Assessing Injury and Violence Prevention in North Carolina’s Local Health Departments

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BACKGROUND Injury and violence-related morbidity and mortality present a major public health problem in North Carolina. However, the extent to which local health departments (LHDs) engage in injury and violence prevention (IVP) has not been well described.

OBJECTIVES One objective of the current study is to provide a baseline assessment of IVP in the state’s LHDs, describing capacity, priorities, challenges, and the degree to which programs are data-driven and evidence-based. The study will also describe a replicable, cost-effective method for systematic assessment of regional IVP.

DESIGN This is an observational, cross-sectional study that was conducted through a survey of North Carolina’s 85 LHDs.

RESULTS Representatives from 77 LHDs (91%) responded. Nearly one-third (n = 23; 30%) reported that no staff members were familiar with evidence-based interventions in IVP, and over one-third (n = 29; 38%) reported that their LHD did not train staff in IVP. Almost one-half (n = 37; 48%) had no dedicated funding for IVP. On average, respondents said that about half of their programs were evidence-based; however, there was marked variation (mean, 52%; standard deviation = 41). Many collaborated with diverse partners including law enforcement, hospitals, and community-based organizations. There was discordance between injury and violence burden and programming. Overall, 53% of issues listed as top local problems were not targeted in their LHDs’ programs.

CONCLUSIONS Despite funding constraints, North Carolina’s LHDs engaged in a broad range of IVP activities. However, programming did not uniformly address state injury and violence priorities, nor local injury and violence burden. Staff members need training in evidence-based strategies that target priority areas. Multisector partnerships were common and increased LHDs’ capacity. These findings are actionable at the state and local level.

In the United States, injury and violence lead to over 187,000 deaths, 2.8 million hospitalizations, and 32.4 million emergency department visits each year [1]. Taken together, injury and violence are the 3rd leading cause of death in the country, and they cost more than $406 billion annually in medical care and lost productivity [1]. In 2014, more than 6,000 North Carolinians lost their lives to injury and violence [2]. The average life lost is estimated to have been nearly 18 years, and the total years of life lost under the age of 65 years is over 112,000 [2-4]. From 2008 to 2013 in North Carolina, injury and violence were the 5th most common cause of death for all ages combined, and they were the top cause among 1-4-year-olds and in each 5-year age group thereafter up to age 44 years [3, 4]. Leading causes of injury deaths include motor vehicle crashes (1,203 deaths in 2013), suicides (1,237), unintentional poisoning (1,085), falls (820, mostly among elderly individuals), and homicides (538) (Scott Proescholdbell, MPH, epidemiologist, Injury and Violence Prevention Branch [IVPB], Chronic Disease and Injury Section, Division of Public Health, North Carolina Department of Health and Human Services; e-mail communication, December 2015). In the 5-year period 2009-2013, age-adjusted mortality rates for each of these injury types were higher in North Carolina than in the United States as a whole, as was the overall injury-related mortality rate [3, 4].

