Reviewer's report

Title: Spatial pattern of severe acute respiratory syndrome in-out flow in 2003 in Mainland China

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Reviewer: Dan Feng

Reviewer's report:

This article explores a kind of technology used to analysis the spatial distribution characteristics of an infectious disease. The author takes SARS as an example, presents the spread of SARS spatial distribution and propagation path by using the in-out flow model, they has carried on a beneficial exploration. However, in this paper, there are following problems:

1 just as the author says, 2003 SARS in mainland China, total 5327 patients were reported, but the author only involved 1975 patients (only 37.4% of the total records) in their study. That would affect the reliability of research conclusion;

2 There are three questions about the method and data in this paper:
(1) in this paper, the author used data came from the infectious diseases report system, the system provide information was limited, especially this paper concerned with space related information, such as registered residence, workplace, current residence, onset location. The information about place coming from the infection disease report system, i.e. the record of registered residence, workplace or current residence, does not mean the patient had experience of space migration, such as a patient whose registered residence was Shanxi, but workplace, or current residence, or onset location was Beijing, that didn’t mean the patient had moved from Shanxi to Beijing in that period of the time. Perhaps, the patient always has been living in Beijing in that period, in other words, the patient did not leave Beijing at that period. Only epidemiological evidence can prove whether the patient had migration facts.

(2) About "permanent residence", according to the author said "permanent residence is mainly based on current residence, but if there is no current residence, registered residence or workplace is used instead", this alternative has problem, because current residence can be similar to workplace, but the current residence does not necessarily equal to registered residence.

(3) In this paper, external flow group was only involved in 198 cases, and were separated as three subgroups, i.e.101 cases of self-spreading flow, 15 of hospitalized flow, and 82 cases of migrant flow. The number of cases of the study was smaller, especially the hospitalized flow group, only 15 patients were involved in. The judgement of division of the three groups was according to registered residence, workplace, current residence, onset location and occupation. The division method existed basis. It need epidemiological data to support, to determine whether the patient was infected in the hospital, whether
the patient had migration experience in this period.

3. The conclusions mentioned in the discussion of the paper did not give us some innovative discoveries.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests