Reviewer's report

Title: Epidemiology and health economic analysis of injury in Shandong Province, China

Version: 3 Date: 25 March 2007

Reviewer: Mei Wen

Reviewer's report:

Thank you for the opportunity to review your paper – it is an important area for work in developing countries, especially China (and India). The paper addresses a gap in literature where the health and economic burden of injuries has not been well documented in China.

Major Compulsory Revisions

The sampling method is multistage random sampling but it is not clear how the samples are selected and what were the characteristics of the sample.

- In the paper, it is stated that 4 cities and 6 rural counties were randomly selected – how?
- What does it mean to be a “rural” - please define. Is there such a term or classification system in China?
- How did the researchers randomly select the households?
- What is the proportion of rural vs. urban by female vs. male? This directly influences how representative the conclusions for the whole province.
- It would be important to describe how many people were interviewed are from rural areas, and urban areas, but there is no description or information provided in the paper.

There needs to be consistency in the use of terms: for example, “incidence rate of injury” is used in line 3, page 4, but “incidence” or “injury incidence” is used in many other places where maybe you should use injury incidence rate.

YPLL does not take morbidity or disability into account, but in this study only 17 cases out of 24,438 residents are fatal cases.

- Thus one could argue that the main impact of injuries is on non-fatal health outcomes. If that is the case, then YPLL is not the most appropriate measure for capturing this burden. Please justify this choice of indicator.
- Summary measures of populations health (such as the Healthy Life Year – HeaLY; or Disability Adjusted Life Year -DALY) might be a better choice as losses from deaths and disability are combined.
- Also, for these calculations of YPLL it appears that age weighting and discounting were not included; but please clarify.

Parts of table 1 appear to be the same as page 4 on Gardner JW, Sanborn JS. Years of potential life lost (YPLL)--what does it measure? Epidemiology 1990;1(4):322-9. A note should be put under the table.

There is no clear explanation how the consumed years, and un-consumed year are calculated. While the supplementary pages provide some information, neither the source not the rationale for division of the lifespan into 3 segments or the average wages (and methods) is provided. Please clarify.

On Page 4 (results), states that “the incidence of 72.5 per 1,000 per year for injury episode” and is calculated by 1,772 (number of cases of injury) divided by 24,438 (the whole target population). However, in the same paragraph, it is clearly indicated that the “response rate of the survey was 97.75%”. Has this been adjusted?

What is the rationale for the study to assume that there is no injury or deaths among the ‘non-responding’ population? Is there any previous data to support this claim? If not, then the authors should consider alternative strategies for dealing with this issue, such as clearly deleting that sample, or imputing estimated rates.

In table 2 (the part on “Distribution of injury incidence”) it might be better to state clearly the proportion or number of male vs. female, age group, and mechanism. For example, it is not clear if more males accepted doing the survey interview, and that can lead to differential reporting of injuries.

While table 2 provides rates by three variables, it is not clear if there were any associations observed between the three pairs: sex*mechanism; age*mechanism; or sex *age. And it is not clear if there is any difference when sex is introduced to injury incidence rate by mechanism. Therefore it is difficult to
understand aggregate statements like, "Males are characterized by a high incidence of traffic injuries (17.5 per 1,000) and females by a high incidence of falls (12.3 per 1,000). The fatality rate for males (105.57/100,000) is also higher than for females (32.99/100,000) (?2=72.42, P<0.01)." Please clarify.

For Table 3, the Chi-square test is used to test whether there are significant differences in injury incidence rate among different educational levels, occupation or income. And yet the table did not give the proportions of 'others', [although the paper states “Injuries were more frequently observed among preschool children (10.30%) and illiterates (8.42%), compared to others] and the number of injuries in each cell is not provided. It might be useful to put either the number of injuries, or proportion of injuries, into each cell of the table, and then show the Chi-square test results.

In table 4, there is no standard error listed in the table.

The data on injury in this study, just as shown in the paper, is a rare event. The authors should test (and verify) whether the data is normally distributed before using logistic regression for the data analysis. It is likely that the data is skewed and other analysis might be required. Please clarify.

On page 6, “Characteristics of injury occurrence”, please make clear those in brackets are proportions or injury incidence rate?

The source for the classification of severity is not clear. Page 8 (bottom) states that “Disability days were used instead as a measure of severity of injury.” What was this based on (self-classification by the interviewees, or the researchers used a standard)?

While there is a line in the supplement about the definition of costs, the reference to this on page 7 (“Economic loss caused by injury”) and Table 5, calls for a better explanation of how indirect and direct costs have been defined and what are included?

• How are they estimated – reference should be made to a standard economic costing method?
• On page 8, it states that “the total number of injuries caused 22.3 billion RMB Yuan of economic cost, accounting for 1.8% of the GDP in Shandong Province in the same year. Traffic injuries accounted for 44.79% of the total economic loss.” How was the estimation made? Please verify.

The limitation section needs to be enhanced to cover some of the issues mentioned above. In addition, the authors should comment on:

• Whether the study is representative of the 90-million population in Shandong?
• How and in what way can this data be compared with studies in other regions of China and in other countries?

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
I declare that I have no competing interests.