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## TABLE OF CONTENTS

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Document 1 of 28

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Document 2 of 28

# Public Health Across the Political Spectrum for All

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## ABSTRACT (ENGLISH)

Public health has been through an extraordinary period over the past two years. Between December 31,2019, and today, millions of people died, economies slowed, and unemployment reached record levels in many countries, all stemming from a pandemic that had been unknown two years ago. In the United States, COVID-19 was the third leading cause of death in 2020 and resulted in a downturn in life expectancy unprecedented since World War II.

## FULL TEXT

Public health has been through an extraordinary period over the past two years. Between December 31,2019, and today, millions of people died, economies slowed, and unemployment reached record levels in many countries, all stemming from a pandemic that had been unknown two years ago. In the United States, COVID-19 was the third leading cause of death in 2020 and resulted in a downturn in life expectancy unprecedented since World War II.

I was the executive director of the Utah Department of Health from 2005 to 2011, appointed by Governor Jon Huntsman. During mytenure, we also experienced a "pandemic" of a "novel virus," the H1N1 variant, in 2009 and 2010, which the Centers for Disease Control and Prevention estimated killed 151 700 to 575400 people worldwide. Utah was among the first states affected, but it had relatively low mortality because of a prompt and effective response (I believe we succeeded in immunizing approximately 70% of our state's population). Looking back on this time, it seems almost trivial compared with the current, protracted COVID-19 pandemic. I can assure you, though, that it was a very serious threat at the time, and tragic for those who died, many of whom were younger than those who die from the typical viral flu. But because it was relatively short-lived, we did not experience the resistance to public health efforts to combat the infection.

Now is a very different time. We have a stubborn germ that changes-"mutates"- into different variants. This has required our public health response to also adapt to these changes, which unfortunately has been interpreted by some to be "flipflopping" when they update recommended safety practices. Fortunately, we have safe and effective vaccines to prevent COVID, which has undoubtedly saved millions of lives worldwide. But it is apparent that among our fellow citizens there are serious philosophical differences, including deeply held beliefs by a minority of the population related to the role of government in regulating our lives. These views have been vigorously expressed in the media-some political, some personal-and to some extent have hindered our efforts of mitigate the consequences of this infection. Notwithstanding this facet of our society that values freedom of expression, our collective public health efforts have overall been successful: we have been able to make the vaccine available to the 85% of the population that wants its protection. Thus, the noisy political debate does not reflect this acceptance of public health policies by a significant majority of Americans.

I am a primary care physician who has had the unexpected opportunity to also work in developing public health policy and administering public health programs-at the national and state levels-for many years. As a Republican, I hold dear certain principles that include limited government in most aspects of our lives, prudence in spending taxpayers' dollars, assurance of a strong national defense, and promotion of free enterprise. I also think there is an important and essential role for government in ensuring the health and well-being of all of our citizens, and this requires providing public education about safe health practices, information about risks to our heath, and the resources to fight a pandemic-for example, support for proven efforts, such as vaccines, and personnel who are so essential at such times.

I call upon everyone to respect each other, to not demonize the detractors of public health, and-for those who are resistant to government recommendations-to recognize the benefits to all that will result from containment over time. And I call upon my colleagues in public health to demonstrate some humility, to acknowledge that broad-scale lockdowns of entire communities, school closures, and mandates have not proven as effective as hoped, and have been very costly, both economically and on our emotional health. The world's slow exit from COVID-19 will be a time for reflection and careful reconsideration ofwhat really works and what hasn't, and for learning from the many other voices that have emerged in the past five years.

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Document 3 of 28

# Food Insecurity and Delayed or Forgone Medical Care During the COVID-19 Pandemic

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## ABSTRACT (ENGLISH)

Objectives. To describe food insecurity in the United States in December 2020 and examine associations with underuse of medical care during the COVID-19 pandemic. Methods. We fielded a nationally representative Web-based survey in December 2020 (n = 8318). Multivariable logistic regression models and predicted probabilities were used to evaluate factors associated with food insecurity and compare the likelihood of delaying or forgoing medical care because of cost concerns by food security status. Results. In December 2020,18.8% of US adults surveyed reported experiencing food insecurity. Elevated odds of food insecurity were observed among non-Hispanic Black, Hispanic, and low-income respondents. Experiencing food insecurity was significantly associated with a greater likelihood of forgoing any type of medical care as a result of cost concerns. Conclusions. Food insecurity during the COVID-19 pandemic disproportionately affected non-White and low-income individuals. Experiencing food insecurity was a significant risk factor for delaying or forgoing medical care, an association that could have cumulative short- and long-term health effects. Public Health Implications. Comprehensive policies that targetthe most at-risk groups are needed to address the high rates of food insecurity in the United States and mitigate its adverse health effects. (Am J Public Health. 2022;112(5):776-785. https://doi.org/10.2105/AJPH.2022.306724)

## FULL TEXT

### Headnote

Objectives. To describe food insecurity in the United States in December 2020 and examine associations with

underuse of medical care during the COVID-19 pandemic.

Methods. We fielded a nationally representative Web-based survey in December 2020 (n = 8318). Multivariable logistic regression models and predicted probabilities were used to evaluate factors associated with food insecurity and compare the likelihood of delaying or forgoing medical care because of cost concerns by food security status.

Results. In December 2020,18.8% of US adults surveyed reported experiencing food insecurity. Elevated odds of food insecurity were observed among non-Hispanic Black, Hispanic, and low-income respondents. Experiencing food insecurity was significantly associated with a greater likelihood of forgoing any type of medical care as a result of cost concerns.

Conclusions. Food insecurity during the COVID-19 pandemic disproportionately affected non-White and low-income individuals. Experiencing food insecurity was a significant risk factor for delaying or forgoing medical care, an association that could have cumulative short- and long-term health effects.

Public Health Implications. Comprehensive policies that targetthe most at-risk groups are needed to address the high rates of food insecurity in the United States and mitigate its adverse health effects. (Am J Public Health. 2022;112(5):776-785. https://doi.org/10.2105/AJPH.2022.306724)

The COVID-19 pandemic has quickly become one of the most profound public health crises of modern times. Since the first reported COVID-19 infection in the United States in January 2020, the virus has resulted in more than 43 million infections and 700 000 deaths across the country (as of October 1,2021).1 Throughout the pandemic, burdens on the health care system caused by overcrowded emergency rooms, insufficient medical staff, and efforts to prevent COVID-19 transmission have led to delays in medical procedures and rationing of care.2

In addition to the direct impact the pandemic has had on morbidity and mortality in the United States, COVID-19 also created significant economic challenges that have threatened the health and livelihoods of people across the country. Economic shutdowns caused by COVID-19 resulted in increasing unemployment rates, from 3.6% in December 2019 (before the first case of COVID-19 was reported in the United States) to as high as 14.8% during the first wave of COVID-19 cases in April 2020.3 Early reports indicated that, by April 2020, 43% of adults in the United States had lost a job or a portion of their income because of the COVID-19 pandemic. The significant health and economic effects of the pandemic have been especially devastating for US racial and ethnic minority groups, with rates of job or income loss because of the pandemic4 and COVID-19-related hospitalizations and deaths being disproportionately higher among non-Hispanic Black and Hispanic Americans than among Whites.5

Food insecurity, defined by the US Department of Agriculture (USDA) as "limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways,"6 is strongly connected to income and disproportionately affects nonHispanic Black and Hispanic households.7-9 Food insecurity is also associated with numerous adverse health effects including a greater likelihood of chronic medical conditions,10 psychological distress,11,12 cost-related medication and health care underuse,13 and poor disease management.14,15

Despite earlier surveys suggesting a sharp rise in food insecurity in the United States during the first year of the COVID-19 pandemic,16,17 the USDA's report on household food security in the United States in 20207 showed that the overall prevalence of food insecurity duringthe pandemic had remained stable at 10.5%, unchanged from 2019. However, the report did reveal that food insecurity had increased significantly in certain household subgroups such as non-Hispanic Black households (from 19.1% in 2019 to 21.7% in 2020), and food insecurity was significantly higher in households in which a reference person identified as being nonHispanic Black or Hispanic, having a low income, or being unable to work because ofthe pandemic.

Food insecurity can directly harm health by creating nutritional deficiencies or promoting intake of cheap, heavily processed foods that have been associated with a greater likelihood of developing certain chronic diseases.10 Another pathway by which food insecurity can contribute to negative health outcomes is by forcing people to choose between buying food to eat and affording medical care.13

The relationship between food insecurity and cost-related medical care underuse has been well documented13,18 but may be especially important to examine duringthe pandemic, when insufficient medical care use might contribute to exacerbation of chronic health conditions that have been strongly associated with hospitalizations and deaths caused by COVID-19.5,19 In addition, although the longer-term health effects of food insecurity experienced duringthe pandemic may take years to observe, conceptual models and prior evidence suggest that these effects could contribute to a greater burden of chronic disease, increased stress and mental health challenges, and widening health disparities among low-income and minority households well beyond the pandemic.16,20

In this study, we sought to describe patterns of food insecurity in the United States in December 2020 and to evaluate associations between food insecurity and delaying or forgoing medical care as a result of cost concerns. Data were collected as part of the Johns Hopkins Pandemic Pulse project, in which multiple cross-sectional surveys have been conducted during the pandemic to measure inequities and health effects related to COVID-19. The December 2020 wave was the first in which food insecurity was assessed.

Previous evidence suggests there may be longer-term health and economic effects ofthe COVID-19 pandemic,21,22 and food insecurity could be a critical early indicator of populations at risk for worse health outcomes. Therefore, understanding who is at most risk of experiencing food insecurity and identifying how food insecurity is affecting use of medical care during the pandemic are important in better directing public health policies and programs. To our knowledge, this is the first study of its kind to examine the relationship between food insecurity and delaying or forgoing medical care because of cost concerns amid the COVID-19 pandemic in a large, nationally representative US sample.

## METHODS

We fielded a nationally representative Web-based survey in partnership with Dynata, a first-party data platform that maintains a panel of 62 million users. Dynata panels have been used previously to conduct state- and nationally representative surveys.23 The survey participants, who were randomly selected from a nationally representative group of adults (aged 18 years or older) living in the United States, were recruited by Dynata via e-mail. The sample was matched to the 2019 US census with respect to age, race, gender, income, and census division. The survey was fielded from December 15 to 23, 2020, and yielded 10107 responses. A total of 8481 respondents provided consent and completed the survey. Respondents were compensated by Dynata for completing the survey. We reviewed responses with incomplete or missing data for our primary indicators and excluded participants who refused to indicate whether they had lost a job or more than 50% oftheir income duringthe pandemic (n 5 128) and those who identified their gender as "other" (n = 35). Our final sample consisted of 8318 participants.

### Measures

We used the USDA's Household Food Security Module 6-item short form to assess adult food security status in the preceding 30 days. This scale derives a sum score, based on the number of affirmative responses to the 6 food security questions, that corresponds to 1 of 3 levels of food security: high or marginal (raw score = 0-1), low (raw score = 2-4), and very low (raw score 5 5-6).24 Adults with low or very low food security were classified as food insecure. Evidence suggests that Internet-based surveys can overestimate food insecurity,25 so we employed an income screen as part of our food insecurity measure. We were unable to screen based on federal poverty level; thus, consistent with methods described in prior literature,26 we classified households with incomes above $50 000 as food secure regardless of how they responded to the food security questions. This income threshold was selected because it approximates 185% of the federal poverty level for a household of 4 and has been shown in earlier literature to produce consistent, if slightly conservative, food security estimates relative to estimates that include a federal poverty level screen.26

Cost-related medical care effects were assessed by asking participants whether they had delayed any type of medical care because of cost concerns in the past month and whether they had skipped or delayed specific types of medical care (e.g., filling a medical prescription) since the beginning of the pandemic. We included covariates that might be associated with food insecurity and cost-related medical care effects such as sex, race/ethnicity, age, education, current employment status, income, number of chronic health conditions, health insurance coverage, state of residence, and loss of a job or more than 50% of one's income as a result of COVID-19.13,27'28

### Statistical Analysis

Post hoc survey weights for age and race/ethnicity by census division were generated from the 2019 US census and applied to our sample to produce nationally representative estimates. We used weighted cross tabulations and the x2 test to describe unadjusted characteristics of the survey sample overall and by food security status. We then used multivariable logistic regression to estimate associations between the covariates just mentioned and food insecurity. To examine the effect of food insecurity on delaying or forgoing medical care, we created multivariable logistic regression models adjusted for the included covariates to estimate the odds of delaying or forgoing any medical care in the preceding month and experiencing each type of cost-related medical care outcome at any point during the pandemic; in our analyses, we compared people classified as food insecure with those who were food secure.

Post-estimation margins were used to generate predicted probabilities of delaying or forgoing medical care because of cost concerns among those with food insecurity versus those who were food secure. Stata version 16.1 (StataCorp LP, College Station, TX) was used in conducting our analyses. All tests were 2-sided, and the significance level was set at a P level of less than .05.

## RESULTS

Weighted descriptive characteristics of the study sample by adult food insecurity status are shown in Table 1. Overall, we found that in December 2020 18.8% of US adults had experienced food insecurity in the preceding 30 days, with 8.7% experiencing low food security and 10.1% experiencing very low food security. Adults with food insecurity were more likely to be non-Hispanic Black or Hispanic, to be younger, to have a low income, to lack health insurance, to have 2 or more chronic medical conditions, to be working part time, to be unemployed, and to have COVID-19 job or income disruptions (all Ps <.001).

The prevalence of medical care underuse differed according to food insecurity status (Table 2). Overall, 7.4% of people reported that they had delayed or skipped some type of medical care in the past month because of cost concerns, but this percentage was substantially higher among those with low (11.6%) and very low (15.8%) food security (P< .001). Delaying dental care (18.2%) was the most prevalent of the other cost-related medical care effects experienced during the pandemic; however, skipping a prescription (8.8%), medical test (8.8%), or doctor-recommended treatment (9.9%) or follow-up (9.1%) and not seeing a doctor (9.1%) or specialist (6.1%) when a medical problem warranted it were reported as well.

The adjusted logistic regression model for food insecurity status (Table 3) identified several factors associated with greater odds of food insecurity. Respondents identifying as non-Hispanic Black (odds ratio [OR] 5 1.92; 95% confidence interval [CI] 5 1.57, 2.36; P< .001), Hispanic (OR 5 1.53; 95% CI 5 1.26,1.86; P <.001), or a member of another racial/ethnic group (OR 5 1.56; 95% CI 5 1.19, 2.05; P 5 .001) had significantly higher odds of experiencing food insecurity than non-Hispanic White respondents. The odds of experiencing food insecurity were greatest among those in the youngest age group (18-24 years; OR 5 14.12; 95% CI 5 9.70, 20.55; P <.001) and decreased for each subsequent age category.

Lower educational attainment, being unemployed or furloughed, and having lost a job or more than 50% of one's income because of COVID-19 were also associated with greater odds of experiencing food insecurity. In addition, the odds of food insecurity were greater among those with 2 or more chronic medical conditions (OR = 1.51; 95% CI 5 1.22,1.86; P <.001) and those with public health insurance (OR 5 2.76; 95% CI = 2.30, 3.31; P< .001) or no health insurance (OR 5 2.61; 95% CI 5 2.13,3.20; P <.001).

Table 4 shows adjusted odds and predictive probabilities of delaying or forgoing different types of medical care because of cost among adults experiencing food insecurity and those with food security. Experiencing food insecurity significantly increased a person's odds of having delayed any type of medical care in the past 30 days (OR 5 2.17; 95% CI 5 1.52,3.12; P <.001) because of cost concerns. Those experiencing food insecurity were also significantly more likely to have skipped or delayed medical care because of cost at any point between March and December 2020.

In addition, individuals with food insecurity had higher odds of skipping a medical prescription (OR = 2.96; 95% CI 5 2.09, 4.20; P< .001); skipping a doctor-recommended medical test (OR 5 3.28; 95% CI 5 2.39, 4.49; P< .001), treatment (OR 5 3.50; 95% CI 5 2.48, 4.94; P <.001), or follow-up (OR 5 2.27; 95% CI 5 1.69, 3.05; P <.001); having a medical problem but not going to a doctor or a clinic (OR 5 2.54; 95% CI 5 1.92, 3.36; P <.001); not going to a doctorrecommended specialist (OR 5 2.58; 95% CI 5 1.82, 3.65; P <.001); and delaying or skipping dental care (OR 5 1.81; 95% CI 5 1.49, 2.20; P <.001) or vision care (OR 5 2.47; 95% CI 5 1.92, 3.19; P< .001). Individuals experiencing food insecurity were more likely than those with food security to have forgone any type of medical care in the preceding 30 days or at any point during the pandemic. Those experiencing food insecurity were most likely to delay or skip dental care (25.6%), skip a doctor-recommended medical test (19.4%), delay or skip vision care (18.9%), or skip a doctor-recommended treatment (17.9%).

## DISCUSSION

The results of our nationally representative, cross-sectional survey show that, amid the COVID-19 pandemic in December 2020, food insecurity disproportionately affected racial/ethnic minority and low-income populations. Furthermore, we found that adults experiencing food insecurity were significantly more likely than their food-secure counterparts to delay or forgo medical care because of cost concerns. In contrast with the most recent USDA household food security report,29 according to which the prevalence of household food insecurity in 2020 was 10.5% (unchanged from 2019), we estimated that 18.8% of US adults experienced food insecurity in December 2020. This difference in estimates could be due to differing food insecurity measurement units (adult vs household food insecurity), survey methodologies (online 6-item survey vs 10 questions fielded via interviews), and time frames (experiences in the past month vs over an entire year).

Both the USDA report and our study reaffirm that food insecurity is unevenly distributed in the United States, with adults and household reference persons who identify as non-Hispanic Black or Hispanic and as having a low income being more likely to experience food insecurity. Food insecurity is closely tied to economic indicators, and previous work has shown that economic shocks can cause food insecurity to rise.30 In this study, we found that losing a job or at least 50% of one's income during the pandemic was associated with significantly greater odds of food insecurity. There is evidence that the groups with the highest odds of food insecurity in our study-namely, members of minority groups, younger people, and low-income individuals- are also most likely to lose a job or income because of COVID-19.4This suggests that the disproportionate effects of the COVID-19 pandemic on these populations could have significant economic and public health consequences.

Data from early in the pandemic suggest that approximately 2 in 5 US adults reported forgoing medical care between March and mid-July 202031; to our knowledge, however, ours is the first study to explore the association between food insecurity and underuse of medical care during the COVID-19 pandemic specifically because of cost concerns. Even after adjustment for several demographic, economic, and health-related variables, food insecurity was associated with significantly higher odds of delaying one or more forms of medical care.

The relationship between food insecurity and delaying or forgoing medical care is multilevel, with overlapping pathways that tend to be mutually reinforcing.16 The overarching driver of health consequences related to food insecurity is the significant economic constraints that underlie its presence, which can limit resources available to access nutritionally appropriate diets,10,30 contribute to stress and poor mental health,12 and force people to make difficult decisions between affording food and medical care.13 The impact of food insecurity on medical care use may have been further compounded during the COVID-19 pandemic as millions of people in the United States lost their jobs and incomes, medical systems were repeatedly strained owing to the influx of COVID-19 patients, and disruptions in the food supply chain left grocery stores bare and food assistance programs scrambling to meet rapidly growing demand.16

Unlike other reasons for delaying or forgoing medical care during the pandemic, such as deprioritizing nonessential procedures or fear of contracting COVID-19, experiencing food insecurity could lead to trade-offs that increase the risk of developing chronic diseases and result in poorer disease management well beyond the pandemic.16 Because the economic recovery from COVID-19 may take many years, the long-term health consequences of food insecurity brought on by the pandemic deserve careful consideration to avoid and mitigate distal worsening of chronic disease outcomes, particularly among socioeconomically disadvantaged populations.

Efforts to alleviate food insecurity in response to the COVID-19 pandemic must address the immediate need to provide adequate nourishment to at-risk individuals and households while also incorporating longer-term strategies that more comprehensively cope with systemic factors that limit access to basic needs such as food and contribute to health disparities among people of color and other groups that have been marginalized. In the early months of the pandemic, the Supplemental Nutrition Assistance Program (SNAP) quickly expanded its caseload by more than 6 million, and food banks scrambled to meet unprecedented demand.17

The American Rescue Plan increased federal contributions to unemployment benefits and increased access to SNAP as well as SNAP benefit amounts.32 Although these policy changes were temporary, the Thrifty Food Plan, on which SNAP benefits are based, was also recently revised by the USDA, with SNAP benefits being permanently increased by an average of 27% above prepandemic levels.33 These new higher benefit levels are an important step in addressing food insecurity, but more research is needed to understand the impact of such policies, especially in the context of rising prices and cost of living. It is critical that government and public health agencies increase opportunities for people to access food assistance and free meals, for example by continuing to support expanded access to SNAP, increasing funding for public schools and community colleges to provide free meals to families in need, and connecting farm surplus areas with low-income communities.

Ensuring access to affordable medical care and high-quality and affordable health insurance is also essential to addressing potential trade-offs between food and medical care that households experiencing food insecurity may make. Access to health insurance is a key factor in decreasing the burden of health care costs, and thus it is critical to increase access to Medicaid, particularly in states that have not yet chosen to expand Medicaid. Investigating the effects of Medicaid expansion on food insecurity and delaying or forgoing medical care because of cost concerns may be a fruitful area for future research.

A small but growing number of politicians have endorsed the idea of providing some form of guaranteed income for US families,34 which could help offset the cost of healthy food and other basic needs. Policymakers and public health advocates must also recognize that persistent disparities in food insecurity in the United States are rooted in structural racism,9 and an intensified focus is needed to more holistically address oppression and discrimination that socially and economically disadvantage people of color. Our results suggest that adequately addressing food insecurity now and investing in more comprehensive and equitable approaches to improving access to healthy, affordable food among those most at risk can have substantial benefits for public health in the pandemic and beyond, as trade-offs between food and medical needs can be avoided.

## Limitations

The limitations of this study include its cross-sectional design, which prevented us from determining causation or measuring the cumulative effects of food insecurity on cost-related medical care outcomes at different points in the pandemic. Food insecurity was measured in the past 30 days; however, measures of delaying specific types of medical care referred to any point during the pandemic, which may have overestimated the odds of the effects because they could have preceded the onset of food insecurity. Although we were able to control for many measures commonly associated with experiencing food insecurity and delaying medical care, other competing factors that could be associated with food insecurity and medical care use, such as housing stability, household size, child care, living arrangements, and other financial support, were not measured in this study.

Using online surveys to measure food insecurity also has limitations, including the tendency to overestimate food insecurity prevalence25 and differences in how younger adults may interpret and respond to food insecurity questions.35 However, the income screening approach could potentially misclassify food security status and underestimate the prevalence of food insecurity in our sample, especially among respondents living in locations with higher costs of living.

In addition, all our measures were self-reported and could be subject to recall bias and social desirability bias. The survey required a computer or smart phone, which could have excluded respondents with lower incomes or those who were less tech savvy. The survey was also conducted in English only and thus excluded nonEnglish-speaking respondents. Both latter factors could have led to underestimates of food insecurity and low representation among groups at higher risk of food insecurity.

Public Health Implications

In this study, we examined sociodemographic factors associated with food insecurity in December 2020, 9 months after the start of the COVID-19 pandemic in the United States. We also assessed the ways in which experiencing food insecurity was associated with increased odds of delaying or forgoing needed medical care during the pandemic. Understanding more about the populations most at risk for food insecurity and potential effects on health care use can assist policymakers in generating more targeted and effective solutions to reduce food insecurity and mitigate its adverse health impacts over the short and long term, especially among groups that have been marginalized. >4JPH

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CONTRIBUTORS

J. Bertoldo and J.A. Wolfson wrote the first draft of the article and conducted the data analyses. J.A. Wolfson,J. Edwards, D. Gibson, S. Agarwal, and A. Labrique drafted the survey. J. Bertoldo, J.A. Wolfson, and S. M. Sundermeir developed the research questions and hypotheses. All of the authors provided feedback on the article.

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The authors have no conflicts of interest to disclose.

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This study was approved by the institutional review board oftheJohns Hopkins Bloomberg School of Public Health. Participants provided informed consent via a question at the beginning of the survey.

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## DETAILS

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Document 4 of 28

# Perceived Message Effectiveness of the Meatless Monday Campaign: An Experiment With US Adults

Rayala, Hannah-Therese, BSPH; Rebolledo, Natalia, PhD, MSc; Hall, Marissa G, PhD; Taillie, Lindsey Smith, PhD, MPH

ProQuest document link

## ABSTRACT (ENGLISH)

Given the negative health and environmental impacts of red meat consumption, reducing red meat intake in the United States is important for both human and planetary well-being. To experimentally evaluate the impact of health-focused and environment-focused messages from the Meatless Monday campaign, we conducted an online randomized experiment among US adults aged 18 years or older (n 5 1244). Compared with control messages, health-focused and environment-focused Meatless Monday messages led to significantly higher perceived message effectiveness and increased intention to reduce meat consumption. (Am J Public Health. 2022;112(5):724-727. https://doi.org/10.2105/ AJPH.2022.306766)

## FULL TEXT

### Headnote

Given the negative health and environmental impacts of red meat consumption, reducing red meat intake in the United States is important for both human and planetary well-being. To experimentally evaluate the impact of health-focused and environment-focused messages from the Meatless Monday campaign, we conducted an online randomized experiment among US adults aged 18 years or older (n 5 1244). Compared with control messages, health-focused and environment-focused Meatless Monday messages led to significantly higher perceived message effectiveness and increased intention to reduce meat consumption. (Am J Public Health. 2022;112(5):724-727. https://doi.org/10.2105/ AJPH.2022.306766)

Excess consumption of red and processed meat is a growing problem in the United States, where the amount of meat consumed is more than three times the global average.1 Given the association between excess meat intake and negative health and environmental outcomes, decreasing meat consumption in high-income countries such as the United States is important for reducing the global burden of chronic disease and the negative environmental consequences of meat production.2 Mass media campaigns are a promising but untested population-level strategy for reducing meat intake.

### INTERVENTION

In 2003, the Johns Hopkins Bloomberg School of Public Health launched the Meatless Monday campaign with the goal of reducing meat consumption by 15% to promote human and planetary health.3 A nationally representative sample of US adults from 2019 found that 42% of respondents were aware of the Meatless Monday campaign, and 21% had participated in Meatless Monday at some point.4 The campaign strategy tested in our study consisted of graphics communicatingthe negative health and environmental impacts of meat consumption. The specific images used were selected on the basis of a combination of (1) image popularity measured by social media shares and (2) diversity of stimuli in terms of different health and environmental outcomes depicted in the messages and design styles represented (Figure A, available as a supplement to the online version of this article at http://www. ajph.org).

### TIME AND PLACE

Our randomized experiment consisted of a one-time online survey launched from September 2020 to October 2020 through CloudResearch's Prime Panels.

### PERSON

The study population consisted of 1244 US adults aged 18 years or older who could read, write, and speak English and had consumed red meat at least once per week in the past 30 days (Table A, available as a supplement to the online version of this article at http://www.ajph.org). In the overall sample, the mean age was 45 years (SE 5 0.48) and 27.6% of participants had an annual household income of less than $25 000. Most participants self-identified as White (77.9%) and non-Hispanic (89.0%). The largest proportion of participants were male (52.2%), had obtained at least a college degree (49.1%), and self-identified as Democrats (40.3%).

### PURPOSE

Although Meatless Monday is widely recognized, the campaign has not yet been evaluated for perceived message effectiveness (PME). This measure predicts behavioral change and is often used to vet campaign messages.5 In addition, it is unclear whether Meatless Monday campaign messages attract attention or lead to negative affect, cognitive elaboration, increased social interactions, and intention to reduce red meat intake. All of these constructs are on the pathway from message exposure to behavioral change according to the University of North Carolina Warnings Impact Model, which has been used to evaluate other health outcomes (e.g., sugar-sweetened beverage consumption and tobacco use).6,7 Furthermore, it is unclear whether consumers' reactions to Meatless Monday messages vary by their frequency of red meat consumption.

To address these knowledge gaps, our study sought to experimentally evaluate the impact of health-focused and environment-focused messages from the Meatless Monday campaign using constructs predictive of behavioral change through a one-time online survey in a sample of US adults. Additionally, we aimed to understand whether the frequency of red meat consumption moderated the impact of Meatless Monday campaign messages on consumers.

## IMPLEMENTATION

After eligibility screening and providing electronic informed consent, participants proceeded to the experiment survey, which used a between-subjects design. Participants were randomly assigned to one of three trial arms: (1) control messages (which pertained to credit scores), (2) health-focused Meatless Monday messages, or(3) environment-focused Meatless Monday messages; they viewed four graphics specific to the trial arm displayed in random order (Figure A). Participants then answered a series of questions about the messages they viewed regarding health concern, environmental concern, discouragement, and unpleasantness, which, taken together, constituted our primary outcome measure of PME (Table B, available as a supplement to the online version ofthis article at http://www.ajph.org). Participants were also asked questions regarding attention, negative affect, cognitive elaboration, social interactions, and intention to reduce meat consumption, which were all secondary outcome measures in this study (Table C, available as a supplement to the online version ofthis article at http://www.ajph.org).

We used unadjusted linear regression models to compare the differences in the mean value of the primary and secondary outcomes between trial arms. We also examined whether red meat consumption frequency moderated the effect of environmental and health messages on PME. We used a linear regressions model, with trial arm, the moderator, and their interaction as predictors. We probed significant interactions by calculating the marginal effect of environmental and health messages on the outcome at different levels of the moderator. Moderation analyses used a Bonferroni-corrected P value to account for multiple comparisons.

## EVALUATION

We found that compared with control messages, both health-focused and environment-focused Meatless Monday campaign messages effectively increased PME (Table 1). Additionally, both health-focused and environmentfocused messages scored significantly higher in all secondary outcome measures, including attention, negative affect, cognitive elaboration, social interactions, and intention to reduce meat consumption. Furthermore, there were no significant differences between health-focused and environmentalfocused messages for any of the outcomes. These findings show that relative to control messages, Meatless Monday messages attracted participants' attention more, increased their negative perception of meat consumption, led them to think about the health and environmental harms of consuming meat, and made participants more interested in talking about the Meatless Monday campaign in their social interactions. Given that these constructs are predictive of behavioral change, these results suggest that widespread communication campaigns such as Meatless Monday are promising public health strategies to mitigate the negative health and environmental effects of meat consumption. However, further research would benefit from testing these messages on behavioral outcomes, such as purchases and consumption of red and processed meat. Additionally, given that our sample was predominantly White, future studies should examine whether these findings hold in more diverse samples with respect to race and ethnicity.

Following our analysis of meat consumption frequency as a potential moderator of the effect of Meatless Monday messages on PME, we found that among high-frequency meat consumers (i.e., participants who reported consuming red meat once a day or more), neither the health-focused nor the environment-focused messages elicited significantly higher PME compared with the control messages (Table 2). These results appear to be driven by higher ratings of the control messages among frequent meat consumers. It is unclear what drove the higher ratings of the control messages within this group, but further investigations on attitudes and values surrounding meat consumption would be valuable in providing insight into effective message designs tailored to reach high-frequency meat consumers.

ADVERSE EFFECTS

No adverse effects were observed.

SUSTAINABILITY

By focusing only on eliminating meat one day per week, Meatless Monday provides a more feasible wayto reduce meat consumption among current meat consumers, compared with complete elimination diets as seen with vegetarianism and veganism. Although real-world evidence of the impact of the Meatless Monday campaign is nascent, many popular fast-food chains (including McDonald's, Subway, and Burger King) already offer plantbased options on their menu, and Starbucks has even launched a campaign to provide customers discounts for meatless options on Monday.8,9

PUBLIC HEALTH SIGNIFICANCE

Our results suggest that the Meatless Monday campaign's health and environmental messages are effective in increasing intention to reduce meat consumption among consumers who are exposed to them. Because previous evidence from behavioral studies has shown that intention to change is one of the strongest predictors of actual behavioral change, national distribution and promotion ofthe Meatless Monday campaign could have meaningful effects on meat consumption in the United States.6,10,11 Although this study shows promise with regard to the perceived effectiveness ofthe messages, it is important to acknowledge that campaign messages can only be effective if they are aired at sufficient weight to be noticed by the majority of the population over a sustained period.12 Overall, our results suggest that widespread implementation of similar initiatives among other popular food chains and through public policy could prove to be a promising and attainable step forward in reducing meat consumption in the United States. >4JPU

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CONTRIBUTORS

L. S. Taillie conceptualized the study. L. S. Taillie and M. G. Hallacquired funding. H.-T. Rayala analyzed the data, drafted the manuscript, and contributed to data analysis and interpretation. All authors critically reviewed and revised the manuscript.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

HUMAN PARTICIPANT PROTECTION

The institutionalreview board ofthe University of North Carolina at ChapelHillapproved all study procedures (IRB #20-2552). All participants provided their written informed consent before accessing the main study survey.

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## DETAILS

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Document 5 of 28

# Prevalence of Alzheimer's and Related Dementia Diseases and Risk Factors Among Transgender Adults, Florida, 2012–2020

Guo, Yi, PhD; Li, Qian, MS; Yang, Xi, PhD; Jaffee, Michael S, MD; Wu, Yonghui, PhD; Wang, Fei, PhD; Bian, Jiang, PhD

## ABSTRACT (ENGLISH)

Objectives. To estimate the prevalence rates of Alzheimer's disease and related dementias (ADRD) and their risk factors in the transgender population and compare the rates to those in cisgender adults. Methods. We identified 1784 transgender adults in the linked electronic health records and claims data between 2012 and 2020 from the OneFlorida Clinical Research Consortium. We calculated the prevalence of ADRD and ADRD risk factors for the transgender and matched cisgender control adults. Results. The prevalence of ADRD was higher in the transgender adults compared with the cisgender control adults. Overall, the prevalence of ADRD risk factors was significantly higher in the transgender adults than the cisgender controls for 11 out of the 13 risk factors, with the only exceptions being traumatic brain injury and visual impairment. Conclusions. Transgender adults are at significantly higher risk for ADRD than cisgender adults. Our study highlights the urgent need for more research on the unique ADRD risks among the aging transgender and larger sexual- and gender-minority populations. (Am J Public Health. 2022;112(5): 754-757. https://doi.org/10.2105/AJPH.2022.306720)

## FULL TEXT

### Headnote

Objectives. To estimate the prevalence rates of Alzheimer's disease and related dementias (ADRD) and their risk factors in the transgender population and compare the rates to those in cisgender adults.

