Child Injury Control: Trends, Themes, and Controversies

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ABSTRACT

Injury is a major cause of morbidity and mortality among US children, and an important driver of health status globally. Despite its enormous burden, injury is preventable. Over the last 10 years, significant progress has been made in the reduction of unintentional injury among US children. However, aggregate trends mask important disparities by age group, region, and injury mechanism. Basic and translation research is needed to develop and test prevention strategies to address these new or recalcitrant problems. Motor vehicle occupant injury has fallen to historic lows, but challenges remain in protecting novice drivers and managing the distraction of new technologies. Injury to pedestrians has also declined, but likely as a result of decreased exposure as fewer children walk. This calls for a broader public health perspective to promote activity while enhancing safety. Deaths due to drowning are common and illustrate the difficulty in measuring and promoting appropriate supervision. Environmental modification and use of protective products may be a more appropriate response. Concussion in sport is another challenging issue: public health laws promote identification and appropriate management of concussed athletes, but less progress has been made on primary prevention of these injuries. Unintentional poisoning is on the rise, attributable to misuse of, and overdose with, prescription opioids. Injury deaths to infants are also increasing. This trend is driven in part by better death investigation that classifies more sleep-related deaths as suffocation events. Finally, we examine a sample of cross-cutting themes and controversies in injury control that might be amenable to empiric evaluation.

KEYWORDS: concussion; drowning; injury prevention; road traffic injury; surveillance

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AFTER INFANCY, INJURY remains the leading cause of death for US children.[1] Road traffic injuries, drowning, burns, and—increasingly—unintentional poisoning are common mechanisms of injury death. Beginning in the early teen years, suicide and homicide, together with unintentional injury, round out the top 3 causes of death for individuals 15 to 24 years old. Mortality, however, represents only a fraction of the total burden that child injury imposes on society.

Injury is also a leading cause of morbidity throughout childhood and is a common cause of pediatric hospitalization and emergency department use.[1] Although most injuries can be treated, residual disability is common.[2] Recent studies suggest that disability after even mild injury can affect a child's quality of life over 2 to 3 years.[3] The psychological toll of injury on its victims is also large and often underappreciated. Research estimates that 14% of children hospitalized after a car crash experience symptoms of acute traumatic stress, and 6% go on to have diagnosable posttraumatic stress disorder.[4]

Finally, there is an economic burden to child injury. Because injury disproportionately affects younger people, the years of potential life lost and impact on disability-adjusted life-years are high. Economic quantification of health care costs and productivity losses, using 2005 data, suggest that fatal injury to 0- to 19-year-olds cost US society over $24 billion and that nonfatal, emergency department or hospital-treated injury cost an additional $59 billion.[5]

US injury statistics pale beside estimates of the global burden of injury-related death and disability.[6] Over 90% of pediatric injury mortality occurs in low- and middle-income countries.[7] In 2008, the World Health Organization called attention to these issues in its *World Report on Child Injury Prevention*.[8] This included basic descriptive statistics and a review of prevention strategies for the 5 most prevalent causes of child injury mortality. Recent Global Burden of Disease estimates suggest that across all age groups, injury accounts for 9% of mortality and 12% of global disability.[9] These proportions are much higher than those for tuberculosis, HIV, and malaria combined.

Despite these sobering numbers, there are reasons for optimism and evidence of progress. Most child injury is preventable, and advances in treatment and rehabilitation are improving care for injured children. The Centers for Disease Control and Prevention (CDC) recently reported that over the period 2000 to 2009 overall unintentional injury death among US children 0 to 19 years old fell by almost 30% (from 15.5 to 11.0 per 100,000 population), including a 41% decline in motor vehicle traffic death rates alone.[10] Although this success doubtless reflects injury prevention policies and programs, some fraction of the

decline is also due to decreased exposure to injury risk. The global economic recession, coupled with high fuel costs in the United States, has changed driving patterns and behaviors.[11] At least some of the decline in motor vehicle traffic deaths resulted from these presumably time-limited influences, with recent increases in motor vehicle crash rates accompanying economic recovery.[12] Similarly, child pedestrian fatalities in the United States are at historic lows, but this is due more to decreases in the proportion of children walking to school than to structural changes that support safe walking.[13] The use of research tools to identify the relative contributions of injury risk reduction and injury exposure are important adjuncts to trends in injury burden over time.[14]

