



# History of Injury and Violence as public health problems and emergence of the National Center for Injury Prevention and Control at CDC

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## ABSTRACT

Injuries and violence are among the oldest health problems facing humans. Only within the past 50 years, however, has the problem been addressed with scientific rigor using public health methods. The field of injury control began as early as 1913, but wasn't approached systematically or epidemiologically until the 1940s and 1950s. It accelerated rapidly between 1960 and 1985. Coupled with active federal and state interest in reducing injuries and violence, this period was marked by important medical, scientific, and public health advances. The National Center for Injury Prevention and Control (NCIPC) was an outgrowth of this progress and in 2012 celebrated its 20th anniversary. NCIPC was created in 1992 after a series of government reports identified injury as one of the most important public health problems facing the nation. Congressional action provided the impetus for the creation of NCIPC as the lead federal agency for non-occupational injury and violence prevention. In subsequent years, NCIPC and its partners fostered many advances and built strong capacity. Because of the tragically high burden and cost of injuries and violence in the United States and around the globe, researchers, practitioners, and decision makers will need to redouble prevention efforts in the next 20 years. This article traces the history of injury and violence prevention as a public health priority – including the evolution and current structure of the CDC's National Center for Injury Prevention and Control.

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## 1. The Centers for Disease Control and Prevention

The Centers for Disease Control and Prevention (CDC) protects the nation's health by preventing and controlling disease, injury, and disability. CDC is unique relative to other federal health agencies in the United States. It was founded in 1942 as the agency for malaria control in war areas. The agency was headquartered in the southern part of the United States where malaria was endemic and where World War II troop training facilities were located. In 1946, the agency was renamed the Communicable Disease Center (CDC) and undertook infectious disease control with other practical services as a field station of the Bureau of State Services – a unit of the U.S. Public Health Service (Etheridge, 1992).

CDC has undergone major changes in its 66 year history. CDC saw the need to address other public health areas outside infectious and communicable diseases as the nation's health burden changed to include chronic disease like cancer and diabetes, and injury and violence prevention. In 1992, the words “and Prevention” were added to the Centers for Disease Control name to emphasize the focus on prevention and the need to address upstream solutions to the most challenging public health problems.

As part of the Department of Health and Human Services (DHHS) of the U.S. Government, CDC employs 12,000 staff in 170 occupations worldwide and had a 2012 annual budget of over \$10 billion. Most of CDC's funding goes outside the agency in the form of grants and cooperative agreements and to support state and local public health programs. CDC has established eight different centers in addition to various Offices and Institutes to promote public health, including the National Center for Injury Prevention and Control (NCIPC). Whether the threat is at home or abroad, CDC works to stop it—through detecting, investigating root causes, researching and implementing ways to bolster prevention, and by working with communities, states, and a wide array of partners.

## 2. Early beginnings in injury control

Compared with other scientific fields, surprisingly little attention has been given to the history of injury prevention and safety promotion (Guarnieri, 1992). Many consider the first 50 years of the 20th Century as the pre-scientific era of injury control due to the perception at the time that injuries resulted from inevitable, random, or unavoidable events (Sleet et al., 2011). Early developments in the field included the creation of the National Safety Council (NSC) in 1913, whose principle function was to serve as a clearinghouse of safety information. Later, in 1953, NSC was granted a charter by the U.S. Congress to recognize their leadership in industrial accident prevention (NSC, 1953).

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In the beginning, injury prevention (or accident prevention as it was once called) progressed largely by trial and error. The 3 Es (Education, Engineering, Enforcement) were introduced by Julian Harvey in 1923 and later adopted by the National Safety Council as a way to control the causes of accidents (Nichols, 1970). A 1922 issue of the American Journal of Public Health discussed the problems of accidents in children (Green, Tobey, & Calver, 1922) using data collected by the Metropolitan Life Insurance Company. One out of every three deaths in gainfully employed boys ages 13–17 was due to accidents and the solution was to “...prohibit minors from engaging in those pursuits where industrial accident hazard is the greatest” (p 34–35).

Many feel that the word *accident* has obstructed the study of injury prevention because it suggests that these events take place at random and without cause (Loimer & Guarnieri, 1996). “When the word is used to describe human error, it frequently does so in a way that inhibits examination of the factors contributing to the error and consequent injury ...the public usually associates the word with an event, not with the damage that results” (Loimer & Guarnieri, p 101). Efforts to replace the word *accident* with *injury*, however, have only been partially successful (Langley, 1988).

Some progress was made in the 1930s as psychologists looked for the causes of industrial accidents. Heinrich, for example, classified the cause of 1,490 accidents as related to personal worker behavior and defective equipment; however, 975 of them were deemed “unpreventable” (Heinrich, 1931). Godfrey (1937) described what he believed to be the role of health departments in the prevention of accidents “...to use the tools of public health to alleviate accident hazards ...by plotting them on “spot” maps, discovering common hazards, influence can be brought to bear for the removal of these hazards just as influence of the health department removed the hazards of polluted water supplies – ( and ) reduced the hazard of raw milk “ (cited by Fisher, 2003, p.5). Nonetheless the epidemiological framework for addressing injuries and the use of these public health principles to prevent them would take another two decades.

Between 1940–1950, the scientific approach to injuries laid the groundwork for the development of public health's understanding and response to injury (National Committee for Injury Prevention and Control, 1989). DeHaven (1942), himself a WWI pilot and crash survivor, studied cases in which individuals fell distances of 50–150 feet without sustaining injury. John Stapp (1957), coined “the world's fastest man,” studied how the human body responded to sudden deceleration (such as a crash at 200 mph) by riding in an experimental sled powered by rockets. Both men observed that it was the type of force and its distribution that contributed to injury, paving the way for engineering designs that prevented or modified energy release such as seat belts, dashboard padding, and bicycle helmets (Guarnieri, 1992).

Prior to that time, public health officials largely believed injury prevention was outside the realm of scientific inquiry. There were exceptions of course among forward thinking leaders beginning in 1947. Kent and Pershing (1952) from the U.S. Public Health Service Home Accident Prevention Unit, Division of Sanitation of the Bureau of State Services provided checklists to local health department nurses and inspectors to collect data on home injuries and risks and alert housewives to the principal hazards in their homes. The first Poison Information Center (now a US national system of Poison Control Centers), began in Illinois in 1953 and consisted of one desk, one telephone, and a clerk (Scherz & Robertson, 1978).

In 1949, John E. Gordon suggested that injuries, like classic diseases, were characterized by epidemic episodes, seasonal variation, long-term trends, and demographic distribution (Gordon, 1949). He further explained how injury, like disease, was the product of at least three sources: the host, the agent, and the environment, thus beginning the disciplined scientific approach to injury causation and prevention.

Ten years later, in 1959, James J. Gibson, an experimental psychologist who applied traditional epidemiological method to the study of injuries,

concluded that injuries to a living organism can only be produced by some form of energy exchange (Gibson, 1961). This energy may be kinetic, chemical, thermal, radiant, or electrical and when released, can cause tissue damage or functional impairment. In the case of an automobile crash, the agent of injury is kinetic energy released to the host in amounts that exceed human tolerance. This discovery helped clarify the energy-transfer-theory of injury causation.

In 1953, the first conference on home accident prevention was held at University of Michigan School of Public Health under the sponsorship of the U.S. Public Health Service (PHS), the National Safety Council, the American Public Health Association, and the W.K. Kellogg Foundation (University of Michigan, 1953). W.K. Kellogg had funded demonstration projects in health departments in the 1950s and 1960s. According to Waller (1994) “...they were valuable because they stimulated considerable interest and showed that health departments could – and should – function in this area” (Waller, 1994, p667).

By 1956, a rudimentary Accident Prevention Program was established in the PHS under the direction of James Goddard who had previously established a highway safety unit in the New York State Health Department (Waller, 1994). It was nearly 10 years later that the PHS published the first *Guide to the Development of Accidental Injury Control Programs* for states.

During the early 1960s, the Public Health Service within the Office of the Assistant Secretary for Health spearheaded some federal injury control activities. The Division of Accident Prevention provided several federally funded projects for state and local public health practitioners to conduct home hazard assessments. Support for these programs diminished when the Division was later dismantled and its responsibilities divided among the Food and Drug Administration, the Health Services and Mental Health Administration, and CDC (Fisher, 2003).

### 2.1. Traffic injury prevention

The adverse public health consequences of increases in vehicles on the road in the first few decades of the twentieth century led President Herbert Hoover in 1924 to convene the first National Conference on Street and Highway Safety, designed to create a uniform set of traffic laws to prevent collisions (American Public Health Association, 1961). Franklin D. Roosevelt in 1935 issued a plea for state cooperation to reduce the rising number of traffic deaths and injuries on the highway, cited progress made at the 1924 conference and asked for “...universal application of these remedies which have proved effective where applied” (Dellinger, Sleet, & Jones, 2007, p346). On April 13, 1954, President Dwight D. Eisenhower established a Committee for Traffic Safety, giving it formal status on January 13, 1960 (under the leadership of William Randolph Hearst, Jr.) by signing Executive Order #10858 to “advance the cause of street and highway safety” (Weingroff, 2003, p 120). His successor, President Kennedy, retained the Committee, quickly declared that traffic accidents in the United States were a major public health problem needing attention (Department of Health, Education, and Welfare [DHEW], 1968; Shah, 2006).

During 1965 and 1966, traffic death rates had reached epidemic proportions, raising the specter for vehicle injury prevention. In 1965, President Johnson, continuing President Kennedy's interest in motor vehicle crashes, created the President's Commission on Highway Safety to address the problem. The Commission characterized motor-vehicle crash deaths and injuries as a preventable public health burden and stated that a coordinated national highway safety program should be a major priority (President's Commission on Highway Safety, 1965). President Johnson announced his intention to discuss highway safety in his State of the Union address in 1966 (Highway Safety Act of 1966 PL 89-564, 1967; US Government Printing Office Public Papers of the Presidents, 1967; Shah, 2006).

Congress enacted both the National Traffic and Motor Vehicle Safety Act and the Highway Safety Act in 1966, (Highway Safety Act of 1966 (PL 89–564), 1967) which summoned a national commitment to

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