

of government whose actions must be changed to achieve the desired result. Few, however, specify that state, provincial, or federal health departments have a role to play. To ensure that the encouraging downward trends in mortality continue, injury control must be fully recognized as a public health problem. □

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Editorial: Reducing Violence—How Do We Proceed?

Since the 1980s, there has been tremendous growth in attention to injury as a public health problem.¹ This growth is reflected in many ways, from the frequency of published articles in medical and public health journals to the scope of the Centers for Disease Control and Prevention's injury control efforts (now given Center status). This attention has produced improved understanding of the scope of the injury burden, with an increasing focus of studies and interventions on specific injury types and settings, particularly related to unintentional injuries (what we used to call "accidents"). Articles in this issue of the *Journal* exemplify this focus, for example, articles on occupational injury deaths of 16- and 17-year-olds,² child and adolescent drownings in one county,³ and recall bias in injury surveys.⁴ Such a focus has proven necessary for the development of effective prevention measures. Means are now recognized for reducing the frequency or severity of several specific injury types, including, for example, toddler pool drownings,⁵ bicycle head injuries,⁶ and child motor vehicle passenger injuries.⁷

It has been increasingly acknowledged that suicide and assault (together sometimes called "intentional injury")

contribute to the national injury burden. But until recently, these aspects of injury, in which human agency is most critical, were given much less attention than other types of injury. Some landmark publications give evidence of this disparity. About 25% of the Centers for Disease Control's 1990 report to Congress on injuries in children dealt with suicide and violence.⁸ About 20% of the second edition of the *Injury Fact Book* is devoted to these topics.⁹ In one sense, these proportions are more or less reasonable: suicide and homicide cause about 22% of deaths in childhood and adolescence¹⁰ and 35% of all injury deaths.⁹

But the proportion of injuries due to homicide and suicide does not give a full picture of their burden, for at least two reasons. The first concerns their contribution to years of potential life lost. Fatal unintentional injuries rise to their highest rates among the elderly. Suicide rates are rather stable through adult life. Homicide rates are at their highest as a proportion of all injury deaths in infancy, peak again during the second decade of life, and fall with increasing age after about age 30.^{9(p18)} As a result, violence contributes disproportionately to years of potential life lost from injury.

Second, a focus on the proportion of deaths due to violence does not reflect historical trends. While rates for most other types of injuries have been falling in recent years, homicide and suicide rates have been stable for the entire population^{9(p34)} and increasing for young people.¹¹⁻¹³ This pattern predicts a growing contribution of violence to total injury deaths and has made firearm homicide the leading cause of death for African-American teenaged boys.¹⁴

Because violence poses a disproportionate current and future burden, it deserves more attention than it was getting in the 1980s. One need only read the newspapers to know that in the 1990s the warranted attention is being paid. The public health costs of violence are receiving growing public attention, now often overshadowing the costs of unintentional injuries.

This situation challenges public health researchers and practitioners. Many have begun to work on this contemporary plague, and many more are considering doing so. As we plan how to begin or continue our work, we

Editor's Note. See related articles by Waller (p 664), Castillo et al. (p 646), Warneke and Cooper (p 593), Harel et al. (p 599), and Wintemute (p 561) in this issue.

