Author's response to reviews

Title: Population-based Incidences of Non-fatal Injuries - Results of a German-wide Telephone Survey 2004

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Title of the article: Population-based Incidences of Non-fatal Injuries - Results of the German-wide Telephone Survey 2004

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Dear Ms Pafitis and Editors,

Many thanks for sending the expert opinion on our manuscript “Population-based Incidences of Unintentional Non-fatal Injuries - Results of the Germany-wide Telephone Survey 2004”. We have carefully checked and implemented the advice of the three experts. You will find detailed information on this in the appendix.

We think that the many readers of BMC Public Health would be interested in our findings about unintentional non-fatal injuries in Germany. Injuries caused by accidents are a major public health issue. It has been estimated that about 8.25 million people were injured in 2010. However, a nationwide comprehensive recording of unintentional non-fatal injuries does not exist in Germany. Our Germany-wide telephone survey 2004 provides the most comprehensive and recent epidemiological data on injuries due to non-fatal accidents. Using this data, the report presents population-based incidence estimates of accidents according to key determinants such as age, gender, and educational level. This information is important for the planning of targeted preventive measures against accident-related injuries.

Best regards,

Anke Christine Saß
Appendix

Population-based Incidences of unintentional non-fatal Injuries - Results of the German-wide Telephone Survey 2004

Criticism of the reviewers and implementation by the authors (in italics)

Reviewer: Steffen Niemann

Major Compulsory Revisions

1. In the method section the health survey is described as an "annual cross-sectional study". Why did the authors use the survey from 2005 and not the most recent one?

Although health surveys are conducted at the Robert Koch Institute every year, not all topics are surveyed in detail every year. We have inserted this information in the “Methods” section of the manuscript. Accident occurrences were surveyed again in detail in a telephone health survey conducted in 2010. These data are currently being adjusted and processed.

2. For estimating incidences it is crucial to have unbiased data. The survey represents the German speaking adult population in private households. Particularly when comparing the results to other statistics, e.g. insurance registries, what is about the non- or bad speaking part of the population? Foreigners often work in occupations with higher risks. In consequence of this, occupational injuries may be underestimated.

Because the telephone survey was conducted in German, migrant participation was below average. There are only a very few evaluations of work accidents among foreign nationals in Germany and they indicate a higher risk\textsuperscript{i}. If we go by official statistics, however, the error rate should be low. The percentage of gainfully employed foreign nationals in Germany is low and the probability of a work accident is also low\textsuperscript{ii}. Analyses of the inclusion of migrants in telephone surveys by the Robert Koch Institute also show no clear trend as to whether the
state of health is presented too positively or too negativelyiii. We have supplemented this information in the manuscript in the section on limitations.

3. The sample is drawn by random numbers for the fixed-line network. Households with only mobile phones should be considered. Although the proportion was probably not high in 2003.

The percentage of mobile-only households rises every year and is posing an increasing challenge where telephone surveys are concerned. The percentage was still low in 2004, however, at roughly 7%iv and does not therefore pose a problem in our view.

4. Although the categorization of the "accident location" compared to other statistics is discussed, it is not clear why this categorization was chosen. It is a mix of places (roads, at home, at work) and activity (leisure).

It is true that these categories are not sharply focused and not ideally suited. They were chosen because by doing so, it is possible to categorise results and compare them with the statistics available in Germanyv. The recording of accidents in our surveys also serves to supplement the official statistics and identify “blind spots”. Austrian accident statistics also work with the categories used here, by the wayvi.

Did the respondents have to choose from a list or were the categories derived later for data analysis?

When the respondents reported an accident, various possible accident locations were read out. The respondents categorised their accident to a location by themselves.

Why is there a category "unknown place"? Can people remember the accident but not where it happened?

The meaning of the category “unknown place” is explained in the “Methods” section (Manuscript P. 6): “Places of accidents were cumulatively documented. As an example, for a
Subject reporting two unintentional injuries at the workplace and one injury at home, two (workplace and home) locations were documented although three separate accidents had occurred. Therefore, the assignment of places of occurrence became ambiguous if the number of accidents did not equal the number of places of accidents. Accidents that reportedly occurred at unclearly defined places were assigned to the category “unknown places”.

5. I was wondering about the shapes in figures 3 and 4. They are the expected u-shaped curves for road accidents, but not for home and leisure. It is known that falls have a high incidence with increasing age. Are falls of the elderly sufficiently represented in the telephone survey?