Methods. We identified 1784 transgender adults in the linked electronic health records and claims data between 2012 and 2020 from the OneFlorida Clinical Research Consortium. We calculated the prevalence of ADRD and ADRD risk factors for the transgender and matched cisgender control adults.

Results. The prevalence of ADRD was higher in the transgender adults compared with the cisgender control adults. Overall, the prevalence of ADRD risk factors was significantly higher in the transgender adults than the cisgender controls for 11 out of the 13 risk factors, with the only exceptions being traumatic brain injury and visual impairment.

Conclusions. Transgender adults are at significantly higher risk for ADRD than cisgender adults. Our study highlights the urgent need for more research on the unique ADRD risks among the aging transgender and larger sexual- and gender-minority populations. (Am J Public Health. 2022;112(5): 754-757. https://doi.org/10.2105/AJPH.2022.306720)

Alzheimer's disease (AD) is the sixth leading cause of death in the United States.1 More than 6 million Americans live with AD and related dementias (ADRD),1 yet there exists no effective treatment of AD because of its complex pathogenesis mechanisms. Targeting relevant risk factors for early AD prevention is therefore crucial for alleviating population-level AD burden. It is suggested that addressing modifiable ADRD risk factors could prevent or delay up to 40% of all dementia cases.2

Transgender people, a subgroup of sexual and gender minorities (SGMs), are individuals who have a gender identity that differs from their sex assigned at birth. The transgender population is disproportionately exposed to health risks, many of which are related to ADRD.3 As the older transgender and SGM population is rapidly growing in the United States,4 the Alzheimer's Association has declared that ADRD is a disease of high priority in SGM, including transgender, individuals.5

In this study, using real-world data in a large clinical research network, we estimated the prevalence rates of ADRD and their risk factors in transgender adults and compared the rates with those in cisgender adults.

## METHODS

We obtained linked electronic health records and claims data between January 1,2012, and July 31,2020, from the OneFlorida clinical research network, 1 of 9 clinical research networks in the National PCORnet.6 OneFlorida contains patient data for more than 1.5 million (> 60%) Floridians. These data follow the PCOR-net common data model, which includes detailed demographics and clinical variables.

In OneFlorida, we identified transgender adults using a computable phenotyping algorithm previously developed and validated by our group.7 The algorithm determines whether an individual is transgender or not based on (1) the gender identity field in the PCORnet common data model and (2) International Classification of Diseases (ICD), Ninth Revision, Clinical Modification (ICD-9-CM; https://www.cdc.gov/nchs/icd/icd9cm. htm); ICD, Tenth Revision, Clinical Modification (ICD-10-CM; https://www.cdc.gov/ nchs/icd/icd10cm.htm); and Current Procedural Terminology codes (https://www. ama-assn.org/amaone/cpt-currentprocedural-terminology) related to transgender status (e.g., ICD-10-CM code F64 for gender-identity disorders). To avoid bias in prevalence estimation because of insufficient encounter, we included only transgender adults who had at least 1 outpatient encounter every 2 years. We used the exact matching methods to match each transgender adult with 10 men and 1 0 women based on age (within 1 year) and race (non-Hispanic White, non-Hispanic Black, non-Hispanic other, Hispanic, and unknown). The cisgender control adults were randomly selected in OneFlorida who were not transgender as determined by the phenotyping algorithm and had at least 1 outpatient encounter every 2 years.

### Risk Factors of Interest

We defined ADRD using ICD codes provided by the Centers for Medicare and Medicaid Services' (CMS's) Chronic Conditions Data Warehouse.8 We summarized the ADRD risk factors from 3 creditable sources: (1) the 2021 Alzheimer's disease facts and figures published by the Alzheimer's Association1; (2) the 2020 Lancet Commission report on dementia prevention, intervention, and care2; and (3) 2 systematic reviews identified in PubMed.9'10 For the 13 risk factors that could be identified in OneFlorida data (Table 1), we compiled diagnosis or drug (Tables A and B, available as supplements to the online version of this article at http://www.ajph.org) codes and extracted information on these factors. Consistent with Chronic Conditions Data Warehouse criteria, diagnosis of ADRD and the risk factors related to diseases was confirmed with the presence of 1 inpatient or 2 outpatient ICD codes within 1 year.8 ADRD risk factors related to medication use were identified from both prescriptions and dispensing records using the RxNorm or National Drug Code.

### Statistical Analysis

For the transgender and cisgender control adults, we calculated the prevalence rate of ADRD and each risk factor as the fraction of the population who had the risk factor, both overall and stratified by age (18-49 or $ 50 years). We used the x2 or Fisher exact test to test differences in rates. Using the Bonferroni correction, we controlled for multiple testing by considering a significance level of 0.05 m 14 (ADRD and 13 ADRD risk factors) = 0.0036. We performed all statistical analysis in SAS version 9.4 (SAS Institute, Cary, NC).

## RESULTS

We identified 1784 transgender adults in OneFlorida, among whom 452 (25.3%) were aged 50 years or older (Table 1). The average age of the transgender adults was 39.2 years. As seen in Table 1, the transgender and matched cisgender adults had comparable age and race distribution.

The prevalence of ADRD was significantly higher in the transgender adults than the cisgender controls both overall (1.7% vs 0.8%; P <.001) and in adults aged 18 to 49 years (1.1% vs 0.3%; P <.001). Among adults aged 50 years or older, the prevalence of ADRD was higher in the transgender adults (3.5%) than the cisgender controls (2.2%), although the difference was statistically nonsignificant because of insufficient statistical power (P 5 .067).

Overall, the prevalence of ADRD risk factors was significantly higher in the transgender adults than the cisgender controls for 11 out of the 13 risk factors, with the only exceptions being traumatic brain injury and visual impairment, for which the prevalence was statistically the same in the 2 groups. When we restricted age to 18 to 49 years, the transgender adults had significantly higher rates of ADRD risk factors than did the cisgender controls for 10 out of the 13 risk factors, with the only exceptions being diabetes, traumatic brain injury, and visual impairment. When we restricted age to 50 years or older, the transgender adults had significantly higher rates of ADRD risk factors than the cisgender controls for 7 out of the 13 risk factors, with the exceptions being alcohol use disorders, hearing loss, high cholesterol, obesity, traumatic brain injury, and visual impairment. For the nonsignificant risk factors, the statistical tests were likely underpowered because of small disease counts in transgender adults when we restricted age to 50 years or older.

## DISCUSSION

Using OneFlorida electronic health record data, we found that the prevalence of ADRD and most of the ADRD risk factors was significantly elevated in transgender adults compared with cisgender controls. To our knowledge, no previous studies have examined the prevalence of ADRD risk factors in the older transgender population using clinical data as most previous research on transgender individuals was surveybased. Results from our study support that ADRD is a disease of high priority in the growing population of older transgender adults.5

The observed higher ADRD risk in the transgender population was largely expected as previous studies have documented a high prevalence of adverse health outcomes in this population.11 However, we found that prevalence of ADRD and more than half of the risk factors was more than twice or even 3 times higher in the transgender adults, suggesting that ADRD could be a much more serious problem in this population and deserves more attention as the transgender population continues to grow and age.

In general, the transgender and the larger SGM populations are understudied, largely because of the scarcity of relevant data. There exists few population-based representative samples or routine surveillance efforts for SGM population health studies. Our study shows that decent-sized cohorts of transgender individuals can be identified in real-world data from large clinical research networks for ADRD research. These data contain important demographic and clinical variables that are critical for studying the complex ADRD risks and outcomes in the transgender and the larger SGM populations.

## PUBLIC HEALTH IMPLICATIONS

Transgender adults are at significantly higher risk for ADRD than are cisgender adults. Our study highlights the urgent need for more research on the unique ADRD risks among the aging transgender and larger SGM populations. _4jPU

## ABOUT THE AUTHORS

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## CONTRIBUTORS

Y. Guo and J. Bian conceptualized the study. Y. Guo, Q. Li, and Xi Yang performed the data analysis. All authors contributed to interpreting the results and drafting the article.

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The authors have no conflicts of interest to disclose.

HUMAN PARTICIPANT PROTECTION

The study was approved by the University of Florida institutional review board.

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## DETAILS

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Document 6 of 28

# Increasing Murders but Overall Lower Crime Suggests a Growing Gun Problem

Donohue, John J, PhD, JD [1] [1] Stanford Law School, Stanford, California, and the National Bureau of Economic Research, Cambridge, MA

## ABSTRACT (ENGLISH)

The article by Feinglass et al. in this issue of AJPH (p. 795) provides an interesting window on the immense human toll associated with assaultive gun violence (not even including the costs from gun suicides and accidents) by focusing on hospital visits in Cook County, Illinois, for gun assaults from 2018 to 2020. Shortcomings with the hospital data may give an exaggerated impression of the extent of the recent increase in shootings, and some discussion on how the situation in Chicago compared with that in the nation overall and other large cities may provide useful context for considering the broader homicide picture in America.

## FULL TEXT

The article by Feinglass et al. in this issue of AJPH (p. 795) provides an interesting window on the immense human toll associated with assaultive gun violence (not even including the costs from gun suicides and accidents) by focusing on hospital visits in Cook County, Illinois, for gun assaults from 2018 to 2020. Shortcomings with the hospital data may give an exaggerated impression of the extent of the recent increase in shootings, and some discussion on how the situation in Chicago compared with that in the nation overall and other large cities may provide useful context for considering the broader homicide picture in America.

### URBAN AND NATIONAL CRIME TRENDS

After the major crime increases that plagued the country during the Reagan and George H. W. Bush administrations, the national murder rate peaked at almost 10 per 100000 in 1992, decreased to 4.4 per 100 000 in 2014, and then rose to 6.5 per 100 000 in 2020 with a particularly sharp jump in the final year as the nation struggled with the coronavirus disease pandemic, the social unrest after the death of George Floyd, and a binge of gun buying.1

As in the nation as a whole, the homicide picture in 1992 was similarly bleak for its four largest cities: the murder rate in Chicago, Illinois, peaked at 33 per 100 000, and it was 31 in Los Angeles, California. New York City and Houston, Texas, had only a slightly lower rate, tied at 27.

By 2020, the picture was quite different. New York City had done the best, with a murder rate of 5.7 per 100 000, and Los Angeles was next with a rate of 8.8. Despite the sizable murder jumps of 2020, these two cities still had 79% and 72% lower homicide rates, respectively, than they did in 1992.

In contrast, the situation was much worse in 2020 for Houston, with a murder rate of 17.3 per 100 000, and Chicago now suffering with a murder rate back up to 28.8 per 100 000. Houston's rate of murder, which was identical to New York City's in 1992, is now three times higher than New York's. Chicago is even worse, with a murder rate in 2020 that is five times higher than that of New York and more than three times higher than that of Los Angeles.

Interestingly, Houston initially followed the same pattern of the sharply declining murder rates in New York and Los Angeles until about 1996, when its improvement flagged as Texas increasingly became a "gun-friendly" state even as New York City and Los Angeles continued to lower their murdertoll while tightening their regulation of firearms.

The pattern in Chicago was somewhat different. Its downward trend in murder after 1992 was far slower than in the other three cities. Chicago's murder rate bottomed out at 15.2 per 100 000 in 2014, only to nearly double by 2020.

The federal court decision that mandated the introduction of the right to carry concealed weapons in Illinois starting in 2014 likely contributed to the poor crime performance thereafter.2 Houston's benign trend in murders ended around 1996, the year that Texas adopted its right-to-carry law.

### THE LESSONS FROM THE LARGEST FOUR CITIES

Two lessons emerge. First, 2020 was a terrible year for all these cities as gun sales soared throughout the nation, but New York City and Los Angeles still had dramatically lower murder rates that year than they did in the early 1990s and dramatically fewer murders than Houston and Chicago. Superior gun regulation and less gun prevalence are almost certainly part of the explanation for why cities in California and New York have fewer homicides than cities in Illinois and Texas, but guns and gun laws alone are not the whole story; otherwise, Houston would have a higher rate of murder than Chicago.

Second, the malign influence of rightto-carry laws and other measures that loosen the restrictions on firearms is particularly worrisome because the US Supreme Court seems poised to strike down restrictions on the carrying of concealed weapons in a major Second Amendment case it heard in November 2021. The conservative justices on the Court showed little awareness that their ostensible ardor for allowing citizens to carry concealed weapons more freely would start moving New York and Los Angeles murder rates in the direction of those of Houston and Chicago.

## MURDER ROSE IN 2020 BUT NOT OTHER CRIMES

Surprisingly, as bad as the murder increase was in the last year of the Trump administration, the overall crime picture in 2020 was not as bleak. Although the national murder rate rose that year by a stunning 28.7% according to the FBI Uniform Crime Reports, violent crime rose only by 4.7%, and property crime actually decreased by 8.1%, reaching a new low.3 Strikingly, the National Crime Victimization Survey showed that violent crime for households across the United States decreased by 21.9% in 2020.

The crime pattern in Chicago is even more starkly divergent. First, Table 1 underscores that the ostensible 100% increase in hospital visits for gun assaults from 2018 to 2020 described in the abstract of Feinglass et al. substantially overstates the true increase in shootings in the city because there was only a 36% increase in murders (and a far smaller jump in aggravated assaults). Second, although it is not hard to believe that policing in Chicago has been worse than in New York and Los Angeles, one sees that, during this three-year period, overall Chicago crime was not skyrocketing: rape and robbery decreased substantially, and overall violent crime and property crime decreased in Chicago. Of course, just as the gun assault hospital visit data are flawed, one always needs to consider the accuracy of American crime data, which is notoriously less accurate than it should be.

## MORE GUNS AND LESS GUN REGULATION

What can we distill from this array of conflicting patterns in crime? When murders and shootings are rising while rape, robbery, and burglary are all falling sharply, one can rule out a general crime wave unleashed by police "pulling back" or the leniency of progressive prosecutors. The evidence that (1) murder and shootings are rising when gun sales are skyrocketing, (2) the percentage of homicides committed with a fire-arm was the highest ever in 2020,4 and (3) weakening gun laws and promoting concealed carry elevate violent crime5-8 suggests that increased gun sales and weak gun regulation are having their predictable lethal effect.

The Supreme Court should recognize this before it renders its coming Second Amendment decision.

## CORRESPONDENCE

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## CONFLICTS OF INTEREST

The author has no conflicts of interest to disclose.

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## DETAILS

| | |
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Document 7 of 28

# Pursuing an Evidence-Informed Approach to the Prevention of Gun Violence

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ProQuest document link

## ABSTRACT (ENGLISH)

The book largely focuses on solutions that can be implemented right away. [...]in line with existing data and literature on prevention of gun violence, it underscores the need for a multifaceted prevention approach. The authors then identify clear gaps in existing public health surveillance (particularly as they consider different types of gun violence), and this discussion ends with a call for a coordinated data collection effort to be expanded to include nonfatal injuries from firearms. A true preventive public health approach must consider the ways in which both indirect (e.g., witnessing gun violence) and direct (e.g., being injured with a bullet) forms of exposure to gun violence affect the health and well-being of individuals and communities.4,5 Building off of this foundation, the predominant theme woven throughout the book's subsequent chapters is the notion that multiple strategies across sectors and levels are needed to reduce the harms that stem from our national gun violence crisis.

## FULL TEXT

In an area that has historically been deeply underfunded,1 particularly in comparison with other areas related to public health, it is extraordinarily valuable to have a book available that serves as an accessible, clear, and wellresearched reference on gun violence. Gun Violence Prevention: A Public Health Approach, edited by Linda Degutis and Howard Spivak, provides us with such a resource. Here I highlight the contributions of the book and the ways in which this body of work might serve as a foundational reference for the field of gun violence prevention, both forthose pursuing research and forthose looking to communicate accurately to the public about the issue. Indeed, the latter- accurate and evidence-informed public communication-is of particular importance in an era when misinformation has emerged as a public health threat.2 Also, given that this topic has long been politicized, we need a vernacular that stakeholders invested in addressing this social crisis can readily draw on.

Gun Violence Prevention aims to serve as a reference grounded in empirical evidence, and its premise assumes-correctly-that we must learn to safely coexist with firearms in the United States given their ubiquity and wide circulation in communities across the country. (This is especially the case as the number of firearms in circulation has increased precipitously during the COVID-19 pandemic, alongside increases in gun violence.3) It is formatted as a reference book in that it does not need to be read cover to cover and includes multiple contributions from well-known scholars.

The book largely focuses on solutions that can be implemented right away. Moreover, and in line with existing data and literature on prevention of gun violence, it underscores the need for a multifaceted prevention approach. The authors draw from other public health successes to provide their readers with a clear and tangible sense of what such an approach might actually look like. At times, the book adopts an encouraging and optimistic tone that empowers its readers to be active contributors to these solutions. There is something to be said for that kind of inclusive and inviting approach, particularly in the case of an issue in which community-based advocacy and civic engagement have contributed to meaningful progress.

I appreciated that the editors included a chapter focused specifically on how to be an effective advocate.

## MULTIFACETED AND MULTISECTORAL SOLUTIONS

If advocacy is to be effective, however, a clear and evidence-informed framework for how to address and respond to gun violence in communities across the United States is needed. Of course, the very availability of reliable information serves as the foundation of such solutions. Gun Violence Prevention thus begins with a thoughtful review of existing data sources on firearm violence, including their respective strengths and weaknesses. The authors then identify clear gaps in existing public health surveillance (particularly as they consider different types of gun violence), and this discussion ends with a call for a coordinated data collection effort to be expanded to include nonfatal injuries from firearms.

This latter call is in line with recent literature discussing the different types of exposure to gun violence and their corresponding effects on short- and long-term health outcomes (particularly among children and other vulnerable subgroups).4,5 It is encouraging to observe this shift in thinking, that is, prevention of death from firearm-related injuries, although critical, is not sufficient. A true preventive public health approach must consider the ways in which both indirect (e.g., witnessing gun violence) and direct (e.g., being injured with a bullet) forms of exposure to gun violence affect the health and well-being of individuals and communities.4,5

Building off of this foundation, the predominant theme woven throughout the book's subsequent chapters is the notion that multiple strategies across sectors and levels are needed to reduce the harms that stem from our national gun violence crisis. More specifically, Degutis, Spivak, and their contributors consider the ways in which risk factors at the individual and community levels, coupled with policies at the state and federal levels, are necessary components of a comprehensive solution. As the authors discuss throughout, this involves understanding the behavioral risk factors that exacerbate firearm violence; documenting the health effects of exposure to such violence; working with stakeholders from law enforcement, the criminal justice system, education, and other sectors to identify responses; investing in comprehensive data surveillance efforts at both the local and national levels; and investing in basic community-wide infrastructure (e.g., via increased access to mental health support and improved access to and availability of safe shelters).

Importantly, the authors also recognize that one cannot talk about these types of infrastructure investments without also considering this country's history of systemic racism that has hindered access to some of these most fundamental resources. One of the most powerful chapters in the book is the contribution byJennifer Bronson on "Social Justice and Institutional Racism," which highlights the ways in which structural racism has perpetuated cycles of violence and has placed specific subgroups at heightened risk for gun violence. This understanding is critical to the pursuit of effective and equitable public health solutions.

As noted, there is also a call for the use of effective, clear, and accurate reporting of gun violence by the media. The book invites us to consider the following question: what does effective public messaging consist of, and why is attention to this so important? It is also worth observing the authors' commitment to embedding firearm safety asa part of what they consider a comprehensive solution. For example, the authors include a section devoted to "firearms as a consumer product" (including details on product oversight as well as guns and technology). It is particularly interesting to see the idea of "firearm design" embedded as one example, of several, that could be part of a realistic firearm violence prevention strategy.

CONCLUSIONS

Gun Violence Prevention highlights that-as with so many other public health problems-there is no one policy or practice that will "solve" this issue. Rather, a coordinated, well-resourced, and multifaceted response is needed. Encouragingly, with such a response, we can collectively achieve meaningful reductions in the persistence of gun violence in the United States. This resource provides thoughtful and evidence-informed guidance on how to realistically attain that goal.

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Document 8 of 28

# Inaccurate Comparison of the COVID-19 Response in the United States and Cuba/Respond

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ProQuest document link

## ABSTRACT (ENGLISH)

"1(p2191) Meanwhile, according to reports in the New York Times,2 Reuters,3 the Wall Street Journal,4 and The Guardian,5 the COVID-19 pandemic exposed the shortcomings of the Cuban health care system, with one Cuban physician telling reporters, "Simply put, I saw what I would have hoped to never see: the collapse of our health system. According to news reports, the Cuban health system began to feel high pressure, and its shortcomings were most apparent, during the summer 2021 surge in infections caused by the delta variant.1,2 As in the United States and countless other countries, the root causes of these weaknesses existed even before the strain of the pandemic brought them to light. The pandemic led to worldwide economic crises, and, paired with the ongoing US embargo, Cuba has felt the effects in a major way.3 In addition, on the basis of recent data from the Institute for Health Metrics (Table 1), it is clear that underreporting of COVID-19 deaths is an issue in both the United States and Cuba.

## FULL TEXT

In their article "Comparing the COVID-19 Responses in Cuba and the United States," Powell et al.1 lauded Cuba's aggressive, proactive, and cen-tralized approach to fighting COVID-19. They wrote that comparisons of outcomes in the two countries "signal clear failures in the United States."1(p2191)

Meanwhile, according to reports in the New York Times,2 Reuters,3 the Wall Street Journal,4 and The Guardian,5 the COVID-19 pandemic exposed the shortcomings of the Cuban health care system, with one Cuban physician telling reporters, "Simply put, I saw what I would have hoped to never see: the collapse of our health system."3 There were shortages of supplies and drugs (as also reported by the US Embassy6), forcing some patients to pay steep prices for basic drugs on the black market, as well as widespread protests. Physicians spoke up on social media against the regime's response, and some were punished for it. COVID-19 deaths were underreported.

The reports by credible media outlets stand insharpcontrasttotherosypicture ofCuba's response painted by Powell etal. By failingto even acknowledge these reports, the article leaves readers with the impression that it is not a comprehensive accounting ofthe strengths and deficiencies of each system. ÂjPU

CORRESPONDENCE

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CONFLICTS OF INTEREST

The author reports no conflicts of interest.

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## Powell et al. Respond

Mary Anne Powell, Paul C. Erwin, MD, DrPH, and Pedro Mas Bermejo, MD, PhD

### I ABOUT THE AUTHORS

Mary Anne Powell is an MPH student in the School of Public Health, University ofMinnesota,Minneapolis. Paul C. Erwin is an associate editor of AJPH and is with the School of Public Health, University of Alabama at Birmingham. Pedro Mas Bermejo is with the Kourl Tropical Medicine Institute, Havana, Cuba.

We thank David Howard for a thoughtful letter raising pertinent issues about Cuba's pandemic response. Our intention in the article was to contrast the unique strategies Cuba has employed duringthe pandemic with those of the United States. We posited that differences in outcomes can be attributed in large part to those varying strategies as well as major structural differences between the nations' health systems. As opposed to painting a rosier picture of one country versus the other, we aimed to provide a fair, balanced view based on specific strategies and objective measures as a means of assessingthe strengths and weaknesses of each country's response.

According to news reports, the Cuban health system began to feel high pressure, and its shortcomings were most apparent, during the summer 2021 surge in infections caused by the delta variant.1,2 As in the United States and countless other countries, the root causes of these weaknesses existed even before the strain of the pandemic brought them to light. The pandemic led to worldwide economic crises, and, paired with the ongoing US embargo, Cuba has felt the effects in a major way.3 In addition, on the basis of recent data from the Institute for Health Metrics (Table 1), it is clear that underreporting of COVID-19 deaths is an issue in both the United States and Cuba. It does appear, however, that the degree of underreporting is higher in Cuba.

The challenge of covering COVID-19 in a fast-moving news cycle with an ever-increasing amount of information (both peer-reviewed sources and popular news media) is enormous. Howard cited news accounts that were all published after the date our article was submitted. All but one of them were published afterthe submission of our revised article as well. Howard's inclusion ofthese articles reminds us that the rapidly changing sea of COVID-19related information demands updated searches duringthe article revision process.

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### CONTRIBUTORS

M.A. Powell drafted the letter. All of the authors participated in editing and revising the final version.

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The authors report no conflicts of interest.

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Document 9 of 28

# COVID-19 Vaccine Uptake Among Nursing Home Staff via Statewide Policy: The Mississippi Vaccinate or Test Out Policy

Syme, Maggie L, PhD, MPH; Gouskova, Natalia, PhD; Berry, Sarah D, MD, MPH

ProQuest document link

## ABSTRACT (ENGLISH)

Objectives. To examine whether COVID-19 vaccine mandates that allow a test-out exemption for nursing home staffare associated with increased staff vaccination rates in nursing homes. Methods. Using the National Healthcare Safety Network data, we conducted analyses to test trends overtime in statewide staff vaccination rates between June 1,2021, and August 29, 2021, in Mississippi, 4 adjacent states, and the United States overall. Results. COVID-19 staff vaccination rates increased slowly following Mississippi enacting a vaccinate-ortest-out policy, achieving small, but statistically greater gains than most comparator states. Yet, staff vaccination rates in Mississippi remained well below the national average and similar numerically to surrounding states without mandates. Conclusions. Mississippi's COVID-19 vaccinate-or-test policy was ineffective in meaningfully increasing staff vaccination rates. For COVID-19 nursing home mandates to be effective while still balancing the staff turnover risks, facilities might consider a more stringent or hybrid approach (e.g., test-out option not offered to new staff). Public Health Implications. Statewide COVID-19 vaccine mandates, when given a test-out option, do not appear to be an effective strategy to meaningfully increase nursing home staff COVID-19 vaccination.

## FULL TEXT

### Headnote

Objectives. To examine whether COVID-19 vaccine mandates that allow a test-out exemption for nursing home staffare associated with increased staff vaccination rates in nursing homes.

Methods. Using the National Healthcare Safety Network data, we conducted analyses to test trends overtime in statewide staff vaccination rates between June 1,2021, and August 29, 2021, in Mississippi, 4 adjacent states, and the United States overall.

Results. COVID-19 staff vaccination rates increased slowly following Mississippi enacting a vaccinate-ortest-out policy, achieving small, but statistically greater gains than most comparator states. Yet, staff vaccination rates in Mississippi remained well below the national average and similar numerically to surrounding states without mandates.

Conclusions. Mississippi's COVID-19 vaccinate-or-test policy was ineffective in meaningfully increasing staff vaccination rates. For COVID-19 nursing home mandates to be effective while still balancing the staff turnover risks, facilities might consider a more stringent or hybrid approach (e.g., test-out option not offered to new staff).

Public Health Implications. Statewide COVID-19 vaccine mandates, when given a test-out option, do not appear to be an effective strategy to meaningfully increase nursing home staff COVID-19 vaccination. (Am J Public Health. 2022;112(5):762-765. https://doi.org/10.2105/AJPH.2022.306800)

It is critical to achieve high COVID-19 vaccination rates among nursing home staff to prevent further outbreaks and deaths.1 Staff COVID-19 vaccination rates have lagged behind those of nursing home residents,2 despite robust public health initiatives. A national debate ensued over vaccine mandates as the best alternative to increase staff vaccination, including the Centers for Medicare and Medicaid Services (CMS) announcingtheir intent to mandate vaccination for all nursing home workers in August 2021, taking effect on November 5, 2021.3 Vaccine mandates are an effective public health strategy overall for increasing influenza vaccination among health care workers, including nursing home staff.4 Yet, vaccine hesitancy remains high, particularly regionally (e.g., Southern states),5 and a test-out option was considered by some as a solution.6 Of the states initially considering nursing home staff mandates, Mississippi was the first to enact a vaccine mandate policy for nursing home employees effective June 1 5, 2021,7 allowing for a test-out option (twice weekly) and medical or religious exemptions.

Our hypothesis was that nursing home facilities with a mandate policy that allowed a test-out option would experience a similar rise in staff COVID-19 vaccination rates as compared with facilities in similar states with no mandates. Results may have implications for health care organizations implementing COVID-19 staff vaccination mandates. METHODS

This was an observational study including all nursing home staff in Mississippi along with adjacent states-Alabama, Arkansas, Louisiana, and Tennessee- from June 1 to August 29,2021, with vaccination rates ascertained through the National Healthcare Safety Network.2 Because the most predictive factors of nursing home staff vaccination are community COVID-19 prevalence and political leaning, we selected adjacent states with these similar characteristics (see Table A, available as a supplement to the online version of this article at http:// www.ajph.org, for COVID-19 community case rate by state). The study period was restricted to the weeks following mandated reporting of nursing home staff vaccination to National Healthcare Safety Network and ended with the weeks coinciding with CMS announcing its plans for a nursing home mandate (August 18, 2021). There were 1210 facilities included in the state analyses (AL: n = 221; AR: n 5 217; LA: n = 267; MS: n = 197; TN: n 5 308). State COVID-19 vaccination mandate status was obtained from multiple sources, including Kaiser Family Foundation data.6 The comparator states surrounding Mississippi had no nursing home staff COVID-19 vaccination mandate, but facilities were subject to staff testing 1 or 2 times weekly depending on their nursing home resident and staff cases, per CMS policy.8

The primary outcome was staff COVID-19 vaccination rates (fully vaccinated) in all nursing home staff in Mississippi, comparator states, and the United States overall. Rates are presented weekly along with the absolute change in percentage ofvaccinated staff over the 13 weeks by state (Table 1).

We compared trajectories of vaccination rates by fitting longitudinal generalized estimating equation models to account for correlation between facility data overtime,9 model criteria being lowest quasiliklihood under the independence model criterion. Staff vaccination rates were modeled using a generalized estimating equation logistic regression model linear in time, which used the number of events divided by number of trials notation. The number of events was the number ofvaccinated employees and the number of trials was the total number of employees for a given week in a facility. Models included state (with MS as reference), linear time, and state-by-time interaction. We tested differences between trajectories of COVID-19 staff vaccination rates by comparing state-specific time slope coefficients using a 1 -degree-of-freedom contrast.

RESULTS

Staff COVID-19 vaccination rates in Mississippi increased from 43.0% before the vaccinate-or-test-out mandate to 51.3%, an absolute increase of 8.3%. Absolute increases in comparator states were 5.7% (AL), 9.7% (AR), 6.8% (LA), and 4.8% (TN). The absolute increase in the national average was 5.6% (Table 1). Arkansas achieved the highest vaccination rates across the 13 weeks (range 5 58.1%-67.8%), yet none of the states in the analysis achieved high staff vaccination rates (> 75%) according to goals and standards set by the Centers for Disease Control and Prevention and leading nursing home organizations.10 The trajectory of staff COVID-19 vaccination over 13 weeks was statistically greater in Mississippi (i.e., odds of being vaccinated increased by 3% each week) than the national trend and most comparator states (odds increased by 2% each week), except Arkansas and Louisiana, which had a similar increase in odds of being vaccinated each week as Mississippi (increased by 3%; Table 1 and Figure A, available as a supplement to the online version of this article at http:// www.ajph.org). However, the absolute rise in staff vaccination rates in Mississippi was numerically similar to all comparator states without any form of COVID-19 vaccine mandate.

## DISCUSSION

COVID-19 vaccination rates remained low among nursing home staff, with small, steady increases across the 13 weeks of analysis. While the vaccinateor-test policy implemented in Mississippi was associated with a statistically significant increase in the likelihood of staff vaccination across time as compared with most comparator states, the increase was very modest at best, with numerically similar gains observed in states without a mandate. Notably, many facilities in comparator states were likely testing staff once to twice weekly because of the high community prevalence of COVID-19 during this time period in this region, perhaps leaving Mississippi's policy with a marginal additive impact.

Was Mississippi's policy a success? Staff COVID-19 vaccination rates did increase in Mississippi, and somewhat more than other surrounding states without a mandate. The marginal gains may be attributable to providing an opt-out strategy for some nursing home staff who wished to avoid vaccination, as evidenced by the continued very low rates of staff vaccination in Mississippi following policy implementation. Mississippi, like comparator states, started out very low, and, though they increased 8.3% in 13 weeks, they remained well below industry standard10 (> 75%) after implementing a statewide nursing home staff policy. This is in contrast to influenza vaccine mandates, which have been found to increase vaccination rates to higher than 90% in health care settings.4The COVID-19 pandemic is uniquely challenging given the politicization of vaccination and continued vaccine hesitancy in the United States.5 However, it can be concluded that COVID-19 vaccination mandates with a test-out option at the state level can modestly increase vaccination behaviors in a very challenging environment (nursing homes) in a region with the lowest rates of vaccination in the United States.

Recent substantial gains2 in staff vaccination have been made following the enactment of CMS's COVID-19 vaccine regulation requiring nursing home facilities to obtain 100% staff vaccination rates, with only medical or religious exemptions. This rule was temporarily challenged in several states, though it is now legally enacted in all states and updated to accommodate those out of compliance that have improvement plans.11 This appears to be a more successful mandate option, allowing enough flexibility for facilities struggling with vaccine uptake while not providing an easier test-out option.

Study limitations included the observational nature of the data. The National Healthcare Safety Network staff vaccination data were newly required by facilities as of May-June 2021, which limited the premandate period and may have resulted in missing data because of lagged reporting. Implementation of Mississippi's policy was likely variable across facilities (e.g., time off after positive test), which may have affected its success, though we would expect similar variation in similar testing policies8 among comparator states as well. Although the analyses did not statistically account for some of the factors known to affect nursing home COVID-19 staff vaccination,12 comparator states were purposefully chosen for their similarities in political leaning and trends in community outbreaks. Other statewide vaccine campaigns not assessed may have affected staff vaccination rates, though campaigns such as lotteries have been shown to be ineffective at the state level.13 Furthermore, we did not have data on staff retention, which, given the nationwide shortage of nursing home staff, it is essential to understand the impact of vaccine mandates on staff leaving to work elsewhere.

