inform residents and homeowner associations of 40-year rectification violation reports, rather than only notifying boards of directors.

Sidebar

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CONTRIBUTORS

T. L. Hollar and A. Ferreira de Melo conceptualized the study. A. Ferreira de Melo led the procurement of data, and K. Maitland assisted with the procurement of data. T. L. Hollar performed the data analysis. T. L. Hollar, A. Ferreira de Melo, K. Maitland, and S. Cuenca wrote the manuscript. E. Chung created the choropleth map. All of the authors assisted with revisions.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

HUMAN PARTICIPANT PROTECTION

The institutional review board of Nova Southeastern University designated this study as non-human participant research.

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"Tell Me, Who's That They're Letting Down?": COVID-19 and the Working Class

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ABSTRACT (ENGLISH)

During the early weeks of the second wave of the 1918 influenza pandemic, the Courier-Citizen described the effects the pandemic had on the city of Lowell, Massachusetts, the birthplace of the US Industrial Revolution and home to a diverse and often class-conscious population of immigrant workers: Industry during the three weeks of the epidemic was badly hurt. Our munitions plants caught the tendency early in the epidemic . . . they were unable to keep anywhere near a full working crew on the job. In the cotton mills the same situation had to be contended with.1(p1). Another article described the work of Lowell nurses during the pandemic. For one nurse-Mrs. Chase-in addition to caring for sick patients, this work also involved making "daily rounds with her car delivering nourishment to the required family from the public kitchens."2(p5) As the paper noted, there was an "urgent need of every hand that can be procured to assist the labors of these sadly overworked women."2(p5). Both in terms of facing the disease's health consequences and fighting those consequences, working people were on the front lines of the 1918 influenza pandemic.

FULL TEXT

During the early weeks of the second wave of the 1918 influenza pandemic, the Courier-Citizen described the effects the pandemic had on the city of Lowell, Massachusetts, the birthplace of the US Industrial Revolution and home to a diverse and often classconscious population of immigrant workers:

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Another article described the work of Lowell nurses during the pandemic. For one nurse-Mrs. Chase-in addition to caring for sick patients, this work also involved making "daily rounds with her car delivering nourishment to the required family from the public kitchens."2(p5) As the paper noted, there was an "urgent need of every hand that can be procured to assist the labors of these sadly overworked women."2(p5)

Both in terms of facing the disease's health consequences and fighting those consequences, working people were on the front lines of the 1918 influenza pandemic.

COVID-19 OUTBREAKS AMONG WORKERS

As highlighted by Heinzerling et al. in this issue of AJPH (p. 1180), more than a century later, this situation has not changed. In their article, they record nearly 20 000 reported workplace outbreaks of COVID-19 in the state of California between January 2020 and August 2021. These outbreaks resulted in more than 300 000 cases of the disease. As the authors acknowledge, these numbers are likely underestimates of the true extent ofthe problem. Reporting outbreaks was only required for non-health care facilities starting in January 2021. Before that period, rules for reporting were determined by local jurisdictions. In addition, even with reporting requirements, many workplaces will likely be noncompliant, resulting in underreporting, a frequent problem in occupational health surveillance. Furthermore, these data predate the Omicron wave, which brought the highest case counts ofthe pandemic. Finally, these cases only represent the workers who were infected. In many cases, these workers likely exposed household members.

The article provides indispensable information about industries most impacted by these outbreaks. Nearly half of all reported outbreaks occurred within the health care and social assistance industry. However, even within the health care and social assistance industry sector, the risk of outbreak varied substantially. Remarkably, skilled nursing facilities experienced more than one outbreak per establishment on average. Residential care facilities and community food and housing, emergency services, and hospitals also had very high numbers of outbreaks per establishment.

The risk of outbreaks was, of course, not contained solely within the health care and social assistance industry. There was also a higher number of outbreaks among workers in the food, education, retail (especially grocery stores), and construction industries. All of these industries contain workers performing the essential services that society relies on.

As the authors also highlight, the burden of these outbreaks did not fall on all workers equally. As previous research has shown,3 many essential industries disproportionately employ workers of color. In the Heinzerling etal. study, this fact is reflected in Latino workers comprising a disproportionate share of cases in a number of high-risk industries. In the absence of denominator data about the number of workers in these industries by race/ethnicity, these data should be interpreted with care. However, even with race/ethnicity data missing in many instances, ofthe 21 industry sectors analyzed, Latino workers comprised more than 50% of outbreak-associated cases in six of these industries, despite comprising less than 40% of the California population. The authors point to the manufacturing, retail, accommodation and food services, and transportation and warehousing industries as having both a high number of outbreaks and a high percentage of Latino workers. Other research in California has highlighted how, even when the distribution of workers by occupation is taken into account, workers of color still had elevated rates of excess mortality during the pandemic compared with White workers in the same occupations.4

WHAT WE KNOW ABOUT COVID-19 AND WORK

The article by Heinzerling et al. is a comprehensive and timely addition to the literature about both the impact that the COVID-19 pandemic has had on workers and the role that workplace transmission has played in the spread of the virus. This literature has revealed how early cases of COVID-19 were frequently tied to workplace exposure,5 how workers in high-risk industries and occupations bore a disproportionate share ofthe burden of COVID-19,4,6 how this burden contributed to racial/ ethnic disparities in COVID-19,3 and how the mental strain ofthe pandemic on workers, especially those in health care, is having further negative health consequences.7

In the early days ofthe pandemic, there was often lack of recognition about the role of workplace exposure as an important contributor to the spread of COVID-19. This lack of recognition was seen most acutely in the initial reluctance to focus on the role of airborne transmissions ofthe virus. Through much of 2020, workplaces focused on individual behavioral changes like handwashing at the cost of systematic solutions that would have been more effective like improved ventilation. The evidence is now clear that there is widespread workplace transmission of COVID-19 and that this transmission contributes to community risks for the disease. Now the question is what to do with that evidence. The fact is that the COVID-19 pandemic was not a health crisis that created worker vulnerability but rather that this vulnerability has been growing for decades, and the stress ofthe pandemic revealed the true extent ofthe problem.

THE CHANGING NATURE OF WORK AND COVID-19

Many workers, including those most affected by the present pandemic, have been increasingly marginalized, and their jobs have become less secure.8 The rise ofthe "gig economy" and other forms of insecure employment has meant that many workers no longer have the same guarantees of employment that they did in the past. In the context of COVID-19, this insecurity can mean that workers feel compelled to work even when they may be sick or may want to avoid exposure to protect themselves or household members. At the same time, compensation to workers has stagnated, even in those industries that we now recognize-even though they always have been-as essential.9 The decline in unions has meant that fewer workers are part of these valuable organization that once allowed negotiations for more secure and well-compensated employment.10 Such unions could have compelled management to intervene to protect workers, like meat processing workers, who suffered an extremely high risk of contracting COVID-19.

These changes in the workplace have benefited a small class of people who can profit from more malleable and cheaper employment. These same people have often seen their profits grow rapidly duringthe COVID-19 pandemic.11 Even in the health care industry, much of which is nonprofit and should theoretically be more immune from the compulsion to squeeze workers for all they are worth, we still see an increasingly marginalized and vulnerable workforce.12

WHAT CAN BE DONE

There are many actions that can be taken to protect workers-from new labor protection standards and more enforcement of existing standards to engineering controls in the workplace, like better ventilation. Unfortunately, even a supremely sensible step to protect workers and the public, like paid sick leave, which was briefly implemented duringthe pandemic, has been rolled back. Not having paid sick leave-in addition to other leave policies provided by almost all other countries, like parental leave-available for everyone forces workers to choose between protecting themselves and caring for their family and losing their livelihood.

At the same time, there is a need for integrating occupational information into public health surveillance systems. Work plays a fundamental role as determinant of innumerable health outcomes in addition to COVID-19. Having, at the very least, data about industry and occupation in all health surveillance systems will make it possible for more studies like the one by Heinzerling et al. so that we can better understand how workers can be protected.

We are seeing workers beginning to solve these problems on their own terms. Workers at workplaces where there have been many health and safety concerns even before the COVID-19 pandemic, like Amazon Warehouse, have seen increasing pushes for unionization. The successful unionization of a Staten Island warehouse shows that these efforts can be successful. However, one wonders, if a global pandemic that killed thousands of vulnerable workers is not enough to encourage the government to fully protect working people-what will be?

Sidebar

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DETAILS

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Improving National Public Health Data Collection as an Act of Antiracism

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ABSTRACT (ENGLISH)

Two months after COVID-19 was declared a pandemic in the United States, George Floyd was murdered. Just after the announcement of the 1 000 000000th death from COVID-19 in the United States, a gunman killed 10 Black people in a Buffalo, New York, grocery store in a racially motivated act of domestic terrorism. The murder of George Floyd, the murders in Buffalo, and the distribution of infection and death from the pandemic make manifest the toll of racism in the United States. In response, individuals and institutions have made commitments to counteract racism. It is past time to move from solidarity to action. The findings of Aliseda-Alonso et al. (presented in this issue of AJPH; p. 1161) indicate that deaths from COVID-19 far exceed 1 000 000 000, with communities of color bearing an unrecognized extra toll in addition to previously well-documented disparities. Latinos and Blacks not only have suffered a disproportionate burden of infection and mortality but also were more likely to die younger than their non-Latino White counterparts. During the first wave of the pandemic, for example, approximately one third of COVID-19 deaths among non-Whites occurred among individuals younger than 65 years, compared with only 13% among non-Latino Whites,1 and this pattern persisted through 2020.2 All-cause excess mortality that year increased for all racial and ethnic groups but was much worse among Latinos (53.6%) and non-Latino Blacks (34.6%) than among non-Latino Whites (11.9%).

FULL TEXT

Two months after COVID-19 was declared a pandemic in the United States, George Floyd was murdered. Just after the announcement of the 1 000 000000th death from COVID-19 in the United States, a gunman killed 10 Black people in a Buffalo, New York, grocery store in a racially motivated act of domestic terrorism. The murder of George Floyd, the murders in Buffalo, and the distribution of infection and death from the pandemic make manifest the toll of racism in the United States. In response, individuals and institutions have made commitments to counteract racism. It is past time to move from solidarity to action.

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Latinos and Blacks not only have suffered a disproportionate burden of infection and mortality but also were more likely to die younger than their non-Latino White counterparts. During the first wave of the pandemic, for example, approximately one third of COVID-19 deaths among non-Whites occurred among individuals younger than 65 years, compared with only 13% among non-Latino Whites,1 and this pattern persisted through 2020.2 All-cause excess mortality that year increased for all racial and ethnic groups but was much worse among Latinos (53.6%) and non-Latino Blacks (34.6%) than among non-Latino Whites (11.9%).3

It is alarming that these profound disparities may be worse than we thought. In their study, Aliseda-Alonso et al. compared publicly available surveillance data from the Centers for Disease Control and Prevention (CDC)to data on COVID-19 cases and deaths from state and territorial governmental sources; they found that the CDC consistently underreports the cases and deaths of Blacks and Latinos as well as people younger than 65 years. These findings justify investment in a reliable national data-monitoring system with standardized data reporting for key variables.

WHY IMPROVE DATA COLLECTION

Systematic bias in the reporting of demographic data is harmful because data drive investment and policy. Appropriate allocation of resources for the hardest hit communities relies on accurate data to track pandemic trends and concentrate investments in primary and secondary prevention, ongoing scientific inquiry, and community reinvestment.

Despite COVID-19 fatigue, the pandemic is not over. Infection and hospitalization are increasing because of waning immunity and relaxed prevention measures. Accurate testing and treatment data inform where testing should be offered, hospital planning, and continued funding for test and treat efforts if the burden persists in low-income communities, where rates of uninsurance and other health care access obstacles are prevalent.

The COVID-19 pandemic is ongoing, and its aftereffects will continue for decades; secondary prevention is vital for preventing harms to physical health, mental health, and the economy. It is estimated that up to 30% of people who recover from COVID-19 may develop persistent symptoms ("long COVID")45 Mental health problems related to COVID-19 are the subject of consternation and considerable media coverage and include posttraumatic stress disorder among those hospitalized with COVID-19 and depression and anxiety in people whose loved one has died of COVID-19. In addition, the financial harms from economic slowdown, lost wages because of illness or death, and lost potential among youths whose education was disrupted by the pandemic will radiate from the COVID-19 sufferer totheirfamiliesand ultimately their communities. Given the disproportionate impact of COVID-19 in communities of color, it is likely that the most affected bythe long-term effects of COVID-19 will be the uninsured or underinsured, who will have high out-of-pocket costs for long-term physical and mental COVID-19 care afterthe expiration of the Coronavirus Aid, Relief, and Economic Security Act (Pub L No. 116-136).

The work of Aliseda-Alonso et al. also highlights the importance of data in scientific inquiry. Accurate reporting of the proportionate burden ofCOVID-19 by race and ethnicity is important for researchers to ensure that emerging data on COVID-19 are representative of the affected population and for inclusive study design. Ongoing scientific inquiry must include communities that have suffered and continue to suffer the greatest rates of and harms from COVID-19. Many questions remain unanswered. What conditions allowed COVID-19 to flourish? What does recovery from

COVID-19 at all levels look like? What does equitable participation in clinical trials look like?

Investment in communities to facilitate pandemic recovery should be guided by residents of the most affected communities. Investment must be paired with evaluation in an iterative process of community engagement, program and policy implementation, and program and policy improvement. Successes in some hyperlocal COVID-19 response efforts have again demonstrated the benefit of community engagement and responsiveness. CommuniVax was a national, multisite rapid ethnographic research project with the aims of(1) advancing awareness of, access to, and acceptability and uptake of COVID-19 vaccines among Black and Latino communities; and (2) accelerating the development of local public health governance systems in which marginalized populations can exercise collective agency over their health and wellness. Black and Latino community members participated in CommuniVax in six communities across the United States and expressed what they wanted for their community so it could emerge from the pandemic stronger and more resilient. Two recommendations distilled from dozens of individual interviews and other qualitative methods were to "Rebuild the public health infrastructure, properly staffing it for community engagement" and "Stabilize the community health system as the backbone for equity and resilience."6

HOW TO IMPROVE DATA COLLECTION

Three requisites of an improved national data collection system are suggested by the findings of Aliseda-Alonso et al.: standardization, interoperability, and accountability. The authors had to reconcile 402 unique combinations of sociodemographic data to create a nationallevel data set; 402 combinations is unreasonable and unworkable. States need to receive a template for collecting and reporting a manageable and sufficient number of sociodemographic variables to accompany essential health outcome data. States would not be precluded from collecting additional data of regional importance. Why not use the US census questions as the basis for the template? Any template will have critics, but the status quo prevents us from addressing disparities.

Standardizing data collection and reporting is necessary, but not sufficient, for interoperability-the ability of the US health system's many sectors to easily exchange information to benefit clinical, public health, and research efforts. The decentralized, fractured nature of the US health system increases the challenge of interoperability. A wide variety of data sources will be required, including, but not limited to, public health surveillance data, clinical data from public and private health systems, death certificates, claims, and administrative and survey data. The Office of the National Coordinator for Health Information Technology has created an Interoperability Standards Advisory process to provide information regarding standards needed for interoperability, although without the authority to require implementation or adoption.7 In a 2020 report, interoperability between health systems in the United States was reported to be improving, albeit slowly; it is concentrated in cities, is highly variable, and is associated with health system size.8 In Iran, Shanbehzadeh et al. consulted the literature and convened experts to create a COVID-19 minimum data set and interoperable reporting framework to support their nation's public health pandemic response.9

Following the implementation of a standardized, interoperable data collection system, states must be held accountable for data reporting. The Ryan White program provides a model.10 The federal government disburses money to states for the care of persons living with HIV or AIDS. States must report data regarding program participants and the use of funds to maintain funding. Another example is the system ofvalue-based payments, one version of which requires health systems to report quality metrics to avoid hefty penalties and be eligible for incentive payments.11 Finally, the US census again comes to mind. Although the work of maximizing census participation is distributed, states have a vested interest in census completion rates, as they determine congressional representation and federal funding.

A CALL TO ACTION

Standardizing local health-reporting systems, creating a national-level interoperable data system, and holding states financially accountable for reporting data are acts of antiracism whose time has come. ÂfW

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Assessing the Impact of Vaccine Lotteries on COVID-19 Vaccination Rates in the United States in 2021

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ABSTRACT (ENGLISH)

We assessed the impact of COVID-19 vaccine lottery programs on COVID-19 vaccination coverage using Centers for Disease Control and Prevention-reported first-dose vaccination administration rates for the population aged 18 years and older for 19 states that adopted lottery-based incentive programs. We did not find evidence of increased first-dose vaccination rates following lottery announcements across participating states and, therefore, find little justification for the use of COVID-19 vaccination lotteries to increase vaccination rates.

FULL TEXT

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As COVID-19 first-dose vaccination rates slowed in the late spring of 2021, several US states launched cash lottery programs to incentivize vaccine uptake. As COVID-19 continues to be a global public health challenge, and as public health officials continue their efforts to support routine vaccinations, understanding the impact of these lotteries, as well as other incentives, is critical to effective public health policy and program design.

INTERVENTION AND IMPLEMENTATION

For much of the past two years, our team has focused on ensuring that as many residents of Connecticut as possible receive a COVID-19 vaccine. Like nearly every other state in the country, in April 2021, the dynamics of our

COVID-19 vaccine program changed: for the first time since vaccines were introduced, supply outpaced demand. The urgency of building demand for vaccines and continuing to address access barriers became our primary concern. As part of this effort, we closely observed the national interest in incentives and, specifically, states utilizing large-scale cash lotteries to encourage vaccination. During this time, we conducted an analysis based on Centers for Disease Control and Prevention (CDC) data to discern whether lotteries were encouraging vaccinations. This analysis has been updated and is presented here.

PLACE, TIME, AND PERSONS

On May 12, 2021, Ohio announced the first lottery program to incentivize COVID-19 vaccine uptake. Ohio offered five, $1-million prizes to individuals aged 18 years and older who had received at least one vaccine dose and entered the drawing either online or by phone; separately, Ohio gave away five state scholarships to adolescents aged 12 to 17 years under the same guidelines.1

Ohio's announcement garnered national media attention, and Arkansas, California, Colorado, Delaware, Maryland, New York, and Oregon subsequently announced similar programs in late May. These, as well as additional lottery programs in June and July, may have been influenced by early reports2 that Ohio's vaccination rates increased substantially week-over-week following the lottery announcement.

PURPOSE

The initial launch ofthe Ohio lottery coincided with the expanded age indication for those aged 12 to 15 years (May 13, 2021) and CDC changes to masking guidance for vaccinated individuals (May 13, 2021); these and other structural factors may have contributed to the perceived "lottery bump." Indeed, previous work3,4 has cast doubt on the effectiveness of Ohio's lottery, as well as of vaccine lotteries broadly. Here, we offer a more specific look at the impact of lotteries on state vaccination rates.

By comparing trends in vaccination in the periods before and after the announcement of a lottery in each individual state, we investigated the unique impact that a lottery announcement had on state vaccination rates. Because these lottery announcements were spaced out over time, the broader trends driving vaccination rates, such as changing public health guidance, expansion of age eligibility, or trends in vaccine hesitancy, were mitigated in our analysis, and the effect of the lottery announcements was isolated as our subject of analysis.

To assess the impact ofthese vaccine lotteries, we analyzed CDC first-dose vaccination data for individuals aged 18 years and older, both to exclude the impact of vaccinations on individuals aged 12 to 15 years as they became newly eligible and because the states had inconsistent policies for the prizes for children aged younger than 18 years. Our analysis included the 19 states identified previously3 as offering cash or in-kind lotteries (full list in Table A, available asa supplement to the online version ofthis article at https://ajph.org).

EVALUATION AND ADVERSE EFFECTS

For an initial view of lottery impact on vaccination rates within each state (i.e., as a result of different-sized hesitant populations), we compared the vaccination rates in the three weeks following the lottery announcement with the state's vaccination rate for the two weeks before the lottery announcement. Our analysis does not regard lotteries successful if they arrest or reverse trends in declining vaccination rates; rather, we seek to observe whether there are incremental vaccinations that can be attributed to lottery states subsequent to announcement (even if overall trends continue to decline). To account for these factors, we compared the change in vaccination rates within lottery states to the change in vaccination rates for the rest of the United States (i.e., excluding the 19 lottery states) over each of the relevant time periods. This final measure of lottery impact is represented in terms of aggregate impact on the first-dose coverage rate for the population aged 18 years and older.

We chose the window of analysis because three weeks generally covered at minimum the first round of selection of winners. We evaluated the sensitivity ofthis analysis to other control and effect periods with similar results (Table A). We express the output figures in terms of the aggregate impact on the first-dose vaccination coverage rate for the population aged 18 years and older.

Table 1 presents this analysis for the "early adopter" May announcement states. Of the early lottery states, only Ohio increased its vaccination coverage relative to the rest of the United States, and only by 0.2% of the population aged 18 years and older, considerably within the bounds of the 2.1 % standard deviation in percent change of vaccinations observed across all states over this period. More broadly, only Ohio, Arkansas, and New York demonstrated increased coverage at the third week mark or later versus the rest of the United States, and only marginally (Table A). Overall, lottery states underperformed the rest of the United States by 0.6% coverage of the population aged 18 years or older in the three weeks after announcement versus the two-week preceding baseline. It is possible that either the lotteries did not move a meaningful number of individuals to receive a COVID-19 vaccine or that the lotteries did encourage some vaccinations that were ultimately offset by other individuals for whom the lotteries had a negative impact on vaccine acceptance. In addition, other states and private institutions offered more targeted incentives; it is possible that these were more effective strategies, contributing to the aggregate underperformance ofthe lottery states as these sorts of initiatives were crowded out. Overall, our analysis does not support the idea that lotteries themselves drove incremental vaccinations at the population level when compared with national performance.

SUSTAINABILITY

We did not find evidence that lotteries systematically increased first-dose vaccination rates in the population aged 18 years or older. Furthermore, the public health impact ofthese programs may prove to be worth neither the cost nor the negative externalities associated with gambling-related activities.

We also have concerns about the precedents that such lotteries set for other vaccination and public health efforts. COVID-19 is one of several lifesaving vaccines that we want adults and children to receive. We must focus not just on ensuring COVID-19 vaccine coverage but also on ensuring that children catch up on routine vaccines- some ofwhich were missed duringthe COVID-19 pandemic, presentingyet another threat to lives and livelihoods yet to emerge. As an alternative to lotteries, our state pursued a more targeted and modest set of incentive programs and redoubled efforts to tap into peer-to-peer and trusted messenger activation and engagement.

PUBLIC HEALTH SIGNIFICANCE

Continued efforts to encourage vaccination amongthe remaining unvaccinated population are essential to achieving and maintaining herd immunity levels of coverage and protecting the population against the continued threat of COVID-19. We recognize that this is a preliminary analysis, and we urge the continued use of more detailed and rigorous methods to continue to elucidate the impact of these lotteries (particularly with regard to the impact of lotteries on more "vaccinehesitant" populations).

We hope that by sharing this analysis, we can not only encourage further research into this important topic but also encourage other states to thoughtfully consider how to best deploy their vaccine incentives in a way that will not only encourage vaccination but also serve their broader public health, economic, and equity goals. ÂfPU

Sidebar

ABOUT THE AUTHORS

Jeffrey Sload ¡s a fellow at the Connecticut Department of Public Health in Hartford. Benjamin Bechtolsheim is director of the COVID-19 Vaccination Program at the Connecticut Department of Public Health. Deidre Gifford is the acting commissioner of the Department of Public Health and the commissioner of the Department of Social Services in Hartford.

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J. Sload conducted the analysis and led the writing of the article. B. Bechtolsheim provided guidance on the analysis

and assisted with writing and revision. D. Gifford provided guidance on the analysis and writing of the article.

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The Missing COVID-19 Demographic Data: A Statewide Analysis of COVID-19–Related Demographic Data From Local Government Sources and a Comparison With Federal Public Surveillance Data

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ABSTRACT (ENGLISH)

Objectives. To collect and standardize COVID-19 demographic data published by local public-facing Web sites and analyze how this information differs from Centers for Disease Control and Prevention (CDC) public surveillance data. Methods. We aggregated and standardized COVID-19 data on cases and deaths by age, gender, race, and ethnicity from US state and territorial governmental sources between May 24 and June 4, 2021. We describe the standardization process and compare it with the CDC's process for public surveillance data. Results. As of June 2021, the CDC's public demographic data set included 80.9% of total cases and 46.7% of total deaths reported by states, with significant variation across jurisdictions. Relative to state and territorial data sources, the CDC consistently underreports cases and deaths among African American and Hispanic or Latino individuals and overreports deaths among people older than 65 years and White individuals. Conclusions. Differences exist in amounts of data included and demographic composition between the CDC's public surveillance data and state and territory reporting, with large heterogeneity across jurisdictions. A lack of standardization and reporting mechanisms limits the production of complete realtime demographic data. (AmJ Public Health. 2022;112(8):1161-1169. https://doi.org/10.2105/ AJPH.2022.306892)

FULL TEXT

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Methods. We aggregated and standardized COVID-19 data on cases and deaths by age, gender, race, and ethnicity from US state and territorial governmental sources between May 24 and June 4, 2021. We describe the standardization process and compare it with the CDC's process for public surveillance data.

Results. As of June 2021, the CDC's public demographic data set included 80.9% of total cases and 46.7% of total deaths reported by states, with significant variation across jurisdictions. Relative to state and territorial data sources, the CDC consistently underreports cases and deaths among African American and Hispanic or Latino individuals and overreports deaths among people older than 65 years and White individuals.

Conclusions. Differences exist in amounts of data included and demographic composition between the CDC's public surveillance data and state and territory reporting, with large heterogeneity across jurisdictions. A lack of standardization and reporting mechanisms limits the production of complete realtime demographic data. (AmJ Public Health. 2022;112(8):1161-1169. https://doi.org/10.2105/ AJPH.2022.306892)

The impact of the COVID-19 pandemic in the United States has not been equal across different demographic groups. Multiple studies have shown that US racial and ethnic minority populations have a proportionally higher number of COVID-19 cases,1,2 higher mortality rates,3-6 and lower access to testing.7,8 Also, studies from other countries have shown that although the prevalence of COVID-19 is similar between males and females, males have higher mortality rates.9-11 Advanced age is a significant risk factor for severe illness and death, with adults older than 65 years accounting for 75% of all COVID-19 deaths in the United States.12

Most epidemiological studies of demographic characteristics of cases, hospitalizations, and deaths rely on data from death certificates3 or specific populations from metropolitan areas,1,5,7 hospitals and health systems with highquality data,4,9 or data from foreign countries.10,11,13 These data sources are informative but incomplete. They may be limited to specific populations, may lack subnational representativeness, and may not be updated rapidly enough to adopt mitigation measures in specific populations.14

At the state and local levels, hospitals, health care providers, and laboratories report individualized data to health departments through a mandatory process known as "case reporting."15 Using case reports, local health departments have created public-facing dashboards, data repositories, or Web sites with COVID-19 aggregated counts and demographic data. However, all publicfacing dashboards are different, varying considerably in the availability and presentation of data. Therefore, comparing and tracking these data require that they be collected from different sites, organized, standardized, and concentrated in a single data repository.

By contrast, the US Centers for Disease Control and Prevention (CDC) collects deidentified patient-level data, including demographic characteristics, through a reporting mechanism called "case notification."15 Using these patient-level data, the CDC produces the COVID-19 Case Surveillance Public Use Data with Geography data set. This data set contains 19 different characteristics for each COVID-19 case shared with the CDC, including demographics and geography (state and county), exposure history, and disease severity indicators. However, case notification is slower, voluntary, and less complete, as it depends on each jurisdiction's reportable conditions. Moreover, the CDC follows a privacy protection review protocol that redacts specific information-including demographic characteristics-to reduce the risk of reidentification.16

Several independent efforts to gather and publish comprehensive race and ethnicity data from each jurisdiction's health department in a single publicly available aggregator have also emerged outside CDC sources. Examples of these efforts include the COVID Racial Data Tracker from the COVID Tracking Project and the Boston University Center for Antiracist Research,17 The Color of Coronavirus project from the APM Research Lab,18 and the COVID-19 Vaccine Monitor Dashboard from the Kaiser Family Foundation.19 However, those efforts concluded in March 2021.

Despite the many advantages of having COVID-19 demographic data to mitigate disparities,20 it is not well understood how various public sites reporting demographic data compare. Moreover, it is unclear whether demographic data are complete and timely and whether they show consistent trends. To understand the impact of COVID-19 across different demographic groups at the state and territorial levels, the Johns Hopkins Coronavirus Resource Center (CRC) started collecting, processing, and publishing demographic data related to COVID-19 outcomes from state and territorial sources in April 2021 21 The CRC has been working since to routinely gather and standardize data that allow compilation-in a comprehensive, accurate, and uniform manner-ofthe diverse, publicly available data from all US states and territories.

As part of this effort, we sought to understand how these data from public-facing state and territorial Web sites compare with the national aggregation published regularly by the CDC. Here we describe the methods used to collect and standardize COVID-19 demographic data from various local sources and compare the standardized data set with a similar publicly available data set from the CDC, focusing on the demographic composition of cases and deaths and the proportion of missing data.

METHODS

The CRC collects, standardizes, and publishes demographic data from official and publicly available state and territorial data sources related to the ongoing COVID-19 pandemic. The CRC demographic data set includes information on cases, deaths, testing, and vaccination reported by health departments from the 50 states, the District of Columbia, Puerto Rico, Guam, and the US Virgin Islands. The demographic categories included in the data set are age group, gender or sex, race, ethnicity, and race and ethnicity combined where available. Furthermore, each category contains different demographic groups (e.g., 20-29 years old, female, Hispanic or Latino, Asian, non-Hispanic White). Finally, some mixed demographic categories, such as ethnicity by age group and age group by gender, are not included in the CRC's data collection effort because they are not widely available.

Standardization Process for CRC Demographic Data

The CRC follows a standardization process to produce common demographic groups across all states and territorial sources for the aforementioned demographic categories. This standardization process produces comparable demographic groups across all states and territories that are also comparable with demographic groups used in external data sources from the CDC and the US Census Bureau. In addition, it incorporates methods previously used in different race and ethnicity data analyses, including analyses of COVID-19 outcome data.22,23

First, we aligned the race and ethnic1Γ/ groups reported by local health authorities with the groups established in the Office of Management and Budget's Standards for the Classification of Federal Data on Race and Ethnicity.24,25 Second, given that the Hispanic or Latino group comprises different races and some local health authorities do not disaggregate according to race and ethnicity, we kept race and ethnicity combined when the jurisdiction in question did so.

In addition, we calculated the ethnicity category in a manner similar to the California Department of Finance's "Hispanic hierarchical" approach.26 We classified all self-reported Hispanic or Latino individuals as such, regardless of reported race, and categorized all selfreported non-Hispanic respondents claiming more than 1 race as "Two or More Races." Also, we aggregated all gender and sex categories into 3 large groups: female, male, and other.

To standardize all age groups available across sources, we re-binned the age distributions to match the American Community Survey's specific age categorization. We initially assumed i inform distributions for each original bin, then transformed the state-specific age ranges to 5-year age bins, and finally aggregated them, assuming that the i upper limit of the 85 years old and older group was 100 years.27 In addition, we combined any missing or unreported data, data under investigation, or unavailable data into the "unknown" group for all demographic categories.

After this process, we generated a data set with all of the data collected from the source and a standardized data set. The original and the standardized data sets, the documentation, and the most up-to-date data sources can be accessed in a public repository (https://github.com/govex/COVID-19/ tree/master/data_tables/demographic data).

CDC Public Demographic Data and COVID-19

To compare how demographic data for cases and deaths from states and territorial sources differ from CDC public data, we used CRC demographic data, after standardization, eolloctod from May 24 through June 4, 2021. With röspect to CDC data, we i usoP the June 23, 2021, update of the CDC's COVID19 Case Surveillance Public Use Data with Geography. Wo aggrogatod the CDC Case Surv-eillanco Public Uso Data with Geography' data sot for ago, sox, raco, and ethnicity from tho patrent to tho stato level. In addition, wo cnmited a new combined race and ethnicity category.

After standardizing and processing CRC demographic data and CDC Case Surveillance Public Use Data with Geography, wo comparecí tho proportion of each demographic group's share of the total cases or deaths from both sources, including unknowns. Next, we compared tho proportions of tho groups' shares of total casees and deaths to evaluate the demographic composition of casos and deaths from tho CDC's publicly available' data and stato and territorial sources. Finally, we performed a 2-proportion Z test to evaluate tho statistical significance' of tho difforonco m proportions laotwoon tho 2 data sets by demographic group, category, and state or territory. R version 4.0.3 (R Foundation, Vienna, Austria) was used in conducting all of our analyses.

RESULTS

There was significant variation in demographiccatogorios across difforont sources and considerable heterogeneity' in how similar domographrt group's wore named among local sourcos. Data by ago wore available from tho majority of state and territorial sources. Table 1 shows that age data were available in 92.6% of the states and territories for cases, 88.9% for deaths, and 85.2% for vaccines. Ethnicity data were less frequently available across states (in only 48.1% of states and territories for vaccinos, only 10.7% for doaths, and only dd.a% for casos). Testing data wore least available across all COVID-19 outcomes; 9 states or territories (16.7%) had testing data by age, and only 3 (5.6%) had such data by ethnicity or race. We could not find a shared demographicgroup prosent in any of tho 5i states and territories included in the data collection process for any COVID19 outcome.

In addition to data availability, standardization of demographic groups across data sourcos was a challongo. We identified 402 different demographic groups across all demographic catogorios through tho data 'OclMcticn process. domo of those difforoncos wore a rosi ult of semantic difforoncos in how each sourco namos similar groups. For example, Black or African American is referred to as Black in somejurisdictions such as Mississippi, whoroas other jurisdictions such as tho District of Columbia match the CDC's categorization scheme. However, other differoncos wore moro profound and implie·d domographic groups that cannot oasily be compared with others. For example, Asian is aggregated with Native Hawaiian or Pacific Islandor in Michigan but only with t'acific Islandor in North Carolina. It is also included in the "other" category in certain jurisdictions such as Indiana.

As shown in Table A of the appendix (available as a supplement to the online version of this article at http://www. ajph.org), we recoded and aggregated 230 source-specific groups for gender or sex, race, ethnicity, and race and ethnicity. For age groups, we re-binned 134 source-specific groups into bins ranging from 0 to 9 years old to 85 years old and older. After the standardization process, we produced a data set that contained 8745 data points across 10 age groups, 3 ethnicity groups, 4 gender or sex groups, 8 race groups, and 23 race and ethnicity groups, including an "unknown" group for every category.

