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Reducing Firearm Injuries: The Role of Local Public Health Departments

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SYNOPSIS

Objective. The purpose of this study was to gather data regarding local public health departments' involvement in activities to prevent firearm-related morbidity and mortality.

Methods. A questionnaire was sent to local public health departments serving cities with populations ≥60,000 to assess their perceptions of the magnitude of the firearm injury problem in their jurisdictions and the activities in which they were engaged to reduce firearm-related injuries.

Results. Almost half (49.7%) of respondents said that their departments had not seriously thought about being involved in activities to reduce firearm-related injuries, and fewer than one in five (17.8%) reported that their departments were involved in such activities. Respondents identified three barriers to involvement in activities to reduce firearm injuries: limited financial resources (62.7% of respondents), lack of expertise (50.8%), and not enough time (47%).

Conclusions. Despite the extent of firearm injuries in the US, systematic collection of local data on firearm morbidity and mortality to help guide policy development is lacking.

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Firearm-related morbidity and mortality are serious and growing public health problems in the United States. The epidemic of gun violence in this country cannot yet be fully characterized, but existing information provides an appalling picture of pain, suffering, disability, and death.

The financial costs of firearm injuries are staggering when direct expenditures are combined with lost productivity due to disability and premature death. These financial costs are high in large part because of the severity of the injuries and the young age of most of the decedents.[1] These costs are often borne by taxpayers through Medicaid and the cost of unreimbursed care provided by hospitals. A recent Louisiana study found that more than 80% of the care for firearm victims in 1994 was paid with government funds.[2]

The physical, psychological, social, and economic costs of firearm-related injuries underscore the need for local public health departments to be involved in activities to prevent firearm-related morbidity and mortality. We conducted a survey to assess what activities local public health departments were involved in to address the problem of firearm-related injuries; how important public health departments perceived firearm-related injuries to be compared with other public health problems; what the perceived barriers were to being involved in activities aimed at reducing firearm-related injuries; and whether personal ownership of firearms by public health professionals was related to their departments' firearm-related prevention activities.

METHODS

We obtained a list of all cities in the United States with populations of 60,000 or more from a Census Bureau online database, *Time Series of Resident Population of Places: April 1, 1990 to July 1, 1994*.[3] We chose communities of this size because a convenience sample of 17 health commissioners from small communities (<25,000 population) reported that gun issues were not a big problem in their geographic areas. We matched all cities of ≥60,000 population with city or county public health departments in their immediate geographic areas as listed in the 1992–1993 *National Directory of Local Health Departments*[4] ($N = 252$).

Questionnaire. Based on a review of the literature on guns and gun violence, we developed a 17-item questionnaire to assess public health department officials' perceptions of their role in reducing firearm-related morbidity and mortality. All items on the anonymous questionnaire were closed-format, requiring respondents to select among choices provided to them. The questionnaire included two background items about the department—location (urban, suburban, rural or mixed) and size of population served—and five demographic items regarding the respondent (sex, educational level, position in department, whether the respondent owned one or more firearms, and, if so, the purpose of firearm ownership).

The questionnaire also explored respondents' perception of the magnitude of the firearm-related injury problem in their department's jurisdiction; how they thought community members perceived the problem; and how important they thought it was in relation to other public health problems. In addition, we asked respondents whether they agreed with the statement: "Currently, the public health field *does not have* suitable methods available which can reduce firearm morbidity/mortality."

We used the Stages of Change model[5–7] modified for institutions to assess departments' activity regarding firearms. The questionnaire also included nine items addressing the core functions of public health as defined in the Institute of Medicine's report on *The Future of Public Health*[8] as they relate to firearm injuries (three each on assessment, policy development, and assurance). The Stages of Change model is a technique for assessing the readiness of individuals to change a behavior and has been found to be useful in designing behavior change interventions.[5] The six Stages of Change are *Precontemplation* (no intention to change), *Contemplation* (thinking about changing), *Preparation* (taking steps to change a behavior in the near future), *Action* (recently made a behavioral change), *Maintenance* (have maintained the behavior change over an extended period of time), and *Relapse* (used to but no longer engage in the behavior). Studies have found the Stages of Change model generally robust for personal behaviors across a variety of health-related behaviors.[6,7] The questionnaire is unique in its application of the model to organizational rather than personal behavior.