In summary, we found a statewide policy to mandate COVID-19 vaccination among nursing home staff allowing a test-out option was able to increase staff vaccination rates very modestly, though not a clearly meaningful gain. However, more stringent mandates may meet with pushback, similar to CMS's rule that was legally challenged in 24 states. Yet, the CMS rule has shown significant gains in staff vaccination, including more flexibility for facilities working toward compliance. Also, vaccination mandates should apply to health care workers in other settings and in other low-wage jobs, thereby limiting the option for unvaccinated staff to work elsewhere. Ultimately, mandates for staff vaccination may be most effective as a piece of a more complex public health approach to effectively enhance infection control and safety in nursing homes. >4JPH

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CONTRIBUTORS

All authors have contributed substantially to the development, drafting, revision, and approval of the final version of this article. M. L. Syme and S.D. Berry principally determined the conceptualization and design, and N. Gouskova led the analysis and interpretation of the data.

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CONFLICTS OF INTEREST

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HUMAN PARTICIPANT PROTECTION

This study was exempt because of the secondary nature of the data.

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# Financial Hardships Caused by Out-of-Pocket Abortion Costs in Texas, 2018

Dickman, Samuel L, MD; White, Kari, PhD, MPH; Sierra, Gracia, PhD; Grossman, Daniel, MD

ProQuest document link

## ABSTRACT (ENGLISH)

Objectives. To identify financial hardships related to costs of obtaining abortion care in Texas, which has the highest uninsured rate in the United States and restricts insurance coverage for abortions. Methods. We surveyed patients seeking abortion at 12 Texas clinics in 2018 regarding costs and financial hardships related to abortion care. We compared mean out-of-pocket costs and the percentage reporting hardships across income and insurance categories. Results. Of 603 respondents, 42% were Latinx, 25% White, and 21% Black or African American, and most (62.0%) reported having low incomes (< 200% federal poverty level). Mean out-of-pocket costs were $634, which varied little across insurance groups. Patients with low incomes were more likely to obtain financial assistance from an abortion fund than were wealthier patients (12.3% vs 1.6%, respectively; P< .05). Financial hardships related to abortion costs were more common among uninsured (57.6%) and publicly insured (55.1 %) patients than those with private insurance (48.2%). One in 5 (19.8%) uninsured respondents delayed buying food to pay for abortion care. Conclusions. Restrictions on insurance coverage for abortions result in high out-of-pocket costs and major financial hardships for most patients with low incomes in Texas. (Am J Public Health. 2022;112(5): 758-761. https://doi.org/10.2105/AJPH.2021.306701)

## FULL TEXT

### Headnote

Objectives. To identify financial hardships related to costs of obtaining abortion care in Texas, which has the highest uninsured rate in the United States and restricts insurance coverage for abortions.

Methods. We surveyed patients seeking abortion at 12 Texas clinics in 2018 regarding costs and financial hardships related to abortion care. We compared mean out-of-pocket costs and the percentage reporting hardships across income and insurance categories.

Results. Of 603 respondents, 42% were Latinx, 25% White, and 21% Black or African American, and most (62.0%) reported having low incomes (< 200% federal poverty level). Mean out-of-pocket costs were $634, which varied little across insurance groups. Patients with low incomes were more likely to obtain financial assistance from an abortion fund than were wealthier patients (12.3% vs 1.6%, respectively; P< .05). Financial hardships related to abortion costs were more common among uninsured (57.6%) and publicly insured (55.1 %) patients than those with private insurance (48.2%). One in 5 (19.8%) uninsured respondents delayed buying food to pay for abortion care.

Conclusions. Restrictions on insurance coverage for abortions result in high out-of-pocket costs and major financial hardships for most patients with low incomes in Texas. (Am J Public Health. 2022;112(5): 758-761. https://doi.org/10.2105/AJPH.2021.306701)

Health care services are increasingly unaffordable for low- and middle-income US families because of copayments and deductibles and high uninsured rates, especially in states that have not expanded Medicaid under the Affordable Care Act.1 Although abortion access is associated with greater long-term financial stability,2 patients paying out of pocket (often in excess of $500) may experience financial hardships (e.g., delaying or being unable to pay for food, bills, or rent). People living in or near poverty, who make up the majority of those obtaining abortions,3 are especially vulnerable.

Texas has not expanded Medicaid eligibility and has the nation's highest uninsured rate.4 Like 32 other states, Texas's Medicaid program excludes abortion care except in cases of rape, incest, and life endangerment. Texas also restricts coverage for abortion care in private insurance plans. We surveyed Texas abortion patients to determine the prevalence of financial hardships related to out-of-pocket costs of obtaining care.

METHODS

We recruited patients seeking abortion care in 7 Texas cities between June and December 2018. We selected independent and Planned Parenthood-affiliated facilities that offered both medication and procedural abortions up to at least 14 weeks since patients' last menstrual period.

A study coordinator approached patients seeking abortion in facility waiting rooms. Eligibility criteria included being aged 18 years or older, being English or Spanish speaking, and having completed the preabortion ultrasound required by Texas law. Participants completed the self-administered survey on a tablet at their preabortion consultation, abortion, or follow-up visit after providing digital informed consent. Participants received a $20 gift card. The survey collected demographic information, reproductive health history, and preferences regarding abortion care, and drew from previous studies assessing patients' access to abortion care.5,6 We classified participants with incomes of less than 200% of the federal poverty level (FPL; $3463 monthly for a family of 3 in 2018 per the 2018 Department of Health and Human Services poverty guidelines) as having low incomes.

Primary outcome variables for this analysis included patients' self-reported out-of-pocket costs for abortion care, whether they received financial assistance from abortion funds (nonprofit organizations that help cover some costs), and whether they experienced financial hardships, including needing to sell valuable possessions or delaying expenses (rent, bills, food, childcare, medical care, or other expenses) to pay for abortion care. Using Stata version 16.1 (StataCorp LP, College Station, TX), we compared the mean out-of-pocket costs and the percentage reporting financial hardships across insurance types and income groups, with SEs adjusted for clustering at the clinic level.

RESULTS

A total of 603 people completed the survey; 42% were Latinx or Hispanic, 25% White, and 21% Black or African American. At 11 (of 12 total) facilities where research staff approached patients directly, the response rate was 76%. (Response rates at the final remaining clinic were not available because staff there referred interested patients to a research assistant.) About half (46%) of respondents were uninsured, and 8% were covered by public insurance (Medicaid, Tricare, VA, or Medicare). Most (62%) respondents had incomes of less than 200% of the FPL, and 40% (including 47% of those with lower incomes) had experienced a financial hardship in the preceding year. Ninety-four percent of respondents received an abortion during the first 13 weeks and 6 days since the respondent's last menstrual period, and 4% between 14 and 22 weeks.

The mean cost of abortion care was $634 and ranged from $586 for participants with public insurance to $644 for privately insured participants (Table 1). Fewer than 1 in 12 (8%) respondents received financial assistance from an abortion fund; lower-income patients were more likely than those with incomes at 200% or more of the FPL to receive such assistance (12.3% vs 1.6%; P <.01).

More than half of uninsured (57%) and publicly insured (55%) patients reported financial hardship related to the cost of their abortion, compared with 48% of privately insured respondents. Three fifths (61 %) of low-income respondents experienced financial hardship, compared with 38% of respondents with incomes at or below 200% of the FPL.

Overall, 19% of respondents sold something of value to pay for abortion care, and this was most common among low-income (24%) and uninsured (27%) respondents. One in 5 (20%) uninsured respondents and 17% of low-income respondents reported that they delayed buying food to pay for their abortion. The most common financial hardships related to out-of-pocket abortion costs were delayed bills (28%) and delayed nonmedical expenses (18%).

DISCUSSION

Patients in our study frequently reported financial hardships related to paying out-of-pocket abortion costs. More than 1 in 6 patients reported selling something of value, and 14% delayed buying groceries. Our study supports previous research from Texas,6 Arizona,5 and across the United States7 that finds substantial financial hardship related to abortion costs.

Financial hardships attributed to abortion were common regardless of insurance status. Although some states use nonfederal funds to cover abortion care in Medicaid programs, Texas-like most other states-does not, which may explain why publicly insured and uninsured patients reported similar rates of financial hardship. Publicly insured respondents' somewhat lower out-of-pocket costs ($586 vs $644 for privately insured respondents) may be attributable to clinics offering "sliding scale" financial assistance to low-income patients or to those experiencing rare exceptions (rape, incest, life endangerment) that allow public plans to cover abortion services. Privately insured respondents' relatively high rates of financial hardship because of abortion costs are likely related to a Texas law prohibiting private "marketplace" plans from covering abortion care, in addition to high deductibles, fear of unwanted disclosure, and bureaucratic barriers.

Our sobering finding that 1 in 5 uninsured women seeking abortion care delayed buying food for their family is consistent with research showing that food insecurity is associated with out-of-pocket medical expenses.8 Abortion care, because it is often uniquely excluded from insurance coverage, may be more likely to lead to food insecurity than other unexpected medical conditions. Notably, difficulty paying for food was attenuated for patients covered by Medicaid, perhaps because they were also eligible for the Supplemental Nutrition Assistance Program.

Most people living in poverty are unable to afford an unexpected $400 expense of any type,9 which is less than the typical out-of-pocket cost for abortion care in our study. Some abortion restrictions in Texas and other states, such as those requiring patients to make 2 in-person visits and allowing only physicians to provide abortion care-despite evidence that advanced practice clinicians can safely provide first-trimester abortion care10- increase costs to patients.11 Out-of-pocket costs will likely increase under Texas's recent ban on abortion after approximately 6 weeks since the last menstrual period, causing many patients to have to pay for travel, missed work, childcare, and other expenses.

The Women's Health Protection Act, introduced in both the House of Representatives and the Senate, would provide insurance coverage for abortion care to people with Medicaid and prohibit states from limiting abortion coverage in private plans. These changes, as well as allowing nonphysicians to provide abortion care and eliminating other restrictions not supported by medical evidence, would be meaningful steps toward achieving equity in access to reproductive health services.

Our study has several limitations. Our findings may not be generalizable to other states or to minors (who we excluded because of privacy concerns). We did not verify respondents' selfreported out-of-pocket payments with providers. Poverty-related stigma may have led some respondents to underreport financial hardships, leading to underestimation of abortion costrelated difficulties. We did not quantify the dollar value of items sold or expenses delayed to pay for abortion care.

## PUBLIC HEALTH IMPLICATIONS

Restrictions that limit insurance coverage for abortion care contribute to major financial hardships for patients. State and federal policymakers should reconsider insurance restrictions on abortion care, which disproportionately harm low-income families. ÂfPU

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## CONTRIBUTIONS

S.L. Dickman wrote the first draft of the article and conducted all analyses. S.L. Dickman and K. White conceptualized the study. K. White and G. Sierra cleaned and processed the survey data. K. White and D. Grossman designed the survey instrumentand collected the data. All authors edited the article.

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## CONFLICTS OF INTEREST

None of the authors have conflicts of interest regardingthis work.

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The University ofTexas at Austin institutional reviewboard approved this study.

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## DETAILS

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# Trends in Hospital Care for Intentional Assault Gunshot Wounds Among Residents of Cook County, Illinois, 2018–2020

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## ABSTRACT (ENGLISH)

Objectives. To examine gun violence with respect to hospital visits for treatment of intentional assault gunshot wounds (IGWs). Methods. IGW-coded visits among residents of Cook County, Illinois, were matched to census zip code tabulation areas (ZCTAs) to map changes in IGW visit frequencies between 2018 and 2020. Patient characteristics were compared across years, and Poisson regression models for the likelihood of an inpatient admission or in-hospital death were estimated. Results. Over the study period, Cook County residents made 7122 IGW-coded hospital visits to 89 Illinois hospitals, resulting in $342 million in charges and 24894 hospital days. The number of visits almost doubled between 2018 and 2020, from 1 553 to 3031; 6 ZCTAs had increases of more than 60 visits. Approximately one third of patients with a visit were admitted, and 6.5% died. Conclusions. Hospital statistics do not include the full toll of nonfatal gun injuries or the costs of related community-level trauma. The health care system remains crucial in implementing epidemiological approaches to violence prevention. Addressing the national spike in shootings will require large investments in community economic development and a professional public safety workforce. (Am J Public Health. 2022;112(5):795-802. https://doi.org/10.2105/AJPH.2022.306747)

## FULL TEXT

### Headnote

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The 2020 increase in gun violence in Cook County, Illinois, mirrors similar trends in many large urban areas.1 Although the per capita gun homicide rate in Chicago, Illinois, was not among the highest (and was lower than that of St. Louis, MO, or Detroit, MI), it had the largest increase in the number of gun homicides of any US city in 2020.1 Shootings have increased in suburban Cook County as well. In this study, we examined the alarming increase in gun violence in Cook County in terms of hospital visits for treatment of intentional assault gunshot wounds (IGWs).

Most studies of trends in gun violence rely on police crime records and homicide rates in particular. Gun homicides appear to account for about 20% of identified shooting victims, with a much larger number of nonfatal gun injuries.2 Because hospital emergency departments are a critical component of evolving violence prevention programs3 and are legally obligated to report gun injuries to the police, we sought to study patterns of emergency department and inpatient hospital use for IGWs.

We used administrative hospital data to study escalating gun violence in Cook County between 2018 and 2020. A number of previous studies have shown that hospital IGW data significantly underrepresent the incidence of nonfatal gunshot wounds.4,5 For example, hospital data do not include homicide victims who die before reaching the hospital or those who refuse medical treatment. Moreover, these data often suffer from inconsistent International Classification of Diseases (ICD) coding. It was nevertheless of interest to study IGW visits as part of an overview of the 2020 spike in gun violence in Chi===cago and surrounding suburban areas. METHODS

All records from emergency department visits and inpatient hospitalizations for residents with zip codes in Cook County that were coded for IGWs were obtained from the Illinois Hospital Association's Comparative Health Care and Hospital Data Reporting Services database. Cook County includes 5.27 million residents, of whom 2.74 million live in the city of Chicago. We analyzed data for all IGW-coded visits by Cook County residents at Illinois nonfederal hospitals from January 2018 to December 2020, excluding 0.5% of visits with missing zip code data. To provide a perspective on the extent to which IGWcoded hospital data reflect larger trends in crime data, we compared annual IGW hospital visits with publicly available Chicago Police Department (CPD) data on nonfatal gunshot injuries.6 Hospital administrative data included patient sex, age, Chicago versus suburban Cook County residence, insurance status, race and ethnicity, and whether the visit occurred on a weekend. We used 2019 American Community Survey zip code tabulation area (ZCTA) data to classify patients according to their area's level of poverty (< 5%, 5%-9.99%, 10%-19.99%, $ 20% of households categorized as poor). Changes between 2018 and 2020 in the number of IGW hospital visits in each ZCTA were mapped with Esri ArcGIS Desktop 10.8.1 software (Redlands, CA). Changes in IGW visit frequencies in ZCTA "hot spots" in 2020 were categorized as reductions, no changes, less than 5 additional visits, 5 to 19 additional visits, 20 to 59 additional visits, and 60 or more additional 2020 visits.

We used the x2 test to determine the significance of differences in patient characteristics by year. Poisson regression models with robust variance estimates were used to analyze the likelihood of inpatient admissions and hospital deaths after control for patient characteristics with standard errors adjusted for clustering of visits within hospitals.7 Statistical analyses were conducted with Stata version 16 (College Station, TX).

RESULTS

Over the 36-month study period, Cook County residents made 7122 IGW-coded hospital visits to 89 Illinois hospitals. Almost half (48%) ofthese institutions had 5 or fewer IGW visits, with almost 4000 visits occurring at just 3 institutions. Each year approximately 15% of IGW visits were made by patients from suburban zip codes. Figure 1 displays the monthly totals for all IGW visits as well as for inpatient admissions and deaths. Gun violence in 2018-2019 peaked in the summer months, and the number of gunshot wound visits increased from 136 in July 2018 to 337 in July 2019. In 2020 there was a similar summer spike, with 336 visits in July (directly after the lifting of the COVID-19 pandemic stay at home order). However, unlike the previous years, 2020 IGW visits then continued to increase into the fall, with a new peak of 432 in October. Total annual IGW emergency department and inpatient visits almost doubled from 1553 in 2018 to 3031 in 2020.

Figure 2 displays a map of ZCTA area changes in IGW visits between 2018 and 2020. There were 24 ZCTAs with reductions in IGW visits and 27 with no changes in visits. Although 85% of the ZCTAs with no changes had less than 5 IGW visits in each study year, one of those ZCTAs had 26 IGW visits in each year. There were 37 ZCTAs with less than 5 visits, 34 with less than 20 visits, 16 with 20 to 59 visits, and 7 with 60 or more additional visits between 2018 and 2020. Hotspots included a North and South Lawndale (Chicago) ZCTA with 115 additional 2020 visits and an Austin ZCTA with 107 additional visits. The 23 ZCTAs with more than 20 IGW visits accounted for 61.6% of all visits among county residents.

Data on the characteristics of patients with IGW visits are presented in Table 1. IGW visits increased the most among those from more affluent ZCTAs while decreasing among those from the poorest ZCTAs (from 61.8% in 2018 to 49.4% in 2020). Although statistically significant, yearly age group and race/ethnicity differences were modest. Overall, 8.8% of IGW visits occurred among patients younger than 18 years, 75.6% among non-Hispanic Black patients, and only 3.5% among non-Hispanic White patients. Medicaid coverage increased from 50.9% in 2018 to 59.7% in 2020, whereas IGW visits among uninsured patients fell from 28.9% to 23.0%. There were no significant yearly differences with respect to weekend visits (which were overrepresented at 35.5% across the study years).

More than one third of IGW visits resulted in inpatient hospitalizations. There were 6452 hospital days for IGW patients in 2018 versus 11 419 days in 2020. Combined inpatient and emergency department visits accounted for approximately $67 million in hospital charges in 2018, increasing to more than $181 million in 2020. Over the entire

36-month study period, IGW visits accounted for more than $342 million in charges and 24894 inpatient hospital days.

Table 2 presents Poisson regression results for the likelihood of inpatient admission and hospital death. Men were almost twice as likely to die in the hospital as women. Patients from higher-poverty ZCTAs had a significantly reduced likelihood of death. Uninsured patients had a 40% lower likelihood of being admitted than privately insured patients and a 44% higher likelihood of death; conversely, Medicaid patients had a higher likelihood of inpatient admission and a lower likelihood of dying in the hospital. Hispanic patients were 42% less likely to die in the hospital than non-Hispanic Black patients, but there were no other significant differences between years or by patient race/ethnicity.

The CPD reported 9584 nonfatal gunshot injuries in Chicago during the years covered by our study.6 The ratio of hospital IGW visits to CPD nonfatal gunshot victims varied from 54% in 201 8 to 96% in 201 9 and 75% in 2020. This variation resulted in IGW-coded visits among county residents increasing by 95% between 2018 and 2020, as compared with only a 42% increase in CPD-reported nonfatal victims.

## DISCUSSION

Chicago has a long history of gun violence and had experienced a previous spike in gun homicides in 2016. The underlying social conditions in poor, segregated Chicago neighborhoods, and increasingly in south suburban Cook County, reflect generations of structural racism and disinvestment. Although these long-lasting conditions are well-known underlying causes of violence, there had been a 20-year trend of declining gun violence in US cities including Chicago.8,9 Chicago gun violence had peaked in the 1990s and, following nationwide trends, declined by more than 50% by 2014, when there were 416 gun homicides. An increase in gun homicides began in 2015 and there was a sudden and sharp spike in January 2016, with 764 deaths occurring in that year. In 2016 the percentages of gun homicide victims who had at least 1 previous arrest (80%), a prior gun-related arrest (30%), and more than 10 prior arrests (40%) remained similar to previous years.10

The 2016 gun violence spike began the same month that the Laquan McDonald police shooting video was finally made public, and some attributed the spike in violence to a "Ferguson effect" in which trust in the police collapsed in some neighborhoods.11 It occurred during a state budget crisis that cut violence prevention and social service funding. That same month the CPD introduced new documentation requirements that significantly lowered investigatory street stops. The homicide "clearance rate," which reflects the number of murder arrests, declined from an average of 45% in 2013-2014 to 26% in 2016 and has remained dismal in the years since, fueling the likelihood of retaliatory killings and an unwillingness of witnesses to come forward.10 However, a University of Chicago Crime Lab study showed that there was little direct evidence supporting any particular theory regarding the cause of the 2016 spike.10 After falling in 2017-2018, gun violence reached a new high during the COVID-19 epidemic.

### Gun Violence During the COVID-19 Pandemic

The March 2020 shelter-in-place orders followed by other restrictions shut down restaurants, theaters, schools, and other public spaces, leading to large service sector job losses, social displacement, and isolation. Gun and alcohol sales spiked, as did opioid overdoses.12,13 Community violence prevention programs, which are dependent on person-to-person contact, also shut down. A national wave of gun violence ensued, with Chicago among the most affected cities.14,15 Although 1 national study revealed no evidence that the COVID-19 pandemic surge in firearm purchases was related to increased gun violence at the state level,16 that finding might not hold true specifically for the Chicago area, where household gun ownership has increased dramatically.17 In 2016, Chicago police recovered illegal guns at 6 times the rate of New York City, including a higher proportion of the most lethal, higher-caliber, largermagazine weapons.10

### Epidemiological Model of Gun Violence

Social network researchers have used crime data to study how gun violence is transmitted through interpersonal ties in social networks.18 According to one study, social contagion accounted for more than 63% of Chicago shooting episodes from 2006 to 2014, with numerous shooting "cascades" wherein individuals were shot shortly after a social network peer "infector" had been shot.19 The social contagion approach is similar to models of the spread of infectious diseases and attempts to apply a public health lens and community outreach methods to mitigate the gun violence epidemic.20 This has led to promising use of professional violence "interrupters," trusted individuals with gang and prison reentry backgrounds who are capable of reaching young potential offenders and offering opportunities for lifestyle changes.21 However, at present only a few hundred intermittently funded violence interrupters are practicing in Chicago.

## LIMITATIONS AND CONCLUSIONS

A recent study from Indianapolis, Indiana, that matched individual police gunshot injury victims to electronic health records revealed that 83% of victims were matched to clinical records within 48 hours of a shooting.5 Some of the unmatched victims may have refused medical attention; however, most of the discordant cases reflected apparent ICD coding errors. In our study, it is clear that IGW data significantly underrepresented the true incidence of nonfatal gun injuries likely to require hospital care.22 The fact that differences between emergency department visits and CPD data were especially pronounced in 2018 led to inflated hospital data estimates of percentage changes between 2018 and 2020. However, there is no reason to believe that the areas we identified as having the largest increases in IGW emergency department visits were not the same areas experiencing the largest spikes in gun violence.

Despite the undercount of nonfatal gun injuries, the findings presented here regarding the terrible costs of gun violence provide an important perspective on the cost effectiveness of future economic investments in communities with high levels of gun violence. The $342 million in hospitalization charges for IGWs during the study period is only a fraction of the total medical care costs of gun violence, which extend to lifetime care for many individuals crippled by shootings and trauma-related health conditions for entire families and communities.

While police and criminal justice system expenditures soar, dissatisfaction with the "warrior policeman" approach to gun violence has grown, with many urging new approaches to communitybased security that can solve what has been described as simultaneous overpolicing and underpolicing.23-25 For example, expensive Chicago police "shot spotter" audio sensing technology has been criticized for its ineffectiveness in achieving shooting arrests and its effect on police behavior after alerts.26 Increased patrols and frequent illegal gun arrests of citizens with no previous criminal record remain controversial, and murder investigations suffer from lack of resources, hostility related to years of racist policing, and an inability to protect witnesses.27 The nationwide increase in shootings in 2020 has cast doubt about what has been seen as increasingly effective, evidence-based violence prevention.28

Coordinating crime and clinical data on IGW victimization will require greater public health resources with respect to accurate coding to match crime incidents to all related clinical information. Errors likely work both ways, with some gunshot wound medical treatment cases not found in police records despite legal reporting requirements.29 In the context of the national spike in gun violence, the health care system remains a fertile location for violence prevention outreach. Hospital emergency departments can play an important role, for instance, by allowing interrupters to persuade victims' families and associates to not seek retaliation and providing social services to help victims and their families.3,30 Longer-term approaches will require large investments in new programs and a community-based, professional public safety workforce.

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J. Feinglass conceptualized the article and oversaw the data analysis and the writing and revising ofthe article. T. R. Patel assisted with the literature review, the data analysis, and the writing of the article. K. Rydland provided the geographic information system mapping. K. Sheehan assisted with the literature review and the writing of the article.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

HUMAN PARTICIPANT PROTECTION

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# Measure of Personal Network Size Using the Known Population Method: A Methodological Guide

Clay-Warner, Jody, PhD; Kawashima, Tenshi, MA; Edgemon, Timothy G, PhD

## ABSTRACT (ENGLISH)

The network scale-up method (NSUM) has shown promise in measuring the prevalence of hidden public health problems and at-risk populations. The technique involves asking survey respondents how many people they know with the health problem or characteristic of interest and extrapolating this information to the population level. An important component of the NSUM estimate is the size of each respondent's network, which is determined by asking respondents about the number of people they know who belong to populations of known size. There is little systematic discussion, however, to guide selection of these questions. Furthermore, many of the most commonly used known population questions are appropriate only in countries with a robust data infrastructure. Here, we draw from the NSUM literature to present a set of best practices in the selection of NSUM known population questions. Throughout, we address the unique situations that many researchers face in collecting prevalence data in the developing world, where innovative prevalence estimation techniques, such as NSUM, are most needed. (AmJ Public Health. 2022;112(5):747-753. https://doi.org/10.2105/ AJPH.2022.306731)

## FULL TEXT

### Headnote

The network scale-up method (NSUM) has shown promise in measuring the prevalence of hidden public health problems and at-risk populations. The technique involves asking survey respondents how many people they know with the health problem or characteristic of interest and extrapolating this information to the population level.

An important component of the NSUM estimate is the size of each respondent's network, which is determined by asking respondents about the number of people they know who belong to populations of known size. There is little systematic discussion, however, to guide selection of these questions. Furthermore, many of the most commonly used known population questions are appropriate only in countries with a robust data infrastructure.

Here, we draw from the NSUM literature to present a set of best practices in the selection of NSUM known population questions. Throughout, we address the unique situations that many researchers face in collecting prevalence data in the developing world, where innovative prevalence estimation techniques, such as NSUM, are most needed. (AmJ Public Health. 2022;112(5):747-753. https://doi.org/10.2105/ AJPH.2022.306731)

The network scale-up method (NSUM) is a prevalence estimation technique designed to measure the size of populations that are hidden from view. The technique was developed to measure the number of deaths caused by the 1985 Mexico City earthquake.1,2 One resident reportedly said that thousands must have perished because everyone knew at least 1 person who died.1 Intrigued by this comment, the research team devised the NSUM as a way to use respondents' knowledge about deaths among their contacts to estimate the total number of deaths caused by the earthquake. Specifically, researchers derive NSUM prevalence estimates by determining the proportion of people who have the characteristic of interest in the social network of respondents and then "scaling-up" to the population level. The NSUM approach is a useful tool for public health researchers, as it is necessary to measure the prevalence of health problems or characteristics that put people at risk to develop effective interventions. Indeed, it has been used to calculate the size of many hard-toreach populations, including men who have sex with men,3 intravenous drug users,4 and sex workers.5

A significant barrier to widespread implementation ofthe NSUM, however, is correct measurement of personal network size. Because people may be unable to report accurately the number of people they know if asked directly,6 NSUM researchers ask respondents how many people they know with characteristics whose prevalence is known (populations of known size) and infer the size of their personal network from their responses to these questions (see example in the next section). Inaccurate measurement of personal network size reduces the accuracy ofthe prevalence estimates, as network size is the denominator in the NSUM equation.7 Thus, appropriate selection ofthe known population questions that serve as the basis ofthe personal network size estimate is essential. While some research addresses specific aspects of question selection8,9 and there are examples in the applied NSUM literature of different types of known population questions,4,10-12 there is little in the way of systematic, practical guidance. The purpose of this article is to offer a set of best practices on the selection of known population questions used to determine personal network size in NSUM prevalence estimates. This provides needed information to public health researchers who may have considered using the NSUM but were unsure how to proceed. We review the NSUM literature to suggest solutions to common problems with known population questions. We also present information about known population questions and data sources from published NSUM literature in a table for easy reference (Table A, available as a supplement to the online version of this article at http://www.ajph.org). In doing so, our article also serves to introduce the NSUM to public health researchers who are unfamiliar with the method. In suggesting best practices for selecting known population questions, we highlight techniques applicable in the developing world, where indirect prevalence estimation techniques such as the NSUM are most needed.13 Increasing understanding of how to select known population questions will not only improve and increase the usage of the NSUM as a prevalence estimation technique, but it will also inform related research in the social sciences that requires estimation of personal network size.8,14,15 We begin by providing an illustration of the NSUM.

## ILLUSTRATION OF THE NETWORK SCALE-UP MODEL

To highlight the role of known population questions in NSUM prevalence estimates, we present an example of howthe NSUM would be used to produce an estimate of prescription opioid use. A researcher wanting to estimate the prevalence of prescription opioid use in a given US state would ask respondents how many state residents they know who are members of populations of known size, as well as how many state residents they know who use prescription opioids. The questions about populations of known size are used to estimate the size of the respondent's network. Surnames are a common type of known population question.10,13 For example, ifthere are 20 000 people in the state with the last name Johnson, and the respondent knows 3 of these people, then we would estimate that the respondent knows 0.00015 of the state's population (3/20 000). If the population of the state is 2 000 000, then we would conclude that the respondent knows approximately 300 people (0.00015 x 2 000 000). Because of nonrandom mixing in the population (e.g., not everyone's social network is equally represented by persons named Johnson), it is necessary to include a large number of known population questions-such as questions about different surnames, including those that vary by region or ethnicity-and average across these responses to create accurate estimates of personal network size.

The researcher then calculates the proportion of the respondent's personal network that uses prescription opioids and extrapolates this figure to the population of the state. For example, if a respondent who has an estimated network size of 300 reports knowing 4 people who use prescription opioids, then this suggests that 0.013 ofthe population (4/300) use prescription opioids. Because no individual's network is completely representative ofthe population, estimates of prescription opioid use are averaged across a large number of respondents to produce an overall prevalence rate.10

As this example illustrates, for the estimates produced by the NSUM model to be accurate, the network size must be correctly estimated. If the estimate of personal network size is erroneously large, then prevalence estimates will be much lower than they should be. Conversely, ifthe estimate of personal network size is too small, then the prevalence estimates will be inflated. As a result, questions used to calculate personal network size must be carefully chosen.

## BEST PRACTICES FOR SELECTION OF KNOWN POPULATION QUESTIONS

Best practices for selecting known population questions involve identifying appropriate data sources on populations of known size, selecting questions from these data sources that avoid recognized biases in the NSUM method, and final selection of questions after data have been collected that maximize estimation accuracy. In this section, we provide guidance for each of these phases.

### Identification of Data Sources

The first task for NSUM researchers is to identify data sources from which to select questions about populations of known size. These sources must contain accurate data about the population for which prevalence estimates are sought. The most typical data source is a nationwide census, as some form of census data is gathered in most countries on a regular basis (see Table A for examples of data sources). Probabilistic surveys associated with the census, such as the American Community Survey orthe UK Annual Population Survey, can also be useful, as these types of surveys provide more detailed information than the main census.16,17

Probabilistic surveys collected by external agencies are an alternative to governmental censuses. The Demographic and Health Survey and the Multi-Indicator Cluster Survey, in particular, are appropriate data sources in developing countries where census data are limited. The Demographic and Health Survey and the Multi-Indicator Cluster Survey include information about health behaviors, economic situations, birth rates, religious affiliation, and family structure. To date, however, there are few studies that have used data from these probabilistic surveys to aid in the estimation of hidden populations in the developing world. One notable example is a study that utilized several indicators from the Rwanda Demographic and Health Survey as known population questions, including people who smoked, people who are Muslim, and people who are widowers, to estimate the size of personal networks.13 This study highlights the unrealized potential of using data from the Demographic and Health Survey, the Multi-Indicator Cluster Survey, and similar probabilistic surveys in constructing prevalence estimations of hidden populations in the developing world.

To be useful for estimating network size, however, statistics about the known population must be available at the same geographical level (e.g., city, prefecture, region, or country) as the hidden population for which prevalence estimation is sought. To estimate the size of several hidden populations in Nebraska, for example, researchers used state-level census data on names and occupations to construct their known population questions.18 This allowed the researchers to estimate how many people each respondent knew who lived in Nebraska, which is the relevant personal network for estimating the size of hidden populations in that state.

Finding sufficient data on population characteristics at subnational geographic levels, however, can be challenging in parts of the world where data infrastructure is limited. In these cases, using a combination of data sources might be useful. For example, to obtain data about known populations in Tabriz, Iran, researchers used student registration data from the Tabriz University of Medical Sciences, car fatality data from the local health center, and marriage data from the local marriage registration offices.19 Here again, the Demographic and Health Survey and the Multi-Indicator Cluster Survey are good resources, as most data are reported at the state or province level, allowing researchers to target hidden populations within relatively narrow geographic areas.

