Author's response to reviews

Title: The experience of linking Victorian emergency medical service trauma data

Authors:

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Author's response to reviews: see over
The experience of linking Victorian EMS trauma data

Reviewers Comments & Authors Reply

Editorial Comment
Spell out EMS in full in both the title and abstract of your manuscript

Authors Reply
This has been done.

Reviewer 1 – David Clark

Reviewer’s Comments
1) The authors never define what is meant by “deterministic”, “probabilistic”, and “manual” methods of record linkage, which would be helpful for readers unfamiliar with this methodology. A reference to one or more general reviews of the subject (e.g., Clark, Injury Prevention 2004) might suffice for this as well as enhance the relatively brief background discussion.

Authors Reply
A table of definitions has been added and more information in the background section.

Reviewer’s Comments
More credit should be given to the previous similar work from Western Australia, including that reported by Ferrante et al. (Reference 11), and updated by Rosman et al. (Accident Analysis and Prevention 2001).

Authors Reply
Additional information about the article by Ferrante et al has been included in the background as it utilised EMS (ambulance) data in developing the Road Injury Database. As the article by Roseman et al did not specifically mention EMS data linkage it has not been included.

Reviewer’s Comments
It is rather difficult to follow exactly how the authors evaluated the results of their linkage. It might be useful to have Venn diagrams or other graphical depictions of how many people were recorded in each database, how many appeared to be recorded in more than one database after linkage, and how many should have been recorded in more than one database if linkage had been perfect. There is no discussion of whether any of the “successful” matches were false-positive on clerical review.

Authors Reply
Information regarding the records in each dataset and the matching success has been clarified with additional information about false positive matches for the probabilistic matching added.
Reviewer’s Comments
Table 1 does not add much useful information, and the last page (trauma triage algorithm) seems completely irrelevant to this report.

Authors Reply
This table (hospital defined major trauma) has been included as the international definition for major trauma varies considerably. It is also included so comparisons can be made with other authors who are linking datasets to determine patient outcomes, including those with major trauma.

Reviewer’s Comments
In general, it may be useful for other jurisdictions to be informed what was learned by this effort in Victoria, but the authors never say whether they thought record linkage was worthwhile or what advice they would offer their colleagues other than to improve EMS data quality.

Authors Reply
This is covered, somewhat, in para 6 of the discussion, with an additional paragraph added in the discussion.

Reviewer 2 – Kirsten McKenzie
Reviewer’s Comments
Background:
1. More background is needed regarding why data linkage is important between trauma datasets - several studies have examined linked trauma data which could be which could support such an argument.

Authors Reply
More information has been added in the background section.

Reviewer’s Comments
Methods section: Unstructured and difficult to follow:

2. Information regarding each dataset should be included in consecutive sections rather than switching between discussions about the EMS, VEMD, VAED, and VSTORM at various points.

Authors Reply
Information about each dataset has been separated.

Reviewer’s Comments
Needs to first state what the purpose of the data collection is

Authors Reply
This is stated in the first para of the methods section
Reviewer’s Comments
what the inclusion/exclusion criteria is,

Authors Reply
This is explained in the referenced articles for each EMS dataset.

Reviewer’s Comments
what variables the dataset contains,

Authors Reply
The trauma profile dataset contains 100 variables, the MOI only dataset contains 171 variables (including patient observations), and the sudden deterioration dataset contains 177 variables (including patient observations). There are too many variables to list, even for a supplementary section, and I do not see how this information will add value to the article.

Reviewer’s Comments
how large the sample of cases is in each dataset

Authors Reply
This is included in the methods section for the EMS and VSTORM datasets. The number of records in the DHS datasets, VEMD and VAED, is not divulged by DHS staff.

Reviewer’s Comments
which cases are omitted and why,

Authors Reply
All records in the datasets are included in the matching. Records were only omitted if they were a duplicate. The process for removing duplicates in each dataset is described in the referenced articles. I don’t see the need to add paragraphs of additional information, which may detract from the main aim of the article, where it is available elsewhere if the reader desires to know how it was undertaken.

