Reviewer's report

Title: A Strategy to Increase Adoption of Locally-produced, Ceramic Cookstoves in Rural Kenyan Households

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Reviewer: Lisa Thompson

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Paper: “A Strategy to Increase Adoption of Locally-produced, Ceramic Cookstoves in Rural Kenyan Households”

Overview:

This paper is measuring the success of cookstove adoption in 60 villages in rural Kenya. The authors describe several combined approaches they used to achieve equitable uptake of an improved stove: training local vendors; behavior change efforts; incentives to promote stove distribution; and co-implementation of water treatment intervention with cookstove adoption. This is a partnership with the Safe Water and AIDS project (SWAP, Kenyan NGO) and a Child health and education project (NICHE, US CDC). The main study used a two-stage cluster design to enroll 1,500 homes in 60 villages in Nyanza Province. This sub-study used SWAP self-help group members (“vendors”) and trained them to be local stove vendors, and also trained them on a behavioral change method (“education through listening”). These SWAP vendors added stove promotion to other health promotion efforts they were already doing (I assume in the area of safe water and AIDS). Stove sale data and household questionnaire data (including water treatment efforts) were collected by NICHE “enumerators”. Overall, it is important to evaluate what explains stove adoption: Are health promoters who have been trained in behavioral change methods effective? Do households who treat drinking water also more likely to install a clean stove? What are the characteristics of households who choose to install a stove? How is success measured? All of these questions were explored in this paper and they are important questions to answer. Unfortunately, this paper was trying to cover too much in one paper and I have major concerns about overall structure of the paper and how each of those questions was addressed.

Major Compulsory Revisions

1. It was very difficult to see how this sub-study fit into the overall study. Each of the four aims of the study was implemented at different times, in different villages, by different people. There was overlap in pilot/expansion of training of vendors with baseline questionnaire and follow-up questionnaire at the household level. The vendors were not the same as the enumerators. A timeline or a flowchart would help the reader to understand all of the elements in the study and how they intersect with the larger study.
2. Behavior change technique was poorly explained in background & not cited. Authors need to lay a foundation for why this is important and how it pertained to the overall study or to stove adoption. The results related to this aim do not describe how ETL is related to stove sales; I imaging there are other covariates that explain the increase of sales. Either expand or eliminate (the latter seems to be supported by discussion where 2:1 ratio of sallies in villages with/without SWAP vendors who received training was present before the training).

3. Paper has many aims and not all are well described in methods/results/discussion. Recommend refocusing aims.

Minor Essential Revisions

Abstract:

Results:

>95% use wood does not match main results (p. 11) which says >99% use trees
stones for cooking.

[add Kenyan] Shillings

1,124 in 747 [add multi-family] households

Transactions involved incentives (clarify for both vendor and purchaser?)

Last line: provide percentages about adoption before p value.

Conclusions:

1st line: change “into” to “in”

5th line: change “exported” to “adopted”

Last line: will follow [add adoption of cookstoves]

Introduction:

2nd para, line 3: Change “The” to “An” ideal design

Methods:

p. 5, line 3: change “included” to “includes”

p. 6, Project Design: enumerators are field workers? Health workers? Surveyors? I am not familiar with this term.

p. 6, line 15: Change to…‘procedure. In the first sampling stage, 60…”

p. 6, line 16: Change to…’Province were selected”.

p. 6, line 17: Is 1999 census the most recent census?
p. 7, Baseline section: remove “baseline and follow-up” after conducted and put at end of sentence “at baseline and during follow-up”

p. 8, first para: Who did you survey? Vendors? What about expansion period, did you do surveys then? Don’t add more dates and numbers to text, already confusing, need flow chart or figure.

p. 8, Heading “SWAP vendors” change to something like “roles of vendors”, make consistent with aims of study

p 8, para 2: 34 vendors result in 20 trained installers. Why not 34? Installers are vendors, but confusing here. From this para, 20+126=146, but later on authors state that there were 160 vendors. Are these installers? How many installations per vendor before they were considered “installers”?

p. 8, line 11: Vendors install stoves not villages

p. 9, Change heading “Education through listening” to “behavior change” to reflect aims

p. 9, para 1: Methodology very scanty. How may vendors trained?> How random was sample? What did training consist of? How do you measure effectiveness of training? Where are citations on theories used? This seems like it could be a whole separate paper.

p. 9, para 2: Where in timeline of pilot training does this stove promotion month fit in? Was this intentional?

p. 10, para 1: Change heading to Integration of stove and water sanitation products, or something that describes aim

This paragraph seems like a whole separate paper. Here you are testing adoption in early adopters, because they participate more? Methods could be more thoroughly described, and reason for considering it as a separate paper.

p. 10, last para: Equity of Stove adoption

Here PCA is described so briefly that it is hard to know how the PCA was conducted, what was added/removed to assess best fit for SES quintiles. Is Equity of cookstove adoption the dependent variable and SES quintiles from PCA the IV? Did you do this PCA or was this done by cited reference [24] which was done in India? This is very important and it seems like it could be another separate paper.

p. 11, para 1, last line: which variables examined in Chi-square? Not clear on what is DV/IV in this section

Results:

p. 11, para 3, first line: 99% or 95%?
p. 11, para 3, line 3: “Cooking frequently occurred in kitchen in same room as sleeping…” In table, highest frequency is separate cooking building. This seems misleading, State % instead

p. 12, para 2-4: Needs to be reorganized to include most important information. Group children’s exposures together. Could say “In households with children < 2 years and children 2-5 years, smoke exposures were ___ and ___, respectively

p. 12, para 3, line 2: How were 202 selected? Why does 91 (30%)+ 202(68%) not add up to 100%?

p. 12, para 3, line 4: Why were improved stoves in separate building more than 3-stone fire? Can you talk about before/after improved stove and change in same household instead of between households? Does getting the stove change where people cook?

p. 13, SWAP vendors. Line 2: Add multi-family between 757 and households

p. 13, SWAP vendors. Line 6: “A total of 5,868…” This goes in methods, not results.

p. 13, SWAP vendors. Para 2, Line 1: Reword awkward sentence. Clarify 160 or 146 SWAP vendors?

p. 14, Educate through listening” Entire section needs more information. I don’t think data substantiate success of this training.

p. 15, line 8, line 10, line 12: Need to present results (proportions, X2 result, p-value) for each of these results. Last sentence discussed in discussion? IS this exposure misclassification?

Discussion:

p. 16, para 2: Scanty discussion about behavior change.

p. 17, para 3, last sentence: How was convenience sample selected? Where?

p. 18, line 13: Field testing IAP seems out of place here.

p. 18, line 16: first mention of Luo ethnicity, if keep this in discussion then end sentence with..adopted equitably in other communities.

Conclusions:

P. 19, line 5: change date to “by end of 2010”

Table 1: I understand cooking location adds up to > 100%, but does Money spent on firewood also > 100%? Please check %s

Table 2: Note d: 83% of SES data missing for upesi jiko HH? How did you deal with this large missing data problem?

Figure 2: I see a timeline in figure that would be more helpful if expanded upon
as separate figure with recruitment numbers and villages.

**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.