PUBLIC
HEALTH
REPORTS

Public Health Reports
2019, Vol. 134(2) 150-154
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DOI: 10.1177/0033354918819755
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Local Decision Making for Implementing Social Distancing in Response to Outbreaks

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Abstract

Objectives: Social distancing is the practice of restricting contact among persons to prevent the spread of infection. This study sought to (1) identify key features of preparedness and the primary concerns of local public health officials in deciding to implement social distancing measures and (2) determine whether any particular factor could explain the widespread variation among health departments in responses to past outbreaks.

Methods: We conducted an online survey of health departments in the United States in 2015 to understand factors influencing health departments' decision making when choosing whether to implement social distancing measures. We paired survey results with data on area population demographic characteristics and analyzed them with a focus on broad trends.

Results: Of 600 health departments contacted, 150 (25%) responded. Of these 150 health departments, 63 (42%) indicated that they had implemented social distancing in the past 10 years. Only 10 (7%) health departments had a line-item budget for isolation or quarantine. The most common concern about social distancing was public health impact (n = 62, 41%). Concerns about law, politics, finances, vulnerable populations, and sociocultural issues were each identified by 7% to 10% of health departments. We were unable to clearly predict which factors would influence these decisions.

Conclusions: Variations in the decision to implement social distancing are likely the result of differences in organizational authority and resources and in the primary concerns about implementing social distancing. Research and current social distancing guidelines for health departments should address these factors.

Keywords

social distancing, quarantine, preparedness, isolation

In the past 2 decades, emerging and reemerging domestic and international communicable diseases, including severe acute respiratory syndrome, Middle East respiratory syndrome, H5N1 influenza, H1N1 influenza, Ebola, and the threat of bioterrorism, have emphasized the need for public health officials to be prepared to confront these threats. Often, access to effective medical countermeasures may not be adequate or available in the early days of an outbreak. During those times, nonpharmaceutical interventions at the individual, community, and environmental levels, including social distancing measures and other behavior modifications, may be the only interventions available to public health officials to mitigate the spread of disease.

The decision to implement social distancing measures, particularly quarantine and isolation, is not always supported by good evidence, nor is there strong evidence of the public health impacts of such measures. Even where guidance exists, such as the revised community mitigation guidelines from the Centers for Disease Control and Prevention (CDC)[1] and state-level plans for educational institutions,[2] there may be barriers to their use and lessons learned in practice. In addition, the guidance for social distancing often lacks sufficient details about implementation.[2] The factors considered by public health officials when making those decisions are not well known. Enacting social distancing is complicated by

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political, ethical, and moral challenges and can be influenced by experience and resources.[3,4]

In the United States, local and state public health officials, rather than federal officials, often govern the response to public health events, which can lead to varying responses across the country.[5,6] This variation was evident during the 2014-2016 Ebola outbreak, when states did not act consistently in implementing social distancing regulations, despite receiving the same guidance from CDC and having access to the same epidemiologic data from the affected areas in West Africa. Some states and territories did enact policies in line with guidance from CDC and the World Health Organization, other states and territories instituted more aggressive policies than recommended by CDC, and still others issued no policies at all.[7,8]

Given the prominent role of health departments in responding to communicable disease outbreaks in the United States and the documented variation in policies and use of social distancing measures, we sought to identify key features of preparedness (eg, facilities, budget, legal authority) as well as the primary concerns affecting state and local public health officials' decision to implement social distancing measures. We also aimed to determine whether any particular factor, including population size, political leaning, and history of implementing social distancing measures, could explain the widespread variation among localities in response to outbreaks and, specifically, whether the locality weighs nonhealth concerns as important as, or as more important than, public health or clinical concerns.

Methods

We conducted an online survey of local health departments in the United States in 2015. We collaborated with the National Association of County and City Health Officials to generate a stratified random sample of 600 local health departments and obtained contact information for the preparedness official or executive officer at each sampled health department. We oversampled health departments in southern border states (Arizona, California, New Mexico, and Texas) to explore differences between health departments near an international border and health departments not near an international border. We oversampled health departments serving medium and large populations because we hypothesized that they would have policies in place for social distancing. We stratified sampling by population size: <200 000, 200 000-1 million, and >1 million persons. We collected and managed survey data using REDCap electronic data capture tools hosted at the Children's National Medical Center.[9]

We contacted each of the 600 selected health departments by email. Generally, the individual contacted was the health department's emergency preparedness coordinator or the top executive, if contact information for the emergency preparedness coordinator was unavailable. We asked the recipient to complete the online survey or to designate another knowledgeable person in the organization to respond to the survey. Project staff members made up to 7 attempts during 6 months to remind the official to complete the survey. We excluded from analyses surveys that were mostly incomplete (ie, surveys in which only the demographic information was completed but not answers to the survey). Surveys were completed between June 29 and December 14, 2015.

We then matched health departments to demographic data compiled from the US Census (2010 data and 2015 US Census-developed estimates).[10,11] For local health departments that encompassed multiple political jurisdictions (counties or municipalities) used by the US Census, we estimated geographic area demographic characteristics by summing population data and calculating average demographic statistics weighted by the populations of the individual political jurisdictions that fell within that local health department's jurisdiction. For local health departments serving populations in areas not aligned to 1 or more political jurisdictions used by the US Census, demographic characteristics other than population were not available. The US Census does not release demographic data for jurisdictions with a population of <5000 persons; for local health departments serving these small jurisdictions, only the following data were available: population as of April 1, 2010, and population estimate as of July 1, 2015. Finally, we linked survey data from the 2013 National Profile of Local Health Departments to our survey data for each locality, to capture additional information on the health departments, particularly preparedness levels.[12] We attempted to use narrative responses to verify categorizations.

To explore whether department demographic characteristics may have helped shape preparedness and concerns, we ran logistic regression models with the answers to 3 questions as dependent variables (the presence or absence of facilities for isolation or quarantine, the use or nonuse of social distancing in the past 10 years, and the biggest concern being health-related vs any other concern). For this analysis, we combined the 2 health-related concerns (public health impact and clinical implications). The 4 uncorrelated variables—per-capita income, population, percentage rural, and border state versus nonborder state—were chosen to represent relatively independent characteristics and because they tended to have lower rates of missing data than rates of other characteristics.

Statistical Methods

The original data analysis plan specified that statistical analyses would account for the stratified probability-based sampling plan used to survey the health departments. However, given the statistical uncertainties introduced by the relatively low response rate, we focused on broad trends rather than on precise estimates of population characteristics. Therefore, we calculated statistics without using methods ordinarily used for complex probability samples. The resulting 95% confidence intervals and *P* values should therefore be considered as approximate.

Table 1. Characteristics of local health departments that completed a survey on decision making about implementing social distancing measures[a] in response to outbreaks (n = 150), United States, June 29–December 14, 2015

Characteristic	Median (Interquartile Range)
Inhabitants in jurisdiction, no.	269 721 (78 288-490 945)
Urban inhabitants, %	30 (10-60)
Suburban inhabitants, %	30 (8-50)
Rural inhabitants, %	25 (10-52)
White inhabitants, %	84 (74-92)
Black or African American inhabitants, %	6 (2-14)
Foreign-born inhabitants, %	8 (4-15)
Hispanic or Latino inhabitants, %	8 (4-19)
Median household income, 2014 $	52 963 (45 720-62 516)
Health department employees, no.	102 (58-216)

[a]Social distancing is the practice of restricting contact among persons to prevent the spread of infection.

To explore whether demographic characteristics of health departments may have helped shape preparedness activities for an outbreak or decision making for social distancing, we ran logistic regression models with the answers to selected survey questions as the binomial variable to be predicted (ie, the presence or absence of facilities for isolation or quarantine, the use or nonuse of social distancing in the past 10 years, and the biggest concern being public health impact).

We conducted all analyses using SAS version 9.4.[13] We used a 2-tailed test of significance, with $\alpha < .05$ considered significant. We did not adjust for multiple comparisons. This study was approved by the institutional review boards of George Washington University and Georgetown University.

Results

Of 600 health departments contacted, we received fully or mostly completed survey responses from 150 (25%) health departments. We considered health departments as nonresponding if all responses beyond demographic questions were left unanswered. Compared with the 450 nonresponding health departments, responding health departments were more likely to be larger; the median number of employees was 46% higher at responding health departments than at nonresponding health departments (102 vs 70 employees), and the median population size was 16% larger (269 721 vs 226 249). Seventy-five percent of responding local health departments had ≥58 employees (Table 1).

Only 31 (21%) health departments reported having facilities, and 10 (7%) had a line item in their budget for isolation or quarantine measures (Table 2). One hundred twenty-two health departments (81%) said they had legal authority to make social distancing decisions; however, 17 (11%) health departments did not answer the question. Sixty-nine (46%) respondents knew whether social distancing measures had been issued in their district in the past 10 years; of these, 63 indicated that these measures had been issued by the health department, and 6 indicated that these measures had been issued in their jurisdiction by another government agency.

