Addressing the Implementation Gap in Global Road Safety: Exploring Features of an Effective Response and Introducing a 10-Country Program

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Yearly, more than 1.2 million people are killed by road traffic injuries (RTIs) around the globe, and another 20 to 50 million are injured. The global burden of RTIs is predicted to rise. We explored the need for concerted action for global road safety and propose characteristics of an effective response to the gap in addressing RTIs.

We propose that a successful response includes domains such as strong political will, capacity building, use of evidence-based interventions, rigorous evaluation, increased global funding, multisectoral action, and sustainability.

We also present a case study of the global Road Safety in 10 Countries project, which is a new, 5-year, multipartner initiative to address the burden of RTIs in 10 low- and middle-income countries. (*Am J Public Health.* 2012;102:1061–1067. doi:10.2105/AJPH.2011.300563)

EVERY YEAR, MORE THAN 1.2 million people are killed by road traffic injuries (RTIs) around the world; another 20 million to 50 million are injured or disabled.[1] This global burden of RTIs is predicted to climb steadily, from the ninth leading cause of death in 2004 to the fifth leading cause in 2030.[2] Projections also show that RTIs will be 1 of the 3 leading contributors to the global burden of disease as measured by disability adjusted life years (DALYs) lost over the next 2 decades.[1]

In 2004, the global health community recognized the importance of this growing burden with the publication of the *World Report on Road Traffic Injury Prevention*.[1] This report presented information about the causes, risks, and interventions for RTIs, and prompted the United Nations (UN) General Assembly to pass Resolution 58/289, which acknowledged the global importance of addressing RTIs.[3] The same year, the 57th World Health Assembly adopted Resolution 57/10 on Road Safety and Health, which called for member states to take action on the issue.[4] Three additional UN resolutions have since been adopted on the topic.[5–7] Together with the first Ministerial Meeting on Road Safety, these culminated in the UN General Assembly proclaiming 2011 to 2020 the Decade of Action for Road Safety.[3,4,7,8]

With this political momentum and funds from Bloomberg Philanthropies, the World Health Organization (WHO) issued a *Global Status Report on Road Safety*,[9] providing the first-ever assessment of road safety in 178 countries. The key message from this global baseline report was the widespread lack of road safety programs and the need for effective implementation of evidence-based interventions.

Yet, despite the strong political call for action at the global level, limited action has been taken, leaving an implementation gap. In response to this gap, we explore the need for concerted action for global road safety, characterize the nature of an effective response to the gap in addressing RTIs, and define the types of actions that are required to stimulate governments to invest in safety. In doing so, we also highlight a new initiative funded by Bloomberg Philanthropies that serves as one example of how the global community can work toward closing the implementation gap in road safety.

THE EVIDENCE-TO-ACTION GAP IN ROAD SAFETY

Although RTIs remain a global phenomenon, their burden is concentrated in low- and middle-income countries (LMICs). Rates of road traffic deaths in these countries are twice as high as those in developed economies.[9] Between 2004 and 2020, these rates are predicted to increase by 27% in LMICs, but to decrease in high-income countries by 83%.[9] Moreover, 90% of road traffic deaths occur in LMICs even though they have less than 50% of the world's registered automobiles.[9] In terms of economic losses, RTIs were estimated to cost LMICs US $100 billion every year, almost twice what these countries receive in aid assistance on an annual basis, and equivalent to 1% to 3% of their gross domestic product.[10]

Within LMICs, the burden of RTIs is unequally distributed across population groups.[11] More than half of all deaths are among young adults aged 15 to 44 years, and 73% of all road traffic fatalities are male (i.e., often the most economically productive section of the population[9]). Additionally, more than half of RTIs affect pedestrians, cyclists, and those who use motorized two-wheelers. These individuals make up the most vulnerable groups of road users, but are often the least targeted for interventions.[9,12]