Moreover, we compared the demographic composition ofthe CDC Case Surveillance Public Use Data with Geography data set across specific demographic groups using the CRC standardized demographic data set as a benchmark separately for cases and deaths. In addition, we performed a 2proportion Z test to evaluate whether differences were statistically significant at a 95% confidence level. This CDC data set incorporates patient-level data for more than 27.1 million COVID-19 cases. It includes demographics such as age, sex, ethnicity, race, state and county of residence, and underlying medical conditions (e.g., diabetes, cardiovascular disease).

We were able to join and compare 745 unique state and demographic group pairs for cases and 595 for deaths. We joined only state and demographic groups present in both data sets and excluded pairs in which there were no cases or deaths in either data set. Also, we manually excluded deaths by race for Montana and deaths by gender and race for Pennsylvania as a result of incomplete data for most groups.

When comparing specific demographic groups, we found that some groups are consistently overreported and others are consistently underreported in the CDC data set. For example, Figure 1 shows that deaths among people older than 65 years are overreported across states. The number of deaths among people older than 65 years in Louisiana is 23.1 percentage points (P< .001) higher in the CDC data set than in the CRC demographic data. The difference is similar in Utah, where the number of deaths among people older than 65 years is 21.5 percentage points (P< .001) higher in the CDC data set.

By contrast, we found that the proportion of cases and deaths in the Hispanic or Latino population is consistently underreported in the CDC data set. For example, Figure 2 shows that cases and deaths among Hispanic or Latino individuals are underreported compared with CRC demographic data across all states and territories with the exception of cases in Missouri. In addition, in an extreme example, 45.3% of California's total cases are among people who identified as Hispanic or Latino in the CRC demographic data set. The CDC data set reports only 16.3%, a difference of 29 percentage points. Moreover, Oregon reported that 23.5% of total cases correspond to Hispanic or Latino individuals, whereas the CDC reported only 2.4%.

Also, some demographic groups (e.g., females) are underreported in cases but overreported in deaths in the CDC data set. Figure A (available as a supplement to the online version of this article at http://www.ajph.org) shows that of the 44 states where we could compare both data sets, the CDC underreports cases among females in 40 states or territories with a statistically significant difference. However, in 18 of the 32 states or territories with available data, the CDC overreports the proportion of deaths in this demographic group.

Furthermore, we found that the CDC data set underreports the proportion of cases and deaths among Black or African American individuals for most jurisdictions. For instance, cases among Black or African American individuals are 13 percentage points (P <.001) lower in Georgia and 6.8 percentage points (P< .001) lower in North Carolina in the CDC data set than in the CRC's demographic data (Figure B, available as a supplement to the online version of this article at http://www. ajph.org). For deaths, the differences increase to 30.7 percentage points (P <.001) in Georgia and 15.1 percentage points (P< .001) in North Carolina. However, not all race groups are consistently underreported in the CDC data set. For example, White individuals are overreported in deaths in 16 of 20 states and territories with available data (Figure C, available as a supplementto the online version of this article at http://www.ajph.org).

Finally, we examined 2 ways in which missing data in the CDC data set could be driving the differences we previously identified. First, we compared the total number of COVID-19 cases and deaths in both data sets to check for the overall completeness of the CDC data set by state and territory. We used the total number of COVID-19 cases and deaths from the CRC data set as the benchmark; this data set contains cumulative totals collected from official public sources and represents one of the most up-to-date sources for COVID-19 cases and deaths.28

The CDC Case Surveillance Public Use data set includes 80.9% of all COVID-19 cases registered in the United

States. However, it contains only 46.7% of all reported COVID-19 deaths, with considerable heterogeneity across states (Figure 3). For cases, most states and territories have reported the majority of their patient-level data to the CDC, or they even update the CDC more frequently than their local public reporting. For example, the CDC data set includes more than 100% of all cases registered in the CRC data set for New York (103.33%) and New Jersey (103.9%). However, 5 states have reported less than 10% of their total case data to the CDC: Wyoming (2.1%), Texas (2.73%), Louisiana (4.14%),
West Virginia (5.44%), and Missouri (9.73%).

In addition, death data are incomplete overall. There are 11 states or territories that do not report patient-level data on COVID-19 deaths to the CDC. These jurisdictions are Alaska, Delaware, Guam, Hawaii, Missouri, Nebraska, South Dakota, Texas, the US Virgin Islands, West Virginia, and Wyoming. Massachusetts (95.96%) and Illinois (88.23%) report the most significant amounts of patient-level data for deaths.

Second, we compared the overall proportion of cases and deaths with unknown demographics between the 2 data sets for all demographic categories and performed a 2-proportion Z test. We found that the overall proportion of cases and deaths with unknown demographics is larger in the CDC data set than the CRC data set for all demographic categories (Table B, available as a supplement to the online version of this article at http://www.ajph.org). For example, the number of cases with unknown race and ethnicity is 24.2 percentage points higher in the CDC data set than in the CRC data set. Similar results were observed in most states and territories with available data.

DISCUSSION

The results of our analysis reveal considerable heterogeneity in howjurisdictions present demographic data on COVID-19 outcomes. Differences were found both across and within jurisdictions for different COVID-19 outcomes, which complicates comparisons across states. To overcome this challenge, we developed a standardization process that recategorized these groups, reducing the number of groups to a smaller number of common categories across states and territories. After a semantic alignment process and a re-binning process for age groups, we reduced the number of unique categories from 402 to 48. This standardization process produced a data set with demographic data by state or territory for common demographic groups in all states where sufficient data were available.

There are several limitations to our approach stemming from the lack of patient-level data from states. First, there were not enough data available to produce all demographic groups for all jurisdictions. Second, some states or territories do not report certain demographic categories or present data from different demographic groups aggregated into a single large group. Finally, the age re-binning process assumes a uniform distribution within a bin, which is problematic when a state reports a wide age bin. Enhanced data reporting standards across all jurisdictions could help ensure that states employ consistent categories, which might allow for more comparable and complete demographic data.

Our analysis revealed differences in size and demographic composition between patient-level demographic data from the CDC's public COVID-19 data set and state and territory reporting. We found that the CDC data contain fewer COVID-19 cases and deaths and a larger proportion of unknown or missing demographics for cases and deaths, with significant variation across states and territories. Overall, the CDC data set includes 80.9% of all COVID-19 cases publicly reported by state and territorial health departments. For deaths, the CDC data set includes less than half of all deaths reported in the United States by state and territorial authorities. In addition, information for COVID-19-related deaths from 11 jurisdictions is completely missing from CDC reporting.

Moreover, the 2 data sets seem to present different demographic compositions of COVID-19 patients, especially with respect to deaths. For example, cases and deaths among Hispanic or Latino and Black or African American populations, and cases among females, are consistently underreported across the vast majority of states and territories in the CDC reporting. By contrast, deaths among those aged 65 years and older and White individuals are consistently overreported in CDC data relative to state and territorial sources.

It is unclear how data supply and processing might be affecting the demographic composition ofthese different sources. Further research is needed to understand how data reporting mechanisms might contribute to these differences. Additional research is also needed to assess the extent to which privacy protection rules limit the completeness of the CDC demographic data and whether such limitations could partially explain the differences in state and territory reporting.

Throughout this analysis, we have indicated that lack of standardization and ineffective data reporting mechanisms limit the ability to aggregate complete real-time demographic data at the national level. At best, discrepancies between data reported by states and those reported by the CDC may create confusion. At worst, there may be systematic bias in reporting of demographic data on the part of either states or the CDC. To ensure transparency and data quality, it is important that the causes ofthese discrepancies be investigated, understood, and, if necessary, adjudicated. However, these discrepancies may also deepen distrust, leading to hesitancy and noncompliance with mitigation strategies such as social distancing, masking, and vaccination.

Having accurate and timely demographic data may also help government agencies make data-informed decisions on how to target resources and allow the scientific community to understand the spread and impact of the virus in the most at-risk populations. For example, in the short run, health authorities could use COVID-19 demographic data to identify where to increase targeted vaccination efforts, how current and future variants will affect different communities and age groups, and which communities are being excluded from access to testing. In the long run, COVID-19 demographic data should influence decisions on where to increase clinical support to treat patients with post-COVID-19 conditions, which communities lack sufficient access to health care resources, and how COVID-19 affects educational outcomes and school dropout rates.

In conclusion, there is a need to improve the current US public health data landscape by modernizing data reporting mechanisms between health care providers, local health authorities, and the CDC. This will require significant policy and funding changes that should also affect the current standards for reporting demographic data. Nevertheless, having complete, accurate, and timely demographic data will help in efforts to deploy proper mitigation strategies in the short term and improve the ability of academics and governments to study how social determinants affect the population's health.

Sidebar

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CONTRIBUTORS

All authors conceptualized the article, provided criticalfeedback, and discussed the findings. A. Aliseda-Alonso, A. Lee, and E. N. Pond collected the data. A. Aliseda-Alonso, S. Bertran de Lis, and A. Lee performed the analysis. A. Aliseda-Alonso led the writing and draft revisions with input from the other authors. S. Bertran de Lis, B. Blauer, L. Rutkow, andJ. B. Nuzzo supervised the project.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

HUMAN PARTICIPANT PROTECTION

No protocolapprovalwas needed for this study because no human participants were involved.

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DETAILS

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Alcohol and Tobacco Use During COVID-19

Anonymous

ProQuest document link

FULL TEXT

Slovenia

An increase in substance (e.g., alcohol and tobacco) use can occur in times of heightened stress as a maladaptive coping strategy to manage psychological distress. Krnel et al. explored alcohol and tobacco consumption changes during the COVID-19 pandemic among Slovenian adults. Data were from the European Alcohol Use and COVID-19 Survey (May-June 2020; n = 495). Most people reported no change in their drinking patterns, but approximately 24% increased their drinking frequency; those with financial distress were 4 times more likely to increase their drinking frequency. Few people (n = 119) used tobacco, and of those who did, nearly 50% had increased tobacco use in the past month.

Sidebar

Citation. Krnel SR, Kilian C, Keršmanc MH, Roškar M, Koprivnikar H. Changes in the use of alcohol and tobacco in Slovenia during the first wave of the SARS-COV-2 pandemic. Zdr Varst. 2021;61(1):6-13. https://doi.org/10.2478/sjph-2022-0003

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Community Health Worker Activities in Public Health Programs to Prevent Violence: Coding Roles and Scope

Barbero, Colleen, PhD MPPA; Abdullah, Abdul Hafeedh Bin, CHW BA; Wiggins, Noelle, EDD MSPH; Garrettson, Mariana, PhD; Jones, Dean, CHW MSW; Guinn, Angie S, MPH; Girod, Candace, MPH; Bradford, Joivita, BA; Wennerstrom, Ashley, PhD MPH

ProQuest document link

ABSTRACT (ENGLISH)

In multiple and related forms, violence ¡s a serious public health Issue with lasting Impacts on health and wellness in the United States. Community health workers (CHWs) are frontline public health workers and trusted members of communities.

We aimed to analyze recent examples of CHW activities in violence prevention public health programs with a goal of informing future programs and research. We collected more than 300 documents published between 2010 and 2020 to identify public health programs to prevent violence including CHW activities. We used an iterative process to develop and apply a coding scheme to the CHW activities.

We identified 20 public health programs to prevent violence which included CHW activities. CHWs most often addressed community violence, youth violence, and family violence and played an average of 8 of 10 core roles per program. Fewer than a third (i.e., 6 programs) reported community-focused CHW activities to address upstream and structural determinants of health inequities. This first examination, to our knowledge, of the intersection of the CHW and violence prevention literature shows that CHWs have played many of their core roles in public health programs to address multiple forms of violence.

In the United States, violence, in multiple, related forms, is a public health issue with lasting impacts on health and wellness.1,2 Social and structural marginalization can also position certain populations and communities to experience greater exposure to and risk of violence.3 For example, homicide is the leading cause of death for

African American males aged 15 to 34 years.4 In addition, a study of Chicago neighborhoods in 2013 showed that Hispanic and Black youths were 74% and 112% more likely to be exposed to violence than White youths, respectively.

FULL TEXT

Headnote

In multiple and related forms, violence ¡s a serious public health Issue with lasting Impacts on health and wellness in the United States. Community health workers (CHWs) are frontline public health workers and trusted members of communities.

We aimed to analyze recent examples of CHW activities in violence prevention public health programs with a goal of informing future programs and research. We collected more than 300 documents published between 2010 and 2020 to identify public health programs to prevent violence including CHW activities. We used an iterative process to develop and apply a coding scheme to the CHW activities.

We identified 20 public health programs to prevent violence which included CHW activities. CHWs most often addressed community violence, youth violence, and family violence and played an average of 8 of 10 core roles per program. Fewer than a third (i.e., 6 programs) reported community-focused CHW activities to address upstream and structural determinants of health inequities. This first examination, to our knowledge, of the intersection of the CHW and violence prevention literature shows that CHWs have played many of their core roles in public health programs to address multiple forms of violence.

In the United States, violence, in multiple, related forms, is a public health issue with lasting impacts on health and wellness.1,2 Social and structural marginalization can also position certain populations and communities to experience greater exposure to and risk of violence.3 For example, homicide is the leading cause of death for African American males aged 15 to 34 years.4 In addition, a study of Chicago neighborhoods in 2013 showed that Hispanic and Black youths were 74% and 112% more likely to be exposed to violence than White youths, respectively.5

Violence prevention can include intervention to avert violent events,6 as well as addressing the risk and protective factors (e.g., adverse childhood experiences, such as experiencing violence in the home or community) that contribute to multiple forms and intergenerational transmission of violence.7,8 Violence prevention also requires a focus on addressing the upstream and structural and intermediary determinants of inequities.9 According to the World Health Organization's (WHO's) Framework for Action on Social Determinants of Health, upstream determinants of health inequities include

structural mechanisms that generate stratification and social class divisions in the society and that define individual socioeconomic position and are rooted in the key institutions and processes of the socioeconomic and political context.9(p5)

The intermediary determinants of inequities derive from the upstream and structural determinants and include factors such as material circumstances, psychosocial and behavioral factors, and the health and social service system.9 Lastly, the cross-cutting determinants (e.g., social cohesion and capital) are related to collective efficacy to modify upstream and structural determinants of inequities,10 such as structural racism,11 and to prevent the inequities created by existing hierarchies.9

As a workforce with the recognized potential to promote health equity,12 community health workers (CHWs) played a critical rele d iring the COVID- 9 pandemic,13 with the Centers for Disease Control and Prevention (CDC) and Health Resources and Services Administration investing more than $480 million in programs to engage CHWs in pandemic response efforts.14,15 The development of a national infrastructure to support CHW 'engagement in the public health response to COVID-19, along with an increased national focus on addressing violence,16,17 has created a window of opportunity to support the natural extension of CHW roles to include violence prevention.

CHWs have existed in the United States since the 1950s, but they have been receiving increased attention as the workforce has beco·me more professionalized.18 In 2009, just before federal policy inch rded CHWs as a strategy for improving health outcomes, CHWs led the American Public Health Association (APHA) in creating a standard definition fora CHW that is widely accepted now in the field:

A community health worker is a frontline public health worker who is a trasred member of and/or has an jnjs.nll_ sp.ee iride|-s^anding of the community served. This trusting relationship * enables the worker to ser e as a liaison lin! intermediary between health/social services and the romimimity to facilitate access to services and improve the quality and cultural competence of service delivery.A sovmmunity health worker also builds indi idnl and community capacity by increasing health knowledge and self-sufficiency'through a range of activities such as outreach, ccmnanaip edr-ation. in?rmal counseling, sockal sucmaT and adsocncy/d9

During the past decade, CHWs' organizing and advocacy at the local, state, and national levels have further established a CHW professional identity, including creation of a national CHW aSSiCäati,en, and advanced workforce development thud !gh the development of core roles.20,2'

The CDC has supp'orted CHW programs and research related to chronic disease prevention and management for more than a decade.12 Systematic reviews during this time have alsē provided support for interventions engaging CHWs to prevent and manage' chronic diseases.22 However, to date, the peer-reviewed literature has given little attention to the intersection of the to·picsof CHWs and violence prevention. We aimed to review recent published literature no identify and analyze examples of CHW activities related to violence prevention, including CHW activities to address upstream and structural and ¡ntenTiediary determinants of health inequities. We use gaps and limitations from our review to identify potential ne·.t steps for supp'orting CHW leadership in programs and research to prevent violence.

METHODS

In January 2021, our team of 9 authors, including 2 CHWs (A. H. B. A. and D.J.) with experience working in violence pre/enten, led by the CDC Division of Violence Prevention, consulted with 10 additional subject matter experts to conceptualize the rapie develop search terms, and define' a document and pnogram inclusion and exclusion process. We (the aurhcr bram) searched PubMed, Medline, Scopus, Psyclnfo, and CINAHL for amcles in English published between January 1,2010, and December 31,2020, by using the following terms; sscmmunigv health worker," "promotora," "promotor," "community health representative," "violence interrupter,"".violence prevention specialist," "violence intervention specialist," "violence prevention professional,""lay health worker," "community outreach worker," "community health advisor," "behavioral health aide," "village-based counselor," "street worker," and "youth worker" and "violence," "child abuse," "child maltreatment," "child neglect," "elder abuse," "elder maltreatment," "elder neglect," and "safety." We included titles of CHWs conducting vl·olence interruption and outreach because subject matter experts reported that these workers have begun to idonnfy with the APHA dofininnn for a CHW and have connected with CHW opganizatoois.

Figure 1 describes our document and program indusion and exclusion process. After collecting the peer-reviewed literature, 2 authors (C. B. and N. W.) independently reviewed titles and available abstracts to identify documents that (1) described a public health program that had been implemented in the United States, (2) induded at least 1 spetificform of interpersonal violence prevention as a program focus (exdud-ing treatment alone), and (3)reported at least 1 individual meeting the APHA definition for a CHW19 conducting activities relevant to the violence-prevention focus. Our focus on interpersonal violence included 8 forms of violence that occur between individuals, as defined by the CDC (Table A, available as a supplement to the online version of this article at<https://ajph.orgl> and excluded self-directed violence. After reviewing the list of included documents and programs, subject matter experts added documents and programs that were not identified through our literature search.

Lastly, we conducted Web searches using Google with the names of the included programs to identify supplemental documents. During this process, we determined that most of the identified programs did not have replications, except for the Cure Violence program. Because CHW activities were similar across these replications, we decided to analyze them as 1 program.23

Coding Scheme Development

We collaboratively developed a coding scheme that could be applied to each program, using an iterative process to develop, test, and refine the coding scheme and develop consensus on the coding. We developed initial codes based on our review of the included literature and subject matter expert input. Next, one reviewer coded each program based on associated documents (Table B, available as a supplement to the onlineversion of this article at https://ajph.org). At least 1 additional reviewer then examined the same documents and provided edits for the program's coding. The reviewers did not assign codes to programs for CHW activities that were not explicitly described. The first author (C. B.) coordinated communications about the coding among reviewers and ensured that changes to the coding process were applied to all the programs. We met 3 times to refine and review coding results together to ensure consistency and consensus and determine the format for presenting results.

Final Coding Scheme and Definitions

Tables 1 and 2 include the final coding scheme, and Table B includes the final code definitions. Programs with CHW activities were coded for 8 forms of violence, 5 professional sectors, and 4 focus populations experiencing structural racism and historical trauma. On the basis of previous research,20,21 we also coded CHW activities in the programs for 10 CHW core roles, applying additional codes to identify the roles that could be focused on the community (i.e., community-focused activities), in addition to on individuals and families (i.e., community-based activities). Programs with identified communityfocused CHW roles were also coded for the focus of these roles on 6 types of upstream and structural and intermediary determinants of health inequities from the WHO Framework.9 Because upstream and structural determinants are expected to have the largest public health impact, we also documented program impacts related to upstream and structural determinants. All relevant codes within a category were applied for each program. For example, a program could include CHW activities aimed at addressing multiple forms of violence.

Coding Analysis

To aggregate the coding across programs, we counted the number of programs with each code and, for each category, averaged the number of codes per program. Program coding results are provided in Tables 1 and 2. Table 3 provides results from the analysis of the coding.

RESULTS

From the literature, 18 public health programs to prevent violence including CHW activities were identified (Figure 1). Subject matter experts added 2 programs, for a total of 20 identified public health programs to prevent violence including CHW activities.

Forms of Violence, Sectors, and Populations

Table 1 includes the coding for forms of violence addressed, focus populations, and professional sectors connected by CHW activities for each of the 20 identified programs. Our analysis of this coding found that CHWs addressed an average of 3 forms of violence, 3 sectors, and 1 population per program (Table 3). In addition, CHWs most often addressed community violence (13 programs), youth violence (10 programs), and family violence (10 programs). Community violence occurs between individuals who are unrelated, generally takes place outside the home, and can include youth violence.1 Family violence includes a range of violence that can occur in families, including intimate partner violence, child abuse, and elder abuse by caregivers and others.2 Table A includes these and other definitions for the 8 forms of violence coded.

CHWs in the identified programs worked most often with the community sector (in all 20 programs), social service sector (18 programs), and health care sector (15 programs). CHWs in these programs worked with Black/African American (10 programs), Latinx/ Hispanic (10 programs), American Indian/Alaska Native (2 programs), and Asian American (1 program) populations (Tables 1 and 3).

Community Health Worker Core Roles

Table 2 includes the coding for CHW core roles and intermediary and upstream and structural determinants of health inequities addressed by CHW activities for each of the 20 programs. Table A also includes a definition for each CHW core role included in Tables 2 and 3. Programs reported an average of 8 of the 10 CHW core roles, with 6 of the 20 programs reporting all 10 roles (Table 3). CHWs' cultural mediation, social support, and capacity building roles were seen in all the programs (Tables 2 and 3). For example, these roles were reported for the Prescription for Hope program, in which culturally familiar support specialists helped to facilitate initiation of social services by accompanying participants to appointments and mentoring youth participants.24 As another example, in the SAFER Latinos program, social promotores and peer advocates recruited from the community and schools provided one-on-one support to youths and parents, helped improve communication between families and the school system, and facilitated referrals to academic, job preparation, and other services through the program's "drop-in" community center.25

In addition, CHWs participated in research and evaluation in 19 of the 20 programs (Tables 2 and 3). For example, in the Safe Spaces, Acción para la Salud, and Cambodian Women's Group programs, CHWs contributed to program design and measurement through a community-based participatory research approach.26-28 CHWs also provided culturally appropriate health education in 19 programs (Tables 2 and 3). For example, in the Family Spirit program, bilingual American Indian paraprofessionals delivered a parenting curriculum to adolescent mothers in their homes.29 CHWs provided assessments, direct services, and care coordination in 16,15, and 14 of the programs, respectively (Tables 2 and 3). For example, all 3 of these roles were reported for the Wrap Around Project, a hospital-based program in which violence intervention specialists provided violently injured patients with one-on-one case management, based on an initial risk assessment, including mental health services, employment opportunities, and guidance to other resources.30

The CHW advocacy role was reported the least, by 9 of the 20 programs (Tables 2 and 3). CHW activities involving community-focused capacity building, assessments, and advocacy were reported by 8, 7, and 4 programs, respectively (Table 3). Acción para la Salud offers an example of a program reporting all 3 of CHWs' communityfocused roles. The CHWs in this program used client encounter forms to assess and identify problems to discuss in community forums, developed and implemented policy action projects that included community coalition building and mobilization, and advocated for community needs with policymakers.27

Intermediary Determinants

Eight of the 20 programs reported that CHWs conducted community-focused activities to address psychosocial or behavioral factors and collective efficacy (Tables 2 and 3). For example, CHWs in the Striving to Reduce Youth Violence Everywhere (STRYVE) Multnomah County program provided training to community members to articulate violence as a public health problem.31 In the Cure Violence program, the CHWs facilitated meetings with community members to help shift community norms around violence.23 In the We Are Health Movement program, the CHWs participated in consciousness raising, a first step in community advocacy.32

In 6 ofthe 20 programs, communityfocused activities by CHWs aimed to have an impact on the health and social service system (Tables 2 and 3). For example, a CHW-led coalition focused on strategies for improving intimate partner violence services in the Safe Spaces program.26 Five ofthe 20 programs reported community-focused activities conducted by CHWs to address the material circumstances in the community (Tables 2 and 3).

For example, the CHW facilitating the Cambodian Women's Group engaged community members to develop a community garden.28 As another example, CHWs in the STRYVE Multnomah County program improved the community environment by engaging youths in placemaking activities, including creating murals and peace poles.31

Upstream and Structural Determinants

In 6 ofthe 20 programs, CHWs led community-focused activities that helped to reveal upstream and structural determinants of inequities related to the socioeconomic or political context (Tables 2 and 3). For example, the CHW facilitator ofthe Cambodian Women's Group led discussions that identified generation gap, lack of education, unemployment or underemployment, trauma, poverty, and discrimination as key upstream and structural drivers of health and violence issues in the community.28 Three of these 6 programs reported program impacts related to the socioeconomic or political context.23'31,33 First, in the Cure Violence program, the focus of programs was shifted from criminal justice to community health by obtaining new funding sources.23 Second, in the STRYVE Multnomah County program, the CHW who was included in county-level meetings to improve policing in the community helped to identify a subjective and potentially discriminatory policing practice.31 The CHW then proposed a policy that would rely on data, which the county adopted.31 Third, the statewide implementation ofthe Family Wellness Warriors program, which is entirely led by the Native people of Alaska (including CHW "natural helpers"), was reported as leading directly to philosophical and policy changes in the health care, social service, judicial, educational, and correctional systems in Alaska.33

Lastly, 3 ofthe 20 programs reported CHW community-focused activities and program impacts related to socioeconomic position.23'31'32 The We Are Health Movement and STRYVE Multnomah County programs reported that community members who attended the trainings were able to find permanent employment as CHWs.31'32 In addition, the Cure Violence program included community partner education efforts that helped lead to employment for community members at high risk for violence.23

This first examination of the intersection of the CHW and violence-prevention literature shows that CHWs have played many of their core roles in public health programs to address multiple forms of violence. We also found examples of CHWs' community-focused roles20,21 applied to address upstream and structural determinants of health inequities,9 with several programs reporting impact.23,31-33

Our analysis succeeded in revealing key gaps in the recent programmatic literature. While the CHWs in the 20 programs we reviewed most often addressed community, youth, and family violence, we saw that CHW activities reported in these programs less frequently focused specifically on child abuse or neglect, and none of the programs we reviewed provided CHWs with a specific focus on elder abuse or neglect (Tables 1 and 3). Also, despite the potential for community-focused activities to have upstream and structural impacts,9,10 most of the programs we identified only included CHWs providing community-based services to individuals and families (Tables 2 and 3). Finally, fewer than a third of the programs (i.e., 6 programs) reported community-focused CHW activities to address upstream and structural determinants of health inequities (Tables 2 and 3).

Limitations

Our review has 3 main limitations. First, we did not code for program outcomes in this analysis because these outcomes could not be directly attributed to the CHW roles and activities we analyzed. This attribution issue is a common limitation in CHW program evaluations and systematic reviews.20 A second limitation was our collection of mostly published literature. A third limitation is that our search included only the most widely used titles of CHWs, along with titles of the specific community-based violence intervention and prevention workers who we were aware had a preexisting connection with the CHW profession.

Our results and limitations suggest next steps to improve programs and research. The opportunity to combine CHW and community violence prevention is salient given the current context.15 However, public health programs may currently be missing opportunities for CHWs to address the increases in child and elder abuse and neglect seen during the pandemic.34,35 The programs we identified that specifically focused on child abuse and neglect tended to include multigenerational behavioral interventions.29,33 Strategies focusing on the primary prevention of adverse childhood experiences through community-focused activities (e.g., affecting policies, cultural norms, and social norms) could also help to prevent child and elder abuse and neglect and other forms of violence.7,8

A logical next step after this review could be a scan and analysis of a wider breadth of unpublished program reports detailing CHW activities. Such an effort may also help to identify more examples of CHWs' community-focused roles and activities to address upstream and structural determinants. It could also be beneficial to examine CHW roles related to preventing self-directed violence (e.g., suicide) and other forms of violence that were not a focus of this review.

In addition, while our review found that CHWs were often included in the research and evaluation of a program (Tables 2 and 3), equity in researcher or program designer and CHW partnerships might be further advanced by including CHWs as co-researchers and co-program designers. For example, this article is the product of a partnership including CHWs and non-CHW allies. CHWs contributed to the conceptualization of this review and provided input to refine our coding for CHW roles and activities based on their extensive experience developing, implementing, and evaluating violence intervention and prevention strategies in the field. The CHW authors of this article also provided a combination of lived experiences, practice-based wisdom, and previous leadership roles that has proven imperative for determining the vision, scope, purposes, implications, and opportunities to disseminate this work. Going forward, it will be important to fully document partnerships between researchers or program designers and CHWs to share best practices and success stories.

Research is also needed to analyze the outcomes of the promising violence prevention strategies and adaptations that CHWs are developing and leading in the field. For example, in Wilmington, North Carolina, a CHW-led communitywide violence prevention initiative has involved transforming a dormant community asset (i.e., vacant lot and abandoned building) into a community center that aims to build community cohesion and collective efficacy.36 The CHW Common Indicators Project, a national project with CHW leadership,37 is developing process and outcomes measures that could be used in the future to evaluate the impact of CHW activities related to violence prevention. Systematic reviews could be completed once a rigorous evidence base on outcomes has been developed.

Because the impact of violence on health and well-being is established,1,2 another next step could be to support CHWs in chronic disease and other health promotion programs to extend their existing roles and activities to include violence prevention. This could involve the development of new tools and partnerships with CHW training programs, which exist in nearly every state.38 In addition, the CHW definition provides an umbrella that could also potentially inform outreach to a wider range of community-based violence-prevention workers (e.g., victim advocates). Identifying more communitybased violence prevention positions and developing partnerships with violence prevention programs could help to support more individuals meeting the CHW definition in connecting with the broader profession of CHWs (e.g., through national, state, and local CHW organizations and networks).

Finally, programs and partners may also want to consider how to help advance sustainable financing for CHW roles and activities relevant to violence prevention. For example, Illinois and Connecticut recently passed laws directing Medicaid reimbursement for violence intervention services.39 One potential issue with CHW Medicaid financing relevant to violence prevention is the current gap in financing for CHWs' community-focused activities.38,40 New research could help to inform models that could help programs to ensure fidelity across sites and provide evidence in support of sustainable financing mechanisms.

Conclusions

Violence continues to be a serious public health issue that has lasting impacts for individuals, families, and communities. The examples in this essay help to illustrate CHWs' potential to provide a comprehensive approach to violence prevention that involves reframing violence as a public health issue, changing community norms around violence, helping communities to heal collectively from violence and trauma, and developing community leadership and capacity to initiate change in structural conditions. Supporting CHW leadership in programs and research to prevent violence could have a substantial public health impact, especially if efforts support CHWs in working upstream. ÂfPH

Sidebar

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Note. The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the Centers for Disease Controland Prevention.

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CONFLICTS OF INTEREST

There are no conflicts of interest related to this article. There are no financialconflicts to disclose.

HUMAN PARTICIPANT PROTECTION

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A Rights-Based Approach to Youth Inclusion in Public Health Policy

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ABSTRACT (ENGLISH)

The overall health of the US population has steadily improved over the last century.1 However, this progress has not been experienced equally, indicated by widening health disparities rooted in unfair social, political, and economic arrangements governing people's living conditions.1 Youths have historically been kept at the margins of processes that differentially shape the social contexts patterning their health experiences and potentials. Drawing on examples of youths engaged in public policy in the US state of Maine, we argue that youths have a right to meaningful inclusion in public health policymaking as laid out in the UN Convention on the Rights of the Child. Furthermore, we assert that youths' developmental strengths, as seen through the lens of positive youth development (PYD), are uniquely valuable in structural health equity initiatives.

FULL TEXT

The overall health of the US population has steadily improved over the last century.1 However, this progress has not been experienced equally, indicated by widening health disparities rooted in unfair social, political, and economic arrangements governing people's living conditions.1 Youths have historically been kept at the margins of processes that differentially shape the social contexts patterning their health experiences and potentials. Drawing on examples of youths engaged in public policy in the US state of Maine, we argue that youths have a right to meaningful inclusion in public health policymaking as laid out in the UN Convention on the Rights of the Child. Furthermore, we assert that youths' developmental strengths, as seen through the lens of positive youth development (PYD), are uniquely valuable in structural health equity initiatives.

YOUTHS' RIGHT TO HEALTH-AFFIRMING SOCIAL CONTEXTS

People are embedded within neighborhoods, communities, political atmospheres, and economic systems; these contexts determine living conditions such as access to quality education, employment with living wages, adequate and appropriate health care, affordable healthy food and physical recreation, and community support. These contexts, known as social determinants of health, shape people's health outcomes.1

Social determinants of health begin shaping youths' lives and health potentials before they are given opportunities to participate in shaping the policies that affect them. Yet youths have inherent rights to health, enumerated by the UN Convention on the Rights of the Child.2 Among these are the rights to "the highest attainable standard of health" (Article 24), and to "a standard of living adequate for the child's physical, mental, spiritual, moral and social development" (Article 27). Furthermore, Article 12 affirms children's right to formulate and "express [their own] views freely in all matters affecting [them], [their] views ... being given due weight in accordance with [their] age and maturity." When youths participate in matters of public policy that affect them, they are often met with patronizing, dismissive, or derogatory reactions from adults.3 This norm undermines youths' right to participate in decision-making processes that shape their living conditions, which in turn determine their health.

SOCIETY'S NEED FOR POSITIVE YOUTH DEVELOPMENT

Aligned with the social determinants of health framework, which situates individuals' health outcomes within social contexts, PYD regards human development as a product of youths' internal assets functioning in tandem with their environmental resources and supports.4 As a strengths-based perspective, PYD maintains that all youths have internal and external assets that make their individual development and their contributions to society unique.5

Aligned with the UN Convention on the Rights ofthe Child, PYD insists that society is responsible for fostering environments where youths have the resources they need to thrive and, importantly, for involving youths as partners in shaping their world, as contribution is both a means and an end to PYD.5

Although favorable environmental contexts are essential for positive development, Yeager identifies four internal drives that help youths develop through adolescence5: (1) to stand out: o develop a personal identity; (2) to fit in: to develop a sense of connectedness; (3) to measure up: to develop competence and find ways to achieve; and (4) to take hold: to make commitments to particular goals, activities, and beliefs. Two hallmark internal strengths of adolescence help fulfill these drives: an increased willingness to take risks for social rewards6 and an increased drive to participate in community and be included by peers.7 These attributes position youths to be uniquely daring, innovative, and justice-conscious contributors to initiatives addressing structural justice and health equity.

