Reviewer’s report

Title: Patient, Physician, Encounter, and Billing Characteristics Predict the Accuracy of Syndromic Surveillance Case Definitions

Version: 1 Date: 16 October 2011

Reviewer: Julie Pavlin

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Very interesting and novel work on improving accuracy of syndrome definitions through administrative characteristics.

Minor Essential Revisions-
1. Some minor grammatical errors throughout - e.g., Background, billing practices first line - "No prior studies HAVE examined..."; 4 lines up from that, "health conditionS encountered..."; missing period second line page 14.

Discretionary Revisions-
2. Page 5, physician characteristics - the first one listed seems counterintuitive. Later in the paper the authors explain this more (that those with less experience often use reference materials instead of relying on (often faulty) memory. But at this first encounter, perhaps should be explained a little more - add in "potentially due to the use of reference materials" or something like that.

3. Page 6, billing practices. Accuracy expected to be better for physicians vs. clerical staff - and throughout the paper. Are there any professional coders in Canada? In the US, there are often people who specialize in coding and who do the coding - we saw improvements in accuracy in the military system when they started hiring them vs. having the physicians do it who didn't really care (because they are salaried and not paid per patient). Also lots more ICD codes were used per patient by coders vs. physicians who were only required to put down one, so that's what they did. The down side is it takes a lot longer.... In Table 4, what is RAMQ? Is that professional coders? If you don't have that comparison, might be good to just mention that there could be a difference in secretarial staff vs. professional coders.

4. Results - How many ICD codes can be used? Were these rank ordered? I'm just a little confused with the primary reason for visit when compared to the medical chart. For example, if there were 8 ICD10 codes used and the 8th one was for diarrhea and therefore it was included as a Glsyndrome positive visit, but that wasn't the primary reason for the visit when looking at the medical record, was that considered a non-accurate match?

5. Patient characteristics - What about material deprivation? You had some significant differences between low deprivation and at least middle deprivation - you should mention that, it is interesting.
6. Encounter characteristics - you should also mention day of the week. Although not significant with multivariate analysis, it is close and bolsters your earlier assertion that perhaps on weekends, there are less complex patients, people coming in with just one main problem that is easier to code.

7. Billing practices - very interesting with the differences in automated vs. manual billing systems. In Table 4, there are quite a few others that were worse than Purkinje. Having no idea what these systems are, it would be extremely helpful to categorize them into automated vs. manual (and perhaps leaving out those that are a mixture or don’t fit in those categories) and doing another analysis to see if this holds true. One of the most important points of the paper and good tie-in with the meaningful use discussion later on. If you do any of these revisions, do this one!

8. Related to #3 above, 2nd paragraph of discussion. If someone uses professional coders, you wouldn’t expect the higher physician workload to impact accuracy (more complex patients still might, although perhaps to a lesser extent). If you know that some professional coders were used, if you could re run the analysis looking at physician coding vs nonphysician coding - could show different results that would be important to know. Also, if there were unprofessional coders (that sounds bad, but I mean generally medically and coding untrained like general secretaries), complex patient coding may get worse, but workload may not change (depending on how much time they are given to do the work).

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.