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Original Research

The incidence and economic burden of injuries in Jiangxi, China

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ABSTRACT

Objectives: This study estimated the incidence, direct medical and non-medical costs, and productivity losses due to morbidity and mortality across multiple strata for injuries that occurred in Jiangxi, China.
Study design: Cross-sectional study.
Methods: Data came from the Jiangxi injury survey, a provincially-representative, population-based sample of 100,010 households. The major economic costs of injuries were divided into direct costs and indirect costs. Direct costs encompass medical costs and direct non-medical costs. Indirect costs refer to the productivity losses due to injury-related morbidity and mortality.
Results: In 2005, about one of 18 residents in Jiangxi, China, experienced an injury. Overall, fall, animal bite, and road traffic crash (RTC) injuries accounted for more than 66% of all injuries, while fall, RTC, drowning, and self-harm injuries accounted for 80% of fatal injuries. Average cost per case for a fatal injury was 163,389 RMB ($20,171) for lost productivity and 2800 RMB ($346) in direct medical & non-medical costs. A non-fatal injury resulting in hospitalisation or permanent disability on average caused 5221 RMB ($643) in direct costs and 18,437 RMB ($2276) in lost productivity and, an additional loss of three school days. A non-hospitalised non-fatal injury on average caused 303 ($37) RMB in direct costs and 491 RMB ($61) in lost productivity and, an additional loss of 0.5 school days.

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Conclusions: The unequivocal evidence of the substantial health and financial burden of injuries indicates to Chinese policy makers that more research and efforts are needed to find efficacious and cost-effective interventions targeting injury.

Introduction

Injuries pose a large and growing health risk to children and adults in many countries.[1–5] In China, the overall injury death rate remained relatively stable between 1995 and 2008, with the injury death rate decreasing from 60 per 100,000 per year in 1995 to 52 in 2003, and then increasing to 55 in 2008.[6] Injuries are the leading cause of death among children and adults aged 1–44 years and the fifth leading cause of death for all ages.[7] Injuries affect the health and welfare of all Chinese people through premature death, disability, medical costs, missed school work, and lost productivity. Estimating the economic burden of injuries is important for raising awareness of the magnitude of injury and its costs for the population.

Although injuries are one of the leading causes of mortality and morbidity in China, few studies have systematically assessed the economic burden of injuries. The only study we found used the mortality data from the 1999 National Health Statistics Report and the morbidity data from the 1998 Second National Health Service Survey to estimate the total costs of injuries.[8] While study by Zhou et al.[8] includes both direct and indirect costs, there are a number of limitations to this study. First, the study used only premature mortality to estimate the losses due to different types of injury because morbidity data by type of injury were not available. Second, the study did not include the economic costs caused by disability due to the lack of detailed disability data by injury. Therefore, the economic burden is seriously underestimated.

The objectives of this study were to present estimates of the incidence, medical costs, direct non-medical costs, and value of lost productivity due to morbidity and mortality across multiple strata for injuries that occurred in Jiangxi, China, in the year 2005.

Methods

In this study, the injury experience from a provincially-representative, population-based sample of 100,010 households is used to estimate the incidence and economic burden of injuries in Jiangxi, China in 2005.

Sources of data

Data came from the Jiangxi injury survey (JIS), which was conducted using a multistage, stratified, cluster sample selected from the current Jiangxi Public Security Bureau roster using probability-proportional-to-size (PPS) sampling methods. Jiangxi is one of China's inland provinces, a predominantly rural province with a total population of about 43 million. It is located in the southeastern part of the country, on the southern bank of the Yangtze River. The fieldwork for the JIS was conducted by the Provincial Health Bureau and Jiangxi Center for Disease Control and Prevention during September–December, 2005. Funding for JIS was provided by United Nations Children's Fund (UNICEF) and technical assistance for the survey was provided by Chinese Field Epidemiology Training Program (CFETP), Centers for Disease Control and Prevention (CDC), and The Alliance for Safe Children (TASC).

Following the TASC/UNICEF regional survey protocol, 100,010 households were interviewed in 250 townships/street committees among 98 counties across the entire Jiangxi province. The total number of respondents included in this study was 319,543 including 98,335 children under 18 years of age, making this one of the largest community based injury surveys ever conducted in a developing country. Informed consent was obtained from all respondents as the first step in the interview process. The respondent was chosen as the most knowledgeable adult member of the household among those present at the time of the interview. Where possible, the head of household plus as many household members as possible were present to corroborate answers or add detail. For a child death or serious morbidity, the respondent was the child's caretaker, usually the mother. Details about the design and methods of the JIS can be found elsewhere.[9]

The survey questionnaire consisted of separate modules on demographics, socio-economic information, household risk factors, and structured questions regarding injury mortality for 3 years prior to the survey and morbidity events during the 12 months preceding the JIS survey for all household residents. However, only mortality events from injury occurring the year preceding the survey were included in this study for the incidence and economic burden estimation of injuries for the year 2005. In addition, a set of questions was developed to collect information on costs and the treatment outcomes when injury occurred. For each injury event, respondents were asked how much they spent on medical treatments, transportation to and from the hospital (or clinic), the costs of hiring somebody to provide care for the injured individual, and how many days of work, household work, and school work lost by both the injured individual and family members or friends who provided nursing care for the injured.

Measures of injury incidence

All members of a household were given a comprehensive list of types of injury and asked whether any deaths from those caused had occurred in the preceding three years, and