Public health scientists and practitioners do not consider these events to be “accidents,” but rather predictable and preventable events with known risk factors [5]. Evaluation research demonstrates the effectiveness of a variety of interventions in saving lives and reducing the tremendous health and societal burden of injury and violence [6]. The North Carolina Division of Public Health has a clear and robust role in working with local health departments (LHDs) for injury and violence prevention (IVP). The IVPB, a state entity within the Chronic Disease and Injury Section of the North Carolina Division of Public Health, conducts injury and violence surveillance, provides technical assistance to practitioners, and leads North Carolina’s strategic plan for IVP [7]. In a workforce development program, the IVPB collaborates with the Injury Prevention Research Center at the University of North Carolina (UNC) at Chapel Hill to conduct an annual Injury-Free NC Academy. Teams from various North Carolina counties, including LHD staff, participate in a yearlong learning collaborative involving a series of in-person meetings, work with coaches, and online technical assistance to develop a community prevention plan for a different issue each year.
This research aimed to develop a replicable method to describe LHDs’ local-level IVP activities across the state. North Carolina is a local control state, meaning that LHDs are decentralized and autonomous. Some have boards of health and some report directly to county commissioners. They are funded through a variety of mechanisms, both public and private. Historically, very few state dollars have been allocated specifically to IVP [8]. The majority of LHDs’ funds come from federal sources passing through with state oversight for specific topics such as tobacco, diabetes, and community health. The Safe States Alliance, a leading national nonprofit organization, delineates 9 key IVP roles for LHDs: building coalitions and partnerships; conducting needs assessments and strategic planning; identifying and supporting effective policy approaches; seeking sustainable financial resources; implementing evidence-based policies, programs, and practices; enhancing public awareness; conducting surveillance; building practitioner capacity and skills; and supporting the medical community in assessing and responding to injury and violence [9]. In a 2014 report, however, the National Association of County and City Health Officials reported that just 38% of LHDs were working in injury prevention and only 21% were working in violence prevention [10]. In North Carolina, the North Carolina Association of Local Health Directors reported in 2013 that only about half of the state’s LHDs provided injury control services [11].

Given LHDs’ central role in public health, it is important to assess their IVP efforts, especially as the IVPB works to update the state’s strategic plan. The current study—a collaborative effort between the IVPB and a team of graduate students from the Department of Health Behavior at UNC Gillings School of Global Public Health—surveyed LHDs’ resources, capacity, and programming, and it examined what influences LHDs’ implementation of evidence-based interventions (EBIs) for IVP [12]. We focused on how programs aligned with the state’s first strategic plan for IVP, which targeted homicide, suicide, falls among older adults, motor vehicle crashes, and unintentional poisoning (including prescription drug overdoses) [13]. That plan, which is tied in with Healthy North Carolina 2020 goals, aimed to reduce injury and violence-related morbidity by 15%. To disseminate promising practices and promote networking among IVP stakeholders, we also developed case studies of example programs at different stages (example case studies are available on the IVPB website at http://www.injuryfre enc.ncdhhs.gov/preventionResources/countycasestudies.htm) [14].

Methods
To develop the survey questionnaire, we conducted 9 semi-structured key informant interviews with national and state stakeholders to gain practitioners’ and researchers’ perspectives of IVP and EBIs. Key informants were experts from state and local government, academia, and the nonprofit sector. Interviews centered on stakeholders’ practice experiences, barriers or facilitators of program selection and implementation, and definitions and perceptions of evidence-based IVP. These discussions provided practice-based insights into challenges that LHDs face and the multiplicity of factors that influence programming decisions. Interventions proven to decrease injury and violence-related morbidity and mortality target multiple sociocultural levels, including individual-level educational and behavior change-focused programs (eg, balance and strength training to prevent falls among elderly individuals), structural approaches (eg, building bicycle lanes), media advocacy, community initiatives (eg, prescription drug take-back programs), and policy (eg, suicide means restriction, graduated driver licensing) [15-17]. In this project, we defined EBIs broadly as activities and strategies at any level that have been evaluated and proven effective with qualitative and/or quantitative methods [18, 19]. Other central themes in the interviews included resource constraints (including funding and staff capabilities), capacity building through partnerships, and community interests (which could either facilitate or hinder data-driven, evidence-based programming). We shaped the survey questionnaire around these themes.

Our survey questionnaire (see Appendix 1; online version only) captured the state of IVP in diverse LHDs and the extent to which programming addressed the 5 IVPB strategic plan priorities: homicide, suicide, falls among older adults, motor vehicle crashes, and unintentional poisoning. Questionnaire domains included staff competencies and training, coalitions and partnerships, use of IVPB resources, local injury and violence burden, factors influencing program areas, and use of evidence-based strategies. We used items from a recent North Carolina Institute of Medicine questionnaire from a more general assessment of evidence-based practices in LHDs [18], changing the language to make them IVP-specific. We adapted Safe States Alliance’s core competencies as a metric to measure LHD staff capabilities and training [20].