Unfortunately, funding priorities do not reflect a consideration of this evidence. In 2000, the Global Forum for Health Research highlighted that less than 10% of global funding for health research was spent on diseases and conditions responsible for 90% of the global burden of disease[13]—the "10/90 gap." Developing countries have mostly failed to devote funds for road safety proportional to the local burden of RTIs. For example, studies have

shown that countries like Pakistan and Uganda suffer from a high burden of RTIs but have traditionally spent little (US $0.07–$0.09 per capita annually) on RTI prevention and control.[14,15]

This evidence-to-action gap becomes especially noticeable when relatively inexpensive, effective interventions for RTIs are available. For example, WHO estimates that correctly using seatbelts can reduce the risk of dying in a crash by 61%, and proper wearing of a standard helmet can reduce the risk of fatal head injuries by 45%.[1] Other RTI interventions, such as targeted traffic enforcement and erecting traffic-calming measures such as speed bumps, have been deemed some of the most cost-effective interventions in public health.[16–20] Many RTI-related interventions were estimated to have an average cost-effectiveness of less than US $500 per DALY, with several below US $100 per DALY that were deemed highly cost-effective.[20] Recent empirical work in LMICs continues to demonstrate this trend. For example, a study in Uganda showed that an increase in traffic patrols for RTI prevention was valued at US $27 per life-year saved.[15]

Large-scale interventions related to transport infrastructure are being planned in LMICs and are also predicted to have good returns on investments.[21] For example, a 20-year road safety program in Malaysia is projected to bring about an expected return of US $16 in averted crash costs for every US $1 invested.[22] There is also significant potential for RTI reductions by providing multimodal transportation and improvements to road design standards in urban areas, thereby reducing vehicle miles traveled.[23,24] Sustainable transport has significant potential as a road safety policy because of the numerous cobenefits that can be achieved while reducing RTIs (e.g., reduced greenhouse gas emissions and pollutants, reduced congestion, improved accessibility for all transport modes[25]). However, such evidence has not resulted in actual investments in LMICs. Despite the need for and availability of cost-effective interventions, an implementation gap persists. That is, the growing body of evidence supporting the use of RTI interventions has yet to be operationalized into an effective program on the ground.

CHARACTERISTICS OF AN EFFECTIVE RESPONSE

A consortium of partners (see case study in the next section) have been studying previous road safety and injury projects, reviewing experience in other fields of health such as health services delivery in LMICs, and using their own expertise in global road safety to explore key characteristics necessary for an effective response.[20,26,27] This approach is exploratory and uses a programmatic and policy scan to prioritize elements that have made public health responses in LMICs successful in the past. It also accounts for the work done since the sentinel 2004 world report on road safety to propose 10 features of the types of response required to effectively curb the mounting burden of RTIs.[1,9]

One of the biggest challenges to closing the implementation gap is lack of global funding for RTIs (Figure 1). Until RTIs receive the budgetary support their growing numbers demand, the global health community will be limited in the actions taken to prevent and control RTIs. The current amount of funding does not allow for road safety programs or demonstration sites to be studied within a reasonable geographic scope. Closely tied to this lack of global funding is the need to focus action where RTIs are highest. This means that efforts should be concentrated in LMICs, which not only bear the largest global burden of RTIs but will also face an increasingly larger share of this burden in the coming decades. These 2 issues have implications for the third characteristic—the scale of actions needed to address road safety needs commensurate with the burden. With more than 90% of the world's road traffic deaths occurring in LMICs, which are also home to more than 80% of the world's population, action must be taken on a scale large enough to reach a sizable portion of the target population.[28]

Road safety is not the sole purview of the health sector. In many instances, critical actions will be performed by other sectors such as police, transport, and communications. As a result, multisectoral action is an important fourth characteristic for closing the road safety implementation gap. Implicit in this is the need for coordination across a variety of actors within and across sectors. Players throughout the global community must work together and combine expertise to address RTIs. These will include those in the public (governmental), nongovernmental (civil society), and private (for-profit) sectors.