PARTNERING WITH YOUTHS TO EFFECT HEALTH JUSTICE

Maine contends with significant and persistent health disparities stemming from inequitable social contexts.8 The COVID-19 pandemic made this apparent when in 2020 the state experienced some of the country's lowest rates of cases and deaths but saw the greatest racial disparity in the United States.9 Black, Latino, Indigenous, and other community leaders of color demanded substantive action to address these disparities emerging from Maine's "legacy of racism."10 In response, Maine's Department of Health and Human Services announced the establishment of the Office of Population Health Equity (OPHE) within the Maine Center for Disease Control (MCDC) to collaborate within and beyond the MCDC to achieve health justice.11

The MCDC prioritizes youth participation through its funding to the Maine Youth Action Network (MYAN), which is composed of community-based, PYDguided programs that engage youths on issues of public health education, research, and policy. Through this network, the MCDC supports youths' knowledge of local needs and solutions, which inform state-level policies and resource allocation. PYD principles guide MYANaffiliated programs in supporting youth development, activating youths' strengths, and avoiding harms such as tokenizing, condescending, and inadequately supporting or micromanaging youths. However, mirroring the limited scope of issues prioritized for youth engagement federally,12 MCDC-funded youth engagement has so far focused on primary prevention of substance use, commercial tobacco use, obesity, and suicide. The MCDC's recommitment to health justice presents an opportunity to leverage youths' developmental orientation toward justice and capacity for innovation by expanding the scope of youth engagement to include the work assigned to the OPHE.

Changes to Maine's social contexts wrought by youth activism indicate that the MCDC can accelerate health equity work by extending more power to youth partners. Maine youths are dynamically engaged in social justice issues in their communities and exert increasing influence in Maine's government and public systems via a Young People's Caucus and a deepening bench ofyouth advisory stakeholders.13 Maine youths are active in national and global movements such as March For Our Lives campaigning to change gun control legislation and Youth Climate Strikes urging large-scale climate action. OUT Maine's Trans Youth Health Board conducted research linking health disparities affecting lesbian, gay, bisexual, transgender, and queer (LGBTQ) Mainers to inadequate and exclusionary sex education taught in schools. Their work yielded detailed recommendations for inclusive health education in schools as well as training and inclusive protocols for health care practitioners.14 Indigenous Wabanaki youths supported a years-long effort to remove Native mascots, conducting research on Indigenous misrepresentation and producing a public awareness campaign about how dehumanizing, hypersexualized, and commercialized misrepresentation contributes to adverse health experiences and ongoing erasure of Indigenous people.15 These and other examples of MYAN-affiliated work demonstrate that youth inclusion can effectively dismantle structures that produce health disparities and establish more just and health-affirming norms.

CONCLUSION

Structural inequality results in health disparities in Maine, as elsewhere. This status quo is incompatible with PYD and fails to uphold youths' right to health. PYD's embrace of context and interconnectedness makes it an apt lens for seeing our health outcomes as intertwined. Furthermore, PYD's rejection of paternalism means that youths' contribution to our shared social contexts is both a necessary component for youths' individual development and an invaluable asset for actualizing health justice. PYD is therefore a framework for a justice-oriented social contract that takes a holistic view of health and development in social contexts and insists on both society's accountability to youths and youths' contribution to society. In fulfillment of the UN Convention on the Rights of the Child and guided by PYD, public health policymaking in Maine and beyond should include youths as valued collaborators and equal stewards of the social contexts shaping people's health. .4JPH

Sidebar

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The authors have no conflicts ofinterestto declare.

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Impact of Massachusetts' Statewide Sales Restriction on Flavored and Menthol Tobacco Products on Tobacco Sales in Massachusetts and Surrounding States, June 2020

Kingsley, Melody, MPH; McGinnes, Hannah, MPH; Song, Glory, MPH; Doane, Jacqueline, BS; Henley, Patricia, MEd

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ABSTRACT (ENGLISH)

In June 2020, Massachusetts implemented a first In the nation statewide law that restricts sales of menthol and other flavored tobacco. Since implementation, sales data indicate high retailer compliance. Drastic decreases were seen in sales of all flavored tobacco. Most neighboring states did not see increases in overall tobacco sales, although New Hampshire saw an initial increase in menthol sales, which was not sustained. We found that menthol restrictions are effective and that federal-level legislation is important, as some cross-border sales highlight.

FULL TEXT

Headnote

In June 2020, Massachusetts implemented a first In the nation statewide law that restricts sales of menthol and other flavored tobacco. Since implementation, sales data indicate high retailer compliance. Drastic decreases were seen in sales of all flavored tobacco. Most neighboring states did not see increases in overall tobacco sales, although New Hampshire saw an initial increase in menthol sales, which was not sustained. We found that menthol restrictions are effective and that federal-level legislation is important, as some cross-border sales highlight. (AmJ Public Health. 2022;112(8):1147-1150. https://doi.org/10.2105/ AJPH.2022.306879)

In 2009, federal law banned the sales of all flavored cigarettes except menthol. The exclusion of menthol perpetuated existing inequities in tobacco marketing, tobacco use, and health outcomes among groups historically targeted by the tobacco industry (including Black, LGBTQ [lesbian, gay, bisexual, transgender/-sexual, queer or questioning], and female populations, as well as youths).1-3 This ban also led to an increase in availability and youths' use of non-cigarette-flavored tobacco products.4 In 2019, youths' tobacco use in Massachusetts reached its highest rate in more than 20 years (Massachusetts Youth Risk Behavior Surveillance System, 2019).

INTERVENTION AND IMPLEMENTATION

In response to the increasing availability of flavored tobacco, in 2014, local municipalities in Massachusetts began to pass restrictions on its sale. However, these restrictions excluded menthol. In November 2019, resulting in part from local momentum, advocacy coalitions, and youth and community engagement efforts, Massachusetts passed An Act Modernizing Tobacco Control (https://www.mass.gov/guides/ 2019-tobacco-control-law), a first in the nation statewide law that restricts the sales of all flavored tobacco (including menthol) to adult-only smoking bars (for onsite consumption only). This law also includes an excise tax on vape products.

To help ensure compliance, Massachusetts used its rigorous enforcement infrastructure to provide communications (i.e., mailings and media promotion) and educational visits to retailers before and after implementation. Retail scanner data were used to provide timely surveillance data for monitoring compliance and evaluating policy impact.

PLACE, TIME, AND PERSONS

The new law took full effect June 2020. The availability of menthol and other flavored tobacco was reduced from more than 6000 outlets to fewer than 30.

Before the law, 12% of Massachusetts adults smoked cigarettes, and of those an estimated 37%, or 216 611, smoked menthol cigarettes (63% identified as people of color; Massachusetts Behavioral Risk Factor Surveillance System, 2019). Furthermore, the tobacco industry targeted flavored products at the 847 000 youths (aged 10-19 years) who live in Massachusetts (American Community Survey, 2019). As a result, 37% of Massachusetts high school students reported current (past 30day) use of any tobacco product (i.e., cigarettes, cigars or cigarillos, smokeless tobacco, vape products) in 2019 (Massachusetts Youth Risk Behavior Surveillance System, 2019).

PURPOSE

The law took a step toward improving racial and health equity and protecting youths and young adults from industry targeting. Previous research demonstrated that policies that restrict flavored tobacco are effective at reducing the sales and availability of flavored tobacco in the retail environment and at reducing adult and youth tobacco use.5-8

EVALUATION AND ADVERSE EFFECTS

The Massachusetts Tobacco Cessation and Prevention program obtained tobacco product UPC (Universal Product Code) scanner data from the Nielsen Company. We obtained data from three years before the law was implemented to one year after (June 2017-June 2021) in five state-specific markets: Massachusetts and the neighboring states of New Hampshire, New York, Rhode Island, and Vermont. For each state, we aggregated unit sales of four categories of tobacco (i.e., cigarettes, cigars or cigarillos, smokeless tobacco, and vape products) and stratified them by flavor category (i.e., menthol, other flavor, and unflavored).

We standardized data in accordance with existing methods. One pack of cigarettes, one large cigar, two cigarillos, 20 little cigars, one disposable or rechargeable e-cigarette, one e-cigarette refill or kit, one three-ounce container of chewing tobacco, one 1.2-ounce container of dip or snuff, or one container of snus equaled one unit.9,10

Results suggest that the law was effective in reducing flavored product sales in Massachusetts. In the year after implementation (June 13, 2020-June 12, 2021), overall tobacco sales in Massachusetts decreased from 33 917 494 to 25 315189 (25.4%) units compared with the previous year (June 2019-June 2020; Figure 1). Sales of unflavored products increased from 22 609 326 to 24947 827 (10.3%) units, menthol products decreased from 10 355 518 to 317 863 (96.9%) units, and sales of other flavored products decreased from 952 650 to 49 499 (94.8%) units compared with the previous year. Trends in Massachusetts across the study period were driven largely by cigarettes, as they make up 77% of total tobacco sales in the state, followed by cigars (12%), vape products (7%), and smokeless tobacco (4%; Figure 2).

We examined sales data from bordering states to assess whether an unintended consequence ofthe law was Massachusetts residents traveling out of state to purchase tobacco. Altogether, total sales in New Hampshire, New York, Rhode Island, and Vermont decreased by 1.8% in the year after implementation compared with the previous year (from 106 863 560 to 104937096 units). Individually, total sales decreased in New York, Rhode Island, and Vermont (from 31 952 666 to 24896472 [22.1%] in NY; from 12 345 375 to 11 840 564 [4.1%] in RI; and from 6 234 704 to 5 937 620 [4.8%] in VT). In these states, most changes in sales of menthol and other flavors were also decreases. However, small increases occurred in Vermont and Rhode Island: menthol sales increased from 1 582 520 to 1 595 765 (0.8%) units in Vermont, and other flavored sales increased from 427 341 to 479 624 (1 2.2%) units in Rhode Island (Figure A, available as a supplement to the online version of this article at http://www.ajph.org). In New Hampshire, tobacco sales increased in the year after implementation compared with the previous year, but only by 5 931 624 (10.5%) units. Sales of unflavored products decreased 338498 (0.9%) units, sales of menthol products increased 6417 808 (40.2%) units, and sales of other flavored products decreased 147 686 (13.1%) units during this period (Figure 1). Although overall tobacco sales initially increased 22.6% in the three months after law implementation (compared with three months before law implementation), menthol sales then decreased in the following six months (September 2020March 2021). Furthermore, when comparing changes in menthol sales in New Hampshire and Massachusetts in the year after implementation, we saw a net decrease in menthol sales.

Some limitations exist. We did not include Connecticut, another state bordering Massachusetts. Nielsen captures only large chain retailers and convenience stores (e.g., big box supermarkets, drug stores, and dollar stores), so only a quarter of retailers in Massachusetts are represented. In addition, sales data are a proxy for availability and use; an increase in New Hampshire sales does not necessarily indicate a widespread increase in menthol cigarette availability or sustained or increased rates of menthol cigarette use among Massachusetts residents. Finally, any increases seen in tobacco sales may have been driven in part by increased adult substance use during COVID-19 (data not shown). Massachusetts will continue to monitor trends in sales as well as additional data directly capturing tobacco access and use behaviors to assess how the new law affects Massachusetts tobacco users in the longer term.

SUSTAINABILITY

We saw that, with rigorous outreach and enforcement, retailer compliance with the law in Massachusetts was high and that other states did not have substantial increases in tobacco sales. We saw a marginal increase in Massachusetts' menthol sales from April through June 2021. We will continue to monitor sales data to assess whether compliance continues in the longer term. In New Hampshire, although we saw an initial increase in the proportion of menthol tobacco sales three months after the law was implemented, seasonal trends in sales may partially account for this increase, and we will monitor data over time to assess whether sales return to the rates before the law was implemented. Preliminary data from July through September 2021 suggest that menthol sales in New Hampshire are trending downward. Furthermore, historical New Hampshire cigarette stamp data indicate an initial increase in cigarettes stamped immediately after Massachusetts increased its cigarette sales tax in 2013, but this increase was not sustained (New Hampshire Department of Revenue).

In geographically smaller states like Massachusetts, many tobacco users can drive across state lines, for example, into New Hampshire and Rhode Island, to obtain products.6 The price of a pack of menthol cigarettes in New Hampshire is on average $2.39 to $4.23 cheaper than in Massachusetts and surrounding states (NY, RI, VT).11 Therefore, removing these products from the market entirely would maximize the public health benefit of flavored tobacco restriction policies. This study demonstrates the importance of federal legislation.

PUBLIC HEALTH SIGNIFICANCE

Reducing the availability of flavored tobacco may lead to decreased tobacco use and smoking-attributable mortality. Researchers estimate that from 1980 to 2018, menthol cigarettes were responsible for 10.1 million additional smokers, 3 million life-years lost, and 378 000 premature deaths.12 In addition, these policies may help protect youths from a lifetime of nicotine addiction; recent research provides promising evidence that flavored tobacco restrictions can curb youths' tobacco use.5,6 Furthermore, given industry targeting of menthol to people of color, policies that reduce the availability of menthol products may have a direct impact on reducing racial inequities in smokingattributable mortality.

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M. Kingsley and H. McGinnes led study design, drafted the article, and contributed equally to the article. H. McGinnes analyzed the data. G. Song contributed to study design and article development. All authors reviewed and revised the article.

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Preventing Childhood Vision Loss Through Exploitative Prison Labor: A Call for Action

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ABSTRACT (ENGLISH)

The California Prison Industry Authority (CALPIA), a semiautonomous prison labor agency under the California Department of Corrections and Rehabilitation, runs two optical laboratories operated by people incarcerated at Valley State Prison and California State Prison, Solano,1 and these laboratories supply ophthalmic lenses to eligible Medicaid recipients, such as this young patient. Three months before this child's surgery, CALPIA had paused the vast majority of its operations, including those at its optical laboratories, because of the COVID-19 outbreak.2 This situation did not just illuminate a surprising connection between public health care and prisons. It caused the authors-two physicians and one lawyer in California-to rethink public health care stakeholders' participation in a system that supports exploitative prison labor. With more than 1.5 million people incarcerated in state and federal prisons and approximately half of the incarcerated population assigned to work programs, the United States is home to a sprawling prison labor economy.3-5 Prison labor, which refers to the work performed by incarcerated individuals, was explicitly licensed by the Thirteenth Amendment, which states that slavery and involuntary servitude may serve as "punishment for crime whereof the party shall have been duly convicted." This practice became common in postbellum Southern states and allowed private companies and slave labor camp owners to "rent" predominantly Black imprisoned people to perform uncompensated work. Despite this practice falling out of favor, the underlying philosophy behind state-controlled prison labor remains essentially unchanged in 2022: the government, without violating the Constitution, may order incarcerated people to perform uncompensated or

minimally compensated labor. Incarcerated people may be required to perform tasks to keep the prison running, work for private companies that contract with prisons, or work for public entities such as CALPIA, California's prison labor agency, that create products (e.g., eyeglasses) to supply both public and private entities.

FULL TEXT

In July 2020, together with a corneal surgeon, I (J.T.O.) performed complex eye surgery for a two-month-old baby born with a congenital malformation of the front of the eye requiring corneal transplantation and cataract removal. Postoperative care required obtaining a pair of glasses as soon as possible to prevent irreversible vision loss from amblyopia. Conversations with the optical dispensary revealed a several month delay in glasses production with an unexpected cause: COVID-19 outbreaks in the California prison system.

The California Prison Industry Authority (CALPIA), a semiautonomous prison labor agency under the California Department of Corrections and Rehabilitation, runs two optical laboratories operated by people incarcerated at Valley State Prison and California State Prison, Solano,1 and these laboratories supply ophthalmic lenses to eligible Medicaid recipients, such as this young patient. Three months before this child's surgery, CALPIA had paused the vast majority of its operations, including those at its optical laboratories, because of the COVID-19 outbreak.2 This situation did not just illuminate a surprising connection between public health care and prisons. It caused the authors-two physicians and one lawyer in California-to rethink public health care stakeholders' participation in a system that supports exploitative prison labor.

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An example of prison labor's entrenchment in US commerce is its use in public health care. Documents we obtained through a public records request revealed that our state's public health agency, the California Department of Health Care Services (DHCS), agreed to pay CALPIA up to $37.9 million for the 2021/22 fiscal year for optical services alone. A CALPIA representative confirmed that DHCS, through its Medicaid contracts, makes up 74% of CALPIA's optical service revenue. In other words, California's Medicaid program is far and away the largest funder of the optical division of the state's prison labor system.

So, despite the virtuous principles underlying public health care, DHCS relies on unambiguously exploitative labor. CALPIA wages in prison-based optical shops range between $0.35 and $1.00 per hour,6 up to 55% of which can be deducted by law for restitution and administrative costs, resulting in an effective pay rate as low as $0.16 per hour.7 Courts have routinely rejected legal challenges to these meager wages by concluding that, because the Thirteen Amendment permits the involuntary servitude of incarcerated people, the federal minimum wage law does not apply to prison labor.8

The result is a strange supply chain that is not always transparent or top of mind: medical devices produced by poorly paid imprisoned people are provided to the poorest members of free society, such as the infant who needed sight-saving glasses. We (two medical providers and a lawyer for incarcerated people) have observed firsthand how interconnected the two groups' vulnerabilities are. The medical care of poor, publicly insured patients depends in part on the low wage labor performed by incarcerated workers. The low wages of incarcerated workers depend in part on a complacent buyer-the public health department-and, arguably, complacent medical providers who prescribe devices purchased by state Medicaid entities.

Put simply, a system designed to protect children who otherwise would not have access to care supports exploitative conditions affecting another vulnerable population. Money allocated for public health ultimately funds an institution known to disproportionately punish marginalized people.9 This use of prison labor to manufacture glasses is not unique to California and has been described in Pennsylvania and New York, but more research is needed to determine whether this labor relies on publicly funded resources.10,11

Some argue that prison labor benefits incarcerated people. For instance, an incarcerated worker could learn marketable skills through their assigned job and may derive meaning from contributing to society by making medical devices that will help someone's sight. In our state, for example, the incarcerated people working for CALPIA's prisonbased optical laboratories can and should be credited with producing the device that prevents childhood vision loss. Participation as a prison laborer can also be viewed favorably with regard to decisions about parole. But these "benefits" must not distract from the exploitative context in which they arise. In our state, prison work is not only extremely undercompensated but also mandatory-governing law states that incarcerated people are "obligated to work"12 and subjects them to discipline if they do not.13 How meaningful is a benefit that one is forced to accept?

Ultimately, this situation illuminates a complex system that ties physicians and their patients to the prison industrial complex. Increasing awareness of this relationship could result in a greater understanding of the far-reaching effects of prison labor and greater scrutiny of the role of physicians in acknowledging and addressing the systems we support through our clinical care. The twomonth-old patient was not the first and will not be the last to rely on an exploitative system to provide a medically necessary and sight-preserving treatment prescribed by her physician.

Others have called for public health officials, researchers, and physicians to address the sprawling reach of the prison industrial complex.14 Medical providers could use their position of authority to advocate better pay and conditions for incarcerated workers who produce the very devices that providers prescribe. Alternatively, medical providers could organize around resisting a systematic reliance on prison labor-sourced medical devices. In other words, "First, do no harm" may extend beyond the patient-doctor relationship and include a broader obligation to think critically about how one's medical practice is indifferent to, or even causes, harm to others besides the patient. As care providers, we are not free from the social complexities that underlie the US history of incarceration or prison labor. >4JPH

Sidebar

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J.T. Oatts conceptualized the editorial. J. Hutt provided legal expertise. All authors edited and submitted the final version of the editorial.

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The authors have no conflicts of interest to declare.

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Xylazine and Overdoses: Trends, Concerns, and Recommendations

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ABSTRACT (ENGLISH)

Xylazine is a nonopioid veterinary anesthetic and sedative that is increasingly detected in the illicit drug supply in the United States. Data indicate a striking prevalence of xylazine among opioid-involved overdose deaths. The emergence of xylazine in the illicit drug supply poses many unknowns and potential risks for people who use drugs. The public health system needs to respond by increasing testing to determine the prevalence of xylazine, identifying its potential toxicity at various exposure levels, and taking mitigating action to prevent harms. Currently, there is little testing capable of identifying xylazine in drug supplies, which limits the possibility of public health intervention, implementation of harm reduction strategies, or development of novel treatment strategies. (AmJ Public Health. 2022;112(8):1212-1216. https://doi.org/10.2105/ AJPH.2022.306881)

FULL TEXT

Headnote

Xylazine is a nonopioid veterinary anesthetic and sedative that is increasingly detected in the illicit drug supply in the United States. Data indicate a striking prevalence of xylazine among opioid-involved overdose deaths.

The emergence of xylazine in the illicit drug supply poses many unknowns and potential risks for people who use drugs. The public health system needs to respond by increasing testing to determine the prevalence of xylazine, identifying its potential toxicity at various exposure levels, and taking mitigating action to prevent harms.

Currently, there is little testing capable of identifying xylazine in drug supplies, which limits the possibility of public health intervention, implementation of harm reduction strategies, or development of novel treatment strategies. (AmJ Public Health. 2022;112(8):1212-1216. https://doi.org/10.2105/ AJPH.2022.306881)

Xylazine is a veterinary pharmaceutical that is rapidly disseminating across the unregulated drug supply in the United States. It is not commonly tested for in clinical settings or forensic testing labs and can be deadly.1,2 As recently as 2018, xylazine was rarely seen in the US drug markets, but it is now a common additive to substances like fentanyl, heroin, and cocaine. Most concerning is its increasing involvement in drug overdose deaths.3

Xylazine is a nonopioid anesthetic and sedative approved by the US Food and Drug Administration for use in veterinary medicine but not for use in humans.4 It is an a-2 adrenergic receptor agonist that has a chemical structure similar to dexmedetomidine, a paralytic, and clonidine, an antihypertensive, as well as phenothiazines and tricyclic antidepressants.4,5 In humans, a-2 agonist medications similar to xylazine are often used as adjunctive medications in anesthesia to reduce the requirement for general anesthesia.6 The effects of xylazine are primarily actuated in the central nervous system (CNS) via the locus coeruleus, which then causes sedation, analgesia, and muscle relaxation.5 These actions appear to be mediated by xylazine inhibiting the release of norepinephrine in the CNS, leading to decreased excitatory action.7

The effects of xylazine that may contribute to overdose risk in humans include CNS depression, hypotension, bradycardia, and respiratory depression.8 When combined with opioids, xylazine increases the potential for fatal respiratory depression. Although the opioid reversal agent naloxone plays a critical role in responding to any overdose with possible opioid involvement, it does not reverse the effects of xylazine. Furthermore, there is no specific reversal agent for xylazine approved for use in humans, although the a-2 adrenergic antagonist tolazoline has been described as a xylazine reversal agent in veterinary medicine.9 Consequently, people who ingest xylazine may need acute medical care, including mechanical ventilation.8 Without timely and widespread testing for xylazine, clinicians are underprepared to recognize and respond to the medical needs of people exposed to it.

In this article, we describe current trends of xylazine in the US drug supply highlighting state-level data from

Connecticut, identify clinical concerns, and present recommendations for addressing xylazine contamination moving forward.

CURRENT TRENDS IN DRUG SUPPLY

Xylazine was first reported as a frequently encountered drug contaminant in Puerto Rico in 2001.10 Since then, reports from Pennsylvania, Connecticut, and other areas of the United States have arisen.3,11,12 Starting in 2019, xylazine first presented in toxicology reports of opioid overdose fatalities in Connecticut.13 Over the last 2 years, xylazine has more than doubled in prevalence among fatal opioid overdoses in Connecticut,14 with similar increases reported in Philadelphia, Pennsylvania,3 implying widespread and underrecognized adulteration of the illicit drug supply. Besides being used as an adulterant, xylazine is sought out by some individuals for its effects when combined with other substances, in part leading to its increased prevalence.

Xylazine is rapidly increasing in prevalence among various illicit substances, primarily in combination with fentanyl, but is also found in samples containing cocaine, heroin, and other substances.15 The effects of xylazine are thought to enhance, prolong, or modify the effects of heroin and fentanyl, and recent mixed methodologies including ethnographic data note that people use xylazine to extend the "legs" (duration of opioid effect) of fentanyl.16 In 2014, it was believed to be more accessible and easier to acquire than substances such as fentanyl because xylazine is not classified as a controlled substance.8 Furthermore, xylazine may serve as a bulking agent that can be used by street-level distributers to extend the supply of their other drug products.11,17

In Puerto Rico, xylazine has been used for almost 2 decades. Despite long-time knowledge that xylazine has been used as an adulterant of other substances, little has been done in terms of prevention, surveillance, and education regarding this substance. In the United States, xylazine is currently emerging as a significant component of the drug supply and appears to be regional. Current data show that in 2019 only 2% of all drug overdose deaths contained xylazine, but the majority of cases (67%) were in the northeastern United States.12 However, this regional distribution could reflect the uneven availability of toxicology testing for xylazine, with variability across counties and states, rather than the true distribution of xylazine, which may be more widespread.

STATEWIDE DATA FROM CONNECTICUT

All suspected overdoses in the state of Connecticut are investigated through the Office of the Chief Medical Examiner, and toxicology testing is standardized statewide; xylazine testing commenced in 2013 for all suspected accidental drug intoxication deaths.13 Monthly and annually, the Connecticut Department of Public Health releases an update on fatal drug overdoses. The department's August 2021 monthly report showed rising rates of xylazine-involved overdose deaths since they started tracking in 2019 (Figure 1).14 In 2019, the first report of xylazine among opioid-involved overdose deaths in Connecticut identified 71 deaths containing xylazine and fentanyl. In 2020,141 overdose deaths involving xylazine and fentanyl were reported, and in the first 30 weeks of 2021 there were 172 overdose deaths involving xylazine and fentanyl. In August 2021, data from the report indicated that xylazine prevalence among fatal opioid overdoses was rapidly increasing.14 The US Centers for Disease Control and Prevention (CDC) reported that between 2019 and July 2020, Connecticut saw unintentional drug overdose deaths with a lethal combination of fentanyl and xylazine increase from 5.8% to 11.4% of cases.11

NATIONAL DATA

National data are similar to the trends seen in Connecticut, with evidence of increased prevalence of xylazine in the US drug supply. In 2019, the CDC released a report indicating that xylazine had been identified in postmortem toxicology samples from drug overdose deaths in 25 of the 38 states that were examined.12 Prevalence of xylazine-involved overdose deaths has risen over the past year, with states including Connecticut, Massachusetts, and Pennsylvania reporting substantial increases in the number of cases identified from postmortem toxicology testing over the past 1 to 2 years.3,11,18 The CDC also reported that xylazine was identified in over 3800 national toxicological surveillance samples reported from 2015 through December 2020, with progressive increases each year, culminating in 1492 reports in 2020.12

DATA LIMITATIONS

Reported increases in prevalence of xylazine-involved overdose deaths significantly underestimate true prevalence because of wide variation in how cause of death is reported and how postmortem samples are tested within and across states.1 Causes of death are classified according to International Classification of Diseases, 10th Revision (ICD-10) classifications, many of which do not specify the substance involved (e.g., "other opioid," "other narcotic," or "drug overdose"). Thus, even if the involved substance is known, it is not captured via current overdose death reporting systems. Although the National Association of Medical Examiners recommends listing all involved substances on death certificates, this recommendation is not universally adopted in standard practice.1 Furthermore, xylazine involvement is likely being undercounted among overdose deaths because testing only occurs at the request of the medical examiner and not in routine practice.8

CLINICAL CONCERNS

The clinical effects of acute xylazine toxicity in humans are not well defined but generally include significant respiratory depression, bradycardia, hypotension, and decreased consciousness.8 There are no specific reversal agents for xylazine toxicity approved for use in humans, and supportive measures such as mechanical ventilation, fluid resuscitation, blood pressure management, and heart rate monitoring may be indicated.8

Another important clinical concern is unique skin lesions associated with chronic xylazine injection, typically appearing as abscesses or ulcerations predominantly on the extremities.19 Multiple associations have been made between xylazine and severe skin ulcerations based on observational studies.19,20 Although a link has not yet been definitively established, it is important to recognize these severe skin lesions as potentially xylazine related to effectively address the underlying cause and recommend cessation of xylazine injection, both intentional and unintentional. Of note, these ulcerations are not specifically localized to the sites of injection but can occur diffusely.10

RECOMMENDATIONS

The rising prevalence of xylazine in the drug supply is a concerning trend that may be altering the risk profile of substance use, changing use patterns, and affecting treatment response for individuals with suspected overdose events. To further understand the impact of xylazine on the drug supply and on drug users, additional testing, research, education, and harm reduction measures are needed.

Testing

Despite postmortem testing showing xylazine involvement in an increasing number of overdose deaths, there remains minimal screening, surveillance, or monitoring for xylazine among people who use drugs, or of the drug supply itself. There is great need for improved surveillance to develop a better understanding of the current drug supply. This information is crucial for an appropriate and directed public health response and for first responders and clinicians making medical decisions related to xylazine-involved drug overdoses and associated complications.

Despite there being high-quality, detailed data from Connecticut, Philadelphia, and a few other areas in the Northeast United States, overall, there is a dearth of surveillance testing and therefore a scarcity of information on the prevalence of xylazine, both nationally and in most localities. All cases of suspected drug overdose should include xylazine testing; however, current xylazine testing requires a comprehensive toxicology screen via gas chromatography-mass spectrometry, which is a timely and costly barrier to widespread screening. A rapid xylazine screening test needs to be developed and disseminated to allow for point-ofcare testing for clinical and individual use. In fact, point-of-care drug checking services using Fourier transform infrared spectroscopy have identified xylazine in the drug supply.21 Given the growing presence of xylazine in drug overdose deaths, test kit developers should consider creating xylazine test strips, similar to fentanyl test strips (rapid antigen testing for use on urine samples), to allow for rapid detection of xylazine in settings utilizing drug checking technologies to identify components of unregulated substances prior to use.

Research

Research is critical to better understanding the national distribution of xylazine in the drug supply, the physiological effects of xylazine in humans at various exposure levels, and the combined effects of xylazine and other commonly used drugs (e.g., fentanyl, heroin, cocaine, amphetamines). One important area of clinical research is determining any causal relationship between xylazine and skin ulcerations and ways to treat and prevent these dangerous complications. The safety and effectiveness of tolazoline as a reversal agent for xylazine-related sedation in humans should also be investigated. More qualitative research, including ethnography, is critical to understanding how people are managing xylazine's risks, adapting their use patterns, and avoiding the substance or seeking it out, and to knowing the drug's relative availability and cost on the street and its embodied effects.

Patient and Clinician Education

Education about the presence ofxylazine in the drug supply is important for both patientsand clinicians. First-line medical staff and responders- including emergency medical technicians, paramedics, emergency medicine clinicians, and people who use drugs-need to be aware of its rising prevalence as well as what to do in cases of suspected xylazine-involved overdose. In addition to continuing the use of naloxone for all overdoses with potential opioid involvement, all first responders should consider xylazine as a contributor when response to naloxone administration is inadequate, and be prepared to provide hemodynamic support for xylazine-induced hypotension. Testing for xylazine should be performed, if available, and those with confirmed or suspected xylazine exposure should be evaluated for skin ulcerations. Importantly, testing the drug supply, and informing people who use drugs of identified contaminants, provides them the opportunity to modify their behaviors and incorporate harm reduction strategies.

Harm Reduction

Because there are currently no specific interventions for xylazine, it is important to continue to recommend and implement universal harm reduction measures as the prevalence of xylazine increases around the country. Harm reduction strategies and education on xylazine should be given to all individuals who use drugs. These harm reduction interventions include the following:

* Never use drugs alone. If using alone, individuals should take advantage of resources such as the Never Use Alone hotline (1-800484-3731).22
* Always have and know how to use naloxone if using unregulated substances. Always administer naloxone in response to any suspected overdose, including suspected xylazine, to reverse any possible opioid involvement.
* Start low and go slow: use a small test sample first to ensure that potency and effects are what is expected. Give ample time between dosing. Stagger use if using with others, so that 1 person can administer naloxone if necessary.
* Use from the same supplier if possible.
* Adopt safe injection practices (sterile syringes, clean skin with alcohol swab, don't lick needles, don't share or reuse needles).
* Seek medical care for unusual abscesses.
* Always contact emergency services in the event of drug overdose. Naloxone will not reverse the effects of xylazine.

CONCLUSION

The emergence of xylazine in the US drug supply represents a growing threat to people who use drugs. Coupled with the rise of high-potency synthetic opioids, such as fentanyl and its analogs, xylazine is a new potential risk in an ongoing overdose crisis. Initial steps to addressing this threat must include expanded xylazine testing, patient and clinician education on its risks, and promotion of harm reduction strategies to prevent further morbidity and mortality. >4JPH

Sidebar

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R. S. Alexander is responsible for conceptualizing the article, writing the initial draft, constructing the finalsubmission, responding to reviewer comments, and editing the final version. B. R. Canver was involved in the conceptualization of the article and revisions of subsequent drafts. K. L. Sue was involved in revision of drafts for important intellectual content and in responseto reviewer comments. K. L. Morford was involved in revision ofdrafts for important intellectual content, design ofthe article, response to reviewer comments, and final approval ofthe article.

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DETAILS

Subject:	Health promotion; Toxicity; Public health; Trends; Hypotension; Anesthesia; Skin; Toxicology; Ventilation; Fentanyl; Intervention; Narcotics; Overdose; Drug overdose; Fatalities; Heroin; Cardiac arrhythmia; Xylazine; FDA approval; Cocaine; Veterinary medicine; Harm reduction; Health surveillance; Surveillance
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Ecological and Environmental Factors in a Yellow Fever Outbreak

Anonymous

ProQuest document link

FULL TEXT

State of Rio de Janeiro, Brazil

Abreu et al. investigated geographical, ecological, and entomological factors contributing to a 2017-2019 outbreak of sylvatic yellow fever virus in a coastal region of Brazil previously considered free of sylvatic yellow fever virus. Yellow fever has a high mortality rate and, despite the availability of a safe and effective vaccine, there continue to be outbreaks in the Americas and Africa. The virus transmission cycle involved nonhuman primates, mosquitoes, and humans. The authors assigned functional traits related to behavior, physiology, habitats, and epidemiological importance to 89 mosquito species from 84 sampling points. Assessed spatial environmental characteristics included altitude, land use, forest fragment size, and vegetation cover. Abundance of Haemagogus mosquitoes, combined with lower species richness and diversity, increased infection risk. Infections were most common in large, continuous forests and in small forest fragments. This work may help predict future outbreaks and inform targeted vaccination and prevention measures.