If no appropriate secondary data sources are available, researchers may choose to collect original survey data that establish the size of the populations used to estimate personal network size. It is more feasible to carry out a survey of a smaller geographic area, making this a more viable solution in the cases in which this approach is most likely to be needed. A slightly different approach was taken by a group of researchers in Iran who administered a national-level survey specifically to determine the average network size of Iranian residents, using official data sources to benchmark the size of the known subpopulations.20 Researchers then fielded NSUM-style surveys on a variety of public health topics, using the average network size derived from the national survey in their NSUM prevalence estimation equations.21

When none of these options are feasible, researchers could consider the summation method of estimating network size, which avoids known subpopulation questions altogether.22 In this method, respondents are asked to recount the number of people they know in various life domains, such as family, work, and school. The number of individuals in each group is then summed. While this method is not without problems,23 it is a straightforward approach that could prove useful in areas with poor data infrastructure.

## Avoiding Known Biases

Once researchers have identified appropriate data sources for known population questions, they should select questions that minimize the 3 main sources of bias in NSUM prevalence estimates: transmission bias, barrier bias, and recall bias. These biases not only affect responses to questions about the population of interest (e.g., number of prescription opioid users a respondent knows), but they also affect estimates of respondents' personal network size8 (See Table A for full listing of questions used in previous NSUM studies).

Transmission bias. First, transmission bias occurs when a respondent fails to recognize that they know something about people in their social network.7 This occurs because the information is not easily observable, such as having diabetes, or is unlikely to be communicated because the condition is stigmatized, such as being HIV positive.4,24 Transmission bias would occur, for example, if there were 4 people in a respondent's social network who were HIV posirme, but the respondent was aware of only 1. Transmission bias can be reduced by asking about characteristics that are commonly communicated, such as names and occupations, or easily observed, such as physical traits. Using first names, for example, avoids transmission bias in the construction of network size estimates because a first name is the most base piece of information that one knows about those in their social network.8 Researchers further rccdT'imond selecting first names that do not typically generate nicknames, as this can introduce transmission bias.8

Awareness of some social characteristics, though, is not as straightforward. The ement to which some information is transmitted to people in one's personal network varies cross-culturally, which means that solutions to transmission bias must be sensitive to the local context. For example, while it is common in the West to talk about one's job with an acquaintance, occupational identity is less salient in non-Western contexts, making it less likely that acquaintances know one another's occupations.25,26 Similarly, it would not be appropriate in Japan to ask about certain health statuses, such as having cancer, because Japanese people rarely reveal information about their health.27

Researchers should also, avoid asking abdit non visible stigmatized activities or conditions, as people are unlikely to communicate this infermatien. What is considered stigmatising varies, through, across contexts. For example, use of tobacco is stigmatized for women in some parts of the dmedeping world, making it an inappropriate question.28 Because some natiēnal surveys from which known population questions are drawn focus on "problems," such as smoking or drug use, candidate questions often referto stigmatized populations. This is especially true ofthe known pepi ılaticns that are relatively rare, because cniditions that are more present in the population are, by definition, more normalized. Researchers should conduct focus groups on candidate questions before survey· administration to determine exactly what characteristics are stigmatized in particular cultural contexts.9,22,29

It is also possible to adjust statistically for transmission bias. Though this is not typically ömplCynd for transmission bias in known population questions, such adjustments are often used to correct for transmission bias relating to the characteristic whose prevalence is being estimated.27 This usually involves surveying people who belēng to the popularnu of interest to determine what proportion of pes-ple in their social network is aware of their membership in this population (the visibility factor) and then adjusting the prevalence estimate nomndingl/. o Applying this approach to each of the known populations could be quite laborintensive, so we recommend that researchers consult the bmader social network literature that models the effects of transmission bias on estimates of personal network size31 before concluding that statistical adjustments are necessary.

Barrier bias. i fee, burner bias refers to the physical and social barriers that prevent a respondent from knowing certain kinds of pes-pke bęc-ausę of the nonrandom mixing of people in society.7 According to the norm of homophily, people are more likely to know pes-pke who are similar to them, which may limit their access to particular segments ofthe population.32 Barrier bias can be a problem, for example, when known population questions ask about characteristics that are more remmen among people of certain income brackets, given the uneven mixing of people across socioeconomic status. Ideally, known populaton questions should ask about characteristics that are evenly distributed across the population.10 Because most personal characteristics are subject to barrier bias, researchers shd uld select a set ef known population questions that, tegether, cever the pepa 11пг1оп te ensure cerreet estimation of personal network size.33 For this reason, researchers conducting a recent prevalence study in China selected various surnames that were remmen in different areas of China sc that, in combination, the surname questions would represent all parts of the country.10 Similarly, another group of resd·.irchd·s selected a variety of first names that represented different racial and age groups.34 Others using first names stress the importance of selecting names whose popularity is consistent across recent generations.35 Here, too, cultural context is important, as different characteristics are subject to barrier bias in different places. For example, researchers did not need to acycunt for ethnic variation in surname use in their prevalence study in China because China is largely monoethnic.10 In many other countries, though, researchers using questions about surnames to measure personal network size wcu uld need to select surnames that adequately covered the country's ethnic groups.

One interesting technique to address barrier bias involves utilizing known population questions that are related to the population of interest, thus creating an estimate of a more focused personal network where barrier bias is reduced. Here, researchers seeking to measure the prevalence of heroin use established personal network size through questions about criminal victimization, such as being "beaten up, attacked, or hit" or having "their apartment, home, or garage broken into," as well as engagement in binge drinking or marijuana use.4 Because information on the size of these populations is not available in secondary data sources, these researchers collected data about the "known" populations used to estimate personal network size through the same survey that they used to collect information on the population of interest. The collection of data for the known populations through the same survey used to collect data on the population of interest can also help circumvent problems with poor data infrastructure in the developing world, but it does require strict adherence to random sampling and high response rates to ensure that data are representative. Consistent with more general best practices, one must also avoid questions about highly stigmatized activities. Thus, questions about criminal victimization are more appropriate than questions about criminal perpetration.

Recall bias. Finally, recall bias occurs when the respondent does not accurately remember the number of people they know with a certain characteristic.7 For example, recall bias occurs if the respondent is aware that there are 5 Johnsons in their social network but remembers only 3 of these individuals at the time of the survey. Psychological research has shown that high levels of cognitive load delay recall36 and increase central tendency bias, where people overestimate values lower than average and underestimate values higher than average.37 Thus, recall bias is more likely to occur when people are asked to provide a precise numerical count about a large population, as this creates substantial cognitive load.8

A prime goal in asking questions about populations of known size is to reduce the recall bias that necessarily occurs when people are simply asked, "How many people do you know?"23 If known populations are too large, however, then cognitive load remains high, increasing the risk of recall bias.22 For this reason, researchers recommend selecting questions about known populations that constitute 0.1% to 0.2% of the whole population, and should never exceed 5% of the total population.8,10

## Postsurvey Question Selection

The final step in known population question selection occurs after the survey has been administered. Atthis stage, it is important to examine the data collected from participants about the known populations and use only questions in the calculation of personal network size whose response distribution seems reasonable given the prevalence of the characteristic in the population. This step serves as a validation check, as a large number of responses that are out of step with the actual population prevalence may occur because of transmission, barrier, or recall bias that was not recognized at the time that questions were initially selected, or because of data collection errors.

Specifically, research finds that using back-estimation techniques to select final questions for inclusion in network size estimation can greatly improve the quality of these estimates. The most straightforward approach, known as the "hold-out" method, involves an iterative process of holding out 1 known population question at a time when back-estimating the other known populations and then eliminating the questions that produce estimates that deviate significantly from the true size of the known population.38 This process allows researchers to see which questions are producing unrealistic estimates. Using this method, for example, researchers in China found that including the last name "Liu" produced unreasonably large estimates of the size ofthe population ofthe other last names used as known population questions, given the actual prevalence of those names in the population.10 As a result, they dropped the name "Liu" from the list of known population questions used to estimate personal network size.9 Using this procedure, it is typical to drop questions that produce ratios of estimated to actual population size that are below 0.5 or above 2.38

An elaboration ofthis approach also uses back-estimation techniques and "holds-out" questions in an iterative fashion. Researchers implementing this technique note, however, that removing 1 variable at a time in the traditional back-estimation process and using fixed cutoffs for removal of questions, such as ratios below 0.5 or above 2, fails to recognize that questions perform differently as estimators in combination with different questions.18 They propose, instead, a recursive approach in which the variable that produces the most inaccurate estimate during each iteration is considered for removal and establishing cutoffs for removal that are based on a logarithmic function. This procedure results in cutoffs that vary depending upon the variables included in the back-estimate. This procedure allows researchers to retain a larger number of known population questions, which can improve the accuracy of network size estimation.

## CONCLUSION

For prevalence estimates produced by the NSUM to be accurate, the size of respondents' personal networks must be correctly calculated. Correct calculation of personal network size depends on careful selection of known population questions from data sources that measure the known population at the same geographic level as the level for which the hidden population estimates will be made. The selected questions must avoid transmission, barrier, and recall bias, which are known threats to NSUM estimation. Researchers should also utilize back-estimation techniques after data collection to ensure the appropriateness of the final set of known population questions. We have constructed a checklist of these best practices to complement our narrative discussion of these topics (Table B, available as a supplement to the online version of this article at http://www. ajph.org).

Our analysis of known population question techniques and distillation of the NSUM literature (Table A) also provides a foundation for research beyond traditional NSUM prevalence models. New advances in NSUM techniques, such as Bayesian estimation,9 allow for more accurate prevalence estimates, which will likely increase use of the method in public health. These new advances, however, still require accurate personal network size estimates, making it vital that researchers who employ the NSUM engage in best practices for known population question selection. Our recommendations will also be helpful to public health researchers engaged in network size estimation outside ofthe NSUM context, such as those investigating the relationship between personal network size and health outcomes.39,40 Thus, our work serves as a resource for a broad array of public health researchers. A]PU

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CONTRIBUTORS

J. Clay-Warner conceptualized and supervised the project. All authors contributed to the writing and editing.

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## DETAILS

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# The Politicization of Public Health and the Impact on Health Officials and theWorkforce: Charting a Path Forward

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## ABSTRACT (ENGLISH)

Before the COVID-19 pandemic, few Americans had a clear understanding of what public health is or what it does for society because many of its activities and protections take place behind the scenes. In the absence of a crisis, public health does not receive much attention. As it turns out, this creates ongoing challenges for public health. Over a 100-year period, public health measures have improved life expectancy by 25 years1; however, as recent public dialogue has indicated, these benefits and public health's credibility can easily be forgotten.

## FULL TEXT

Before the COVID-19 pandemic, few Americans had a clear understanding of what public health is or what it does for society because many of its activities and protections take place behind the scenes. In the absence of a crisis, public health does not receive much attention. As it turns out, this creates ongoing challenges for public health. Over a 100-year period, public health measures have improved life expectancy by 25 years1; however, as recent public dialogue has indicated, these benefits and public health's credibility can easily be forgotten.2

## THE NEW VISIBILITY OF PUBLIC HEALTH

Two years into the pandemic, nearly every American seemingly has a strong opinion about public health. Public health is now regularly discussed at dinner tables, and previously unknown agency acronyms and their public health leaders are household names. In fact, in many instances, state or local health officials have become the scapegoats for many of the COVID-19 restrictions society has experienced.3 The distaste for mask requirements and stay-at-home orders as well as other limits on individual liberty have been used as reasons to threaten health officials with violence, attack them on social media, and stage protests at their homes and workplaces. In some cases, they have also been the targets of "doxing," where their personal information is distributed so that others can join in on the harassment.

## THE REALITY OF WORKPLACE VIOLENCE

Harassment of health officials has made national headlines, particularly because it was often coupled with news of their firing or resignation. It was also newsworthy because it occurred during the longest public health emergency response the United States has seen since the 1918 influenza pandemic. Not only is this a time when public health leaders are essential to leading their agencies and their staff, but it also occurred at a point when public health is dually challenged by ongoing staff shortages and the impending retirement of a large portion of the existing workforce.4,5 One might say that losing valued experts from the field could not come at a worse time.

In their article in this issue, Ward et al. (p. 736) explore the role of harassment in health official turnover during the first 10 months of the pandemic. The authors reviewed and cataloged media reports of the harassment of US public health officials and linked these data with health official turnover records. The authors also used data collected by the National Association of County and City Health Officials in late 2020 and early 2021. Completed by local health department officials or their designee, the survey collected information about harassment targeting either the health official or the agency as well as health official turnover. These various data were merged and analyzed collectively by the authors.

Ward et al. found that approximately half ofthe local health departments reported at least one type of harassment of their health official, which was similar to the findings of their media analysis. They also found that one in three health officials who left their positions during those first 10 months ofthe pandemic (222 health officials in total) had experienced harassment. However, perhaps more important, they found that a substantial portion of health officials who experienced harassment, including personal threats, did not voluntarily leave their positions. These public health officials stayed on and endured.

News reports about the harassment and turnover of health officials bring attention to societal changes and happenings. The study by Ward et al. helps put these news reports into context and provides qualitative insights that are incredibly telling. The researchers grouped the challenges that health officials experienced into five categories: underrecognized expertise, an underresourced infrastructure, villainization, politicization, or disillusionment with their roles. Along with explanations of each of these categories, the authors discuss the overarching implications of these issues for the field and offer suggestions for ways to address these issues.

## CHARTING A PATH FORWARD

Perhaps one of the biggest take-aways from this work is that the backlash against public health and ongoing politicization of public health mean that the path forward for both public health leaders and the workforce is complex. It will require navigating widespread burnout, posttraumatic stress and other mental health issues, and disillusionment with their contributions to the greater good. Thankfully, the authors' thoughtful discussion and recommendations provide a starting place for action.

One of the authors' recommendations is to train health officials to respond to political conflict and improve colleague support networks. This suggestion aligns with recent findings from studies of current and former state health officials who reported that the skills they needed the most included navigating political processes and working with governmental leaders.6 The Association of State and Territorial Health Officials has a leadership institute that offers training for state public health leaders on howto navigate politics and work with lawmakers. A similar program could be valuable for local health officials. Recent Health Resources and Services Administration guidance for the Regional Public Health Training Center Program requires that each training region have a leadership institute, which may eventually provide similar trainings and networking among local health officials. In addition, leadership institutes should also provide trainings in health policy and advocacy, public health science, and media management. Ward et al. note that these skills may be particularly useful for countering the public health backlash to mitigation efforts of protracted emergencies.7

In the context of the public health worker disillusionment that Ward et al. identified, they recommend providing trauma-informed worker support and establishing workplace violence reporting systems and legal protections for public health. The authors poignantly remind us that "no public health employee should be made to feel unsafe or devalued in their effort to protect the health and safety of the public." Another essential component to prioritizing worker well-being and addressing burnout is ensuring long-term public health staffing and infrastructure investments. Requests for public health infrastructure funds are not new,8 and, yet, a declining infrastructure and staffing losses directly limited public health's ability to respond to the current pandemic and will do so in the future if it is not addressed.2

One upside to the pandemic is that it put a spotlight on the nation's public health needs. Unfortunately, the pandemic also more firmly placed public health leaders and public health science into political discourse. The pandemic will eventually subside, and traditional public health activities will continue to be needed. Foodborne outbreaks, multidrug-resistant tuberculosis, lead contamination, and other such "routine" public health challenges will still require the types of actions by public health officials that are today placing them in harm's way. For the sake of society at large, I hope we can find a path to ensuring the safety and stability of the public health workforce, despite the recent politicization of public health protections. >|JPH

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## DETAILS

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Document 14 of 28

# Further Improving Analysis of Date-Based COVID-19 Surveillance Data/Respond

Goldstein, Neal D, PhD MBI [1] ; Burstyn, Igor, PhD [1] [1] Drexel University Dornsife School of Public Health, Philadelphia, PA.

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## ABSTRACT (ENGLISH)

[...]the authors state "many estimations methods [for infection date] homogenize substantial heterogeneities," but they disregard this in their demonstration of recovering infection date in Figure 2: "infection dates were estimated as symptom onset dates minus a median incubation period. "1(p2129) Although this is straightforward to calculate, it ignores the "substantial heterogeneities," and leads to invalid conclusions.2 Forthose interested in obtaining infection date, we would suggest deconvolution, which has been applied in infectious disease surveillance for decades,3 and has also been implemented for estimating the reproductive number of SARS-CoV-2 during the pandemic.2,4 There is another issue with these data that must be dealt with before making any inferences about the outbreak: outcome misclassification.4,5 Such errors will primarily be underreporting (i.e., suboptimal sensitivity of the surveillance program) through asymptomatic infection orthose symptomatic and unable or unwilling to test, but there may also be issues with diagnostic accuracy, including both false positives and false negatives. Burstyn I, Goldstein ND, Gustafson P. Towards reduction in bias in epidemic curves due to outcome misclassification through Bayesian analysis of time-series of laboratory test results: case study of COVID-19 in Alberta, Canada and Philadelphia, USA. Respond Ian Hennessee, MPH, Julie A. Clennon, PhD, MSc, Lance A. Waller, PhD, MS, Uriel Kitron, PhD, MPH, and J. Michael Bryan, PhD, MPH I ABOUT THE AUTHORS Ian Hennessee is a PhD candidate with the Gangarosa Department of Environmental Health, Rollins School of Public Health, Emory University, Atlanta, GA.

## FULL TEXT

In the December 2021 issue of AJPH, Hennessee et al. reminded readers of an important limitation of COVID-19 surveillance data.1 As they noted, there are many dates that can be captured in a time series, including dates of SARS-CoV-2 infection, symptom onset, test, and report. These dates provide information useful to public health, from calculating measures of contagion to demand on the health care system. We agree with the authors that, epidemiologically, infection date is most relevant.

However, the authors do notdojustice to the complexities inherent in analyzing these data and, worse yet, may inadvertently mislead readers regarding best practices for addressing these complexities. Indeed, the authors state "many estimations methods [for infection date] homogenize substantial heterogeneities," but they disregard this in their demonstration of recovering infection date in Figure 2: "infection dates were estimated as symptom onset dates minus a median incubation period."1(p2129) Although this is straightforward to calculate, it ignores the "substantial heterogeneities," and leads to invalid conclusions.2 Forthose interested in obtaining infection date, we would suggest deconvolution, which has been applied in infectious disease surveillance for decades,3 and has also been implemented for estimating the reproductive number of SARS-CoV-2 during the pandemic.2,4

There is another issue with these data that must be dealt with before making any inferences about the outbreak: outcome misclassification.4,5 Such errors will primarily be underreporting (i.e., suboptimal sensitivity of the surveillance program) through asymptomatic infection orthose symptomatic and unable or unwilling to test, but there may also be issues with diagnostic accuracy, including both false positives and false negatives. As such, taking epidemic curves at face value is problematic.6

Methods are freely available to rigorously address both the timing of infection and flaws in the capture of cases.4 Figure 1 is our application of these methods to the Georgia Department of Public Health time series COVID-19 data used by Hennessee et al. and shows the divergence in the two approaches beyond the stochastic error of the 95% uncertainty interval, which may have implications for pandemic management.7 Methodologically rigorous adjustment for biases in the surveillance data smoothed out fluctuations and leads to a more definitive interpretation, reducing the need for qualitative judgements. Although our methods can be improved upon, we urge public health practitioners to adopt the best available methods, because both our collective credibility and, more importantly, success in combating COVID-19 rest on using tools that are state-of-the-art. ÂfPU

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Both authors drafted the letter, conducted the analysis, and interpreted the results.

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N. D. Goldstein and I. Burstyn serve as expert witnesses on COVID-19-related litigation.

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The analysis used publicly available aggregated data.

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## Hennessee et al. Respond

Ian Hennessee, MPH, Julie A. Clennon, PhD, MSc, Lance A. Waller, PhD, MS, Uriel Kitron, PhD, MPH, and J. Michael Bryan, PhD, MPH

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We welcome the comments by Goldstein and Burstyn on our recent publication, in which we discuss considerations for improving reporting and analysis of date-based COVID-19 surveillance data.1 Goldstein and Burstyn point out the complexities of estimating unknown dates and recommend relevant methods for addressing these. Although we agree that rigorous approaches are needed for inference, our discussion was primarily concerned with identifying a consistent starting point for reporting and analysis (i.e., which date to use) rather than with methods for obtaining a final product for inference. Our use of a simplified approach for estimating infection date was therefore to demonstrate the challenges in interpreting epidemic curves when dates with long reporting lags are used; it was not intended to be a methodological recommendation.

We also point out that clear, straightforward methods used to collect and report case data are essential for public understanding and trust.2,3 This is especially important in the current environment in which COVID-19 surveillance data are widely consumed, and often questioned, by the public.4,5 Interpretable approaches are also critical for policymakers and public health professionals who rely on surveillance data for decision-making and are often called upon to explain and defend them.6 Efforts to improve surveillance data should therefore be guided by interpretability and transparency in addition to scientific rigor.

Goldstein and Burstyn also discuss the potential for outcome misclassification of COVID-19 cases, and suggest methods for addressing this. Although that was notthe focus of our article, we agree that such approaches are important for estimating cases and for comparing disease burden overtime. Consistent and clear documentation in the choice of dates used by health departments would indeed benefit such analyses; again, however, we stress the importance of interpretability for how health departments report incident cases. We also support renewed calls to focus on hospitalizations for assessing COVID-19 impact trends, as is highlighted with the rapid spread of the omicron variant.7 Hospitalizations are less susceptible to case ascertainment issues and may better reflect the health burden of COVID-19 as it progresses from a pandemic to an endemic disease.

As the United States grapples with the current wave of omicron and prepares for inevitable future variants, we believe a more consistent approach to the choice of dates reported by state and local health departments could improve public comprehension, trust, and decision-making. It would also provide a more consistent starting point for data processing such as that suggested by Goldstein and Burstyn.

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The authors have no potentialconflicts of interest to declare.

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## DETAILS

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Document 15 of 28

# Public Health and Public Safety: Converging Upstream

Gourevitch, Marc, MD, MPH [1] ; Kleiman, Neil, PhD [2] ; Falco, Katy Brodsky, JD [3] [1] Department of Population Health, New York University Grossman School of Medicine, New York [2] Robert F. Wagner Graduate School of Public Service, New York University, New York [3] Criminal Justice Lab, New York University School of Law, New York

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## ABSTRACT (ENGLISH)

Rarely have both health and public safety held such high priority for policymakers throughout the United States. The COVID-19 pandemic, in underscoring profound inequities in health outcomes, has refocused attention on structural approaches to achieving more equitable distribution of social determinants of health. In parallel, a separate yet related national debate has surfaced on how to improve public safety, spurred by police use of lethal force against Black Americans and other people of color, and also by high rates of violent crime and incarceration nationwide. Despite moving on different tracks, these two sets of issues share fundamental attributes that could prove mutually reinforcing in framing forward-facing policies.

## FULL TEXT

Rarely have both health and public safety held such high priority for policymakers throughout the United States. The COVID-19 pandemic, in i inderscering profound ineqi litios in health o itcomes, has refeci ised attention on smictural approaches to achieving more equitabfó distribution of social determinants of health. In parallel, a separate yet related national debate has surfaced on howto improve pi iblic safer,', spi ured by police use of lethal force against Black Americans and other people of color, and also by high rates of violent erime and incarceratien nationwide. Despite moving on different tracks, these two sets of issues share fundamental attributes that could prove mutually reinforcing in framing forward-facing pelicies.

First, consider health. In the words of the widely cited World Health Organization definition, health signifies mēre than the absence of disease-specifically, "a state of complete physical, mental and social well-being" (https://bit.ly/3Mv7dVn). Though aspirational, such framing sends a clear message: although medical care can blunt or reverse an individual's physical and mental illness, only by adelree·sing core upstream determinants of health-from fundamental (racism, poverty) to social and envirermKmtal (peer education and housing, air pollution) causes-is progress toward im| 1 1 lth at the population fevel achievable. .erthe United States temini ies to spend more on health care, and prepertionally less on addressing 1 inderlying causes of ill health, than any other wealthy country.

Now consider public safety. Just as health signifies more than the absence of diseases public safety embodies far more than the absence of cyme- rather, a sense of physical, emotional, social, and material security that fosters stability and is aeC'Cmpanied by support from community and society when needed. Fundamentally, safety is a core human need that ocm-prise/s not only physical safety but also security in health, housing, education, and living-wage jobs.1 As with health, the implicaton of such a framing is clear: althei igh pwlicing can contribute to ley dimeneiens of safety, a deeper state of public safety and security can only emerge if essential needs-such as supportive conditions in early childhood, and safe and affordable; housing- are met, and rott cai ises like exposure te racism addressed. Just as it is preferable to prevent disease than treat it, so too must we prioritize preventing unsafety (crime being a pronounced example) rather than only responding to it.

As with health care, the United States, is an oi itlier among Organisation for Economic Co-operation and Development countries in its high per capita spending on police and other law enforcement, and it maintains a higher rate of incarceration than any other country.2 Also as with health care, much of o ir public ollows a fee-fer-service medel, festering incenti ves for seme in centirned downstream in/estment in measures like prison construction and bail bonds. It is perhaps not surprising, then, that the aggregate experience of safety in the United States, again as with health, is in the middle of the pad- of other nations3, and falls disproportionately shert in marginalized ccmmmities.

To improve public safety and enhance equity, as with health, we must feci is more squarely on systemic, root causes-such as shortcomings and structurally racist inequities in eur systems of education, housing, and health care, and entrenched gaps in income and 'employment. vet as long as the links between these undorUng and systemic drivers of unsafety, including' crime, are not held up clearly to the public's view, action by policymakers and community members is dampened. The iwi ilt is a fundamental elif·cennecT that stands uncerrected: although determinants are systemic, reaction and blame-in the form of arrests, eenvietiens, and incarcerations that disprepertienately affect people of celer- are meted out at the individual level.

What is missing? First, purposeful efforts are needed to build widespread public i ınderetanding that peerer public safety eutcemes have their reets in upstream drivers: exposure to racism, lack of employment opperti inities at a living wage, unaffordable housing, exposure to lead and other toxins. Such understanding would help drive public sentiment that crucial police and other downstream reforms must be complemented by reversing chronic upstream disinvestment in communities across the nation. It would also support the growth of less intensive responses to threats to safety-from violence interrupters and restorative justice practices to integrating mental health and social service professionals into the responses to emergency calls. And it would spark needed conversation about which communities of "the public" need the greatest allocation and realignment of resources to improve their safety. Additionally, there is need for research that delineates the determinants of public safety (construed more broadly than crime alone)4 to the same degree as has been achieved for the social determinants of health.

Second, guided by local data and knowledge, resources must be allocated to catalyze measurable gains in public safety, broadly construed. Given the strong alignment between social and environmental determinants of health and of public safety, targeted upstream investments can be expected to yield dividends in both health and public safety realms.5,6 To date, US spending in health and public safety has been disproportionately concentrated on the most resource- and technology-intensive end ofthe spectrum, with a focus on addressing ratherthan preventing harm. Allocating greater spending upstream will be essential to advancing goals of health, safety, and equity.

Fortunately, promising examples point the way. The Healthcare Anchor Network is working with health care systems across the country to lend the economic power ofthe hospital sector to strengthening community health through purposeful investment in social determinants of health. An initiative to restore blighted and vacant spaces in communities in Philadelphia, Pennsylvania significantly improved residents' sense of safety while reducing police-reported crime.7 As recent federal investments in infrastructure, education, housing affordability, and reducing childhood poverty have demonstrated, spending on drivers of public safety need not be considered a zero-sum game.

To build public and policymaker support for apportioning greater resources upstream, a reframing of public safety is needed, accompanied by new metrics, programming, and funding. Four initiatives would advance this agenda:

1. Community-partnered redefinition of public safety, supported by community-partnered research to sharpen definition of its social and environmental drivers in diverse contexts and ofthe effectiveness and impact of dedicating greater resources to addressing these drivers;
2. A widely accessible data resource with metrics of key determinants of public safety for cities and communities across the country, to help broaden public understanding and catalyze local action (e.g., modeled after the City Health Dashboard8 for social determinants of health);
3. Funding for local initiatives to reframe health and public safety goals in specific cities and communities that achieve consensus on upstream determinants and metrics of success; and
4. Resource reallocation initiatives, at an ambitious (citywide or regional) scale, jointly funded by philanthropy, the business community, and the public sector.

We stand at a crossroads. We must now seize the historic opportunity, following the trail blazed by our evolving understanding ofthe social determinants of health, and shift public safety policy and practice from its narrow focus on policing and crime to a broader vision, inclusive of upstream drivers, that is at once more equitable and more effective. ÂIPU

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Document 16 of 28

# Harassment of Health Officials: A Significant Threat to the Public's Health

Fraser, Michael R, PhD, MS [1] [1] Association of State and Territorial Health Officials (ASTHO), Arlington, VA

## ABSTRACT (ENGLISH)

The article by Ward et al. in this issue of AJPH (p. 736) aptly quantifies the harassment and devaluation experienced by many public health officials in the earliest and darkest days of the COVID-19 pandemic in the United States. Local and state public health officials, who before the pandemic mainly worked behind the scenes to protect the public's health, were quickly thrust into the spotlight alongside their governors, mayors, and county commissioners to explain public health mitigation efforts such as business and school closures, mandatory mask orders, and social distancing recommendations. This new visibility led some members of the public to celebrate and thank these public health heroes, and others to disparage and vilify them.

The harassment of health officials has taken many forms. One of the most dramatic was the armed protest in the front yard of Ohio's then health officer, Amy Acton.1 Others reported receiving death threats, being physically assaulted, and being the targets of racial, religious, transphobic, and sexist hate speech by phone, mail, or social media.2-6 In some of these cases, the threats and harassment warranted state police protection with officers detailed to personal residences or police protection at public vaccination events, county council meetings, and school board meetings.7-9 These events were serious, led to the resignation of several local and state health officials, and resulted in many others ending their public participation in press briefings and news conferences and playing a less public role in their jurisdiction's COVID-19 response.

Controversy and criticism in public health is not new, nor are isolated experiences of harassment of health officers. Before COVID-19, state and territorial health officials faced opposition from members of the public for supporting efforts to ban youth vaping and the sale of flavored e-cigarettes, for failing to support (and in some states for supporting) the use of cannabis for medical or recreational use, for enforcing vaccination requirements for school entry, or for supporting taxes on sugar-sweetened beverages. But these prior controversies and their discontents were few, local in nature, and less vehement. In their study, Ward et al. found that more than half of local health directors surveyed reported harassment of themselves, their staff, or their agencies in the study period (n 5 1499) between March 2020 and January 2021. As Ward et al. describe, COVID-19-related harassment has been far more widespread, far better organized, and much more violent than anything we have seen before.

## FULL TEXT

See also Kapadia, p. 706, and Ward et al., p. 736.

The article by Ward et al. in this issue of AJPH (p. 736) aptly quantifies the harassment and devaluation experienced by many public health officials in the earliest and darkest days of the COVID-19 pandemic in the United States. Local and state public health officials, who before the pandemic mainly worked behind the scenes to protect the public's health, were quickly thrust into the spotlight alongside their governors, mayors, and county commissioners to explain public health mitigation efforts such as business and school closures, mandatory mask orders, and social distancing recommendations. This new visibility led some members of the public to celebrate and thank these public health heroes, and others to disparage and vilify them.

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## A VIEW FROM THE FIELD

As the executive director of the Association of State and Territorial Health Officials (ASTHO), I have seen firsthand the stress, strain, and cognitive dissonance that results from the denigration and defamation of our public health leaders. On the basis of my conversations with state and territorial health officials, I posit that almost every state health officer experienced some form of harassment during the COVID-19 pandemic. Most common are disparaging and offensive social media posts; public sharing of their work and personal cell phone numbers, e-mail addresses, residential addresses; or other virtual bullying. In some cases, this harassment includes the higherprofile cases of death threats, armed protests, and threats of physical violence requiring law enforcement protection.

How have we arrived at this point? How can a small but vocal segment of the population believe it is appropriate to threaten and harass health officials whose primary job for the past two years has been to protect us from a novel infectious disease that has claimed the lives of more than 900 000 Americans? One explanation is COVID-19's emergence at the start of the 2020 presidential election year, appearing in a hyperpartisan environment full of "gotcha"momentsand political scorekeeping. Facingthe threat of COVID-19, America's leaders could have rallied around a collective, warlike response to an emerging global pandemic, but instead some used the virus and our response to it to strengthen, not to heal, bitter partisan divides. Health officials became targets ofthis partisan rhetoric and the public outcry that followed. The former Secretary of Health and Environment for Kansas, Dr. Lee Norman, astutely remarked on the Rachel Maddow television show shortly after his resignation in November 2021 that "public health has always been political .. . but never so partisan."10

## WEAKENING PUBLIC HEALTH AUTHORITY

It is a sad state of affairs when those charged with protecting the public are instead disparaged by it. But as sad, unwarranted, and uncivil as the harassment of health officers has been, far more disastrous is the resultant long-term damage to public health authority that has followed. Public discontent with mask mandates and school and business closures catalyzed policymaker backlash against public health authority. By November 2021, almost every state legislature has seen the introduction of a bill to weaken or remove the emergency powers of governors and/or local or state health officials.11 Successful efforts to reduce the power of public health authorities are a Pyrrhic victory: knee-jerk reactions that incite one's political base but with potentially deadly consequences for all of us when health officials' hands are tied in new outbreaks. These legislative attempts to purportedly check unbalanced executive powers are misguided efforts to score political points and win future elections. They come at the very perilous cost of weakeningthe ability of health officials to use necessary and important mitigation tools to protect the public from future public health threats. These efforts should concern us all, regardless of political ideology or partisan perspective.