Charts 3 and 4 only show the locations of the accidents, not the types (e.g. falls) which can occur at various accident locations e.g. on the roads, at home during leisure time. For the category “road accidents”, we asked about “accidents on public footpaths, roads or squares”, so this can also involve falls. The results therefore appear to be credible, even though there tended to be lower participation in the survey in the highest age groups. More information on the participation of older people is to be found under Item (6), below and in the remarks of the reviewer Gabriele Ellsäßer (Item 5, Appendix P. 13 ff.)

6. On page 15 the authors state that they "are not able to report the sensitivity and specificity of self-reported injuries". However, they can discuss the problems of surveying the elderly and recall errors in general. For the latter issue there are published articles. E.g. Warner, et al. The effects of recall on reporting injury and poisoning episodes in the National Health Interview Survey. Injury Prevention 2005;11:282-7 or Harel, et al. The Effects of Recall on Estimating Annual Nonfatal Injury Rates for Children and Adolescents. American Journal of Public Health 1994;84(4):599-605.

Surveying the elderly
By conducting a telephone survey, it is possible to reach the majority of the elderly (including those with impaired health and mobility). The percentage of persons who live in nursing homes and cannot participate for this reason (also because they do not have their own land line) is very low in Germany. Of all persons aged 65 and over, not even 4 % lived in nursing homes in 2003 and 2005. The processing of the data record also included the adjustment of the random sample to the distribution of age, gender and region in the basic population of adults in private households. Despite this, the significance of the results for the elderly has to be discussed. More details of this are included in the remarks of the reviewer Gabriele Ellsäßer (Item 5, Appendix P. 13 ff.) and a short text has been inserted in the manuscript under “Discussion”.

We are assuming that, in relation to elderly people who live in private households, the accident prevalence reported in the survey give an indication of the occurrence of accidents in higher age groups. Special surveys for the elderly which use different interview techniques, such as personal visits to people with severe impairments (including impaired hearing) or personal interviews in nursing homes can supplement our analyses.

Recall errors

Our survey inquired about injuries caused by accidents in the last 12 months. It is known from the literature that the respondents have a poorer recollection of injuries which occurred further in the past and were not so severe, while injuries to children through accidents are also forgotten about more quickly. A memory period of three months is recommended for surveys, but this recommendation comes from a study in which a family member was asked to provide information on the injuries of all of the other persons in the household.

In our survey, we only asked about injuries which required medical treatment, so no trivial injuries were included. In addition, only adults were included in the survey. In addition to
this, the accident prevalence determined is comparable with the estimations of the Federal Institute for Occupational Safety and Health for the year of the survey. Despite this, it cannot be excluded that a small percentage of the injuries suffered were not mentioned. We have supplemented information on recall errors in the manuscript in the section on limitations.

Minor Essential Revisions

7. Why is the working population restricted to the age group up to 69? Would a border up to 65, the typical age for retirement, not be more reliable?

We decided to orientate the age limit for work accidents in our evaluations on the details provided by the respondents themselves in the survey. Some of the 60 to 69-year-old respondents are still working and are therefore at risk of work accidents. 20% of the respondents stated that they were gainfully employed (194 persons). Restricted to the 65 to 69-year-olds, almost 12% are still gainfully employed (53 persons). By the way, the actual average retirement age in Germany is below 65 and it was below 63 in 2003 (old-age pension).

8. The comparison of the distributions of school degrees in the survey and the German census data is also restricted to the ages 20 to 64. Why are the elderly (65+) not included?

For the elderly, we focused on the age group which typically shows selection effects by school degree, i.e. aged 20-64 years. In older age groups there are fewer differences in the levels of education. The proportion of people with low qualifications is higher.

9. The categories for travel mode in traffic related injuries are not exhaustive, e.g. powered two-wheelers or a category "other" are missing.

The designation was inaccurate and we corrected it. The question was asked about “Drivers or passengers in other modes of transport”.

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10. Typo: page 15, 1st paragraph: "Currant available…"

*We have modified this.*

Discretionary Revisions

11. The Authors mention the variable hospitalization in the questionnaire but no data is shown on this. It would be very informative for the readers to see what the proportion of more serious injuries is.

*We have inserted information on the proportion of accident victims who were treated in hospital in the “Results” section.*

12. There are only 13 questions on injuries. They should be published (maybe as a web-appendix). This would be very informative for the reader and makes it easier to comprehend the used categories for accident location.

*The only thing that was not reported in the article was information on the injury types and injured body parts, as well as handicaps resulting from accidents. With several questions (including those on injury types) in the 2004 telephone survey, however, it transpired that they were no good for evaluation purposes. That is why we decided to go for the selection of aspects presented and modified the questions in the follow-up survey.*

13. The results on the higher incidence of occupational injuries for full-time compared to part-time-employees are trivial and can be dropped with respect to the manuscripts length.