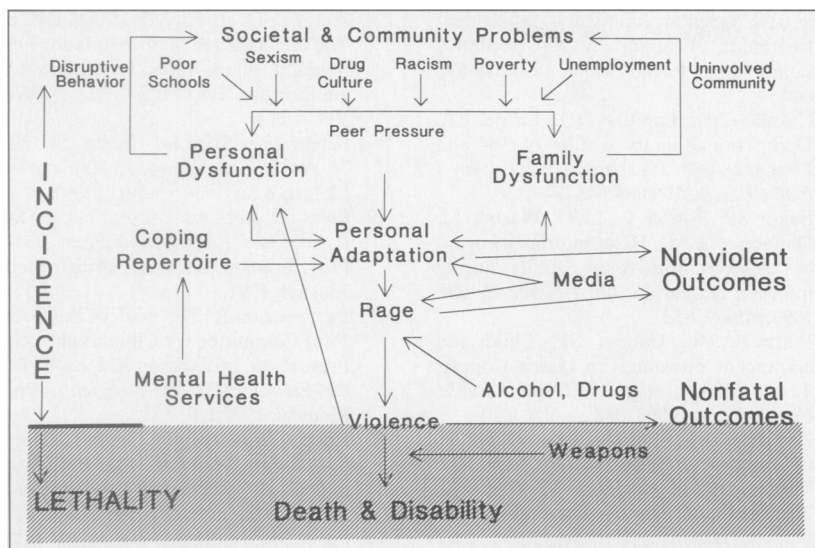


FIGURE 1—Contributors to peer assault morbidity and mortality.

need to ask: How are we to proceed? We must learn from the productive work on unintentional injuries, and so aim to develop information that is sufficiently specific to allow successful prevention of the many manifestations of violence. To do this, we must identify types of violence that can be studied and addressed specifically.

It is a reflection of the immaturity of the work on violence that there is not yet unanimity on its definition. For some, violence is synonymous with crime. Others see violence as a set of dysfunctional individual behaviors. A National Institutes of Health conference a few years ago defined violence as including suicide and maltreatment, defining the latter as

behavior toward another person, which (a) is outside the norms of conduct and (b) entails a substantial risk of causing physical or emotional harm. The behaviors included will consist of actions and omissions, ones that are intentional and ones that are unintentional. They will have severe, mild, or no immediate adverse consequences.¹⁵

The National Center for Injury Prevention and Control uses injuries to measure the effects of violence; the center is moving away from the “intentional injury” terminology (which misleadingly suggested that perpetrators always intend to harm) and is currently using this definition: “threatened or actual use of physical force against oneself or an individual or group that either results, or is likely to result, in injury or death”

(James Mercy, acting director, Division of Violence Prevention, written communication, December 1, 1993). A consensus definition for public health purposes is needed.

Even without such a definition, distinct, albeit probably interrelated, types of violence are evident. These include child abuse (violence against children by caregivers), peer assault (including domestic violence), stranger assault, elder abuse (violence against elders by caregivers), political torture, war, and suicide. But no such taxonomy of violent events can lead directly to prevention, because for many purposes broad categories will need to be broken down further—for example, peer and caregiver assault into physical and sexual subcategories. The article in this issue of the Journal concerning homicides of law enforcement officers addresses one subtype of stranger assault.¹⁶

Furthermore, there are many contributors to the human interactions that lead to violent injury. Figure 1 presents a diagram of the biopsychosocial pathways involved in the manifestations of peer assault, which accounts for most homicides.^{9(p79)} This problem is at least as complex as metabolic pathways, which are studied enzyme by enzyme. Similar diagrams could be drawn for other types of violence. Effective control of violence will require that we understand and specifically address the many contributors to each type. Our success will be

measured in the short term by our impact on the contributors to violence (e.g., by increased support resources for families); in the long term, by our impact on one or more types of violence (e.g., peer homicide).

The larger, upper portion of Figure 1 describes the factors that contribute to the incidence of violent interactions; the lower portion describes the factors that contribute to the severity of violent interactions that occur. Although severe violent injuries can be seen as just a symptom of underlying problems that contribute to the incidence of violence, progress on this end of the problem, for example, via handgun control, could save many potential homicide victims to benefit from work on the more fundamental problems. It will be important to work on all levels at once. Given this complexity, it will not be possible to succeed quickly.

We can look forward to a growing body of research on violence. In many ways, the content of the research should be familiar to readers of the Journal. For specific types of violent injury, surveillance reports will clarify epidemiologic patterns. Other reports will elucidate contributing attitudes and practices in many settings (public, corporate, and private); identify critical measures that can alter damaging attitudes and practices; measure the short- and long-term effectiveness of interventions; and track risk factor and outcome trends in different areas and subpopulations.

