Reviewer's report

**Title:** Implementation of tuberculosis infection control in health facilities in Mukono and Wakiso districts, Uganda

**Version:** 3 **Date:** 6 March 2013

**Reviewer:** Michael Reid

**Reviewer's report:**

**Summary**

This is a research article describing the implementation of TB infection control parameters across 51 health facilities in two districts in Uganda. It demonstrates that there are considerable deficits in TB infection control in that setting. This is relevant to other sub-Saharan African settings that have similar deficits in TB IC implementation. However, I have several major concerns about the manuscript in its current format, which I have outlined below.

**MAJOR Revisions**

1. **Approach to TB IC.** The manuscript lacks a clear hypothesis and covers several different areas. I think the data on TB IC implementation and facility level findings are interesting and may be relevant to other similar health care systems. However, it is not clear if the authors are trying to assess the impact of the TB CAP training. If so, this is not clearly stated. Please outline in the introduction clearly what the purpose of the intervention is.

2. **Clear focus on the core elements of TB IC.** The WHO endorses 4 key components to effective TB IC implementation. A useful approach to presenting the data would be to systematically detail how each element of the WHO approach (managerial, administrative, environmental and personal protective) have been implemented. Please address this.

3. **Knowledge questionnaire** - I am concerned that the component of the study that details with HCW knowledge. The researchers describe that HCWs had TB IC knowledge scores ranging from 8-9. The test included is very simple and all participants scored very high. I do not think that these findings are predictive of either TB implementation or clinical practice. Furthermore, I find the statistical analysis related to these scores to be meaningless. I think the study would be far more insightful if it only included the facility assessment and not the HCW knowledge data. I would strongly advocate for removing the HCW component from a revised version.

4. **Reference to HIV epidemic** – there is very little detail on the impact of HIV either on HCWs or on burden of TB disease across the sites. This is a huge determinant of nosocomial transmission and its impact on TB IC needs to be discussed in the intro and in the discussion.
MINOR Revisions

Abstract

Study aim – the explicit study aim is not consistent with the outcomes, which suggest that the study aim was to assess implementation of TB IC practices. This needs to be clarified.

Results – It would improve the results section if you clearly delineated the two types of data that have been recorded (facility assessment data and staff perception data).

Results - barriers to implementation were stated to include under-staffing and lack of funds. However, there is no data included in the abstract to support this

Introduction

• There is very little reference to the HIV epidemic in Uganda. The reader is not left with a clear sense of the HIV problem and how that impacts TB infection control in that setting. A more detailed review of how HIV impacts TB transmission is vital and the absence suggest that the authors do not think this is an important problem.

• Uganda data – please include information on the prevalence of HIV in the regions studied as well as TB case notification rates and number of HIV-infected patients acquiring TB.

• The WHO does not recommend three types of infection control measures, but four. Specifically it recommends a hierarchy of controls that includes managerial measures, administrative measures, environmental measures and personal protective measures. The impact of managerial measures, especially in the context of a study that evaluates health care worker knowledge and attitudes in important.

• References 9 and 10 are not research articles and do not provide research evidence to support the statement to which they are assigned.

Methods

• Semantic point – but you have two separate study populations: those HCWs that undertook the knowledge test and the facilities where the implementation assessment took place. Separating the methods into two distinct sections would be useful.

• It is not clear why you include these two regions. One had received training and one had not, yet there is no mention of whether your intention is to compare the two sites.

• Unless the intention of the study is to assess the impact of training in Wakiso, I do not think that including detail with respect to training is pertinent. If your hypothesis was that training improved TB IC then should be clearly stated (in the introduction) and then the methods should reflect this.
Semantic point – however, it is not clear throughout the manuscript whether you are referring to ‘cough triage’ and TB screening. The former informs strategies to segregate IC risk patients, the latter is a clinic approach to identifying patients with active TB.

Data collection

- HCW survey: has this been validated? Where does the content come from?
- Facility survey: more detail on this is required. Was it piloted? How did you assess for test retest agreement? Reliability?
- Page 5, paragraph 3: are ‘masks’ actually N95 respirators are the authors referring to regular ‘surgical’ masks.
- Air ventilation: authors refer to a ratio of window area to floor area. Has this been validated elsewhere? What are operating characteristics of this measurement compared to more established indices of ventilation (such as air changes per hour).
- Qualitative data: it is completely baffling to me why HCW focus groups would be gender specific? What was the rationale for this? Was there difference by cadre according to the gender groups? If so please include.
- Health facility survey: I am curious why the observation data and the survey data were combined. I would presume that the former was used to validate the latter. This would be a useful marker of whether the survey data was good enough quality.

Results

- When stating percentages please include the n as well. 65% of facilities is meaningless if the n=3.
- The methods includes no detail on the definitions of the facilities, yet they are referenced in the results. What is a HCIII?
- What is the context for 16212 encounters? Does it refer to facilities or districts?
- The median number of TB patients seen is incredibly low at 24. Is this absolute number? What is the case notification rate for these districts? Can you make meaningful comments about TBIC if the incidence is so low?
- There is a lot of unnecessary statistics. For example, I do not think the IQR for respondents age is really that useful or informative!

Knowledge

- Frankly, I do not find any of the data with respect to knowledge scores useful. The range of scores is incredibly narrow – and the statistical differences seem meaningless. Furthermore, I do not think that there is any surprise with regards to better scores in the setting of TB IC training.
- Also I have some concerns about the question that 343% of HCWs got right about surgical masks and protection against TB. There is literature demonstrating that these do protect (See Dharmadhikari AS, in Am J Respir Crit
TB infection control measures in facilities

• There is established literature with respect to assessing lab space for ventilation (in terms of biosafety cabinets, etc). Were standardized assessments used to assess the lab areas?

Personal risk reduction

• No mention of HIV status and whether HIV+ HCWs were offered the chance to change work site.

Perceived barriers to implementation of TB IC?

• How many questionnaires/surveys were performed?

• Page 10, para 5: authors confusing triage and TB screening. These are different and serve different purposes….

Discussion

• The discussion could be better structured (for example, addressing environmental, administrative, personal protective, etc systematically)

• You mention an ‘open window policy’ in the discussion, but not in the results. What were the findings?

• You state that there were low knowledge about TB IC and yet the average score was 8/11. Explain?

• The discrepancy between self-reported and observed TB IC suggests explanations other than knowledge explain the difference, e.g., HR challenges.

• ‘Low knowledge’ could be a consequence of a poor (unvalidated) questionnaire rather than genuine lack of knowledge. Discuss.

• There are many measures that can be employed to assess the coverage of TB IC measures. There is a lot of data evaluating patient flow analysis as an index of effective triage. It is also possible to assess natural ventilation using CO monitors or air changes per hour. Discussion about their role in these setting would be useful

• There is no mention of any data on TB notification rates among HCW in Uganda? Do we know if this is a problem? Also no mention of the burden of HIV at evaluated facilities.

Level of interest: An article of limited interest

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.
Declaration of competing interests:

I declare that I have no competing interest