Finally, we asked respondents about barriers to being involved in activities aimed at reducing firearm-related morbidity and mortality.

We established instrument validity by submitting the questionnaire for review to a panel of five commissioners of public health departments and two published authorities in Stages of Change research. Minor suggestions in wording were recommended, but no new items were added. We estimated reliability using a convenience sample of 15 directors of public health departments of various sizes, none of which were included in the final sample. The 15 commissioners filled out the survey at a meeting, and one week later we mailed them a second copy of the survey

along with a postage-paid return envelope. The estimated reliability, assessed as percent agreement of responses between the first and second questionnaires, was 87%.

Procedures. In the spring of 1998, we mailed the questionnaire along with a hand-signed cover letter and postage-paid return envelope to the commissioners of all US public health departments servicing populations of 60,000 or greater (N = 252). We assured respondents that their responses would be anonymous and that only group data would be reported. Two weeks after the initial mailing, we sent all 252 public health departments a second copy of the survey, another postage-paid envelope, and a hand-signed cover letter urging those who had not yet responded to please do so as soon as possible. Previous research on duplicate anonymous mailings has shown double responses from one respondent to be minimal (1% to 4%).[9,10]

RESULTS

We received responses from 185 (73%) of the 252 local public health departments that received the mailings. The majority of respondents were male (60.5%), 30.3% were commissioners of health, and about half (49.7%) had master's degrees (Table 1). The majority (59.5%) of respondents reported not personally owning one or more firearms. More than half (56.2%) of the public health department personnel who responded worked in urban departments, and just under half (53.5%) worked in departments that served populations of 100,000 to 499,000 (Table 1). It is interesting to note that 34.8% of the respondents reported owning one or more firearms and that the main reason cited for owning firearms was personal protection (Table 1).

Perceptions of firearm-related morbidity and mortality. We dichotomized responses to the Likert-format item on perception of the size of the firearm-related morbidity and mortality problem in respondents' geographic area into "minor problem" (scores 1 and 2 on a seven-point scale ranging from "minor problem" to "major problem") and "major problem" (scores 6 and 7). Of the 185 respondents, 53 (28.7%) believed firearm morbidity and mortality was a major problem in their geographic areas (Table 2). Sixty-five (35.1%) believed it was as important a problem as any with which they dealt. Furthermore, 30.8% believed that their communities perceived firearm-related morbidity and mortality to be a major problem.

We found that perception of the magnitude of the problem of firearm-related morbidity and mortality was related to

Table 1. Characteristics of respondents, survey of local public health departments, 1998 (N = 185)

Characteristics	Respondents	
	Number	Percent
Sex		
Male	112	60.5
Female	69	37.3
No response	4	2.2
Education		
Bachelor's degree	40	21.6
Master's degree	92	49.7
Doctorate	48	25.9
No response	5	2.7
Position		
Commissioner	56	30.3
Division Director	36	19.5
Area Coordinator	9	4.9
Staff Member	9	4.9
Assistant/Associate Division Director	7	3.8
Assistant/Associate Commissioner	5	2.7
Other[a]	59	32.0
No response	4	2.2
Owned one or more firearms		
No	110	59.4
Yes	71	38.4
No response	4	2.2
Purpose of firearm ownership[b]		
Personal protection	34	18.4
Hunting	33	17.8
Target shooting	27	14.6
Gun collection	18	9.7
Other	2	1.1
Location		
Urban	104	56.2
Suburban	34	18.4
Rural	21	11.4
Mixed location[c]	26	14.1
Size of population served		
60,000–99,999	48	25.9
100,000–499,999	99	53.5
500,000 or more	38	20.5

NOTE: Percentages may not add to 100.0 due to rounding errors.

