Reviewer's report

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

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Reviewer: Eric Lau

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The paper described the movement of SARS cases across provinces in China which is potentially informative to understand how transmission could be affected by population movement as well as major holiday (Chinese New Year) or disease control interventions. The authors specifically analyzed three types of external movement depending on the timing of movement with respect to disease progression and migration. However, there are concerns in the definitions of in-out flows, external flow and selection bias which needs to be clarified.

Major Compulsory Revisions

Abstract
- There was no clear definition or data to support of the ‘hierarchy’ in the flow of SARS cases.
- Results/conclusion: There was no formal analysis or data to demonstrate the effect of Spring Festival travel or SARS panic effect

Background
- 1st para: Please provide a reference for the economic loss due to SARS
- 3rd para: Please describe how the study is different from / added value to the study (ref 21)

Methods
- Data: is there any difference in registered/current residence and permanent residence? Are these two separate information collected from the SARS cases?
- Please describe in more detail about the accuracy in the variables registered residence, workplace or current residence, onset location and “Medical location”. These are important variables in the analysis. e.g. If a person is a migrant worker, is it true that in the data the current and permanent residence will be different? Was “medical location” defined by diagnosis or hospitalization and is it possible for patients to be transferred to other hospitals. If so, how were they recorded and analyzed?
- Could the author clarify the definition of in-out flow? Do you consider movement of SARS patient irrespective of his/her disease status only, or movement of SARS patients after SARS infection?
- How many SARS cases were actually medical staff? If the main objective is to describe the impact of population flow on transmission, would the authors
consider accounting for the effect of nosocomial transmission?

- In table S1, for ‘self-spreading flow’ it was defined to be permanent residence different from onset location. However it is not clear to me that this represent external flow accurately. It depends on (1) if the information on permanent residence is updated and (2) the timing when the patients has been infected.

- The definition of migrant flow is also unclear to me: Do you refer to those who got sick but decided to be treated in his/her hometown? Were these flow only application to those patients with occupation as migrant workers?

- Table S1. The footnote needs clarification: 0, 1 do not represent “no”, “yes”, as patients with missing data in any of these fields have been excluded from the study.

- In the conclusion, it was mentioned that only 37.4% of the patients have the required data for inclusion. This is better reported in the results section. How would this affect the results? One simple example is that if a major hospital in a province consistently missed the permanent address then there will be no in or out flow from this province. A supplementary table of missingness by each province will be very helpful.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

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

**Declaration of competing interests:**

I declare that I have no competing interests