Sidebar

Citation. Abreu FVS, de Andreazzi CS, Neves MSAS, et al. Ecological and environmental factors affecting transmission of sylvatic yellow fever in the 2017-2019 outbreak in the Atlantic Forest, Brazil. Parasit Vectors. 2022;15(1):23. https://doi.org/10.1186/s13071-021-05143-0

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Workplaces Most Affected by COVID-19 Outbreaks in California, January 2020–August 2021

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ABSTRACT (ENGLISH)

Objectives. To describe which industries have the highest burden of COVID-19 outbreaks in California.
Methods. We assigned US census industry codes to COVID-19 outbreaks reported to the California Department of Public Health (CDPH) from January 1,2020, to August 31,2021, and determined numbers of outbreaks, numbers of outbreak-associated cases, and outbreak incidence levels by industry. We determined characteristics of outbreak-associated cases using individual case data linked to COVID-19 outbreaks.
Results. Local health departments reported 19 893 COVID-19 outbreaks and 300 379 outbreak-associated cases to CDPH. The most outbreaks (47.8%) and outbreak-associated cases (54.8%) occurred in the health care and social assistance sector, where outbreak incidence levels were highest in skilled nursing facilities and residential care facilities (1306 and 544 outbreaks per 1000 establishments, respectively). High proportions of outbreaks also occurred in the retail trade (8.6%) and manufacturing (7.9%) sectors. Demographics of outbreak-associated cases varied across industries.
Conclusions. Certain California industries, particularly in the health care, manufacturing, and retail sectors, have experienced a high burden of COVID-19 outbreaks during the pandemic.

FULL TEXT

Headnote

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Conclusions. Certain California industries, particularly in the health care, manufacturing, and retail sectors, have experienced a high burden of COVID-19 outbreaks during the pandemic.

Work-related exposures and risk factors play an important role in COVID-19 disease transmission. Workers in certain industries, such as health care, agriculture, manufacturing, and transportation, have been found to be at increased risk for COVID-19 infection and mortality.1-3 In addition, overrepresentation of certain racial and ethnic groups in higher risk occupations and industries may contribute to the disproportionate burden of COVID-19 morbidity and mortality experienced by those groups.2,4

COVID-19 outbreak data can provide additional information about which workers may be at higher risk for exposure and infection. Although COVID-19 outbreaks have been well documented in certain industries, including health care, corrections, and meat processing,5-8 less information is available about outbreaks in other types of potentially high-risk workplaces, and limited comprehensive information is available about which types of workplaces have been most affected by COVID-19 outbreaks. This type of information could help direct prevention efforts such as workplacespecific guidance, nonpharmaceutical interventions, and workplace- or industrytargeted vaccination campaigns.

In California, home to both the largest population and the highest total number of COVID-19 cases of any US state,9 employer reporting of workplace COVID-19 outbreaks is mandated under a state law that became effective January 1,2021. The law also requires the California Department of Public Health (CDPH) to publicly report numbers of outbreaks and outbreakassociated cases by industry.10 Using these statewide data on COVID-19 outbreaks, as well as outbreak data reported by local health departments in 2020, we sought to describe which industries have experienced the highest burden of COVID-19 outbreaks during the pandemic. We also sought to describe temporal trends in COVID-19 outbreaks and characterize demographics of outbreakassociated cases.

METHODS

We analyzed all confirmed COVID-19 outbreaks reported to CDPH as of September 27,2021, in which onset occurred between January 1,2020, and August 31, 2021.

Outbreak Definitions and Reporting

Outbreak definitions vary by setting.

In non-health care workplaces, CDPH defines an outbreak as 3 or more probable or confirmed COVID-19 cases within a 14-day period among people who are epidemiologically linked in the setting, are from different households, and are not identified as close contacts of each other in any other case investigation.11 Separate definitions apply to health care workplaces; for example, in long-term care facilities, an outbreak is defined as 1 or more facility-acquired cases in a resident.12

Potential outbreaks are reported to local health departments (LHDs) by employers or facilities; LHDs may also identify outbreaks via individual case investigations and contact tracing. During 2020, requirements for employers to report outbreaks to LHDs varied by type ofworkplace and jurisdiction. Since January 1,2021, however, California law has required non-health care employers to report to their LHD when they identify 3 or more cases of COVID-19 among workers in a workplace within a 14-day period; separate reporting requirements apply to health care facilities. Once notified by an employer, LHDs investigate to determine whether the reported cases constitute an outbreak according to the specified CDPH outbreak definitions. LHDs then report confirmed outbreaks to CDPH via established electronic reporting systems, as required by existing California regulations.13

Outbreak reports also include numbers of associated cases. Outbreakassociated cases may include workers as well as nonworkers present at the worksite, such as residents or patients in congregate residential or health care settings or students in educational settings. LHDs are asked to link patient records for outbreak-associated cases to outbreak reports in electronic reporting systems, although not all LHDs consistently do so. For outbreak-linked cases for which data were available, we analyzed demographic variables such as sex, age, and race/ethnicity. Because nonworker cases cannot be reliably distinguished from worker cases on the basis of information submitted by LHDs, we analyzed these demographic variables across all outbreak-associated cases reported to CDPH, including cases among both workers and nonworkers.

Industry Assignments and Incidence Calculations

A CDPH team trained in industry coding reviewed available information for individual outbreaks reported to CDPH, including location name, address, and LHD outbreak descriptions, and assigned each outbreak a 2012 US census 4-digit industry code.14 Each individual industry is also part of a larger industry sector (e.g., hospitals are an individual industry that is part of the health care and social assistance sector). Total numbers of reported outbreaks and outbreakassociated cases were calculated for each individual industry as well as each industry sector. Outbreak incidence by sector and individual industry was calculated by dividing numbers of reported outbreaks by numbers of establishments in each industry or sector. If a single facility reported more than 1 outbreak during the study period, each outbreak was counted separately (i.e., a single facility could be responsible for more than 1 outbreak in the data set).

Numbers of establishments were obtained from the California Employment Development Department's Quarterly Census of Employment and Wages and were calculated as the average numbers of establishments from the first through fourth quarters of 2020; 6-digit North American Industrial Classification System codes used by the Employment Development Department to classify establishments were crosswalked to US census industry codes. For a limited number of US census industry codes (0590, 0690,1290, 2990, 3290, 3875, 3980, 4590, and 5590), no North American Industrial Classification System code is available that crosswalks directly to the specific 2012 US census industry code; these industries were therefore excluded from outbreak incidence calculations. (A total of 120 outbreaks and 1476 outbreak-associated cases occurred in these excluded industries. Among them, the "not specified food industries" category [census code 1290] included the most reported outbreaks [56] and outbreak-associated cases [1017].)

We also ranked industries according to their prevention indexes. The prevention index is a tool that can be used, alongside other considerations, to prioritize occupational health and safety interventions. As described elsewhere, we calculated prevention indexes by ranking industries according to outbreak count and outbreak incidence and dividing the sum of the count and incidence ranks by 2; this produced a prevention index for each industry, with lower prevention indexes corresponding to a higher priority for intervention.15 We rank ordered individual industries by prevention index values (with rank 1 as the highest priority).

RESULTS

Local health departments reported to CDPH 19 893 COVID-19 outbreaks and 300 379 outbreak-associated cases in which onset occurred between January 1,2020, and August 31,2021; this corresponded to an incidence of 12.2 outbreaks per 1000 establishments. An additional 489 outbreaks were reported to CDPH but were excluded because of insufficient information to assign an industry code (281) or because they occurred in homeless encampments, a nonoccupational setting (208). Outbreak-associated cases represented 7.0% of COVID-19 cases reported in California during this period.

A total of 9513 outbreaks (47.8%) and 164659 outbreak-associated cases (54.8%) were reported in the health care and social assistance sector (Table 1). Other sectors with high percentages of outbreaks included retail trade (8.6%), manufacturing (7.9%), and accommodation and food services (7.3%). The sector with the highest overall incidence of reported outbreaks (78.1 outbreaks per 1000 establishments) was public administration, which includes correctional facilities and public safety establishments such as police and fire services.

Among individual industries in the health care and social assistance sector (Table 2), percentages and outbreak incidence values were highest in residential care facilities (22.8% of all outbreaks; 544 outbreaks per 1000 establishments), skilled nursing facilities (13.0%; 1306 per 1000), community food and housing and emergency services, including homeless shelters (3.3%; 425 per 1000), and hospitals (2.9%; 409 per 1000). Among individual retail industries, outbreak percentages were highest in grocery stores (2.5% of all outbreaks; 47 per 1000) and department and discount stores (1.3%; 272 per 1000). Restaurants, part of the accommodation and food services sector, had the third-highest percentage of outbreaks of any individual industry (6.5%; 16 per 1000).

Seventy-three percent of outbreaks involved 10 or fewer associated cases; the median was 5 cases per outbreak (interquartile range = 3-11). Although most outbreaks were small, 389 (2%) involved more than 100 associated cases. Larger outbreaks were observed in certain congregate living settings where cases occurred among workers as well as residents, as evidenced by higher mean numbers of outbreakassociated cases in those settings. Examples include the justice, public order, and safety activities industry, which includes correctional facilities (mean of 56.3 cases per outbreak), and skilled nursing facilities (35.3 cases per outbreak). Mean numbers of cases per outbreak were also high in certain manufacturing industries such as ship and boat building (55.7 cases per outbreak), cut and sew apparel manufacturing (33.0 cases per outbreak), and animal slaughtering and processing (32.5 cases per outbreak).

The 5 industries with the highest prevention index rankings were skilled nursing facilities, residential care facilities, community food and housing and emergency services, hospitals, and justice, public order, and safety activities (Table 2). Several manufacturing industries not included in Table 2 because of lower total numbers of outbreaks had high prevention index rankings as a result of their higher outbreak incidence levels; these industries included animal slaughtering and processing (182 per 1000; prevention index rank 5 11), aerospace products and parts manufacturing (555 per 1000; rank 5 12), fruit and vegetable preserving and specialty food manufacturing (134 per 1000; rank 5 13), and seafood and other miscellaneous foods manufacturing (70 per 1000; rank 5 17).

Case-level information was available for 162 207 (54.0%) outbreakassociated cases. The availability of case-level data varied across industry sectors and was lowest in the information (32.6%), wholesale trade (32.9%), and construction (34.8%) sectors and highest in the public administration sector (82.4%).

Among outbreak-associated cases with available information, 84653 of 159 351 (53.1 %) cases occurred among men and 82 523 of 162104 (50.9%) among individuals 18 to 49 years of age (Table A, available as a supplement to the online version of this article at http://www.ajph.org). Race/ethnicity information was missing for 24.8% of cases with available case-level data and 59.4% of cases overall. Among cases with available information, the distribution by race and ethnicity varied across industry sectors (Table 3; Figure A, available as a supplement to the online version of this article at http://www. ajph.org); for example, Latino people were most highly represented in the agriculture sector (84.2% of cases), whereas Asian people were most highly represented in the real estate sector (16.6%) and Black people in the public administration sector (13.2%).

The largest numbers of reported outbreaks occurred during November 2020 to January 2021, coinciding with California's winter 2020-2021 COVID-19 surge; the highest monthly number (21.0% of all outbreaks) was reported in December 2020. Outside of the winter surge, the highest numbers of monthly outbreaks during the study period were seen in July and August 2021 (5.7% and 6.9% of all outbreaks, respectively), coinciding with an increase in overall COVID-19 cases associated with the Delta variant.

During most months, the highest numbers of outbreaks were reported in residential care facilities and skilled nursing facilities; however, reported outbreaks were highest in elementary and secondary schools in April (34.8%) and May (30.5%) 2021 and in August 2021 (34.9%) (Figure 1; Table B, available as a supplement to the online version of this article at http://www.ajph. org). Overall, the percentage of outbreaks reported in the health care and social assistance sector decreased in 2021 (40.5%) relative to 2020 (52.0%); the percentages of outbreaks remained stable in most other sectors with the exception of educational services, which increased from 2.9% of reported outbreaks in 2020 to 11.8% in 2021 (Table C, available as a supplement to the online version of this article at http://www.ajph.org).

DISCUSSION

We identified nearly 20 000 COVID-19 outbreaks reported in California from the beginning of the pandemic through August 2021. These outbreaks occurred across industry sectors, with the most outbreaks and outbreak-associated cases reported in the health care and social assistance sector, which includes residential care facilities and skilled nursing facilities. These known high-risk settings have been the focus of significant public health interventions during the COVID-19 pandemic, including setting-specific guidance and consultation, an emphasis on personal protective equipment and other protective measures, and early prioritization for vaccination.

However, our study also highlights additional industries with high counts and a high incidence of COVID-19 outbreaks such as restaurants and retail and manufacturing industries, where employees continued to report to work during the pandemic and had publicfacing roles or worked in close proximity to others. Although these industries may have received less attention, their elevated burden of COVID-19 outbreaks merits intervention, including development of industry-specific strategies for outbreak prevention and response; specific outreach to workers and labor unions, employers and trade associations, and local health departments in areas where these industries are concentrated; and targeted vaccination campaigns.

Residential care facilities, skilled nursing facilities, and correctional facilities ranked highly in terms of both outbreak counts and incidence in California and require ongoing public health attention and intervention. These settings are known to involve a high risk of COVID-19 outbreaks owing to their vulnerable resident populations, frequent close contact between residents and staff, movement of residents and staff between facilities, and other factors.16 These are also congregate settings where nonworkers are present and often account for a significant proportion of cases. Although high outbreak case counts in these settings may therefore overestimate COVID-19 incidence rates among workers, they nonetheless likely result in an increased occupational risk of COVID-19 exposure. Health care facilities have also been subject to outbreak reporting mandates since early in the pandemic and have lower thresholds in terms of the number of cases required to be considered an outbreak; both ofthese factors may have led to increased numbers of reported outbreaks in these settings relative to others.

In addition to the known high-risk settings just discussed, we also identified other industries with high proportions of reported outbreaks. Given that prevention strategies are likely to differ across industries, such industries may require both additional prevention efforts and additional investigation of which interventions may be most effective in those specific settings. One such industry is the restaurant industry, which had the third-highest outbreak count of any individual industry. This corresponded to a relatively low outbreak incidence, likely as a result of the high number of establishments in this industry, but the large number of workers and workplaces potentially affected nonetheless warrant prioritization. In addition, many restaurants were closed for in-person dining in California during portions of the pandemic, which may have contributed to lower outbreak rates. As restaurants reopen, workers remain vulnerable to COVID-19 exposure from coworkers as well as from members ofthe public.

Several additional industries and sectors had high outbreak counts and incidence levels. The manufacturing and retail trade sectors each represented around 8% of all outbreaks reported to CDPH. These sectors have also been identified as high risk in other jurisdictions; in reports from Utah, Wisconsin, and Los Angeles, both manufacturing and retail ranked highly in numbers of COVID-19 outbreaks among non-health care, noncongregate settings during portions of 2020.4,17,18 Within the retail trade sector in California, several individual industries had high outbreak counts, incidence levels, and prevention index rankings, including grocery stores, department and discount stores, and automobile dealers, all workplaces where employees are likely to come into close, frequent contact with other employees as well as with members ofthe public.

Within the manufacturing sector, fewer individual industries ranked highly in outbreak counts, likely because of smaller industry sizes, but many had high outbreak incidence levels and prevention index rankings. Examples include several food processing industries such as animal slaughtering and processing, fruit and vegetable preserving, and seafood manufacturing, which have been documented settings of large COVID-19 outbreaks in numerous jurisdictions.8,19 High outbreak incidence levels were also seen in some nonfood manufacturing industries, in particular the aerospace manufacturing industry, which had the third-highest outbreak incidence of any individual industry.

Unlike workers in retail industries, workers in manufacturing industries are typically not public facing; most of these workers did, however, continue to report to work throughout the pandemic, typically in high-density workplaces where the risk of exposure to other workers with COVID-19 may be higher. Another industry with similar risk factors is the warehousing and storage industry, which had high outbreak counts, incidence levels, and prevention index rankings.

Outbreak-associated cases reported to CDPH represented 7% of COVID-19 cases in California; this finding was comparable to the percentage of cases associated with outbreaks in a Seattle report (5%) but lower than the percentage identified as outbreak associated in Utah (12%) and Wisconsin (18%)418,20 The true number of outbreak-associated cases is likely higher than the number reported to CDPH, as not all cases associated with an outbreak are identified as such and additional cases identified after the initial outbreak report are not consistently reported to CDPH.

Some demographic groups-in particular, communities of color and those of lower socioeconomic status-have been disproportionately affected by the COVID-19 pandemic, and the overrepresentation ofthese groups in certain essential industries and occupations may play a role in these disparities.21,22 In Utah, for example, Hispanic and nonWhite individuals represent 24% ofthe state's workforce but were found to make up 73% of workplace outbreakassociated cases.4 In our outbreak data, the distribution of outbreak-associated cases among racial and ethnic groups was similar to the overall distribution ofthe state's population; however, there were variations in the distribution of outbreak-associated cases by race and ethnicity across industry sectors.

For instance, in several sectors with high numbers of outbreaks, including manufacturing, retail, accommodation and food services, and transportation and warehousing, more than 50% of outbreak-associated cases with race/ ethnicity information available involved Latino individuals. Given that Latino people have been disproportionately represented among COVID-19 cases and fatalities in California,21,23 these findings highlight occupational factors and enhanced workplace protections as a potential avenue for addressing disparities.

These demographic trends in our outbreak-associated case data should, however, be interpreted with caution. Race and ethnicity information was missing or unknown for nearly 60% of cases, and the amount of missing data varied across industry sectors. In addition, outbreak-associated cases included workers as well as nonworkers, so the demographic trends described here may not represent demographic trends among workers, particularly in certain settings with larger numbers of nonworkers present such as health care, correctional, and educational settings. Nonetheless, our findings as well as those of earlier reports indicate that public health interventions should continue to target industries with high proportions of workers from disproportionately affected groups and should be culturally and linguistically appropriate and informed by worker demographics. In addition, efforts should be made to improve collection and reporting of key demographic variables in outbreak data.

Numbers of reported outbreaks over time overtime largely paralleled overall trends in COVID-19 cases in California, with the highest numbers of outbreaks seen during California's winter 20202021 COVID-19 surge and a July and August 2021 increase in outbreaks alongside an overall increase in cases associated with the Delta variant. For the most part, the distribution of COVID-19 outbreaks across industries remained stable overtime. One exception was elementary and secondary schools, which experienced few outbreaks in the early months of the pandemic, when they remained largely closed, but were responsible for a larger proportion of outbreaks during periods of 2021 when many California schools reopened for in-person learning.

Limitations

This report is subject to several additional limitations. Although a statewide requirement for non-health care employers to report outbreaks to LHDs has been in place since January 1,2021, prior to that reporting requirements differed by local jurisdiction and by type of setting, which may have led to differential reporting across settings. The proportion of outbreaks reported in non-health care settings relative to health care settings increased from 2020 to 2021, which might suggest an increase in reporting following implementation of the statewide requirement; however, the proportions of outbreaks reported in most individual non-health care sectors, with the exception of educational services, remained relatively stable in 2020 and 2021. This year-to-year comparison should also be interpreted in the context of other changes over time; for example, closures in schools and other non-health care settings in 2020 and earlier availability of vaccination in health care and congregate settings may have led to fewer outbreaks in those settings relative to others.

In addition, although employers are required by law to report COVID-19 outbreaks, some may be unaware of or noncompliant with this requirement, which would lead to underestimation of outbreak incidence; it is also possible that consistency in reporting differs across industries. Furthermore, work arrangements in certain industries-for instance, industries with mobile or temporary workforces such as transportation or agriculture-might be less conducive to outbreak identification, which could lead to outbreak underreporting in those industries. CDPH outbreak data also rely on reports received from LHDs, and these local departments may have had limited resources to report outbreaks. Such limitations may have led to underestimated outbreak counts and incidence levels, particularly during COVID-19 surges.

We assigned industry codes on the basis of available information submitted by LHDs; misclassification may have occurred as a result of missing or inaccurate information. In addition, although many of the outbreaks included in our analysis occurred in settings where workers were present, some may have been nonoccupational; we were unable to distinguish workers from nonworkers in our outbreak data. This limitation precluded calculation of outbreak-associated case incidence levels among workers; because our outbreak incidence estimates did not account for numbers of workers per establishment, they may overestimate or underestimate the relative impact of workplace COVID-19 outbreaks on workers in industries with particularly large or small establishment sizes. Although prevention indexes incorporate data on burden of disease as well as disease risk, they do so with limited precision and should be used in the context of additional information and tools to prioritize interventions.

Finally, although outbreaks in our data set were classified by industry, we were unable to analyze COVID-19 incidence according to worker occupation. It is possible that increased risk of COVID-19 among certain occupational groups was not captured in our industry-based analysis.

Public Health Implications

Individual case investigations and contacttracing have formed the backbone of the response to COVID-19 in the United States but may not represent the most timely or complete methods for identifying COVID-19 workplace outbreaks, as workplace information is not always collected during individual case investigations and mechanisms may not exist for linking individual cases identified in the same workplace.20 Furthermore, during the current phase of the pandemic, as public health departments transition away from universal case investigation and contact tracing,24 employer reporting of workplace outbreaks can provide a mechanism for health departments to continue to identify higher-risk settings and target interventions.

An outbreak reporting mandate such as California's may help ensure that such reporting happens more consistently and enable more systematic tracking of where COVID-19 outbreaks are taking place. The resulting outbreak data can be used to categorize outbreaks by industry, as we have done in this report, and identify settings with high numbers and incidence levels of outbreaks and outbreak-associated cases. The use of outbreak data to direct prevention efforts, including workforce vaccination, can play an important role in the ongoing effort to combat the COVID-19 pandemic and in planning for future pandemic responses to protect the workers who are most at risk.

ÂfPU

Sidebar

Public Health Implications. Tracking COVID-19 outbreaks by industry may help target prevention efforts, including workforce vaccination. (AmJ Public Health. 2022;1 12(8):1180-1 190. https://doi.org/

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CONTRIBUTORS

A. Heinzerling, A. Nguyen, B. Materna, and S.Jain conceptualized the study. A. Nguyen, M. Frederick, E. Chan, K. Gibb, A. Rodriguez, and J. Wong prepared the data for analysis, and A. Heinzerling and A. Nguyen conducted the analysis. All of the authors contributed to interpretation of the analysis. A. Heinzerling drafted the article, and all authors provided critical feedback.

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Note. The findings and conclusions in this article are those of the authors and do not necessarily represent the views or opinions of the California Department of Public Health or the California Health and Human Services Agency.

CONFLICTS OF INTEREST

The authors do not report any conflicts of interest.

HUMAN PARTICIPANT PROTECTION

This study was determined by the California Health and Human Services Committee for the Protection of Human Subjects to be public health practice as opposed to research and was exempt from institutional review board review.

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DETAILS

Subject:	Censuses; Food; Mortality; Employment; COVID-19; Retailing industry; Homeless people; Public health; Coronaviruses; Disease transmission; Meat processing; Codes; Employers; State laws; Workers; Prevention; Pandemics; Epidemics; Departments; Public health departments; Health care; Workplaces; Outbreaks; Manufacturing; Nursing; Health care industry; Health services; Retail industry; Nurses; Residential institutions
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Notes From the Field: A Repository of Best Practices

Morabia, Alfredo, MD, PhD

ProQuest document link

FULL TEXT

Last year we Introduced the article format Notes From the Field (NFTF). NFTF articles are made to share the experiences that may Improve the practice of public health. They are a popular article format. Between February 2021 and July 2022, we have published 47 of them In AJPH regular Issues and 6 In two AJPH supplements. The Initial NFTF article was published In February 2021. They describe successfulexperiences, usually at a locallevel, that can eventually be reproduced elsewhere. In supplements, they have the key role of Illustrating meaningful field experiences related to a specific theme. With this purpose In mind, the format of NFTF ensures that the key Information Is provided.

In 1200 words, with an 80-word abstract, up to 12 references, and up to 2 table or figure elements, NFTF successively describe goals and objectives; how the Intervention was Implemented In practice; the geographic location, the years when the Intervention was Implemented, and the population subject to the Intervention; and the motivation behind the Intervention. Importantly, they provide evidence on whether the Intervention worked or not and, If relevant, whether the Implementation of the Intervention can be expected to have adverse or other unintended consequences. The last step means that Interventions that are still being programmed or In the Implementation phase are not eligible as NFTF articles. Finally, NFTF state why the Intervention Is felt to be sustainable and the Importance of the Intervention for public health.

Of the 47 NFTF articles published In AJPH regular Issues, 26 were related to responses to the COVID-19 pandemic. They dealt with topics such as contact tracing, vaccine administration, masking, and quarantines. NFTF articles have attracted reports of public health actions In schools, In jails, and among hardto-reach populations.

The Institutionaland geographic origins of the NFTF Indicate that they are on the publication radar of many readers across the country. The sources of NFTF articles have primarily been universities but substantially have also featured local, city, or state health departments and the Centers for Disease Controland Prevention. Nonfederal sources have been In locations across the United States, such as Maryland, New York, California, Georgia, and Wisconsin. One NFTF article has come from Israel and 1 from Spain.

We try to process NFTF articles rapidly so that they can be quickly disseminated on social media. On average NFTF articles have been downloaded 392 times (overall 18435 times). Among those that have generated more than 1000 downloads, there was a casebased seroprevalence survey of SARS-Cov-2 (severe acute respiratory syndrome coronavirus 2) antibodies In Arizona, Meatless Monday campaign In US adults, food environment In Washington State-run correctionalfacilities, contact tracing In Latinx communities, COVID19 data publication In New York City, and COVID-19 vaccine outreach In Wisconsin.

The success of the NFTF suggests that the format responds to a need. We hope that public health departments and grassroots and frontline organizations will use this space to share their experiences with AJPH readers. .4JPI-I

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Sidebar

11 Years Ago

Screening for Tuberculosis at an Adult Education Center: Resultsofa Community-Based Participatory Process

We used a community-based participatory research (CBPR) approach to plan and implement free TB skin testing at an adult education center to determine the efficacy of CBPR with voluntary tuberculosis (TB)screening and the prevalence of TB infection amongimmigrant and refugee populations. We formed a CBPR partnership to address TB screening at an adult education center that serves a large immigrant and refugee population in Rochester, Minnesota.... A total of 259 adult learners volunteered to be skin-tested in April 2009; 48 (18.5%) had positive TB skin tests_Our results implythat TB skin testing at adult education centers that serve large foreign-born populations may be effective.Our findings also show that a participatory process may enhance the willingness offoreign-born persons to participate in TB skin-testing efforts.

From AJPH, July 2011, p. 1264

80 Years Ago

Relationship of Mental Hygiene to a Local Health Department Program

The immediate purpose of this project was a quantitative study of mental illness and maladjustment in a rural community, with the ultimate objective of devising and demonstrating methods for the inclusion of mental health procedures in the programs of existing public health agencies.... The experience gained in the one county used as a proving ground should determine largelythe procedures to be followed in extending mental health services to other counties ofthe state.On the whole, the results obtained with the clinic have been gratifying. It provides the county with facilities for prevention and treatment which, in our opinion, are at least the equal of those afforded by established services functioning in ruralareas elsewhere.Moreover, the community is learning to take advantage of the services offered.

From AJPH, September 1942, pp. 1005-1011, passim

DETAILS

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Tuberculosis Outbreaks in State Prisons, United States, 2011–2019

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ABSTRACT (ENGLISH)

Objectives. To understand the frequency, magnitude, geography, and characteristics of tuberculosis outbreaks in US state prisons.
Methods. Using data from the National Tuberculosis Surveillance System, we identified all cases of tuberculosis during 2011 to 2019 that were reported as occurring among individuals incarcerated in a state prison at the time of diagnosis. We used whole-genome sequencing to define 3 or more cases within 2 single nucleotide polymorphisms within 3 years as clustered; we classified clusters with 6 or more cases during a 3-year period as tuberculosis outbreaks.
Results. During 2011 to 2019, 566 tuberculosis cases occurred in 41 state prison systems (a median of 3 cases per state). A total of 19 tuberculosis genotype clusters comprising 134 cases were identified in 6 state prison systems; these clusters included a subset of 5 outbreaks in 2 states. Two Alabama outbreaks during 2011 to 2017 totaled 20 cases; 3 Texas outbreaks during 2014 to 2019 totaled 51 cases.
Conclusions. Only Alabama and Texas reported outbreaks during the 9-year period; only Texas state prisons had ongoing transmission in 2019. Effective interventions are needed to stop tuberculosis outbreaks in Texas state prisons. (AmJ Public Health. 2022;112(8):1170-1179. https://doi.org/10.2105/ AJPH.2022.306864)
The inherent social vulnerability of incarcerated individuals entitles them to certain protections.1 Protecting them from harmful pathogens is both a public health and social justice issue.2,3 Because weekly turnover is above 50% in local jails,4 the incidence of infectious diseases in jails largely derives from background community epidemiology.
In contrast, an average state prison sentence is 2.6 years.5 For the approximately 1.2 million individuals currently incarcerated in US state prison systems,6 this longer sentence duration means that the natural history of an infectious disease-from initial exposure to illness onset-is more likely to occur during incarceration.
Following the 1980s-to-1990s sharp increase in the number of incarcerated individuals in the United States, which co-occurred with the onset of the HIV/ AIDS epidemic,7 multiple tuberculosis (TB) outbreaks in correctional facilities were documented.8-11 Few state prison TB outbreaks appeared in the subsequent literature,12-15 but each one involved Mycobacterium tuberculosis spread beyond the prison and into the broader community, including correctional officers and children. The recent dearth of articles describing TB outbreaks in state prisons could be a result of a true decline in such outbreaks. However, before the analysis described here, the nationwide incidence of TB outbreaks in state prisons was unknown. In this analysis, we used established national TB surveillance and nextgeneration whole-genome sequencing methods to estimate the frequency and magnitude ofTB outbreaks in state prisons, describe their geographic distribution, and summarize characteristics of individuals associated with those outbreaks.

FULL TEXT

Headnote

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METHODS

Public health departments report all verified cases ofTB in the United States to the National Tuberculosis Surveillance System.16 Each case report includes demographic, clinical, and programmatic variables such as whether a patient was diagnosed with TB while incarcerated and, if so, the incarceration facility type (federal, state, local, juvenile, other, or unknown). Case reports also include employment type, which facilitates identification of TB cases among correctional workers. M. tuberculosis isolates from culture-confirmed cases are routinely genotyped. We included all verified TB cases that the 50 US states reported during 2011 to 2019 as occurring in a person incarcerated in a state prison at the beginning of the diagnostic evaluation that led to the TB diagnosis. Data on incarceration length and history were unavailable. To generate annual TB incidence in state prisons, we used each state's year-end estimates from the US Bureau ofJustice Statistics as denominators.5,17,18

To identify TB cases that might represent M. tuberculosis transmission within state prison facilities, we first identified all clusters of 3 or more TB cases in a single state prison system during any 3-year period from 2011 to 2019 that involved 2-locus or fewer differences on spacer oligonucleotide typing (spoligotyping) and 24-locus mycobacterial interspersed repetitive unit-variable number tandem repeat typing results; these clusters represented the top 10% of cluster sizes in our data set. Then, to increase our molecular resolution, we performed whole-genome sequencing for all isolates from cases in those initially identified clusters. We used whole-genome single nucleotide polymorphism comparisons to measure the genetic distance between isolates. A conservative threshold of 2 or fewer single nucleotide polymorphisms was used to define cases as closely related (i.e., signifying evidence of recent transmission).

Only the initially identified clusters with 3 or more closely related cases during a 3-year period remained in the analysis; we added other cases in the same state prison system from other years during 2011 to 2019 if those other cases' isolates were within 2 single nucleotide polymorphisms of an isolate from a case in the cluster. Finally, we classified the subsets of clusters with 6 or more closely related cases during a 3-year period asTB outbreaks.19,20

We compared demographic, programmatic, and clinical characteristics of cases among incarcerated individuals in clusters ("clustered cases") with cases among incarcerated individuals who were not in clusters ("nonclustered cases") of 3 or more cases and cases for which a cluster designation could not be made ("nondesignated cases"; i.e., nongenotyped cases, cases for which an isolate could not be analyzed, and cases in a cluster with less than 3 cases with an analyzable sequence). Demographic characteristics included sex, age, race/ethnicity, and country of birth. Programmatic characteristics included elements of the standard diagnostic evaluation for TB (e.g., chest radiograph performed and sputum smear examined) and identification of known risk factors (e.g., whether the patient was documented as having had an infectious TB exposure in the past 2 years). Clinical characteristics included acid-fast bacilli sputum smear and chest radiograph results, drug resistance, and patient outcome (e.g., treatment completion, death).

We used SAS version 9.4 (SAS Institute Inc, Cary, NC) to conduct our analysis. All data were collected as part of routine TB surveillance activities.

RESULTS

Of the 85161 verified TB cases reported to the National Tuberculosis Surveillance System during 2011 to 2019, 566 (0.66%) occurred among individuals who were incarcerated in a state prison at the time of diagnosis. The total number of TB cases in state prisons nationally ranged from 107 cases in 2011 to 41 cases in 2019 (a national annual median of 59 cases).

Per state, a median total of 3 TB cases occurred in state prisons during 2011 to 2019. Iowa, Maine, Montana, Nebraska, New Hampshire, Utah, Vermont, West Virginia, and Wyoming reported no cases in state prisons;

10 states reported only 1 case in a state prison during the 9-year period (Table 1). Fourteen states reported 8 or more cases (75th percentile), and 3 states reported 48 or more cases (95th percentile): California (48 cases), Florida (61 cases), and Texas (201 cases).

TB incidence among people incarcerated in state prisons ranged from 7.7 cases per 100 000 individuals in 2011 to 3.1 cases per 100 000 in 2017 (median = 5.0 cases per 100 000), as compared with 3.4 per 100 000 and 2.7 per 100 000 in 2011 and 2019, respectively, in the general US population. Seven states had a median incidence of more than 5 cases per 100 000 individuals in state prisons during 2011 to 2019 (Table 1): Alabama (6.5), Alaska (19.7), Arkansas (5.6), Georgia (5.6), Mississippi (5.2), North Carolina (8.2), and Texas (14.0).

