

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Rate of venous thromboembolism among surgical patients in Australian hospitals: A multicentre retrospective cohort study
AUTHORS	Assareh, Hassan; Chen, Jack; Ou, Lixin; Hollis, Stephanie; Hillman, Ken; Flabouris, Arthas

VERSION 1 - REVIEW

REVIEWER	STAVROS KAKKOS UNIVERSITY HOSPITAL OF PATRAS, GREECE
REVIEW RETURNED	03-Jul-2014

GENERAL COMMENTS	<p>Well written manuscript. Some minor comments shown below: Title: this is not a "population-based study", as stated, please amend. Page 6, line 45: Correct "Error! Reference source not found. summarised the study population by outcomes across hospital and patient characteristics and related statistics" Page 7, line 36: Correct "Error! Reference source not found.)." Figures: please provide the denominator for all rates</p>
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REVIEWER	Maria Cristina Vedovati, MD Internal and Cardiovascular Medicine and Stroke Unit University of Perugia Perugia, Italy
REVIEW RETURNED	14-Jul-2014

GENERAL COMMENTS	<p>Data are not defined according to type of surgery (eg. minor, major, orthopaedic, abdominal...). This could have led to differences in VTE rates among hospitals and years. A sentence should be added in the discussion if data will not be available.</p> <p>The authors did a great effort in performing the study and should be congratulated. Overall, 4,362,624 patients have been included and the main findings were 1) an increased incidence of VTEs over years and 2) a large variability of outcomes among hospitals.</p> <p>For the first point I wonder if age, comorbidities and type of surgery were different according to year (from 2002 to 2009). Moreover, have been differences in disease-coding across years?</p> <p>The second finding underline the importance of standardization of post-operative VTE measures across hospitals as stated in the discussion.</p>
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	<p>It is unclear why patients from principal referral hospitals had higher VTE rates respect to patients from district hospitals. As type of surgery influence VTE risk, it will be interesting if data regarding type of surgery (eg. minor, major, orthopaedic, abdominal...) among hospitals will be available.</p> <p>Rates on cancer and on cancer-surgery should also be considered across years and hospitals.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer 1:

Comment: Well written manuscript.

Response: We appreciate the reviewer's positive comments.

Comment: Title: this is not a "population-based study", as stated, please amend.

Response: We had change "population-based study" term to "large retrospective cohort study".

Comment: Page 6, line 45: Correct "Error! Reference source not found. Page 7, line 36: Correct "Error! Reference source not found.)."

Response: All references were updated and corrected.

Comment: Summarised the study population by outcomes across hospital and patient characteristics and related statistics".

Response: Summaries of study population across all patient and hospitals characteristics were incorporated in Table 1. Additional case-mix related information over the study period was also provided in Appendix 2.

Comment: Figures: please provide the denominator for all rates.

Response: Denominator details were added to the figure legends.

Reviewer 2:

Comment: Data are not defined according to type of surgery (eg. minor, major, orthopaedic, abdominal...). This could have led to differences in VTE rates among hospitals and years. A sentence should be added in the discussion if data will not be available.

Response: We appreciate the reviewer's thoughtful point. Therefore, we defined and extracted six major surgery types including coronary-artery bypass graft, abdominal aortic aneurysm repair, total hip replacement, total knee replacement, cholecystectomy, and other surgical procedures, and incorporated as a covariate into the models. Accordingly, all summaries, statistics, results and discussion have been revised and updated.

Comment: The authors did a great effort in performing the study and should be congratulated.

Overall, 4,362,624 patients have been included and the main findings were 1) an increased incidence of VTEs over years and 2) a large variability of outcomes among hospitals.

Response: We appreciate the reviewer's positive comments.

Comment: For the first point I wonder if age, comorbidities and type of surgery were different according to year (from 2002 to 2009). Moreover, have been differences in disease-coding across years?

Response: We provided summary statistics for age, comorbidity index and surgery type over the study period as a supplementary material in Appendix 2. A consistent procedure and codes were applied to identify major diagnosis groups as well as surgery types over the study period. References

for disease coding were appropriately cited within the manuscript and details of procedure codes were provided in Appendix 1.

Comment: The second finding underline the importance of standardization of post-operative VTE measures across hospitals as stated in the discussion.

It is unclear why patients from principal referral hospitals had higher VTE rates respect to patients from district hospitals. As type of surgery influence VTE risk, it will be interesting if data regarding type of surgery (eg. minor, major, orthopaedic, abdominal...) among hospitals will be available.

Response: We provided and discussed some considerations (care quality, adherence, hospital volume, staffing) on between-hospital variation. Interestingly as shown in the revised results the between-hospitals trends and variations remained consistent after taking into account surgery type as a covariate in the models. Due to small number of surgery type (except other group), hospital peer group-specific analysis (summaries and trend analysis) was not conducted. As suggested in the manuscript further analyses can provide a better insight on what drives the observed variations.

Comment: Rates on cancer and on cancer-surgery should also be considered across years and hospitals.

Response: We showed that surgical patients with cancer (Table 1) had a higher risk of post-operative VTE compared to other major diagnostic groups. However we conducted trend analysis to a limited number of well-defined and extractable surgeries (coronary-artery bypass graft, abdominal aortic aneurysm repair, total hip replacement, total knee replacement, cholecystectomy, and other surgical procedures). Cancer and its broad variation (among both surgical and medical patients) require specific consideration which falls outside of the current study's aim and scope.

VERSION 2 – REVIEW

REVIEWER	Maria Cristina Vedovati University of Perugia,Italy
REVIEW RETURNED	17-Aug-2014

GENERAL COMMENTS	<p>Authors did a great effort in extracting data on different types of surgery and should be complimented.</p> <p>Please correct 'Error! reference source not found.' at page 28 line 50 and at page 29 line 49.</p> <p>Outcomes should be better temporarily defined: post-operative is too vague, please add in the methods section how is defined; please add information on hospital stay (median,range) in results section or in table.</p>
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VERSION 2 – AUTHOR RESPONSE

Reviewer's comment (Dr. Vedovati):

Comment: Authors did a great effort in extracting data on different types of surgery and should be complimented.

Response: We appreciate the reviewer's positive comment.

Comment: Please correct 'Error! reference source not found.' at page 28 line 50 and at page 29 line 49.

Response: References to tables were corrected.

Comment: Outcomes should be better temporarily defined: post-operative is too vague, please add in the methods section how is defined.

Response: The definition of the outcome measure was expanded in the "methods" section and cited

accordingly.

Comment: Please add information on hospital stay (median, range) in results section or in table.

Response: Length of stay statistics were added to the results section.