[a]For example: Assistant Department Director, Department Director, Board Member.

[b]Respondents were directed to check all that applied.

[c]For example, suburban/rural, urban/suburban.

Table 2. Respondents' perceptions of firearm-related morbidity and mortality as a public health problem, survey of local public health departments, 1998 (*N* = 185)

Questionnaire item	Respondents			
	Number	Percent	Number	Percent
How big a problem is firearm-related morbidity/mortality in your geographic area?	*Minor problem*[a] 32	17.3	*Major problem* 53	28.7
Our community perceives firearm-related morbidity/mortality in our geographic area as a	*Minor problem*[a] 27	14.6	*Major problem* 57	30.8
Currently, the public health field *does not have* suitable methods available which can reduce firearm morbidity/mortality	*Strongly disagree*[b] 23	12.4	*Strongly agree* 75	40.5
In relation to other public health problems which your agency deals with, how important is firearm morbidity/mortality?	*Extremely important*[c] 15	8.1	*Not important* 65	35.1

[a]On a seven-point Likert scale, minor problem = responses 1 and 2; major problem = responses 6 and 7
[b]On a seven-point Likert scale, strongly disagree = responses 1 and 2; strongly agree = responses 6 and 7
[c]On a seven-point Likert scale, extremely important = responses 1 and 2; not important = responses 6 and 7

the location of the department and whether the respondent personally owned a firearm. An ANOVA on location (urban, suburban, or rural) by perceived size of the problem (minor problem vs major problem) was significant (F = 10.53, degrees of freedom [df)] = 2, 150, $P < 0.001$). Post-hoc Tukey t-tests found that respondents from urban public health departments (mean score = 4.76, standard deviation [SD] = 1.86) perceived firearm-related injuries as a more serious problem than respondents from suburban (mean score = 3.59, SD = 1.68) or rural (mean score = 3.14, SD = 1.28) departments. A t-test on perception of how big the firearm problem was in their geographic area by whether the respondents owned a firearm was significant (t = 2.26, df = 1, 173, $P = 0.025$). Those who owned one or more firearms perceived firearm-related violence to be less of a problem in their geographic area (mean score = 3.97, SD = 1.74) than those who did not own firearms (mean score = 4.61, SD = 1.85).

We dichotomized responses to the Likert-format item on perception of the importance of firearm-related morbidity and mortality in relation to other public health problems into "extremely important" (scores 1 and 2) and "not important" (scores 6 and 7). An ANOVA conducted on the location of the public health department by perception of the importance relative to other public health problems of firearm-related morbidity and mortality showed a significant effect (F = 6.90, df = 2, 152, $P = 0.001$). Post-hoc Tukey tests found that respondents from urban public health departments (mean score = 4.34, SD = 1.45) saw firearm-related injuries as significantly more important in relation to other public health problems than those from suburban (mean score = 5.21, SD = 1.51) or rural (mean score = 5.29, SD = 1.15) public health departments.

Level of activity. Almost half (49.7%) of the respondents said that their agencies had not seriously thought about being involved in activities to reduce firearm-related morbidity and mortality; this put them in the Precontemplation Stage. (This is not surprising since many in public health perceive gun-related violence as a criminal justice issue.) Almost one-fourth (23.2%) of the respondents were planning activities to reduce firearm related morbidity and mortality in the near future (Preparation Stage). However, fewer than one in five (17.8%) respondents said their departments were actually involved in activities to reduce firearm-related morbidity and mortality (Action or Maintenance Stages).