Leading a state or territorial health department is not an easyjob on a typical day, let alone during a pandemic. Who would want the position when you may face legislative roadblocks to your every move to protect the public's health and relentless social media trolling in the best of times, and death threats in the worst? Add to the mix "moral injury," a term used to describe the cognitive harm experienced when what we think is right and helpful is viewed by others as wrong and harmful, and our ability to recruit and retain health officials in the future may be seriously compromised. Ward et al. describe the number of voluntary resignations and transitions in health department leadership duringtheir study period. Although not explicitly stated, many were most likely a result of the cognitive stress and moral strain of repeatedly trying to do the right thing and being punished for it. Moral injury, typically reserved for the experience of soldiers returning from war, is now common in the public health workforce. This might also partly explain why a significant percentage of public health workers reported experiencing a serious mental health condition, including depression, anxiety, and suicidal ideation, alongside the COVID-19 pandemic.12

## TOWARD SOLUTIONS

Quantifying pandemic-related violence against health officials is an important part of chronicling the impact of the COVID-19 pandemic in the United States. But beyond merely telling the story of how bad it has been for public health leaders are the authors' suggested solutions. Some of these are tasks that ASTHO and its partners can commit to today, such as training leaders in how to address moral injury and howto respond to political conflict more effectively. Other recommendations are longer term but equally important and include mitigatingthe partisan rhetoric and political pressures that have led some members of the public to intimidate, vilify, or denigrate public health work. These efforts cannot begin soon enough: in November 2022, we will have 36 state and four territorial gubernatorial elections and perhaps as many transitions in state and territorial health officers shortly thereafter.

The harassment of health officials should be far more than a footnote in future chronicles of our COVID-19 response: it is an alarming symptom of a far more serious condition that has pushed some policymakers to undermine the authority of government health officials. Ward et al.'s recommendations to address harassment provide a path forward. We can manage the symptoms ofthis condition with training and peer support, but its treatment is a robust, high-functioning, and sustainable public health system from which we all benefit. Most important, and perhaps hardest of all, however, will be reminding all Americans about the importance of our collective good and that the benefit of avoiding future illness and death often means temporarily compromising individual desires to assure the health of many. Âfpu

## CORRESPONDENCE

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Document 17 of 28

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Document 18 of 28

# Unanticipated Pandemic Outcomes: The Assault on Public Health

Freeman, Lori Tremmel, MBA [1] [1] National Association of County and City Health Officials, Washington, DC

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## ABSTRACT (ENGLISH)

Throughout the past two years of the pandemic, public health department officials and department staff have been physically threatened, intimidated, harassed, and politically scapegoated. These baseless attacks on public health professionals have spanned red and blue states, as well as urban and rural cities and counties.

Compromising the role of public health officials makes our nation less safe and less secure. Public health departments are unsung heroes and ultimate defenders of our health: before there is a COVID-19 test, before there is a confirmed case, before there is an emergency room visit, there is prevention. This is the principal tenet of public health. We must protect the role of our public health departments. We should be thanking them for their tireless work and heeding their advice, not threatening their safety, their careers, and their livelihoods.

## FULL TEXT

Public health is under attack during this pandemic. And that should frighten us all as a country. Our public health departments are under assault simply for doingtheir jobs.

Throughout the past two years of the pandemic, public health department officials and department staff have been physically threatened, intimidated, harassed, and politically scapegoated. These baseless attacks on public health professionals have spanned red and blue states, as well as urban and rural cities and counties.

Compromising the role of public health officials makes our nation less safe and less secure. Public health departments are unsung heroes and ultimate defenders of our health: before there is a COVID-19 test, before there is a confirmed case, before there is an emergency room visit, there is prevention. This is the principal tenet of public health. We must protect the role of our public health departments. We should be thanking them for their tireless work and heeding their advice, not threatening their safety, their careers, and their livelihoods.

Many of these attacks on public health are surprisingly well organized. Groups such as Freedom Angels, Sovereign Nation, the Boogaloo Boys, and Colorado Counties for Freedom have coordinated strong pushback on public health measures in communities and have specifically targeted local health officials by generating messaging that includes personal attacks on integrity, conducting in-person demonstrations at the homes of public health officials, taking out radio advertisements against public health, and using other tactics to pressure public health officials regarding unpopular health orders and mitigation efforts.

The threat level to local health officials and staff has been so high during the pandemic that the National Association of County and City Health Officials (NACCHO) was quickly compelled to act. NACCHO worked to bring attention to the issue nationally by engaging with the Network for Public Health Law to look at what state protections exist for public health officials from a statutory standpoint. According to the resulting report, Legal Protections for Public Health Officials, 35 states and the District of Columbia have "criminal statutes punishing individuals who impede public health officials' duties with such behavior." Roughly 15 states "either do not have a statute protecting government officials in these circumstances or do not have one protecting public health officials."[1]

NACCHO also sent a letter to Attorney General Merrick Garland strongly requesting protections for public health officials and the departments that serve them. The letter outlined some of the most egregious examples of how local health officials have endured everything from targeted efforts to diminish and cast doubt on their expertise, training, and experience to attempted murder. In addition, the letter noted that

threats and acts of violence against our public health workforce in their professional capacity have profound impacts on these individuals and their families. Some have had to move to driving unmarked cars or adding at-home security cameras, others have had to rely on police escorts and round-the-clock security, while others changed their children's behavior worried about if they will be targeted instead.[2]

The ultimate impact of violence against public health departments has been a mass exodus ofthis critical workforce. Hundreds of local health officials have lost their jobs while trying to protect and defend the health of their community during their on-the-ground response to the COVID-19 pandemic. Significant numbers of health officials have stepped down, making tough choices to leave long-term positions and careers to protect themselves and their loved ones rather than continue to endure actual or perceived threats and relentless pressure.

The field of public health is losing leadership and irreplaceable experience during a public health emergency of staggering proportions. The compounding effect ofthis strain has taken a historical toll on our public health leadership. In a study of departures by The New York Times, more than 500 public health department officials were documented as having left their role since the start of the pandemic.3 These are only counts of individuals in the highest leadership role in their health department. There has not been as close tracking yet of other health department leadership and staff departures; however, it is believed that the pandemic has taken a similar toll on the whole of the health department workforce. These leadership losses arrive on the heels of more than a decade-long disinvestment in public health that resulted in a prepandemic 20% reduction in the local health department workforce and a less than stable infrastructure.4These cracks in the foundation of our public health infrastructure have only deepened during the pandemic.

Recovering from these losses to the field of public health will remain challenging. The more contentious serving in governmental public health becomes, the more difficult it is to recruit replacements. Even though schools of public health have been experiencing record enrollments, many graduates have not turned toward health departments to establish their career paths. NACCHO has been the leading organization to promote passage of public health loan repayment legislation geared toward drawing more of these graduates into public health by requiring a commitment to work at a health department for three years in return for loan forgiveness.5

We often describe out nation's nearly 3000 health departments as being on the front line of the front line of response, doing all they can to prevent people from needing a hospital or emergency room. Their role began immediately at the start ofthe pandemic. Local health departments have been testing patients, managing case investigations and contact tracing for their communities, managing extraordinary amounts of data, providing wrap-around services forthose isolating or quarantining, hosting communitybased mass testing and vaccination sites, communicating with the public and the media, and regularly convening local partners including business, education, early child care, emergency medical services, police, fire, hospital systems, and providers.

We forget that local health department officials and their staffs are also real people experiencing this pandemic personally like the rest of us. They have performed their jobs with the utmost professionalism, dedication, and strength while navigating the same personal challenges faced by others in their community, such as child-care issues or the economic impact of laid-off family members. The importance ofthe role of local health departments in communities across the country will never lessen even as the total number of professionals committed to this work declines.

We have some rebuilding of resilience to do within our health departments. NACCHO worked with the Centers for Disease Control and Prevention on a recent survey ofthe field on the mental health effects ofthe pandemic. Much has been said about the impact ofthe pandemic on emergency care and hospital workers, but not enough has been said about the impact on our public health workforce. More than 50% ofthe survey respondents-and there were approximately 27 000 responses to this survey-demonstrated clinical signs of depression, mental illness, posttraumatic stress syndrome, or suicidal ideation. This is tragic, and we must continue to call on our federal health agencies to commit specific investments to take care of our own, including provision of mental health services and other forms of assistance to our health departments to help them recover and rebound from this time of personal and professional crisis.

Our safety and health demand that public health officials make recommendations based on science and free from intimidation. They need our support. We must act now to protect public health. NACCHO, working with other national partners and with support from theJohns Hopkins Bloomberg School of Public Health, has worked to bring attention to actions necessary to support public health. This effort has included launching the We Stand with Public Health Call to Action Web site, which asks supporters to sign a commitment to stop workplace violence in public health. The campaign focuses on stopping the harassment of public health professionals by (1) reporting threats and violence against public health and working to hold accountable those who make take these actions; (2) asking Congress to require state and local monitoring and reporting of threats and harassment against public health workers for performing their official duties, including threats related to race, religion, sexual orientation, or gender; and (3) using existing statutes, and supporting new laws, to protect public health professionals.6

Let us all stand behind health officials and the staffs that serve their departments. Let them know that we see them, we trust in them, and we stand with them. Let them know that we will fight to restore trust in them and the field they have chosen to serve so nobly. And, above all, let us thank them for their continued strength and their unwavering service to our country.

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CONFLICTS OF INTEREST

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# Managing Death Reporting at a Peak of the COVID-19 Pandemic in New York City in Spring 2020

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## ABSTRACT (ENGLISH)

The COVID-19 pandemic increased interest in death data and accelerated demand for accurate, timely death certificates and permits to facilitate appropriate disposition of the deceased.1 Researchers may have little awareness of the death registration process, including how data are collected and verified and how these processes can be improved locally to ensure timely, high-quality data. One of 57 independent vital records jurisdictions in the United States responsible for the registration of births and deaths, New York City (NYC) registers approximately 55 000 deaths in a typical year. As NYC braced for the impact of the COVID-19 pandemic in March 2020, it made changes to its operations to accommodate excess deaths it anticipated but could not predict in magnitude. Ultimately, all-cause deaths rose from an average baseline of 150 per day to 1200, hovering at approximately 1000 deaths per day for two weeks.2 This editorial summarizes changes made to staffing, systems, policy, and reporting to manage the surge. Knowledge of these changes may improve understanding of death data; provide insight into how to interpret heterogeneity in national data, which reflects the policy and practices of each of the 57 jurisdictions; and enhance other jurisdictions' ability to respond to mass fatalities.

## FULL TEXT

The COVID-19 pandemic increased interest in death data and accelerated demand for accurate, timely death certificates and permits to facilitate appropriate disposition of the deceased.1 Researchers may have little awareness of the death registration process, including how data are collected and verified and how these processes can be improved locally to ensure timely, high-quality data. One of 57 independent vital records jurisdictions in the United States responsible for the registration of births and deaths, New York City (NYC) registers approximately 55 000 deaths in a typical year. As NYC braced for the impact of the COVID-19 pandemic in March 2020, it made changes to its operations to accommodate excess deaths it anticipated but could not predict in magnitude. Ultimately, all-cause deaths rose from an average baseline of 150 per day to 1200, hovering at approximately 1000 deaths per day for two weeks.2 This editorial summarizes changes made to staffing, systems, policy, and reporting to manage the surge. Knowledge of these changes may improve understanding of death data; provide insight into how to interpret heterogeneity in national data, which reflects the policy and practices of each of the 57 jurisdictions; and enhance other jurisdictions' ability to respond to mass fatalities.

## STAFFING

Death registration and analysis are essential services. The vital statistics team supports medical and funeral home staff who report deaths electronically through NYC's electronic death registration system, eVital; manually enters paper certificates; codes literal text on death certificates to International Classification of Diseases, 10th Revision (ICD-10; Geneva, Switzerland: World Health Organization; 1992), standards; registers deaths in the official NYC record; and issues death certificates. Staffing and scheduling accommodate the usual volume of interactions required to manage 150 deaths per day, with the ability to flex to accommodate a modest increase in work, roughly equivalent to 50 additional calls or deaths per day. The volume of deaths during the first wave of the pandemic far exceeded this flexibility. Staffing was doubled, and schedules were either expanded or reduced, based on task, to better support electronic reporting, maximize capacity for producing death certificates for mailing and pickup by funeral directors, and make data available for analyses.

Corrections and amendments to death certificates, also essential, increased during the peak, likely because of the sudden and unexpected nature of the deaths that occurred. Corrections reflect loved ones needing time to make and then possibly change burial or cremation plans. Staff were tasked with prioritizing this work to manage the volume and scheduled to be on call after hours for urgent requests.

Although many employees in the agency transitioned to 100% remote work, most of the team reported to work in person at least one day per week, and the death registration team reported to work five days per week. Because this work was traumatic and difficult, we provided mental health resources for staff working on our death registration team.

## SYSTEMS

Our electronic vital event management system, eVital, supports electronic reporting of vital events. In early 2020, 95% of deaths were reported electronically and 5% were reported on paper. Significant additional functionality was implemented in response to COVID-19. First, although human review of each death report had been part of our business process, we implemented automatic death registration. This action was feasible because extensive validation rules are already built into the data entry system to filter out poor-quality data and because we imposed a "hold" period during which a death reporter could make modifications to their entry before registration. To monitor the quality of the data, we initiated more frequent data quality assessments. We also created a new interface with our local medical examiner's office, which facilitated more timely insight into and management of human remains at hospitals and nursing homes that had met their morgue capacity and needed city morgue storage. Pop-up boxes and modifications to the death and disposition data entry pages were made to ensure that deaths were properly characterized on death certificates. Finally, the system's user list was leveraged to communicate guidance on how to complete the cause-of-death section on death certificates as per the World Health Organization and National Center for Health Statistics. All these changes were necessary to facilitate timely reporting of death data.

## POLICY

Although staffing helped us process the electronically reported deaths, there were still deaths being reported on paper. Paper not only required in-person interactions but also forced a laborious and time-consuming process of manual death registration and slowed data reporting. A highly proficient staff member could manually register a paper death certificate in about 15 minutes, but we were receiving up to 50 such certificates each day, requiring 12.5 person-hours of work to complete, which was not sustainable. Thus, Emergency Executive Order No. 106 was issued on April 9,2020, by the NYC mayor to suspend section 17-196 of the NYC Administrative Code, and on April 10,2020, the NYC Commissioner of Health issued an emergency order to modify subdivision (4) of section 205.03 of the NYC Health Code. As a result, regulatory changes allowing NYC to require electronic death reporting, eliminating the need for funeral directors to bring paper certificates to the health department for registration, were implemented. Instead, funeral directors could print a work copy of a registered death certificate along with the burial permit and proceed with their efforts to support a family's funeral preparation process. This change also allowed deaths to be registered and analyzed more rapidly.

## ANALYTIC REPORTING

Timely provision of mortality data to decision-makers was critical to COVID-19 response planning. After deaths were electronically reported, they were coded by NYC nosologists, who assigned ICD-10 codes to each death more quickly than would have been possible if they had waited for national coding. To speed the transfer of data from eVital to our analysts, an extract from eVital to our mortality surveillance system was updated to capture certified but unregistered deaths for analysis. Seven days per week, analysts matched incoming lists of laboratory results with the list of deaths reported in NYC. Matched cases were reported as confirmed COVID-19 deaths, whereas those with a mention of COVID-19 on the death certificate but no positive laboratory test result were deemed probable COVID-19 deaths. The rich demographic data on the death certificate were also used for reporting. Data were posted to the NYC health department's website each day. In addition, our mortality surveillance system was updated to include reports of deaths caused by COVID-19, which were analyzed in the context of other cause-of-death trends. Numerous additional ad hoc reports were also created. These were provided to city leadership to support planning for the response, modeling efforts by academic partners, and countless data requests by the media.

Data accuracy and timeliness are driven by local staffing, systems, policy, and reporting decisions. High-quality death data at the national level require investment and commitment to scientific integrity in each of the 57 independent vital records jurisdictions in the United States. In NYC, at a peak ofthe COVID-19 pandemic, we leveraged our existing staffing, administrative and health codes, electronic system, and analytic strengths to ensure timely and complete registration of each death and near real-time data reporting. This enabled NYC to fulfill its mandate to provide the documents, services, and data needed to support its response to the pandemic and New Yorkers' response to the loss of their loved ones.

CORRESPONDENCE

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CONFLICTS OF INTEREST

The author has no conflicts of interest to declare.

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## DETAILS

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# COVID-19 Pandemic Factors and Depressive Symptoms Among Primary Care Workers in São Paulo, Brazil, October and November 2020

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## ABSTRACT (ENGLISH)

Objectives. To investigate associations between COVID-19-related factors and depressive symptoms among primary care workers (PCWs) in Sao Paulo, Brazil, and to compare the prevalence of probable depression among PCWs before and during the pandemic. Methods. In a random sample of primary care clinics, we examined 6 pandemic-related factors among 828 PCWs. We used multivariate Poisson regression with robust variance to estimate prevalence ratios for probable depression. We assessed the prevalence of probable depression in PCWs before and during the pandemic in 2 comparable studies. Results. Adjusted prevalence ratios were substantial for insufficient personal protective equipment; experiences of discrimination, violence, or harassment; and lack of family support. Comparisons between PCWs before and during the pandemic showed that the prevalence of probable depression among physicians, nurses, and nursing assistants was higher during the pandemic and that the prevalence among community health workers was higher before the pandemic. Conclusions. Our findings indicate domains that may be crucial to mitigating depression among PCWs but that, with the exception of personal protective equipment, have not previously been examined in this population. It is crucial that governments and communities address discriminatory behaviors against PCWs, promote their well-being at work, and foster family support.

## FULL TEXT

### Headnote

Objectives. To investigate associations between COVID-19-related factors and depressive symptoms among primary care workers (PCWs) in Sao Paulo, Brazil, and to compare the prevalence of probable depression among PCWs before and during the pandemic.

Methods. In a random sample of primary care clinics, we examined 6 pandemic-related factors among 828 PCWs. We used multivariate Poisson regression with robust variance to estimate prevalence ratios for probable depression. We assessed the prevalence of probable depression in PCWs before and during the pandemic in 2 comparable studies.

Results. Adjusted prevalence ratios were substantial for insufficient personal protective equipment; experiences of discrimination, violence, or harassment; and lack of family support. Comparisons between PCWs before and during the pandemic showed that the prevalence of probable depression among physicians, nurses, and nursing assistants was higher during the pandemic and that the prevalence among community health workers was higher before the

pandemic.

Conclusions. Our findings indicate domains that may be crucial to mitigating depression among PCWs but that, with the exception of personal protective equipment, have not previously been examined in this population. It is crucial that governments and communities address discriminatory behaviors against PCWs, promote their well-being at work, and foster family support. (AmJ Public Health. 2022;112(5): 786-794. https://doi.org/10.2105/AJPH.2022.306723)

Brazil is among the most affected countries of the COVID-19 pandemic, and within Brazil the city of Sao Paulo has had high numbers of cases and deaths. Brazil's government has been especially negligent duringthe pandemic,1,2 with the president encouraging people to ignore physical distancing and mask wearing, promoting the use of ineffective treatments such as chloroquine,1 and providing minimal support for vaccination.3

The COVID-19 outbreak has overstretched the Brazilian health care system, overwhelmed health care workers, and jeopardized the mental health of these workers. Health care workers in general, and primary care workers (PCWs) in particular,4 have been largely neglected, as exhibited by limited government support2 and unfavorable workplace conditions. We sought to identify factors strongly related to depression among PCWs in this context as a means of informing policies and interventions designed to reduce the mental health toll on these workers. We could not identify any previous studies focusing on samples drawn to represent PCWs duringthe pandemic.

We therefore selected factors that have been related to depression among health workers in other countries duringthe COVID-19 pandemic (e.g., lack of personal protective equipment [PPE]5) or have been related to mental disorders in previous pandemics (e.g., discrimination toward health workers6). We also sought to compare the prevalence of depression among PCWs before and duringthe pandemic.

Accordingly, we first used data from a sample of PCWs (n = 828) who took part in the COVID-19 Health Care Workers Study (HEROES)-Sao Paulo (HEROES-SP) to examine the relationship between COVID-19-related factors and depression among PCWs in the city of Sao Paulo. The study was conducted as part of the larger HEROES global initiative, which examined the mental health effects of the pandemic on health workers in 25 countries.7 Second, we analyzed data from 2 directly comparable subsamples of PCWs, one from HEROES-SP (n 5 376) and the other from Panorama of Primary Health Care Workers in Sao Paulo, Brazil: Depression, Organizational Justice, Violence at Work, and Burnout Assessments (PANDORA-SP; n = 574); these subsamples were restricted to the same region within Sao Paulo and to the same types of workers (i.e., physicians, nurses, nursing assistants, and community health workers [CHWs]).

The PANDORA-SP subsample was studied before the initial pandemic outbreak, and the HEROES-SP subsample was studied shortly after the initial outbreak.8 We compared these 2 subsamples to examine whether and to what degree overall rates of depression were higher after the pandemic onset. (Note that HEROES-SP is an ongoing longitudinal, cohort study, and only baseline data are reported here.)

## METHODS

To examine pandemic-related factors and their association with depression, we conducted an online survey in October and November 2020 of PCWs who took part in HEROES-SP (Figure A, available as a supplement to the online version of this article at http://www.ajph. org). The sample was obtained by randomly selecting 26 primary care clinics in Region 1 of Sao Paulo and including all of the PCWs in the selected clinics. Of 2106 potential participants, 828 (39.3%) completed the survey. Data on age were missing for 5.2% of the sample; there were no missing data for other variables.

We used subsamples from HEROESSP and PANDORA-SP to compare the prevalence of depression among PCWs before and after the initial COVID-19 pandemic onset in Sao Paulo. These subsamples comprised 2 different random samples of all primary care clinics in Region 1 of Sao Paulo. For comparability, we restricted both subsamples to physicians, nurses, nursing assistants, and CHWs. PANDORA-SP was a cross-sectional study conducted in Sao Paulo in 2012 to examine depression and burnout among PCWs. For that study, we randomly selected 66 primary health clinics in Sao Paulo. All workers involved in the Family Health Program were eligible to participate. Details on PANDORA-SP have been provided elsewhere.8 The PANDORA-SP response rate was 93%.

Although PANDORA-SP was conducted nearly a decade ago, the context in which PCWs work has remained essentially the same in subsequent years. For instance, (1) the Sao Paulo primary model, adopted by the secretary of health, has continued to be based on the national family health strategy primary care model adopted in 1994; (2) each Family Health Program team maintains the same staff composition (e.g., physicians, nurses, nursing assistants, and CHWs), is located in the same region, and covers the same vulnerable populations; (3) primary care centers in Sao Paulo are still coordinated by private institutions in partnership with the local government; and (4) the private institution that managed PCWs in Region 1 at the time of PANDORA-SP is the same institution that has managed these workers during the pandemic.

Table 1 describes the sampling procedures and response rates for PANDORA-SP and HEROES-SP. Table 2 provides data on the characteristics of participants from the PANDORA-SP and HEROES-SP subsamples.

In addition, to understand differences between the HEROES-SP sample and the overall PCW population in Region 1, we compared the characteristics of HEROES-SP participants and HEROESSP "minimal responders." Minimal responders are PCWs who began filling out the HEROES-SP questionnaire but did not finish it and did not complete the Patient Health Questionnaire (PHQ9; Table A, available as a supplement to the online version of this article at http://www.ajph.org).

## Measures

The HEROES questionnaire was originally created in both Spanish and English versions. HEROES-SP employed a Portuguese version. The Spanish version ofthe HEROES questionnaire was translated to Portuguese and back-translated according to the World Health Organization's standard procedures.9

### Outcome

Depression was assessed with the Brazilian version of the widely used PHQ-9.10 As in previous studies, some from Brazil,11,12 we used a score of 10 or higher to indicate at least moderate symptoms of depression. Participants were asked whether they had experienced any of 9 depressive symptoms (assessed via the Diagnostic and Statistical Manual of Mental Disorders13) in the preceding 2 weeks. Possible responses for each symptom included not at all (0), several days (1), more than half of the days (2), and nearly every day (3).

### Exposures in HEROES-SP

We assessed the following factors hypothesized to be related to depression:

1. Level of access to PPE (sufficient, a little insufficient, much/very much insufficient).
2. Experiences of discrimination ("I have felt discriminated due to being a health worker during the pandemic" [yes or no]), violence ("I have experienced violence due to being a health worker during the pandemic" [yes or no]), and harassment ("I have been harassed by family members of patients with COVID-19" [yes or no]); response options ranged from 0 to 2 or 3.
3. Job type (physician, nurse, nursing assistant, CHW, other clinical staff, administrative staff).
4. Financial strain ("Have you felt constantly under financial strain?" [yes or no]).
5. Family support ("I have loved ones who support me when needed?" [yes or no]).
6. Isolation due to COVID-19 ("How many days have you been in isolation for being a suspected or confirmed case of COVID-19?" [0 = no isolation, 1 5 1 day or more in isolation]).

### Confounders and Government Mistrust

We considered the following sociodemographic variables as potential confounders: age (18-30, 30-40, 40-50, $ 50 years), gender (female, male, other), and self-reported skin color (White, Black, Brown, and other).

To document government mistrust, we assessed participants' responses to an item regarding their level of trust in the government (none, a little, a lot).

## Statistical Analysis

Stata version 14.0 (StataCorp LP, College Station, TX) was used in conducting all of our analyses. We used Poisson regression analyses with robust variance estimates to obtain prevalence ratios (PRs) for relationships between the aforementioned exposures and depression among HEROES-SP participants. This type of regression was selected to minimize overestimation of the associations given that the outcome was frequent in our sample (25%).14We included all ofthe aforementioned confounders and pandemicrelated factors in the model. The analysis was restricted to the 828 PCWs who completed the survey. For the missing data on age, we used the mean age of the sample. We used the variance inflation factor to investigate multicollinearity. Variance inflation factor values for explanatory variables ranged from 1.00 to 1.09, with a mean of 1.04. No significant correlation was found between a given explanatory variable and any other explanatory variable in the model.

We compared log-pseudolikelihood values between models and selected the model with the lowest value (-453.809) as the final model. In addition, we chose the model with the highest pseudo R2 (0.0839).

We examined the prevalence of depression among PCWs before (i.e., in PANDORA-SP) and after (i.e., in HEROES-SP) the initial COVID-19 pandemic onset overall and by job type. We used the Pearson x2 test to estimate P values.

Ethical Considerations

Privacy and confidentiality of data were guaranteed in HEROES, HEROES-SP, and PANDORA-SP. Individuals were asked to sign a consent form before participation.

For HEROES, a Web-based platform is being used to collect data across countries. This platform is akin to REDCap in terms of protection and data management. As a means of guaranteeing confidentiality, each participant is issued an identification number created by a code system. Access to the system is restricted to personnel with credentials defined by the study's steering committee.

RESULTS

The majority of PCWs in the HEROESSP sample reported no (18.6%) or little (69.1%) trust in the government. Table 3 presents data on the frequency of pandemic-related factors and confounders. The mean age ofthe sample was 36.2 years (SD = 9.2), and most participants were women (n = 712; 85.9%). In terms of pandemic-related factors, 51.6% ofthe participants (n 5 427) had insufficient access to PPE, and 38.1% (n 5 315) reported at least one experience of discrimination, violence, or harassment at work. Table 3 also provides data on the prevalence of probable depression (i.e., PHQ score above 10). Overall, 25% ofthe participants had probable depression. Some ofthe categories included in Table 4 were combined in the Poisson regression to avoid cells with small numbers, reduce the number of categories, and clarify presentation. For example, we combined physicians, nurses, and nursing assistants (in contrast to CHWs, who had limited contact with patients) because they were frontline workers during the data collection period.

Table 4 presents crude and adjusted results with respect to relationships between pandemic-related factors and probable depression. The adjusted results showed that prevalence ratios for probable depression were 1.5 or higher among participants who had insufficient access to PPE (adjusted PR [APR] 5 1.53; 95% confidence interval [CI] 5 1.14, 2.04); reported 2 or more experiences of discrimination, violence, or harassment (APR 5 2.06; 95% CI 5 1.53, 2.78); reported financial strain (APR 5 1.54; 95% CI 5 1.22,1.94); or did not receive family support (APR 5 2.48; 95% CI 5 1.93, 3.21). Prevalence ratios were significantly lower for CHWs and other clinical staff (e.g., psychologists) than for physicians, nurses, and nursing assistants.

We used data from the PANDORA-SP (n 5 574) and HEROES-SP (n 5 376) subsamples to compare the prevalence of probable depression among PCWs before and during the pandemic (Table B, available as a supplement to the online version of this article at http://www.ajph.org). The results showed that the prevalence of probable depression was lower before than duringthe pandemic among physicians (9.5% vs 28.6%), nurses (16.9% vs 28.6%), and nursing assistants (19.2% vs 24.7%; Table B). These differences were statistically significant for physicians but not for nurses or nursing assistants. When we combined physicians, nurses, and nursing assistants into a single category, the prevalence of probable depression was higher before (16.9%) than during (26.7%) the pandemic (x2 5 6.18, P 5 .01). The prevalence of probable depression among CHWs was higher before the pandemic (25.1 %) than during the pandemic (20.5%), although the difference was not statistically significant (x2 5 1.35, P 5 .24).

DISCUSSION

This study of PCWs was conducted in Sao Paulo, Brazil, shortly afterthe initial phase ofthe COVID-19 pandemic. The social context included neglect of health workers and denial ofthe pandemic by the president, reflected here in the 87.7% of participants who reported little or no trust in the government. Overall, 25% of PCWs reported symptoms consistent with at least moderate depression (i.e., a score above 10 on the PHQ).

Three pandemic-related factors were strongly associated with probable depression: insufficient PPE; experiences of discrimination, violence, or harassment; and limited family support. Directly comparable studies of PCWs before and duringthe pandemic indicated that those who were frontline workers duringthe pandemic period (physicians, nurses, nursing assistants) had a higher prevalence of depression during that period; in contrast, CHWs, who could not see patients in the community for safety reasons, had a lower prevalence of probable depression during the pandemic.

In this section, we offer potential explanations for the 3 associations with depression.

The higher prevalence of probable depression among PCWs who ceived that PPE was insufficient is consistent with the findings of other studies of health workers duringthe pandemic.5,15 For example, in the early stages ofthe COVID-19 outbreak in Wuhan, China, dissatisfaction with PPE was associated with a higher prevalence of depression.16 Limited access to PPE can lead to increased fear of becoming infected and infecting close contacts (especially older relatives), which in turn can affect mental health. Therefore, workplace prevention strategies for PCWs that ensure adequate access to PPE during the pandemic are essential for protection of mental health as well as protection from infection.

Most PCWs reported experiencing discrimination, violence, or harassment because they were health workers. Those who reported 2 or more of these experiences had a markedly higher prevalence of probable depression than those who did not report any such experiences. Studies conducted during the pandemic in other countries, especially low- and middle-income countries, have revealed similar experiences among health workers.17,18 For example, health workers have been attacked with eggs and physically assaulted in Mexico and have been beaten, stoned, and evicted from their homes in India.19 Menon et al.17 noted that the spread of misinformation on COVID-19 has increased fear of health care workers as potential sources of infection. Although reports of harassment of health workers had been increasing in clinics and hospitals worldwide20 before the pandemic, such reports seem to have now risen to a higher level.

PCWs who reported not having support from their family had a higher prevalence of probable depression. We could not identify previous reports on family support and depression among PCWs during the pandemic. In the general population, lack of social support (not only from family members) during the pandemic has been associated with poor mental health,21 including anxiety and depression. Also, studies of health workers before the pandemic have suggested that lack of support from family members is associated with poor mental health outcomes.22

## Strengths and Limitations

The strengths of this study include the focus on PCWs, who are an essential component of health care in many countries; the investigation of pandemicrelated factors (e.g., discrimination, violence, or harassment and family support) that have not been examined in previous studies of health workers, and the well-defined target population (i.e., a random sample of primary care clinics in a defined area). Other strengths include the response rate of 40%, which is much higher than the rates in other online surveys conducted in meaningful target populations during the pandemic, and the use of directly comparable subsamples before and during the pandemic.

However, there were also limitations. We cannot infer causality from a cross-sectional study, although strong associations do identify the most likely factors that could play a causal role. The PHQ-9 was developed as a screen for depression, and, although commonly used in epidemiological studies as a proxy for depression, it is not equivalent to a clinical diagnosis. In addition, potential participants did not have to reach out, as they were required only to respond to an e-mail. Although this mitigates volunteer bias to some degree, there may still be response bias; for example, PCWs without mental health problems might have been more likely to respond. The converse is also possible (i.e., PCWs with mental health problems might have been more likely to respond). We note that such response bias based on mental health status could have affected our estimate of the prevalence of probable depression.

Another possible limitation is that exposure to violence was underreported owing to recall bias.23 Moreover, our findings might not be generalizable to other locales in Brazil and elsewhere in Latin America where primary services are less developed. However, many primary care teams face similar challenges in large urban settings within low- and middle-income countries. With respect to comparisons between PANDORA-SP and HEROES-SP, it is possible that time effects influenced the outcomes. This possibility is unlikely, however, because work-related contextual conditions remained mostly the same from 2012 (PANDORA-SP) to 2020 (HEROES-SP).

Although previous studies have detected associations between negative professional performance (e.g., malpractice or absenteeism) and depression among health care workers, we did not examine such associations during the pandemic. Also, we did not collect data on satisfaction with work and home life, which could have been another limitation. Finally, we used job type as a proxy for income, which may not have been the best choice of a single socioeconomic status measure in a short online survey. We are expanding measurement of socioeconomic status in the upcoming follow-up questionnaire, adding income alongside other indicators such as assets and household size.

## Public Health Implications

Our study has potentially important implications with respect to mitigating the adverse consequences of the pandemic on PCWs' mental health. First, it underscores that PCWs must have adequate PPE. Second, it suggests that, at least in some contexts, it is vital for ernments and to dispel misinformation and in other ways ensure that PCWs are appreciated for their hazardous work rather than targeted for harassment. Third, PCWs appear to be vulnerable when family support is limited, and this should be considered in the design of policies and interventions. Although we cannot infer causality from a cross-sectional study and we have noted that our results are not necessarily generalizable to other settings, we believe that these areas need more attention and are likely to be relevant in mostsettings.

Previous studies have highlighted that depression among health care workers has serious consequences, including absenteeism24 and malpractice,25 and that it can hamper the sustainability of health systems. In the context of an unprecedent global crisis, these consequences may be even worse. The associations we observed between depression and negative professional performance and satisfaction with one's work environment need to be investigated further. ,4jPU

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## CONTRIBUTORS

A.T.C. da Silva participated in the design and planning of the study, data collection and analysis, interpretation of the results, and writing. F. Mascayano participated in the design and planningofthe study, data analysis, interpretation of the results,writing,and reviewing. L. Valeri advised about statistical methodology and participated in data analysisandwriting. M.E.de MedeirosJrand M. Pimenta e Souza participated in data collection, data analysis,and writing. D. Ballester, M. Tavares Cavalcanti, M. F. Moro, E. van derVen, and R. Alvarado participated in dataanalysis, interpretation of the results,and writing. G. Martinez-Alás participated in data analysis, interpretation ofthe results, writing, and reviewing. E. Susser participated inthe design and planning ofthe study and supervised the dataanalysis and statistical methodology, interpretation ofthe results,writing, and reviewing.All oftheauthors reviewed the final version.

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CONFLICTS OF INTEREST

The authors have no potential conflicts of interest to report.

HUMAN PARTICIPANT PROTECTION

The HEROES-SP COVID-19 Health Care Workers Study (HEROES)-Sao Paulo was approved by the institutional review board ofthe city of Sao Paulo, Brazil, and bythe ethics committee ofthe Associaqâo Santa Marcelina. Participants provided informed consent.

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## DETAILS

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Document 21 of 28

# Impact on Health Care Utilization and Costs of a Medicaid Community Health Worker Program in Detroit, 2018–2020: A Randomized Program Evaluation

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## ABSTRACT (ENGLISH)

Objectives. To compare health care utilization and costs between beneficiaries randomly assigned to usual services versus a community health worker (CHW) program implemented by 3 Medicaid health plans. Methods. From February 2018 to June 2019, beneficiaries residing in Detroit, Michigan's Cody Rouge neighborhood with more than 3 emergency department (ED) visits or at least 1 ambulatory care-sensitive hospitalization in the previous 12 months were randomized. CHWs reached out to eligible beneficiaries to assess their needs and link them to services. We compared ED and ambulatory care visits, hospitalizations, and related costs over 12 months. Results. In intention-to-treat analyses among 2457 beneficiaries, the 1389 randomized to the CHW program had lower adjusted ratios of ED visits (adjusted rate ratio [ARR] = 0.96; P <.01) and ED visit costs (ARR 5 0.96; P <.01), but higher adjusted ratios of ambulatory care costs (ARR = 1.15; P <.01) and no differences in inpatient or total costs compared with the usual-care group. Conclusions. Initial increases in ambulatory care use from effective programs for underserved communities may mitigate savings from decreased acute care use. Longer-term outcomes should be followed to assess potential cost savings from improved health.

## FULL TEXT

### Headnote

Objectives. To compare health care utilization and costs between beneficiaries randomly assigned to usual services versus a community health worker (CHW) program implemented by 3 Medicaid health plans.

Methods. From February 2018 to June 2019, beneficiaries residing in Detroit, Michigan's Cody Rouge neighborhood with more than 3 emergency department (ED) visits or at least 1 ambulatory care-sensitive hospitalization in the previous 12 months were randomized. CHWs reached out to eligible beneficiaries to assess their needs and link them to services. We compared ED and ambulatory care visits, hospitalizations, and related costs over 12 months.

Results. In intention-to-treat analyses among 2457 beneficiaries, the 1389 randomized to the CHW program had lower adjusted ratios of ED visits (adjusted rate ratio [ARR] = 0.96; P <.01) and ED visit costs (ARR 5 0.96; P <.01), but higher adjusted ratios of ambulatory care costs (ARR = 1.15; P <.01) and no differences in inpatient or total costs compared with the usual-care group.

Conclusions. Initial increases in ambulatory care use from effective programs for underserved communities may mitigate savings from decreased acute care use. Longer-term outcomes should be followed to assess potential cost savings from improved health.

Trial Registration: ClinicalTrials.gov identifier: NCT03924713. (AmJ Public Health. 2022;112(5):766-775. https://doi.org/10.2105/AJPH.2021.306700)

Emergency department (ED) visits and hospitalizations because of ambulatory care-sensitive conditions are important markers of unmet needs and impaired access to health care.1 If people diagnosed with conditions such as asthma, heart failure, and type 2 diabetes have access to high-quality ambulatory care and the resources to effectively manage these conditions, they are less likely to require acute care. However, many low-income urban residents face unmet social needs and barriers to accessing services.2,3 These barriers contribute to high rates of ED visits and hospitalizations, low rates of ambulatory care visits, and poor health outcomes.

A necessary but often insufficient prerequisite for access to outpatient care is health insurance. In 2014, the Healthy Michigan Plan, Michigan's Medicaid expansion program, extended health insurance to more low-income residents. Yet many Medicaid beneficiaries still struggle with unmet social needs such as food insecurity and face other barriers to managing their health and navigating outpatient health care.4

Community health worker (CHW) programs are one effective approach to provide outreach, support, and linkages to health and social services for individuals facing barriers to care. Trained frontline health workers who share characteristics such as culture, ethnicity, language, and community with those they serve,5 CHWs have improved clinical outcomes among adults with a range of ambulatory care-sensitive conditions.6-12 In efficacy trials, CHW programs have decreased hospital readmission rates13 and lowered costs.14-18

To date, however, few controlled effectiveness trials have evaluated CHW programs implemented in real-life practice. Moreover, the impact of most CHW initiatives remains limited by their dependence on short-term grants. For any model to be sustainable, payors must be willing to cover the costs of CHW services, or a fee-for-service billing code for CHW services must be established.19 In addition, few studies have examined effects of CHW programs on both acute and ambulatory care. Our study addresses these gaps by evaluating a potentially sustainable CHW program designed in collaboration with 3 Medicaid health plans, the Detroit Health Department, a neighborhood-based community organization, and a university, and implemented as a regular covered program staffed by salaried Medicaid health plan CHWs.

Health plans are well-positioned to address population health needs because most health care spending in the United States flows through them, and health plans typically bear financial risk for their enrollees. Thus, targeting investments to address social, behavioral, and medical needs that contribute to high health care costs can make financial sense for these plans. Since 2016, Medicaid health plans in Michigan are required to provide CHW services to their beneficiaries, either with CHWs they hire or through contracts with community-based organizations. Thus, Michigan offers an excellent opportunity to evaluate the impact of CHW services on beneficiaries' health care utilization. Accordingly, we worked with 3 Medicaid health plans to design and evaluate a demonstration project building on their existing CHW services that prioritized beneficiaries with high acute care use living in one low-income urban Detroit, Michigan, community.

We hypothesized that beneficiaries randomized to the program would have decreased acute care utilization (ED visits and ambulatory care-sensitive hospitalizations), increased ambulatory care (primary care and subspecialty medical) visits, and lower overall costs compared with beneficiaries receiving usual health plan services.

## METHODS

The program was implemented in Cody Rouge, a low-income neighborhood in Detroit, with about 36 000 predominantly Black (81%) residents, strong community organizations, and a federally qualified health center.20 The participating Medicaid health plans also determined that Cody Rouge has among the highest concentrations in Detroit of Medicaid enrollees who overutilize acute care yet underutilize ambulatory care.

Over a 12-month period before initiating the project, we conducted interviews with stakeholders from 10 community health and social services organizations in Cody Rouge to inform program development, implementation, and evaluation. These interviews further helped establish a community advisory committee with representatives from neighborhood organizations to inform program activities. We then partnered with 3 Medicaid health plans, the Detroit Health Department, and the Joy-Southfield Community Development Corporation to design and implement a CHW-led Cody Rouge-focused program that incorporates best practices from our previous work and the CHW literature.5-18

### Selection, Recruitment, and Randomization

The study protocol is described elsewhere.21 Briefly, from February 2018 to June 2019, on a monthly basis, each plan compiled lists of its members who (1) resided in Cody Rouge zip codes and (2) either had more than 3 ED visits, defined for eligibility as a unique date with an ED visit claim as identified by Current Procedural Terminology version 4 (CPT4)22 and Universal Bill version 4 (UB-04) revenue codes,23 or at least 1 ambulatory care-sensitive hospitalization, defined through International Classification of Diseases, Tenth Revision (ICD-10) diagnosis codes,24 in the previous 12 months (Appendix A, available as a supplement to the online version of this article at http://www.ajph.org). These enrollees were randomized by random number generator to be offered either the CHW program or usual health plan services. To ensure adequate representation of the highest-need members, randomization was stratified so that half of each arm consisted of enrollees with 5 or more ED visits in the previous 12 months and half with fewer than 5.

### Intervention

Each of the health plans assigned their own salaried CHWs to lead the program (2 CHWs at 1 health plan who worked part-time on the program and 1 each at the other 2 plans). Each plan assigned Black CHWs from or familiar with Cody Rouge. The CHWs underwent training by a trainer from the Detroit Health Department (R. G.), under a contract with the Michigan Community Health Worker Alliance. Although each health plan had provided their CHWs with in-house training, the Michigan Community Health Worker Alliance's core competency-based training ensured a common set of skills and approaches aligned with the national CHW Core Consensus.25 In response to recommendations from the community advisory committee, 2 "program trainees" who were residents of Cody Rouge were recruited to participate in the training and consult with the CHWs on neighborhoodspecific issues.

Each month, the CHWs were provided by their health plan the list of members randomized to the program and reached out to them either by phone or in person to offer their services. These lists included more members than the CHWs had time to reach out to. Those members who remained eligible and for whom no contact was attempted were included on the next month's list, but there were still more eligible members each month than the CHWs had time to try to contact. Participants met with their health plan's CHW who was tasked with (1) conducting an initial comprehensive health, behavioral, and social needs assessment; (2) developing an individualized action plan; and (3) linking members to necessary services. The frequency and duration of follow-up support depended on identified needs and required support as determined collaboratively by the CHW and the participant.

Each CHW provided services to his or her own health plan's eligible members. All CHWs, however, followed the same outreach protocol, assessed the same domains in their assessments, and followed similar counseling, action plan, and follow-up protocols. Each CHW completed brief encounter forms to track contacts and log key activities and referrals.

The health plan CHWs met as a group at regular intervals with the trainer (R. G.) to reinforce skills and share best practices and information on Cody Rouge resources. These "reflective consultation" sessions built mutual support among the CHWs, provided opportunities for ongoing training, and encouraged the program trainees to offer their perspectives related to neighborhood-specific social needs and services.

### Usual Care

Members randomized to the control arm were eligible for usual services. Each health plan has algorithms for identifying which members meet criteria for outreach (e.g., not completing quality measures).

### Data Collection and Outcomes Measures

Data on the primary outcomes-ED visits, ambulatory care-sensitive and all hospitalizations, and ambulatory care visits-and claims summaries used to compute standardized costs were obtained from health plan limited data sets. The health plans provided the evaluation team individual-level data on billing (CPT4, UB-04) codes, diagnosis (ICD-10) codes, and dates of health care services for a 36-month period from 24 months before to 12 months after the date individuals were randomized. Outcomes were measured for the 12-month postrandomization period, and baseline utilization and costs were measured for the 12-month period immediately preceding randomization. Charlson comorbidities were identified using the "charlson" command in Stata version 16 (StataCorp LP, College Station, TX) and participants grouped into those having 0,1, or 2 or more comorbid condtions.26,27

For purposes of study eligibility, ED visits were counted as the number of unique days with an ED claim (CPT4 code: 99281-99285 or UB-04 revenue code: 0450-0452, 0456, 0459, 0981). To achieve a more accurate count of unique ED visits for comparing outcomes and baseline utilization, we counted ED claims within 3 days of one another as a single visit28 and compared the number of visits (not days) between groups. Ambulatory care-sensitive hospitalizations were identified from inpatient stays with an ambulatory care-sensitive condition as the primary diagnosis.

### Sample Size Power Calculations

We calculated the required sample size by using the following assumptions. Among high utilizers, we anticipated a mean of 2 ED visits per beneficiary-year in the usual health plan services arm. We expected a reduction in mean ED visit by 0.65 per year to be clinically meaningful. Thus, we required 125 participants per arm to provide 80% power to detect this difference with a 0.05-level 2-sided test, assuming 0.01 within-CHW correlation. For hospitalizations, we expected 1.5 hospitalizations per beneficiary in the control arm; the proposed sample size provided 80% power to detect a difference in the number of hospitalizations of 0.37 between the 2 groups.

## Analyses

We first compared the 2 study arms to check for balance in age, gender, prevalence of baseline comorbid conditions, Medicaid eligibility through the Healthy Michigan Plan program, previous year rates for ED visits, office visits, hospitalizations, and ambulatory care-sensitive hospitalizations, and previous year standardized costs both in total and separated into ED visits, non-ED outpatient care, and inpatient hospitalizations. Because of privacy concerns, the health plans did not provide race or income data. To be eligible for the Healthy Michigan Medicaid plan, however, household income had to be 133% or less of the federal poverty level29 (e.g., $16 000 for a single person in 2018). We compared continuous variables by using the 2-sample t test with cost variables compared on the log($cost 1 $1)-scale. We used the x2 test to compare categorical variables, and univariate Poisson regression for rate-variables, with an offset for a participant's (log) months enrolled duringthe 12-month baseline period.

In intention-to-treat analyses comparing numbers ofvisits, hospitalizations, and costs between the 2 study groups of ED visits and hospitalizations over a 12-month period after randomization, we used separate quasi-Poisson regression models with each having a CHW group indicator as the primary predictor and adjusting for age, gender, and rate of utilization in the previous year. To account for within-plan clustering, we fit the quasi-Poisson model using generalized estimating equations (GEEs)30 We estimated adjusted rate ratios (ARRs) with their 95% confidence intervals (CIs) based on the models and reported as a summary measure of comparison. We used similar approaches to examine differences in ambulatory care visits between groups. As a planned secondary "as-treated" analysis, we compared differences in outcomes between health plan members randomized to the CHW program who the CHWs recorded in their disposition logs had been "partially engaged" or "fully engaged" or for whom the CHWs had provided resources or taken any action on their behalf. We repeated all analyses described previously adjusting for this "active" treatment status and compared the active treatment group to both controls and inactive treatment members. While these comparisons unavoidably conflate treatment and selection effects, they provide a useful upper bound on the likely treatment effect among active participants.

Standardized costs for professional billing for outpatient services were taken from Medicare national average payment amounts by CPT4 code using Medicare public-use files.31 Costs for services for which these estimates were unavailable were imputed using the average cost of all CPT4 codes sharing the first 4, 3, or 2 digits, with more digits preferred when applicable. Costs for ED visits included any associated professional billing and an estimated per-visit facility charge of $1118 based on the national average.32 Costs for inpatient hospitalizations were based on diagnosis-related groups and length of stay using an imputation model derived from the 2017 State Inpatient Database for Michigan assembled by the Healthcare Cost and Utilization Project33 (Appendix B, available as a supplement to the online version ofthis article at http://www.ajph.org). All costs were Winsorized to the 98th percentile to reduce the influence of potential outliers.34

We compared ED, outpatient, and total costs (plus $1) between groups using g-family GEE models with log link and otherwise identical to those described previously. Most patients had zero hospitalizations, so they had no inpatient costs. We thus modeled inpatient costs using a 2-part model with a binomial GEE for whether a participant was hospitalized and a g-family GEE for inpatient costs conditional on hospitalization(s). We summarized these models using the average ARR of expected inpatient cost (probability of hospitalization multiplied by expected cost). We estimated the standard error ofthis average ARR for inpatient costs using 200 bootstrap replications, with replication stratified by health plan and intervention arm. Data were cleaned and organized using Stata version 16 with statistical analyses done in R version 4.0.2 and 4.1.1 using the "geepack"35 library for GEE models.

There were no missing values for baseline variables. Some randomized participants left their health plans before the 12-month end point and were censored when they disenrolled. To account for this censoring, our generalized linear models included offsets forthe (log) number of days of followup divided by 365. These "days-covered" values represent the number of postrandomization days for which we have data on each enrollee's health care utilization.

## RESULTS

The CONSORT diagram (Figure 1) shows participant flow. The CHWs attempted to contact 1090 (61 %) of 1782 beneficiaries randomized to the program. A total of 284 beneficiaries (16%) had at least some recorded engagement in the program. Participants' baseline characteristics are reported in Table 1. We had outcome data for at least 1 month of follow-up on 1068 eligible controls (78%) and 1389 eligible participants (78%). Groups were balanced in terms of mean age (29.4 vs 29.9 years) and gender (36.1% vs 36.6% male). Relative to the national Medicaid population younger than 65 years, our cohort was less likely to be younger than 21 years (25.7% vs 58.1%) and more likely to be aged 21 to 26 (16.4% vs 7.5%), 27 to 45 (28.7% vs 20.4%) or 46 to 65 years (19.4% vs 15.1%).36

Program Engagement

Among the 284 participants for whom CHWs logged engagement in the program, the average number of days separating randomization from the first contact attempt was 76.4 (SD = 90.2) days and the median was 43.5 (interquartile range = 25.0-80.3) days. Across these participants, 23.1% of the follow-up period preceded the first contact attempt. The 12-month postrandomization follow-up period therefore includes approximately 2.8 preintervention months and 9.2 postrandomization months, which can be expected to attenuate the estimated intervention effect. Of participants with at least some engagement in the program, 55.3% (157/284) had 1 recorded interaction with their CHW. On average, CHWs recorded 1.9 (95% CI = 1.7, 2.1) contacts with engaged participants. A majority of 59.2% (168/284) were referred to at least 1 community resource with an average of 0.7 (95% CI 5 0.6, 0.8) referrals per engaged participant.

Outcomes

Table 2 shows unadjusted outcomes at 12 months. Of "active" participants, 77.5% had 360 or more days of followup compared with 72.2% of the inactive group and 71.4% of the control group; the difference was not statistically significant (P 5 .13). In the fully adjusted intention-to-treat analyses (Table 3), enrollees randomized to the CHW program on average had fewer ED visits than control patients (ARR 5 0.96; 95% CI 5 0.94, 0.98; P <.01) over the 12month follow-up period. There were no significant differences in average ambulatory care-sensitive or overall hospitalizations, or ambulatory care visits. Those randomized to the CHW program had significantly lower ED visit costs (ARR 5 0.96; 95% CI 5 0.94, 0.98; P <.001) but higher ambulatory care visit costs (ARR 5 1.06; 95% CI 5 1.00,1.11; P <.05), with no significant between-group differences in inpatient or total costs.

Enrollees with some reported engagement with a CHW (Table 3) also had higher ambulatory outpatient costs (ARR 5 1.14; 95% CI 5 1.08,1.21; P <.001) and fewer ED visits (ARR 5 0.91; 95% CI 5 0.86,0.96; P <.01) relative to the control group. There were no significant differences in average numbers of hospitalizations, inpatient costs, or total costs. (Appendix C, available as a supplement to the online version of this article at http://www.ajph.org, shows adjusted models with all variables.)

DISCUSSION

In this Medicaid health plan CHW-led demonstration program, although only 16% of plan beneficiaries randomized to the CHW program had any recorded engagement in the program, even in intention-to-treat analyses, those randomized to the program had fewer ED visits and more outpatient ambulatory care resource use at 12-month followup than beneficiaries randomized to usual care. Because of the greater ambulatory care costs, the lower rates of ED visits did not translate into a decrease in total costs.

This study contributes to the literature on CHW program effects on health care utilization in 3 key ways. First, we evaluated a real-world CHW program using a highly rigorous methodology. Many CHW programs have been implemented successfully in the United States37 and globally.38 Evaluation ofthese programs often has not employed rigorous methodologies such as random assignment, comparison groups, intent-to-treat samples, and 12-month follow-up, in part because of resource and time constraints and the need for rapid within-program feedback. At the opposite end of the spectrum are programs that are efficacious in randomized controlled trials conducted under well-controlled conditions, but may not be effective when implemented under real-life conditions.39,40 Studies can increase engagement and limit attrition by paying participants and employing research staff to facilitate enrollment and follow-up. As these tools are unavailable to programs in the real world, the leap from research to practice can expose a promising intervention to problems that mitigate its effects.

The current study thus took place at a unique intersection of real-world CHW programming and methodological rigor, allowing for exploration of important implementation factors. Although the current program was effective in reducing ED visits and increasing ambulatory resource use relative to the control group, CHWs reported engaging with less than 20% of eligible beneficiaries. We explored this challenge through an ancillary qualitative interview study41 that found that barriers to successful outreach included the CHWs' schedules (not working evenings or weekends), out-of-date enrollee phone numbers and addresses, and concerns among would-be recipients that the CHWs were affiliated with child protective services or other enforcement agencies. These barriers would not have been identified in a clinical randomized controlled trial in which participants are recruited and consented. Nor would the ultimate effectiveness of the intervention under real-life conditions-in spite of these barriers-have been established.

Second, while prior studies have found CHW programs to reduce ED visits and hospitalizations,13-18 few studies have examined both acute and ambulatory care use and costs. In many underserved populations such as in our study, high acute care use is often combined with little or no ambulatory care use. Thus, as in our study, a successful program may in the short term increase use of ambulatory care sufficiently to match cost savings from decreased acute care utilization. More than 12 months of follow-up data are necessary to assess longerterm patterns of health care use and potential cost savings from improved health.

Third, this study illustrates an important cross-sectoral model of partnership among a university, 3 Medicaid health plans, a city health department, and a local community organization in which the partners worked cooperatively to implement and evaluate a potentially sustainable demonstration program with already employed plan CHWs that incorporated best practices and prioritized a high-need urban neighborhood.

Limitations

This study should be understood in the context of some limitations. First, because this was a nonregulated program evaluation, we had no direct contact with participants and, thus, were not able to examine patient-centered outcomes. Second, we lacked data on participant characteristics such as race/ ethnicity, and the study lacked power to conduct subgroup analyses to determine whether results varied by participants' characteristics. Third, the program was implemented by 3 separate health plans with differing histories, practices, and preexisting CHW services. The study team worked with the CHWs and their supervisors before the program's launch to establish standard operating guidelines with respect to practices such as number of outreach phone calls and home visits, assessment domains, and "action plan" approaches. However, each health plan has its own culture and workflow. These may have introduced subtle differences in intervention delivery. Finally, privacy concerns made it infeasible to audio-record meetings or otherwise introduce fidelity or uniformity checks for CHW counseling or actions.

Notwithstanding these limitations, this evaluation represents one ofthe first efforts to examine the effects on health care use and costs of a realworld CHW demonstration program conducted by Medicaid health plans with their own salaried CHWs focused on beneficiaries in a specific urban neighborhood. Our findings can inform other programs and public policy on sustainable financing of CHW services.

Public Health Implications

Our study suggests that even with outreach barriers and low rates of engagement, significant positive outcomes are possible. Those hopingto implement real-world CHW programs are encouraged to build on the lessons learned in our demonstration project. First, a useful strategy may be for health plans and systems to contract with CHWs employed by community-based organizations that are trusted, have close linkages to the specific communities they serve, and are able to field a range of flexible outreach and engagement strategies. It is encouraging that recently Michigan's Medicaid program has incentivized Medicaid Health Plans to contract for CHW services with such communitybased organizations.

Second, increasing use of ambulatory care-thereby leading to a short-term increase in costs despite decreased acute care utilization-should be considered a marker of success for programs seeking to benefit underserved communities. It will be necessary to follow outcomes over a longer period than 12 months to assess potential cost savings from the improved health that can flow from increased ambulatory care utilization. Third, efforts to reach beyond the health care system to improve health require multisectoral partnerships such as this study's partnership. Fourth, as the State of Michigan has supported a financially sustainable model of CHW programming through its

Medicaid health plans, other state Medicaid programs should test this and other models to provide sustained funding for evidence-based CHW programs.

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CONTRIBUTORS

M. Heisler and A. Lapidos are joint first authors. All authors participated in the design and conduct ofthe evaluation.J. Henderson conducted data analyses, and all authors reviewed analysis results. M. Heisler drafted the article. All authors edited and approved the finalarticle.

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CONFLICTS OF INTEREST

The authors have no conflict of interest or financialdisclosures.

HUMAN PARTICIPANT PROTECTION

As this was an evaluation of a program offered by Medicaid health plans, with each plan conducting its own randomization processes, the University of Michigan institutionalreview board deemed the outcomes analysis nonregulated.

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## DETAILS

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# Work and Nonwork Contributory Factors to Health Care Workers' Mental Health

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## ABSTRACT (ENGLISH)

Athough much research has examined the prevalence of poor mental health among health care workers, few studies have adequately compared rates during the COVID-19 pandemic with a suitable prepandemic sample. Enter Silva et al. (p. 786), who in their study in this issue of AJPH not only provide such a comparison with Brazilian health care workers but also examine potential pandemic-related contributing factors. In this cross-sectional survey of 828 participants, they report that insufficient personal protective equipment (PPE); experiences of discrimination, violence, and harassment; not receiving family support; experiencing financial strain; and having to isolate because of COVID-19 were each associated with an increased prevalence ratio of probable depression cases. The prevalence of cases also varied by participants' job types. Against a backdrop of a denial ofthe pandemic by the Brazilian president and a neglect of health care workers, these contributing factors may have been exacerbated and resulted in 87.7% of participants reporting little or no trust in their government. This breadth of potential contributory factors and the sociopolitical system in which they are situated highlights the need for a more holistic understanding of predictors of health care workers' mental health.

## FULL TEXT

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### HETEROGENEOUS WORK EXPERIENCES OF HEALTH CARE WORKERS

What is interesting is the different probable depression rate for different types of health care workers. The prevalence of probable depression for physicians, nurses, and nursing assistants was 26.7% (against 16.9% before the pandemic), whereas for community health care workers, there was a nonsignificant decrease from 25.1% before the pandemic to 20.5% during the pandemic. This reinforces that health care workers are not a homogeneous group of workers; they have different and at times unequal working conditions and experiences. For example, working on COVID-1 9 or intensive care wards is a particular risk factor,1,2 whereas concerns have been raised about differential access to PPE based on one's role, sex, and ethnicity.3 One postulation from Silva et al. is that community health care workers were no longer able to visit community homes, potentially alleviating some work demands and reducing their exposure risk or vulnerability to violence and discrimination. Because ill mental health is a factor in the global challenge to retain health care workers, we need better research, policies, and support to understand, capture, and model these differences.

### MEETING THE BASIC NEEDS OF HEALTH CARE WORKERS

Silva et al. are right in identifying how and why a lack of PPE, the experience of discrimination and harassment, and insufficient family support are associated with cases of probable depression. Drawing on the occupational health psychology literature, we also believe that these factors build on individuals' need for justice, recognition, and support. Although the provision of adequate PPE is imperative as protection against COVID-19 exposure, it is also symbolic of how much health care workers are appreciated in the work that they do.2 Equally, high levels of abuse from the public or lack of support from their families would impact one's self-worth and, in turn, one's mental health.4 The detrimental impact of a lack of familial support is also not surprising, given that support is a core construct in many work-related well-being theories (e.g., the job demands-resources model5). These theories emphasize the needs not only for workers to feel they belong but also an additional form of coping. Consequently, building support is an important resource for health care workers to draw on and to mitigate the detrimental impact that demanding work environments can have on their mental health.5,6

### A SYSTEMS PERSPECTIVE ON HEALTH CARE WORKERS' MENTAL HEALTH

The six potential pandemic-related contributing factors shift the narrative of health care worker well-being away from only the individual, emphasizing the responsibility of governments and health care leaders. This links to the Healthy Healthcare perspective,7 where macro factors such as government policies and health care systems influence the working environment of workers within it, with corresponding impact on staff well-being and patient outcomes. As Silva et al. discuss, governments and health care providers need to provide adequate PPE for their staff while also accurately and clearly conveying COVID-19 information and challenging misinformation to avoid health care worker scapegoating and abuse.

Silva et al. also report that experiences of discrimination, violence, and harassment were associated with cases of probable depression. Throughout the COVID-19 pandemic, health care workers have also been fighting an "infodemic" against fake news, misinformation, and conspiracy theories.8 The public's confidence in health care workers' ability to deal with COVID-19 has been influenced by the excess of information that has, in some instances, led to mistrust and concern over the professional response from health care workers. This is concerning as a potential additional burden on health care workers' mental health, especially because 38.1% of participants in Silva et al.'s study reported experiencing discrimination, violence, or harassment because of being a health care worker. This has led to guidance for the scientific community, health professionals, and policymakers to rebuild credibility and public trust in health professionals' expertise.8,9

Managing the infodemic can be even more challenging when health information messages are incorporated into political narratives, with pandemic issues becoming the focus of disputes in a highly polarized political environment in Brazil. It is worth mentioning that the study was conducted in Sao Paulo, where the political perspectives of the state government often clashed with those adopted by the Brazilian federal government. This may also explain why 87.7% of participants in Silva et al.'s study had little or no trust in government. It is possible that health policies not based on scientific evidence10 and the lack of coordinated action have negatively influenced the trust of health care workers in the government while also hampering the coordination and promotion of public health actions.11

Although it would have been interesting if Silva et al. had examined this response's relationship with probable depression cases, we think this measure opens the door for future research to do so. Too often, research on health care workers' well-being has focused on individual factors (such as psychological states and traits) as antecedents to their well-being, neglecting the various other organizational and societal factors they are exposed to.7

Although the lack of PPE and job type are work-related contributing factors to probable cases of depression, the contributing role of family support and financial strain highlights how nonwork factors are also important. Since the start of the COVID-19 pandemic, it has been evident that we can no longer clearly delineate work from our nonwork lives. Much ofthe focus on nonwork factors has been on home and remote working, the challenges of work-life balance, and managing the need to always be available.12 A more holistic take on worker well-being, inclusive of factors outside or at the interface of work, is therefore needed. We see this in the National Institute for Occupational Safety and Health's expanded framework for worker well-being,13 which includes a "home, community, and society" domain that accounts for the financial strain, loneliness, and lack of support measured by Silva et al.

## CONCLUSION

Mindful that Silva et al.'s cross-sectional study does not establish causality, we believe that it nevertheless makes some important contributions. As COVID-19 moves from being considered a pandemic to being endemic, we need to recognize that debates and decisions across all levels of society influence the experiences of health care workers, not only in Sao Paulo but also around the world. The availability of PPE, the discrimination and abuse received from patients and the public, and the level of family support available are all subject to these debates and decisions. It is therefore imperative that we continue to maintain policies and practices that mitigate potential contributors to probable depression cases in this essential group of workers.

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# Community Health Workers in the United States: Time to Expand a Critical Workforce

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## ABSTRACT (ENGLISH)

Community health workers (CHWs) have a long, rich global history of extending essential health services and helping address social determinants of health for underserved populations.1 The 1978 Declaration of Alma-Ata, which called for the achievement of "health for all," explicitly defined a role for CHWs as an integral member of primary health care teams.2 In the United States, CHWs have historically been patient health educators and advocates, particularly for patients who have limited health knowledge or whose first language is not English. The 2010 Affordable Care Act called for the integration of CHWs into primary care settings to help improve the provision of care to culturally diverse patients. Despite these efforts, the CHW workforce in the United States has been underrecognized and underutilized, and many have called for policy change to better integrate CHWs into the US health system.3,4 CHWs have been largely neglected in health workforce planning, with existing programs often led by multiple actors without coordination, with fragmented or disease-specific foci, unclear links to the health system, and unclear identities because of wide-ranging job titles. Small programs and demonstration projects have shown the efficacy and promise of CHWs to improve population health outcomes,5,6 but monitoring and evaluation systems for large-scale CHW programs have been weak, and evidence of their real-world effectiveness and cost-effectiveness has been limited.
In this issue of AJPH, Heisler et al. (p. 766) describe an innovative multisector partnership between Medicaid health plans, a local health department, community-based organizations, and academia that implemented and evaluated a health plan-led CHW program in a low-income neighborhood in Detroit, Michigan. One year in, the study found that emergency department visits and costs were lower in the intervention group of Medicaid beneficiaries randomized to the CHW program compared to beneficiaries who received usual care. Outpatient ambulatory care costs were higher in the intervention group. Although total costs did not differ between the two groups, increases in ambulatory care use among low-income, medically underserved populations are a clear marker of success, and future longitudinal studies may demonstrate important implications for long-term savings and health outcomes.

## FULL TEXT

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The strengths of this study are numerous. Importantly, the evaluation of a real-world program revealed key implementation barriers that more controlled CHW efficacy trials do not typically face; yet, they can ultimately hamper translation of research to practice. Furthermore, this study provides a rigorous methodological template for other settings to replicate in evaluating their own CHW program effectiveness and cost-effectiveness. Although recent studies have shown that CHW programs can address health disparities and generate a positive return on investment (ROI),7 a lack of available context-specific evidence on costeffectiveness and ROI often inhibits interested organizations from implementing CHW programs, despite mounting evidence of their success.5-7 This study and the future studies it will inspire are essential to achieve sustainable financing for CHW workforces in the United States. Reliance on short-term grants and cumbersome reimbursement mechanisms are welldocumented challenges to CHW workforce expansion8,9; thus, health planimplemented CHW programs such as the one described by Heisler et al. can serve as an innovative model for other contexts.

The next challenge is to replicate, extend, and scale up such programs. Evidence, innovation, and policy change are needed to ensure that CHWs become trusted members of the workforce and are reimbursed accordingly.9 The COVID-19 pandemic has escalated the urgent need for CHW programs and has also created opportunities for the necessary policy changes.

## LESSONS LEARNED DURING COVID-19

The COVID-19 pandemic has called attention not just to persistent health disparities in the United States but also to the severe underinvestment in community health workforces needed to address them. A national CHW workforce could and should have been in place at the start of the pandemic to address issues ranging from vaccine hesitancy, barriers to accessing testing, and low health literacy and misinformation to the broader social, economic, and behavioral health needs of vulnerable populations. Instead, an onslaught of federal funding through the 2020 Coronavirus Aid, Relief, and Economic Security Act and the 2021 American Rescue Plan meant that state and local governments scrambled to hire, train, and deploy CHWs amid the ongoing public health crisis. In March 2020, the US Department of Homeland Security included CHWs, for the first time, as part of the Essential Critical Infrastructure Workforce in their strategy to ensure community and national resilience in the COVID-19 response.

