Reviewer's report

Title: Measuring underreporting and under-ascertainment in infectious disease datasets: a comparison of methods

Version: 1
Date: 13 November 2013
Reviewer: Rob Lake

Reviewer's report:

Discretionary Revisions

This paper summarises generally accepted ideas about the problem of underestimation, under-reporting and under-ascertainment (for morbidity only), describes various types of study to address the problem of determining multiplication factors, and then collates published estimates of multiplication factors for salmonellosis and campylobacteriosis.

1. The paper is generally well written, although repetitive at times. Sentence 3 on page 5 (“If overall of health literacy…”) needs work. Some of the text is not informative (for example at the end of the second paragraph in the discussion the text indicates that using the best and most appropriate data generates the most accurate results). The literature review is comprehensive.

2. There are two issues which could be addressed more clearly. Under-ascertainment and under-reporting occur for a variety of reasons, and the authors acknowledge the problem of variability of the multiplication factors within a country, particularly according to age of cases. However, there is no discussion of the various types of base value to which the multiplication factor is applied i.e. the “cases correctly reported” in Figure 1. For countries and diseases where the MF is large (e.g. 39,000 for campylobacteriosis in Bulgaria) estimates will be very sensitive to changes in the base value.

3. Secondly, how are we to handle asymptomatic cases? Should they only be considered when asymptomatic cases lead to sequelae or mortality? If so, which infectious diseases are relevant?

4. The data in Tables 1 and 2 (the title of Table 2 needs fixing) are a useful collation but additional commentary would help – what do these data tell us (apart from the fact that MFs are variable)? Under-reporting will be less important than under-ascertainment for so-called notifiable diseases, but what about diseases where only occasional outbreaks may be reported?

5. Similarly with the data in Table 3. In my opinion, it is encouraging to see reasonable consistency of the MF estimates in the Netherlands and the UK from different types of study, but do these studies overlap? For example, do pyramid reconstruction studies use information from CBS studies? Can any comment be made about UR and UA in terms of disease categories e.g. enteric diseases
versus STDs? Given the difficulty of “borrowing” MF between countries, and the need to assess surveillance systems when doing this, can any comments be made comparing the Netherlands and UK?

6. An important factor influencing under-reporting will be laboratory testing regimes for faecal samples which are important for a range of infectious diseases. Which tests are applied routinely, and availability of more specialised tests, will have a significant influence. This factor deserves greater discussion.

**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.