Table 2. Responses of local health departments (n = 150) to preparedness questions and concerns about future decision making on implementing social distancing measures[a] in response to outbreaks, United States, June 29–December 14, 2015

Question	Response	No. (%)[b]
Do you have any existing facilities your health department uses for isolation or quarantine?	Yes	31 (21)
	No	114 (76)
	No response	5 (3)
Do you have an explicit line item in your annual budget for isolation or quarantine measures, if they are deemed appropriate?	Yes	10 (7)
	No	136 (91)
	No response	4 (3)
Does your health department have legal authority to make social distancing decisions?	Yes	122 (81)
	No	11 (7)
	No response	17 (11)
Concerning the past 10 years (since January 1, 2005), to your knowledge, have voluntary or involuntary orders related to social distancing (including: quarantine, isolation, school closures) been issued in your jurisdiction?	Yes, by health department	63 (42)
	Yes, by other government agency	6 (4)
	No	57 (38)
	Don't know	16 (11)
	No response	8 (5)
If faced with a decision to use or not use social distancing measures today, what would be your biggest concern?	Public health impact	62 (41)
	Legal	15 (10)
	Political	12 (8)
	Vulnerable populations	12 (8)
	Financial	11 (7)
	Sociocultural	10 (7)
	Clinical implications	3 (2)
	Other	10 (7)
	No response	15 (10)

[a]Social distancing is the practice of restricting contact among persons to prevent the spread of infection.

[b]Frequency distributions for all variables were similar after excluding the 24 health departments from southern border states (Arizona, California, New Mexico, and Texas).

The biggest health concerns about the use of social distancing were public health impact or clinical implications for half of the 135 departments responding to this question. Respondents also cited legal (n = 15, 10%), political (n = 12, 8%), vulnerable populations (n = 12, 8%), financial (n = 11, 7%), sociocultural (n = 10, 7%), and other (n = 10, 7%) concerns.

In our analysis of whether department characteristics could have shaped preparedness and concerns, the only significant association was between percentage rural and having issued social distancing orders in the past 10 years, where each 10% absolute increase in percentage rural was associated with a 16% decrease in the odds of a history of social distancing orders ($P = .03$; Table 3).

Table 3. Factors predicting preparedness and relative concern for public health in implementing quarantine and isolation orders among health departments, United States, June 29–December 14, 2015

Factor	Existing Facilities for Isolation or Quarantine[a]		History of Social Distancing Orders[b]		Biggest Concern Is Public Health Impact or Clinical Implication[c]	
	aOR[d] (95% CI)	*P* Value[e]	aOR[d] (95% CI)	*P* Value[e]	aOR[d] (95% CI)	*P* Value[e]
Per capita income (in $10 000s)	1.29 (0.60-2.77)	.51	0.98 (0.48-2.02)	.96	1.38 (0.68-2.81)	.37
Population (in 100 000s)	0.97 (0.87-1.09)	.63	1.10 (0.96-1.25)	.18	0.98 (0.89-1.08)	.69
Percentage rural (in 10% increments)	0.91 (0.76-1.09)	.30	0.84 (0.72-0.98)	.03	1.10 (0.96-1.26)	.18
Border state (0 = no; 1 = yes)	2.34 (0.75-7.31)	.15	1.00 (0.32-3.08)	>.99	1.87 (0.63-5.55)	.26
Political leaning (0 = Republican; 1 = Democratic)	1.44 (0.49-4.23)	.50	0.65 (0.24-1.73)	.39	0.96 (0.39-2.38)	.94

Abbreviation: aOR, adjusted odds ratio.

[a]Based on the following survey question: Do you have any existing facilities your health department uses for isolation or quarantine? (yes = 24, no = 115; sample size = 139).

[b]Based on the following survey question: In the past 10 years (since January 1, 2005), to your knowledge, have voluntary or involuntary orders related to social distancing (including quarantine, isolation, school closures, and work closures) been issued in your jurisdiction? (yes = 50, no = 100; sample size = 150).

[c]Based on the following survey question: If faced with a decision to use or not use social distancing measures today, what would be your biggest concern? (yes = 49, no = 107; sample size = 156).

[d]Each independent variable is adjusted for the other 4 department characteristics in each model.

[e]Using a 2-tailed test of significance, with $P < .05$ considered significant.

Discussion

Almost all of the surveyed health departments had the legal authority to make social distancing decisions, and half had made these decisions, but more than three-quarters did not have any facilities or an explicit line item for isolation and quarantine measures in their annual budget. Without these resources, local health departments may struggle to respond efficiently and effectively to communicable disease outbreaks in which social distancing measures are appropriate.

