Author's response to reviews

Title: Unintentional injury mortality in India, 2005: nationally representative mortality survey of 1.1 million homes

Authors:

Jagnoor Jagnoor (jjagnoor@george.org.au)
Wilson Suraweera (SuraweeraW@smh.ca)
Lisa Keay (lkeay@george.org.au)
Rebecca Q Ivers (ivers@george.org.au)
JS Thakur (thakurj@searo.who.int)
Prabhat Jha (jha@smh.ca)

Version: 2 Date: 7 February 2012

Author's response to reviews: see over
Dear Dr. Keall

Many thanks for time and effort expended by you and the reviewers in considering our work.

Our point-wise response to issues raised by the reviewers and editors is detailed below (in italics). We have uploaded a revised manuscript and have added the statement on ethics as advised.

Please note that though the guidelines suggest only one corresponding author, if accepted, we would appreciate if Professor Prabhat Jha is included as the post publication corresponding author as indicated on the title page.

Many thanks and best regards

Jagnoor
Reviewer 1- Zafar Fatmi

General comments:

R1.C1) The objectives of the paper is well defined. Methods are clearly written however category of “falls of objects” results were not given.

*R1.R1) Thank you. “Fall of object” includes ICD codes W20-W49. These have been included within deaths due to Mechanical Forces in Table 2 and within “Others” in Table 3. Further link to ICD 10 coding has been added in the footnote to Table 2 for detailed explanation of each code.*

- Major Compulsory Revisions:

R1.C2) Distinction between a rural area and health facility death is vague. As health facilities are also present in rural as well as urban areas. Therefore, all deaths cannot take place either in rural areas or health facility.

*R1.R2) We have clarified this by removing the text in paragraph 1 of the Results section relating to place of death – the data for place of death is in Paragraph 6 of the results and Figure 3. The variable for place of residence for deceased were categorized as rural and urban (presented in Table 1); and place of death has been categorised as “home”, a “health facility” (irrespective of rural or urban place of residence for the deceased) and any other place like road, in transportation etc as “Others” as described in paragraph 2 of the Methods.*

R1.C3) International comparison was not done anywhere in the discussion with any other country.

*R1.R3) Data has been compared to other countries in South Asia, China, Bangladesh and Thailand; references 26, 27, 28 and 29.*

R1.C4) Table 1 compares number of unintentional injury deaths in the current study with rates in other studies. This comparison is not valid. Number of deaths does not give a good idea of estimates.

*R1.R4) Table 1 revised title “Unintentional injury attributed deaths in the Sample Registration System 2001-2003 and estimated national rates for 2005 by age, sex and place of residence” presents the distribution of injury deaths within the Sample registration system and further estimates based on this representative sample for the entire Indian population. We are able to clarify that this table does not make comparison with other studies. The new title should make this clear to the reader.*
R1.C5) Table 2 again compares SMR per 100,000 with number of deaths which gives no clue for comparison between the two figures. The study sample says that the study was conducted from 2001-2003 which is discrepant from 2005 as described elsewhere.

R1.R5) Perhaps the title of the table is misleading. We have revised the title and the headings of the table. The table is now titled “Table 2: Number of unintentional injury deaths by type, in the Sample Registration System, 2001-2003 and estimated national totals for 2005.” The table column two presents number of injury deaths (n), based on which proportional mortality was calculated for the study period, 2001-2003. These cause of death proportions from the study sample were used to estimate the number of deaths and standardised mortality rates for the year 2005, as explained in the methods section.

R1.C6) Table 3 is appropriate comparison. However, “Others unintentional injuries” have not been clearly defined. Asterisks are not explained in the legend below the table. Question numbers such as “V90-V98....” do not make sense to a reader. Please explain the type of injuries. Table 3 is not referred in the text.

R1.R6) Thank you, we have now corrected the asterisk to correspond to the explanation “Other unintentional injuries”. Further link to the ICD-10, WHO code has also been added for detailed explanation of each code.

R1.C7) Figure on cause of death was made based on proportion of deaths at each age group. It should have been made on rates rather proportions for all international comparison.

R1.R7) We agree that it is difficult to draw comparison based on proportions and rates should be used for any such comparison. Mortality rates by age for unintentional injuries are reported in Table 1, further by type of injuries are reported in Table 2. Figure 1 shows the changing patterns by age for the 3 major causes of death.