We looked at involvement by public health departments in activities directed toward reducing firearm-related injuries by location and by whether the respondent personally owned one or more firearms. A Pearson chi-square failed to show a significant association between location (urban, suburban, or rural) and whether the department was involved in activities to reduce firearm-related trauma. However, a Pearson chi-square showed a significant association between respondents' gun ownership and whether their departments were involved in activities to reduce

firearm-related injuries (X^2 = 684, P = 0.009). Of the respondents who said they personally owned one or more firearms, only 8.5% reported that their departments were involved in reducing firearm-related morbidity and mortality. Almost three times as many of the respondents who did not personally own firearms (24.6%) reported that their departments were involved in such activities.

Core functions. Of the 33 public health departments (17.8%) involved in reducing firearm-related morbidity and mortality, more than half reported current or past involvement in each of four activities related to core public health functions (Table 4). Approximately 85% of these 33 respondents said their agencies were working in collaboration with other community agencies (policy development). A majority of respondents identified each of the following as activities in which their department was engaged or had previously been engaged: collecting data on firearm-related mortality (75.8%), educating the public regarding firearm-related morbidity and mortality (69.7%), and collecting data on firearm-related morbidity (60.6%). Almost half (48.5%) of the 33 respondents also reported supporting changes in public policies related to reducing firearm-related morbidity and mortality.

Perceived barriers. Respondents reported an average of 2.91 barriers to involvement in activities aimed at reducing firearm-related morbidity and mortality. The majority of the respondents (62.7%) identified limited financial resources as a barrier (Table 5). About half of the respondents (50.8%) also reported a lack of expertise as a barrier, and 47% identified not enough time as a barrier to involvement.

We used t-tests to compare the mean numbers of perceived barriers reported by those who saw firearm injuries as a major problem and those who saw it as a minor problem. There was no significant difference in the number of perceived barriers between those who saw firearm injuries as a major problem and those who saw it as a minor problem.

DISCUSSION

This country is moving toward the year 2003, when firearm trauma may well be the leading cause of injury deaths.[11] In light of this, it is incumbent on local public health departments to step forward to reduce the health-related costs of firearm violence. Society and public health department officials can no longer afford to view firearm violence as an issue solely for the criminal justice system. Most gun deaths in the United States are not crime-related. As noted by a leading authority:

> *A public policy debate that focuses solely on firearms violence as a "crime issue"—concentrating primarily, if not exclusively, on regulating access to firearms and on punishing those who use them in criminal acts—misses the greater part of the problem. Seen from its proper perspective, firearms violence is a widespread public health and safety issue. Crime is merely the most publicly recognized aspect of this broader health and safety problem.*[12]

Table 3. Level of activity regarding firearm-related morbidity and mortality, survey of local public health departments, 1998 (*N* = 185)

Questionnaire item	*Respondents*	
	Number	*Percent*
We have not seriously thought about activities regarding firearm-related morbidity/mortality. *(Precontemplation Stage[5])*	92	49.7
We have been thinking about activities regarding reducing firearm-related morbidity/mortality. *(Contemplation Stage[5])*	43	23.2
We are currently planning activities to reduce firearm-related morbidity/mortality implementation in the near future. *(Preparation Stage[5])*	19	10.3
We are currently conducting activities to reduce firearm-related morbidity/mortality which were started within the past year. *(Action Stage[5])*	17	9.2
We have been conducting firearm-related morbidity/mortality activities for more than one year. *(Maintenance Stage[5])*	16	8.6
We used to conduct firearm-related morbidity/mortality activities, but have discontinued our efforts in this area. *(Relapse Stage[5])*	1	0.5

Table 4. Firearm-related activities associated with core public health functions[8] currently or previously engaged in by local public health departments, 1998 (*N* = 33)

Core public health function	Respondents	
	Number	Percent
Policy development		
Work in collaborative relationships with other community agencies aimed at reducing firearm-related morbidity/mortality	28	84.8
Support changes in public policies related to reducing firearm morbidity/mortality	16	48.5
Provide leadership that advocated for policies aimed at reducing firearm-related morbidity/mortality	11	33.3
Assessment		
Collect data on firearm-related mortality	25	75.8
Collect data on firearm-related morbidity	20	60.6
Conduct community perception assessments of firearm-related morbidity/mortality	5	15.2
Assurance		
Educate the public regarding firearm-related morbidity/mortality	23	69.7
Develop and implement mass media information programs on firearm-related morbidity/mortality	4	12.1
Formally evaluate firearm-related morbidity/mortality activities or interventions	3	9.1
Other[a]	7	21.2

NOTE: Respondents were directed to check all that applied.