We defined EBIs as “those that have been rigorously tested and have been shown to be effective,” and we asked respondents to estimate what proportion of their IVP programming was evidence-based. In a series of items on programming, respondents were asked to indicate the following 3 items: in which IVP areas their department had conducted programs within the last year; to which IVP areas their department devoted the most resources; and which were the largest sources of morbidity and mortality in their service area. Another series of items asked about barriers specific to conducting programming related to the IVPB’s strategic plan. We asked respondents to rank the top challenges their departments face in implementing EBIs in IVP from a list of barriers identified in the key informant interviews: administrative issues, incompatibility with community needs, financial constraints, relative lack of IVP program evaluation research, staff knowledge of EBIs and
program adaptation skills, need for implementation training and technical assistance, lack of support from partners, and lack of political will. We also asked respondents to rank influences on specific programming decisions for the 5 prioritized areas.

Finally, the questionnaire invited respondents to nominate local programs as potential case studies. The survey was built and administered using Qualtrics software version 61331. This project was approved by the institutional review board at the University of North Carolina at Chapel Hill.

After pilot testing, the questionnaire was sent electronically to all LHD directors in North Carolina (n = 85). As an incentive, we entered respondents in a raffle for 1 of 4 $50 gift cards, and we sent reminders by e-mail and phone. Data were collected in January and February of 2014. We managed survey data and conducted descriptive statistical analyses in Qualtrics and Microsoft Excel version 2013, and we used Stata to generate bivariate, county-level calculations of how specific LHDs’ programs matched self-reported community burden.

We purposely selected 6 programs for case studies to showcase work at different stages of implementation in diverse geographic regions of the state, targeting the prioritized prevention areas. We designed a semistructured interview guide to gather information on the programs’ histories, facilitators, barriers, evaluation strategies, and impact, and we sought advice for other entities seeking to implement the programs. We conducted 17 in-person and phone interviews with LHD staff, partners, and community coalition members from the selected programs to develop the case studies.

Results
Representatives from 77 of the 85 accredited LHDs completed the online survey, providing a 91% response rate. Each responding department submitted 1 questionnaire. Fifty-three respondents (69%) were LHD directors. Other respondents were health educators, public health nurses, nursing supervisors, environmental health program specialists, county health administrators, and other managers. Fifty-seven respondents nominated exemplary programs. Only 2 respondents (<3%) indicated that their LHDs did not conduct IVP programs. Findings about staff competencies and training, partnerships for IVP, and programming issues are summarized below [21]. As not all respondents completed each survey item, the denominator in our calculations varies; thus we report both frequencies and percentages (rounded to the nearest whole number).

Staff Competencies and Training
Table 1 lists competency areas, percentages of respondents who reported that a staff member met the competency, and percentages of LHDs training staff in each area. On average, respondents reported that their LHD staff collectively met 6 of 9 competencies. Most respondents (n = 57; 74%) said staff could locate and understand IVP EBIs; however, nearly one-third (n = 23; 30%) estimated that none of their staff working in IVP were familiar with specific EBIs (data not shown). Fewer than half reported that staff could build and manage programs, and only 10 (13%) LHDs trained staff in building and managing programs. On average, respondents reported that training was provided in 2 of the 9 areas (data not shown). Only 3 LHDs (4%) reported training staff in all 9 areas (data not shown), and more than one-third (n = 29; 38%) reported that their LHD did not train staff in any of the competencies.

Partnerships
Twenty-eight respondents (36%) reported the existence of a formal IVP coalition in their service area; of these, 21 (75%) reported that their LHD participated in the coalition. Thirty-two respondents (42%) said there was not a coalition for IVP in their community, and 17 respondents (22%) did not know. Respondents were asked to identify organizations with which their LHD partnered to identify, implement, or evaluate IVP programs. The most commonly cited partners were law enforcement agencies, local schools, and hospitals. Many respondents (n = 32; 42%) worked with community-based organizations such as domestic violence shelters, YMCA branches, and the United Way. One-quarter (n = 19; 25%) worked with other government agencies including departments of social services, parks and recreation, and emergency management; fire departments; and the cooperative extension service. Nearly one-third (n = 21; 27%) worked with other LHDs.