A cluster designation could be made for 422 (74.6%) of the 566 cases among individuals incarcerated in a state prison at diagnosis. Among those, we identified a total of 19 TB clusters comprising 134 cases (Figure 1). States with TB clusters of 3 or more cases in state prisons included Alabama (2 clusters), Florida (2 clusters), Georgia (1 cluster), Indiana (1 cluster), North Carolina (2 clusters), and Texas (11 clusters; Figure 1).

Clustered cases (i.e., all 134 cases in 19 clusters in 6 states) occurred predominantly among US-born (98.5%) and nonHispanic Black (56.7%) individuals. As a comparison, nonclustered cases (n 5 288) were associated with proportionately fewer US-born (78.8%) and non-Hispanic Black (39.2%) individuals (Table 2). Pulmonary TB percentages were similar among individuals who were (80.6%) and were not (83.7%) part of a cluster, as was the prevalence of acid-fast bacilli smear-positive disease in cases among people reported as receiving a sputum smear examination (51.1% and 53.0%, respectively). However, sputum smear examinations were reported less frequently in surveillance data for TB cases among individuals diagnosed within the Texas state prison system (56.2%) than for cases among incarcerated individuals in the reminder of the United States (mean = 92.9%); this incomplete reporting of a clinical evaluation element primarily affected people who were part of clusters (data not shown).

HIV coinfection was present among fewer incarcerated individuals who were part of clusters (1.5%) than among those who were not (10.4%). The 4 individuals with multidrug-resistant TB that occurred in state prisons were not part of clusters.

Of the 19 TB clusters, 5 clusters in 2 state prison systems met the outbreak definition of 6 or more cases: both clusters in Alabama and 3 of the 11 clusters in Texas. Case counts for the 5 outbreaks ranged from 9 to 32 cases in these 2 states. No additional cases occurred in the 2 Alabama outbreaks after 2017, but all 3 outbreaks in Texas continued to accumulate cases through 2019.

All outbreak-associated cases in Alabama and 72.5% of outbreak-associated cases in Texas were reporting as having pulmonary involvement. All of Alabama's 20 outbreak-associated cases had a chest radiograph performed and sputum smear examination reported. In Texas, 49 (96.1%) of the total 51 outbreakassociated cases had a chest radiograph performed, and 30 (58.8%) had a sputum smear result reported (Table 3).

Compared with 65% of outbreakassociated cases among incarcerated persons in Alabama, relatively few (5.9%) of the outbreak-associated cases among incarcerated persons in Texas were reported as recent contacts of infectious TB cases in surveillance data. Of the outbreak-associated cases among incarcerated individuals with the opportunity to complete treatment by the end of the surveillance monitoring period, 25 (78.1 %) of 32 in Texas and all 20 in Alabama involved completion of treatment.

Although not included in TB case counts involving incarcerated people, there was 1 case in a correctional employee for each outbreak-associated genotype: 2 correctional employees in Alabama and 3 correctional employees in Texas.

DISCUSSION

In this first national analysis of TB clustering in US state prisons, we found that outbreaks of TB are rare. Two states reported 5 outbreaks of 6 or more cases during 2011 to 2019. In Alabama, the last outbreak-associated case was reported in 2017. In Texas, all 3 identified outbreaks continued to add new outbreak-associated cases through the end of 2019.

In contrast to TB outbreaks in correctional settings in the 1990s,8-10'12 multidrug-resistant TB, HIV coinfection, and deaths did not characterize any of these outbreaks. The momentous strides in management and treatment of HIV have made this dangerous coinfection relatively infrequent.16 None of the outbreak-associated cases among incarcerated individuals in this analysis involved HIV coinfection, demonstrating that HIV is no longer fueling TB outbreaks in US state prisons. Conversely, 10.4% of cases among incarcerated individuals who were not part of a genotype cluster involved HIV coinfection, indicating that this strong risk factor for progression from M. tuberculosis infection to TB21 may have contributed to TB incidence among individuals in state prisons who were not part of a cluster.

The Centers for Disease Control and Prevention's guidance on TB control in correctional facilities22 focuses on the importance oftesting people for both latent TB infection and TB disease at the time of admission and at least annually thereafter if they remain incarcerated. Individuals who have signs or symptoms suggestive of TB should be housed separately in an airborne infection medical isolation room until a TB diagnosis has been excluded or treatment has rendered them noninfectious. Newly admitted individuals with latent TB infection benefit from treatment that prevents later progression to TB.

Short-course regimens for latent TB infection have demonstrated better treatment completion rates23 and decreased costs24 for correctional facilities than the older 9-month isoniazid regimen. As a result of these logistical advantages, the Federal Bureau of Prisons uses the 12-week, once-weekly dosing regimen of isoniazid and rifapentine as the standard treatment of latent TB infection.25 Latent TB infection identified before progression to TB can be treated for approximately $500.26 By contrast, the direct treatment cost for a single case of drug-susceptible TB in 2020 was approximately $2 0 0 00.27'28 State prison systems that implement treatment protocols similarto that ofthe Federal Bureau of Prisons could decrease costs, both in facilities and in the communities where people return upon release.

Any evidence of person-to-person transmission within correctional facilities also warrants additional investigation and interventions.22 To prevent widespread and ongoing waves of M. tuberculosis transmission, there should be rapid and thorough contact investigations of potentially infectious TB whenever there is a suspected or confirmed case of pulmonary, laryngeal, or pleural disease. Sputum smear and chest radiograph results can help determine the patient's infectiousness, location of disease, and the extent ofthe contact investigation. For this reason, every patient with suspected TB, including those with suspected extrapulmonary TB only, should undergo a chest radiograph and provide sputum for acid-fast bacilli smears and cultures. However, surveillance records documented sputum smear results for 58.8% (i.e., 30 of 51) of Texas's outbreakassociated cases (Table 3). The reasons for incomplete reporting-which could lead to underascertainment of pulmonary TB status and underestimation of patient infectiousness-are unknown but should be addressed.

Contact investigations can be accomplished effectively as a collaborative process with state or local health departments.22 Contacts at highest risk should be screened first. Early detection of additional cases is an important TB control aspect of contact investigations, particularly in congregate settings; initiating treatment not only benefits the individual contact but also halts infectiousness to other incarcerated individuals and correctional employees, breaking the chain of transmission and potentially averting an outbreak.

Reporting new cases as recent contacts of an infectious individual demonstrates that epidemiological links between incarcerated people are known, which can facilitate interventions for interrupting transmission. In Alabama, 65% of individuals associated with outbreaks were listed as known recent contacts, suggesting that these outbreaks were effectively halted through active case finding (i.e., enabling early detection and treatment). In Texas, less than 10% of outbreakassociated cases were reported this way. Whether this was the result of incomplete contact investigations or incomplete reporting is unknown.

When contact investigations are inadequate, opportunities to breakthe chain oftransmission are lost, and cluster growth is expected.

Many ofthe challenges associated with executing effective contact investigations outside correctional settings, such as obtaining names of potentially exposed and infected individuals, locating them, and arranging for testing and treatment, are negated by the fixed and detained position of incarcerated individuals. Therefore, identifying and halting transmission in a prison should be a swift and obtainable objective. Prisons that experience ongoing transmission should review their administrative infection control and contact investigation policies and procedures. Health service staff in correctional facilities should work closely with their local or state health department to investigate potential transmission as soon as a diagnosis of TB in a congregate setting is suspected and to stop outbreaks when they occur.

Outbreaks in correctional settings are not only detrimental to the health of incarcerated populations, they also threaten the health of correctional workers and the surrounding community.1 2-1 5,29,30 According to estimates from a previous report, approximately one third of new M. tuberculosis infections among prison employees are due to occupational exposures.29 Not all corrections institutions, however, require TB testing of employees,31 so the extent of this occupational risk is difficult to ascertain. Each of the 5 outbreak-associated genotypes in our analysis involved at least one diagnosed TB case in a correctional employee. Although beyond the scope of our study, other reports have shown substantial circulation of outbreak strains in the community in the years following an outbreak in a correctional institution.10,12-15'30

Furthermore, M. tuberculosis transmission in correctional facilities hampers progress toward the national goal of TB elimination. Worldwide, the fraction of TB in the general population that can be attributed to exposure in prisons has been estimated as 8.5%.32 Although it is difficult to draw conclusions from an international systematic review that includes both high- and low-burden TB countries, a US-based analysis in an urban area also revealed substantial overlap between incarceration and TB: 46% of US-born adults with TB had documented histories of being incarcerated in a jail or a prison, including 16% during the year before diagnosis.33 According to our analysis, if Texas state prisons reduced TB clustering to match clustering levels in other state prison systems (i.e., typically 0, but at most 2, rather than 11 clusters of 3 or more closely related cases), their overall TB case counts would be reduced by up to 45%, and the national total number of TB cases among people incarcerated in state prisons each year would decrease by about 15%.

Finally, and importantly, preventing transmission of infectious diseases among prisoners is an ethical and social justice obligation.2'3 The United States has one of the highest incarceration rates in the world.34 The loss of autonomy associated with confinement uniquely compromises incarcerated people's ability to protect themselves1 from airborne diseases. Responsibility for the health and safety of state prisoners belongs to the state's department of corrections (or equivalent organization), with opportunities for additional resources from and interventions by state government officials when current procedures are inadequate to prevent outbreaks from occurring or persisting.

Strengths and Limitations

In this study, we used established national surveillance data and nextgeneration whole-genome sequencing methods to describe M. tuberculosis transmission and TB outbreaks in state prisons in the United States. Strengths of our analysis include its unique national scope, with 9 years of data and the specificity of the outbreak classification used (i.e., a conservative threshold of 2 or fewer single nucleotide polymorphisms with whole-genome sequencing methods). However, we likely undercounted the number of cases associated with recent M. tuberculosis transmission in state prisons. This underestimate would be a result of not only the high specificity of our whole-genome sequencing approach but also our inability to include nongenotyped cases. We also lacked information about previous incarceration, so any matching cases diagnosed among individuals after release from prison would have been excluded.

Another limitation is our inability to determine disease timing relative to duration of incarceration; individuals who were infected just prior to incarceration (e.g., by the same state prison strain circulating in the community) may have been misclassified as part of a prison cluster. In addition, although using surveillance data facilitated a standard approach to state prisons throughout the United States, we may have mischaracterized outbreaks if actual patient characteristics were different than those reported to surveillance (e.g., sputum smear results reported to surveillance as not available when smear tests were in fact performed with results documented elsewhere).

Finally, standard surveillance records provide an incomplete characterization of factors associated with transmission and outbreaks in state prisons. Reviews of entry screenings, infectious periods, diagnostic delays, sentence lengths, epidemiological links, and infection control policies and procedures in affected facilities would be needed to provide better targeted recommendations.

Public Health Implications

This first nationwide analysis describing the epidemiology of TB outbreaks in US state prisons demonstrates that TB transmission and outbreaks were rare in most state prison systems during 2011 to 2019. Given the numerous case reports of TB outbreaks in correctional settings in the 1990s,8-11 this finding is reassuring and affirms the effectiveness ofTB prevention and control practices22 in most state prisons. However, the large and ongoing outbreaks in Texas state prisons warrant additional investigation. A better understanding of policies and practices facilitating transmission is needed to inform the targeted public health actions needed to stop these outbreaks, reduce morbidity in a vulnerable population, and substantially reduce the TB burden in the Texas state prison system. >4JPU

Sidebar

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CONTRIBUTORS

R.J. Stewart and K. M. Raz contributed equally to this work. R. J. Stewart, K. M. Raz, J. S Kammerer, M. B. Haddad, B.J. Silk, andJ. M. Wortham conceptualized the project. R.J. Stewart, K. M. Raz, and M. B. Haddad drafted the article, and R. J. Stewart and K. M. Raz conducted the data analysis. S. Burns conducted the next-generation wholegenome sequencing on isolates. All of the authors contributed to writing and revising the article.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

HUMAN PARTICIPANT PROTECTION

All data were collected as part of routine tuberculosis surveillance activities. As such, the Centers for Disease Control and Prevention determined that this analysis did not constitute research involving human participants and was not subject to institutional board review.

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DETAILS

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The (Im)precision of Life Expectancy Numbers

Hanley, James A, PhD

ProQuest document link

ABSTRACT (ENGLISH)

Life expectancy figures for countries and population segments are increasingly being reported to more decimal places and used as indicators of the strengths or failings of countries' health and social systems. Reports seldom quantify their intrinsic statistical imprecision or the age-specific numbers of deaths that determine them.

The SE formulas available to compute imprecision are all model based. This note adds a more intuitive data-based SE method and extends the jackknife to the analysis of event rates more generally. It also describes the relationships between the magnitude of the SE and the numbers of person-years and deaths on which it is based. These relationships can help quantify the statistical noise present in published year-to-year differences in life expectancies, as well as in same-year differences between or within countries.

Agencies and investigators are encouraged to use one of these SEs to report the imprecision of life expectancy numbers and to tailor the number of decimal places accordingly.

FULL TEXT

Headnote

Life expectancy figures for countries and population segments are increasingly being reported to more decimal places and used as indicators of the strengths or failings of countries' health and social systems. Reports seldom quantify their intrinsic statistical imprecision or the age-specific numbers of deaths that determine them.

The SE formulas available to compute imprecision are all model based. This note adds a more intuitive data-based SE method and extends the jackknife to the analysis of event rates more generally. It also describes the relationships between the magnitude of the SE and the numbers of person-years and deaths on which it is based. These relationships can help quantify the statistical noise present in published year-to-year differences in life expectancies, as well as in same-year differences between or within countries.

Agencies and investigators are encouraged to use one of these SEs to report the imprecision of life expectancy numbers and to tailor the number of decimal places accordingly. (Am J Public Health.

(ProQuest: ... denotes formulae omitted.)

Some counties have begun to report national sex-specific life expectancy (LE) at birth to 2 decimal places, whereas international organizations use at most 1. Two authors1 have recently taken issue with the absence of margins of error in these reports and with the false precision conveyed by these undue numbers of decimal places. On the basis of several models that allowed them to relate accuracy (they used the width of a 95% confidence interval) to population sizes and mortality levels, they concluded that "even if death registration and population counts were perfect, the accuracy of LE would not reach a year for 30% of all countries, 0.1 years for 63% of all countries, and 0.01 years for any country, even China or India."

Methods to calculate a statistical margin of error for an LE have been available for 80 years and have been described in demography textbooks.2 Thus, it is surprising that national LE figures are seldom accompanied by a measure (or appreciation) of the intrinsic statistical (im)precision of such figures or a mention of the age-specific numbers of deaths that determine them. A few national statistical agencies, such as Statistics Canada,3 publish margins of error for their LEs and document how they were calculated. British agencies make reference to ways to compute them4 but do not publish them. US agencies do so when presenting LEs based on decennial life tables5,6 but not for other life tables.

One possible explanation for not reporting margins of error might be that there is no "sampling" involved.5 In this thinking, the LE derived from the mortality rates for the population or subpopulation of a certain city or country in 2018 is no different than the heating degree days for a city or the average birthweight for those born during 2018. Although this perspective is understandable, it does not communicate how fragile or stable the LE number is (i.e., how much higher or lower it might have been if the number of deaths was one more or one fewer or the year was determined with the Gregorian or fiscal calendar). Because of this fragility, the reported LE for a single calendar year in the Statistics Iceland Web site is "the mean ofthat year and the year before."

Admittedly, the 3 available SE formulas of Wilson,7 Chiang,8 and Silcocks etal.,9 from 1938,1960, and 2001, respectively, are model-based formulas derived from calculus and are not very intuitive or easy to explain, even to those who are comfortable with simple SEs involving a unit variance, a "sample size," and a square root. Thus, here I introduce a new and more intuitive SE method. It retains the attempt by the earliest developer to give an intuition behind-and the insights provided by the components of-the SE formula but avoids the differential calculus.

Also, using several sex-specific, calendar year-specific, and country-specific data sets, I report the empirical relationships between the magnitude of the SE and the numbers of personyears and deaths on which it is based. The SE helps quantify how much statistical noise is present in published year-to-year differences in LEs, as well as in same-year differences between countries. It thus highlights how many decimal places, if any, are meaningful, even when there are no other sources of error. The empirical relationships can also be used to project the approximate magnitude of the SE to be computed from a smaller, not yet examined data set.

I proceed by first reviewing how life tables are calculated, indicating where the statistical uncertainties come from, and explaining how the 3 existing model-based formulas convert these age bin-specific uncertainties into SEs for the LEs derived from the fitted life table. I then show how the jackknife method provides a simple and intuitive way to appreciate how statistically fragile or stable the fitted LE is and which deaths influence it the most. I end by examiningthe empirical relationships between the magnitude of the SE and the numbers of person-years and deaths on which it is based.

FROM OBSERVED MORTALITY RATES TO LIFE EXPECTANCIES

The observed data (the "inputs") used to show the basic LE calculations are given in the first 2 columns of Table 1. The first contains the reported agespecific numbers of deaths (Ds) of Canadian females in 105 1-year age bins in the year 2011. The corresponding amounts of population time (PT; here measured in units of woman-years but more generally person-years [PY]) in each of these bins were calculated as the reported numbers of women in these age bins in mid-2011 multiplied by the width (1 year) of each age bin.

The focus here is on LEs to the age of 105 years to avoid noise from small observed numbers of deaths at ages beyond this age. Three derived columns of numbers must be calculated to arrive at these LEs. The first is the column of observed (or, if they are unstable, smoothed) death rates, derived in the usual way as m = D/PY. From this, one derives the column (q) of (here 1-year) conditional probabilities of dying within the age interval in question. These probabilities refer to a hypothetical cohort. Formerly, when the exponential function was not easily accessible, the column entries were computed arithmetically as explicit fractions, but it now makes more sense to use the exponential formula linking rates and risks, namely q = 1 - exp[-m x 1 year]. The "hats" on the qs are used to emphasize that they are based on empirical ms and thus are as reliable or as fragile as these ms.

Next is the l column, the also hypothetical "proportions still alive" ("living") at the beginning of each interval. Just as in medical life tables, these proportions are computed as the products of successive conditional "survival" probabilities; for example, at the second birthday of the fictional cohort (i.e., at a = 2), the surviving fraction is ... . As with medical life tables, it helps if the "radix" is taken to be l0 = 1 rather than, for instance, l0 = 10 000.

The third is the L column, the numbers of person-years lived in the various intervals by this "cohort." Traditionally, L calculations involve a hypothetical d (numbers of deaths) column formed by successive subtractions of ls and the portions of the interval those who would have died are assumed to have lived. Here a more direct way is used that inverts the relationship m = q/L to obtain L = q/m (or 1 full year if, whenever D is zero, m is also zero). The sum of all of the Ls represents e0, the hypothetical LE at birth. The other e entries-those for subsequent birthdays-are obtained by dividing the partial sums of the L s by the corresponding ls. In what follows, the birthday subscript is omitted.

THREE MODEL-BASED SE[e] FORMULAS

Perhaps because of his several articles and textbooks devoted to the life table, the SE method of Chiang7 is much better known than a very similar one introduced earlier by Wilson.8 Surprisingly, neither of these methods are mentioned in the article9 that introduces the Silcocks version. As shown subsequently, all 3 methods have a common structure and differ only in how they address the sampling variability of the qs. Because Wilson provided the most comprehensive and most comprehensible justification for his derivation, and because his heuristic approach ties in with the approach introduced in the next section, my description begins with his version and is limited to the SE for the estimate of e0. In Wilson's words, this e0 is deduced by a mathematical calculation from the age specific death rates; by definition it is the average number of years lived after birth by a birth cohort of /0 persons, i.e., /0 x e0 is the total number of years lived by the birth cohort.8(p705)

Instead of using the brevity afforded by calculus, he continues as follows8(p705):

Now, if in some particular age interval y to y + 1, the value of qy, the chance of dying between those ages, should perchance be decreased by Sqy, the number of deaths would be decreased by !y x Sqy and the years lived would be increased in that age interval by (1/2)x/y x Sqy and in all ages above y +1 by /y xey11 x Sqy.

Thus the expectation of life e0 would be changed by

...

To a first order of approximation, regarding Sq as infinitesimal, the total change in e0 from variations Sq in different age groups would be the sum of the individual changes, where the summation extends over all intervals, from birth on to the end of the life table. As the variations Sq are supposed to be those of random sampling they must be assumed to be uncorrelated and the square of the standard deviation of e0 is therefore

...

As is shown in the notes of Table 1, each of the 3 calculus-derived versions of the SE formula incorporates a different expression for each Var[qy]. Wilson treated the number of person-years as numbers of persons and considered the random variable m as having the binomial-form variance Var[m] = m(1 - m)/PY. Because he derived q from m using the traditional formula q =f (m) 5 ¶1¾/2, he multiplied Var[m] by the scaling factor (f9).2 For ease of computing, he expressed this factor in terms of q and m, that is, as (q/m)4. Chiang, instead, treated q as a binomial proportion based on an "unknown" number of persons, N, and thus as having variance q(1 - q)/N. He backcalculated the N as N = D/q to arrive at Var(q) = q(1 - q)/N = q2(1 - q)/D.

Silcocks et al. used different notation than the demographers do: L, A, r, and N rather than /, L, D, and PT, respectively. He used the more modern exponential form to derive q from m but calculated L via the trapezium rule rather than as q/m. Because he considered the ms as the random components in equation 1, he calculated each variance component as a Poisson-based variance, that is, as D/PT2. As one can see, the 3 calculated SEs in the worked example are quite close to each other. The reason for the slightly larger Silcocks SE is that he used the (slightly larger) Poisson, rather than binomial, variance components.

A MORE TRANSPARENT STANDARD ERROR CALCULATION

Ofthe 3 authors, Wilson provided the least technical and most readable description ofthe calculus-based derivation of the variance of a complicated nonlinear function of (in the present example) 105 random Ds in the 105 amounts of population time. Moreover, his verbal explanation, starting with the sentence containing the word "perchance," can be seen as a specific example of a related but simpler and empirical (rather than model-based) variance-calculation approach.11 It was formalized 2 decades later12 and named the "jackknife." The appendix (available as a supplement to the online version of this article at http://www. ajph.org) provides a worked example of the jackknife SE for the mean of a sample of 5 values and a Poisson count and illustrates the versatility that led John Tukey to name the "leave-one-out" approach the jackknife.

To apply the jackknife to the current life table in Table 1, one might (for the sake of using "rounder" numbers) consider the 17.2 million person-years of data as 150 trillion person-intervals, each just under 1 hour in duration. Some 120 883 of these personintervals involve a death. (Of course, these time units are arbitrary.) Then, imagine a particular interval "perchance" omitted and a new LE calculated, along with the quantity DLE and how much it differs from the LE based on all n units. Imagine repeatingthis process for each for the n personintervals in turn. Despite the very large n, all but 120 883 ofthe DLEs are zero.

The 120 883 nonzero differences take on the 105 values shown in column 8 with the frequencies shown in column 1. Thus, the jackknife variance, namely the sum ofthe squares ofthe 150 trillion DLEs, reduces to the sum given at the foot of column 9. The jackknife gives just about the same SE as the existing calculus-derived methods, another example ofthe versatility and transparency of this tool.

Over the more than 600 LEs calculated from the sex-specific, calendar year-specific, and country-specific data considered in the next section, the jackknife SEs were from 1.008 to 1.016 times the Wilson SEs, from 1.003 to 1.009 times the Chiang SEs, and from 0.97 and 0.98 times the Silcocks SEs.

Figure 1 shows the age-specific contributions to the variance ofthe LE. The results from the 3 existing (calculusderived) methods show a high level of agreement. This is not surprising given that the formulas differ only in the distributional assumptions they incorporate for the rightmost term in equation 1: the differences become visible only from the age of 70 years onward, when q and m and the associated binomial and Poisson variances begin to diverge, but even then they remain small and inconsequential. The jackknife method is purely data driven and calculates contributions without any assumptions beyond those used in calculating the LE itself.

With greater clarity than equation 1, Figure 1 also highlights which age bins contribute most to the variance ofthe LE. Not surprisingly, the 790 deaths in the first year of life contribute 15% of the variance, although they represent fewer than 1% of all deaths. The 43 in the second year, the 778 in the 55th year, and the 4895 in the 90th year contribute approximately 1% each.

The largest contribution to the variance, 2%, is made by the 2034 deaths in the 75th year.

SE[e0] MAGNITUDES AND THEIR DETERMINANTS

The SE[e0]s shown in Figure 2 are from more than 600 actual data sets: 20 countries in the Human Mortality Database, each with up to 16 individual calendar years, for females and males separately. Even if we were to be less stringent and multiply each one byjust 2 (rather than by 4 as Li and Tuljapurkar1 did), none of the resulting "margins of error" would be less than 0.02 years.

Because the Human Mortality Database does not include them, other data sources13-15 were used for SE calculations for females in India and China.

The year 2010 was chosen, near the middle ofthe calendar period in Figure 1. Numbers of deaths were back-calculated through the use of reported 2010 age-specific mortality rates in the case of India and Canadian mortality rates scaled up so as to match the overall death rate in the case of China. The SEs forthese Indian and Chinese e0s were 0.006 and 0.008 years, so even the "margins of error" (0.012 and 0.016, respectively) were both greater than the resolution of 0.01 years that many smaller countries use to report LEs.

One might also be concerned with the magnitudes of sex-specific SEs based on data from a single calendar year in a country or population segment with a small population. As a means of studying a range of small data sets, Human Mortality Database information was obtained for 2 countries with populations of fewer than 1 million people: Iceland, whose total population ranged from approximately 320 000 to 340 000 over the period 2000 to 2015, and Luxembourg, whose population ranged from approximately 430 000 to 560 000 over the same period.

The SE[e0]s for these countries and calendar years are plotted on the left side of Figure 3. The SEs in different colors further to the right of these SE[e0]s were obtained from reduced versions of these data sets ranging from 1/2 to 1/10th of the actual experience. As a means of formingthese reduced data sets, the actual sex-, year-, and age bin-specific person-years were multiplied by 1/2,1/3,... 1/10th, whereas the corresponding numbers of deaths were sampled from the observed counts with probabilities 1/2,1/3,... 1/10th, respectively.

Although there are some anomalies, the broad patterns in Figures 2 and 3 bear out Li and Tuljapurkar's statement that the SE is roughly inversely proportional to the square root of the reciprocal of each total. One can go a bit further, quantifying the "constants" (slopes) and thus providing a rough empirical rule ofthumb by which to gauge the likely magnitude of an SE using either the total number of person-years or the total number of deaths on which the e0 is based.

Instead of going "through" the data-points, the following equations provide lines that in most instances go "somewhat above" the data points from these 20 countries, 2 genders, and 15 or more calendar years:

...

The magnitudes of the SEs in the left-most panels of Figure 3 are broadly in line with the patterns seen in Eayres and Williams's Table 2.16 The standard deviation in Silcocks and colleagues' Figure 2,9 with 256 000 person-years, is 0.27 years, whereas equation 2 gives an upper bound of 150/square root(256000) 5 0.3 years. Across the simulated experiences of 5000 person-years in Eayres and Williams's Figure 3, the standard deviation was 2 years, whereas the "bound" from equation 2 is 150/square root(5000) = 2.1 years.

CONCLUSIONS

The first objective of this article was to illustrate a versatile tool that provides a more intuitive SE for the LE calculated from a current life table. It provides very similar answers to the existing methods, all of which were derived through differential calculus but are seldom used, even for life tables published by national and international statistical agencies. It also makes fewer assumptions as to the sampling distributions of the numbers of events in each age bin and avoids the confusion about binomial versus Poisson when calculating the variance components in the 3 calculus-based methods. Of course, although it may appear that the jackknife approach does not make distributional assumptions, there is an implicit assumption that the population time is divisible into a very large number of very small independent time elements.

The binomial-based Wilson and Chiang formulas treated the denominator inputs to the empirical age-specific mortality rates (the random vector ms, the fundamental column from which the life table is constructed) as numbers of persons. But deaths occur in (arise from) population time, the amount of which is typically estimated by multiplying the width of the calendar time period by the (estimated) midperiod population size.

This "person-years, not persons" principle comes to the fore when deciding how to apply the jackknife to the inputs to life tables: what is the correct choice of the "unit" of data, that is, what is the "n" in the summation and in the (n - 1J/n in the jackknife variance formula? Unlike a count of persons, population time is infinitely divisible. This divisibility principle is what enables the jackknife approach to yield the same variance as the model-based (Poisson) variance in the (1 age bin) example 2 in the appendix: the PTin the age bin is regarded as a very large number (n) of small time units, some D of which contain 1 death each. Moreover, in the jackknife approach, age bins that contain no deaths do not contribute to the variance in accord with recent findings.13

The second objective was to give a broad sense of how the magnitude of the SE for LE at birth varies with the amount of information in the input data set and of how many (if any) decimal places are meaningful. Not all that surprisingly, and as other authors have found, the SE broadly obeys the "reciprocal of the square root" law, both in the amounts of population time and in the numbers of deaths. This report quantifies the constant in this relationship and offers a rough upper bound for the relationship that should apply to data from populations or population segments with age structures similar to those shown in Figures 1 and 2.

If one works with amounts of population time rather than population sizes, data from multiple calendar years enter into the SE calculations in the same way as single-calendar-year data. Naturally, LEs based on k years of data have SEs that are square root(k) times smaller than those based on a single year of data and also guard against wild fluctuations caused by factors such as influenza activity. The (formerly more common) practice of centering multiyear LE calculations on the census year also reduces the effect of inaccuracies in intercensal population estimates on LEs for individual years.

There is increasing interest17-19 in using the LE as a summary measure for small area mortality levels, and investigators who derive such a summary measure seem quite aware of its imprecision. The relationships shown in Figure 2, which can be seen as extending those in Eayres and Williams's Table 2,16 should be of help. Although I have used single year-of-age bins throughout, the jackknife SE calculations I have shown will-with the usual modifications- work with bins of any width, and the relationships between the various SEs and the overall numbers of deaths and PTshould remain similar. Indeed, one can think of broader bins as a form of smoothing. Fitting, say, a Gompertz or a spline model to Ds and PTs is another way to deal with sparse counts in the early and late ages and also allows the possibility of using the variance covariance matrix for the parameters to obtain a resampling confidence interval via the parametric bootstrap.

The extensive sets of SEs in Figures 2 and 3 reinforce the remarks of earlier authors about the overly precise LEs being reported by national statistical agencies. Because many national LEs are the same ("tied") when rounded to an integer or to 1 decimal place, LE "league table" rankings based on mortality rates in a single year should not be taken too seriously.

I end with general remarks on the shape of the sampling distribution of the LE statistic. Some authors were surprised at how Gaussian it is, even when based on seemingly small samples.

This Gaussian-ness is a reflection of the central limit theorem, which applies also to nonlinear functions of independently (but not necessarily identically) distributed random variables. Just as in the case of Kaplan-Meier and modelbased survival estimates, the applicability of the central limit theorem to fitted LEs is governed by the total number of events as opposed to the number in any one age ortime bin.

Those who still do not trust in the central limit theorem will not be comfortable computing symmetric confidence intervals based on 1 ofthe 3 existing SEs or the jackknife SE and would prefer a bootstrap CI. But how to bootstrap an LE? The infinite divisibility principle discussed earlier suggests a way. In the case ofthe data in Table 1, bootstrap the n = 150 billion personhours that, between them, contain the 120 883 events; then calculate an LE from each bootstrap sample and do this enough times to obtain a sufficiently smooth sampling distribution from which to estimate the required, say, 2.5% and 97.5% percentiles.

If one thinks through what this process involves, one will realize that the same estimated sampling distribution can be obtained by treating each D as the expected value, m, of a Poisson random variable; using a random draw from each ofthese Poisson distributions; calculating a bootstrap LE using the actual amounts of PT and the randomly sampled numbers of deaths, and repeating the preceding steps enough times to have a sufficiently smooth estimated sampling distribution from which to measure the required percentiles. When one applies this procedure to the Ds and PTs in Table 1, one finds that the estimated sampling distribution ofthe bootstrapped LEs is quite Gaussian, and the standard deviation is 0.033 years, just as it was with the methods considered earlier.

When I bootstrapped the various versions ofthe Iceland data (samples of females in the year 2000), the LE sampling distributions were still quite Gaussian, even when the sample contained just 100 deaths. This and earlier investigations suggest that bootstrap confidence intervals are not needed and, if they were, that the considerable imprecision would render the results uninformative. Thus, an SE based on 1 ofthe 3 existing methods-or on the jackknife-can be used to form symmetric confidence intervals. y4jPH

Sidebar

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Looking Back: The Contested Whiteness of Arab Identity

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ABSTRACT (ENGLISH)

In 2019, Abboud et al.1 published a commentary that garnered considerable attention. The authors called for the US Census Bureau and the National Institutes of Health (NIH) to add "Arab" as a discrete identity group. They proposed that this would aid in characterizing members ofthis unique population and would promote research to better understand and improve their health status. Here we provide some thoughts as to why their compelling piece sparked such interest and what it may mean moving forward. Before doing so, we first provide a bit of background and summarize their essential thesis.

FULL TEXT

In 2019, Abboud et al.1 published a commentary that garnered considerable attention. The authors called for the US Census Bureau and the National Institutes of Health (NIH) to add "Arab" as a discrete identity group. They proposed that this would aid in characterizing members ofthis unique population and would promote research to better understand and improve their health status. Here we provide some thoughts as to why their compelling piece sparked such interest and what it may mean moving forward. Before doing so, we first provide a bit of background and summarize their essential thesis.

TERMINOLOGY

Abboud et al. focused their thoughts largely on the US Arab population, typically defined as people having origin from an Arabic-speaking country. There is also a broader, partially overlapping group, the Middle Eastern and North African (MENA) population, ofwhich Arab individuals compose the largest segment. MENA individuals are generally defined as having heritage from one of the 22 Arab League nations and a few non-Arabic-speaking countries such as Iran, Turkey, and Israel.

In addition, the MENA category includes ethnic groups such as Assyrians and Chaldeans, who have origins in Arabicspeaking countries but do not often identify as Arab.2-4 Finally, MENA is the ethnoracial category the US census adopted as a means to provide an identity forthose of Arab ancestry.2,5,6 Although Abboud et al. focused on Arab identity, we believe that their observations, as well as our comments, relate to the broader MENA identity. Thus, for purposes of our editorial, we address both Arab and MENA populations, acknowledging that Abboud et al. may have intentionally limited their scope to Arab Americans.

