

A Blueprint for Injury Control in the United States

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Synopsis

In a 1988 appraisal of the status and progress of the injury control program at the Centers for Disease Control (CDC), a National Academy of Sciences' Review Committee applauded the rapid progress made by CDC in 3 years, including the competitive evaluation of research proposals and funding of 5 injury prevention research centers and 31 demonstration projects. CDC also made progress in forming the Division of Injury Epidemiology and Control, which has developed an intramural cooperative program with other Federal agencies and an outreach effort to State and local public health departments.

The Review Committee felt that, by all measures, the CDC response to the recommendations of the Academy's 1985 report, "Injury in America," has been a success, and a national program for injury control is underway. However, the Committee made the following recommendations for further development and maturing of the CDC program:

The CDC effort needs to gain institute status (National Institute for Injury Control) and appropriate funding to address research needs adequately. As the program grows, the organizational structure of the Institute should attain a balance of the five principal areas of injury control (epidemiology, prevention, bio-mechanics, acute care, and rehabilitation), assuring that CDC programs go beyond traditional public health approaches and identify the causes of injury as the key step toward effective control.

CDC should continue the competitive evaluation and selection of research centers and demonstration projects, including State and local outreach programs, and should direct a major part (80 percent) of its injury control funds in this area. CDC should continue its cooperation with other Federal agencies and consider formal interagency coordination and joint funding of research. An advisory council should be formed to help guide the further development of the CDC program and devise a blueprint for future programs.

DURING THE 20 YEARS following the 1966 study by the National Academy of Sciences' National Research Council of accidental death and disability—"the neglected disease of modern society" (1)—there have been many appeals for a national program to consolidate trauma research, now generally referred to as injury control research. Many of the appeals were based on specific needs in acute care and emergency medical services (2-4) within the broader goals of injury control.

A sufficient coalition of support for a multidisciplinary research and demonstration agenda did not come about until the 1985 publication of a study, "Injury in America," (5) by the Academy. This study gave otherwise disparate researchers common ground—a national agenda for injury control. A consensus was fostered by the Centers for Disease Control (CDC), which formed a Division of Injury Epidemiology and Control (DIEC) early in 1986.

The CDC initiative was bolstered by a commitment from the National Highway Traffic Safety Administration (NHTSA) for a 3-year (1986-88) transfer of Department of Transportation (DOT) funds to the Department of Health and Human Services (DHHS) to support an injury control research program (6).

CDC moved quickly to announce the availability of competitive funds to support injury prevention research centers (IPRC) and demonstration projects (7). It specifically asked for proposals "toward an interdisciplinary, comprehensive approach to the injury problem." Even though there was a short response time after the June 1986 Federal Register notice of fund availability, the announcement unleashed pent-up research interests and resulted in an overwhelming number of submissions on subjects of wide-ranging scientific inquiry.

Submitted for competitive evaluation (see table) were 420 proposals totaling \$86 million in research. Altogether, 39 institutions applied for research center

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support. CDC formed an Injury Prevention Research Committee (INPRESS) to review and evaluate the relative merits of each application. Thirteen proposals were approved (33 percent) and five centers were ultimately selected for funding at a level of approximately \$2 million per year.

Because of the much larger number of research and demonstration proposals, INPRESS was assisted by eight ad hoc review committees to handle the evaluation and ranking of individual projects. Slightly more than 30 percent of the projects were recommended for approval, and 31 were eventually selected for support at a level of approximately \$8 million per year. Many worthwhile center and project applications were left unfunded, but an injury control program at the national level was born.

While the extramural research program was being developed, CDC initiated cooperative efforts with other Federal agencies on issues of common interest in injury epidemiology and control. These efforts laid the foundation for an intramural research program. Studies were initiated on bathroom falls of the elderly in Florida, farm-related fatalities in Wisconsin, and a case control study of suicide clusters. In addition, an outreach program was being put into place to improve injury surveillance at the State and local levels, to standardize injury descriptor and reporting procedures, and to implement linkages to other records. The intramural and extramural programs were well underway through 1987, the last year of the Department of Transportation commitment.

Genesis of the Academy Study

With injury control progress on many fronts, DOT acted on a congressional request and asked the National Academy of Sciences to assess progress of the CDC injury control program. The Academy was asked to set up a committee in 1988 to evaluate how well the recommendations of "Injury in America" (5) had guided the CDC program in the Division of Injury Epidemiology and Control during the initial period and to deter-

mine what recommendations from the earlier report should be reconsidered or modified for future growth of the injury control program.

A review committee was formed within the National Research Council of the Academy's Commission on Life Sciences in collaboration with the Academy's Institute of Medicine.

Given the charge of accomplishing a timely evaluation of the CDC Injury Control Program, the review committee quickly (a) asked Council staff members to conduct discussions with CDC and NHTSA personnel involved in the pilot program; (b) initiated an evaluation of the CDC extramural research program, including the ramifications of the grant announcement in the Federal Register, the review and selection procedures, and progress of the programs in the Injury Prevention Research Centers (IPRC) and in the demonstration projects; (c) initiated evaluation of the CDC intramural programs, including growth of staff and organizational structure and of internal and cooperative programs; and (d) convened a 2-day injury control workshop on March 29–30, 1988, with 30 invited presentations from Federal agencies, private organizations, and foundations.