Although successes should be celebrated, it is unacceptable that 10,000 US children die each year as a result of injury and violence. This burden is unequally distributed across subpopulations defined geographically or by socioeconomic status.[15] Figure 1 shows child injury death rates by US county, illustrating significant geographic disparity in risk. Geographic distribution aligns, albeit imperfectly, with socioeconomic status because poverty is a powerful risk factor for injury. Similarly, observed declines in injury death have not been distributed evenly across age groups. Injury deaths to infants have *increased* in the United States since 2005, primarily as a result of suffocation in the sleep environment, and injury death rates among teens also remain stubbornly high.[10] Finally, cross-national comparisons of unintentional injury death among children 0 to 14 years have the United States in 30th place among the 34 developed OEDC countries ranked.[16] That our unintentional injury death rate is 3 times that of top-performing nations suggests that there are policies and programs available which if successfully implemented in the United States, might reduce the burden of child injury by 60% or more.[17] This alone should promote action rather than complacency in the face of success to date.

Injury research remains a cornerstone of progress in this field.[18] Now more than ever, we need to know what works, in which contexts, and at what cost. Below, we consider recent innovations in injury prevention for a subset of injury mechanisms as well as new frontiers for research. We also examine cross-cutting themes and controversies that might be amenable to empiric evaluation. Because of limited space, not all injury mechanisms are discussed. Although we focus on primary prevention, we also recognize that acute care and rehabilitation have also contributed to declines in the total burden of injury.

Injury Mechanisms: Innovation and Challenge

Road Traffic Injuries

Road traffic injuries are a leading cause of child injury death in the United States and abroad. In low- and middle-income countries, many road traffic injury deaths are among vulnerable road users (pedestrians and cyclists), while in the United States, most fatalities involve motor vehicle occupants.[19] In the last decade, researchers have demonstrated the benefit of using child safety seats and booster seats for older children.[20] The evolution of child restraint best practices has fostered proactive legislation and visible enforcement. States with the best performance[21] have primary enforcement provisions, meaning an officer can stop a driver solely to enforce restraint laws.[22] Some states have reached near-universal seat belt use rates (97.5% in Washington State).

Motor vehicle crashes are commonplace among young, novice drivers.[23,24] Teen driving deaths have fallen in recent years, due in part to reduced exposure as teens

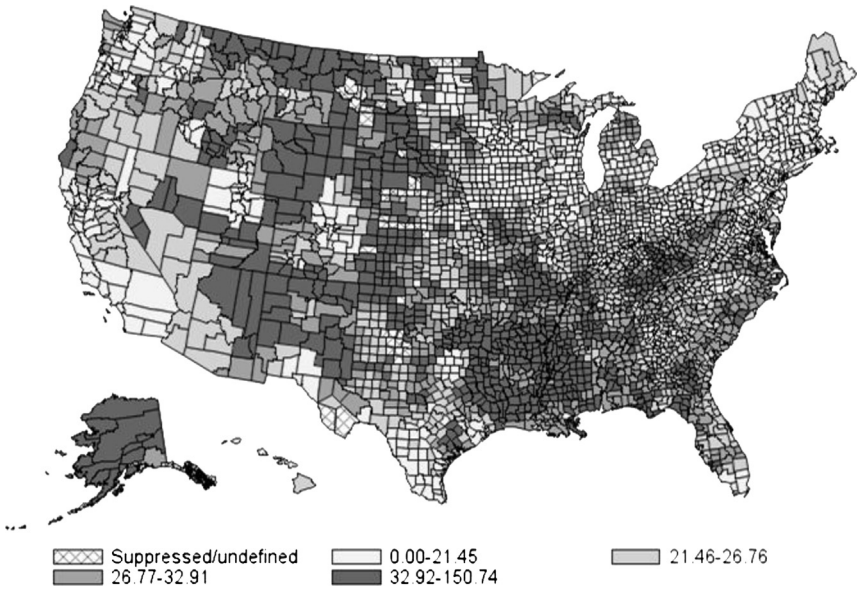

Figure 1. *The 2000–2006 crude injury death rate per 100,000 population, US children 0 to 19 years. Source: Office of Statistics and Programming, National Center for Injury Prevention and Control, CDC. Accessed through WISQUARS (http://wisqars.cdc.gov), September 10, 2012. Rates have been geospatially smoothed.*