- Minor Essential Revisions
R1.C8) The graph on place of death is not making sense. For example most of the RTI is occurring at “other” places. What does that mean? Mechanical forces have been explained in the method section. Why national rank was given alongside proportion of the place of deaths

R1.R8) It is rightly observed that most deaths for RTI occur at other places than home and health facility and this is most likely the road side. This figure highlights the need of alternate methods like verbal autopsy for determining cause of injury death in low middle income countries like India, where most deaths occur outside a health facility.
The bars are presented in descending order of the proportion of deaths at health facility and not based on the burden of each type of injury; hence ranks were included to highlight the scale of deaths for each type of injury.

Reviewer 2 Michael Keall

Major Compulsory Revisions

R2.C1) More detail is needed of the survey. Were the data collected from the households as enumerated in 1993? (this would be a major problem!) What updating is carried out? Why was weighting carried out using 2005 totals rather than choosing population estimates from the middle of the survey period (2001-2003)?

R2.R1) Many of these issues on methods have been documented extensively in previous publications and were not repeated here.¹,² A paragraph on the Sample Registration System in India had been added to the methods. The sample frame of SRS is updated nearly every 10 years. The Million death study was conducted on the sample frame from 1993-2003. The revised manuscript summarises some of the key details requested by the reviewer, Methods paragraph 1.

“The SRS sample frame covers 6.3 million people in all 28 states and seven union territories of India. The sample size is selected based on the total fertility rate. The SRS sample units are randomly selected to be representative of the population at the state level. The sample design is a uni-stage stratified simple random sample without replacement and is updated approximately every 10 years.”

The UN estimates were used to account for the deaths because the SRS undercounts adult mortality by approximately 13-14% but this varies between states.³ The ability to generate absolute rates depends on completeness of enumeration and being able to calculate underlying demographic denominators, including migration. The confidence intervals using population estimates from the SRS and UN overlapped. Since it is known that SRS undercounts adult mortality UN estimates were used for more accurate calculation of deaths and mortality rates. Though the UN estimates also rely on the Indian government sources like the SRS but further uses a correction factor to the population and vital events for most accurate appraisal.

The year 2005 was selected for estimation due to the availability of the most accurate, stable demographic estimates. These estimates were comparable to the Indian census projections for 2006 reported by the office of Registrar General of India. All major cause of death like malaria, infant and neonatal mortality, HIV and other major causes of adult mortality estimates in the population have been drawn for the year 2005. Hence, study results are standardised and comparable for policy implications.
R2.C2) Page 5 - how can be sure that the missing deaths were "at random"? A death may lead to the household moving, so missing deaths are unlikely to be at random. Why were "136,000" deaths enumerated? You need to give the precise number. Surely the 9% that were unable to be coded could have systematic errors (e.g., a field worker with poor handwriting). How did you establish these were not systematic?

R2.R2) A total of 9% of enumerated deaths were not assigned a cause of death. And these were due to several issues like poor image quality, incomplete information and have been acknowledged in paragraph 2, "Cause of death assignment."

We agree it is difficult to ascertain if they were random and hence have revised the text to say that these deaths were and hence have revised the text to say "distributed across all states." However chances of systematic errors at field investigation are minimal due to thorough supervision, field training and re-investigation of random sample of deaths. Hand writing was not identified as a major issue.

The precise number of deaths assigned a cause is stated now stated as "136,480".

R2.C3) "The year 2005 was selected for estimation due to the availability of the most accurate, stable demographic estimates and were comparable to Indian census projections for 2006". Where did the 2005 estimates come from? "and were comparable to" what is the subject of this ... what were comparable?

R2.R3) We have revised the sentence, to say "The year 2005 was selected for estimation due to the availability of the most accurate, stable demographic estimates. In addition the UN estimates were comparable to Indian census projections for 2006."

R2.C4) Was stratified random sampling used? (State this)

R2.R4) Yes, stratified random sampling was used. This detail on sample generation has been added in the revised methods, paragraph 1.

R2.C5) What test has the p value? Just because there may have been little change over 2001-03 does not mean that there was no change from 2001-2005 "segregating the national totals" what does this mean?

R2.R5) The p value is in reference to cause specific mortality fractions and this has been clarified in the text of the Paragraph on National estimates for absolute number of deaths and mortality rates. No significant change in cause specific mortality proportions was observed comparing the annual data for the 3 years of data collection it is highly unlikely that there would
have been any change for estimating deaths for the year 2005 based on proportional deaths from the cohort of 2001-03.

R2.C6) The UN estimates - you need to explain how these were produced. Why are these better estimates of totals than the survey-based ones?

R2.R6) As has been discussed in response R2.R1 the UN estimates were used to account for the deaths because the SRS undercounts adult mortality. Since it is known that SRS undercounts adult mortality UN estimates were used for more accurate calculation of deaths and mortality rates. The UN uses correction factors to account for the undercount in the deaths by the SRS.