The lack of political will to tackle RTIs is an important sixth element, which is seen especially at the country level. Strong political commitment ensures that road safety is given a priority in national and local health and transport plans.[29] Prioritizing road safety also assists with another critical characteristic—the sustainability of efforts to address RTIs. Ideally, any response would have to be integrated into the policies and plans of national governments and budgeted for accordingly. National governments are major stakeholders in any response to RTIs, and their ownership is important for long-term sustainability. The engagement of other sectors in alternate models, such as public–private partnerships, can also be useful.[30,31]

Even with political buy-in, the need for capacity and suitable human resources to address RTIs is a paramount eighth characteristic to ensure effective and sustainable actions. Closing the implementation gap requires a concerted effort to improve existing workforce, train professionals, and develop skills and capabilities at all levels. Another critical feature needed to close the implementation gap that is also linked to good human resources is the use of evidence-based RTI interventions. Programs must be based on actions (e.g., the use of helmets, seatbelts and child restraints, speed control, alcohol control) that have been shown to be effective scientifically.[1,18,20] Funds for road safety should not be wasted on interventions that have not been shown to have an effect on road safety indicators.

Finally, rigorous evaluation would be a key tenth characteristic of any action to close the implementation gap. This is important for showing the effectiveness of the interventions implemented, and also for convincing both decisionmakers and the general public of the utility of road safety investments. Objective methods for real-world evaluations are increasingly being used in the health sector for large-scale programs,[32] and new approaches to such evaluations that allow important attribution of effect, and realistic interpretation of impact over time and location, are being proposed in the literature.[27,28,32]

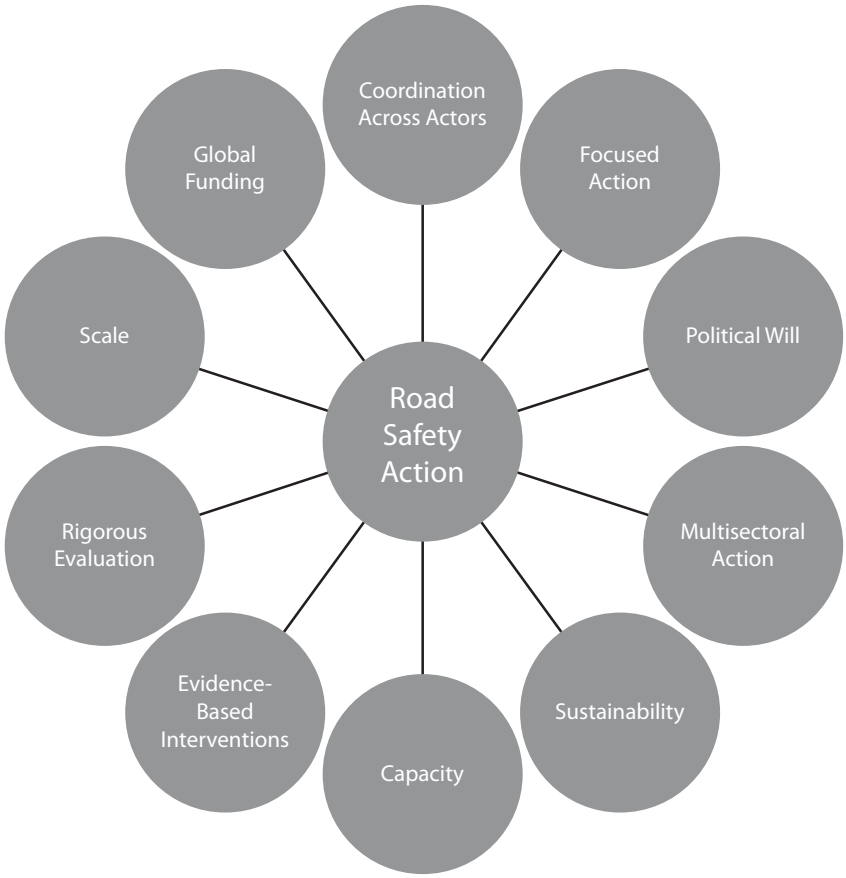

FIGURE 1—Proposed characteristics of an effective response to the implementation gap in global road safety.