Reviewer’s Comments
what data cleaning/manipulation was done prior to matching,

Authors Reply
Only duplicate records were removed from each EMS and VSTORM dataset, refer to previous comments about the removal of duplicates. Information about data cleaning/manipulation of the DHS datasets was not available.

Reviewer’s Comments
what was the process for matching to each other dataset,

Authors Reply
A statement of how this was done is included
Reviewer’s Comments
whether any difficulties in the matching were found.

Authors Reply
A statement about difficulties with the manual matching was previously included but is included in a different area within the methods section.

Reviewer’s Comments
3. More explanation needed regarding why 3 datasets created for the EMS data and what purposes each of these served.

Authors Reply
This has been added in the methods section.

Reviewer’s Comments
Results section: Needs clearer presentation and more numbers in tables to enable the reader to understand the findings:

4. Text needs to be clearly presented in tables showing linkage rates between each dataset and numbers of cases in each dataset and number linked successfully.

Authors Reply
A separate table for each EMS dataset with the matching results has been added. Information about false positive matches for probabilistic matching has been included.

Reviewer’s Comments
5. Discussion: First sentence of paragraph on page 14 says there was successful matching but the rest of the paper indicates matching was unsuccessful – need to clarify this statement and ensure it is not misrepresenting the results.

Authors Reply
I believe the linking was successful and this has been stated but have highlighted issues for consideration by other researchers when using Victorian EMS and linking it to state datasets to determine patient outcomes. This information is also of benefit to policy makers, researchers, and database administrators.

The discussion does highlight the issues associated with missing or inaccurate date from a paper based patient care record when using the various matching processes and makes the statement that the issue of missing or inaccurate date should decrease with the advent of an electronic patient care record. The discussion also highlights the variation in success rates for other linking studies and that 100% successful accurate linking is unlikely.

The linking of EMS dataset to the DHS datasets was successful, however, we were not able to use the results to accurately determine the criteria, Injury Severity Score and if the specific surgery was within the first 24 hours of admission, requirements of the Victorian major trauma criteria.
Reviewer’s Comments
Methods section:

1. Need to describe more fully how the author interpreted deterministic matching and probabilistic matching and which variables were used.

Authors Reply
Additional information has been included.

Reviewer’s Comments
2. Test linkages are discussed but they don’t say which datasets the test linkages were performed on.

Authors Reply
The datasets used has been added.

Reviewer’s Comments
3. Not sure what the author means by the phrase in 3rd para pg 9 stating ‘using the same blocking’.

Authors Reply
This statement has been clarified.

Reviewer’s Comments
4. Not sure why the author made reference to the Albury Base Hospital given that they earlier stated that several hospitals don’t report data.

Authors Reply
This statement is relevant in the Victorian context and has relevance to policy makers and researchers within the Victorian healthcare and prehospital setting.

The statement has been expanded further to clarify where the hospital is and how it fits into the Victorian healthcare system.

Reviewer’s Comments
Results section:

5. In the first paragraph of results the author states ‘When matching EMS data’, I think they mean VEMD data?

Authors Reply
No the statement is correct. Of the patients who were located in the VAED (in hospital dataset) 96% of these patients were identified in the VEMD (emergency department dataset) with one of the variables stating the patient was admitted to hospital.
Reviewer’s Comments

DISCRETIONARY REVISIONS

1. The authors make reference in results section to the calculation of ISS score. I would suggest examining the ICISS scoring system which uses ICD codes to assign severity scores if they wish to pursue this.

Authors Reply

The Victorian State Trauma Outcome Registry and Monitoring (VSTORM) dataset and state health datasets (Victorian Emergency Minimum Dataset and Victorian Admitted Episode Dataset) only use the ISS, at present, therefore it is of no use investigating the ICISS for this or future studies unless the main state datasets incorporate it.