Because the pathophysiologic details relate to the transfer of deadly force, successful solutions are likely to be guided by the science of injury control, so vastly strengthened in the last decade. Other critical contributing disciplines will be developmental biology and psychology, because interventions to control violence will need to take into account developmentally based vulnerabilities and abilities of both perpetrators and victims. The frailty of the infant brain, which leads to severe injury in some abusive circumstances, is an example of a biological vulnerability.¹⁷ Psychological variables include the emotional fragility and recuperative capacities of abused children and adolescent assault victims; the effects of these traumas on later functioning (and violence victimization and perpetration); and the short- and long-term effects of real-life and media modeling of violence at various life stages.

As we work to reduce the toll of violence, we will progress by building on existing knowledge and methods, gradually adding information and techniques that allow specific and effective interventions. Despite the enormity of the task, with patience and persistence we can indeed proceed. □

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Annotation: Firearm-Related Violence—What We Don't Know Is Killing Us

Firearm-related deaths and injuries are a major public health problem in the United States. Overall, guns rank second only to motor vehicles as a cause of fatal injury.¹ The number of 15- to 19-year-old African-American males who died from gunshot wounds in 1990 was 4.7 times larger than the number who died from acquired immunodeficiency syndrome, sickle cell disease, and all other natural causes of death combined.² Unfortunately, our capacity to deal with this problem is compromised by inadequate data and insufficient support for firearms research.³

Society's primary response to violence has been to "get tough on crime." As a result of this strategy, our prison population nearly tripled between 1975 and 1989. Although there is some evidence that sentence enhancement for crimes with a gun may decrease rates of gun homicide,⁴ overall rates of crime and violence have continued unabated.⁵

Recently, a panel of experts convened by the National Research Council recommended a broad-based, interdisciplinary approach to the understanding and control of violent behavior.⁵ It is unlikely, however, that more effective countermeasures will be forthcoming

without adequate data to shape our thinking. Like blind men feeling the elephant, our grasp of the problem is limited by the information at hand.

Our singular focus on the actions of the offender is a case in point. Although individuals should certainly be held accountable for their actions, efforts to control violence need not be limited to the traditional criminal justice strategies of deterrence, incapacitation, and rehabilitation.⁵ Preventive measures, including modification of high-risk situations, settings, and weapons, could significantly enhance our current approach to violence control.^{1,5}

In this issue of the Journal, Garen J. Wintemute uses handgun production figures and Federal Bureau of Investigation (FBI) statistics to estimate the relative risk that various types of handguns will be involved in the homicide of a law enforcement officer.⁶ These homicides are the only ones with enough weapon-specific data to support this kind of analysis. His findings strongly suggest that certain types and calibers of handguns are disproportionately involved in criminal homicide.

This study is important because it frames a small but particularly impor-

tant class of crimes (homicides of law enforcement officers) in a new context (the type of handgun involved). Unfortunately, it also demonstrates the limitations of our current sources of data. Handgun production figures by type and caliber were obtained from the Bureau of Alcohol, Tobacco and Firearms, but crucial design elements (such as barrel length and ammunition capacity) are not recorded. Sales figures are not reported. Since rates of handgun ownership by caliber, model, or brand are unknown, Wintemute was forced to use a range of estimates of the number of handguns in circulation.

Significant gaps were noted in the FBI's homicide statistics as well. The manufacturer of the handgun was not recorded in one of every four cases, and barrel length was not noted one third of the time. In many instances, the weapon was probably not recovered; in other cases, the reporting agency may have considered this information unimportant. Sadly, the FBI data are the best available. National statistics on homicides involving the rest of the US population are far less complete.

Editor's Note. See related article by Wintemute (p 561) in this issue.