Author's response to reviews

Title: Automated comparison of last hospital main diagnosis and underlying cause of death ICD10 codes, France, 2008-2009

Authors:

Agathe Lamarche-Vadel (agathe.lamarche-vadel@inserm.fr)
Gerard Pavillon (gerard.pavillon@inserm.fr)
Albertine Aouba (albertine.aouba@inserm.fr)
Lars A Johansson (LarsAge.Johansson@socialstyrelsen.se)
Laurence Meyer (laurence.meyer@inserm.fr)
Eric Jougla (Eric.Jougla@inserm.fr)
Gregoire Rey (gregoire.rey@inserm.fr)

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Author's response to reviews: see over
Answers to the reviewers

We are very grateful to the referees for their recommendations about our manuscript entitled: Automated comparison of last hospital main diagnosis and underlying cause of death ICD10 codes, France, 2008-2009.

Our answers and the modifications to the manuscript and appendices are described below.

Reviewer 1: Robert Anderson

Minor Essential Revisions
1. P. 4, first paragraph, last sentence - I think this sentence needs to be revised for clarity. It is unclear if the average of 3.4 conditions includes the UCD or is addition to the UCD. I think the authors mean including UCD.

   In response to the reviewer’s suggestion, we have clarified the sentence:
   “Data included for this analysis were all the causes mentioned on the death certificate, 3.4 on average, plus the UCD determined by the ICD-10 rules. The UCD can be one of the causes mentioned on the death certificate or a combination of these causes in a single code (e.g. Diabetes with renal complication).”

2. P. 5, first paragraph - the details on definition of MD in France need to be included in this paragraph. Appendix 2 is short and could easily be incorporated. It is important that the reader have this information readily available and not in the supplementary material.

   In accordance with the reviewer’s suggestion we have incorporated the details on definition of MD in France in the manuscript, and deleted Appendix 2. As a consequence, the remaining appendices were renumbered.

3. P. 6, first paragraph - I’m not sure exactly what "diseases of neuro-sensorial" refers to. Is this Chapter VI, Diseases of the nervous system or a combination of chapters VI and VII? If just VI, then the chapter title should be used (here and elsewhere in the paper). In any case, it would be helpful here to indicate exactly which chapters are being referred to, e.g., neoplasms (Chapter II), circulatory (Chapter IX), etc.

   To broadly classify the diseases, we used the European shortlist for Causes of Death ([http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LIST_NOM_DTL&StrNom=COD_2012&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC](http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LIST_NOM_DTL&StrNom=COD_2012&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC)). In this shortlist’s titles, diseases of the nervous system (Chapter VI) and the sense organs (Chapter VII) are pooled together.

   Pursuant to the referee’s suggestion, we have specified in the method section which ICD10 chapters are being referred to.

Discretionary Revisions
4. P. 4, 3rd paragraph - suggest moving the information from Appendix 1 into this paragraph.

   In accordance with the reviewer’s suggestion we have incorporated the details on the matching method in the manuscript, and deleted Appendix 1. As a consequence, the remaining appendices were renumbered.

5. P. 5 - descriptions of "similarity" and "acceptable sequence" - suggest adding 1 or 2 additional examples. This will provide some added clarity as to the meaning of the key indicators.

   Following the referee’s advice, we have added an example of similarity case and an example of acceptable sequence. We have also specified the ICD codes for all examples.
Reviewer 2: Tain-Junn Cheng

Major Compulsory Revisions:
Is there any data analyzed about the quality of care assessment? This is the third aim of this study. If there is no data to demonstrate this issue, please consider to delete this aim.
Pursuant to the referee's suggestion, we deleted this aim.

Discretionary Revisions
1. Besides socio-demographic and medico-administrative variables, is there any other variables, such as medical comorbidity or procedures, could contribute to the independency?
   We totally agree with the referee that taking comorbidities or procedures into account would have modified the judgment on independence. However, this would have been a tremendous work and we were not able to perform it in this study.
   Following the reviewers remark, we precised the related sentence in the discussion section, as follows:
   “Comparing all the conditions mentioned in the hospital discharge abstract to the UCD, or exploiting the information on medical procedures would resolve this; it would need the development of a more complex algorithm.”

2. Based on these results, is there any suggestions about this method for improvement or for future application?
   We consider this method to be a proof of concept that can certainly, but not easily, be improved.
   Three suggestions have been mentioned in the Limits section of the Discussion chapter: to build a knowledge table stricter than the ones used in assessing causality on death certificates; to seek users’ feedback in order to refine the algorithm; and to develop a more complex algorithm in order to take all the conditions and medical procedures mentioned in the hospital discharge abstract into account. About future application, we are currently testing the utility of this method in the field of hospital-wide mortality indicators, as described at the end of the paper.
We do believe that this method has the potential of being developed and used for various diagnoses comparisons across time periods or databases, as mentioned in the conclusion.
Reviewer 3: Lee Taylor

Major compulsory Revisions
In Appendix 3, it is noted that “...we checked whether UCD could have caused MD.” and “...the last question was whether UCD could have caused MD”. It is not clear whether this is carried out automatically by the Iris software or whether an additional process was developed by the investigators, or perhaps both. This should be clarified.

Following the referee’s suggestion, in order to leave no room for ambiguity about the automatic nature of the whole procedure, we clarified these two sentences: “...test certificates were used to check automatically whether UCD could have caused MD (case II.1.) or not (case II.2) [TC2]” and “...the last series of test certificates was ran in order to know whether UCD could have caused MD (case III.1.) or not (case III.2) [TC4]”.

In Appendix 4 and the associated figure, reference is made to Parts and a variety of rules. Ideally these Parts and rules should be described and referenced in Appendix 4. However, if they are complex and not reproducible in the space allowed, then a reference should be included. If possible, this reference should be a web-link.

In accordance with the reviewer’s request, we specified that “the location of each diagnosis on the test certificate is specified, according to the denominations of the different sections used in the International Form of medical certificate of cause of death (Part I, line a to line d, and Part II)”. We expressed more clearly that the rules applied by Iris are the ICD-10 rules and guidelines for mortality coding described in ICD-10 volume 2, and a web-link to has been added (http://apps.who.int/classifications/icd10/browse/Content/statichtml/ICD10Volume2_en_2010.pdf).

Minor Essential Revisions
In the attached document which shows the decision tree, box TC1 refers to “Partie 3”. I suspect this is meant to read “Part 3”.

Yes indeed, the French word for Part had not been translated, the correction has been made. In this figure, to be fully aligned with the denomination of the International Form of Medical Certificate of Cause of Death, “line 1” has been replaced by “line a” and “line 2” by “line b”.

Quality of written English: Needs some language corrections before being published
The text has been thoroughly reviewed and some language corrections were made.