*The section was removed.*

Quality of written English: Needs some language corrections before being published

*The manuscript was revised by a professional proofreading service.*
Reviewer: Kumari Navaratne

The team seems to be clear about the question they needed to address. But as the survey data they have used is 2003/2004 the data is now nearly 8 years old and therefore interpretation of findings need to be made after taking into account possible changes that would have happened in the interim period.

Although health surveys are conducted at the Robert Koch Institute every year, not all topics are surveyed in detail every year. Accident occurrences were surveyed again in detail in a telephone health survey conducted in 2010. These data are currently being processed. We have inserted a note on this in the “Methods” section of the manuscript.

From the estimates of total accident occurrences as conducted by the Federal Institute for Occupational Safety and Health, it can be recognised that at least the key data on accident occurrences have not changed in the last few years. Between 2004 and 2010, the proportion of persons injured due to accidents among the residential population is consistently estimated at roughly 10%. Accidents in the home and during leisure time accidents always account for roughly two thirds of the non-fatal accidents. A note to this effect was inserted in the manuscript under “Discussion”.

The methods/results would need to be described in more detail as described below. As the methods section says that a telephone survey is conducted annually, it would be useful to mention the reason for using the 2003/2004 annual data instead of using a more recently carried out telephone data set.

A note on this was inserted in the manuscript under “Methods”.

It will also be necessary to include the eligibility criteria for identifying a telephone number as an eligible household. It is also good to mention the exclusion criteria more precisely. As the
authors are saying that the response rate is 36-39% the methods section would benefit if a small flow chart/figure is inserted showing the proportion of telephone numbers excluded and the final sample of telephone householder who underwent the survey.

A corresponding chart was inserted into the manuscript (Figure 1).

It will also be necessary to mention the definition of ‘unintentional injury’ used for this survey in the methods section.

We have inserted how “unintentional injury” is understood in the survey and how it was explained to the participants before the interview in the “Methods” section of the manuscript.

Authors would need to provide more information before using the survey findings to be representative of Germany wide estimates. One reason for this conclusion is the information provided in the methods section on the discrepancy of the census data and the telephone survey data with regards to education level of the responders. A somewhat large difference is seen in the two data sets but the authors do not comment if this difference noted was statistically significant. The authors have attempted to correct for this difference using sensitivity analysis for the 20 to 64 year olds but the estimates used for the below 20 years and over 65 years may still be an under or an over estimate due to this reason.

A difference of the distribution of school degrees between our sample and the census data is most likely due to selection effects and not chance. A significance test that could answer the issue of chance is therefore not informative here. Furthermore, we and many others believe that significance testing is generally a problem in epidemiology as mentioned above. For ages < 20 years, the census does not provide data on school degree distribution by one-year age groups. Therefore, we would not be able to reconstruct the school degree distribution among people aged 18-19 years that would be necessary for the comparison with our sample. For the elderly, we focused on the age group that typically shows selection effects by school degree,
i.e. ages 20-64 years. In older age groups there are fewer differences in the levels of education. The proportion of people with low qualification is higher.

A retrospective injury incidence based on a 12 month recall can also report under or overestimates different types of injuries differentially. If an injury was work related and it affected work there is a higher likelihood of it being remembered than a leisure time injury happening to an older individual the same time. It would be good if the authors can look at the data to see of such differences are noted for different injuries over the recall period. If obvious differences are seen it may be necessary to correct for these before providing non-fatal injury estimates for Germany.

*It can be taken from the literature that it is more the severity of the accident that plays a role.*

*Please refer to the answer to Item 6 from review Steffen Niemann on P. 4 ff of the appendix. A short text on recall bias was included in the manuscript under “Discussion”.*

It is important for the authors to present the percentages in all relevant tables along with appropriate statistical tests wherever relevant and possible.

*For at least two reasons, we avoid the use of p-values or the null hypothesis significance testing:* 

1. *P*-values are confounded values (effect size and study size).

2. *P*-values are expressed on a different scale than the effect measure and express only evidence against one specific hypothesis (null hypothesis).

According to one of the editors of the text book “Modern Epidemiology”, Timothy L. Lash, “epidemiologic research is an exercise in measurement. Its objective is to obtain a valid and precise estimate of either the occurrence of disease in a population or the effect of an exposure on the occurrence of disease.”

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The conclusions are based on the findings but the authors incidence estimates for non-fatal unintentional injuries requiring medical treatment could well be affected by unknown proportions of fatal injuries due to these same injury types. Therefore, it would have been useful if the fatal injuries can be also considered in the discussion.