In many communities, CHWs have been instrumental in COVID-19 public health messaging and communication, contact tracing and monitoring in medically underserved communities, navigation to vaccine and testing appointments, and even in conducting rapid antigen testing with the proper training and personal protective equipment. They have leveraged their established relationships and trust of their communities to dispel myths, advocate against evictions, help clients access their stimulus checks, and promote mental and physical health and resilience.4 CHWs have also expanded the capacity of social service organizations who have been on the front line throughout the pandemic, including homeless shelters, food pantries, and other agencies providing public assistance. The recent federal investments in CHWs, though overdue and time limited, should be leveraged to strengthen the workforce to address ongoing community health needs and prepare us for future public health crises.

## A WINDOW OF OPPORTUNITY

The political commitment needed to expand and sustain a robust CHW workforce was largely lacking until recently. In January 2022, a new bill was introduced in the Senate, S.3479- Building a Sustainable Workforce for Healthy Communities Act-which calls for investment in the sustainability of the CHW workforce and expands funding opportunities beyond state and local governments to include communitybased organizations. The success of this bill is yetto be determined, but, as with any policy, demonstrating success and positive ROI will be critical to its sustainability. Rigorous large-scale longitudinal evaluations of CHW programs with respect to health care use, health outcomes, and health system savings will become increasingly necessary. Heisler et al. provide an elegant blueprint for a health plan-implemented and potentially financially sustainable model whose evaluation can strengthen the evidence base for CHW effectiveness and cost-effectiveness.

Future studies should focus on longer-term impacts of CHW programs and should consider including patientcentered outcomes in their evaluation. A growing commitment to community engagement and patient-centeredness in public health research funding will also increase opportunities to engage CHWs as research partners,10 creating further opportunities for workforce expansion. Leveraging this current momentum and unique window of opportunity to strengthen and expand this critical workforce will require evidence-based practices8,11,12 for effective recruitment, training and certification, retention, evaluation, supervision, reimbursement, recognition, and remuneration of CHWs to ensure success and sustainability long beyond the COVID-19 pandemic. >4JPH

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# School Mandate and Influenza Vaccine Uptake Among Prekindergartners in New York City, 2012–2019

Hong, Kai, PhD; Lindley, Megan C, MPH; Tsai, Yuping, PhD; Zhou, Fangjun, PhD

ProQuest document link

## ABSTRACT (ENGLISH)

New York City (NYC) introduced a universal prekindergarten program in 2014 that mandated influenza vaccination for enrollment. We conducted a difference-in-difference-in-differences study to evaluate the program using 2012 to 2019 MarketScan claims data. After the introduction of the program, influenza vaccine uptake among four-year-old children in NYC during the subsequent seasons increased by 6.3 to 9.8 percentage points compared with the rest of New York State. (Am J Public Health. 2022;112(5): 719-723. https://doi.org/10.2105/AJPH.2022.306765)

## FULL TEXT

### Headnote

New York City (NYC) introduced a universal prekindergarten program in 2014 that mandated influenza vaccination for enrollment. We conducted a difference-in-difference-in-differences study to evaluate the program using 2012 to 2019 MarketScan claims data. After the introduction of the program, influenza vaccine uptake among four-year-old children in NYC during the subsequent seasons increased by 6.3 to 9.8 percentage points compared with the rest of New York State. (Am J Public Health. 2022;112(5): 719-723. https://doi.org/10.2105/AJPH.2022.306765)

School-entry vaccination mandates have been implemented in the United States to reduce the risk of vaccine-preventable disease outbreaks by increasing childhood vaccination coverage. Under such mandates, vaccination records are required for school entry, and students must be up-to-date on required vaccinations, with exemptions allowed under certain circumstances. Studies have shown that school-entry vaccination mandates effectively increase coverage with various vaccines,1 but there is limited evidence on influenza vaccination.2,3 One possible reason for this is lack of widely implemented school-entry mandates: until July 2020, there were only five states (Connecticut, New Jersey, Ohio, Pennsylvania, Rhode Island) and one city (New York City) mandating annual influenza vaccination for school entry, all at child care or preschool levels,4 probably because of political or legal backlash from parents who view influenza vaccination as optional. Influenza vaccination coverage among children aged six months to 17 years in the United States remains below the Healthy People 2030 target of 70%.5,6 Rigorous empirical evidence on the associations between school-entry mandates and influenza vaccination could be helpful for policymakers seeking to design strategies to increase children's influenza vaccination uptake.7

INTERVENTION

A universal prekindergarten (UPK) program in New York City (NYC) provided an opportunity to fill this knowledge gap. In the fall of 2014, NYC introduced Pre-Kfor All, a program that provided one year of free prekindergarten (Pre-K) education for approximately 53 000 four-year-old children born in 2010. Children residing in NYC were eligible for UPK starting in September of the year when they turned four years old. The program became universal in the fall of 2015; a seat was guaranteed for any eligible child who applied for enrollment. Since then, approximately 70 000 children have been enrolled yearly, accounting for about 60% of the four-year-old population in NYC. The program has built-in health policies, which has improved the health of children from low-income families.8 Specifically, NYC's UPK program requires a series of childhood vaccinations for enrollment, consistent with the requirement for Pre-K enrollment in New York State (NYS).9,10 Additionally, the NYC program requires one dose of influenza vaccine during the current influenza season by December 31 of the Pre-K school year, whereas NYS does not have such a requirement for Pre-K enrollment.9,10 A few exemptions are allowed in both NYC and NYS.7 A similar influenza vaccine mandate was introduced for city-regulated child care programs in 2014 without citywide program expansion.7 In total, the mandates affected about 150 000 children aged six to 59 months.

PLACE AND TIME

The program was implemented in NYC, which had an estimated population of 8269 194 in 2019, about 7.4% of which (613 571) comprised children aged younger than six years. In 2019, the rest of NYS had an estimated population of 10943 619, 6.6% of which (718 657) comprised children aged younger than six years.

The mandate was introduced with the UPK program in September 2014, was suspended in December 2015, and has been in force since being reinstated in June 2018. The mandate for city-regulated child care programs experienced the same suspension and reinstatement. We analyzed data from August 1,2012 through May 31,2019.

PERSON

The treatment group consisted of Pre-K-eligible children aged four years residing in NYC. The control group consisted of Pre-K-ineligible children residing in NYC (three or five years of age) or the rest of NYS (three through five years of age). We used the MarketScan Commercial Claims and Encounters databases that included children who were privately insured. Each year from 2012 to 2019, the percentage of children aged younger than six years with private health insurance was 46% to 51 % in NYC and 63% to 65% in the rest of NYS.

PURPOSE

The mandate was imposed to protect prekindergartners from getting and spreading influenza, especially to older or more medically vulnerable household members, and potentially to reduce community influenza spread.

IMPLEMENTATION

The mandate was enacted in 2014 by the NYC Board of Health and the NYC Department of Health and Mental Hygiene. In mid-December 2015, the mandate for influenza vaccination was suspended by the NYS lower courts in response to a lawsuit against the mandate; in June 2018, the highest court of NYS upheld and reinstated the mandate.7

EVALUATION

Usingthe 2012-2019 MarketScan Commercial Claims and Encounters databases,11 we used a difference-in-difference-in-differences (DDD) approach to evaluate whether the UPK program was associated with changes in children's influenza vaccination uptake (Appendix Figure A, available as a supplement to the online version of this article at http:// www.ajph.org). The data and methods are described in detail in the Appendix (Data and Measures, Methods).

Our study sample consisted of 279 941 observations of 178 873 children. Appendix Table A summarizes children's characteristics that were controlled in DDD analyses, by influenza season and birth cohort. Despite some statistical significance, overall, the differences in children's characteristics by age were small.

From the 2012-2013 to the 20182019 influenza season, influenza vaccination coverage in NYC increased from 53.1 % to 68.5% among three-year-old children, from 50.4% to 69.2% among four-year-old children, and from 47.2% to 55.3% among five-year-old children. During the same period, in the rest of NYS, influenza vaccination coverage increased from 56.8% to 60.1% among three-year-old children, from 54.5% to 55.6% among four-year-old children, and from 51.6% to 53.2% among five-year-old children (Table 1). The substantial increases in coverage among three- and four-year-old children in NYC were likely due to the influenza vaccination mandates introduced to child care and preschools.

Table 2 shows the estimated changes (in percentage points) in influenza vaccination uptake that were associated with the UPK program. After the introduction of UPK influenza vaccination mandate, uptake by four-year-old children in NYC increased by 6.3 percentage points (95% confidence interval [CI] = 2.5,12.0) during the 2014-2015 influenza season. The increase mostly occurred by the end of December, when the uptake increased by 5.5 percentage points (95% CI 5 1.5,13.3). The cumulative instantaneous probability of influenza vaccination further confirmed that the increases mainly occurred from mid-November to mid-January (Appendix Figure B).

We conducted several additional analyses (Table 2). First, we found no statistically significant association between a placebo UPK program in 2013 and influenza vaccination uptake during the 2013-2014 influenza season (-2.2 percentage points; 95% CI = -7.2, 5.0), validating our DDD strategy. Second, we found a stronger association afterthe full UPK rollout in the 2015-2016 influenza season (8.3 percentage points; 95% CI = 5.4,15.5). Third, there was no statistically significant association during the suspension of the mandate (-1.9 percentage points in the 2016-2017 influenza season, 95% CI 5 -4.9, 2.8; 0.5 percentage points in the 2017-2018 influenza season, 95% CI 5 -6.9, 5.9). Fourth, we obtained a statistically significant association after the reinstatement during the 2018-2019 influenza season (9.8 percentage points; 95% CI 5 7.5,15.9). Finally, the estimated associations differed by the age of children in the control group, probably affected by the mandate introduced to city-regulated child care that might increase influenza vaccination among three-year-old children. Meanwhile, five-year-old children were mostly in kindergartens, for which there was no influenza vaccine mandate. Detailed results from the main DDD and additional analyses are presented in Appendix Tables B through D.

Limitations include the fact that our study included privately insured children only. The associations for other children might be different.

ADVERSE EFFECTS

The mandate faces legal challenges and was suspended for two and half influenza seasons. Side effects of influenza vaccination were not systematically collected.

SUSTAINABILITY

During our study period, because of the legal challenge, the influenza vaccination mandate was implemented for only two and half influenza seasons. Longer-term evidence is needed to understand the sustainability. Influenza vaccinations for children are available at their pediatrician's or primary care doctor's office. Starting in January 2018, prekindergartners in NYS can also receive influenza vaccinations from certified pharmacists.

PUBLIC HEALTH SIGNIFICANCE

The NYC's UPK program successfully got more children vaccinated against influenza by mid-January, which is prior to the peak of influenza activity in the United States in most seasons.12 Our findings demonstrate that school-entry influenza vaccination mandates are potentially effective strategies to increase children's influenza vaccination uptake, particularly in a large urban environment with suboptimal coverage, and help protect other more vulnerable household and low-income community members. Mandating influenza vaccination together with other required vaccinations is feasible, although the effectiveness might be weaker when tracking systems of immunization histories have not been well established. Our evaluation provides useful information for policymakers about feasibility, benefits, and potential legal challenges, when they consider mandating influenza vaccination for school-aged children.

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

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CONTRIBUTORS

K. Hong contributed to conceptualization, methodology, software, validation, formalanalysis, investigation, data curation, writing (original draft), and writing (review and editing). M. C. Lindley contributed to conceptualization, investigation, validation, data curation, and writing (review and editing). Y. Tsai contributed to conceptualization, methodology, validation, data curation, and writing (review and editing). F. Zhou contributed to conceptualization, methodology, validation, data curation, and writing (review and editing). All authors provided final approvalof the version to be published.

CONFLICTS OF INTEREST

The authors report no conflicts of interest.

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As a secondary analysis of de-identified data, this study did not require institutionalreview board approval.

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Document 25 of 28

# Pandemic-Related Workplace Violence and Its Impact on Public Health Officials, March 2020–January 2021

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## ABSTRACT (ENGLISH)

Objectives. To characterize the experience and impact of pandemic-related workplace violence in the form of harassment and threats against public health officials. Methods. We used a mixed methods approach, combining media content and a national survey of local health departments (LHDs) in the United States, to identify harassment against public health officials from March 2020 to January 2021. We compared media-portrayed experiences, survey-reported experiences, and publicly reported position departures. Results. At least 1499 harassment experiences were identified by LHD survey respondents, representing 57% of responding departments. We also identified 222 position departures by public health officials nationally, 36% alongside reports of harassment. Public health officials described experiencing structural and political undermining of their professional duties, marginalization of their expertise, social villainization, and disillusionment. Many affected leaders remain in their positions. Conclusions. Interventions to reduce undermining, ostracizing, and intimidating acts against health officials are needed for a sustainable public health system. We recommend training leaders to respond to political conflict, improving colleague support networks, providing trauma-informed worker support, investing in long-term public health staffing and infrastructure, and establishing workplace violence reporting systems and legal protections.

## FULL TEXT

### Headnote

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Results. At least 1499 harassment experiences were identified by LHD survey respondents, representing 57% of responding departments. We also identified 222 position departures by public health officials nationally, 36% alongside reports of harassment. Public health officials described experiencing structural and political undermining of their professional duties, marginalization of their expertise, social villainization, and disillusionment. Many affected leaders remain in their positions.

Conclusions. Interventions to reduce undermining, ostracizing, and intimidating acts against health officials are needed for a sustainable public health system. We recommend training leaders to respond to political conflict, improving colleague support networks, providing trauma-informed worker support, investing in long-term public health staffing and infrastructure, and establishing workplace violence reporting systems and legal protections. (Am J Public Health. 2022;112(5):736-746. https://doi.org/ 10.2105/AJPH.2021.306649)

The COVID-19 pandemic imposed social, economic, and health burdens on individuals and communities; strained health systems; and thrust public health into the spotlight. An immediate rise in attention on public health interventions nationally1 was shadowed by reports of public backlash.2,3 By June 2020, journalists were reporting cases of social media insults, doxing campaigns (i.e., public distribution of personal information), protests, and armed threats against public health officials.4 By August 2020, conflict-related resignations and firings were also reported.5 According to the National Institute for Occupational Safety and Health, such nonphysical violence (e.g., threats, harassment) and physical violence (e.g., assaults) directed at people while at work, like the acts targeting public health officials, constitute workplace violence.6

Public health officials are hired or appointed to a state health department (SHD) or local health department (LHD) as public servants. They work to protect and promote the health of all populations within their jurisdiction, including the responsibility to create, champion, and implement laws that affect health.7 Thus, for public health officials, residents of their jurisdiction are analogous to patients in a health care setting. In health care settings, such as emergency departments, nonphysical workplace violence perpetrated by patients has been associated with reduced job satisfaction and burnout.8 The experiences and consequences of nonphysical workplace violence in the form of harassment or threats from the public directed at public health officials remain unexplored. In addition, how such interactions may affect pre-existing public health workforce concerns related to job satisfaction, morale, and turnover is unknown.9-11

A team of public health policy researchers and practitioners, including an occupational health nurse and a former employee of the National Association of County and City Health Officials (NACCHO), collaborated with NACCHO to understand the extent of public health officials' pandemic-related experiences of violence in the form of harassment and threats. Our aim was to characterize the experience and impact of such acts on public health officials during the first 10 months of the COVID-19 pandemic. We selected a mixed methods approach to enrich and contextualize media reports. We discuss our findings in terms of nonphysical workplace violence implications on the public health workforce.

## METHODS

We employed a convergent parallel mixed methods study design, an approach in which data are collected from multiple complementary sources in parallel, then jointly analyzed to generate a more complete understanding of a phenomenon within a time-sensitive context (Figure A, available as a supplement to the online version of this article at http://www.ajph.org).12 The complementary sources leveraged were media content and a quantitative survey. The media content included a compilation of actual or threatened departures of public health officials and descriptive narratives for each case, derived primarily from local and national media coverage. The quantitative survey was developed by NACCHO and fielded among the LHD officials that comprise their membership.

### Media Content

We developed an Excel-based database of media-reported departures or threatened departures among US state and local public health officials (e.g., health officers, directors, commissioners), with or without experiences of harassment or other forms ofviolence between March 2020 and January 2021. To ensure thoroughness, we began with a Kaiser Health News and Associated Press (Kaiser/ AP) deidentified, jurisdiction-level list of 190 position departures (April 2020-mid-January 2021 ).13 Kaiser/AP journalists systematically compiled the original list, verifying each case through public sources or direct communication.13 We cross-referenced the Kaiser/AP list with departures reported to NACCHO. We also performed our own online search, inclusive of the full study period. Our search terms included location, position titles, and "resign·" or "depart·." Departures identified by our team were shared and confirmed by Kaiser/AP.

Next, the research team conducted in-depth reviews of each case to identify potentially relevant contextual factors and drivers of departure. For each case, we consulted supplementary sources until we exhausted public sources or reached saturation. Supplementary sources included departments' or officials' social media accounts, local boards of health meeting minutes, etc. (Figure A). We drafted summarizing narratives, capturing these details alongside descriptive or explanatory quotes. We analyzed the narratives by using an iterative process including inductive and deductive coding to identify cross-cutting themes and representative quotes. Separately, we extracted available data on identified public health officials' race, gender, and time in position; departure type (e.g., resigned, fired, retired, other, or not departed); departure date (where applicable); geographic characteristics (e.g., urban, rural jurisdiction); mention of workplace violence (e.g., threats or harassment); and mention of potentially precipitating policy event(s) (e.g., recent mask mandate, gathering restrictions). We calculated descriptive statistics by using Stata version 16.1 to quantitize media-portrayed case characteristics.14

### Quantitative Local Health Department Survey

From October 2020 to February 2021, NACCHO fielded the Harassment and Changes in Local Health Department Roles and Authority supplemental survey module, a complement to the Forces of Change survey of LHDs' perceived public health infrastructure needs.15 Subject-matter experts developed the supplemental module, which was piloted by NACCHO before fielding. The module was sent to NACCHO's full census of LHDs (n = 2430), administered online, and completed by the local public health official or their designee. SHDs were not surveyed.

The survey module included 2 multiple-choice harassment questions. Specifically, respondents were asked to "report any harassment of health officials or your agency in response to COVID-19 that has occurred between March 2020 and today." The 10 response options included general social media backlash; individually targeted messages; public broadcasting of personal contact information ("doxing"); direct threats to personal or family safety; coordinated demonstrations online, in a public setting, or at a personal residence or other private setting; vandalism of public property or personal property; and other (unspecified). Respondents indicated whether actions were targeted at the LHD, LHD leadership, or other personnel. Multiple selections were allowed. This article focuses on acts targeting leaders or affecting whole departments. Separately, respondents were also asked, "Have any agency leaders or other personnel resigned, been reassigned or been fired from your local health department specifically due to conflicts between public and political leaders or due to political pressure related to your COVID-19 response?" We focus on conflict-motivated departures among leaders. Staff experiences and departures are not directly discussed. We used Stata version 16 to calculate descriptive statistics.14

### Quantified and Thematic Merged Analysis

We proportionately compared quantitized components of the media content with quantitative survey results. We assessed qualitative themes to examine experiential trends. Finally, we examined media content, survey results, and qualitative themes in unison to mutually clarify and validate findings. For participant validation, resulting inferences were discussed with a self-selected national sample of 30 public health officials at NACCHO's annual conference. Session participants assessed resonance of themes through anonymous polls and provided unstructured feedback in 3 online discussion groups.

## RESULTS

From March 2020 to January 2021, a total of 256 cases, including 120 resignations, 58 retirements, 20 firings, 24 other departures, and 34 threatened nondepartures, were identified in media reports. These cases represented 42 states, involving 51 SHD and 205 LHD officials. Analyzed by departure date, we found a sustained spike in retirements beginning in May 2020 and a bimodal curve of resignations, peaking in July 2020 and again in December 2020 (Figure B, available as a supplement to the online version of this article at http://www.ajph.org). Table 1 presents characteristics of the media-profiled cases. Across SHDs and LHDs, most leaders were White and female, consistent with public health leadership majority demographics; Black or Asian leaders were disproportionately affected (n = 26/256; 10%).16 LHD cases were regionally overrepresentative of the Midwest (n = 75/205; 37%) and West (n 5 83/205; 40%). SHD cases were regionally overrepresentative of the South (n 5 18/51; 35%). Approximately half of LHD cases occurred in rural jurisdictions (n 5 110/205; 54%). Policy precipitators of leadership turnover were not identified in most cases; where they were, mask mandates and multiple COVID-19 prevention policies were most frequently reported. Policy-associated departures tended to be from LHDs (n 5 76/205; 37%) rather than SHDs (n 5 11/51; 21%).

### Quantitative Local Health Department Survey

From a total of 2430 LHDs, 583 responded to the survey (response rate: 24%; Table 2). The median and mean survey completion dates were November 25, 2020, and December 1 1,2020. Responding departments were proportionately distributed across the Northeast, South, and Midwest but underrepresented the West (n 5 119/550 [22%]; n 5 206/731 [28%]; n 5 208/855 [24%]; and n 5 50/323 [15%], respectively).17 Median population size of represented communities was 34097 (range 5 76-2 387 728; data not shown). In total, 1499 acknowledgments of harassment targeting leadership, staff, or the LHD were reported by 335 departments (57%). The most common leadership-targeted act was general backlash through social media (n 5 194/583), followed by individually targeted, not directly threatening messages (n 5 173/583). Of 583 responding LHDs, 32 agency leaders from 25 departments resigned, were reassigned, or were fired due to political pressure or conflict. Thus, 4.6% of responding LHDs reported leadership departures related to political pressure or conflict (data not shown).

### Quantified Merged Analysis

Across the media content and the survey responses, we found proportionately similar experiences of harassment. Overall, 43% of LHD survey respondents reported 1 or more leadership-targeted forms of harassment (n 5 253/583). Similarly, in the media content, 44% of SHD and LHD officials described experiencing at least 1 form of harassment (n 5 112/ 256). Harassment experiences were reported by 36% of officials who left their positions (n 5 80/222). Across both data sources, threats to individual or family safety affected 9% to 12% of officials (n 5 30/256 cases; n 5 55/ 583 respondents) and 15% of surveyed departments (n 5 88/583). Position departure was associated with one third ofthe 30 SHD and LHD cases involving direct threats (n 5 10/30; 7 by resignation). Demonstrations at private residences were reported in 2% of media cases (n 5 6/256), targeting 2% of survey respondents' leadership (n 5 12/583) and affecting 2% of responding LHDs (n 5 14/583). Doxing was described as affecting approximately 3% of officials by the media (n 5 7/256) and 7% of LHD officials on the survey (n = 42/583). One SHD departure was associated with residential protests and doxing, each. Social media backlash (such as Facebook groups calling for firings or circulating personal insults) and individually directed messages (such as e-mails or phone calls calling the health official "evil" or racial or gendered slurs) were reported by a larger portion of survey respondents than were portrayed by the media (Table 2).

Within the media analysis, COVID-19related public protests were the category of harassment that differed most across SHDs and LHDs. Public protests were reported in 50% of SHD cases (n = 25/51) but just 13% of LHD cases (n = 27/205). Similarly, 10% of survey respondents reported that their LHD experienced public protests (n = 60/583).

Thematic Merged Analysis

Five themes emerged from the qualitative analysis of descriptive narratives, considered alongside the quantitized media content and LHD survey. Leaders described dealing with underrecognized expertise, an underresourced infrastructure, villainization, politicization, and disillusionment stemming from disrupted work-life balance and frustration with the constraints placed upon their professional capacities (Table 3). Member-checking polls indicated strong support across all themes, with at least 90% of members indicating they personally experienced the theme or observed it in other public health leaders.

Underrecognized expertise. Among public health officials who resigned during the pandemic, many indicated that their expertise had been marginalized and disregarded. They identified multiple public health issues as co-occurring with the pandemic, including extreme weather events, an influx of vapingrelated injuries, and calls to action on longstanding social inequities. All these emergent issues demanded public health expertise, yet public health officials believed their responses to these needs were underappreciated, criticized in personal attacks, and further constrained by forces beyond their control.

"Matchsticks and Scotch tape" infrastructure. Across media reports, officials lamented the limitations of the public health system's infrastructure, describing it as underfunded, understaffed, and decapacitated. They cited outdated information technology as complicating time-sensitive processes and delaying contact tracing. Social media offered an affordable and accessible platform for disseminating public health information but also made leaders and agencies vulnerable to public backlash. Position vacancies added to tensions. Several states (e.g., Colorado, Washington, Montana) responded to leadership departures by uniting multiple counties under a single public health official, compounding system strain and workforce limitations.

The lifesaving villain. Although many officials felt poorly positioned to leverage their expertise, many also felt overly situated as the villain of the policy response. In our media analysis, departures identified as potentially precipitated by mask mandates, business closures, or other policies or policy reversals were more common in LHDs (n 5 76/205) than SHDs (n = 11/51). Particularly in rural communities, health officials described challenges in being the public representative of a policy that was not always within their authority to decide. The role of the villain, as described by affected public health officials, was often juxtaposed with the official's previous persona as a public servant and a trusted community member.

Politicized public health. In discussing the trajectory of the public health response, leaders both eschewed and embraced politics as essential to infrastructure needs and policy interventions. Political threats and job insecurities were not explicitly included in the 10 harassment categories used to analyze survey responses and media content. However, 4.6% of LHD survey respondents reported experiencing leadership turnover because of political pressure or conflict. Many media profiles coded as "other" forms of harassment similarly met these descriptions. For example, one former official described masking policies as being perceived as oppositional to economic interests; another described adequate departmental funding as being contingent upon continued political favor with the governor. Public health officials found it a "tough balance" to strike when political messaging and priorities were not aligned with public health priorities. For the public health official, the consequence was often confusion or a sense of futility.

Disillusionment. Across media accounts, public health officials described grappling with colliding identities as neighbors, parents, health care providers, and protectors. They described confusion and frustration with their sudden shift from being a trusted friend and public servant to being the face of an imperfect response or the leader of an attack on personal liberties. Some described conflict between the aspiration of their mission and the reality of their limited capacities. They described overwhelming professional demands, inadequate infrastructure, and fatigue alongside worry for their families and grief for their own losses. Across departure statuses and duration oftime in leadership, a personal reassessment of the meaning, purpose, and sustainability of mission-driven work was ubiquitous.

## DISCUSSION

Consistent with national reporting,18 our research identified high occurrence of harassment directed at public health officials from March 2020 to January 2021 and substantial turnover in public health leadership positions. A national survey of 583 LHDs (fielded October 2020-February 2021) identified 1499 reports of unique forms and targets of harassment across 57% of responding departments. Of surveyed officials, 43% said they had been targeted. Whether directly targeted or responsible for an affected department's operations, LHD officials were impacted. Across roughly 2500 SHDs and LHDs, we identified 222 public health officials who left their positions between March 2020 and January 2021. Of departures, 36% occurred alongside reports of harassment. However, our findings indicated that the relationship between leadership departures, harassment, and personal threats may not be as direct as a cursory review would imply.

Across media and survey sources, we found that a substantial portion of public health officials who experienced personal threats did not resign. Although 9% of surveyed officials (n = 55/583) and 15% of departments (n = 88/583) reported direct threats to individual or family safety, our media analysis only identified 10 safety threats that resulted in leadership departures (n = 10/256; 4%). Similarly, the specific experiences of residential protests and doxing appear to be relatively rare and generallyseparate phenomena from leadership resignations. Presuming leadership departures were primarily driven by threats to personal safety may oversimplify the larger dynamic of nonphysical workplace violence. Safety and retention interventions are warranted, but other, potentially more common and complex victim experiences pose additional workforce concerns. A Centers for Disease Control and Prevention survey of more than 26 000 public health workers in April 2021 identified symptoms of mental health conditions among half of respondents, including 37% with symptoms of posttraumatic stress disorder.19 Many leaders and staff remained in their roles despite experiencing direct threats and other violence, calling for a detailed examination ofwhat trauma-informed workforce protections and supportive services are needed.

Public hostilities, leadership targeting, and public health workforce turnover are incompletely understood through quantified analysis alone. A fuller understanding of the scope, scale, and consequences of harassment within the context of nonphysical workplace violence requires a synthesis of insights from the affected individuals. Our analysis of public health officials' perspectives on pandemic experiences and departures revealed that despite intense demand for their work, public health officials believed their expertise was underrecognized and underappreciated. They described a public health infrastructure that was underfunded and understaffed. Social media was effective for overcoming communication limitations and disseminating information widely. However, it also made officials highly visible and accessible to a public primed to react to policy changes, potentially facilitating villainization of the public health official. Constrained by poor infrastructure, politics, and the backlash of the public they aimed to protect, public health officials described grappling with personal and professional disillusionment, torn between what they felt they should do and their limited ability to pursue it. For some, the conflict was untenable. For those who remain, the reassessment of purpose, tactics, and capacities may have enduring effects.

Previous research by Caillier on workplace aggression against federal government leaders and staff identified experiences of undermining conditions and behaviors (e.g., disregarded expertise, mismatches between demand and infrastructure capacity, political gamesmanship) and ostracizing (e.g., public villainization) as being a particularly toxic combination of stressors, predictive of lower work-stress tolerance and loss of meaningfulness in work.20 In our research, public health officials' descriptions of disillusionment may have been a consequence of this ostracizing and undermining dynamic. Caillier's research further identified that additional exposures to intimidation (e.g., through threatening messages or acts) compounded the stressors and predicted 1.8 times higher likelihood of intention to resign.20 This suggests that there may be opportunity to reduce position departures amid public backlash by ensuring workers' personal and professional safety, combined with efforts to strengthen public health system capacities, preparing leaders to respond to political conflict, and developing more cohesive and supportive public health networks.

### Limitations

These interpretations should be considered alongside some limitations. Specifically, our media content may not be comprehensive for incidents of harassment because of our search's emphasis on leadership departures. This focus, combined with the media's potentially selective reporting, may bias our analysis toward overstated associations between public hostility and workforce turnover. Conversely, the media analysis may have been conservative in limiting identified contextual factors to within-jurisdiction characteristics. Instead, events leading to departures in one county may influence events and turnover in another.

We sought to buffer these limitations with a national survey of LHD experiences of harassment. However, given COVID-19 demands on LHDs, the low response rate of 24% may be biased toward more affected departments. Alternatively, most affected departments may have been less responsive because of overwhelming workloads. Either selection bias could limit generalizability. Noninclusion of SHDs is also a limitation. However, the proportionate concordance of harassment experiences reported across survey respondents and media-profiled cases implies a legitimacy of findings, bolstered through intentional source integration. Resulting inferences, conveyed through the 5 themes presented, were confirmed through member checking. Member affirmations suggested that pervasive challenges may transcend pandemic-specific drivers of public backlash. We examined 1 period within the pandemic; experiences ofviolence continued.18 More formalized reporting systems are needed to detect, monitor, and respond to work-related harassment. Future research should examine disparities in victimization by race, possible sociopolitical characteristics associated with SHDs and LHDs affected by such violence, and restorative workforce interventions that validate public health leaders' expertise.

Public Health Implications

Presuming leadership departures were primarily driven by threats to personal safety may oversimplify the larger dynamic of workplace violence and overlook needed workforce protections and assurances. During the COVID-19 pandemic and other co-occurring public health challenges, public health officials described experiencing threats and intimidation, social villainization and exclusion, and the undermining of their professional duties by poorly aligned politics and an inadequate public health infrastructure. These conditions maximize concerns for stress intolerance, loss of meaning in work, and increased turnover.20 In a field where recruitment and retention relies on mission commitment and meaningful work, stress intolerance and loss of perceived meaningfulness among leadership could be detrimental to the discipline, regardless of whether turnover directly results.10,21

Coordinated interventions are needed to minimize the threat of undermining, ostracizing, and intimidation. First, stronger collaborations with the political sector and leadership training in health policy, advocacy, and media management may help counteract messages of underappreciation and improve system capacities. Second, colleague networks that promote belonging and reinforce strategies for balancing professional ideals alongside system constraints, potentially following models of new graduate nursing consortiums in health care, should be considered.22 Third, long-term staffing and infrastructure investments that support reintroduction of comprehensive programming while retaining surge capacity are needed.23 Finally, safety assurances must be promoted throughout the public health workforce, beginning with better reporting systems and increased awareness and access to legal protections.24 No public health employee should be made to feel unsafe or devalued for protecting the health and safety of the public. Collectively, these strategies will begin to prioritize worker safety and well-being as a core function of all health departments, an essential step toward creating a more enduring public health system. AJPU

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All authors conceptualized the work and provided critical draft revisions.J.A. Ward, E.M. Stone, and P. Mui collected the data. J. A. Ward and E. M. Stone performed the analysis.J.A. Ward led article drafts and revisions. B. Resnick and P. Mui secured funding and provided supervision. All authors approved the final article as submitted and agree to be accountable for all aspects of the work.

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The authors declare no conflicts of interest.

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This study was reviewed and approved as not human participant research by the Johns Hopkins Bloomberg Schoolof Public Health institutional review board.

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## DETAILS

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Document 26 of 28

# GLOBAL NEWS

Anonymous

ProQuest document link

## ABSTRACT (ENGLISH)

The Pan American Health Organization and Amnesty International have called on governments to do more to protect health care workers, for example, by distributing simple, accessible information to combat the spread of misinformation. The authors found that the injury rate was higher in rural and remote areas than in urban areas and that a decline in firearm-related injuries occurred over the study period. Out-of-hospital disputes were also an important cause of serious hospital violence (11%). [...]interviewed health care workers expressed an urgent need for legislation, increased security, and training to handle disputes to prevent the violent incidents against health care workers and protect their safety.