In summary, we propose that an effective response to the global road safety implementation gap ought to be characterized by the 10 features described here (Figure 1). Although many of these features have been described individually in the health literature for effective responses to disease conditions like HIV, malaria, and tuberculosis, together they represent the set of key issues that require attention for global road safety.[26,33]

ROAD SAFETY IN 10 COUNTRIES PROJECT

The new Road Safety in 10 Countries (RS-10) project is a case study in response to the implementation gap described in the previous section and the need for global action. Funded by Bloomberg Philanthropies through a US $125 million 5-year grant (2010–2014), the RS-10 project brings together 6 partners to address the global burden of RTIs: WHO, Johns Hopkins International Injury Research Unit, the World Bank Global Road Safety Facility, the Global Road Safety Partnership, the Association for Safe International Road Travel, and EMBARQ—the World Resources Institute Center for Sustainable Transport (Table 1). The primary goal of RS-10 is to reduce deaths and serious injuries in LMICs by focusing on proven preventive and care interventions, identifying high-performing, experienced partners for implementation, and rigorously evaluating outcomes. The project targets 10 countries that account for almost half (48%) of all traffic deaths globally: Brazil, Cambodia, China, Egypt, India, Kenya, Mexico, Russia, Turkey, and Vietnam (Table 2).[1] It also includes 2 subprojects in 3 countries (Egypt, India, and Kenya) that focus on improving trauma care and data monitoring systems.

A relatively standardized approach is being proposed for all RS-10 countries. At the national level, a high-level working group of stakeholders has been created, a joint national work plan has been developed, road safety legislation is being reviewed, engagement and training of police is occurring, and capacity development of civil society through national awareness and safety campaigns is being launched by nongovernmental organizations. Two or more focused intervention sites (cities and districts or regions) have been identified in each country on the basis of the following criteria: high RTI death rates, political support, readiness to implement interventions, presence of appropriate partners, data availability, ease of geographic access, and the perceived potential to serve as models for neighboring regions (Table 2). Each site has been encouraged to focus on at least 2 of 4 potential risk factors (i.e., drunk driving, excessive speed, lack of seatbelt and child restraint use, and lack of helmet use) on the basis of data associated with increased RTIs. Each participating country has decided on these intervention sites and targeted risk factors together with international partners (Table 1). Once these sites and risk factors were chosen, a baseline assessment of the epidemiology of RTIs was conducted with public data sources and selected new primary data collection.

An effective, evidence-based, and nationally relevant set of interventions—ranging from infrastructure improvement to enforcement—that address the chosen risk factors will be implemented in each site. Local partners have been solicited to partake in planning and overseeing the implementation of each intervention, whereas country and local governments are playing a major role in the entire RS-10 process. All relevant sectors—health, transport, police, and law—are being involved as needed and

TABLE 1—International Collaborators of the Road Safety in 10 Countries (RS-10) Project and Their Primary Roles

Organization	Institution Type	Primary Role	RS-10 Country Coverage
World Health Organization	United Nations Agency	Assistance to ministries for program implementation	All 10
Johns Hopkins International Injury Research Unit	Academic–research group	Monitoring and evaluation	All 10
World Bank Global Road Safety Facility	Facility at a development bank	Road safety capacity assessments	India, China, and Russia
Global Road Safety Partnership	Public–private partnership	Risk factor and enforcement training	All 10
Association for Safe International Road Travel	Nongovernmental organization	Advocacy and civil society development	Kenya, Egypt, and Turkey
EMBARQ—the World Resources Institute Center for Sustainable Transport	Environmental think tank	Promoting sustainable urban transport and development	Turkey, India, Mexico, and Brazil

Note. The 10 countries in the RS-10 project are Brazil, Cambodia, China, Egypt, India, Kenya, Mexico, Russia, Turkey, and Vietnam.

encouraged to participate at the country and site levels. Importantly, an evaluation of the intervention approach has been planned at each site from the outset and not left to the end of the project. The program evaluation integrates regular monitoring of outputs and a final outcome assessment at the end of the 5 years.