postpone initiation of driving, drive less frequently, and drive differently in the face of a weak economy.[25] Success can also be credited to statewide graduated drivers licensing systems (GDL).[26] Although a GDL law serve to educate young drivers, enforcement of the stipulations limiting teen driving to certain hours or under certain conditions is difficult.[27] Thus, parents play an important role in promotion and enforcement of existing GDL regulations.[27] Interventions seeking to enhance parental discussion with, and monitoring of, teen drivers need further study.

Technology also promises some help in monitoring and shaping the behavior of new drivers. In-vehicle camera and recording technology, coupled with feedback to teen drivers and their parents, is a promising approach for optimizing the skill-building experiences early in the driver's career.[28,29] Randomized trials of this technology as an adjunct to GDL and parental monitoring are warranted. If efficacy is established, a cost-effectiveness analysis might persuade individuals, insurers, or governments to subsidize the cost of this program. More broadly, most vehicles are now equipped with event data recorders (EDR), or "black box" technology. These are primarily designed to assist in crash reconstruction.[30] One can imagine, however, that insurers might value access to information about routine driving habits and might choose to pay for it in terms of rate reductions for safer teen drivers. Most drivers, however, do not know that their vehicle records this information, and it is unclear to whom the data that are recorded belong.[31] Numerous challenges in terms of technology and privacy rights will need to be addressed before EDR records can be used to incentivize driving behavior.

Distraction is a threat to all drivers, and novice drivers who are still working to integrate their skills are at highest risk.[32] The proliferation of mobile communications platforms adds to the various sources of distraction present in the driving compartment. Although simulation studies suggest that talking on a cell phone increases the risk of a crash, real-world studies of drivers in naturalistic settings point to the period of handling a phone, dialing, or texting—activities that take the eyes off the forward roadway—as especially dangerous.[33] With leadership from the National Highway Traffic Safety Administration, states are banning cell phone use or texting while driving.[21] Nevertheless, the behavior remains prevalent in the face of lax enforcement, and studies of the outcome of these bans have reached disparate conclusions.[34] We need a smarter smart phone—one that can actively block functionality for drivers. Programs or devices to block smart phone operation in a moving vehicle have been developed but face challenges in keeping up with the rapid evolution of mobile technology,[35] as well as entrenched resistance[36] and compulsive device use.[37]

In the United States, pedestrian and bicycle deaths have fallen, reflecting safety advances but also a decline in exposure to these activities.[38] Trips taken on foot and miles traveled on foot or by bicycle have fallen dramatically over the last 30 years.[39] The resulting drop in associated fatalities should not be interpreted to suggest that these activities are safer. Indeed, on a miles-traveled basis, both remain far riskier than auto travel.[40] This discrepancy disproportionately affects those too young to drive, those too poor to afford a car, and those with disabilities that limit driving. It also discourages walking or biking for active transport or recreation and penalizes transit users who make part of their journey on foot.[41] At the same time, US society has become increasingly sedentary, with an epidemic of childhood obesity.[42] The injury control community must partner with public health colleagues to support healthy communities, active commuting, and lifelong habits of exercise. We must ensure that active transport is safe, without imposing interventions that decrease its desirability and uptake.

One intriguing aspect of this retreat from the streets is seen in studies that suggest safety in numbers—that is, the assertion that cyclists or pedestrians are safer, on a per-person or per-mile-traveled basis, when there are more of these nonmotorized road users present.[43] This is postulated to be due to changes in driver awareness, behavior, and speed when confronted with more cyclists or walkers. It suggests that one approach to increasing safety for these road users is to encourage more pedestrian or bicyclist use and visibility.[44] Studies of this concept are difficult to conduct appropriately but could be influential in policy making and urban planning decisions. At a minimum, planners should consider the needs of all road users, with amenities included to improve safety for pedestrians and cyclists, and recognition that if these are successful, increased nonmotorized traffic should be expected.