Study Recommendations

Armed with new information, the National Academy of Sciences Review Committee deliberated the future of injury control in the United States and provided the following recommendations in its report in May 1988 (8).

Organization. The Committee reaffirmed the recommendations in "Injury in America" to establish a Center for Injury Control within CDC to assure national focus and visibility of efforts on this important public health problem. It suggested, however, that a National Institute for Injury Control, modeled after the National Institute for Occupational Safety and Health (NIOSH) in CDC, would be able to conduct research better while enhancing a service-oriented program.

The Committee also reaffirmed its recommendation to establish an advisory council to guide CDC during the critical period of early development of an injury control program. The council's involvement should be from the top down. It should be involved in strategic planning, setting of program priorities, assuring balance and breadth of the CDC intramural and extramural efforts, giving advice on organizational structure and staffing, and in making policy decisions.

The Committee stated (8a), "The Advisory Council should include persons representing the major elements or disciplines in injury control. Generally stated, its purpose is to guide programming, staffing, and policy decisions. Its efforts must include periodic review of

Results of the 1986 program announcement of grants for injury control research and demonstration projects and injury prevention research centers.

Activity	Number of applications	Approved		Funded		Approved, not funded	
		Number	Percent	Number	Percent	Number	Percent
Demonstration projects	381	119	31	31	8	88	23
Research centers	39	13	33	5	13	8	21

priorities in research and implementation, with an eye to identifying approaches or subjects that promise reductions in morbidity and mortality associated with injury.”

The Committee reaffirmed the recommendation of “Injury in America” that the CDC program should lead the public effort at the Federal, State, and local levels. In addition, it should cooperate with relevant professional societies, private organizations, and foundations in the private sector.

CDC could, for example, expand the scope of the injury control objectives for the year 1990 (9) in the year 2000 health objectives, which emphasize the broad aspects of injury control and add morbidity to mortality goals for the nation. CDC should consider forming an interagency committee to coordinate Federal efforts on injury control. The committee could be separate or overlap with the advisory council. Both groups could include former members of National Institutes of Health (NIH) advisory councils. In addition, members of CDC peer review committees should include researchers familiar with NIH programs as an additional means of integrating the national program on injury control. When research goals overlap agencies, the Committee advised the use of joint funding, which would go beyond good intentions to have cooperation and would formalize coordination and funding of injury control programs.

The Committee recommended that CDC should cooperate with professional societies, private organizations, and foundations, because there is a need for a strong coalition in support of injury control and broadening of the constituency for a national program. Lastly, CDC should continue its effort to coordinate State and local demonstration programs, since the outreach effort is a key to success but must be strengthened to enhance injury control (10).

The Committee saw that the current structure of the Division of Injury Epidemiology and Control was built on CDC strengths, but reaffirmed the “Injury in America” recommendation for a broad-based program built and organized on the five principal elements of injury control. It recommended that CDC attract and retain professional staff members with expertise in acute care, biomechanics, and rehabilitation, and make them full

‘In terms of premature loss of productive years of life, injury surpasses all major disease groups and, unfortunately, the toll in terms of disability is of equal magnitude.’

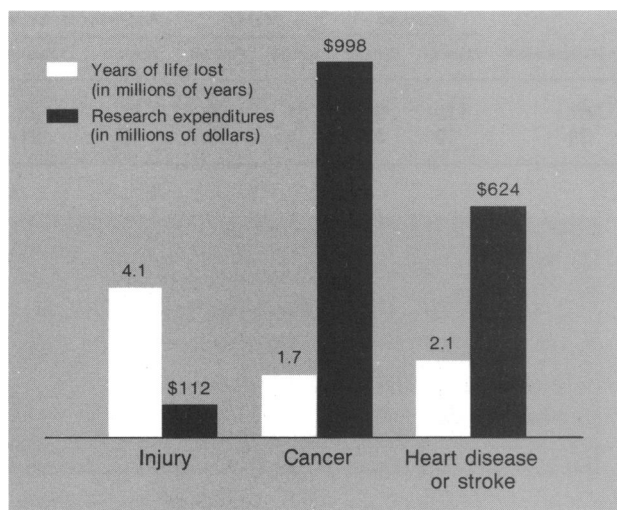
partners in CDC decision making. Training grants could be awarded to universities to develop research professionals in these areas. University grants could serve not only as bridges to the academic community but could build a cadre of future staff members for CDC.

In addition, the CDC program would benefit from expertise in economics to analyze resource allocations, the cost of injury and disability, and the cost effectiveness of injury control programs on a national level. Recent studies (11, 12) show that injury prevention programs are vastly more cost-effective than environmental health programs being considered by many Federal agencies. Such comparative analyses further underscore the potential of injury control measures for economic savings.

