Reviewer's report

**Title:** Access to primary health care in Belgium: an evaluation of policies awarding financial assistance in shortage areas

**Version:** 1  **Date:** 2 August 2013

**Reviewer:** Matthew McGrail

**Reviewer's report:**

The authors aim to test and evaluate a number of different “access” measures for the entire country of Belgium, which either are used or can potentially be used to identify physician shortage (low access) areas. Overall, I believe that this is a moderately well-presented paper which does add to the knowledge in this field.

Four different methods of measuring “access” are presented (technically, I'd call it accessibility or spatial accessibility – the authors largely use ‘accessibility’, but they use these 3 terms interchangeably at different times). Personally, I could see no point to 2 of the methods: “distance to n closest” or “cumulative opportunities within n distance” –because they both are (methodologically) a step back from the currently used PPRs because they really only measure “remoteness” (supply side) and take no account of demand. However, they are only a minor component of the paper. Moreover, why (in Table 1) do the authors need to present multiple variations of each measure? I see no logic to the inclusion of both Dist1 and Dist3, Cum5 and Cum10 and 5 variations of the FCA (more on that soon). This paper did not aim to test the sensitivity of the outcome to parameter choices (e.g. Cum5 vs Cum10), so why complicate Table 1?

My expertise is largely linked to the 2sfca method. In the Background, the authors use 3 pages to present the 2sfca methodology –why so much? More importantly, I don’t understand why they included details around the initial FCA development – this is not required and I don’t believe that this redundant method should be in Table 1. They should jump straight to the 2sfca method (simply state - which came from the initial FCA work) and then add “many authors have demonstrated the benefit of adding a distance-decay function, thus we used the E2sfca in this paper”. In table 1, I believe that only the e2sfca result is required, or possibly keep the 2sfca10 if they want to compare the effect of the distance-decay function. At the end of the Background, I disagree about the statement of “major disadvantage” not accounting for other factors. This is largely debated – and it gets very tricky when you start combining spatial and non-spatial data.

In the first results paragraph they discuss the strong correlations within methods (which has little importance to this paper), but they ignore the between method correlations (which is a key point of this paper). When discussing Table 2, it would be useful to state the between group associations. E.g. 48.0% shortage areas (PPR_Mun) and 29.5% for both PPR_Mun and PPR_Phys – please add
somewhere the value 29.5/48.0 because it is not explicitly clear that the 29.5% comes from the initial 48.0% group.

Table 3 was interesting but hardly “striking” (their word). Of course Dist3 and Cum10 will create large areas and small populations underserved – because these are measuring ‘remoteness’ and will always ‘favour’ (underserved, that is) low density areas.

One method issue which the authors briefly discuss in the background but not in their discussion / limitations is the choice of catchment size (10km) for the 2sfca. I strongly believe that variable catchment sizes are necessary for this method when combining urban and rural settings, even for a small country like Belgium; however I accept that the methodology is currently less advanced on this component (and so can be omitted for this paper). What the authors should add within the limitations text is some discussion around the appropriateness of their choice of 10km for the catchment size for BOTH metro and rural settings alike (which I expect is very unlikely to be true in practice) AND its use for both step 1 (service catchments) and step 2 (popu catchments). This query applies to their reasonably strongly worded advice (in the abstract and latter part of the discussion) that the e2sfca is a better method – this is only true if the method is better ‘mimicking’ real behaviour, and I’m not convinced a 10km catchment does this well for ALL geographies.

Major Compulsory

1. Remove all detail of the FCA method (including results) – jump straight to the widely accepted 2sfca method…then progress to the e2sfca because of the need to include a distance-decay function.

2. Discuss more on the between method correlations re Table 1 and better explain between method associations (e.g. 29.5/48.0 value)

Minor Essential

1. In paragraph 2, they state the US government spends “over $1 million a year on programs” – obviously, this should be some other (much higher) value

2. Add specifics around the median areal and population size of the 3 tested boundaries (physician zones, municipalities, census tracts) to help readers less familiar with Belgium and to minimise their required mental calculations

3. Be more consistent with terms accessibility, spatial access(ibility) and access.

4. Remove unnecessary parameter variation results (e.g. Dist 1, Cum5, 2sfca5…) in Table 1.

5. Discuss appropriateness of 10km catchment for both rural and urban

Discretionary Revisions

1. Edit statement of “major disadvantage” not including non-spatial data

2. I’m unconvinced of usefulness of 2 methods (distance to n, cumulative opportunity). I can’t believe that a policy would ever change to utilise either of these options
Level of interest: An article of importance in its field

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