Finally, capacity development across several sectors is a critical feature of the RS-10 project. International partners will conduct training and skills development programs for national and local public health sector professionals, police, and relevant stakeholders in each country. As a result, at the end of the project, national professionals will be trained in relevant data collection and good practice interventions, which will allow independence from future technical assistance.

The RS-10 project proposes a number of benefits to participating countries. It affords funding for countries to address their RTI burden and intends to support achievement of national priorities aligned with road safety. It aims to create partnerships between local, national, and global experts on road safety with the goal of providing support for greater road safety capability. It encourages multisectoral collaboration in a specific setting for health, transport, police, and other agencies to work together, and includes environmental concerns and transport sustainability. It also builds on existing successes in a few countries such as Vietnam.[34] A thoughtful monitoring and evaluation plan that combines international expertise with national collaborators is provided to ensure an efficient and objective assessment.

The project will provide continuous feedback through regular partner and national meetings to aid in successful project implementation. Although the project aims to save lives in each country, it also expects to strengthen systems and build national capacity. A major focus is placed on sustainability and ensuring that these countries are able to maintain, expand, and scale up their road safety programs. To accomplish this, training is being conducted and RS-10 project aims are being integrated into government plans. An emphasis is being placed on national governments remaining key stakeholders and major contributors during the entire process.

With such an ambitious and unparalleled global project in road safety, many challenges exist. A primary one lies in effective coordination across governments and different partners, which requires extensive planning and communication. As a result, the rate of progress of RS-10 is expected to vary between locations, depending on national contexts. Additional attention will be paid to

TABLE 2—Countries of the Road Safety in 10 Countries (RS-10) Project and Their Burden of Road Traffic Injuries

Country	Intervention Sites, No.	Risk Factors	Country Income Level[a]	Road Traffic Fatalities per 100 000	Road Traffic Fatalities, No.	% Global Road Traffic Fatalities
Egypt	2	Speed, seatbelts	Middle	41.6	31 439	2.6
Kenya	2	Helmets, alcohol	Low	34.4	12 918	1.1
Russia	2	Seatbelts, speed	Middle	25.2	35 972	3
Mexico	2	Seatbelts, alcohol	Middle	20.7	22 103	1.8
India	2	Helmets, speed, alcohol	Low	16.8	196 445	16.4
China	2	Speed, alcohol	Middle	16.5	220 783	18.4
Vietnam	2	Alcohol	Low	16.1	14 104	1.2
Turkey	2	Seatbelts, speed	Middle	13.4	10 066	0.8
Cambodia	3	Helmets, alcohol	Low	12.1	4595	0.04
Brazil	5	Speed, alcohol	Middle	10.9	35 155	2.9
Total					583 580	48.2

Source. Data are from a 2009 World Health Organization report.[9]
[a]Based on World Bank rankings.

this aspect of the project. The project's reliance on local counterparts in implementing the interventions also assumes that some local capacity is available; this ability is evolving in many countries and may affect both the timelines and efficiency of implementation. This challenge will also be evident in terms of standardizing monitoring and evaluation processes across all 10 countries and among intervention sites. The pace and quality of data and timeliness of measurements are expected to be variable, but with one of the international partners specifically assigned to this aspect, RS-10 hopes to have good data on outcomes.

Finally, it is important to note that RS-10 is an externally funded project and its goals may be viewed by some as donor driven. However, in this case, the donor has made information-led and evidence-based participatory decisions. Moreover, by actively integrating all relevant stakeholders, especially governments, into all aspects of the project, RS-10 hopes to minimize this concern.

