Reviewer's report

Title: A nationwide survey on neonatal medical resources in mainland China: current status and future challenges

Version: 1 Date: 04 Dec 2018

Reviewer: John Colin Partridge

Reviewer's report:

The revised manuscript by Qiupong Li et al., A nationwide survey on neonatal medical resources in mainland China: current status and future challenges.

Presents interesting data on the discrepancy between scaling up of neonatal intensive care and the adequacy of staffing. This finding is an important message to healthcare planners in developing countries, as the problem is not limited to China. While similar surveys have been done in other countries, thus making this paper less novel, the findings add to the literature.

The main drawback of this paper is the authors' use of 2011 birth statistics, and their sampling frame in 2012. While the authors correctly compare their data to ANZNN data for 2013, and the authors themselves remark on the rapid development on neonatal care technologies, these data seem far less compelling. Are the 2011 data the most recent available? Could the authors update their data thereby showing whether there has or has not been any improvement over the course of several years?

Also, it would be of interest to know what proportion of units nationally this study represents, either of hospitals at a similar level, or better what fraction of overall neonatal services this survey covers.

It would be ideal were the paper to provide more details of "future challenges" in the Discussion section to match the title.

With regard to the manuscript:

As for overall comments, the grammar is very good, with a few minor exceptions. The manuscript is concise, well-presented, and informative.

The Abstract appropriately presents the study and its findings.

The Background section lays the groundwork for their study.

The Methods section is adequate. The statistical analysis is largely complete, although I do not understand inconsistent use of Fisher's exact text (in Table 3).
The Results section starts with staffing, whereas I would have suggested that the paragraph on staffing come later. However, the link between facilities and available therapeutic modalities makes this sensible enough.

The Discussion section

Throughout the paper, "neonatal department" should be changed to "neonatal departments" where the plural would be more grammatical in English.

Specific comments and suggestions:

Page 1

Line 9: do authors mean highest birth rate, or the largest number of births

Line 31: "operational status of neonatal departments in China … in China's neonatal departments."

Line 56: "All 150 units known to the CNA….."?

Page 1-2: move "covering the disciplinary scale……treatment quality" to the prior sentence, as it has to do with the survey not the survey period.

Page 2

Line 9-12: "sent to the CAN members by mail….."

Line 15: "…possible errors in responses to the questionnaire."

Line 20: substitute "incentive" for "interest"

Line 23: "…used to create the database."

Page 3

Line 4: "of the neonatal departments investigated….."

Discussion section:

First page

line 50: suggest "lack of well-trained neonatal doctors and nurses…"
line 53: suggest "lack of facilities and equipment" if both are true, and follow with "limited NICU technologic capacity" 

line 59: suggest "China has dramatically increased production of neonatal departments (in many/most areas of?) in China in the past two decades."

Second page

line 3: suggest with an intermediate number of beds."

Line 14-17: suggest "lack of an organized system for neonatal care…"

Third page

Line 31: suggest "…which results in a shortage of staff…"

Line 53: suggest "…heavy workload…."

Line 56: suggest '…lack of prestige in NICU care."

Line 56: suggest "… charges for neonatal care are relatively low…."

Line 58: suggest "… annual increases in manpower costs…."

Fourth page

Line 1: Could the authors clarify what they are trying to say about the doctor-patient relationship? If they mean something other than the staffing ratios, this could be another important point for further development in the discussion section.

Line 17: suggest "Meanwhile, understaffing may heighten the risks for less attentive care and also increases risks of hospital-acquired infection."

Line 20: suggest "… improve staffing shortages in neonatal departments …."

Line 48-53: The authors miss the point that in the US, higher level care - with more technology--is achieved by specific referral networks, "quarternary" specialized treatment units for highest levels of intensive care.

Fifth page
Line 4-9: suggest "China's newborn transport networks have been developing since the year 2000, with the mean number of transports annually up to 469 per hospital in 2011."

Line 12: "One-way…"

Line 14: Given the authors' point a mean or median distance might be a better metric than the maximum. If that is not convincing, then at least modify the sentence to say with transports up to 800 km.

Line 17: suggest " … aggravate the neonate's clinical condition." OR, better: "… increase risks of clinical deterioration.”

Line 37: "indicating great progress in this aspect."

Line 53: suggest "number and admission rates for premature infants."

Line 56: "… the relative numbers births in each category in the general population, …." ."

Sixth page

Line 1: "… costs may be the main reason…

Conclusion

Line 9: This study suggests this change but does not directly show that. A repeat analysis would be ideal to show this.

Line 17: Clarify what is meant by effective NICU classification management systems. Does this refer to triage for admission or transfer? Again in line 23.

Line 17-20: suggest " … staff shortages, inadequate facilities, and lack of an organized neonatal transport network."

Line 26: I agree that staff pay increases would help retain physicians and nurses, thereby helping staffing shortages. The authors might suggest ways in which the "position" of newborn doctors and nurses might be elevated, if they do not intend this to mean workload. I might expect that "position" is more how others see neonatal staff, as opposed to physicians and nurses themselves. This might be an added point.

Line 26-34: suggest splitting into two sentences - perhaps expanding on the ideas in more detail.

Line 36 and following: suggest "This sample was neither inclusive nor randomly sampled. The sample includes mostly third-level hospitals, very few second-level hospitals, and no first-level hospitals. In China, 50% of the population lives in rural, … regions, which we did not as comprehensively sample. This may result in bias in our sample."
I would suggest providing the number of units and beds proportional to regional population (Table 1), or state that information in the text.

Table 1.

Is the regional order sensible in China?

Hospital level

Hospital type

General hospital

Children's hospital

Description

Belongs to pediatric department

Annual admissions in 2011 (Why such outdated data?)

Delete per year for > 4000

Table 2

Good point about MD and RN staffing ratios

Put asterisk at top in legend and take out from each descriptor

Admissions in year 2011

Admissions per bed

No. of doctors

Doctor/bed

No. of nurses

Nurse/bed

Table 3
iNo and neonatal should also have used Fisher's exact?

Figure 1

Suggest reformatting No active treatment → Died in Hospital → Discharged home China → Discharged home ANZNN (2013)

Better if the authors were to use 2013 for comparison or even most current 2011 stats very outdated given the rapidity of change. Even better, if they were able to show little change over the interval since their survey by a repeat survey.

y-axis → no decimal point

Figure 2

y-axis → no decimal point.

Abbreviations

CAN or CNA? Correct throughout the manuscript.

Acknowledgements

No reason to list each hospital in an international. I recognize the politics surrounding their participation and the need to recognize their efforts, but this could be more pertinent within China than on the international scene.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Unable to assess

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes
Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

Declaration of competing interests
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?
2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?
3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?
4. Have you received reimbursements, fees, funding, or salary from an organisation that holds or has applied for patents relating to the content of the manuscript?
5. Do you have any other financial competing interests?
6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare that I have no competing interests.

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.
I agree to the open peer review policy of the journal