The Federal Institute for Occupational Safety and Health estimates that 8.48 million people have been injured in 2004\textsuperscript{xii}. 19,458 persons were involved in fatal accidents\textsuperscript{xiii}, which equates to a proportion of 0.2% of all persons injured in accidents. We are assuming that the low prevalence of fatal injuries does not alter the overall picture of significant accident locations, especially as accidents in the home and during leisure time are dominant among the fatal as well as the non-fatal injuries (63.1% of accidental deaths). The proportion of traffic accidents among the fatal accidents is significantly higher, however, than among the non-fatal (31.0 % vs. 5.2 %).

The authors also mention that none of their data can be compared to other earlier studies, or to studies in other countries… I think the authors need to analyze at least some important injury types using similar definitions so that the findings can be compared to other similar studies in the country and / or in the region. It will be important if some references are made to similar survey/s carried out in the past.

The comparison of our data with other numbers from Germany functions really well for certain aspects, such as the estimates of the Federal Institute for Occupational Safety and Health\textsuperscript{xii}. They are based in part on a survey which was similar to ours. We were also able to find parallels to the results of European statistics. Comparison with industrial and traffic accident statistics is difficult on the other hand. There is no obligation to report accidents in the large area of home and leisure in Germany, which means there are no official statistics and no big surveys with which we could compare our data. That we were able to conduct this survey was due among other things to the fact that, because there are no representative data
in Germany on total accident occurrence, the project was sponsored by the Federal Ministry of Health and Social Security.

We believe that a careful comparison of accident statistics among countries would become a project on its own as a systematic review of the literature and thereafter a careful description of the definitions of accidents would be required. Furthermore, results of such a review cannot easily be summarised in a paragraph of the “Discussion” section.

The paper will benefit from using an editor who could fine tune the writing and further enhance the messages highlighted in the paper.

The manuscript was revised by a professional proofreading service.
Reviewer: Gabriele Ellsäßer

5. Are the discussion and conclusions well balanced and adequately supported by the data?

A number of limitations of the study should be accounted for and pointed out more clearly:

(1) With 100 interviews, the response rate amongst the age group 80+ has been low, considering that the age group has a total population of about 4.3 million. Consequently this age group is underrepresented in the sample. With a total of 13 reported injuries in this age group, the data cannot be representative. The data for this age group should be excluded from the study.

Moreover, statistics given for traffic accidents according to road user among the elderly should be excluded because of the low number of traffic accidents in the age group 70-79 (n=14) and 80+ (n=8). The same limitation applies for leisure accidents among 70-79 (5 accidents) and among 80+ (zero accidents).

3.4 million people aged 80 and over lived in Germany at the end of 2003, which equates to a share in the population of 4.2%. But with 1.5%, the percentage of very old people in our random sample is low. At the end of 2003, 12.0% of the German population belonged to the 70+ age group and this group made up 7.2% of the random sample. Although an adjustment of the random sample to the population status was made with the help of a weighting process, this aspect must still be taken into account.

The absolute numbers of accidents in the high age groups are relatively small and accordingly unreliable (age 70 and over: 525 persons, 46 instances), but if we want to calculate age-standardised rates, it is important to take them into consideration because they contribute to the result. For this reason, we list estimated values for age-standardised rates with measures of variation which make clear that the estimators
are imprecise. We list supplementary estimators for age-specific rates in the charts.

For the sake of good order, we decided against the presentation of measures of variation here. The established incidence rates should be interpreted as the lower estimation values of accident frequency. A short text on this has been inserted in the manuscript under “Discussion”.

Special surveys for the elderly which use different interview techniques, such as personal visits to people with severe impairments (including impaired hearing) or personal interviews in care homes, can supplement our analyses.

(2) Injuries at work (employed subjects) are taken for the age group up to 70 years. In the age group of 60-69 years, only 2 work related injuries are reported, suggesting that there is no risk for people in this age group. Considering the German retirement age of 65 years for men and 63 years for women there is no sufficient work time among the 60-69 age group compared to the 18-59 age groups. Henceforth work related injuries should only be looked at in the 18-59 age group.

The answer to Item 7 by reviewer Steffen Niemann (Appendix P. 6) contains a reply from the authors to this question.

6. Are limitations of the work clearly stated?

Limitations in terms of the data set should be discussed in more detail (see 5).

Several limitations of the survey were supplemented in the “Discussion” section of the manuscript, including those concerning the findings for the elderly.

Assessment of the paper

However, the authors should address the weakness of a limited samples size in the age group 70+ in a compulsory revision.
See above

6http://www.kfv.at/kfv/kommunikation/oesterreichische-unfallstatistik/ (10.01.2013)