The US Arab community numbers between 2 and 3.7 million; the primary countries of origin are Lebanon, Egypt, Syria, Iraq, Yemen, and Palestine.2,3,7,8 The lower population figure represents the US census estimate,2 whereas the upper estimate is adjusted for undercounting. When the broader MENA parameters (e.g., Iran, Morocco, Turkey) are considered, the US MENA population likely exceeds 4 million. The two largest US Arab/MENA populations are found in California and southeastern Michigan.

According to Abboud et al., members of Arab/MENA communities reside in a state of demographic purgatory. De facto they are classified as White, which Abboud and colleagues argue is both conceptually dubious and practically harmful. Because ofthis misclassification, Abboud et al. assert, Arab/MENA communities are demographically and epidemiologically invisible. Moreover, classifying Arab/MENA individuals as White can mask the disproportionate discrimination and health disparities they experience.5

The US census continues to be bound by the 1997 Office of Management and Budget standard known as Directive 15 (NOT-OD-15-089). The Office of Management and Budget defines White individuals as those "having origins in any of the original peoples of Europe, the Middle East, or North Africa." In the 2020 census, respondents were allowed to indicate their origin in a free text field located below their selected racial category. However, given that the "origin" field is optional, it cannot be used to accurately enumerate the MENA population because many respondents ignore it. It is increasingly recognized that a separate MENA option, be it under race or ethnicity, will yield a more accurate count ofthis population.5,6

PAST EFFORTS TO ADD A MENA RESPONSE OPTION

Since the 1980s, members of the Arab American/MENA community have been advocating for a separate identity category on the decennial US census, and MENA was almost included as a separate check box in 2020. In the early 2000s, the US Census Bureau was receptive to calls for a MENA option and in fact performed a National Content Test in 2015 that, among other areas, explored the logistics and impact of adding a discrete MENA category.5,9 The results showed that when a MENA category is present, 70% to 80% of MENA individuals select the box.9 Another recent study similarly indicated that as many as 88% of MENA individuals will select the MENA option if offered.6 These findings suggest that this option, if implemented, would not only result in a more precise enumeration of Arab/ MENA communities but would reduce the number of people selecting "some other race," leading to a more granular census.9 These pilot results led the Census Bureau to recommend inclusion of the MENA category in future census administrations.9

However, this recommendation was never implemented by the Office of Management and Budget, and the reasons have not been fully articulated.5,6 Census staff have continued to meet with MENA community leaders and scholars (includingthe authors ofthis editorial) to discuss the inclusion of a MENA category. In September 2021 the authors, along with other scholars convened by ACCESS,10 the largest Arab American nonprofit health and social service agency in the country, submitted a series of recommendations for including a MENA option in federal data collection efforts to the Equitable Data Working Group. This working group, formed through Executive Order 13985, is tasked with developing equitable measurements throughout the federal government. Although national inclusion of the MENA category remains elusive, local implementation of a MENA option on surveys has begun in Michigan, California, Massachusetts, and Chicago, Illinois.

In addition to the US census, federal health research provides another opportunity to enumerate Arab/M ENA communities. These efforts could include the Centers for Disease Control and Prevention and the NIH, which has a robust minority health portfolio and funds the National Institute on Minority Health and Health Disparities. The NIH, as part of its minority health and health disparities research framework, identifies eight health disparity populations: American Indians/Alaska Natives, Asian Americans, Blacks/African Americans, Hispanics/ Latinos, Native Hawaiians and other Pacific Islanders, sexual and gender minorities, socioeconomically disadvantaged populations, and underserved rural populations. Neither the MENA nor the Arab population is included in the list.

Absence from the list of disparity populations does not preclude the NIH from funding MENA research, as investigators can apply for funds to conduct such research under general calls for proposals (i.e., investigator-initiated proposals); it can, however, impede MENA research from being funded under announcements that fall under the "minority" or "disparity" rubric. Calls for proposals targeting minority or disparity research may consider Arab/MENA-focused applications to be nonresponsive. This is not a criticism of the NIH orthe Department of Health and Human Services, because they are bound by federal regulations. Nonetheless, expanding the definition of what constitutes minority and disparity at the federal level would provide important recognition of Arab/MENA communities and would likely lead to more health research and health services for these communities.5,11

Abboud et al. concluded that the absence of a discrete Arab/MENA identity option and omission from the list of disparity populations leave this population undercounted and underresearched. This may also, albeit unintentionally, communicate that these individuals' struggles and challenges are not worthy of our attention despite clear evidence that they exhibit significant health disparities, including lower cancer screening rates as well as higher rates of discrimination and stress over deportation (Paul J. Fleming, unpublished data, 2022)5,12-14

A CONFLUENCE OF EVENTS

At that time, US president Donald Trump expressed anti-immigrant and anti-Muslim rhetoric and proposed policies consistent with these sentiments. Among his first presidential actions (Executive Order 13769, eventually reissued as 13780) was the so-called "Muslim ban," which limited immigration from several predominantly Muslim (although not all Arab) countries.6,15 Citizen outrage and judicial intervention limited its impact on actual immigration, but the psychological and health repercussions in the MENA community were nonetheless immense.16 Subsequently in 2019, deriding four female members of Congress, all ofwhom were women of color and two ofwhom were Muslim (and MENA), Trump declared that they were "free to leave" the country and accused them of "hating" America. He later tweeted that they should "go back" to the "places from which they came." One was born in Somalia; the other three were all born in the United States.

Looking back, we propose that Trump's anti-Arab/anti-Muslim rhetoric may have unintentionally mobilized many Americans to rally to the defense of the MENA community.6 He may have triggered a social "reactance," an opposite reaction of tolerance incited by his intolerance. His attacks on these communities may have spurred public empathy and interest in such issues on the part of researchers and public health practitioners. Finally, during this time, Americans were becoming more aware of the plight of refugees displaced to the United States and elsewhere as a result of the wars and political strife that had torn through the Middle East, some of which were due to US policies and actions. Interest in the Abboud et al. article may have been intertwined with these cultural forces.

Beyond the anti-Muslim sentiments that were circulating at that time, 2019 may have been a major inflection point in our national social justice debate.17 Americans were confronting persistent unfairness, and this may have predisposed us to empathize with the plight of the MENA population. The Abboud et al. commentary may have coincided with these awakenings. An article calling for American demographers and researchers to offer MENA communities the dignity of being counted was timely.

It is interesting that, for those of us at the University of Michigan Rogel Cancer Center, 2019 marked the beginning of our MENA research initiative. The initiative was driven in part by feedback from external advisors that we were ignoring an important disparity population in our own backyard: the Dearborn enclave, the largest visible and most concentrated MENA community in the United States. This ongoing initiative has led to numerous publications documenting unique health and social issues facing the local MENA population12,14,18-21 and to the development of several culturally tailored interventions, including the Yallah Quit! smoking cessation program and homebased human papillomavirus testing, which aimed to assuage modesty concerns that discourage some MENA women from seeking health services. Although not the focus of the Abboud et al. commentary, an outstanding issue regarding assessments of MENA identity is to what extent, if MENA were ultimately listed as a discrete ethnic or racial category, individuals who are members of this population would actually check the MENA box. Overall, it appears that 70% to 80% of eligible respondents would use the MENA checkbox6,9; however, these percentages may vary by subgroup. For example, Maghbouleh et al. found that respondents who identified as Muslim were more likely to check the MENA box than those who identified as Christian.6 Similar variations in MENA affiliation by country of origin were observed in the US census pilot.9

Thus, some individuals who may have Arab or Chaldean origin may nonetheless still prefer to report White identity either instead of or in addition to their MENA identity. This preference may be due to the status and privilege it conveys as well as a desire to dissociate from an identity that has been viewed with suspicion and derision,6,22-24 particularly since the War on Terror prompted by 9/11.24 Perhaps over time, when the MENA identity becomes widespread and more normative, more members of the community will check the MENA box.

The fact that affiliation with MENA identity varies within the MENA population was addressed in a letter to AJPH submitted by Ford and Sharif25 that was prompted by the Abboud et al. article. Ford and Sharif proposed that MENA identity and related disparities are better understood through an intersectional framework. They posited that the status of MENA individuals in American society is driven not only by whether they are perceived as White but also by their gender, clothing, religion, socioeconomic status, experience with discrimination, and nationality.26 Thus, there are multiple, often interacting dimensions of identity that affect MENA communities.26 For example, MENA individuals who practice Islam may have very different lived experiences in US society than those who identify as Christian. These multiple influences affect whether they identify as M ENA.

Abboud et al. challenged us to reconsider what constitutes a disparity population. Health disparity is defined by the National Institute on Minority Health and Health Disparities (https://www. nimhd.nih.gov/about/strategic-plan/ nih-strategic-plan-definitions-andparameters.html) as a higher incidence, higher prevalence, or earlier onset of a disease or its risk factors, as well as disproportionate consequences or burdens. Disparity populations (the eight earlier-defined groups) are characterized by key criteria including racial/ethnic minority status, low socioeconomic status, residence in an underserved rural area, and membership in a sexual or gender minority group. Currently MENA health disparities, although substantial, are not fully appreciated because the MENA population is not an officially recognized race or ethnic minority group. Creating a unique MENA identity separate from White and adding MENA to the list of disparity populations seems a reasonable remedy to this problem.

Recognizing MENA as a unique demographic group and including it as a disparity population are critical steps in achieving social and health equity.5 However, while we wait for these broader fixes, we can address MENA health issues outside the official disparity rubric. For example, researchers can conduct epidemiological and intervention research on these communities without labeling the work as "minority" or "disparity." The rationale for the research can still be based on the need to understand the unique health issues of MENA communities without the research being framed as disparity or minority.

Disparities, of course, arise from the interplay of numerous factors from biology and socioeconomics to structural and interpersonal discrimination. Although it is critical to identify and understand these root causes and intervene upon them at societal levels, we can address some of these adverse consequences through tailored interventions.10 Formally recognizing MENA in demographic counts will alleviate some of the problems caused by the status quo. However, tailored interventions will still be needed moving forward to address the unique culture and social experiences of MENA communities.

Several conceptual and logistic issues regarding MENA identity remain unresolved. For example, whether Arab/ MENA should be considered a racial group or an ethnic group (as we currently classify Hispanic origin) is still up for debate.5 Also, if MENA is granted unique status, other groups such as Afro-Caribbean Americans or Central Americans may seek discrete status. Finally, an interesting, perhaps more philosophical question is whether MENA individuals should in fact check the MENA box, an imperative reflected in the "Check it Right; You Ain't White" campaign.27

The answer to this question has significant implications. If endorsing the MENA option is considered objectively beneficial for the MENA community and broader society, then perhaps campaigns encouraging individuals to identify as such may be warranted. By contrast, if using the MENA option is considered simply a personal preference, then perhaps it should be approached with equipoise. Although we are not certain where Abboud et al. would land on this issue, we believe that MENA communities should be provided with information about the benefits of using the MENA option and support for their personal autonomy in choosing their identity.

In summary, Abboud and colleagues' timely piece appeared to coincide with a rising national consciousness regarding the invisibility of our MENA communities and the need to fully count them and address their health and social needs. Abboud et al. also raised important issues around how we measure and conceptualize race and health disparities that can guide our public health agenda moving forward. The addition of a unique MENA identity in the census and public health systems is a critical first step. Future efforts can focus on incorporating an intersectional perspective of MENA identity and including MENA communities within our health disparity service and research endeavors. Â1PU

Sidebar

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Note. Ken Resnicow serves on the National Advisory Council of the National Institute on Minority Health and Health Disparities (NIMHD). The opinions expressed here are his own and do not necessarily reflect those of NIMHD.

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The authors have no conflicts ofinterest to disclose.

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The Growing Importance of Self-Managed and Telemedicine Abortion in the United States: Medically Safe, but Legal Risk Remains

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ABSTRACT (ENGLISH)

Excessive regulation under state law has made it increasingly difficult for Americans to get a legal abortion. State lawmakers passed more than 100 restrictions on abortion in 2021, more than any previous year.1 Meanwhile, the Supreme Court shifted rightward with the appointment of three justices duringthe Trump administration, threatening constitutional protection for abortion and setting a course for state-level abortion bans.

In light of these developments and new research, we revisit the groundbreaking research article "Demand for Self-Managed Medication Abortion Through an Online Telemedicine Service in the United States"2 and comment on its significance and implications since publication. This study by Aiken et al. examined the demand for remote medication abortion (a regimen consisting of mifepristone and misoprostol pills) among US residents in 2017 through 2018 and assessed variation in barriers to clinical abortion care by state policy context (hostile vs supportive). Metrics collected by AJPH demonstrated that this study garnered much attention from AJPH readers and the media (https://bit.ly/3kKAG0I). The article presented a model of abortion care that sidestepped long-standing barriers to clinical abortion care and presented evidence of a strong interest in and need forthis model among US residents.

The salience of the study has grown as the proportion of Americans who use medications to end their pregnancies has increased and as state-level legal barriers to abortion access have proliferated, with outright bans expected within months.3 The ongoing COVID-19 pandemic has also increased demand for at-home medication abortion because of concerns about the risk of contracting COVID-19 in a clinic or in transit; this has added to long-standing barriers to access for clinic-based abortion care, including long distances to the nearest clinic, arranging care for dependents, and more.4 Aiken et al. note the effect of abortion restrictions on increasing demand for at-home medication abortion and offer a preview into the future of abortion seeking for the growing number of Americans who will be legally unable to obtain abortion in a clinical setting.

FULL TEXT

Excessive regulation under state law has made it increasingly difficult for Americans to get a legal abortion. State lawmakers passed more than 100 restrictions on abortion in 2021, more than any previous year.1 Meanwhile, the Supreme Court shifted rightward with the appointment of three justices duringthe Trump administration, threatening constitutional protection for abortion and setting a course for state-level abortion bans.

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ABORTION AND THE LAW

In their study, Aiken et al. examined US residents' requests to the online telemedicine abortion service Women on Web, for which consultation included a medical doctor's review of a client intake form. The Women on Web model of online telemedicine, quite uniquely, combines elements of two models of abortion care: (1) telemedicine-"the delivery of healthcare services ... by a healthcare practitioner to a patient in a different physical location ... through telecommunications technology,"5 and (2) self-managed abortion-the use of medication to end a pregnancy on one's own, without clinical supervision.6 To fully understand the implications of the article by Aiken et al., we distinguish between "selfmanaged" abortion and "telemedicine" abortion because of differing treatments of these two models in research and law, with the acknowledgment that the Women on Web model uniquely combines both approaches. Although the medications (misoprostol alone or in combination with mifepristone) taken through both telemedicine abortion care and self-managed abortion are the same and the process is largely similar, laws apply to self-managed abortion differently than to telemedicine. The difference is largely because telemedicine abortion involves a licensed clinician, whereas self-managed abortion does not.

After the article by Aiken et al. was published, telemedicine became legal in some states, when, in December 2021, the Food and Drug Administration (FDA) removed an in-person dispensing requirement for mifepristone, permitting patients to access medication abortion by mail. The FDA's move codified a previous decision not to enforce the in-person dispensing requirement during the pandemic.7 In other states, however, laws require in-person visits or have explicit bans on telemedicine for abortion or mailing abortion pills-laws that may apply regardless of the FDA decision. Questions remain about the challenging legal issues that will arise with actions that cross borders of states with differing laws.3

Self-managed abortion may place the person having the abortion or people who help them at risk for criminal and civil penalties8; indeed, people who self-managed their abortion and individuals who helped them have been arrested and prosecuted in the United States.9 The laws of some states specifically criminalize self-managed abortion, whereas laws unrelated to abortion (e.g., fetal harm laws, homicide laws) may also be used to prosecute people who self-manage.9

The distinction between self-managed abortion and telemedicine is also pertinent to the study of the safety and effectiveness of telemedicine abortion, which is well-established as on par with clinic-based medication abortion.4,10 Research on self-managed medication abortion has similarly found levels of effectiveness and safety comparable to clinical care.6,11 Because of the ambiguous legality and decentralized nature of self-managed abortion, however, research on this experience faces unique challenges, such as difficulty identifying a representative sample of people who self-manage and difficulty gaining their trust in the face of privacy and legal concerns-challenges that are less likely when researching telemedicine abortion.12

The model that Aiken et al. studied is somewhat of a hybrid, with the recordkeeping end more closely mirroring telemedicine models and the experience of the person seeking abortion more closely mirroring that ofselfmanaged models. There are lessons for researchers in both spaces, including the value of using existing systematic records collected by community-based organizations that provide access to or support of at-home medication abortion, as well as the central importance of close partnership with these trusted groups.

RESEARCH SIGNIFICANCE AND IMPLICATIONS

Aiken et al. compared data on requests for abortion between states, based on whether the policy context in each state was classified as hostile to or supportive of abortion access. The researchers found that demand for mailed medication abortion was higher in states with hostile policies than in those with supportive policies, with barriers related to legislative restrictions more pronounced in hostile states.

The hostility to abortion in policy will become more severe in the coming months.3 In December 2021, the Supreme Court heard arguments in Dobbs vJackson Women's Health Organization, a case in which the court is predicted to overturn or significantly undermine Roe v Wade byJune 2022. If, as anticipated, federal constitutional protections for abortion are abandoned, more than half of US states are positioned to ban abortion outright. Twelve states have laws that were created to ban abortion automatically if Roe is overturned, and nine states have pre-Roe bans (a law enacted before 1973 that was never removed from the legal code), which will also go into effect if Roe is overturned. Ten states have six-week bans, and two have enacted total abortion bans.13 Viewing the study results of Aiken et al. through the lens of the future abortion landscape in the United States would predict an increase in demand for out-of-clinic abortion, as state law becomes more restrictive with the weakening of federal constitutional protections. The study positions future researchers well for investigating the effect of specific state-level abortion policies, which are likely to have differential effects on different groups of people. For instance, the authors cite the Hyde Amendment as a policy that reduces clinic access for Medicaid users. Other such policies include burdensome requirements for minors and unfounded requirements for ambulatory surgical centers.14 The field of legal epidemiology offers tools for research on the relationship between restrictive abortion laws and health outcomes. For example, policy surveillance methods can account for the compounding effect of specific policies. And the development of causal models for the operation of laws can set the stage for accurately measuring the relationship between policy and demand for and incidence of self-managed abortion among specific populations.15

NEW RESEARCH

The study authors appropriately noted the growing evidence of the safety and efficacy of self-managed medication abortion through online telemedicine and highlighted that the primary risk associated with self-managed abortion may be legal risk. Since the study was published, new research has further established the high levels of safety and effectiveness of self-managed medication abortion across a range of out-of-clinic models-ranging from 94% to 100% abortion completion without surgical intervention.11,16

One recent study in particular-the SAFE (Studying Accompaniment model Feasibility and Effectiveness) study-evaluated the safety and effectiveness of self-managed medication abortion with support from accompaniment groups, whereby non-clinically trained counselors provide information and support over the telephone as needed to people self-managing their abortions.11 The SAFE study further established the effectiveness and safety of self-managed medication abortion and, importantly, concluded that effectiveness in the self-managed setting is not inferior to the clinical setting. Indeed, findings from the SAFE study also indicate that self-use of misoprostol alone is similarly effective to self-use of misoprostol in combination with mifepristone-a particularly important finding given that misoprostol is much less heavily regulated and more easily accessible in the United States than mifepristone.

CONCLUSIONS

In short, the findings of Aiken et al. establish that there is a demand for telemedicine and self-use of medication abortion in the United States and that this demand increases in hostile policy climates. Given the anticipated major shift toward even more hostile policy climates in the United States in the coming months,3 we can extrapolate from the article of Aiken et al. that demand for at-home medication abortion will increase. Considered in light of recent research such as the SAFE study, we can set aside public health and clinical safety concerns following an increase in self-managed medication abortion. However, legal risk remains, and people who selfmanage and those who support them are especially at risk for criminalization. Further research collaboration between legal and public health experts using legal epidemiology approaches will produce a fuller picture of the effect of post-Dobbs state abortion restrictions.

The evidence base continues to overwhelmingly lead to the conclusion that telemedicine abortion and selfmanaged abortion, with misoprostol alone or in combination with mifepristone, are safe and effective modes of abortion care. As legislatures hostile to abortion rights move to ban abortion altogether, state lawmakers who support evidence-based policy must take steps to remove legal risk for everyone involved in self-management of abortion. It is a public health imperative. "4JPH

Sidebar

CORRESPONDENCE

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A Social Vulnerability Framework to Identify and Assist With Environmental Injustice

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ABSTRACT (ENGLISH)

t is well established that socioeconomic and demographic factors, such as race and ethnicity, income, and education, are independently linked to health disparities.1 Tools that combine multiple socioeconomic and demographic variables into an overall rank, such as the Centers for Disease Control and Prevention (CDC)/Agency for Toxic Substances and Disease Registry (ATSDR) Social Vulnerability Index (SVI), provide a quantitative framework that can be used by policymakers to identify communities that have higher overall social vulnerability with regard to disparate health outcomes and living conditions across multiple factors, and to develop targeted interventions.2 Historically, the SVI and similar frameworks have been crafted for emergency preparedness and response and used for study and practice in more extreme natural and human-caused disaster scenarios. Over the

years, the SVI has been used for public health research and practice, communications, and accessibility planning, and to target geographically specific interventions related to natural disasters such as flooding and hurricanes,3, human-caused events such as chemical spills,2 and disease outbreaks like the recent COVID-19 pandemic.4 However, addressing issues of health inequity attributable to environmental injustice is imperative, and should not be restricted to alleviating the impact of event-specific hazards. To effect systemic change, public health researchers and practitioners must explore the use of tools like the SVI to identify and provide actionable insights for assisting communities that are subject to the effects of chronic environmental stressors and poor living conditions in their daily lives.

Environmental injustice in the built environment is often associated with the disproportionate placement of hazardous and industrial sites and polluting transportation infrastructure in socially vulnerable neighborhoods,5 where residents often lack the social or economic capital to influence policy decisions.6 Although existing research links housing and health equity,7 the impact of poor housing conditions and household exposures to lead, pests, and indoor air pollutants on the health and well-being of socially vulnerable populations is an important and often overlooked aspect of environmental injustice.7,8 The Environmental Protection Agency's definition of environmental justice is all-encompassing and espouses the idea that environmental justice is only achieved when "everyone enjoys: The same degree of protection from environmental and health hazards, and equal access to the decision-making process to have a healthy environment in which to live, learn, and work."9 Can justice be achieved without addressing housing disparities?

In this issue of AJPH, Hollar et al. (p. 1217) explore whether there is a link between social vulnerability and substandard housing conditions in Miami, Florida, in the wake of a preventable disaster: theJune 2021 collapse of the Champlain Towers. Although a humancaused disaster event is the catalyst of their inquiry, the authors' use of the SVI is not directed toward the emergency event itself. Hollar et al. ultimately find that census tracts with higher SVI scores are more likely to contain "risky housing environments" and recommend that policymakers "identify and assist vulnerable communities" experiencing unsafe housing, as these communities often do not have the social or economic capital to influence decision-makers or change their circumstances. Instead of focusing on the disaster, the article draws attention to a larger long-standing issue affecting the community and likely contributing to the cause ofthe disaster: environmental injustice in the form of substandard housing conditions that result in health inequities. Applying a quantitative social vulnerability framework to environmental injustice in this way opens the door for preventatively applying socially and geographically targeted interventions enacted for disaster preparedness and response to address disparities without the catalyst of the disaster itself.

FULL TEXT

t is well established that socioeconomic and demographic factors, such as race and ethnicity, income, and education, are independently linked to health disparities.1 Tools that combine multiple socioeconomic and demographic variables into an overall rank, such as the Centers for Disease Control and Prevention (CDC)/Agency for Toxic Substances and Disease Registry (ATSDR) Social Vulnerability Index (SVI), provide a quantitative framework that can be used by policymakers to identify communities that have higher overall social vulnerability with regard to disparate health outcomes and living conditions across multiple factors, and to develop targeted interventions.2 Historically, the SVI and similar frameworks have been crafted for emergency preparedness and response and used for study and practice in more extreme natural and human-caused disaster scenarios. Over the years, the SVI has been used for public health research and practice, communications, and accessibility planning, and to target geographically specific interventions related to natural disasters such as flooding and hurricanes,3, human-caused events such as chemical spills,2 and disease outbreaks like the recent COVID-19 pandemic.4 However, addressing issues of health inequity attributable to environmental injustice is imperative, and should not be restricted to alleviating the impact of event-specific hazards. To effect systemic change, public health researchers and practitioners must explore the use of tools like the SVI to identify and provide actionable insights for assisting communities that are subject to the effects of chronic environmental stressors and poor living conditions in their daily lives.

Environmental injustice in the built environment is often associated with the disproportionate placement of

hazardous and industrial sites and polluting transportation infrastructure in socially vulnerable neighborhoods,5 where residents often lack the social or economic capital to influence policy decisions.6 Although existing research links housing and health equity,7 the impact of poor housing conditions and household exposures to lead, pests, and indoor air pollutants on the health and well-being of socially vulnerable populations is an important and often overlooked aspect of environmental injustice.7,8 The Environmental Protection Agency's definition of environmental justice is all-encompassing and espouses the idea that environmental justice is only achieved when "everyone enjoys: The same degree of protection from environmental and health hazards, and equal access to the decision-making process to have a healthy environment in which to live, learn, and work."9 Can justice be achieved without addressing housing disparities?

In this issue of AJPH, Hollar et al. (p. 1217) explore whether there is a link between social vulnerability and substandard housing conditions in Miami, Florida, in the wake of a preventable disaster: theJune 2021 collapse of the Champlain Towers. Although a humancaused disaster event is the catalyst of their inquiry, the authors' use of the SVI is not directed toward the emergency event itself. Hollar et al. ultimately find that census tracts with higher SVI scores are more likely to contain "risky housing environments" and recommend that policymakers "identify and assist vulnerable communities" experiencing unsafe housing, as these communities often do not have the social or economic capital to influence decision-makers or change their circumstances. Instead of focusing on the disaster, the article draws attention to a larger long-standing issue affecting the community and likely contributing to the cause ofthe disaster: environmental injustice in the form of substandard housing conditions that result in health inequities. Applying a quantitative social vulnerability framework to environmental injustice in this way opens the door for preventatively applying socially and geographically targeted interventions enacted for disaster preparedness and response to address disparities without the catalyst of the disaster itself.

One of the key benefits of the SVI as a quantitative framework for social vulnerability is that it provides data necessary for two key activities that Hollar et al. recommend: identification and assistance. The overall ranking is a useful tool to identify communities likely to experience health disparity attributable to high social vulnerability, and the individual factors and themes that make up the index can be broken down to inform actions targeted to the specific socioeconomic and demographic factors driving vulnerability. For example, when looking at the individual indicators driving high social vulnerability in Miami-Dade County (Table 1), the study area of Hollar etal., we see that the minority and language themes, as well as the housing and transportation themes, are the main drivers of high vulnerability in the county.

Further inspection of the data in these themes shows that this county is in the highest percentile, relative to all US counties, for minority residents and residents who speak English less than well, and it ranks very high in percentiles for overcrowded, multiunit, and no-vehicle households. Seeing the specific factors that drive social vulnerability in this county can empower policymakers to address inequities in a socially targeted way. For example, government agencies in the Miami-Dade area may use the information from the SVI to inform specific policies or initiatives such as

* Targeting safe building compliance and enforcement accountability activities in areas zoned for multiunit housing structures;
* Increasing funding or other resource allocation for improved public transportation systems; and
* Increasing the use of multilingual public service and health communications.

Using the SVI in this way takes the information included from a conceptual ranking and makes it useful for taking targeted actions. Additionally, the census tract scale data available in the SVI allow decision-makers to take assistance one step further and geographically target specific interventions to the neighborhoods within a county that are most vulnerable. In the case of Miami-Dade, initiatives would be most helpful in the north-central regions of the county (see Hollar et al., supplemental Figure A).

The SVI has already been used outside the realm of disaster management to better characterize obesity10 and physical fitness.11 Hollar et al. set a new precedent for the value it may bring to the environmental justice sector, and additional research should be done to understand its utility in identifying communities that may be more likely to experience other socially linked conditions associated with environmental injustice, such as routine exposure to indoor and outdoor environmental pollutants, chronic disease burden, poor working conditions, lack of greenspace, and other issues with the built environment, in addition to housing conditions.

The brief by Hollar et al. primes the public health community to use tools, like the CDC/ATSDR SVI, that measure overall social vulnerability to identify and assist communities that need not only more support for disaster preparedness and response but simply more support in their daily lives to prevent health disparities. The authors rightfully assert that their findings can be used to prevent future tragedies. However, when paired with environmental data to get at the cumulative impacts of vulnerability and burden on health, the quantitative social vulnerability framework on which they pin their thesis can do much more than prevent future tragedies. Such a framework offers actionable insights to address current health disparities through preventative and restorative action.

Sidebar

Note. The conclusions of this article are those of the author and do not necessarily represent the official position oftheATSDR or CDC.

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Healthy Davis Together: Creating a Model for Community Control of COVID-19

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ABSTRACT (ENGLISH)

While many higher-education institutions dramatically altered their operations and helped mitigate COVID-19 transmission on campuses, these efforts were rarely fully extended to surrounding communities. A community pandemic-response program was launched in a college town that deployed epidemiological infection-control measures and health behavior change interventions. An increase in self-reported preventive health behaviors and a lower relative case positivity proportion were observed. The program identified scalable approaches that may generalize to other college towns and community types. Building public health infrastructure with such programs may be pivotal in promoting health in the postpandemic era.

FULL TEXT

Headnote

While many higher-education institutions dramatically altered their operations and helped mitigate COVID-19 transmission on campuses, these efforts were rarely fully extended to surrounding communities. A community pandemic-response program was launched in a college town that deployed epidemiological infection-control measures and health behavior change interventions. An increase in self-reported preventive health behaviors and a lower relative case positivity proportion were observed. The program identified scalable approaches that may generalize to other college towns and community types. Building public health infrastructure with such programs may be pivotal in promoting health in the postpandemic era. (Am J Public Health. 2022;112(8):1142-1146. https://doi.org/10.2105/ AJPH.2022.306880)

In response to the COVID-19 pandemic, many institutions of higher education dramatically altered their operations1 to mitigate transmission on campuses.2 Actions included testing, contact tracing, isolation and quarantine support for students and employees, wastewater monitoring, and a variety of behavior change interventions (e.g., masking, remote classes). While at many institutions of higher education campus life extends into the community where local economies depend on students, few institutions of higher education fully extended their mitigation efforts into their surroundings.3

INTERVENTION AND IMPLEMENTATION

The University of California, Davis (UC Davis) and the City of Davis, located within Yolo County, California, partnered to develop a community COVID-19 pandemic response program, Healthy Davis Together (HDT),4 which combined epidemiological infectious disease control measures and health behavior change interventions to mitigate the impact of the COVID-19 pandemic.

Together with UC Davis, the City of Davis, and key community stakeholders, HDT deployed several strategic approaches that fell under two thematic areas: epidemiology (such as testing, contact tracing, and quarantine and isolation) and health behavior change (focused on communication). Project organization is shown in Figure 1.

Epidemiology strategies included expanding access to polymerase chain reaction (PCR) testing by adding new testing sites to those that were otherwise available to Yolo County residents and by offering voluntary, free-ofcharge COVID-19 testing. Additional strategies included augmenting the county's contact tracing capacity with rapid triage to isolation and quarantine, implementing citywide sub-sewershedlevel wastewater monitoring, personal protective equipment (PPE) distribution, and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) vaccination.

Health behavior change interventions included targeted COVID-19 health education, mass communications through different media channels, and personal, group, and business incentives.

Built on a framework of community trust that meaningfully engaged citizens, businesses, and local government officials in planning and operations, we strengthened partnerships among the university, city, and county, and established new partnerships with private and community entities that enhanced communications capabilities, enabled implementation of joint local responses, and facilitated community-wide testing.

Epidemiological Approaches

SARS-CoV-2 RNA was detected by using a saliva-based reverse transcription-quantitative PCR test from the Clinical Laboratory Improvement Amendments-approved laboratory at the UC Davis Genome Center for asymptomatic individuals who live or work in Davis. BinaxNOW point-of-care tests5 were administered for symptomatic individuals. Testing was offered to all Davis kindergarten through grade 12 schools. Quarantine and isolation facilities were offered to newly identified cases and close contacts, along with other need-based wraparound services such as housing, food, and transportation support. Administrative data were used to target some interventions to marginalized populations including persons with less than a four-year college degree, unemployed individuals, the Latinx community, those who were retired or aged 65 years or older, farmworkers, people living in high-density or congregate housing, and individuals utilizing government assistance. Wastewater from the treatment plant and from autosamplers located at 25 subsewershed nodes throughout the city were analyzed for the presence of SARS-CoV-2 RNA by reverse transcriptase-droplet digital PCR.

A PPE procurement and distribution system for Davis residents was established at easily accessible locations (e.g., campus, businesses, K-12 schools, homeless shelters). When COVID-19 vaccines became available, we partnered with Yolo County Public Health and CommuniCare, a multicounty Federally Qualified Health Center, to equitably augment vaccination access.

Health Behavior Change Approaches

HDT implemented several health behavior-change approaches to prevent community spread. A new workforce of more than 200 "Aggie" public health ambassador students was established and deployed on campus and throughout Davis. Ambassadors encouraged healthy behaviors through educational messaging, championing health-promoting behaviors, and distributing incentives. Mass communications, used to drive testing and health-promoting behaviors, were aimed at general as well as specific sectors of the community using print, broadcast, and social media. Incentives included gift cards, PPE, hand sanitizer, snacks and meals, HDT merchandise, prize drawings, and small grants for group-coordinated activities. A business partners program provided onsite consulting to help business owners adopt or adapt practices to increase safety and provided partners with grants, PPE, employee COVID-19 testing, patron incentives, marketing, and public health educational materials.

PLACE, TIME, AND PERSONS

HDT began implementing community-wide interventions on November 18, 2020, in Davis. HDT extended campus efforts (for 39 074 students enrolled in fall 2020)4 to the entire community that worked or lived in Davis (with a city population of approximately 70 000 residents).

PURPOSE

Our goal was to determine whether a program combining epidemiological infectious disease-control measures and health behavior-change interventions could lower the burden of COVID-19 beyond university campus borders and into an entire surrounding community.

EVALUATION AND ADVERSE EFFECTS

We assessed knowledge and practice of COVID-19 health behaviors through a series of repeated cross-sectional surveys using a randomly selected sample of approximately 600 individuals (equally stratified by City of Davis residents or Yolo County residents outside of Davis). We summarized test positivity using a seven-day moving average. We assessed change in test positivity proportion overtime using a repeatedmeasures expanded beta-distributed generalized linear mixed-effects model to compare Davis with non-Davis.

From November 18, 2020, through February 23, 2022, there were 733 606 tests conducted in the Davis community with 13 066 positive results. In September 2021, individuals who reported testing at least once were 85.0% versus 75.5% for Davis residents versus nonDavis residents, respectively (P = .002; Table A, available as a supplement to the online version of this article at https://ajph.org). In November 2021, testing rates further increased to 92.3% versus 79.1% (P <.001), and 72.3% of Davis residents reported being tested three or more times compared with 41.8% for non-Davis residents (P = .029). For Davis residents, 95.0% reported being fully vaccinated in November 2021 compared with 80.4% of non-Davis residents (P = .034).

Figure 2 shows the test positivity proportion for Davis, Yolo County,6 and California from January 1,2021, to February 23, 2022. Positivity was lower in Davis compared with Yolo County as a whole (overall difference -1.42; 95% confidence interval [CI] = -1.45, -1.38), and significantly lower for Davis compared with California (overall difference -2.1 5; 95% CI = -2.18, -2.12). Positivity was significantly lower for Yolo County compared with California (overall difference -0.73; 95% CI = -0.75, -0.71). During both the SARS-CoV-2 Delta and Omicron surges, more striking differences were observed when positivity proportion remained lower in Davis in contrast to the steep increases in Yolo County and California.

Because the pandemic's deadly consequences accelerated the timeline for implementing control measures, our ability to evaluate incremental contributions of each program component was limited. While many components targeted Davis residents, there was spillover to individuals who lived outside of Davis; some interventions such as PCR testing were made available to individuals who worked in Davis but resided elsewhere. Therefore, positivity proportion comparisons by geographic area may be biased by spillover effects, although most likely in the direction of the null value. The observed differences in positivity between Davis and Yolo County are likely understated. No adverse effects were reported or observed that were attributed to project interventions.

SUSTAINABILITY

Several HDT elements directly contributed to the development of local infrastructure in response to the COVID-19 pandemic and can be leveraged to address future public health challenges. These include new or strengthened public-public and public-private partnerships, an undergraduate community health promotion workforce, relatively low-cost measures such as multilevel incentives, and communitywide testing that can be used for other infectious agents. Even measures that required substantial upfront capital investment, like establishing our PCR testing platform, resulted in reduced unit costs more than an order of magnitude less expensive than commercial alternatives and rapidly returned results (typically within # 24 hours). While the utility of wastewater surveillance has yet to be fully realized at a population level, it has the potential to be cost-efficient and complementary to individual testing efforts.7

PUBLIC HEALTH SIGNIFICANCE

Community interventions were built on successful efforts to mitigate infectious disease transmission on a university campus2-comporting with the highly interconnected nature of university and city life. Building partnerships with organizations, government, and key stakeholder groups while combining epidemiological and health behavior change approaches was achievable and likely generalizable to other college towns and to other types of communities. Our multimodal COVID-19 community intervention program resulted in favorable changes in key self-reported health behaviors (e.g., asymptomatic testing and vaccination). Case positivity proportion was much lower in Davis compared with other areas. Building public health infrastructure with such programs may be pivotal in promoting health in the postpandemic era. AJPH

Sidebar

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B. H. Pollock, T. S. Nesbitt, T. Stoltz, and K. C. Burtis developed the concept and design, helped conduct the study, and contributed to the analysis. M. Nu~o and C. L. Bergheimer contributed to the analysis. All authors, including S. R. Belafsky and K. M. Carey, performed interpretation of data, contributed to drafting of article, and provided final approval.

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This study was determined to be exempt from institutionalreview board review by the UC Davis Office of Research.

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Not in Our Name: The Disingenuous Use of "Public Health" as Justification for Title 42 Expulsions in the Era of the Migrant Protection Protocols

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ABSTRACT (ENGLISH)

Like many of the asylum seekers turned away at the border by the Unites States, Celina (name changed to protect her identity) left her home country of Honduras in early 2020 in hopes of a better life, to escape violence and harsh economic conditions, and wishing to reunite with family members living in the United States. However, on reaching the US border, Celina and her child were returned to Mexico because of a policy known as the Migrant Protection Protocols (MPP). Celina was then kidnapped in Mexico, causing her to miss her immigration hearing. When she was finally released and attempted to cross into the United States a second time, she was turned back again, this time because of a second US public health policy known as Title 42, which prevents would-be migrants from entering the country or seeking asylum because of concerns that they may spread COVID-19.

While waiting in Mexico for a chance to reopen her closed MPP case, Celina became worried that she might be pregnant. She had missed her menses, which was not atypical given her history of irregularity, but she started having severe abdominal and pelvic pain accompanied by fevers. A home pregnancy test confirmed her condition. Concerned, she attempted to obtain pregnancy care in Mexico five times but was turned away each time because of her migrant status and her inability to pay for her care. This experience, combined with her history of trauma in her home country and her kidnapping, led Celina to have suicidal ideation. Fortunately for Celina, she was one of the lucky few asylum seekers who was able to secure assistance from a legal team. Members of the legal team approached local border physicians (S. D. R. and M. G.) requesting a letter of declaration attesting to the seriousness of her medical condition. With this letter, the legal team was able to obtain approval for humanitarian parole, which allowed Celina to enter the United States, reunite with her family, and, ultimately, receive appropriate medical care for her pregnancy.

FULL TEXT

Like many of the asylum seekers turned away at the border by the Unites States, Celina (name changed to protect her identity) left her home country of Honduras in early 2020 in hopes of a better life, to escape violence and harsh economic conditions, and wishing to reunite with family members living in the United States. However, on reaching the US border, Celina and her child were returned to Mexico because of a policy known as the Migrant Protection Protocols (MPP). Celina was then kidnapped in Mexico, causing her to miss her immigration hearing. When she was finally released and attempted to cross into the United States a second time, she was turned back again, this time because of a second US public health policy known as Title 42, which prevents would-be migrants from entering the country or seeking asylum because of concerns that they may spread COVID-19.

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Sadly, Celina's experience at the US border is not uncommon, although her ultimate admission to the United States is rare indeed. Because ofthe confluence of MPP and the 2020 invocation of 42 US Code 265 (hereafter "Title 42"), an obscure public health policy last updated in 1944, more than a million expulsions of migrants and asylum seekers occurred at the US border in fiscal year 2021 alone, contrary to international law.1

POLICY BACKGROUND

The policy known today as Title 42 originated in a 1944 law called the Public Health Service Act, which (among other things) granted the federal government quarantine powers and the power to prevent the introduction of disease at the border. Section 265 ofthe law notes:

Whenever the Surgeon General determines that by reason ofthe existence of any communicable disease in a foreign country there is serious danger ofthe introduction of such disease into the United States, and that this danger is so increased by the introduction of persons or property from such country that a suspension ofthe right to introduce such persons and property is required in the interest ofthe public health, the Surgeon General . . . shall have the power to prohibit, in whole or in part, the introduction of persons and property from such countries or places as he shall designate in order to avert such danger, and for such period of time as he may deem necessary for such purpose.2

In March 2020, the Trump administration invoked Title 42 to justify turning away migrants and asylum seekers who presented at ports of entry on the Mexican and Canadian borders and deporting those who were detained within US borders. Robert Redfield, then director of the Centers for Disease Control and Prevention (CDC), determined that introduction into congregate settings of persons from Canada or Mexico would increase the already serious danger to the public health of the United States to the point of requiring a temporary suspension of the introduction of covered aliens into the United States.3

The same order also noted the logistical challenges of preventing the transmission ofCOVID-19 at the border:

Unfortunately, at this time, there is no vaccine that can prevent infection with COVID-19, nor are there therapeutics for those who become infected. . . . Commercial test results are typically available within three to four days. Currently, the time required to obtain test results- coupled with the incubation period of the disease-makes it impracticable to confirm whether each person moving into the United States is infected with COVID-19 at the time of the movement. Widespread, compulsory federal quarantines or isolations of such persons pending test results are impracticable due to the numbers of persons involved, logistical challenges, and CDC resource and personnel constraints.3

Although the US government did not have access to vaccines or rapid tests in March 2020, they need not have adopted such an extreme policy to protect the public's health. Consider, for instance, the reasoning of CDC director Redfield, who stated that invoking Title 42 was necessary to protect the public's health because detained migrants would be held in "congregate areas of [Customs and Border Protection (CBP)] facilities."3 However, it was never necessary to hold asylum-seeking immigrants in congregate areas of CBP facilities for an extended period of time. As Lopez et al. argue:

Given the barriers to effective implementation of PPE [personal protective equipment] and administrative controls to prevent the spread of [COVID-19] in immigration detention centers, an evidence-based public health approach suggests . . . the release of detainees from immigration detention centers, as this strategy will reduce the likelihood of person-to-person infection and enhance the possibility of engaging in meaningful social distancing and hygienic practices as directed by the CDC.4(p112)

That the US government invoked Title 42 for those coming through land borders but instituted only temporary travel bans for other international travelers and did not institute interstate travel bans underscores how unnecessary these extreme measures truly were, even in the early days of COVID-19.5

In addition to the challenges posed by the use of Title 42 to prevent the entry of asylum seekers during COVID-19, MPP-often referred to as the Remain in Mexico program- creates additional barriers for migrants seeking to enter the United States. Under MPP, individuals who arrive at the southern border and ask for asylum (either at a port of entry or after crossing the border between ports of entry) are given notices to appear in immigration court and sent back to Mexico.6 They are instructed to return to a specific port of entry at a specific date and time for their next court hearing. The program, which went into effect in January 2019, was used to send more than 70 000 migrants back to Mexico before it was suspended after President Biden took office.6 In August 2021, a federal court in Texas ordered the Department of Homeland Security to reinstate MPP-a decision that is currently under appeal-and in the meantime, MPP has been reinstated and new enrollments are continuing at several ports of entry.7 The policy was reviewed by the Supreme Court in April 2022, and a decision is expected this summer.7,8 However, even if MPP is ended, the effect of Title 42 will still be felt. The American Immigration Council, a nonpartisan advocacy group, notes that after Title 42 was invoked, "new placements into MPP were almost entirely replaced by Title 42 expulsions, meaning that people would be sent back to Mexico without being placed into any kind of court process."9

CLINICIAN PERSPECTIVE

For a glimpse at the on-the-ground impact of these policies, consider the case of the Rio Grande Valley Sector of the Texas-Mexico border, where S. D. R. and M. G. live and help coordinate medical care for immigrants with serious medical conditions. After Title 42 was invoked in 2020, the number of asylum-seeking families released into this country by CBP decreased dramatically.1 Families that are released to local nonprofit humanitarian shelters generally include women in their third trimester of pregnancy and their children. Department of Homeland Security policies indicate that pregnant people experiencing medical complications of pregnancy or in their third trimester are not subject to MPP,10,11 and, anecdotally, many pregnant women we see in humanitarian shelters report being turned away multiple times by CBP before reaching their third trimester. The mothers and their children who are refused admission in the Rio Grande Valley are returned to one of the most dangerous regions of northern Mexico, the State ofTamaulipas, where they are exposed to the risk of violence, kidnapping, and sexual assault. An alarming number of the released mothers report that their pregnancies are a product of rape on their journey through Mexico or at the US-Mexico border, and many volunteer aid organizations no longer travel to these regions of Mexico to provide humanitarian aid because ofthe extreme danger.

The pregnant mothers arriving at local humanitarian shelters report fearing for their own lives and their children's lives while being forced to remain in Mexico. Such fear, attributable both to Title 42 and MPP, is a form of toxic stress, which has been shown to contribute to adverse health effects in immigrant families.12 This constant level of fear and the lack of access to basic hygiene and health needs, such as showering facilities, safe outdoor portable toilets, clean water, soap, and nutritious food, can have lasting impacts on the health ofthe mother and the fetus.

Clearly, Title 42 presents a significant threat to immigrant health by abusing public health law to enact unjust immigration policies in violation of international law, and this threat is compounded by the continued use of MPP. Despite the Biden administration's previous indications that they planned to rescind Title 42, to date it remains in place and indeed has been defended in court by the Biden administration itself. We argue that this unjust and irregular application of public health law to deter migration severely undermines the stated purpose of promoting public health, exacerbates existing health inequities, and places legitimate asylum seekers, including women and children, at grave risk. We call on the public health community to denounce Title 42 and on the Biden administration to immediately rescind its use as an immigration deterrence measure.

GOING FORWARD

Even granting that caution was warranted in March 2020, when there was very little information about COVID-19 transmission or treatment, it is worth noting that these circumstances have changed. The US government now has many more resources available to address COVID-19 through lessrestrictive means than a total bar to entry, including multiple vaccine options and rapid testing. In the face ofthe CBP's refusal to initiate testing and vaccinations, citing lack of capacity as the excuse, many border communities and local nonprofit humanitarian shelters have taken on the burden of testing and vaccinating.

Despite these changing circumstances, the Biden administration has left Title 42 in place and has used it to justify the expulsion of asylum-seeking migrants, including the well-publicized expulsion of more than 7000 Haitian migrants in October 2021.13 Homeland Security secretary Alejandro Mayorkas defended the policy, saying, "Title 42 is not an immigration authority, but a public health authority. To protect the American public. To protect the communities along the border. And to protect the migrants themselves."14

In the ongoing litigation on the current use of Title 42, a recent ruling in the US Court of Appeals for the DC Circuit underscores the absurdity of this claim. In this case, CircuitJudgeJustin R. Walker observed:

We are not cavalier about the risks of COVID-19. And we would be sensitive to declarations in the record by CDC officials testifying to the efficacy of [Title 42]. But there are none. To be sure, as with most things in life, no approach to COVID-19 can eliminate every risk. But from a public-health perspective, based on the limited record before us, it's far from clear that the CDC's order serves any purpose.15

Judge Walker's acknowledgment that Title 42 does not appear to serve a legitimate public health purpose did not, however, prevent him from finding that migrants could still be expelled without being allowed to make a case for asylum. And indeed, in another case that was decided the same day, a judge in the US District Court for the Northern District of Texas ruled that the Biden administration could not exempt unaccompanied children from Title 42 expulsions. Within a week, the CDC revised its guidance to once again exclude unaccompanied children from Title 42, noting, "Expulsion of unaccompanied noncitizen children is not warranted to protect the public health."16

Secretary Mayorkas's insistence that Title 42 is intended to protect "the migrants themselves" appears almost laughable in light of these decisions. His defense of the policy fails to account for the irreparable harms that can result from returning asylum seekers to Mexico, their country of origin, or a third country without allowing them to make a case for asylum, in violation of international law.17

Another issue with continuing Title 42 expulsions in violation of international law is that the United States may in fact be contributing to the spread of COVID-19 to underresourced nations that do not have the same tools available to curb the spread of the pandemic. Given the wide availability of vaccines and rapid tests in the United States and the limited access to these resources in many of the countries from which asylum seekers hail, Title 42 has the potential to compound global health inequities. This is in stark contrast with the United States' stated position of pursuing global vaccine equity. President Biden said in a statement:

> As long as this pandemic is raging anywhere in the world, the American people will still be vulnerable. And the United States is committed to bringing the same urgency to international vaccination efforts that we have demonstrated at home.18

It is striking that US policy can recognize that the health of all members of the global community is interrelated with regard to the international distribution of vaccine doses but not with regard to the health of migrants at our borders. By failing in its duties toward migrants and asylum seekers during a global pandemic, the United States takes a dangerously narrow view of whose health is included in public health, and in so doing fails in its obligations to promote and protect public health within and beyond its borders.

Public health professionals and human rights advocates alike have denounced both Title 42 and MPP as deeply harmful to public health and to the United States' standing as a world leader.19,20 As a result of this advocacy, the Biden administration has indicated that it plans to end Title 42 restrictions on asylum seekers within the next few months, although they are currently unable to do so because of an injunction by a federal court.21 We call on the Biden administration to remain steadfast in their decision to withdraw Title 42 guidance; to continue efforts to end MPP and resume regular processing for migrants and asylum seekers at the US border; to increase the capacity of CBP to provide testing, isolation, and vaccination; and to stop relying on impoverished border communities and local nonprofit humanitarian organizations to provide these critical services.

Sidebar

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R. Fabi led the writing for the "Policy Background" and "Going Forward" sections. S. D. Rivas led the writing for the introductory paragraphs. M. Griffin led the writing for the "Clinician Perspective" section. All authors contributed to the conceptualization and writing of this article.

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The History of Contact Tracing and the Future of Public Health

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ABSTRACT (ENGLISH)

In the years after the elucidation of the germ theory of disease in the late 19th century, public health officials began to explore new strategies to reduce transmission of infections. Public health programs tracking infectious disease transmission became an important element of infection control and response to epidemics. From an historical perspective, contact tracing focused on the idea that if those infected could be identified, isolated, and persuaded to report their contacts, outbreaks could be slowed and, in some instances, stopped.

As a result, contact tracing has frequently been used to address infectious diseases over the course of the past century. A recent review by El-Sadr etal.1 traces the use of contact tracing for syphilis and gonorrhea, tuberculosis, HIV, Ebola, and, most recently, COVID-19. Awide range of approaches, however, fall within the general rubric of contact tracing. These strategies have been based on the authority of the state to surveil and track epidemics; require physicians and public health agencies to report certain diseases; and identify individuals for surveillance, investigation, and contact by public health authorities.2

The first major contact tracing programs targeted syphilis (Figure 1). Historically, the tracking of sexually transmitted infections led to stigmatization. Tracing required individuals to name sexual contacts, revealing intimate details about sexual relationships, as well as perceived indiscretions and infidelities, sometimes compromising marriages, families, other personal relationships, and employment. In the 1930s, tracing of syphilis infections required what officials often called "shoe leather epidemiology" to hunt down cases (often targeting prostitutes, minorities, and immigrants), as well as the interrogation of "suspects," mandating Wassermann tests, and eliciting "confessions." Contact tracing augmented the existing fear, shame, guilt, and stigma of syphilis.3 Not surprisingly, already vulnerable communities have often viewed these programs as both intrusive and dangerous. The threat of public exposure, isolation, and possible quarantine often encouraged individuals to avoid the "public health police." This historical legacy of contact tracing programs continues to serve as an important obstacle to their widespread and effective implementation. Recognizing that such approaches could have the effect of limiting the voluntary identification of contacts, public health officials duringthe HIV epidemic began to adopt "partner notification programs," which emphasized the contact case's personal and ethical responsibilities to the health of their sexual partners.

FULL TEXT

In the years after the elucidation of the germ theory of disease in the late 19th century, public health officials began to explore new strategies to reduce transmission of infections. Public health programs tracking infectious disease transmission became an important element of infection control and response to epidemics. From an historical perspective, contact tracing focused on the idea that if those infected could be identified, isolated, and persuaded to report their contacts, outbreaks could be slowed and, in some instances, stopped.

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THE PROBLEM OF EFFICACY

Although contact tracing has a clear logic, its potential effectiveness has often depended on the biological characteristics of infectious organisms. The disease-specific variables that influence the efficacy of contact tracing include the mode of transmission, the relative transmissibility of the organism, the length of an asymptomatic phase, and the length of time the agent is transmissible. Effectiveness is also related to the availability and accessibility of sensitive and specific laboratory testing regimes (and the timely access to results), as well as the potential to use treatments to render individuals noninfectious. Contact tracing is also dependent on contextual social, political, and ethical issues. These vary from the approach and skill of public health personnel to elicit names of contacts to complex questions of the social meanings, cultural contexts, and significance of the disease. Together, these biosocial variables make effective tracing challenging and sometimes impossible. For example, in many instances during the COVID-19 pandemic, individuals have been unaware of when they first acquired an infection and may have had hundreds of anonymous "contacts" before they became symptomatic. Highly transmissible, COVID-19 often outran programs for tracing contacts.

The efficacy of contact tracing, however, requires greater clarity about its goals and outcomes. As a public health strategy, contact tracing has historically depended on the participation and cooperation of individuals and communities. Such collaborations are sensitive to ethical considerations of protecting others who may be infected, as well as political assessments of the role of the government in preventing the spread of infectious diseases. Fear of punitive isolation or social stigma has often served as a critical obstacle to participation; in these cases, tracing programs have been seen as acts of surveillance and discipline by the state.4,5

LOOKING BACKWARD, LOOKING FORWARD

The COVID-19 pandemic offers an important opportunity to assess a variety of approaches to what has been broadly deemed "contact tracing." The pandemic has illuminated many of the strengths and weaknesses in current practices in the United States and other countries around the world. Before the advent of vaccines, there was particular interest in contract tracing to reduce transmission of the virus through testing and isolation of the infected. As we look to the future, the COVID-19 pandemic now offers a series of "natural experiments" to assess the value of tracing, especially because policies, technologies, and strategies varied greatly across states and nations.6,7

In particular, the pandemic spurred two critical innovations in approaches to contact tracing. For the first time in history, countries widely used digital technologies to identify possible exposures. Several countries (South Korea, Singapore, Australia, and New Zealand, among others) quickly introduced new digital tracing systems through smartphone applications that could alert individuals to exposures; encourage immediate testing; and, if a person was found to be infected, promote isolation. The comparative efficacy of these programs has yet to be fully determined and requires further research. But in many nations, especially the United States, uptake tended to be relatively low, severely limiting the value of this approach. Individuals who declined to use these applications typically cited concerns about privacy and surveillance.8 For this type of digital tracking to be successful, it is estimated that 60% adoption would be required. This will require clearer assurances of privacy and anonymity, as well as greater understanding of the potential social value of digital public health applications.4,9

In the United States, where skepticism of state authority has been particularly high, it is important that contact tracing programs be seen as serving the interests of individuals, their families, and communities. Several state programs instituted in 2020 sought to embed these values in their approaches, centering attention on informing individuals of their infections; educating them on best practices to avoid transmission; assuring that they had resources to isolate; and providing social support, including food and other necessities. The shift from a public health approach based upon police powers of the state to one that emphasizes community social engagement and support, especially among those most vulnerable, offers an important lesson.10 In such programs, which used the potential of what the late Dr. Paul Farmer described as "accompaniment," contact tracing assumed the goals of dedicated community health work, assuring that the needs of patients with COVID-19 and their contacts were identified and that material resources, social support, and advocacy were available.11,12

This approach has important implications beyond the future of contact tracing. It offers an orientation to public health that relies on collaboration, participation, and the provision of information and services, which erodes traditional notions of state discipline, isolation, and criminalization, often centered on vulnerable minority populations. Furthermore, it suggests that contact tracing can be integral to building trust and confidence in public health efforts that serve individuals, families, communities, and wider populations. The capacity to identify individuals experiencing infectious diseases and help them access medical care and protect their contacts through prevention or treatment is at the core of public health. But how this is done has enormous implications for health outcomes, reducing disparities, promoting equity, and how we imagine the future of public health.

Sidebar

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NIOSH Risk-Based Model to Resume Field Research and Public Health Service in 2020 During the COVID-19 Pandemic

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ABSTRACT (ENGLISH)

In the early months of the COVID-19 pandemic, field research and public health service work conducted by the National Institute for Occupational Safety and Health (NIOSH) was put on hold. During this time, NIOSH developed a risk-based model to resume fieldwork, balancing the public health benefit of such fieldwork with the risks of severe acute respiratory syndrome coronavirus 2 exposure and transmission. We describe our experiences with this model, along with the broader public health significance of the methods used to inform risk management decisions. (Am J Public Health. 2022;112(8):1138-1141. https:// doi.org/10.2105/AJPH.2022.306882)

FULL TEXT

Headnote

In the early months of the COVID-19 pandemic, field research and public health service work conducted by the National Institute for Occupational Safety and Health (NIOSH) was put on hold. During this time, NIOSH developed a risk-based model to resume fieldwork, balancing the public health benefit of such fieldwork with the risks of severe acute respiratory syndrome coronavirus 2 exposure and transmission. We describe our experiences with this model, along with the broader public health significance of the methods used to inform risk management decisions. (Am J Public Health. 2022;112(8):1138-1141. https://doi.org/10.2105/AJPH.2022.306882)

We developed and implemented travel risk management decision tools to facilitate limited missioncritical fieldwork while protecting field staff and workers during the COVID-19 pandemic because ofthe real public health risks from delaying critical work conducted by the National Institute for Occupational Safety and Health (NIOSH)-the only federal institute mandated to conduct research and public health service workto prevent work-related injuries and illnesses.

INTERVENTION AND IMPLEMENTATION

An initial travel risk management decision tree (Figure A, available as a supplementto the online version of this article at https://www.ajph.org) considered four major determinants of risk of a NIOSH employee becoming infected with or transmitting severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) while conducting field visits: (1) site conditions and work requirements, (2) level ofCOVID-19 community spread at the site and surrounding area, (3) mode of transportation and length of stay, and (4) controls in place. The decision tree presented these determinants of risk in the far left column, with descriptors of increasing risk presented from left to right for each category.

We designed the decision tree so that potential risk can stay the same or increase in navigating through the arrows from top to bottom but cannot go from a higher to a lower level of risk between steps. The final risk determination for the field visit is the potential risk level reached at the bottom ofthe decision tree. Elements ofthe decision tree were informed in large part by workplace COVID-19 investigations early in the pandemic,1-3 months before vaccines were available to prevent SARS-CoV-2 infection and serious illness from COVID-19.

In applying the decision tree in the first year ofthe pandemic, NIOSH investigators were asked to prioritize travel requests supporting only the most critical and time-sensitive research and public health service work. Between October 2020 and July 2021, NIOSH investigators submitted 55 requests for field travel, 51 of which were approved. Three requests were rejected because the potential risk was high and the public health benefit of the activity did not outweigh the potential risk. A fourth request was initially put on hold owing to extremely high levels of community spread but was ultimately approved after community case counts decreased.

PLACE, TIME, AND PERSONS

A group of senior NIOSH leaders convened in April 2020 to develop plans to resume paused research and public health activities at NIOSH research field sites and workplaces throughout the United States.

PURPOSE

We initiated this intervention early in the COVID-19 pandemic in an effort to facilitate and safely conduct high-priority NIOSH occupational health and safety fieldwork.

EVALUATION AND ADVERSE EFFECTS

Although somewhat complex and difficult to navigate, the model presented in Figure A facilitated the continuation of limited mission-critical occupational health and safety research relatively early in the pandemic. The evaluation of our risk decision tree included consideration of easier access to frequently updated data, increased knowledge regarding the effectiveness of various control measures, and, importantly, the widespread availability of effective vaccines. We subsequently replaced the risk decision tree with a relatively simple risk matrix framework (Figure 1) that was finalized in August 2021. This model integrates county-level data on SARS-CoV-2 transmission with percentage of adult population fully vaccinated, two important determinants of risk of transmission, infection, and illness,4 and characterizes varying levels of both metrics in terms of a travel location risk rating. The model also considers information on personal contact and mode of transportation in estimating a travel risk level. This model is intended to serve as an initial "snapshot" of potential risk, with final decisions made after considering travel risk level, travelers' vaccination status, specific details on the nature and extent of personal contact, control measures in place, and public health benefits of the proposed travel.

We determined the vast majority of approved travel during the first year of the pandemic (45 of 55 requests) to be medium or elevated risk. For example, two research engineers were able to travel together in a car for four hours to conduct maintenance on a seismic monitoring station, which is critical in conducting safety research on the impacts of seismic events in the mining industry. Additionally, a few requests for travel determined to be high risk with extensive COVID-19 transmission were approved (3 of 55) that we deemed to involve an urgent public health need. In one such case, two investigators traveled to a worksite to investigate a suspected relationship between workers performing welding operations and serious illness involving novel bacteria.

No adverse effects (e.g., reported COVID-19 illness or SARS-CoV-2 infection) were observed. We cannot discount the possibility that the absence of adverse effects is attributable at least in partto a small sample size or lack of data.

SUSTAINABILITY

The process we have used for estimating risk can easily be adapted by other organizations, and alternative metrics can easily be substituted with the current approach if found to be more reliable for informing and managing risk. The risk matrix we developed is just one tool that can be used in a larger risk assessment process. The matrix does not attempt to estimate the probability of an outcome; however, the effectiveness of a simple and sensible approach to risk management in work settings has significant advantages over more complex models, as described elsewhere.5-7

The models NIOSH developed and used have limitations. The complexity of the initial risk decision tree made it difficult to navigate but also may have provided users with an unwarranted sense of confidence in the overall estimate of risk. Furthermore, the simplified risk matrix did not explicitly include some important risk factors (e.g., contact duration, personal risk factors for developing severe illness), and the cut points dividing potential levels of risk for each metric in both models were based largely on convenience rather than an in-depth analysis. Nonetheless, many components of our risk matrix are reflected in the Centers for Disease Control and Prevention's recently updated guidance related to COVID-19 community levels,8 notably the use of a simple model that integrates a limited number of reliable COVID-19-related metrics to inform decision making.

PUBLIC HEALTH SIGNIFICANCE

The work described had a direct impact on the health and safety of US workers, as it facilitated the continued work of NIOSH soon afterthe start ofthe COVID-19 pandemic. Our flexible approach may be adopted and modified by those who are charged with managing risk in their organizations, and it acknowledges that rules and regulations cannot always account for all risk for all sites at all times. Organizations and their employees benefit by developing and clearly communicating mitigation strategies in anticipation of changing risk to minimize potential disruptions to employees and work processes. This may include, as appropriate, categories of risk with ana priori layered approach for control measures at each risk level to increase transparency. In other words, it is clear what mitigation measures will be put in place if the level of risk increases and what controls may be lifted if risk decreases. If executed and documented properly, the approach also creates an ability to track and evaluate what metrics and measures of control work best under varying conditions, which can lead to more consistent implementation strategies and communications across locations.

Sidebar

ABOUT THE AUTHORS

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CONTRIBUTORS

D.O. Johns led the writing. D. O. Johns and J. M. Harney designed the travel guidance and risk management decision tree.J. Howard oversaw the implementation ofthe intervention. G.S. Poplin led the design ofthe risk matrix with input from D.O.Johns and clinical direction from K. M. Yeoman. All authors contributed to the writing ofthe article.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

HUMAN PARTICIPANT PROTECTION

Institutionalreview board approvalwas not required as the work described did not involve human participants.

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Telemedicine, Medication Abortion, and Access After Roe v. Wade

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ABSTRACT (ENGLISH)

For a half-century, pregnant people in the United States have had the legal right to decide their pregnancies and reproductive health. The Supreme Court's ruling in Dobbs v.Jackson Women's Health Organization eliminated that right for millions of people in 26 states. Legislatures in 13 states have passed "trigger" laws that ban abortion if the Roe v. Wade decision is overturned, and 13 have bans that have become enforceable in the absence of Roe. In this environment, public health must continue to seek approaches to improve access to abortion services.

In this issue of AJPH, Seymour et al. (p. 1202) estimate how telemedicine could increase access to medication abortion. Medication abortion-a two-medication regimen of mifepristone and misoprostol-is a safe and effective method to end a pregnancy when used within 70 days' gestation.1 First approved in the United States in 2000, medication abortions have increased in the intervening years, and in 2020, they constituted the majority (54%) of abortions.2 This growth reflects increasing acceptance by patients and providers, changes in medicine driven by the COVID-19 pandemic, and the erosion of access caused by federal- and state-level restrictions.

FULL TEXT

For a half-century, pregnant people in the United States have had the legal right to decide their pregnancies and reproductive health. The Supreme Court's ruling in Dobbs v.Jackson Women's Health Organization eliminated that right for millions of people in 26 states. Legislatures in 13 states have passed "trigger" laws that ban abortion if the Roe v. Wade decision is overturned, and 13 have bans that have become enforceable in the absence of Roe. In this environment, public health must continue to seek approaches to improve access to abortion services.

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FEDERAL RESTRICTIONS ON MEDICATION ABORTION

Delivery of mifepristone for the medical termination of uterine pregnancy is subject to a Risk Evaluation and Mitigation Strategy (REMS) established by the US Food and Drug Administration (FDA). The purpose of the REMS isto ensure that the benefits of mifepristone outweigh its risks through the imposition of these requirements: (1) clinician certification, (2) patient signature on an FDAapproved agreement form, and (3) a requirement that mifepristone is administered under the direct supervision of a certified medical provider (also called the "in-person dispensing requirement"). The American College of Obstetricians and Gynecologists opposes REMS for mifepristone, citing safety data from two decades of use, lack of benefit for patients, barriers they create for underserved and rural communities,3 and barriers for providers and clinics that decrease the number of clinicians providing this care.4 In December 2021, the FDA removed the in-person dispensing requirement and added a requirement for pharmacy certification. These modifications expand the reach of telemedicine for medication abortion (TMAB) because they eliminate the need for patients to travel to participating clinics.

STATE RESTRICTIONS ON MEDICATION ABORTION

Currently, 34 states have bans or restrictions on the provision of medication abortion. Thirty-two limit its provision to physicians, ignoring evidence that physician assistants and advanced practice nurses can safely provide medication abortion. Nineteen states have in-person dispensing requirements that supplant the in-person dispensing requirement that the FDA removed in 2021. Two states have active partial bans based on gestational age, and three additional states have passed complete or partial bans on medication abortion that are blocked by court order. Furthermore, three states banned mailing abortion pills, and three other states have mail bans blocked by the courts. New restrictions are being considered every month; between January and May 2022,16 states introduced bills to ban or restrict medication abortion, seven sought to ban it entirely, five sought to ban mailing pills, and eight sought to ban TMAB.

TELEMEDICINE FOR MEDICATION ABORTION

The combined effects of state-level bans and restrictions have resulted in a dramatic decrease in the number of abortion providers. In their study, Seymour et al. included 925 providers identified via the Advancing New Standards in Reproductive Health abortion provider database in 2018. Just two years later, the number of abortionproviding facilities in Advancing New Standards in Reproductive Health had decreased dramatically, with approximately 750 facilities listed in 2020.

Seymour et al. examined TMAB access where patients presented to a participating clinic, consulted a remote physician, and received their medication. The hope is that expansion of access to TMAB could increase access for women in states with abortion restrictions, because the distance from an abortion provider is a leading barrier. For example, a study by Thompson et al.5 found a doseresponse relationship between travel distance and abortion rate-women living 120 miles or more from a provider had abortion rates one fifth of those among women living within five miles of a provider. Furthermore, shorter travel distances are associated with significant reductions in times to appointments.6 Finally, data from a cohort study representing 85% of medication abortions performed between April and June 2020 indicated that a hybrid TMAB at-home model had a four-day shorter waiting time and an increased proportion of medication abortions provided at six weeks' gestation or earlier.7

In their study, Seymour et al. identified 1091 abortion providers and Planned Parenthood clinics in the United States, geocoded all facility locations, and calculated the proportion of women of reproductive age in every census tract who live within a 30-, 60-, or 90-minute drive to a participating clinic. In 2018, 65.3% of persons of reproductive age lived within 30 minutes of a clinic, 80.5% were within 60 minutes, and 88.9% were within 90 minutes.

Seymour et al. also examined the potential effect on abortion access of two policy changes. In the first, TMAB was expanded to 241 non-abortion-providing Planned Parenthood clinics in states without a TMAB ban. This policy change would increase access with 68.3%, 82.6%, and 90.1% of women of reproductive age within a 30-, 60-, or 90-minute drive to a clinic, respectively. The second policy change evaluated was the removal of existing TMAB bans from 19 states. Abortion access was expanded to 70.9%, 84.7%, and 91.7% of women of reproductive age. Expansion of TMAB to all Planned Parenthood clinics in non-TMAB ban states would mean an additional 781 556 women of reproductive age would live within 90 minutes of a clinic. Elimination of existing state TMAB bans would result in 1.75 million more women living within 90 minutes of a TMAB provider.

TELEMEDICINE MEDICATION ABORTION AFTER ROE

As we face a post-Roe world, telemedicine and medication abortion are leading options for preserving and expanding access to abortion services. Yet, as we increase our focus on these services, we must be mindful of the "digital divide." In the United States, the populations with the greatest barriers to abortion access are disproportionately impacted by barriers to telemedicine. More specifically, vulnerable populations have greater economic and social disparities in the access to, use of, or impact of information and communication technologies. A recent AJPH editorial added urgency to prior calls to define broadband Internet access (BIA) as a social determinant of health because it affects access to health care, economic stability, education, food, community and social context, and neighborhood and physical environment.8 Notably, most people of reproductive age reported having BIA.9 But access varies by age, race/ethnicity, rural residence, and other demographic characteristics. Adults aged 18 to 29 years had lower BIA (70%) than those aged 30 to 49 years (86%). White adults had higher rates of BIA (80%) than Black (71%) and Hispanic (65%) adults. Urban and suburban residents had higher rates of BIA than those living in rural areas (77%-79% vs 72%). Households with incomes of $100 000 or more had higher rates of BIA (93%) than households with incomes less than $30000 (57%).

Although telemedicine breaks down barriers to abortion access, the lack of BIA in many homes puts vulnerable women at a disadvantage when identifying and contacting abortion providers and participating in telemedicine visits. As the women's reproductive health community moves forward in this fight to preserve abortion access, we must also push for an information infrastructure that will ensure equitable access to that care.

Sidebar

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Objectives. To quantify socioeconomic inequalities in COVID-19 mortality in Colombia and to assess the extent to which type of health insurance, comorbidity burden, area of residence, and ethnicity account for such inequalities. Methods. We analyzed data from a retrospective cohort of COVID-19 cases. We estimated the relative and slope indices of inequality (RII and SII) using survival models for all participants and stratified them by age and gender. We calculated the percentage reduction in RII and SII after adjustment for potentially relevant factors. Results. We identified significant inequalities for the whole cohort and by subgroups (age and gender). Inequalities were higher among younger adults and gradually decreased with age, going from RII of 5.65 (95% confidence interval CI] = 3.25, 9.82) in participants younger than 25 years to RII of 1.49 (95% CI 5 1.41,1.58) in those aged 65 years and older. Type of health insurance was the most important factor, accounting for 20% and 59% of the relative and absolute inequalities, respectively. Conclusions. Significant socioeconomic inequalities exist in COVID-19 mortality in Colombia. Health insurance appears to be the main contributor to those inequalities, posing challenges for the design of public health strategies. (Am J Public Health. 2022;112(S6):S586-S590. https://doi.org/10.2105/AJPH.2021.306637)

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Over the past two years the world and its different regions, including Latin America, have been suffering from the enormous burden and impact of the COVID-19 pandemic, which is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Colombia and Venezuela have been greatly affected.1,2 Despite sharing historical and cultural roots and similarities, each nation has entirely different sanitary conditions, especially regarding infectious, tropical, and reemerging illnesses, including vaccine-preventable diseases. Such differences have increased especially during the past two decades.Major infectious diseases in Colombia, such as tuberculosis, HIV, and malaria, are under reasonable control. Malaria, in particular, has significantly decreased during the past decade.3 Conversely, in Venezuela, all of these diseases are rising, especially malaria, which is shifting the country from being the former leader in vector-borne disease control to the nation with the highest morbidity in the Americas.4 Vaccine-preventable illnesses, such as measles, diphtheria, mumps, pertussis, and hepatitis A, show a similar picture, with high vaccination coverage in Colombia and sustained outbreaks across multiple years in the past decade in Venezuela.5In addition, the risk and occurrence of imported cases of these diseases in Colombia, Brazil, Ecuador, Panama, and other countries in Latin America and beyond also increased because of critical Venezuelan migration in the region.6-8 The arrival of COVID-19 to Latin America has compounded existing health crises in Venezuela. The COVID-19 pandemic has required different surveillance, diagnostic, and management approaches as well as marked differences in the national vaccination plans. Therefore, the COVID-19 crisis in these two Andean countries shows two different sides of the coin.

Ruiz-Gomez, F., & Fernández-Niño, Julián Alfredo, MD, PhD. (2022). The fight against COVID-19: A perspective from latin america and the caribbean. American Journal of Public Health, Suppl.Supplement 6, 112, S576-S578. Retrieved from https://www.proquest.com/scholarly-journals/fight-against-covid-19-perspective-latin-america/docview/2717341504/se-2?accountid=211160

Countries in Latin America and the Caribbean (LAC) have made great efforts over recent decades to increase effective coverage of health services although large inequities persist among and within the countries.1 The urban-rural gap is the most notable inequity in this region. However, unlike most of the public health problems that are predominant in LAC,2 COVID-19 has primarily affected urban areas, especially areas of concentrated poverty.3Managing the pandemic has primarily been an urban challenge that has substantially affected the most marginalized areas of the most densely populated cities and municipalities. In those areas, the COVID-19 crisis has predominantly affected the poorest populations, which is owing to the size of the informal workforce, health service access barriers, and malnutrition.4 Compared with high-income countries, LAC presumed early on that it was relatively protected from COVID-19 because the region is more geographically dispersed and its populations tend to be younger. However, it turned out to be one of the areas that is most vulnerable to the pandemic because of regional disparities in health capacities, weak health authority, and structural and historical inequalities that undergird social determinants of health. The role of health systems has been fundamental, but the structural determinants put the region in a sociohistorical position of vulnerability, particularly for the large metropolitan regions.The H1N1 (influenza A virus subtype H1N1), Zika, and Chikungunya pandemics provided important lessons.5 However, the lessons learned were insufficient in the face of COVID-1 9, with its magnitude and duration and the deep social complexity of mitigation measures that were to be adopted in highly uncertain contexts-many of which had not been used for several decades. Nonetheless, the region's countries had prepared antipandemic response plans, including improvements in its epidemiological surveillance systems, information systems, and alert and response systems, which made it possible to adapt the response quickly. Although these plans were unevenly executed, the impact undoubtedly would have been worse without these resources, the experience, and the preparation.

Credits. (2022). American Journal of Public Health, Suppl.Supplement 6, 112 Retrieved from https://www.proquest.com/scholarly-journals/credits/docview/2717341429/se-2?accountid=211160

Correa, A. G. (2022). How we faced the challenge of COVID-19 in antioquia, colombia. American Journal of Public Health, Suppl.Supplement 6, 112 Retrieved from https://www.proquest.com/scholarly-journals/how-we-faced-challenge-covid-19-antioquia/docview/2717341425/se-2?accountid=211160

Before COVID-19 reached Colombia and the World Health Organization (WHO) declared the pandemic, in Antioquia, Colombia, we were already strengthening our capacity to face it. Seeingthe experiences in other countries, we took this threat seriously from the onset. Our departmental government declared a health emergency and public disaster to provide better tools to tackle the situation. We created a first-level management structure that was pioneered in Colombia. A professional with proven experience over a long career and the necessary social sensitivity and organizational ability to coordinate staff led this response with a clear mandate to protect life.We made difficult political decisions. In Colombia, the first lockdowns were ordered and protocols such as the use of face masks were implemented before WHO recommended them. The pandemic showed us that we needed to be united, so we invited citizens to practice physical distancing and change their habits-but to stay united. Our premise was that together we are more powerful than the disease. By caring for ourselves, we care for others.

Báscolo, E., PhD, Houghton, N., M.S., Del Riego, A., MS, Fitzgerald, J., PhD., & Jarboe, R., M.P.H. (2022). Contributions of the new framework for essential public health functions to addressing the COVID-19 pandemic. American Journal of Public Health, Suppl.Supplement 6, 112, S615-S620. doi:https://doi.org/10.2105/AJPH.2022.306750

This article uses a health stewardship perspective to Interpret the strengths of and challenges to national health authorities' capacities to respond to the COVID-19 pandemic through the renewed essential public health functions (EPHF) framework. Based on a literature review, this article argues that the institutional capacities required by countries to respond to the COVID-19 pandemic in the Americas included all 4 stages of the new EPHF policy cycle: assessment, policy development, allocation of resources, and access. While health authorities provided these key functions (e.g., data analysis, intersectoral policy dialogues, allocation of additional funds), the interventions implemented depended on each country's own institutional structures. Health authorities faced significant challenges including fragmentation and the lack of institutional and personnel capacities, thus compromising the delivery of an effective and equitable response. In addition, the response to the pandemic has been uneven because of weaknesses in central leadership and coordination capacity, the politicization of the response, and differences in the capacity to respond at subnational levels. Such challenges reflect structural weaknesses that existed before the onset of the pandemic, as well as the low prioritization of public health in agendas for health systems strengthening. A future agenda should prioritize improving structural elements while strengthening the stewardship capacities of health authorities and developing institutional structures that guarantee access to and universal coverage of health services. (Am J Public Health. 2022;112(S6): S615-S620. https://doi.org/1 0.21 05/AJPH.2022.306750)

Etienne, Carissa F,M.D., M.P.H., & Benjamin, G. C., M.D. (2022). Emergency preparedness: A shared effort. American Journal of Public Health, Suppl.Supplement 6, 112, S574-S575. Retrieved from https://www.proquest.com/scholarly-journals/emergency-preparedness-shared-effort/docview/2717341320/se-2?accountid=211160

The COVID-19 pandemic has exposed gaps and weaknesses in health care systems worldwide, but it has also highlighted countries' capacity to respond and provided valuable lessons for the future. The pandemic has highlighted the need for countries to work together on scientific evidence production and vaccine development and elucidated the commonality of pandemic-related challenges, such as personal protective equipment unavailability and supply chain disruptions. International cooperation has been key to tackling COVID-19 and continues to be a fundamental pillar of emergency preparedness and response in circumstances when synergy among countries is more important than individual efforts.In a context of cooperation, the American Public Health Association (APHA) and the Pan American Health Organization (PAHO) have collaborated for more than 100 years to promote health and address emerging public health threats. This year, APHA celebrates its 150th anniversary, and PAHO its 120th. This joint special issue produced by AJPH and the Pan American Journal of Public Health (PAJPH) commemorates the achievements of our partnership.

Table of contents. (2022). American Journal of Public Health, Suppl.Supplement 6, 112 Retrieved from https://www.proquest.com/scholarly-journals/table-contents/docview/2717341179/se-2?accountid=211160

Gamba, Magda R,N.D., M.Sc, LeBlanc, T. T., PhD., Vazquez, Damián,M.D., M.Sc, Dos Santos, E.,P., & Franco, Oscar H,M.D., PhD. (2022). Health emergency preparedness and response capacity in latin america and the caribbean. American Journal of Public Health, Suppl.Supplement 6, 112 doi:https://doi.org/10.2105/AJPH.2022.306815

Paniagua-Avila, A., Ramirez, D. E.,M.D.M.S.C.E., Barrera-Pérez, A., MD MSCE, Calgua, E.,M.D.M.S.C.E., Castro, C., Peralta-Garcia, A., . . . Puac-Polanco, V. (2022). Mental health of guatemalan health care workers during the COVID-19 pandemic: Baseline findings from the HEROES cohort study. American Journal of Public Health, Suppl.Supplement 6, 112, S602-S614. Retrieved from https://www.proquest.com/scholarly-journals/mental-health-guatemalan-care-workers-during/docview/2717341119/se-2?accountid=211160

Objectives. To assess the baseline prevalence of mental health conditions and associated exposures in a cohort of health care workers (HCWs) in Guatemala. Methods. We analyzed baseline information from the 2020 Web-based COVID-19 Health Care Workers Study (HEROES)-Guatemala. Outcomes included mental distress and depressive symptoms. Exposures included COVID-19 experiences, sociodemographic characteristics, and job characteristics. We used crude and adjusted Poisson regression models in our analyses. Results. Of the 1801 HCWs who accepted to participate, 1522 (84.5%) completed the questionnaire; 1014 (66.8%) were women. Among the participants, 59.1% (95% confidence interval CI] = 56.6, 61.5) screened positive for mental distress and 23% (95% CI = 20.9, 25.2) for moderate to severe depressive symptoms. COVID-19 experiences, sociodemographic characteristics, and job characteristics were associated with the study outcomes. Participants who were worried about COVID-19 infection were at higher risk of mental distress (relative risk RR] = 1.47; 95% CI = 1.30, 1.66) and depressive symptoms (RR = 1.51; 95% CI = 1.17, 1.96). Similarly, the youngest participants were at elevated risk of mental distress (RR = 1.80; 95% CI = 1.24, 2.63) and depressive symptoms (OR = 4.58; 95% CI 5 1.51, 13.87). Conclusions. Mental health conditions are highly prevalent among Guatemalan HCWs. (Am J Public Health. 2022;112(S6):S602-S614. https://doi.org/10.2105/AJPH.2021.306648)

Halpern, Bruno,M.D., PhD., & Ranzani, Otavio T,M.D., PhD. (2022). Lessons from the COVID-19 pandemic in latin america: Vulnerability leading to more vulnerability. American Journal of Public Health, Suppl.Supplement 6, 112, S579-S580. Retrieved from https://www.proquest.com/scholarly-journals/lessons-covid-19-pandemic-latin-america/docview/2717340685/se-2?accountid=211160

The COVID-19 pandemic struck the world in 2020 and was particularly harsh in Latin America, where a combination of social disparities and vulnerabilities led to unprecedented health and economic crises.1 One remarkable impact is the exceedingly high death toll in the region, especially given the "excess mortality rate," which is probably the measure that best reflects the total numbers of direct and indirect deaths during the COVID-19 pandemic.2,3When the pandemic hit Latin America, there was a misconception that its effect in the region would be lighter than that in Europe, considering the younger Latin American population. However, after accounting for the population age difference, the infection fatality rates were worse in Latin America and in low- and middle-income countries compared with higher-income European nations.2,4 Although age is an objective measure, different life course stressors could mean that individuals (and populations) with the same biological age will have extremely different health risks.5,6 Vulnerable individuals in low- and middleincome countries are commonly exposed to hazardous nutritional, environmental, and occupational factors and suffer from social marginalization, structural racism, and poverty. Therefore, comparing countries with large inequities with those with much less inequity based solely on age addresses the life course history and risks of populations facing COVID-19 only superficially. The implementation of social protection systems is a way to tackle vulnerabilities in the region. A governmental commitment to fiscally support such efforts and actively work with vulnerable populations to solve constraints and disparities is critical for Latin American states to adequately respond to future health crises.

Cuadrado, Cristóbal, MD,M.P.H., PhD., Vidal, F., M.Sc, Pacheco, Jorge,M.D., M.Sc, & Flores-Alvarado, S. (2022). Cancer care access in chile's vulnerable populations during the COVID-19 pandemic. American Journal of Public Health, Suppl.Supplement 6, 112, S591-S601. doi:https://doi.org/10.2105/AJPH.2021.306587

Objectives. To examine the COVID-19 pandemic's impact on cancer care access in Chile, analyzing differential effects by insurance type, gender, and age. Methods. We conducted a quasi-experimental study using interrupted time series analysis. We used multiple data sources for a broad evaluation of cancer-related health care utilization from January 2017 to December 2020. We fit negative binomial models by population groups for a range of services and diagnoses. Results. A sharp drop in oncology health care utilization in March was followed by a slow, incomplete recovery over 2020. Cumulative cancer-related services, diagnostic confirmations, and sick leaves were reduced by one third in 2020; the decrease was more pronounced among women and the publicly insured. Early diagnosis was missed in 5132 persons with 4 common cancers. Conclusions. The pandemic stressed the Chilean health system, decreasing access to essential services, with a profound impact on cancer care. Oncology service reductions preceded large-scale lockdowns and supply-side disruptions. Importantly, not all population groups were equally affected, with patterns suggesting that gender and socioeconomic inequalities were exacerbated. (Am J Public Health. 2022;112(S6):S591 -S601. https://doi.org/10.2105/AJPH.2021.306587)

Saisó, S. G., MSc, Marti, M. C., M.S., Medina, F. M., M.Sc, Pascha, V. M., PhD., Nelson, J., M.P.H., Tejerina, L., M.S., . . . D'Agostino, M., MS. (2022). Digital transformation for more equitable and sustainable public health in the age of digital interdependence. American Journal of Public Health, Suppl.Supplement 6, 112, S621-S624. doi:https://doi.org/10.2105/AJPH.2022.306749

This article describes 8 guiding principles for the digital transformation of the health sector and identifies their relationship with the COVID-19 pandemic, as well as highlights their importance to countries undergoing digital transformation processes. In the Region of the Americas, among other gaps, 30% of people do not have access to the Internet, which is why it is mandatory to develop policies and actions to deliver public health interventions equitably and sustainably to ensure that no one is left behind. The 8 principles focus on the 4 areas of a sustainable health system-human, social, economic, and environmental-and highlight the broader possibilities for using digital technology to have an impact on the sustainability of health systems.

Perceived eff ects of the COVID-19 pandemic on female genital mutilation and child and other forced marriages. (2022). American Journal of Public Health, 112(8), 1080. doi:https://doi.org/10.2105/AJPH.2022.306955

Wolitz, Rebecca E,J.D., PhD., Kesselheim, Aaron S, MD,J.D., M.P.H., & Darrow, Jonathan J, SJD, LLM,J.D., M.B.A. (2022). Government patent use to promote public health in the united states: Overcoming nonpatent exclusivities. American Journal of Public Health, 112(8), 1110-1114. Retrieved from https://www.proquest.com/scholarly-journals/government-patent-use-promote-public-health/docview/2695095038/se-2?accountid=211160

The costs to public health that patented prescription drugs present are widely discussed. Patents, by design, facilitate high prices as a reward to inventors of novel products by providing a temporary right to prevent other manufacturers from copying the product. For new drugs, taxpayers or patients ultimately underwrite this reward either directly or through higher insurance costs, sometimes preventing or hindering access to life-preserving medications. Patents, however, are not the sole legal barrier to accessing these drugs in the United States. New medications are often additionally protected by nonpatent exclusivities under other statutes, such as the Hatch-Waxman Act (1984, Drug Price Competition and Patent Term Restoration Act, Pub L No. 98417). Although a statutory regime governs remedies for government use of patented medications without a patent holder's authority, the extent to which US law allows the government to deal with nonpatent exclusivities is unclear. Given that access to high-value medications is a matter of public health importance, we analyze four potential pathways that could permit government patent use for new drugs in the service of public health even before nonpatent exclusivities expire. We argue that of these options, legislative reform is arguably the most desirable long-term solution. Yet, although each of these pathways is available to meet public health needs, each involves a largely reactive intervention and confronts challenges. For this reason, it would also be beneficial to have a greater emphasis on innovation policy levers through which the government could retain greater control over resulting products' accessibility or preempt concerns about exclusivities altogether.

Alexander, G. C., Mix, L. A., M.L.A., Choudhury, S., M.S.E., Taketa, R., M.L.I.S., Tomori, C., PhD., Mooghali, Maryam,M.D., M.Sc, . . . Tasker, K., M.L.I.S. (2022). The opioid industry documents archive: A living digital repository. American Journal of Public Health, 112(8), 1126-1129. Retrieved from https://www.proquest.com/scholarly-journals/opioid-industry-documents-archive-living-digital/docview/2695094976/se-2?accountid=211160

After 20 years and more than one million deaths, the overdose epidemic continues to take a major toll on communities across the United States.1 Although many drugs are implicated in the crisis, opioids have played a central role, and nearly half of opioid-related deaths between 1999 and 2019 involved prescription opioids. A number of factors have contributed to the opioid epidemic, including aggressive marketing of pharmaceutical opioids, misleading claims about their potential to cause physical dependence or opioid use disorder, and lax monitoring and control of pharmaceutical distribution and dispensing by wholesalers and pharmacies.The magnitude of harms, as well as the role of defendants in causing them, has generated thousands of lawsuits against manufacturers, distributors, pharmacies, and others. The lawsuits argue that pharmaceutical manufacturers engaged in deceptive marketing while distributors and pharmacies failed to identify or stop suspicious shipments of controlled substances through the pharmaceutical supply chain, drivingthe opioid crisis.2 The evidence uncovered in these lawsuits has revealed startling shortcomings in how prescription opioids have been marketed, promoted, and managed throughout the pharmaceutical supply chain.Following the precedent of state and federal litigation against the tobacco industry in the 1990s,3 recent and proposed settlements against defendants in opioid litigation, including Insys, Mallinckrodt, McKinsey, and Purdue, have included requirements that documents produced during legal discovery be made public.4To make such documents public requires a system to ingest, process, curate, and host the documents to facilitate their use and impact. We report on an undertaking by the University of California, San Francisco (UCSF) and Johns Hopkins University to consolidate these materials into a free, accessible Opioid Industry Documents Archive (OIDA). Ultimately, the archive is designed to maximize the generation of fundamental new knowledge regarding the opioid overdose epidemic that can inform policies and practice changes to prevent future harms. The archive may also serve a number of additional purposes, ranging from providing the bereaved with greater accountability to supporting historical scholarship that generates fundamental new insights regarding systematic factors that have driven the opioid epidemic.

Seymour, Jane W,PhD., M.P.H., Thompson, T., PhD., Milechin, D., G.I.S.P., Wise, Lauren A,ScD., S.M., & Rudolph, Abby E,PhD., M.P.H. (2022). Potential impact of telemedicine for medication abortion policy and programming changes on abortion accessibility in the united states. American Journal of Public Health, 112(8), 1202-1211. doi:https://doi.org/10.2105/AJPH.2022.306876

Objectives. To quantify the impact of telemedicine for medication abortion (TMAB) expansion or ban removal on abortion accessibility. Methods. We included 1091 facilities from the 2018 Advancing New Standards in Reproductive Health facility database and Planned Parenthood Web site, among which 241 did not offer abortion as sites for TMAB expansion. Accessibility was defined as the proportion of reproductive-aged women living within a 30-, 60-, or 90-minute drive time from an abortion-providing facility. We calculated accessibility differences between 3 scenarios: (1) facilities offering abortion in 2018 (reference), (2) the reference scenario in addition to all facilities in states without TMAB bans (TMAB expansion), and (3) all facilities (TMAB ban removal). We also stratified by state and urban-rural status. Results. In 2018, 65%, 81%, and 89% of women lived within a 30-, 60-, or 90-minute drive time from an abortion-providing facility, respectively. Expansion and ban removal expanded abortion accessibility relative to the current accessibility scenario (range: 1.25-5.66 percentage points). Women in rural blocks experienced greater increases in accessibility than those in urban blocks. Conclusions. TMAB program and policy changes could expand abortion accessibility to an additional 3.5 million reproductive-aged women.

Midwives helping deliver reproductive care in developing countries. (2022). American Journal of Public Health, 112(8), 1080. doi:https://doi.org/10.2105/AJPH.2022.306955

Chang, A. H.,M.D.M.S. (2022). Challenging health inequities in tuberculosis elimination. American Journal of Public Health, 112(8), 1084-1085. Retrieved from https://www.proquest.com/scholarly-journals/challenging-health-inequities-tuberculosis/docview/2695094209/se-2?accountid=211160

Tuberculosis (TB) in correctional settings remains an unaddressed health disparity in the United States.1 Although inmates historically contribute only three to five percent of all TB cases reported in the United States, TB incidence in correctional settings is up to 10 times higherthan in the general US population.2,3 The contribution of incarceration to the perpetuation of structural racism and health disparities has been well described.4 "Structural racism" refers to the cumulative effect of racial injustice resulting from mutually reinforced discriminatory systems of housing, employment, education, media, health care, and criminal justice, among others.5 To confront structural racism in the prevention and control of TB, knowledge of the higher burden of TB in inmates is insufficient. It becomes a public health imperative to better understand the role of TB transmission within correctional settings to address existing health inequities. In this issue of AJPH, Stewart et al. (p. 1170) provide the first national survey of TB outbreaks in US state prisons, made possible through national surveillance reports enhanced with genomic analysis of Mycobacterium tuberculosis isolates from inmates. Genomic analysis provides information on the number of accumulated changes in the genetic code of M. tuberculosis isolates. An increase in genetic changes represents a decreasing likelihood that two reported cases of TB are linked through recent transmission.6 In the study, the authors reviewed both TB clusters (three or more TB cases that were likely attributable to recent transmission) and TB outbreaks (six or more TB cases likely attributable to recent transmission).

Stutman, D. R., M.P.H., Tergliafera, J. K., M.P.H., Black, M. E., M.P.A., Chen, A. L. T.,M.D.M.P.H., Karnes, L. L., B.S., Turner, N. A., M.P.H., . . . Thompson, J. M., M.P.H. (2022). Rapid antigen screening of students and staff for SARS-CoV-2 in rural school districts, pierce county, WA, 2020. American Journal of Public Health, 112(8), 1134-1137. doi:https://doi.org/10.2105/AJPH.2022.306875

During fall 2020 in rural Pierce County, Washington, school districts and the county health department offered weekly rapid antigen screening to students and staff. Asymptomatic screening identified 42.5% of confirmed cases from the population. Parents reported it was a positive experience for their children. The program supported decisions to return to in-person learning, but screening ended because of resource and technical limitations. When planning in-school screening, stakeholder engagement and resource sustainability are important factors to consider. (Am J Public Health. 2022;112(8):1134-1137.

Kapadia, Farzana,PhD., M.P.H. (2022). Reproductive justice matters: A public health of consequence, august 2022. American Journal of Public Health, 112(8), 1107-1109. Retrieved from https://www.proquest.com/scholarly-journals/reproductive-justice-matters-public-health/docview/2695094092/se-2?accountid=211160

At this critical moment, with the Supreme Court's ruling on Dobbs vJackson Women's Health Organization overturning 50 years of a constitutional right to abortion care, reaffirming our commitment to reproductive justice is imperative. Since Roe v. Wade was decided in 1973 and then Planned Parenthood v. Casey (505 US 833) in 1992, a long, steady, and calculated stream of attacks on women's legal right to abortion has been waged by conservative legislatures at state and federal levels, culminating in the overturning of Roe v Wade. REPRODUCTIVE HEALTH AND HEALTH CARE Unlike other high-income countries that have invested in maternal and child care as well as comprehensive reproductive and sexual health care, the US health care system has failed to provide women adequate and appropriate health care. ...]according to a recent March of Dimes survey, 34.8% (1095/3139) of counties in the United States are maternity care deserts-where timely access to quality pre- and postnatal care is unavailable or cost prohibitive (https://bit.ly/3LCbS63). In Georgia, implementation of a 22-week gestational age limit on abortion decreased access to abortion services in Georgia as well as in neighboring states.6 With the US Supreme Court's decision to strike down Roe v Wade on June 24, 2022, nine states have already banned abortion care (i.e., Alabama, Arkansas, Kentucky, Louisiana, Missouri, Oklahoma, South Dakota, Utah, and Wisconsin). (https://bit. ly/3NvNhkI).

Hollar, T. L., de Melo, Anamarie Ferreira, MPH, CPH, Maitland, K., B.S., Cuenca, S., B.A., & Chung, E., B.A. (2022). Social vulnerability and safe building recertification violations in miami, florida, 2013–2018. American Journal of Public Health, 112(8), 1217-1220. doi:https://doi.org/10.2105/AJPH.2022.306890

Objectives. To determine whether an association exists between Social Vulnerability Index (SVI) scores and 40-year recertification violation within the City of Miami, Florida. Methods. A cross-sectional, observational secondary data analysis of social and housing vulnerability, including the Centers for Disease Control and Prevention's SVI overall themes, estimated median year a housing unit was built, and 40-year recertification code violation data. We conducted the study using data sets from 2013 to 2018 at the census tract level in response to the collapse of Champlain Tower South in Surfside, Florida. Results. Every 1-unit increase in a census tract's SVI score yielded a 21-fold increase in the odds of being a census tract with high 40-year recertification violations. Census tracts within the third quartile for SVI scores had approximately 9 times the odds, and tracts within the fourth quartile had 11 times the odds of being tracts with high 40-year recertification violations. Conclusions. Findings demonstrate that inequitable conditions exist among the City of Miami's most socially vulnerable residents, through greater exposure to risky housing environments. (Am J Public Health. 2022;112(8):1217-1220. https://doi.org/10.2105/AJPH.2022.306890)

Hawkins, D., ScD. (2022). "Tell me, who's that they're letting down?": COVID-19 and the working class. American Journal of Public Health, 112(8), 1081-1083. Retrieved from https://www.proquest.com/scholarly-journals/tell-me-whos-that-theyre-letting-down-covid-19/docview/2695093581/se-2?accountid=211160

During the early weeks of the second wave of the 1918 influenza pandemic, the Courier-Citizen described the effects the pandemic had on the city of Lowell, Massachusetts, the birthplace of the US Industrial Revolution and home to a diverse and often class-conscious population of immigrant workers: Industry during the three weeks of the epidemic was badly hurt. Our munitions plants caught the tendency early in the epidemic . . . they were unable to keep anywhere near a full working crew on the job. In the cotton mills the same situation had to be contended with.1(p1). Another article described the work of Lowell nurses during the pandemic. For one nurse-Mrs. Chase-in addition to caring for sick patients, this work also involved making "daily rounds with her car delivering nourishment to the required family from the public kitchens."2(p5) As the paper noted, there was an "urgent need of every hand that can be procured to assist the labors of these sadly overworked women."2(p5). Both in terms of facing the disease's health consequences and fighting those consequences, working people were on the front lines of the 1918 influenza pandemic.

Polk, Sarah, MD,ScM., M.H.S., & Page, K. R., M.D. (2022). Improving national public health data collection as an act of antiracism. American Journal of Public Health, 112(8), 1104-1106. Retrieved from https://www.proquest.com/scholarly-journals/improving-national-public-health-data-collection/docview/2695093519/se-2?accountid=211160

Two months after COVID-19 was declared a pandemic in the United States, George Floyd was murdered. Just after the announcement of the 1 000 000000th death from COVID-19 in the United States, a gunman killed 10 Black people in a Buffalo, New York, grocery store in a racially motivated act of domestic terrorism. The murder of George Floyd, the murders in Buffalo, and the distribution of infection and death from the pandemic make manifest the toll of racism in the United States. In response, individuals and institutions have made commitments to counteract racism. It is past time to move from solidarity to action. The findings of Aliseda-Alonso et al. (presented in this issue of AJPH; p. 1161) indicate that deaths from COVID-19 far exceed 1 000 000 000, with communities of color bearing an unrecognized extra toll in addition to previously well-documented disparities. Latinos and Blacks not only have suffered a disproportionate burden of infection and mortality but also were more likely to die younger than their non-Latino White counterparts. During the first wave of the pandemic, for example, approximately one third of COVID-19 deaths among non-Whites occurred among individuals younger than 65 years, compared with only 13% among non-Latino Whites,1 and this pattern persisted through 2020.2 All-cause excess mortality that year increased for all racial and ethnic groups but was much worse among Latinos (53.6%) and non-Latino Blacks (34.6%) than among non-Latino Whites (11.9%).

Sload, J., M.P.H.I.L., Bechtolsheim, B., M.B.A., & Gifford, D.,M.D.M.P.H. (2022). Assessing the impact of vaccine lotteries on COVID-19 vaccination rates in the united states in 2021. American Journal of Public Health, 112(8), 1130-1133. doi:https://doi.org/10.2105/AJPH.2022.306863

We assessed the impact of COVID-19 vaccine lottery programs on COVID-19 vaccination coverage using Centers for Disease Control and Prevention-reported first-dose vaccination administration rates for the population aged 18 years and older for 19 states that adopted lottery-based incentive programs. We did not find evidence of increased first-dose vaccination rates following lottery announcements across participating states and, therefore, find little justification for the use of COVID-19 vaccination lotteries to increase vaccination rates.

Aliseda-Alonso, A., de Lis, Sara Bertrán, PhD, Lee, A., Pond, E., M.P.H., Blauer, B., J.D., Rutkow, Lainie, JD,PhD., M.P.H., & Nuzzo, Jennifer B,D.R.P.H., S.M. (2022). The missing COVID-19 demographic data: A statewide analysis of COVID-19–Related demographic data from local government sources and a comparison with federal public surveillance data. American Journal of Public Health, 112(8), 1161-1169. doi:https://doi.org/10.2105/AJPH.2022.306892

Objectives. To collect and standardize COVID-19 demographic data published by local public-facing Web sites and analyze how this information differs from Centers for Disease Control and Prevention (CDC) public surveillance data. Methods. We aggregated and standardized COVID-19 data on cases and deaths by age, gender, race, and ethnicity from US state and territorial governmental sources between May 24 and June 4, 2021. We describe the standardization process and compare it with the CDC's process for public surveillance data. Results. As of June 2021, the CDC's public demographic data set included 80.9% of total cases and 46.7% of total deaths reported by states, with significant variation across jurisdictions. Relative to state and territorial data sources, the CDC consistently underreports cases and deaths among African American and Hispanic or Latino individuals and overreports deaths among people older than 65 years and White individuals. Conclusions. Differences exist in amounts of data included and demographic composition between the CDC's public surveillance data and state and territory reporting, with large heterogeneity across jurisdictions. A lack of standardization and reporting mechanisms limits the production of complete realtime demographic data. (AmJ Public Health. 2022;112(8):1161-1169. https://doi.org/10.2105/ AJPH.2022.306892)