Reviewer’s report

Title: The association between travel time to health facilities and childhood vaccine coverage in rural Ethiopia. A community based cross sectional study.

Version: 2 Date: 14 March 2012

Reviewer: Eric Chamot

Reviewer’s report:

This is an interesting and well written paper on access to immunization services in an isolated and low resource setting. The methodology is generally clearly described, and the results are of significant public health importance.

Study strengths include the community survey design, immunization status based on review of immunization cards and health post medical charts, GIS-based estimation of travel time, and analyses accounting for several levels of clustering. Limitations are adequately discussed.

I suggest the following revisions:

Major compulsory revisions:

1. The Results section of the abstract states that 77% of children were vaccinated with DPT3 vaccine in the last five years. This contradicts information presented in table 1-3, where about 93% of children appear to have completed DPT3 vaccine. There are similar inconsistencies for BCG and measles. The problem seems to be due to the fact that missing data were not accounted for consistently throughout the manuscript.

2. Main analyses are based on logistic regression. This is a suboptimal choice when the outcome of interest is “not rare”, because the odds ratio gives a biased estimate of the risk ratio in these situations. To avoid any confusion, the authors should use a more appropriate alternative such as log-binomial regression [Skov T et al. Prevalence proportion ratios: estimation and hypothesis testing. Int J Epidemiol 1998;27:91-95] or Poisson regression with robust standard error estimation [Zou G. A modified Poisson regression approach to prospective studies with binary data. Am J Epidemiol 2003;159(7):702-706].

3. According to the EPI immunization schedule, primary vaccination should be completed by age 12 months; therefore focusing on immunization coverage rates in children aged 12-59 months is somewhat misleading. It is unclear why the author did not focus on vaccination delay, for instance, by reporting proportions of children vaccinated with vaccine X by the age of 2 years (or any other relevant age). At the very least, this issue should be thoroughly addressed in the discussion section on study limitations.

Minor essential revisions:
1. The first reaction when reading the background section of the abstract is that the introductory statement is untrue, because many studies have assessed associations between access to health care and childhood immunization coverage. It is correct, however, that less research has been conducted in truly isolated areas. The authors should consider better emphasizing this point (e.g., by specifying “in remote communities lacking modern transportation and communication systems”).

2. On page 5, in the Methods section, it is unclear whether polio1 is given at birth or at 6 weeks.

3. On page 6, in the Data collection section, eligibility criteria should be described in more details (e.g., only children present at the time of the survey?).

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

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests.