Reviewer’s report

Title: Effects of multicomponent primary care-based intervention on immunization rates and missed opportunities to vaccinate adults.

Version: 0 Date: 24 Oct 2019

Reviewer: Tricia Nowalk

Reviewer's report:

This article reported on a QI project to improve vaccination rates in a large group of practices with tens of thousands of adult patients. While the writing is generally clear, the methodology has several weaknesses which may or may not be "fixable."

Abstract.

1. I feel that it is disingenuous to call this a controlled study, given that the intervention group chose to participate and the comparators did not.

2. It is unclear whether the increases in vaccination were percentage points or percents. I believe that it is the former and should be stated as such.

3. The results repeat information about the increased rates and the format for presenting pre and post rates is quite confusing. I would suggest reporting baseline rates and then the changes in rates.

4. The conclusions are likely overstated given the need for better analyses, but also because of the weak design.

Background.

1. The first paragraph does not flow well and the latter part of para 2 has repetitive language. Lines 87-92.

2. Line 93 I suggest rewriting to read, "...and, especially among adults 19-64 years..."and suggest reordering the list into a more logical order. Is the word "varying" missing before "the target..."?

3. Line 99 change "the efforts" to "their" or "those" efforts.

4. Line 108 #2 is not parallel language.

5. Line 123, delete "is."
6. The fact that staff may have been shared among participating and non-participating physicians and the unequal distribution of family and internal medicine physicians across the groups are two major design flaws.

7. The statistical methods seem to be inadequate. Because the patients were nested within physicians who were nested within practices with specific practice types, hierarchical regression modeling should have been used.

8. Table 1 would benefit from revisions. It was not clear to me who was represented in columns 2 and 3.

9. For all the tables in general, suggest using landscape orientation when necessary instead of squeezing the data and use clearer headings for the columns instead of lengthy footnotes to explain. Also do not use grid lines.

10. Tables 3 and 4 could probably be stacked into a single table and p values added to table 4.

Results

1. The presentation of vaccination rates is confusing as written, as it is not clear to which group each value corresponds. Secondly, the comparisons across groups of the changes from baseline to followup are misleading. Suggest calculating the change scores (Followup minus baseline) then comparing those scores between the two groups. This will account for the fact that the comparator groups generally have lower baseline rates, thus would be expected to have lower follow-up rates despite having equal changes from baseline to follow-up. It is the change in rates that is important.

2. The results of the regressions (hierarchical) should probably be shown in a table instead of text so that all significant factors will be shown.

3. I applaud the use of two different measures of missed opportunities, but the presentation, like that of the vaccination rates should be revised for clarity.

4. There is no mention of fidelity to intervention. Did the authors survey physicians or staff as to which strategies were being used?

Discussion

1. Please check the sentence on line 328; not grammatically correct.

2. The weaknesses of the study design are mentioned in the discussion. However, some of them could potentially be overcome and should be addressed.

3. The entire last paragraph before conclusions has punctuation and other errors.
4. Conclusions. Do not use two connecting words e.g., however, despite...

5. Conclusions. At least some of the conclusions should reflect the study's (new) findings.

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

No

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

No

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

No

**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

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