Reviewer's report

Title: Acute coronary syndrome in Quebec: Regional and temporal variation in the management and outcomes

Version: 1 Date: 3 February 2006

Reviewer: John Rumsfeld

Reviewer's report:

General Comments:

This study evaluated geographic variation in cardiac procedures, cardiac hospitalization, and death after ACS in Quebec. Strengths include the population-based cohort, longitudinal follow-up, and use of hierarchical cluster analysis. Weaknesses include an administrative dataset, lack of clinical data for risk adjustment (beyond age and sex), and lack of ability to differentiate elective cardiac hospitalization (for follow-up procedures). Unfortunately, the incremental value of this study compared to previous studies of regional variation in ACS management and outcomes is not well-justified by the authors, and the hypothesis around whether/how differential cardiac procedure use contributes to regional variation is not clear, nor is it clearly tested or presented in the manuscript.

Major Comments (that the author must respond to before a decision on publication can be reached)
1. The introduction is extremely long and, while interesting and thorough, reads more like a review paper than an introduction to set up this study. The introduction does not clearly justify this study versus previous studies of regional variation in ACS management and outcomes (including in Canada, and including in Quebec). The authors themselves note in the second sentence of the Discussion that the findings of this study ‘have been made in different countries including Canada’.  
2. The hypothesis stated in the final paragraph of the Introduction holds promise as a contribution to the literature (specifically evaluating access to specialized cardiology centers as a factor in regional variation in outcome after ACS), but this is not set up by the Introduction nor is this hypothesis tested in the Methods/Analysis nor are results of this hypothesis presented in this paper. There was no explicit categorization of regions by access to procedures or specific evaluation of specialized centers to test this hypothesis. Rather, there was adjustment for observed procedure use in relation to regional variation in outcome, which is not the same thing (and one of the outcomes, hospitalization, can be directly tied to follow-up procedures and thus is in the ‘causal pathway’). Based on existing literature, it is not surprising that adjusting for age, sex, and observed cardiac procedure use alone would eliminate regional variation in outcome, and this does not directly address the hypothesis about access to procedures.  
3. It is a major limitation that the only risk adjustment was age and sex (cardiac procedure use was not for risk adjustment, as it was the independent variable of interest). This forces assumption of similar case mix over regions. Why wasn’t additional risk adjustment (even from administrative codes of cardiac and non-cardiac conditions/history) done? Also, the proportion of STEMI, NSTEMI, and unstable angina by region should be presented, and stratified analyses within these subgroups should be done, given the likely strong association with cardiac procedure use.

Minor Comments
1. Intro (p.4): ‘As first intent treatment’ is unclear – does this refer to primary PCI? Early PCI with ACS (i.e. early invasive strategy)? Or PCI in general?
2. Intro (p.4): ‘discrepancy between regions must be even greater today’ and ‘ever-increasing discrepancy’ should be clarified….it is unclear what discrepancy is being referred to.
3. Were Figures 2 and 3 also adjusted for cardiac procedure use, or just age and sex? Figures 1, 2, and 3 are difficult to interpret.

**What next?:** Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**Statistical review:** No

**Declaration of competing interests:**

'I declare that I have no competing interests'