Reviewer's report

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

Version: 0 Date: 04 Nov 2019

Reviewer: Robert A. Bednarczyk

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Low adult immunization rates remain an intractable problem, and the authors have sought to implement a multi-component intervention to improve adult immunization. However, the report, as currently structured, does not do a good job of reporting or interpreting the findings from this evaluation. Detailed comments are presented below.

1. It appears that this was a pragmatic trial with no direct patient recruitment or enrollment. Please clarify this, and also indicate what types of institutional review board oversight was conducted for this study.

2. As this was done in an intervention trial setting, it should have been registered with clinicaltrials.gov, but the authors report that this was not registered.

3. There is not much clarity regarding the participating providers. While they all are reported to be part of a health care system, there is no indication of whether they are all in individual offices/practices or if any are in a group practice with each other. Given that, it is difficult to determine if any providers in the same office were both intervention or control providers, and what the impact of potential related study contamination given this would be. For example, you talk about 43 providers from 10 sites, and then give a breakdown of types of providers in each arm, but don't indicate how that translates to physical sites/offices.

4. The authors report that there are similar findings between the intervention and control arms, though a slightly larger effect was often seen in the intervention arm. However, while this may be true from an absolute vaccine uptake proportion perspective, using a difference-in-difference approach to look at changes relative to baseline in both arms shows that, for example, there was a 15% relative increase in influenza vaccine coverage in the intervention arm and a 17% increase in influenza vaccine coverage in the control arm, which shows that the intervention arm was slightly worse. This lack of accounting for baseline differences masks some of the problems with just using an absolute proportion change.

5. The second paragraph under "Effects of intervention on vaccination rates" is very confusing, and the use of p-values with no context to specific coverage levels or changes is not helpful. Again, for these types of comparisons, direct reporting with the potential use of a difference-in-difference approach would be more appropriate.
6. The correlations presented in Table 5 are difficult to interpret and do not seem to have a clearly described set of related methods.

7. For the "majority rule approach" do you have indications of whether the multiple different providers were in the same study arm, and if a patient got vaccinated, whether it was the primary or another provider who vaccinated, and which arm they were in?

**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.

Yes

**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 am able to assess the statistics

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

Acceptable

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