Reviewer’s report

Title: Decision Support During Electronic Prescription to Stem Antibiotic Overuse For Acute Respiratory Infections: A Long-Term, Quasi-Experimental Study

Version: 1 Date: 16 Jan 2017

Reviewer: Makoto Jones

Reviewer's report:

I think that this is an interesting manuscript that contributes to the literature. However, I think that the rationale to motivate the paper is inconsistently applied and could use more development. The introduction takes some space to discuss durability of effects. This is related to the central hypothesis, which is not clearly stated. Education is mentioned but this is in fact not the intervention. Some explanation of education, which promotes an internalized locus of control for the behavior and CDSS that focuses on constant external pressure would be helpful to discuss. A reworking of the discussion in this light would also be helpful.

Other comments as they occur in the text:

Line 27: The background mentions sustainability in different practice settings in its setup. It is not clear that this study really investigates sustainability across practice settings so why mention it? It's really more about durability of effect than sustainability, I think?

Line 50: All antibiotic use promotes the emergence of resistant microorganisms, not just overuse.

Line 51: "Largest use" is awkward construction.

Line 60: Introduction discusses EMR relationship with education but this is not developed, which makes things confusing.

Line 72: Education is again brought up without discussion of what the educational content is. Also, it is perhaps an overstatement to state that the educational content of the CDSS has been assimilated because residents rotate every 2-4 weeks and new trainees are brought in every year.

Line 73: The hypothesis is not clearly stated and doesn't appear to follow directly from the previous sentence.

Line 87: Why wasn't levofloxacin included? Non-formulary use of antibiotics can be relatively common depending on the center.

Line 103: How much was the system overridden? And what were the rationales provided?
Line 109: The work from Citation 13 was on notes from 2003-2004, which is a short time period compared to the study time frame. Language patterns could have changed. Was the stability of the case-detection algorithm over time assessed?

Line 111: The rationale for the sampling categories when they are described would help. Otherwise, readers have to guess.

Line 122: The language surrounding inclusion and exclusion is unclear. I presume that the discussion is around electronic criteria and manual criteria as a secondarily applied filter.

Line 138: Pharmacy Benefits Management Services, not Prescription Benefit Management Service

Line 144: Was the power calculation assuming that all flagged encounters were real or allowing for attrition due to misclassification?

Line 150: The "size of inference test" apparently refers to a threshold for reporting p-values as significant. This is awkward construction.

Methods: the criteria for including variables in multivariable logistic regression should be recorded in the statistical analysis section.

Discuss why time series methods were not used because there appear to be trends to account for as well.

Figure 2: Was azithromycin use decreasing as well?

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.
I recommend additional statistical review

Quality of written English
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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