Reviewer's report

Title: How should social mixing be measured? Comparing survey- and sensor-based methods.

Version: 2 Date: 2 October 2013

Reviewer: Joel Mossong

Reviewer's report:

This is an interesting comparison paper of two methodologies to measure social contacts in high school setting. While the sensor component produced very plausible data, the participation (20%) and more importantly, the compliance/cooperation levels of the online survey component was rather poor (in comparison to paper diary approaches, for example) that a comparison seems slightly tenuous, regardless of the valiant attempt by the authors to account for underreporting.

Major compulsory

1) The authors need to report participation rates also for mote component of the study, independently of whether they agreed to participate in the online survey. This should be done in results not in methods section.

2) It is very surprising that participation in the online survey in a secondary school setting was so low (20%). Authors need to discuss reasons for this. Did participation differ by grade and sex? For example, did the students have access to computers or set lessons to fill in the survey? Did the PIs go to the school in person to explain the reasons for the online survey study and that it is important? Were there issues of confidentiality, e.g. that students did not want to name contacts, was there peer pressure exerted not to participate? The authors need to discuss how participation could be improved in a high school setting? For example, Conlan et al. (ProcBiolSci, 2011) show that very good social contact data quality can be achieved if pupils are scientifically engaged in the project from the outset.

3) A possible reason why participants reported so few contacts numbers in the online survey could have been that the online survey format was adaptive, i.e. participants had to add extra rows themselves, rather than fill in a page of contacts. The average number of contacts reported are very similar to a similarly adaptive telephone-based approaches that were trialled prior to the main POLYMOD study (Akakzia et al, Eur J Public Health, 17 Suppl 2), and then deemed inappropriate for more wider use. The authors need to discuss why they didn't opt for the more widely used paper diary approach.

Minor essential

1) Show a histogram of degree online survey contacts, as a function of day of reporting rather than reporting quartile stats in the main text.
2) Was there any effect of age or sex on number of mean reported number of contacts

3) Specify the word "online" or "web-based" in title and throughout the text before the word "survey" whenever referring to the survey component of the current study.

**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.