Reviewer’s report

Title: Trends in bednet ownership and usage, and the effect of bednets on malaria hospitalization in the Kilifi Health and Demographic Surveillance System (KHDSS): 2008-2015

Version: 0 Date: 02 Jun 2017

Reviewer: Manisha Kulkarni

Reviewer’s report:

General comments: The authors present an interesting study that takes advantage of a unique longitudinal dataset obtained through eight repeated rounds of the DSS in Kilifi, Kenya. The impact of mass bednet distributions on net ownership is assessed, and the effect of reported bednet usage on the incidence of malaria hospitalization in children <5 is assessed using KHDSS population register data linked to data on hospital admissions. Descriptive analyses show significant impacts of mass bednet distributions on net ownership. However, statistical methods to assess the effect of bednet usage on malaria hospitalization are not well described so the results obtained may not be robust.

Specific comments:

* Abstract, lines 30-31: The results statement, "There was a strong association between reported bednet ownership and usage between 2008 and 2015; overall 63% on bednet ownership and 62% on bednet usage" is not clear. Which associations do the percentages reflect? Do the figures reflect mean ownership and mean usage for the entire period (I think this is the most likely interpretation) or do they represent some measure of association between ownership and usage between the 2008 and 2015 surveys? Please clarify.

* Statistical analysis, line 103: The authors state that "The validity of the data collected during the KHDSS routine enumerations was assessed by comparison with observations collected during the overlapping sero-surveys". While I agree this is a logical approach when comparing reported ownership to observed ownership, and I appreciate the fact that the authors are making use of available data on net observation from other serosurveys (since no net observation was done in the DSS surveys), it does not directly validate reported bednet usage estimates. Do the authors assume that the level and nature of recall and/or reporting biases for net usage would be similar to that of net ownership? Is there any evidence to support this assumption?

* Line 111-123: More details on the survival analysis are needed to assess whether the methods are appropriate. How did the authors account for individuals that were captured in successive surveys, since these observations would not be independent? Also it's not clear if the model accounted for clustering, or if this is even needed depending on the DSS survey sampling approach.
Line 125: Did the authors consider applying methods for dealing with missing data, since excluding these records may introduce sample bias if missing data was not at random?

Line 121: The survival analysis was adjusted for sex, age, survey period and location of residence (as a proxy for distance from hospital). Was socioeconomic status considered as a covariate, and if not why not, given that wealth is a common predictor of bednet ownership/use in most settings?

**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.

Unable to assess

**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 recommend additional statistical review

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