Outside the United States, road traffic injuries are an enormous challenge. Motorization and access to roads are directly linked to economic development, and increasing distance from a paved road remains one of the strongest predictors of absolute poverty.[45] As countries invest in transport infrastructure, many do so without considering or mitigating the injury risks created. Road traffic policies typically focus exclusively on motorized traffic, failing to consider the needs of and impact on nonmotorized vehicles, pedestrians, and settled areas. Highways speed through towns and bisect well-established pedestrian routes, increasing risk and exposure to child pedestrians. Motorcycles and electric bicycles, as cheap alternatives to the automobile, are increasingly prevalent and seldom operated by a helmeted driver.[46,47]

Internationally, Bloomberg Philanthropies has contributed US $125 million over 5 years to address road traffic injury in developing nations. The funds consider road safety in 10 high-priority low- and middle-income countries that account for almost half of the world traffic injury deaths.[48] Subsequently, in May 2011, the United Nations General Assembly declared 2011–2020 a Decade of Action for Road Safety with the goal of stabilizing, then reducing, the forecast burden of road traffic injury through policies and activities at the national, regional, and global level.[49] One priority area, often overlooked in these interventions, includes efforts to preserve some of the beneficial transport practices prevalent in less-resourced settings. The use of public transport is widespread, and many daily trips

are made on foot. These practices should be supported and made safer, rather than cast aside in a model of development that prioritizes the use of private automobiles.

Drowning

In the United States, drowning is the leading cause of injury death among 1- to 4-year-old children and is second only to motor vehicle crashes as a cause of unintentional injury death in other pediatric age groups.[50] Drowning is also a major cause of child mortality in low-income countries, especially in Southeast Asia, where exposure to water used for irrigation and farming is common. Evidence from large cross-sectional studies in 5 Asian countries suggested that child drowning is grossly underreported in national vital statistics data.[51]

Children drown quickly, and often silently, in tubs, buckets, swimming pools, ponds, lakes, irrigation canals, and open water. In many cases of drowning, one might be tempted to point, after the fact, to a lapse in parental supervision. It is challenging to quantify the degree and quality of caregiver supervision, although scales to describe context-dependent supervision have been developed.[52,53] It remains difficult to translate the concept of supervision into public health messaging: how much supervision is enough? What are the characteristics of supervision associated with risk reduction? Most importantly, can supervision practices be altered by an intervention? In a remarkable prospective controlled study in Bangladesh, toddler and school-age drowning deaths were reduced in a highly cost-effective program.[54] The intervention included staffed communal crèches where young children were supervised while mothers attended to daily chores, and local instructors taught swimming skills to older children.[55]

In high-income settings, environmental modification is the key to prevention of pool drowning. Four-sided isolation fencing has been shown to reduce the risk of child drowning by 73%.[56] There may also be a role for technology in the form of automated pool monitors that constantly scan the underwater environment and sound an alarm or alert a lifeguard when a human-shaped object exhibits behavior suggestive of drowning.[57] This technology should be tested as an adjunct to traditional lifeguarding in crowded pool environments.

Studies now suggest that formal swimming lessons are associated with an 88% reduction in the risk of drowning among 1- to 4-year-old children.[58] The American Academy of Pediatrics revised its policy setting a minimum age at which children should start learning water-survival skills, though it stopped short of endorsing swim lessons in younger children.[59] More research is needed to identify the optimum age for initiation of swimming instruction, the content elements most strongly associated with a survival benefit, and the generalizability of water safety skills across aquatic environments.

Open-water drowning is especially prevalent among older teens and young adults.[60] Cummings and colleagues recently showed that personal floatation device (PFD) use among recreational boaters was associated with 51% reduction in drowning risk.[61] This suggests that almost half the drowning deaths in this population might be prevented through use of PFDs. In states where PFD use has been measured over time, there has been almost no change in adult PFD use but some improvements in youth PFD use when legislation changed.[62] As in all settings, youth alcohol use impairs judgment around the water, is associated with risk of drowning, and is a critical target for public awareness campaigns and boating law enforcement.[63]

Sports-Related Concussion

Although seldom a cause of death, sports-related head injury has emerged as a public health concern over the last decade. Concussions in sport are underrecognized, underdiagnosed, and often inappropriately managed.[64] Concussions can predispose to more serious brain injury and may have a cumulative detrimental effect.[65] There is uncertainty about the degree to which biomechanical and physiologic models of injury and recovery, developed in adult athletes, can be extrapolated to children. The limited evidence suggests that children are more vulnerable to these injuries and require longer to return to a premorbid functional baseline.[66] Because helmets may not protect against concussive forces,[64,67] appropriate intervention may call for changes in the rules of play to minimize opportunities for injury, decisions about age of onset and cumulative exposure to certain higher-risk sports, and efforts to promote early recognition and intervention with concussed athletes.