Agenda and program plans. CDC should develop a national program plan with the assistance of the advisory council. This plan should set priorities and be a blueprint for future initiatives in injury control. As an example, it may include a national trauma system to assure optimal regional trauma care in accord with the standards of the American College of Surgeons (13) and guidelines of the American College of Emergency Physicians (14). It would be helpful if this blueprint were expanded to include a national system of regional trauma care and rehabilitation.

An increased emphasis on a continuity of treatment from the initial acute trauma to rehabilitation would set a standard of care for the world to emulate. The committee also made a recommendation to improve injury surveillance by incorporating the E-codes of the International Classification of Diseases on hospital and discharge records. This would ultimately help address methods of cost reimbursement and would help identify

Preretirement years of life lost annually and Federal research expenditures for major causes of death in the United States (redrawn from *Injury in America* (5) with permission)



the incidence and prevalence of injury and disability in the United States, particularly brain and spinal cord injury disability.

The Committee recommended annual rounds of extramural research and demonstration projects. This should include the awarding of additional injury prevention research centers (IPRC) and demonstration projects at universities and health departments. The Committee reaffirmed that 80 percent of the CDC injury control budget should support extramural projects and training. Members of the Committee emphasized that a significant increase is needed in support of biomechanics and acute care research. The Committee recommended that the CDC effort should expand beyond traditional public health approaches and should focus on the causes of injury.

While traumatic injury has many similarities to more traditional public health problems such as infectious disease, there is one striking difference. The underlying cause of injury is not biological but mechanical force, which initiates disruption of physiologic processes as well as immediate tissue damage (15). Injury, as a public health problem, needs the combined efforts of engineers, who understand the science of the mechanical forces of impact, and physicians and medical scientists, who understand the biological and physiological consequences.

The causes of some injuries are founded in biomechanics (16), which is a developing field of science in its infancy. A national commitment to research on injury biomechanics will open up new opportunities to prevent and treat traumatic injuries. Emphasis should be placed on providing better experimental models (17, 18) for the study of treatment protocols and

therapeutic drugs to minimize the extent of injury consequences and impairments. More realistic models will also unlock the key parameters of mechanical impact which control the severity of injury. With an improved understanding of injury causes, such as the viscous mechanism of injury (19), the development of new methods to assess safety designs will provide tools for engineers to design consumer products that are safer than those on the market now.

CDC should increase the nation's awareness of injuries and develop a program to educate the American people about this public health threat. In many ways, Americans have been desensitized to the annual loss of life and permanent disability resulting from injury. CDC needs to develop means to break down the implicit acceptance and adaptation of society to the current toll from injury. As a nation, we are appalled by the loss of life from the crash of a commercial airliner or school bus, yet we stand essentially mute in the face of 150,000 fatalities annually (20), unless one somehow touches us personally. Americans need to identify injury for the threat that it actually is and recognize it as one of the nation's most important public health problems.

In many ways injuries are illusive, since risks seem low. For example, the 1988 highway fatality rate is at an all-time low of 2.46 per 100 million vehicle miles travelled (21). This translates to 1 death for every 13,900 trips between New York City and San Francisco. Although this seems low, it is deceptive because crash injuries are a major cause of fatality for young people in America. Injuries kill more Americans ages 1-34 than all diseases combined, and they are the leading cause of death up to the age of 44. In terms of premature loss of productive years of life, injury surpasses all major disease groups, and, unfortunately, the toll in terms of disability is of equal magnitude.

The Review Committee applauded the increased dissemination of timely information on injury to professionals via the Mortality and Morbidity Weekly Report. CDC also held a 1987 conference on injury in America which brought many State health agency workers and other professionals together for the first time in broad-based discussions. Information from the conference appeared in a special issue of *Public Health Reports* (22), which further advanced the dissemination of injury control information. The Committee also recommended an independent review of the CDC program in 3 to 5 years as an effective way to audit progress of the national program for injury control.

Funding and grants. The original funding of the CDC injury control program was contained in Public Law 90-190, which transferred \$10 million from the Depart-

ment of Transportation to the Department of Health and Human Services for a 3-year trial program. This stimulated research and interest in the field and emphasized CDC's leadership in a broad-based program of injury control. The Committee acknowledged and appreciated the DOT initiative but felt that injury is a health problem and that the Department of Health and Human Services is the right department for major funding.

The Committee emphasized that the 1989 recommendation for \$20 million to support injury control and research is disproportionate to the serious societal consequences of injury (see figure). However, should the funding base get bigger, it will pass through a range that is sufficient to support the formation of the National Institute for Injury Control. As the CDC program grows, it should continue to increase the leverage of resources from other agencies to augment the overall growth of funding for injury-related research and demonstration projects. The Committee acknowledged the important role played by injury control coalitions in helping assure appropriate funding but advised that there is a need for renewed efforts to support the future of the CDC Injury Control Program.

In summary, the Committee stated (8b), "Injury is probably the most underrecognized major public health problem facing the nation today, and the study of injury presents unparalleled opportunities for reducing morbidity and mortality and for realizing significant savings in both financial and human terms—all in return for a relatively modest investment. The program housed in the Division of Injury Epidemiology and Control is a beginning, but only a first step. The Committee believes that the program has been sufficiently successful to warrant its establishment as a permanent program."

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