The biggest concern about implementing social distancing among most health departments was health related, specifically public health impact. Although this finding is reassuring, for about half of the health departments, factors other than those listed were ranked as more important. It is imperative to study these health departments to better understand what stakeholders and resources should be involved in preparedness planning and, specifically, planning for social distancing. Ideally, planning for social distancing will result in decision making that is based more on public health implications than on other implications.

The most important finding from this study, however, is the same finding seen in other efforts to explore social distancing in the United States; namely, social distancing efforts vary widely in jurisdictions across the United States.[5-7] Local jurisdictions are influenced by many factors, and data that suggest any consistency or predictability in implementing social distancing are scarce. Individual health departments appear to have unique experiences with outbreaks, and the effects of politics, geography, population size, and resources are unclear. The variation among local jurisdictions creates a challenge in the assessment of how best to engage jurisdictions and advance preparedness plans. At best, following a few universal policies may better prepare jurisdictions for social distancing. Instead, each community will have to be assessed individually.

Limitations

This study had several limitations. First, although we used probability-based sampling and an intensive system of following up on potential respondents, the response rate was low, and nonresponders disproportionately came from smaller health departments: 20% of departments had ≤25 employees. As such, estimation of more elaborate regression models and statistical adjustment for the planned complex survey used became infeasible. Second, some of the questions in the survey were broad and may not have captured every factor that might affect decision making for social distancing.

Conclusions

As guidance on social distancing is updated and disseminated, it is essential to remember that public health officials weigh more than just epidemiologic factors in deciding to implement social distancing measures; variations in the decision to implement social distancing are likely the result of differences in organizational authority and resources and in the primary concerns about implementing social distancing. Research and current social distancing guidelines for health departments should address these factors.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The authors received funding from the National Institutes of Health, National Institute of Allergy and Infectious Diseases (#R15AI105738).

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References

1. Qualls N, Levitt A, Kanade N, et al. Community mitigation guidelines to prevent pandemic influenza—United States, 2017. *MMWR Recomm Rep*. 2017;66(1):1-34. doi:10.15585/mmwr.rr6601a1
2. Uscher-Pines L, Schwartz HL, Ahmed F, et al. School practices to promote social distancing in K-12 schools: review of influenza pandemic policies and practices. *BMC Public Health*. 2018;18(1):406. doi:10.1186/s12889-018-5302-3
3. Cetron M, Landwirth J. Public health and ethical considerations in planning for quarantine. *Yale J Biol Med*. 2005;78(5):325-334.
4. Bensimon CM, Upshur RE. Evidence and effectiveness in decisionmaking for quarantine. *Am J Public Health*. 2007;97(suppl 1):S44-S48. doi:10.2105/AJPH.2005.077305
5. Centers for Disease Control and Prevention. Legal authorities for isolation and quarantine. https://www.cdc.gov/quarantine/AboutLawsRegulationsQuarantineIsolation.html. Published October 28, 2014. Accessed October 12, 2018.
6. Public Health Law Center. State & local public health: an overview of regulatory authority. http://www.publichealthlawcenter.org/sites/default/files/resources/phlc-fs-state-local-reg-authority-publichealth-2015_0.pdf. 2014. Published April 2015. Accessed October 12, 2018.
7. Kraemer JD, Siedner MJ, Stoto MA. Analyzing variability in Ebola-related controls applied to returned travelers in the United States. *Health Secur*. 2015;13(5):295-306. doi:10.1089/hs.2015.0016
8. American Civil Liberties Union, Yale Global Health Justice Partnership. *Fear, Politics, and Ebola: How Quarantines Hurt the Fight Against Ebola and Violate the Constitution*. New York, NY: American Civil Liberties Union; 2015. https://www.aclu.org/report/report-fear-politics-and-ebola?%20redirect=report/fear-politics-and-ebola. Accessed October 12, 2018.
9. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009;42(2):377-381. doi:10.1016/j.jbi.2008.08.010
10. US Census Bureau. QuickFacts, United States: demographic data for counties/cities/towns with over 5000 residents, April 1, 2010. https://www.census.gov/quickfacts. Accessed November 7, 2018.
11. US Census Bureau. American FactFinder. Population estimates, July 1, 2015. https://factfinder.census.gov. Accessed November 7, 2018.
12. National Association of County and City Health Officials. National profile of local health departments, 2013. https://www.icpsr.umich.edu/icpsrweb/HMCA/studies/34990. Published 2014. Accessed October 17, 2018.
13. SAS Institute, Inc. *SAS Version 9.4*. Cary, NC: SAS Institute, Inc.; 2014.