One such strategy is found in public health law. The Lystedt Law, pioneered in Washington State, mandates that a concussed athlete be removed from play until evaluated and cleared by a medical professional.[68] The goal is to promote recognition and appropriate, tailored intervention, precluding athletes from return to play until they have fully recovered. With support from the National Football League, similar laws had been enacted in 40 states and territories as of 2012.[69] Although this has resulted in increased visibility for concussion, studies are needed to determine if the law has its intended effects.

One challenge is that there are no gold standard neurophysiologic tests to establish that an athlete has experienced, or recovered from, a concussion. Neuropsychometric testing, performed by a psychologist or by a computerized algorithm, is one measure of functional impairment.[70] Research is required to better understand the applicability of computerized testing in pediatric athletes and its interpretation, after injury, if an injured player has no baseline data recorded. We also need to improve concussion management, explore the longitudinal impact of mild traumatic brain injury, and disseminate research to help primary care physicians, trainers, coaches, referees, and parents implement evidence-based care.

Unintentional Poisoning

In the United States, unintentional poisoning has surpassed motor vehicle occupant injury as the leading cause of injury death in certain age groups, and it represents the fastest-growing cause of fatal injury for children.[71] The

CDC attributes most of this increase to inappropriate use of prescription opioid medications. Prescription of narcotic painkillers has increased dramatically, with a concomitant increase in misuse and abuse. In 2006, these drugs were involved in more overdose deaths than heroin and cocaine combined.[72]

A public health response is taking shape. Prescription drug monitoring programs, coordinated at the state level, have the ability to identify worrisome patterns of opioid misuse by patients or opioid prescribing by clinicians.[73] Similarly, provider education may reduce the prevalence of opioid management for chronic pain, thus reducing total population exposure.[74] Lockboxes for prescription medications are an underused and potentially effective strategy to prevent diversion of drugs.[75] Good Samaritan laws that allow bystanders to call for help without fear of drug-related prosecution have been enacted in some jurisdictions, as have programs to allow drug users or those who encounter them to administer intranasal naloxone in the event of an overdose. These interventions are worth evaluating and, if effective, implementing on a larger scale.

INFANT SUFFOCATION

Over the last 20 years, sleep-related infant death classified as sudden infant death syndrome (SIDS) has fallen, but death attributed to suffocation in the sleep environment has increased (from 2.8 to 12.5 per 100,000 live births).[76] This is associated with a net increase in injury mortality among US infants (Figure 2). Tools and procedures to standardize infant death investigation have likely resulted in better understanding the determinants of sleep-related infant death, thereby generating more diagnoses of suffocation, a mechanism traditionally considered with injury.[77] This has important implications for researchers, epidemiologists, and prevention advocates.

Although SIDS is, by definition, an event of unknown cause, suffocation can be attributed to behaviors, products, and environments unsafe for infant sleep. This opens the door to more forceful and evidence-based prevention recommendations about the sleep environment.[78]

Child death review is a multidisciplinary process through which local teams consider the context and contributing factors in these unexpected child fatalities.[79] The US National Center for Child Death Review maintains a multistate registry of Child Death Review findings to better understand the contributing causes, demographic distribution, and mechanisms of infant suffocation.[80]

VIOLENCE

Intentional injuries are an important subset of the total injury burden. Child maltreatment is a major cause of death and disability in infancy.[81] The peak incidence of inflicted brain injury is at about 2 months of age, suggesting that pediatricians have very little time with a new family to assess risk and coordinate indicated interventions.[82] Instead, universal interventions must reach all new parents and infant caregivers.[83] For populations at higher risk, nurse home visiting is an evidence-based intervention[81] that is still only sporadically implemented despite the net cost saving associated with this program.[84] Scaling up the program and embedding it in the public health system remains an unmet challenge.

