Children's Safety Network

National Injury and Violence Prevention Resource Center

BICYCLE HELMETS SAVE MEDICAL COSTS FOR CHILDREN

Annually, 196 children younger than age 15 die from bicycle-related injuries. Approximately 8,900 additional children were hospitalized for bicycle-related injuries, and another 344,000 were treated and released in emergency departments. Bicycle helmets prevent 52 to 60 percent of bike-related head injury deaths (for all ages), as well as an estimated 68 to 85 percent of nonfatal head and scalp injuries, and 65 percent of upper and middle face injuries, even when misuse is considered. Thus, bicycle helmets significantly reduce the total medical costs for bike-related head injuries.

COSTS SAVED

- Every $10 bike helmet generates $570 in benefits to society.[1]
- These savings include $50 in medical costs, $140 in future earnings and other tangible resources, and $380 in quality of life costs.
- For each child bicycle helmet law that is passed, it costs $11 per new user and generates $570 in benefits to society.

Figure 1. Every $100 Bike Helmet for Kids Saves $570[1]

- If 85 percent of all child cyclists wore helmets in 1 year, the lifetime medical cost savings would total $197 to $256 million.
- It is very expensive to treat a child with a bike-related head injury. These medical costs may sometimes last the child's lifetime. For example, in 1991, bicycle crashes to children ages 4 to 15 caused 52,000 nonfatal head injuries and

[1] Although the retail cost of bicycle helmets typically range from $10 to $70, nonprofit organizations can buy them in bulk for as little as $7 and distribute them nearly at cost.

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93,000 nonfatal face scalp injuries. Lifetime medical payments for these injuries will approach $394 million.

- 2,200 of the children who sustain these head injuries will suffer permanent disabilities that will affect their ability to work. Universal bicycle helmet use by children aged 4 to 15 would prevent 1,200 to 1,700 of these permanently disabling injuries.
- Every bicycle helmet saves health insurers $57 and auto insurers $17.

Figure 2. Insurers' Benefits per Bike Helmet

- These cost savings estimates may be conservative, as they ignore other significant benefits. For example:
  - Parents will spend less time and money caring for injured children.
  - Lawyers will file fewer lawsuits seeking compensation for child cyclists' injuries.

LIVES SAVED AND INJURIES PREVENTED

- Universal bike helmet use by children aged 0 to 14 would prevent 212 to 294 deaths annually.
- Universal bike helmet use by children aged 0 to 14 would prevent 382,000 to 529,000 bicycle-related injuries annually.

BICYCLE HELMET USE

- Helmet use among children aged 14 and younger is approximately 15 percent nationwide.
- Parents report that 85 percent of children who own bicycle helmets wear them. The usage rate does not vary by income.

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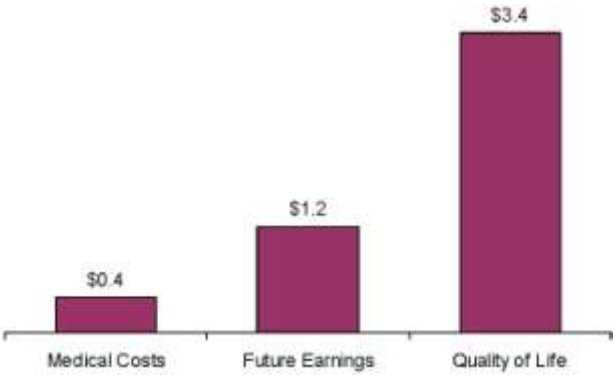

Figure 3. Costs of Child Bicycle-related Head Injuries: $5 Billion per Year (2004 dollars)

(Note: All costs are in 2004 dollars and were computed using the methodology outlined by Miller, Romano, and Spicer [2000]. Numbers may not correspond to totals due to rounding.)

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DEFINITIONS

A. DATA TYPES

- **Fatal:** Mortality data by multiple causes of death include all deaths occurring within the United States. Deaths of U.S. citizens and deaths of members of the Armed Forces occurring outside the United States are not included. Data are obtained from certificates filed for deaths occurring in each State.

- **Admitted:** Hospital patient discharges from short-stay noninstitutional hospitals and general and children's general hospitals regardless of length of stay located within the 50 States and the District of Columbia. Military and U.S. Department of Veteran Affairs hospitals are not included.

- **Nonadmitted:** Information on the health of the civilian, noninstitutionalized population of the United States compiled through the National Health Interview Survey that was designed to obtain accurate and current statistical information on the amount, distribution, and effects of illness and disability and the services rendered for or because of such conditions. Persons who did NOT report going to the hospital for their condition were included; counts related to poisonings were obtained from Toxic Exposure Surveillance System data maintained by the American Association of Poison Control Centers.

B. INCIDENCE-BASED VERSUS PREVALENCE-BASED COSTS

- **Incidence-based costs** are the present value of the lifetime costs that may result from injuries that occur during a single year. For example, the incidence-based cost of head injuries in 2001 estimates total lifetime costs associated with all head injuries that occurred in 2001. Incidence-based costs measure the savings that prevention can yield.

- **Prevalence-based costs** measure all injury-related expenses during 1 year, regardless of when the injury occurred. For example, the prevalence-based cost of head injuries in 2001 measures the total health care spending on head injuries during 2001, including spending on victims injured many years earlier. Prevalence-based cost data are needed to project health care spending and evaluate cost controls.

C. RESOURCE VERSUS PRODUCTIVITY COSTS

Resource costs are broken down into **medical costs** and **other resource costs**. **Productivity costs** include immediate and future work losses due to a childhood injury.

- **Medical costs** include emergency medical services, physician, hospital, rehabilitation, prescription drugs, and related treatment costs, as well as ancillary costs (i.e., crutches, physical therapy, etc.), funeral/coroner expenses for fatalities, and the administrative costs of processing medical payments to providers. For violence, this category also includes mental health treatment costs.
- **Other resource costs** include police and fire department costs, plus the travel delay for noninjured travelers resulting from transportation crashes and the injuries caused by the crashes. For violence, this category also includes social services and victim assistance costs. It excludes mental health services costs. Fact sheets that do not explicitly show other resource costs include paramedic, ambulance, and helicopter transport costs in medical costs.

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- **Future earnings** include victims' lost wages and the value of lost household work, fringe benefits, and the administrative costs of processing compensation for lost earnings through litigation, insurance, or public welfare programs such as food stamps and Supplemental Security Income. Work losses by family and friends who care for injured children also are included. For violence, this category also includes earnings lost by family and friends caring for the injured and the value of school missed when children are temporarily disabled.
- **Quality of Life** places a dollar value on the pain, suffering, and lost quality of life those children and their families experience due to an injury.

Calculation Methods

To value **quality of life lost to fatal injuries**, we start by estimating the value people place on survival. We measure the value of survival from the amounts people spend (in dollars or time) for safety. Fifty technically sound "willingness to pay" studies have estimated this value (Miller, 1990). They examine such things as markets for auto safety features and smoke detectors, extra wages paid to get workers to take risky jobs, and speed choice when driving.

The value of survival is essentially the combined value of future earnings and quality of life. By subtracting the lost future earnings, we get the quality of life costs per death.[131]

To value **quality of life lost to nonfatal injury,** we use two methods. In the first, physicians rate the typical effects of different injuries on six dimensions of functioning: mobility, cognitive, bending and grasping, pain, sensory, and cosmetic. We also collect data about a seventh dimension: the ability to work. Using surveys about the value people place on different dimensions of functioning, we combine the data to obtain a percentage of the value of survival lost to each injury.

Again, we subtract lost future earnings to get the quality of life costs per injury.

The second method uses jury verdicts to value victims' pain and suffering. This method is used in valuing the quality of life lost to violent crime and to drunk-driving crashes without physical injury. It provides our only estimate of the losses due to rape and to fear.

Estimates from the two methods of valuing quality of life lost to nonfatal injury differ by less than 10 percent.

Since 1989, the U.S. Office of Management and Budget has required all Federal regulatory benefit-cost analyses to include quality of life costs if they place a dollar value on saving lives.

[13] Estimating quality-adjusted life years (QALYs) is one way to value the good health lost to an individual who suffers a health problem, is disabled, or dies prematurely. A QALY is a measure based on individual preferences for states of health that assigns a value of "1" to a year of perfect health and "0" to death. QALY losses are affected by the duration and severity of a health problem. To estimate QALY losses, years of potential life lost to a fatal injury are added to the number of years spent with an injury-related disability multiplied by a "weighting factor" that represents the severity of the disability. Such weighting factors can be estimated by using rating scales or by using tradeoff methods that elicit individual preferences between death and various health states.

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Questions about methods and data in this Fact Sheet Series should be referred to: Children's Safety Network Economics and Data Analysis Resource Center
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