R2.C7) "Live births" where did these data come from?

R2.R7) For the results reported in the present study, estimates of live births and deaths by sex, rural/urban area and state for children younger than 5 years of age were proportionally corrected to match the United Nations (UN) Population Division estimates for 2005. Additional text has been added to clarify the data source in the paragraph in the section “National estimates for absolute number of deaths and mortality rates.”

R2.C8) Why not use 95% confidence intervals? These are more commonly accepted and people are used to them.

R2.R8) We have made revisions throughout the paper for reporting 95% CI.

Results

R9.C9) You need to present the confidence intervals with each estimate. "122,828 deaths" - how did you get to this total from the initial 136,000? Maybe a table could explain this.

R2.R9) Text has been revised, last line paragraph 2- “Cause of death assignment”. Cause of death could not be determined for 9% of the identified deaths (136,000). Hence cause of deaths was assigned to 122,828 deaths. Confidence intervals are presented for all estimates of mortality in Table 1 and 2.

R2.C10) The differences in the regional estimates need some explanation in the Discussion.

R2.R10) The only plausible explanation for regional distribution is on geographic features of the region. We have now revised text for drowning; paragraph 7.
Minor Essential Revisions

R2.C11) In the Discussion, you need to review the sentence starting "our mortality rates...." as grammar is wrong.

R2.C11) We have revised the sentence to say “Our study, a household survey using verbal autopsy method is less vulnerable to biases which affect the estimate of cause specific mortality in earlier studies.”

R2.C12) Page 11: "Nevertheless" is the wrong word.

R2.R12) Perhaps due to format of manuscript format available there is change in page number. The word was observed in paragraph 7 of the Discussion on page 12 and has been revised to read “Yet, the observed high proportion of fire related deaths among young adult women remains of significant concern.”

How can a death "present" to a hospital?

In the relevant paragraph the sentence has been revised to read “Fall and drowning deaths are less likely to be medically certified and therefore would be under represented in national estimates based on hospital/medical facility data.”

R2.C13) Page 12, first para: you need to add a sentence something like "this means that.... would underestimate the burden of drowning ....".

R2.R13) We have revised the text as advised.

"unaddressed" is the wrong word

The sentence has been revised to say “While paediatric falls and related traumatic brain injuries have been studied somewhat in the South Asia Region, there is little literature on falls in older people.”

"higher deaths" = "higher death rates"

The reference in the sentence is to the deaths as MCCD does not report death rates and hence comparison has been made on number of deaths.

Causes of deaths - say which causes.

The sentence has been revised to say “Verbal autopsy methods are known to misclassify some causes of death among neonates and older age groups of 70 years and above .”

"and because of the noted ..." this is clumsy and needs rewording. There is also a spelling mistake.
The sentence has been revised as “We caution, however, that hospital-based studies are not ideal studies as a large majority of deaths occur in India without medical consultation and also because of the differences observed in age-sex composition of injury deaths recorded in health facility compared to those recorded at home (Table S2).”

R14.C14) What is an "epidemiological transition"? Reword this.

R2.R14) The sentence has been reworded as “The disease burden in India is undergoing a transition with the burden of both chronic conditions and injury rapidly rising.”

Associate editor’s comments: Michael Keall

In addition to the reviewers' comments I would like to add:

E1.C1) Table 1: This is very hard to follow and needs to be reformatted. The columns in the left-hand side should have the same headings as the right. Rather than male/female in the one column, use two. Use 95% CIs as readers are used to these. What do you mean y "CIs are provided for the cause of death but not for the totals"? You need to resolve this as the CIs cannot account for standard errors of one part of the estimate but not the other part of the estimate. Perhaps you can use the survey totals as part of your estimates and then the CIs can be estimated from the survey data.

E1.R1) We have re-formatted the table as suggested.
   - Deleted the details of unintentional injury column
   - Separated data into a column for male and a column for female data
   - Added CIs for the all-ages data

The 95% CI’s were calculated for the cause of death in the study sample but not for the UN totals for all cause deaths, as there is no satisfactory way to quantify the uncertainties in total population or deaths (the published bounds of the UN estimates are trivially narrow). This is perhaps not clear from the short footnote and we have deleted as this is an irrelevant detail leading to misinterpretation of the analysis.

E1.C2) Table 3: Heading - you mean "Comparison of national injury death rates ..."? Again, use 95% CIs.

E1.R2) We have revised the title of the table as advised and reported 95% CIs.

E1.C3) Figure 2: explain what the "MR" means.
E1.C3) We have added the explanation in figure legend.

References