Bullying has been identified as a precursor to both interpersonal violence and suicide. In one national survey, 20% of high school students reported being bullied on school property in the preceding 12 months, and 16% reported electronic bullying over the same period.[85] Prevalence is higher among middle school students. School-based antibullying programs can achieve reductions in this behavior of 20% or more.[86] It is unclear whether prosocial interventions work by reducing the impulse to bully among perpetrators or whether these interventions generate enough community awareness and intercession to protect potential victims regardless of the effect on those who bully.

Youth suicide is a tragic outcome of self-directed violence.[87] Because it is typically an impulsive act, youth

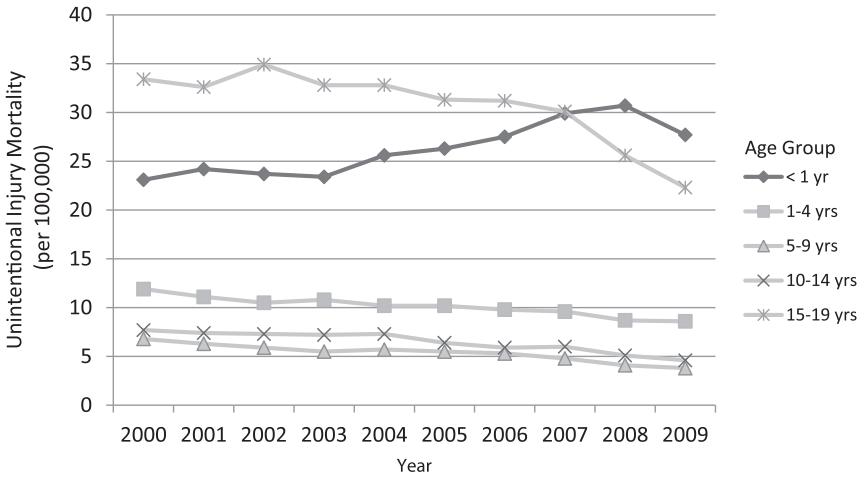

Figure 2. *Trends in unintentional injury death rate per 100,000 population, US children 0 to 19 years, by age group (2000–2009), formatted to highlight increasing rates among infants <1 year old. Adapted from CDC data.*[10]

suicide may be reduced through restricting access to lethal means.[88] But it is also important to recognize and reach out to those youth at risk of suicidality and completed suicide.[89] School dropout is clearly a red flag for suicide risk; unfortunately, it removes youth from the one environment where they might best be screened and served.[90]

Homicide is the second leading cause of death among youth aged 10 to 24 years in the United States.[1] Prior reviews examined the effectiveness of protective measures for reducing the risk of violent injury.[91,92] Firearms remain an important cause of injury for children,[93] with more than 36,500 gun-related injuries occurring in those under 18 during 2007–2009.[1] A small portion of these firearm deaths are unintentional.[94] Safe firearm storage can prevent these child injuries and is also a suicide deterrent. Proven interventions include firearm safe storage promotion[95,96] and child-access protection laws.[97] More work is needed to understand how best to implement and disseminate these violence prevention strategies for parents, care providers, communities, and state and local governments.

THEMES AND CONTROVERSIES

Over a number of these injury mechanisms and in various contexts, there are identifiable themes and unresolved controversies in the injury control community. Perhaps the most basic is, which injuries do we really want to prevent? Clearly, some bumps, bruises, and scrapes are part of being an active child.[98] No one argues that children's activity should be curtailed or their experience of the environment restricted in order to prevent these minor injuries. Unfortunately, in many cases, these minor injuries are caused by mechanisms that could just as easily have resulted in something more serious.[99] The challenge, then—and one that the injury control community has not consistently addressed—is how to prevent or mitigate the more serious sequelae of events without resorting to interventions that dramatically reduce children's exposure to physical activity and independent exploration of their environment.

This discussion needs to include a broad perspective of child health and well-being. Child pedestrian injury, for example, could be completely prevented by interventions to stop children walking in the street environment. Indeed, concern about traffic safety, whether accurate or overstated, has contributed to the reduction in child pedestrian activity in the United States.[100] One could argue that this is a misplaced concern. The health benefits of physical activity for the individual, and the environmental benefits of nonmotorized transport, likely outweigh the real but finite risk of injury on any given trip.[101] But injury risk is accrued now, while any tangible health benefits of physical activity are realized years into the future. Parents are likely to heavily discount future health states in favor of present safety. Our challenge is thus to provide a realistic assessment of injury risk, work to create environments, products, and patterns of behavior that drive this risk as low as possible, and restore a perspective that demands activity be made safer, not that activity be avoided.