Only 24 respondents (31%) said they partnered with the IVPB. To better understand how the IVPB addresses LHDs’ needs, respondents were asked about their use of IVPB resources (see Figure 1). Of those who had used IVPB resources, most had accessed informational support as

**TABLE 1.**
Local Health Department Staff Competencies and Training in IVP

| IVP core competencies | At least 1 staff member has skills (n = 77) | Local health department offers training (n = 76) |
|-----------------------|---------------------------------------------|--------------------------------------------------|
| Disseminate information related to IVP | 72 (94%) | 33 (43%) |
| Access, interpret, use, and present injury and violence data | 62 (81%) | 22 (29%) |
| Demonstrate knowledge, skills, best practices to address IVP | 58 (75%) | 24 (32%) |
| Locate and understand evidence-based interventions in IVP | 57 (74%) | 15 (20%) |
| Describe injury and/or violence as a social health problem | 54 (70%) | 21 (28%) |
| Stimulate change through policy, enforcement, and advocacy | 46 (60%) | 18 (24%) |
| Select IVP interventions based on evidence strength | 44 (57%) | 12 (16%) |
| Design and implement IVP activities | 38 (49%) | 13 (17%) |
| Build and manage an IVP program | 34 (44%) | 10 (13%) |
| None of the above | 1 (1%) | 29 (38%) |

Note. IVP, injury and violence prevention.
assessments varied across the IVPB’s priority areas, however, with greater alignment for unintentional poisoning. The largest burdens-versus-programming mismatches were found in the areas of motor vehicle crashes and homicide. While no LHDs were conducting programming in homicide prevention, per se, departments were devoting resources and programs to domestic and sexual violence and child maltreatment prevention.

Discussion

North Carolina’s LHDs are actively engaged in a variety of IVP activities. Our major finding is the discordance between their programming focus and their community injury and violence burden. This finding may suggest a need for the IVPB to make LHD directors more aware of surveillance data. However, the mismatch between programs and IVP burden has likely arisen from several factors, most notably funding constraints and staff limitations. Although IVP has grown as a field in recent decades and evidence of its effectiveness and cost-savings is plentiful [15, 22], its resources are limited compared to other public health issues [8, 23]. The substantial human and financial burden of injury and violence and the potential to prevent these problems warrants greater investment by the state.

Our respondents estimated that only about half of their programs were evidence-based. It is encouraging, however, that respondents cited staff limitations as greater barriers to the implementation of evidence-based IVP strategies than lack of political will or programs’ incompatibility with community needs. This finding highlights an opportunity for the IVPB to promote their training and technical assistance with coalitions, multisector collaboration, and building community support. The case studies in particular describe how
LHDs can develop intervention strategies that fit their communities and the positive influence of local partners [13]. Multisector partnerships can greatly expand LHDs’ capacity despite funding limitations. Including schools, law enforcement, and hospitals—and using snowball sampling to identify other key partners—could provide a more complete picture of local-level IVP in future assessments.

One limitation of our study was potential response bias, in that we asked respondents to self-report how much of their programming was evidence-based and which were their most burdensome local injury and violence issues. Future questionnaires might instead list specific evidence-based strategies from which respondents could select their LHDs’ approaches [24]. Using surveillance data would provide a more precise picture of the discordance between local problems and local programming. However, the more important limitation is the cross-sectional nature of the study. Interval reassessments could better explain the apparent mismatch and how local entities respond over time to local injury and violence problems. Finally, to contribute more evidence to this growing field, future assessments should include items capturing whether and how LHDs and other stakeholders evaluate their programs.

