

## Peer Review File

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### Reviewer

Overall:

This study examined the influence of population mobility on the prognosis of HIV patients, including in-hospital death rate and vision-related events. This research topic is important because urban migration brings great challenges to the healthcare system in China. The new findings presented in this manuscript could potentially be used to influence HIV prevention policies.

Major comments:

1. In the 52nd line, the authors may mistakenly present the result. They wrote “...but correlated negatively with vision-related events...” Based on the result of OR [95%CI] in the 53rd line – 2.08 [1.54-2.80] and 2.03 [1.47-2.80] – the result should be that migrants were positively correlated with vision-related events.

Response:

We thank the reviewer for your comments and suggestions. We revised the sentence as ‘Migrants correlated negatively with in-hospital death (odds ratio [OR][95%CI], 0.37 [0.29-0.48] and 0.52 [0.40-0.68]) but correlated positively with vision-related events (OR[95%CI], 2.08 [1.54-2.80] and 2.03 [1.47-2.80]).’ (Page 4 Line 51-53)

2. The Data extraction section from the 114th to 124th line was not clearly described. Without providing background information and details of the dataset, it would be difficult for readers to understand some of the methods that the authors mentioned. For example, the authors wrote that “the time of the first hospitalization was divided into three periods according to the changes in HIV mortality” but didn’t explain how the time of the first hospitalization could be grouped based on HIV mortality. It seems to me that the time of the first hospitalization is a fact that documented in a patients’ medical records.

Response:

Thank you for the suggestions. We apologise for not stating the meaning clearly. In this version, we revised the statement as ‘the patients were divided into three groups

according to the changes in HIV mortality in three periods: 2006-2008, 2009-2014, and 2015-2016. (Page 7 Line 111-114)

3. In the section of statistical analysis, the authors mentioned that they identified associated factors in logistic regression models with and without adjustment for systemic diseases. I would suggest the authors providing some specific information in this section on whether they included all the diseases into the multivariate models or just included some selected ones? There are over 30 diseases listed in Table 4.

Response:

Thank you for the suggestions. We revised the statement as ‘The odds ratio (OR) of these factors was identified without and with adjustment for all the selected systemic diseases’ (Page 8 Line 128-130). We also revised the footnotes of both Table 5 and Table 6 as ‘Model 2: Logistic model that additionally includes all the diseases in Table 4’ for better understanding.

4. The Discussion section of the manuscript needs major improvement in terms of content and language. Specifically, some information described in the Discussion section should be described in Results section. For example, in the lines 222-224, “the migrant patients had a significantly higher prevalence of vision-related events.....than the local patients” should be described in the Results section rather than the Discussion section. In terms of language, sentences such as “However, why did migrant patients have much lower in-hospital mortality?” should be revised.

Response:

Thank you for the suggestions. We revised the statement as ‘Table 4 shows the prevalence of systemic diseases in different populations, demonstrating that the migrant patients had a significantly higher prevalence of vision-related events and numerous infectious diseases’ in Result for better understanding (Page 8 Line 187-189). We also revised the statement as ‘However, our results also show that migrant patients would have a lower in-hospital mortality’ in Discussion (Page 12 Line 225-226).

Minor comments:

1. The sentence in the 45th line – “Compared to local patients, migrant patients (within and outside the province) had significantly less access to health insurance, younger age...” is not grammatically correct. I would suggest the authors changing it into “Compared to local patients, migrant patients (within and outside the province)

were younger, had significantly less access to health insurance...”

Response:

Thank you for the suggestions. We revised the statement as ‘Compared to local patients, migrant patients (within and outside the province) were younger, had significantly less access to health insurance, fewer hospitalisation admissions, longer hospital stays, and a higher proportion of physical work ( $p<0.01$ )’ (Page 3 Line 45-47).

2. I suggest the authors deleting the phrase “similar to diabetes” in the 63rd line because HIV infection and diabetes are two different diseases with very different etiologies.

Response:

Thank you for the suggestions. We deleted the phrase ‘similar to diabetes’ and revised the statement as ‘Human immunodeficiency virus (HIV) infection has transitioned from an acute fatal disease to a chronic disease due to the application of highly active anti-retroviral therapy (HAART)’ (Page 5 Line 62-64).

3. Some language of the manuscript need to be improved. For example, in the line 143, “in the different populations” should be deleted. In the line 148, “patient age grew gradually” is redundant. In the lines 211-212, “the number of migrant patients increased rapidly during the study period” is not clear. Does it mean that the number of migrant patients with HIV increased? Also, the sentences in the lines 212-213 “The scope of their registered permanent residence increased surrounding Guangdong Province and Guangzhou City” is difficult to understand.

Response:

Thank you for the suggestions. We deleted the phrase ‘in the different populations’ in Line 140 (Page 8), and revised the statement as ‘patient were getting older’ in Line 145 (Page 9) for better understanding. We also revised the statement as ‘First, the number of hospitalised HIV-infected migrant patients increased considerably during the study period. Their residence enlarged with Guangdong Province and Guangzhou City as the centre (Figure 3, Figure 4)’ in Line 208-210 (Page 12).

4. The table 1 may have a format issue. Not sure if that is an error or a technical issue.

Response:

Thank you for the suggestions. We updated Table 1 accordingly.

5. Some sentences are not cohesive. For instance, the sentence “However, limited studies have explored...” in the 72nd line does not connect well with the previous sentence.

Response:

Thank you for the suggestions. We deleted the sentence for cohesive. (Page 5 Line 72)

6. The following two articles might be helpful.

“The effect of mobility on HIV-related healthcare access and use for female sex workers: A systematic review” (PMID: 29966821) (DOI: 10.1016/j.socscimed.2018.06.017) ;

“Predicting the HIV/AIDS epidemic and measuring the effect of mobility in mainland China” (PMID: 23063617) (DOI: 10.1016/j.jtbi.2012.09.037)

Response:

Thank you for the suggestions. We reviewed the two articles carefully and revised our manuscript accordingly. We also add the citation of the two articles in our manuscript: ‘Previous studies have indicated differences in occupation, income, and education level in different populations<sup>5, 7, 33-36</sup>.’ (Page 13, Line 247)

35. Davey C, Cowan F, Hargreaves J. The effect of mobility on HIV-related healthcare access and use for female sex workers: A systematic review. *SOC SCI MED* 2018; 211: 261-73.

36. Xiao Y, Tang S, Zhou Y, Smith RJ, Wu J, Wang N. Predicting the HIV/AIDS epidemic and measuring the effect of mobility in mainland China. *J THEOR BIOL* 2013; 317: 271-85.