In low- and middle-income countries, injury prevention advocates struggle to confront a growing problem with limited resources and surprisingly little attention from international health agencies.[102] It is tempting to use injury control funds first to establish data collection and surveillance systems.[103] Reliable data should allow one to demonstrate the magnitude of the injury problem in a country or region, perhaps argue for additional resources, and monitor the impact of prevention programs as these are implemented.[104] Unfortunately, surveillance systems can be complex, costly, and sometimes inaccurate.[105] In some areas, more resources are put into surveillance than into prevention itself. A more rational approach might be to rely on existing international data to estimate the distribution and determinants of injury morbidity, perhaps supplemented by addition of injury questions on systematic, periodic health surveys. We would argue that ongoing surveillance should only be proposed if tied to specific prevention programming and resources to support both the intervention and the data collection.

If intervention resources exist, another dilemma arises: should we target high-risk individuals or provide more universal programming? There is an inherent appeal, using risk factor epidemiology, to identifying individuals with an increased risk of injury and focusing outreach, programs, or policies on that group. However, this strategy is much more difficult to implement than one might imagine: risk factors, at an individual level, have poor test characteristics as predictive tools.[106] Risk factors themselves may only be markers for other elements of the causal chain that could be difficult to identify or impossible to change; and targeting individuals because of their risk for an outcome can lead to labeling, stigmatization, or other undesirable side effects.

From a public health perspective, universal interventions—targeting populations or communities—are the logical alternative. Indeed, for injury control, the most effective interventions work at the community, environmental, or policy level, not with individuals. The dilemma in this approach, now becoming clear, is that although a population focus can reduce the average risk of injury and the total burden, it may also worsen inequities within the population affected. If, for example, a universal intervention fails to reach or inadequately benefits people in the lowest income strata, it will, even if quite successful in reducing the total population burden of injury, contribute toward an increase in the disparity in injury risk between higher and lower income groups.[107] Progress is being made, however, in understanding and anticipating these inequities, and interventions can be modified to preserve equity in results. This has been demonstrated in child nutrition interventions and should be studied in injury control as well.[108]

Finally, in the United States and abroad, we need to become more adept at advocating for research and intervention resources to address the injury problem. Data showing the global burden of injury as a cause of mortality, as a contributor to morbidity and disability and as an economic drain on society, have been available for many years, and the policy and public health response has been

suboptimal. Child health advocates need to make a more compelling argument for resources, recognizing that other interest groups are competing for the same funding and seem to be able to do so with greater success.[109]

Given constrained resources, we should insist that programs or interventions proposed be limited to those that have been evaluated and found effective. We should also demand pragmatic trials that test interventions in real-world settings, with resources and protocols that could be replicated in public health practice.[110,111] This will make translation and implementation of interventions more likely.

We also must ensure that intervention studies are conducted in a manner that includes, or allows for, cost-effectiveness research to occur in tandem. Many prevention policies or programs may in fact be cost saving, but costs are typically incurred in one sector (eg, health) while savings are realized in another (eg, transport or criminal justice). A broad societal perspective, with coordination at the highest levels, is required to both justify intervention funding and recoup the savings. This cross-sectorial collaboration may be better served by a positive focus on health and safety promotion than by a narrow view of injury prevention alone.

For too long, we have accepted injury as an inevitable component of the human condition. As we collectively consider policies and a research agenda to promote child health and safety, we need to ensure that assessment of costs and benefits captures long-term effects of injury over a child's lifetime.[2] The lingering effects of physical and psychological injury—as well as the constraints imposed when families face inherently unsafe environments—can dramatically affect the trajectory of a child's development and the likelihood of reaching his or her full human potential. There is a child's story behind every injury statistic. Often these are stories of pain, loss, and grief. But there is also hope in the voice of survivors and, if we can tap it, the emotional energy to galvanize advocacy and redirect research so that each child can look forward to a safe and promising future.

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