This assessment was cost-effective and feasible. Engaging a team of graduate students preparing to enter the public health workforce minimized costs while providing these students with a community service opportunity and valuable hands-on training. The mixed-methods approach tapped into practitioners’ experiences and expertise to identify IVP-specific issues. The brevity of the questionnaire and the ease of online administration contributed to a high response rate.

**Conclusions**

As the IVPB works to update North Carolina’s strategic plan to reduce injury and violence, our findings suggest ways in which state-level policy makers and public health practitioners can support LHDs’ efforts and increase their local capacity for IVP. As issues such as unintentional poisoning and child maltreatment continue to expand, advocating that more state funding be allocated to LHDs for IVP is a logical first step. Our findings also highlight a need for local decision makers to re-examine programming priorities in light of community health assessment and other surveillance data and for the IVPB to promote and expand staff training opportunities. Describing LHDs’ experiences provides the broader IVP community with practice-based evidence of what works at the local level. This structured and systematic assessment yields actionable findings to impact a major cause of morbidity and mortality in our state. NCMJ

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**TABLE 2.**

Factors Influencing Injury and Violence Prevention Programming in Each Priority Area

| Factor                              | Suicide (n = 72) | Homicide (n = 70) | Falls (n = 70) | MVC (n = 69) | Overdose (n = 70) |
|-------------------------------------|------------------|-------------------|---------------|-------------|-----------------|
| Funding                             | 52 (72%)         | 50 (71%)          | 52 (74%)      | 54 (78%)    | 50 (71%)        |
| CHA results                         | 42 (58%)         | 36 (51%)          | 47 (67%)      | 42 (61%)    | 43 (61%)        |
| Community interest                  | 38 (53%)         | 29 (41%)          | 34 (49%)      | 32 (46%)    | 38 (54%)        |
| Partner organizations               | 26 (36%)         | 26 (37%)          | 23 (33%)      | 28 (41%)    | 29 (41%)        |
| LHD staff expertise                 | 19 (26%)         | 22 (31%)          | 16 (23%)      | 19 (28%)    | 20 (29%)        |
| Division of Public Health           | 6 (8%)           | 7 (10%)           | 4 (6%)        | 3 (4%)      | 4 (6%)          |
| Local board of health               | 5 (7%)           | 5 (7%)            | 8 (11%)       | 4 (6%)      | 5 (7%)          |
| Political will                      | 4 (6%)           | 5 (7%)            | 6 (9%)        | 4 (6%)      | 4 (6%)          |

Note. CHA, community health assessment; LHD, local health department; MVC, motor vehicle crashes.
Acknowledgments

The authors gratefully acknowledge the directors of the North Carolina local health departments who participated in this assessment. They also wish to thank Alan Dellapenna, Jennifer Woody, and Margaret Vaughn of the North Carolina Injury and Violence Prevention Branch, and Christine Agnew Brune and Megan Landfried of the University of North Carolina Gillings School of Global Public Health for their guidance.

Contributorship statement. All authors contributed to the study design, data collection and analysis, and writing. M.S.M. and J.C. led the manuscript. J.C., L.E.B., M.M.F., C.F., and M.S.M. collaborated equally on the project as students in the Department of Health Behavior at the University of North Carolina at Chapel Hill. S.M. was project faculty advisor, and she contributed to study design and shaping the manuscript. S.K.P., the team’s primary preceptor and mentor at the North Carolina Department of Health and Human Services’ Injury and Violence Prevention Branch, developed the original concept, led the yearlong project, and participated in manuscript preparation.

Financial support. M.S.M. has a research fellowship funded through NIH training grant 5T25CA057726-24. S.K.P. receives funding and support from the Centers for Disease Control and Prevention National Center for Injury Control and Prevention. J.C.’s position is funded by the Centers for Disease Control and Prevention; however, her work for this manuscript was done independently of that position on a volunteer basis.

Potential conflicts of interest. All authors have no relevant conflicts of interest.

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