POLICY IMPLICATIONS FOR GLOBAL ROAD SAFETY

Global road safety is at a crossroads. Evidence-based interventions are available, and yet governments around the world are not adopting and implementing them. This implementation gap, although not unique to road safety, is harmful. Thousands of lives are being lost as a result, and there is a public health and moral mandate for response. This is an opportune time to respond to the implementation gap, but the response must consider the lessons that have been learned in health and other development sectors about effective programs. The key characteristics that we have proposed need to be integrated to ensure that the impacts on health and economic outcomes are sustained by key stakeholders, allowing programs to last beyond their specific project timelines. This is a challenge for road safety because of the inherent need for multiple sectors to effectively work together, often in a context where such collaborations have not existed in the past. Visionary leadership, good management, and transparency will need to guide such efforts in road safety across and within countries.[35]

The RS-10 project represents a unique initiative to fill the implementation gap by transforming the existing policy momentum around global road safety into a specific global demonstration project that tackles the escalating burden of RTIs. The project addresses many of the characteristics of an effective response (Table 3). In terms of funding, the RS-10 project represents a sentinel investment to address the rising global burden of RTIs. Bloomberg Philanthropies' US $125 million investment represents the single largest donation for global road safety to date. This presents a huge opportunity for the global road safety community, especially for WHO, because injuries have received on average less than 1% of WHO's yearly budget even though they account for a much larger portion of the world's burden of disease.[36]

By including a spectrum of LMICs, RS-10 helps tackle the equity gap in the global burden of RTIs. The participating countries are a diverse and varied group representing nations at multiple levels of socioeconomic development, and they include a wide

TABLE 3—How the Road Safety in 10 Countries (RS-10) Project Compares With Suggested Characteristics Needed for Addressing the Implementation Gap in Global Road Safety

Desirable Characteristic	Specification	RS-10 Features
Funding	To make RTIs a global funding priority	US $125 million guaranteed over next 5 years Largest investment in RTIs to date
LMIC focus	Inequitable burden of RTIs in LMIC needs to be addressed	Implemented in 10 LMICs Includes countries across a wide spectrum of developmental profiles
Scale	Global action to address the growing burden of RTIs	Serves as a global project in 10 different countries Captures 48% of global burden of RTIs
Multisectoral action	To work across sectors like transportation, health, and police enforcement	Encourages collaboration across multiple sectors at the national level
Coordination across actors	Concerted and concentrated effort among a variety of global actors	Brings together 6 global actors to address RTIs: WHO, WB, IIRU, GRSP, ASIRT, and EMBARQ
Political will	National governmental support for road traffic safety	Governments serve as primary stakeholders in the project Governmental aims and priorities integrated into the program
Sustainability	Integration of project goals into national policies and plans	Strong national ownership Participation of health and transport ministries
Capacity	Local experts in road traffic safety and country-level ability to tackle RTIs	Training modules for public health officials and police to increase local capacity
Evidence-based interventions	To use evidence-based interventions when addressing RTIs	Uses effective interventions Will contribute to evidence-based knowledge of RTI interventions via ongoing monitoring and project evaluation
Rigorous evaluation	To illustrate the effectiveness of interventions and encourage political buy-in	Evaluation is ongoing from the project's beginning to ensure an efficient and objective assessment

Note. ASIRT = Association for Safe International Road Travel; EMBARQ = EMBARQ—the World Resources Institute Center for Sustainable Transport; GRSP = Global Road Safety Partnership; IIRU = Johns Hopkins International Injury Research Unit; LMIC = low- or middle-income country; RTIs = road traffic injuries; WB = World Bank Global Road Safety Facility; WHO = World Health Organization.

scale of developmental profiles. This will help translate the findings of the project so that they can be broadly extended to many other countries with similar profiles. Furthermore, the 10 participating countries account for 48% of the global burden of RTIs[2] (Table 2). This affords an unprecedented opportunity to help address a sizable portion of the world's burden of RTIs and ensures that the size and scale of the project will be commensurate with this burden. Pilot projects focused on a single site or one country often have less power to convince national governments. Initiatives in other public health fields have stressed the need for interventions at a scale where populations and the number of people covered can be easily understood as reflecting the "real world."[27]

The RS-10 project places a heavy emphasis on governmental buy-in and capacity development, which will lead to more effective and realistic solutions for improving road traffic safety. All participating RS-10 countries were chosen for inclusion through their strong political commitment to addressing RTIs. As a consequence, these governments will serve as primary stakeholders in the project, and national priorities and aims will be integrated into the project's objectives. In a bid to build national capacity, RS-10 includes training for public health officials and police on road safety.