## FULL TEXT

COVID-19 Misinformation Sparks Threats and Violence Against Doctors in Latin America

Mexico, Colombia, and Argentina

Taylor describes an increase in reports of health care workers being attacked, intimidated, and evicted from their homes during the COVID-19 pandemic in Colombia. As of April 28, 2020, Mexico has documented at least 47 cases of aggression toward health care workers and 265 complaints regarding discrimination because of COVID-19 among health care workers. Taylor suggests that the spread of misinformation, a history of violence in some Latin American countries, and a loss of trust in government could partly explain a lack of trust in doctors. To protect health care workers from abuse, Buenos Aires, Argentina, is issuing fines against people who perpetrate the abuse. The Pan American Health Organization and Amnesty International have called on governments to do more to protect health care workers, for example, by distributing simple, accessible information to combat the spread of misinformation.

Citation. Taylor L. COVID-19 misinformation sparks threats and violence against doctors in Latin America. BMJ. 2020;370:m3088. https://doi.org/10.1136/bmj.m3088.

A Cholera Vaccination Campaign in a COVID-19 Environment

Cameroon, Africa

Cameroon has one of the highest cholera case fatality rates in the world, exhibiting an upward trend higher than 4%. In response, the Cameroon Ministry of Public Health organized an oral cholera vaccination campaign involving 2244 mobilizers and vaccinators to target the south, littoral, and southwest regions. Amani et al. assessed best practices and lessons learned from the campaign in 2020. The vaccine coverage rates varied widely by region (littoral was the lowest at 38.6%) and age (the 20 years and older group was the lowest), and were low overall (64%). Inadequate COVID-19 supplies, staff testing frequency, and distancing indicated that the challenge was to provide the vaccine to those who wanted it. The authors strongly recommend increasing communication activities at least 2 weeks before campaign implementation.

Citation. Amani A, Fouda AAB, Nangmo AJ, et al. Reactive mass vaccination campaign against cholera in the

COVID-19 context in Cameroon: challenges, best practices and lessons learned. Pan Afr MedJ. 2021;38:392. https://doi.org/10.11604/ pamj.2021.38.392.27754

Burden of Firearm-Related Injuries

New South Wales, Australia

Negin et al. highlight a gap in knowledge regarding gun violence in Australia with the aim of characterizing the burden and risk factors of firearm-related injuries in New South Wales. The authors use population-based record linkage data from January 1,2002 through December 31,2016 to explore firearm-related injuries resulting from assault, intentional self-harm, and accidents. Among the 2390 people included in the study, firearm-related injuries were mostly attributable to assault (36%), followed closely by self-harm (33%). The authors found that the injury rate was higher in rural and remote areas than in urban areas and that a decline in firearm-related injuries occurred over the study period. The highest rate of firearm injuries resulting from self-harm was among people older than 60 years. Negin et al. emphasize that these results can help develop strategies for people at higher risk of experiencing harm from firearm-related injuries.

Citation. Negin J, Bell J, Ivancic L, Alpers P, Nassar N. Gun violence in Australia, 2002-2016: a cohort study. Med J Aust. 2021;215(9):414-420. https://doi.org/10.5694/mja2.51251

Characteristics of Violent Incidents in Chinese Hospitals and Health Care Workers' Needs

China

Violence against health care workers is a growing public health issue. Ma et al. analyzed and described 341 violent incidents in hospitals from the China Judgments Online System. Additionally, the authors selected 72 health care workers from 20 secondary and tertiary hospitals in China for semistructured interviews. Most violent incidents (63%) were prompted by patient death or treatment dissatisfaction. Perpetrators were mainly males (80%), had attained high school education or less (87%), and were part of the patient's family (76%). Out-of-hospital disputes were also an important cause of serious hospital violence (11%). Moreover, interviewed health care workers expressed an urgent need for legislation, increased security, and training to handle disputes to prevent the violent incidents against health care workers and protect their safety.

Citation. Ma Y, Wang L, Wang Y, et al. Causes of hospital violence, characteristics of perpetrators, and prevention and control measures: a case analysis of 341 serious hospital violence incidents in China. Front Public Health. 2022;9:783137. https://doi.org/10.3389/fpubh.2021.783137

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Document 27 of 28

# Violence and the COVID-19 Pandemic: A Public Health of Consequence, May 2022

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

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## ABSTRACT (ENGLISH)

As the COVID-19 pandemic continues, with more than 900 000 COVID-19-related deaths in the United States as of February 2022, so do the parallel pandemics of fear, despair, anxiety, anger, and depression as lockdown measures, social and physical distancing, economic repercussions, government-mandated restrictions, and beliefs in conspiracy theories and scapegoating persist. At a population level, this combination of factors is fueling widespread xenophobia, White nationalism, and antigovernment sentiments that will have a profound impact on the fabric of our society and cascading impacts on population-level health and well-being. In this issue, and also highlighted in previous issues of AJPH, we describe the rise in hate crimes, violence, and harassment toward Asian Americans and public health practitioners. While seemingly distinct groups, a closer consideration reveals similarities in how these experiences with violence, hate crimes, and harassment are linked to sociostructural and political drivers of population-level health.

## FULL TEXT

As the COVID-19 pandemic continues, with more than 900 000 COVID-19-related deaths in the United States as of February 2022, so do the parallel pandemics of fear, despair, anxiety, anger, and depression as lockdown measures, social and physical distancing, economic repercussions, government-mandated restrictions, and beliefs in conspiracy theories and scapegoating persist. At a population level, this combination of factors is fueling widespread xenophobia, White nationalism, and antigovernment sentiments that will have a profound impact on the fabric of our society and cascading impacts on population-level health and well-being. In this issue, and also highlighted in previous issues of AJPH, we describe the rise in hate crimes, violence, and harassment toward Asian Americans and public health practitioners. While seemingly distinct groups, a closer consideration reveals similarities in how these experiences with violence, hate crimes, and harassment are linked to sociostructural and political drivers of population-level health.

### ANTI-ASIAN HATE CRIMES AND VIOLENCE

Hohl et al. (https://bit.ly/3hPVNxe) utilized space-time scan statistics to identify geolocated clusters of hateful anti-Asian tweets sent between November 2019 and May 2020 in the United States. The authors identified 15 different geographical clusters that ranged in size from one county to 558 counties. What is compelling about these findings is the wide geographic distribution of cluster locations across the United States, with no clear regional differences. The presence of anti-Asian sentiments on social media across these clusters is aptly described by Hswen (https://bit.ly/3vSmlGv) as "the graffiti of the online world." However, the reach of this graffiti is no longer confined to local spaces but is viewed by the hundreds of millions of Twitter users across the United States and the world. Hswen and other authors[1,2] have described the roots of anti-Asian xenophobia and sentiment that gave rise to structural discrimination and violence against Asians in the United States. The current escalation of anti-Asian rhetoric on social media not only amplifies this history but also portends a dangerous trend in which social media can continue to be weaponized to invoke discrimination and violence against Asian Americans.

In the United States, according to recent Federal Bureau of Investigation statistics (https://bit.ly/3AbjsAt), rates of hate crimes, including assault, against Asian Americans increased by 77% between 2019 and 2020, and in a recent poll by NPR, Robert Wood Johnson Foundation, and Harvard T. H. Chan School of Public Health, one in four Asian American households reported being afraid of a physical threat or attack because of their ethnicity (https://n.pr/3GFtbBy). The impact of these increases in violence, hate crimes, and discrimination against Asian Americans has already exacerbated mental health burdens at a population level.[3] A recent study conducted by the Asian American Psychological Association of Asian Americans and Native Hawaiians/Pacific Islanders found that more than 40% of respondents reported experiencing current mental and physical health burdens, including anxiety, depression, and poor self-rated health (https://bit.ly/3gr4ux8). Moreover, rates of mental distress were higher among Asian Americans and Native Hawaiians/Pacific Islanders who were young adults aged between 18 and 24 years, low wage earners (< $25 000 annual income), US-born, female or nonbinary adults, Southeast Asian Americans, and multiethnic Asian Americans.

### THREATS AGAINST PUBLIC HEALTH OFFICIALS

Ward et al. (p. 736) present findings from a mixed methods study employing both media content analysis and a national survey of local health department (LHD) officials. Their findings present troubling data on the threats of violence, harassment, and intimidation experienced by LHD officials. Among participating LHDs, 57% reported harassment directed at the leadership or the staff; 33.9% of these threats were delivered via social media. Not only were staff and officials threatened but so was the safety of family members. In short, the breadth and depth of harassment experienced by public health officials over these past two years has again been fueled by social media graffiti that include insults, threats, doxing, and political pressure. And, as Yeager notes, (p. 734) the path forward will be a challenging one-for both the staff and leadership at LHDs as well as for the public. While better funding, better infrastructure, and a stronger commitment of support from government officials is essential, so too is understanding how LHD staff and leadership can regain the confidence and trust of the public. A related suggestion to the call by Ward et al. and Yeager for leadership institutes is additional leadership, advocacy, and communication training in public health graduate programs.

## WHERE TO FROM HERE?

The reports by Hohl et al. and Ward et al., while vastly different in methodology and populations studied, remind us that social and political processes are fundamental drivers of a public health of consequence and that neither can be ignored if we seek to improve population health.

First, racism, discrimination, and all forms of marginalization-social, economic, and political-are incontrovertibly accepted and acknowledged drivers of violence and hate crimes. For minority groups such as Asian Americans, who have complex histories and complicated recognition in the United States, we cannot undervalue the impact of these forces on experiences of violence and victimization and, in turn, on population-level health outcomes. The growing evidence base linking discrimination and experiences with violence, as well as fear of violence, with increases in adverse mental and physical health problems also provides a platform for public health action to mitigate these harms.

Second, we must recognize that the threats of violence and ongoing harassment experienced by the local and state health department workforce are a reflection of system-wide failures. Starting now and moving forward, we must ensure safe work environments for public health practitioners and their families. This is an essential requirement and warrants necessary safeguards as detailed in a letter from the National Association of County and City Health Officials to the US Attorney General (https://bit.ly/3Aa8paO). Public health advocates, across the political spectrum, need to recognize that to fulfill the mission of delivering a public health of consequence, adequate and long-term investments in local and state health departments are required. Such investments are necessary not only to rebuild the public health workforce-necessary before the pandemic and now more so because ofthe increase in pandemic-related resignations-but also to reestablish the public's confidence and trust in our public health enterprise. Achieving these two goals, after a prolonged period of disinvestment and loss of public confidence, will be no easy feat and requires the political will to prioritize long-term public health action over short-term gains.4 This is also a step toward developing a public health infrastructure that is prepared to handle the next pandemic or public health crisis.

Finally, the conspiracy theories and scapegoating that stoke violence and harassment across populations and workforce groups need to be countered by public health communication and messaging that is authoritative and trusted. Perhaps the most important lesson to be learned from this pandemic is that we are all responsible for countering misinformation and communicating public health findings to create a society that values public health as a public good for all.

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Document 28 of 28

# Scaling the Strong Start Birth Centers: Promoting Equitable Maternity Outcomes

Ulrich, Suzan, DrPH MSN MN CNM [1] [1] School of Nursing at George Washington University, Washington, DC

ProQuest document link

## ABSTRACT (ENGLISH)

Implementing birth centers can transform the failing maternity care system in the United States. The Centers for Medicare and Medicaid Innovation concluded that birth centers in their Strong Start for Mothers and Newborns initiative reduced preterm births and babies born at low birth weight (LBW) for Medicaid beneficiaries.1,2 Birth centers are uncommon in the United States and deviate from the highly interventive care provided in hospitals. The midwifery model of care, which is characterized by individualized education and timeintensive, holistic care focused on promoting physiologic childbearing, is provided in birth centers. Increasing access to birth centers could improve pregnancy outcomes and decrease cost.3-5

## FULL TEXT

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PREMATURE BIRTHS AND LOW-BIRTH-WEIGHT NEWBORNS

Prematurity and infants born at LBW are intractable problems for the US health care system, which spends more money than any other country on maternity care yet has the worst outcomes of all high-income countires.6 Infants born prematurely have a higher incidence of death and disabilities than infants born at term.7 The prematurity rate for Blacks in 2019 was 14.39%, compared with 9.26% for Whites.8

Burris et al. positthat Blacks consistently have disparate pregnancy outcomes because of long-standing inequities.9 A retrospective study found a 25% increase in preterm births for Blacks living in the most segregated and deprived locales compared with Blacks living in the most integrated and privileged areas.10 Blacks living with institutional, interpersonal, and internalized racism experience chronic stress described as "weathering" by Geronimus.11 A systematic review of 28 studies found that experiencing racism predicted higher allostatic load and poorer pregnancy outcomes.12 Chambers et al. conducted focus groups to understand the lived experience of racism.13 Participants related experiencing discrimination and inadequate medical care and expressed a desire for providers who looked like them.

## TRANSFORMING MATERNITY CARE

It is time to replace care that focuses on pathology with the midwifery model of care, which focuses on promoting normal physiologic birth and is consistently practiced in birth centers.5 Evidence of quality outcomes at birth centers has been consistent from the evaluation of the first birth center demonstration project in 197814tothe study of the Strong Start Initiative for Mothers and Newborns.3-5,15,16 Safety of birth centers relies on collaborative practice, as defined by the Standards for Birth Centers, which ensures appropriate levels of care for all birthing situations.5 An integrative literature review appraised 23 studies using 14 data sets and nine qualitative studies of perinatal outcomes for 84000 births in international birth centers from 1980 to 2011 and found birth center care was safe and resulted in fewer inductions of labor, cesarean deliveries, and operative deliveries.17

Dubay et al. highlighted the impact of the five-year initiative by the Centers for Medicare and Medicaid Innovation comparing three alternatives to traditional maternity care: the birth center model of care, group prenatal care, and maternity care homes.3 Outcomes for 52% of Strong Start participants in the three enhanced models of care were compared with a matched group of Medicaid clients within the same counties who received traditional care. Strong Start birth centers reported prematurity rates 2.2 percentage points lower than the comparison group (6.3% vs 8.5%; P <.001), LBW rates 1.5 percentage points lower than comparison group (5.9% vs 7.4%;
P <.05), 11.5 percentage points fewer cesarean deliveries (17.5% vs 29.0%; P <.001), and 11.7 percentage points more vaginal births following cesarean deliveries (24.2% vs 12.5%; P< .01) while the other two models of care had outcomes similar to traditional care except group prenatal care showed a slight cost saving. Birth centers also saved $2010 per birth.

A study compared the birth outcomes of 6424 Medicaid beneficiaries from 45 Strong Start birth centers with outcomes for 3 945 875 births reported on national birth certificates.18 The sociodemographic characteristics of birth center participants mirrored national data except birth center clients were more likely to be adolescents, unmarried, and White. Birth center clients had histories with more preterm births, smoking, domestic violence, and drug usage. Midwives provided most of the care in birth centers with transfers to hospitals and collaborating physicians when necessary. Physicians attended 89.7% of births in the national group and midwives attended 8.5%. More birth center clients gave birth at home or in the birth center (65.4%) in contrast to the 98.5% of national births occurring in hospitals. In Strong Start birth centers, the LBW rate was 3.7% compared with 8.2% nationally, and the prematurity rate was 4.4%, half the national rate of 9.9%. Black babies in the Strong Start group had a prematurity rate of 5.1 % compared with the national rate of 13.8%. Birth center clients had fewer labor inductions and cesarean deliveries.

To determine what women receiving enhanced prenatal care in the three Strong Start models thought about these enhancements, 133 focus groups including 951 women were held.19 Participants appreciated the additional time spent in prenatal visits, supportive relationships they developed with the providers, intensive education concerning breastfeeding and family planning, engagement of family members in the childbearing process, and referrals to meet financial and social needs.

## BIRTH CENTERS AND MIDWIVES

There have been many calls for reforming the maternity care system in the United States because of high cost and poor outcomes, especially persistent racial disparities.20-22 The success of Strong Start birth centers in reducing prematurity and LBW rates for Medicaid recipients rekindles this effort.4,5,23 Researchers evaluating the Strong Start birth centers believe scaling them up would provide the right care for lowrisk pregnancies and improve outcomes.23 They recommend expansion of state laws to facilitate opening and operating birth centers and utilizing the rigorous accreditation program of the Commission for the Accreditation of Birth Centers for licensure. They also call for funding to expand birth centers by replacing the poorest performing Strong Start maternity care homes sites with birth centers.

Alliman and Bauer advocate grassroots efforts to influence policy to fund demonstration projects opening more birth centers in rural and underserved areas as proposed by the Birth Access Benefiting Improved Essentials Facility Services Act (HR 3337).4 They also urge insurance companies to include birth centers and midwives as distinct options in provider directories. Funding for additional research about developing birth centers in perinatal shortage areas by incorporating birth centers into rural access hospitals and federally qualified health centers was posited. A major change necessary to increase birth center availability for Medicaid beneficiaries is establishing sustainable reimbursement rates.5

Courtot et al. examined how Strong Start birth centers experienced Medicaid reimbursement and found crucial barriers including low reimbursement rates and midwives receiving less reimbursement than physicians resulting in birth centers capping Medicaid beneficiaries.5 Medicaid beneficiaries comprise only 24% of birth center clients. Birth centers were unable to contract with managed care organizations, which execute most state Medicaid programs.

Recommendations by researchers involved in the Strong Start initiative are echoed by the Aspen Health Strategy Group in their report highlighting the failure of the traditional highly interventive model for childbirth and supporting a holistic approach by having states adopt a suite of policies related to licensure for providers and reimbursement mechanisms that support proven approaches to reducing poor maternal and newborn outcomes.21 Integrating birth centers is also recommended in the consensus report "Birth Setting in America: Outcomes, Quality, Access, and Choice."22

To increase access to birth centers, more midwives are needed because the majority of birth center care is delivered by midwives. Midwives are essential to improving pregnancy outcomes according to a study published in The Lancet.24The authors concluded,

These findings support a systemlevel shift from fragmented maternal and newborn care focused on identification and treatment of pathology for the minority, to skilled care for all. Midwifery is pivotal to this approach.24(p1129)

Educating more midwives requires federal funding for midwifery education modeled after medical education. The number and capacity of midwifery education programs needs to increase. There are currently no midwifery education programs in historically Black colleges and universities; developing them should be a priority.

The Black Maternal Health Momnibus Act of 2021, introduced in the US Congress, proposed investments in programs that improve the social determinants of health. Funding for community-based initiatives that improve perinatal outcomes and mitigate inequities is a key component of the bill and could fund birth center development. The bill advocates diversifying the maternity workforce to foster culturally congruent care and could fund midwifery students of color and initiate midwifery education programs in historically Black colleges and universities. Passing this landmark legislation could profoundly affect perinatal outcomes.

## CONCLUSIONS

The maternity care system in the United States is broken. Reliance on technology and overtreating low-risk pregnancies results in extreme costs both in dollars and lives. The evaluation of the Strong Start birth centers demonstrates improved outcomes and reduced costs. It is time to ensure access to birth centers, especially for Medicaid beneficiaries. To scale the birth centers, consumers, health care providers, community organizations, reproductive justice advocates, and state and local governments must align to make critical systems changes as depicted in Box 1. These changes will repair the broken inequitable maternity care system, saving lives.

## CORRESPONDENCE

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CONFLICTS OF INTEREST

There are no conflicts ofinterest to disclose.

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## DETAILS

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Sundwall, D., M.D. (2022). Public health across the political spectrum for all. American Journal of Public Health, 112(5), 693. doi:https://doi.org/10.2105/AJPH.2022.306787

Public health has been through an extraordinary period over the past two years. Between December 31,2019, and today, millions of people died, economies slowed, and unemployment reached record levels in many countries, all stemming from a pandemic that had been unknown two years ago. In the United States, COVID-19 was the third leading cause of death in 2020 and resulted in a downturn in life expectancy unprecedented since World War II.

Bertoldo, J.,M.P.H.R.D.N., Wolfson, J. A.,PhD.M.P.P., Sundermeir, S. M.,M.S.R.D.N., Edwards, J.,M.D.M.P.H., Gibson, D., PhD., Agarwal, S., PhD., & Labrique, A., PhD. (2022). Food insecurity and delayed or forgone medical care during the COVID-19 pandemic. American Journal of Public Health, 112(5), 776-785. doi:https://doi.org/10.2105/AJPH.2022.306724

Objectives. To describe food insecurity in the United States in December 2020 and examine associations with underuse of medical care during the COVID-19 pandemic. Methods. We fielded a nationally representative Web-based survey in December 2020 (n = 8318). Multivariable logistic regression models and predicted probabilities were used to evaluate factors associated with food insecurity and compare the likelihood of delaying or forgoing medical care because of cost concerns by food security status. Results. In December 2020,18.8% of US adults surveyed reported experiencing food insecurity. Elevated odds of food insecurity were observed among non-Hispanic Black, Hispanic, and low-income respondents. Experiencing food insecurity was significantly associated with a greater likelihood of forgoing any type of medical care as a result of cost concerns. Conclusions. Food insecurity during the COVID-19 pandemic disproportionately affected non-White and low-income individuals. Experiencing food insecurity was a significant risk factor for delaying or forgoing medical care, an association that could have cumulative short- and long-term health effects. Public Health Implications. Comprehensive policies that targetthe most at-risk groups are needed to address the high rates of food insecurity in the United States and mitigate its adverse health effects. (Am J Public Health. 2022;112(5):776-785. https://doi.org/10.2105/AJPH.2022.306724)

Rayala, H., B.S.P.H., Rebolledo, Natalia,PhD., M.Sc, Hall, M. G., PhD., & Taillie, Lindsey Smith,PhD., M.P.H. (2022). Perceived message effectiveness of the meatless monday campaign: An experiment with US adults. American Journal of Public Health, 112(5), 724-727. doi:https://doi.org/10.2105/AJPH.2022.306766

Given the negative health and environmental impacts of red meat consumption, reducing red meat intake in the United States is important for both human and planetary well-being. To experimentally evaluate the impact of health-focused and environment-focused messages from the Meatless Monday campaign, we conducted an online randomized experiment among US adults aged 18 years or older (n 5 1244). Compared with control messages, health-focused and environment-focused Meatless Monday messages led to significantly higher perceived message effectiveness and increased intention to reduce meat consumption. (Am J Public Health. 2022;112(5):724-727. https://doi.org/10.2105/ AJPH.2022.306766)

Guo, Y., PhD., Li, Q., M.S., Yang, X., PhD., Jaffee, M. S., M.D., Wu, Y., PhD., Wang, F., PhD., & Bian, J., PhD. (2022). Prevalence of alzheimer's and related dementia diseases and risk factors among transgender adults, florida, 2012–2020. American Journal of Public Health, 112(5), 754-757. doi:https://doi.org/10.2105/AJPH.2022.306720

Objectives. To estimate the prevalence rates of Alzheimer's disease and related dementias (ADRD) and their risk factors in the transgender population and compare the rates to those in cisgender adults. Methods. We identified 1784 transgender adults in the linked electronic health records and claims data between 2012 and 2020 from the OneFlorida Clinical Research Consortium. We calculated the prevalence of ADRD and ADRD risk factors for the transgender and matched cisgender control adults. Results. The prevalence of ADRD was higher in the transgender adults compared with the cisgender control adults. Overall, the prevalence of ADRD risk factors was significantly higher in the transgender adults than the cisgender controls for 11 out of the 13 risk factors, with the only exceptions being traumatic brain injury and visual impairment. Conclusions. Transgender adults are at significantly higher risk for ADRD than cisgender adults. Our study highlights the urgent need for more research on the unique ADRD risks among the aging transgender and larger sexual- and gender-minority populations. (Am J Public Health. 2022;112(5): 754-757. https://doi.org/10.2105/AJPH.2022.306720)

Donohue, John J,PhD., J.D. (2022). Increasing murders but overall lower crime suggests a growing gun problem. American Journal of Public Health, 112(5), 700-702. Retrieved from https://www.proquest.com/scholarly-journals/increasing-murders-overall-lower-crime-suggests/docview/2665175248/se-2?accountid=211160

The article by Feinglass et al. in this issue of AJPH (p. 795) provides an interesting window on the immense human toll associated with assaultive gun violence (not even including the costs from gun suicides and accidents) by focusing on hospital visits in Cook County, Illinois, for gun assaults from 2018 to 2020. Shortcomings with the hospital data may give an exaggerated impression of the extent of the recent increase in shootings, and some discussion on how the situation in Chicago compared with that in the nation overall and other large cities may provide useful context for considering the broader homicide picture in America.

Rajan, Sonati,M.S., EdD. (2022). Pursuing an evidence-informed approach to the prevention of gun violence. American Journal of Public Health, 112(5), 695-696. Retrieved from https://www.proquest.com/scholarly-journals/pursuing-evidence-informed-approach-prevention/docview/2665175247/se-2?accountid=211160

The book largely focuses on solutions that can be implemented right away. ...]in line with existing data and literature on prevention of gun violence, it underscores the need for a multifaceted prevention approach. The authors then identify clear gaps in existing public health surveillance (particularly as they consider different types of gun violence), and this discussion ends with a call for a coordinated data collection effort to be expanded to include nonfatal injuries from firearms. A true preventive public health approach must consider the ways in which both indirect (e.g., witnessing gun violence) and direct (e.g., being injured with a bullet) forms of exposure to gun violence affect the health and well-being of individuals and communities.4,5 Building off of this foundation, the predominant theme woven throughout the book's subsequent chapters is the notion that multiple strategies across sectors and levels are needed to reduce the harms that stem from our national gun violence crisis.

Howard, D. H., PhD. (2022). Inaccurate comparison of the COVID-19 response in the united states and Cuba/Respond. American Journal of Public Health, 112(5), E4-E5. Retrieved from https://www.proquest.com/scholarly-journals/inaccurate-comparison-covid-19-response-united/docview/2665175220/se-2?accountid=211160

"1(p2191) Meanwhile, according to reports in the New York Times,2 Reuters,3 the Wall Street Journal,4 and The Guardian,5 the COVID-19 pandemic exposed the shortcomings of the Cuban health care system, with one Cuban physician telling reporters, "Simply put, I saw what I would have hoped to never see: the collapse of our health system. According to news reports, the Cuban health system began to feel high pressure, and its shortcomings were most apparent, during the summer 2021 surge in infections caused by the delta variant.1,2 As in the United States and countless other countries, the root causes of these weaknesses existed even before the strain of the pandemic brought them to light. The pandemic led to worldwide economic crises, and, paired with the ongoing US embargo, Cuba has felt the effects in a major way.3 In addition, on the basis of recent data from the Institute for Health Metrics (Table 1), it is clear that underreporting of COVID-19 deaths is an issue in both the United States and Cuba.

Syme, Maggie L,PhD., M.P.H., Gouskova, N., PhD., & Berry, Sarah D,M.D., M.P.H. (2022). COVID-19 vaccine uptake among nursing home staff via statewide policy: The mississippi vaccinate or test out policy. American Journal of Public Health, 112(5), 762-765. doi:https://doi.org/10.2105/AJPH.2022.306800

Objectives. To examine whether COVID-19 vaccine mandates that allow a test-out exemption for nursing home staffare associated with increased staff vaccination rates in nursing homes. Methods. Using the National Healthcare Safety Network data, we conducted analyses to test trends overtime in statewide staff vaccination rates between June 1,2021, and August 29, 2021, in Mississippi, 4 adjacent states, and the United States overall. Results. COVID-19 staff vaccination rates increased slowly following Mississippi enacting a vaccinate-ortest-out policy, achieving small, but statistically greater gains than most comparator states. Yet, staff vaccination rates in Mississippi remained well below the national average and similar numerically to surrounding states without mandates. Conclusions. Mississippi's COVID-19 vaccinate-or-test policy was ineffective in meaningfully increasing staff vaccination rates. For COVID-19 nursing home mandates to be effective while still balancing the staff turnover risks, facilities might consider a more stringent or hybrid approach (e.g., test-out option not offered to new staff). Public Health Implications. Statewide COVID-19 vaccine mandates, when given a test-out option, do not appear to be an effective strategy to meaningfully increase nursing home staff COVID-19 vaccination.

Dickman, S. L., M.D., White, Kari,PhD., M.P.H., Sierra, G., PhD., & Grossman, D., M.D. (2022). Financial hardships caused by out-of-pocket abortion costs in texas, 2018. American Journal of Public Health, 112(5), 758-761. doi:https://doi.org/10.2105/AJPH.2021.306701

Objectives. To identify financial hardships related to costs of obtaining abortion care in Texas, which has the highest uninsured rate in the United States and restricts insurance coverage for abortions. Methods. We surveyed patients seeking abortion at 12 Texas clinics in 2018 regarding costs and financial hardships related to abortion care. We compared mean out-of-pocket costs and the percentage reporting hardships across income and insurance categories. Results. Of 603 respondents, 42% were Latinx, 25% White, and 21% Black or African American, and most (62.0%) reported having low incomes (< 200% federal poverty level). Mean out-of-pocket costs were $634, which varied little across insurance groups. Patients with low incomes were more likely to obtain financial assistance from an abortion fund than were wealthier patients (12.3% vs 1.6%, respectively; P< .05). Financial hardships related to abortion costs were more common among uninsured (57.6%) and publicly insured (55.1 %) patients than those with private insurance (48.2%). One in 5 (19.8%) uninsured respondents delayed buying food to pay for abortion care. Conclusions. Restrictions on insurance coverage for abortions result in high out-of-pocket costs and major financial hardships for most patients with low incomes in Texas. (Am J Public Health. 2022;112(5): 758-761. https://doi.org/10.2105/AJPH.2021.306701)

Feinglass, J., PhD., Patel, T. R., B.A., Rydland, K., PhD., & Sheehan, Karen,M.D., M.P.H. (2022). Trends in hospital care for intentional assault gunshot wounds among residents of cook county, illinois, 2018–2020. American Journal of Public Health, 112(5), 795-802. doi:https://doi.org/10.2105/AJPH.2022.306747)

Objectives. To examine gun violence with respect to hospital visits for treatment of intentional assault gunshot wounds (IGWs). Methods. IGW-coded visits among residents of Cook County, Illinois, were matched to census zip code tabulation areas (ZCTAs) to map changes in IGW visit frequencies between 2018 and 2020. Patient characteristics were compared across years, and Poisson regression models for the likelihood of an inpatient admission or in-hospital death were estimated. Results. Over the study period, Cook County residents made 7122 IGW-coded hospital visits to 89 Illinois hospitals, resulting in $342 million in charges and 24894 hospital days. The number of visits almost doubled between 2018 and 2020, from 1 553 to 3031; 6 ZCTAs had increases of more than 60 visits. Approximately one third of patients with a visit were admitted, and 6.5% died. Conclusions. Hospital statistics do not include the full toll of nonfatal gun injuries or the costs of related community-level trauma. The health care system remains crucial in implementing epidemiological approaches to violence prevention. Addressing the national spike in shootings will require large investments in community economic development and a professional public safety workforce. (Am J Public Health. 2022;112(5):795-802. https://doi.org/10.2105/AJPH.2022.306747)

Clay-Warner, J., Kawashima, T., M.A., & Edgemon, T. G., PhD. (2022). Measure of personal network size using the known population method: A methodological guide. American Journal of Public Health, 112(5), 747-753. doi:https://doi.org/10.2105/AJPH.2022.306731)

The network scale-up method (NSUM) has shown promise in measuring the prevalence of hidden public health problems and at-risk populations. The technique involves asking survey respondents how many people they know with the health problem or characteristic of interest and extrapolating this information to the population level. An important component of the NSUM estimate is the size of each respondent's network, which is determined by asking respondents about the number of people they know who belong to populations of known size. There is little systematic discussion, however, to guide selection of these questions. Furthermore, many of the most commonly used known population questions are appropriate only in countries with a robust data infrastructure. Here, we draw from the NSUM literature to present a set of best practices in the selection of NSUM known population questions. Throughout, we address the unique situations that many researchers face in collecting prevalence data in the developing world, where innovative prevalence estimation techniques, such as NSUM, are most needed. (AmJ Public Health. 2022;112(5):747-753. https://doi.org/10.2105/ AJPH.2022.306731)

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Before the COVID-19 pandemic, few Americans had a clear understanding of what public health is or what it does for society because many of its activities and protections take place behind the scenes. In the absence of a crisis, public health does not receive much attention. As it turns out, this creates ongoing challenges for public health. Over a 100-year period, public health measures have improved life expectancy by 25 years1; however, as recent public dialogue has indicated, these benefits and public health's credibility can easily be forgotten.

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...]the authors state "many estimations methods for infection date] homogenize substantial heterogeneities," but they disregard this in their demonstration of recovering infection date in Figure 2: "infection dates were estimated as symptom onset dates minus a median incubation period. "1(p2129) Although this is straightforward to calculate, it ignores the "substantial heterogeneities," and leads to invalid conclusions.2 Forthose interested in obtaining infection date, we would suggest deconvolution, which has been applied in infectious disease surveillance for decades,3 and has also been implemented for estimating the reproductive number of SARS-CoV-2 during the pandemic.2,4 There is another issue with these data that must be dealt with before making any inferences about the outbreak: outcome misclassification.4,5 Such errors will primarily be underreporting (i.e., suboptimal sensitivity of the surveillance program) through asymptomatic infection orthose symptomatic and unable or unwilling to test, but there may also be issues with diagnostic accuracy, including both false positives and false negatives. Burstyn I, Goldstein ND, Gustafson P. Towards reduction in bias in epidemic curves due to outcome misclassification through Bayesian analysis of time-series of laboratory test results: case study of COVID-19 in Alberta, Canada and Philadelphia, USA. Respond Ian Hennessee, MPH, Julie A. Clennon, PhD, MSc, Lance A. Waller, PhD, MS, Uriel Kitron, PhD, MPH, and J. Michael Bryan, PhD, MPH I ABOUT THE AUTHORS Ian Hennessee is a PhD candidate with the Gangarosa Department of Environmental Health, Rollins School of Public Health, Emory University, Atlanta, GA.

Gourevitch, Marc,M.D., M.P.H., Kleiman, N., PhD., & Falco, K. B., J.D. (2022). Public health and public safety: Converging upstream. American Journal of Public Health, 112(5), 716-718. Retrieved from https://www.proquest.com/scholarly-journals/public-health-safety-converging-upstream/docview/2665175122/se-2?accountid=211160