[a]Respondents chose response option "other."

Essential to addressing this problem will be increasing both the variety of activities and the number of local public health departments vigorously involved in these activities. We found that fewer than one in five local public health departments were involved in activities to reduce firearm-related morbidity and mortality. Problem-solving requires accurate information. Much of the information used to describe and monitor health problems is drawn from public health surveillance. Despite the magnitude of the problem, systematic collection of data on firearm injuries to help guide policy development is lacking (only one in six of the public health departments that we surveyed collected data systematically).

Table 5. Respondents' perceptions of barriers to local health departments' involvement in activities aimed at reducing firearm-related morbidity and mortality, 1998 (*N* = 185)

Barrier	Respondents	
	Number	Percent
Not enough financial resources to deal with the problem	116	62.7
Not enough expertise in our department to address the problem	94	50.8
Not enough time to deal with the problem	87	47.0
Not certain what activities we should be involved in	69	37.3
Not part of the mission of our public health department	46	24.9
Not perceived locally as being as needed	43	23.2
Not politically acceptable in our geographic area	33	17.8
Other organizations are adequately addressing the problem	21	11.4
Other[a]	25	13.5

NOTE: Respondents were directed to check all that applied.

[a]For example: public health department administrator has no interest in topic; no local data on this topic; not the role of the public health department.

Local public health departments must do a better job of partnering with the criminal justice system to create surveillance systems that can help answer questions such as the following: Are firearm-related morbidity and mortality increasing or decreasing? What types of firearms are involved? What are the circumstances under which people are likely to suffer firearm-related injuries? Where do the firearms come from that are used in these incidents? Who is most likely to suffer the effects of firearm-related trauma? What are the costs (physical, psychological, social, and economic) of firearm-related morbidity and mortality? How often are firearms used to defend one's self or property? What is the relationship between victims and offenders in firearm injury events? What have been the effects of new programs or policies on firearm-related morbidity and mortality?

It was surprising to find that the percentage of respondents who reported owning firearms (38.4%) was almost equivalent to that among US households in general (41%).[13] Furthermore, the respondents most frequently cited personal protection as the reason for owning firearms, the reason given most often by the general public.[14] It appears that public health department personnel may be no better informed about the dangers of gun ownership than the general public or are not willing to forego gun ownership despite the known dangers.[15]

For local public health departments to take a more active role in reducing firearm-related injuries, they will need help in overcoming barriers including lack of financial resources, time, and expertise. Many local, state, and national gun control advocates have taken a traditional criminal justice system approach—or more recently, a product liability approach—in attempting to reduce firearm-related injuries. The information to help bolster the need for gun-related policy changes must be based on public health surveillance data. Thus, gun control advocates should become more involved in helping public health departments obtain financial support to track firearm-related data. Gun control advocates also need to lend their expertise to local departments to help them identify which data to track and how to track them.

Finally, the limitations of this study should be noted. First, while the response rate of 73% is acceptable, those who responded may have perceived firearm-related morbidity and mortality as a more significant issue than those who did not respond. If so, then the responses would over-report local public health departments' activities in this arena. Since the survey was anonymous, nonrespondents cannot be compared with respondents. Second, the items on the questionnaire were closed format items that did not attempt to elicit additional information on the various areas surveyed. Respondents may have had some beliefs or may have been involved in firearm-related activities that were not assessed by the survey. Last, it is possible that some respondents gave what they perceived as socially desirable responses; some may have even described future activities that were inspired by the questionnaire.

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