Finally, this project also affords the occasion to focus on evidence-based interventions and evaluate their effectiveness. The knowledge obtained from this project has the potential to transform road safety and RTI prevention policies in selected countries and potentially around the world. As a consortium approach, RS-10 uses the varied expertise of multiple partners across sectors and brings them together to help solve challenges associated with road safety. This addresses the need to coordinate actors across a variety of sectors.[35]

RS-10 offers an opportunity for a massive scaling up of RTI prevention interventions. It also serves as a forum for bringing together a diverse group of partners with complementing specialties to address a global concern. With the start of the UN's Decade of Action on Road Safety in 2011, RS-10 helps kick off a global commitment to reducing the burden of RTIs. ■

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Contributors

A. A. Hyder conceptualized the essay, helped write it, and oversaw revisions and finalization. K. A. Allen cowrote the first draft and participated in the revision process. G. Di Pietro, C. A. Adriazola, R. Sobel, and K. Larson assisted in developing and revising the essay. M. Peden assisted in developing and revising the essay and provided technical guidance.

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The Status of Legal Authority for Injury Prevention Practice in State Health Departments

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Despite the potential for public health strategies to decrease the substantial burden of injuries, injury prevention infrastructure in state health departments is underdeveloped. We sought to describe the legal support for injury prevention activities at state health departments.

We searched the Lexis database for state laws providing authority for those activities, and categorized the scope of those laws. Only 10 states have authority that covers the full scope of injury prevention practice; in the others, legal authority is piecemeal, nonspecific, or nonexistent.

More comprehensive legal authority could help health departments access data for surveillance, work with partners, address sensitive issues, and garner funding. Efforts should be undertaken to enhance legal support for injury prevention activities across the country. (*Am J Public Health*. 2012;102:1067–1078. doi:10.2105/AJPH.2011.300454)

APPROXIMATELY 50 MILLION nonfatal injuries[1] and 180 000 deaths from injury occur each year in the United States. Lifetime costs associated with medical expenses and lost productivity from all injury types are estimated to exceed $400 billion.[2] The public health approach to injury prevention, based on the core public health functions of assessment, policy development, and assurance,[3] includes surveillance to define the scope of the problem, identification of risk and protective factors, development and testing of prevention and control strategies, and assurance of widespread adoption of those strategies that prove to be effective.[4] This approach could have a large positive impact on the public's health.

Although injuries impose a substantial public health burden, and effective public health strategies could decrease that burden, public health practice has been relatively slow to take on injury prevention. In recognition that public health needed to increase its focus on injury prevention, the Centers for Disease Control and Prevention created its National Center for Injury Prevention and Control in 1992 (although injury and violence work at the agency dates back to the late 1970s and early 1980s). State and local health department infrastructure to address injuries has been growing since that time as well, but the injury prevention infrastructure in most health departments, if it exists at all, remains small and underfunded relative to the magnitude of the injury problem.

Government public health agencies function within an authorizing environment defined by statute and sometimes clarified by rule or regulation.[5] Although broad statutory authority allows agency leaders some freedom to define their activities, if the agency moves into a new arena without unambiguous legal authority, its activities may be open to challenge, particularly if they involve regulation or are fraught with political implications, as are so many issues in public health, including injury prevention. Clear authority to engage in injury prevention activities is essential if public health agencies are to engage robustly in this area.

We investigated laws in all 50 states that pertain to authorizing health departments to undertake a robust slate of injury prevention activities. We found that the scope of legal authority for injury prevention activities varies widely across the country regarding which kinds of injuries are addressed and which legal tools an injury prevention program is explicitly authorized to use. If state health departments are to fully realize their potential to prevent injuries, efforts to make the legal basis for the full range of injury prevention activities more comprehensive across the country should be undertaken.

METHODS

We conducted a 50-state online review of selected state laws relating to injury surveillance and prevention. Our data came from Lexis searches conducted between March 2007 and April 2008. Search terms were collect and report injury data; injury