Reviewer’s report

Title: Contrasting predictors of poor adherence to antiretroviral therapy in two South African treatment programmes: a cohort study

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Reviewer: Amita Gupta

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Data on adherence from large scale-up programs in low-income countries are needed as much of the adherence information comes from smaller programs. Therefore the rationale for this study as the authors point out is to assess adherence in larger programs.

Major compulsory revisions:

1. The authors define adherence in a different way than what has been traditionally used as the definition in other published literature. Specifically they define non-adherence as either a detectable viral load >400 c/ml at 6 months or discontinuation of care and treatment at 6 months verified by active tracing. Typically most published papers have used medication adherence either by validated self-report questionnaires or pill count methods. The authors are correct to say that viral load is often used to validate adherence measures. Since they report collecting adherence to medications at both 6 weeks and I assume at 6 month visits, it would be useful to assure the reader that use of viral load in this study was strongly correlated with adherence to medication. This is because lack of adherence is a key reason for detectable VL but it is not the only reason (prior exposure to ART even if thought to be ARV naive, transmitted resistance etc). Perhaps the authors should reframe their study description to state baseline factors associated with detectable viral load at 6 months and failure to continue in care.

2. A more detailed explanation of the heirachacal framework is needed as many are not aware of this approach. It certainly adds to the analytical approach but it makes it a little harder to compare to other studies findings.

3. Study duration dates needed in the Methods. It seems the sample size calculated by the study team was never achieved and it is not clear what proportion of potentially eligible patients seen in each of the programs was included. Given the large size of these programs, it is likely that there are several patients seen each week that would be potentially eligible for this study. How representative are the 227 in the community program and the 117 in the workplace program? Over what period of time were they enrolled?

Minor revisions

Abstract: 2nd sentence is missing a word "This is especially important _____ since..."
Sentences usually do not begin with numbers

In results, include adherence information from 6 week visit and compare to 6 month visit as this would provide a more dynamic description of adherence over time

**Level of interest**: An article whose findings are important to those with closely related research interests

**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