Author’s response to reviews

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

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Author’s response to reviews:

Dear Robin L. Cassady-Cain, PhD

Thank you very much for your attention and the referee’s evaluation and comments on our paper BPED-D-18-00711R1. We have revised the manuscript according to your kind advises and referee’s detailed suggestions. Enclosed please find the responses to the referees point to point. In addition, we also sought English professionals to help revised the manuscript. We sincerely hope this manuscript will be finally acceptable to be published on BMC Pediatrics. Thank you very much for all your help and looking forward to hearing from you soon.

Best regards

Sincerely yours

Dr. Zhichun Feng

Please find the following Response to the comments of referees:

Response to the referee’s comments
Editor Comments:

Please provide further information about the questionnaire used, and whether you carried out any validation.

Answer: Please refer to the attached questionnaire filled in by a hospital. I'm very sorry that we haven't had time to translate it into English. If necessary, we will translate it and send it to you within two days. This questionnaire was discussed many times by CNA experts when it was formulated.

BMC Pediatrics operates a policy of open peer review, which means that you will be able to see the names of the reviewers who provided the reports via the online peer review system. We encourage you to also view the reports there, via the action links on the left-hand side of the page, to see the names of the reviewers.

Reviewer reports:

John Colin Partridge, MD, MPH (Reviewer 1):

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?

Answer: Unfortunately, due to language and other problems, we did not submit the paper in time, which led to insufficient novelty in the research. However, we believe that this survey is helpful to understand the medical situation of newborn babies in China. We are also prepared to conduct a new survey as soon as possible to provide updated and more complete information.

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.
According to the data of China's Ministry of Health, there were 1,399 tertiary hospitals nationwide in 2011. The survey included 117 hospitals, 109 of which were tertiary hospitals, accounting for 7.8% of the total number of tertiary hospitals in the country.

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

Answer: Thank you for your suggestion. We have added a special paragraph to the discussion section to discuss the challenges faced by China's neonatal medical care.

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.

Answer: Thank you. We checked the paper carefully and corrected some grammar and spelling mistakes.

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).

Answer: Fisher’s exact test is used in table 3 because the number of cases in some items is less than 5.

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.

Answer: We are as you think

The Discussion section

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

Answer: We have corrected this mistake.
Specific comments and suggestions:

Page 1

Line 9: do authors mean highest birth rate, or the largest number of births
Answer: We mean the largest number of births. We have already made this point clear.

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

Line 56: "All 150 units known to the CNA….."?
Answer: It has been revised according to your suggestion.

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.
Answer: It has been revised according to your suggestion.

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."
Answer: It has been revised according to your suggestion.

Page 3

Line 4: "of the neonatal departments investigated….."
Answer: It has been revised according to your suggestion.

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."

Answer: It has been revised according to your suggestion.

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…."

Answer: It has been revised according to your suggestion.

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.

Answer: We further elaborated on the doctor-patient relationship in the paragraph discussing the challenges ahead.

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 …"

Answer: It has been revised according to your suggestion.

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.

Answer: Thank you for reminding me. Unfortunately, at present, China only has a hospital classification system and has not yet established a NICU classification management system.

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, …" ."

Answer: It has been revised according to your suggestion.

Sixth page

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

Answer: It has been revised according to your suggestion.

Conclusion
Line 9: This study suggests this change but does not directly show that. A repeat analysis would be ideal to show this. Again in line 23.

Answer: We compared this survey data with our 2008 survey data and added relevant data in the paper.

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

Answer: sorry, this is mean a classification of neonatal care just like the classification of neonatal care made by AAP. We have revised it in the manuscript.

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

Answer: It has been revised according to your suggestion.

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.

Answer: We mentioned this in an additional discussion paragraph on future challenges.

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

Answer: We put more contents in an additional discussion paragraph on future challenges.

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."

Answer: It has been revised according to your suggestion.

I would suggest providing the number of units and beds proportional to regional population (Table 1), or state that information in the text.

Answer:
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

Answer: It has been revised according to your suggestion.

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

Answer: It has been revised according to your suggestion.

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

Answer: It has been revised according to your suggestion.

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

Answer: It has been revised according to your suggestion. We given the rapidity of change by compared with the 2008 survy.

Figure 2

y-axis → no decimal point.

Answer: It has been revised according to your suggestion.

Abbreviations

CAN or CNA? Correct throughout the manuscript.

Answer: It has been revised according to your suggestion.

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.

Answer: It has been revised according to your suggestion.
OBJECTIVE - Full research articles: is there a clear objective that addresses a testable research question(s) (brief or other article types: is there a clear objective)?

Yes - there is a clear objective

DESIGN - Is the current approach (including controls and analysis protocols) appropriate for the objective?

No - there are minor issues

EXECUTION - Are the experiments and analyses performed with technical rigor to allow confidence in the results?

No - there are minor issues

Statistics - Is the use of statistics in the manuscript appropriate?

No - there are issues with the statistics in the study

INTERPRETATION - Is the current interpretation/discussion of the results reasonable and not overstated?

No - there are minor issues

OVERALL MANUSCRIPT POTENTIAL - Is the current version of this work technically sound? If not, can revisions be made to make the work technically sound?

Probably - with minor revisions

PEER REVIEWER COMMENTS:

GENERAL COMMENTS: valuable pooled analysis on neonatal care in a big country with emerging economy characteristics

REQUESTED REVISIONS:

May I suggest that the text will be verified by a native English speaking colleague (I'm neither English speaking), but not sure if 'populous' and 'developmental status of neonatal department' is the best phrasing?
Answer: Thank you for your kind suggestion. We have actively sought the help of English professionals.

What the authors provide is a 'snapshot' on the currently available infrastructure and neonatal capacity, specific to neonatal (intensive) care, so not covered 'basic neonatal care'.

Answer: Yes, we mainly focus on sick newborns that need treatment. Basic neonatal care in China is currently mainly undertaken by obstetrics and families.

I also suggest to explain what the authors mean with 'mainland' China.

Answer: Mainland China, also known as the Chinese mainland, is the geopolitical as well as geographical area under the direct jurisdiction of the People's Republic of China (PRC). It includes Hainan island and strictly speaking, politically, does not include the special administrative regions of Hong Kong and Macau, even though both are partially on the geographic mainland (continental landmass).

Can the authors provide information on the NICU level I-IV availabilities?

Answer: Unfortunately, China has not yet established a good NICU classification, which is also the main challenge in the future.

I was somewhat surprised by the doctor/bed to nurse/bed ratio, and are the any guidelines on the 'level of training' needed to work within the N(I)CU setting?

Answer: Shortage of personnel is the main problem facing NICU in China at present. At present, there is no perfect training system for neonatal medical professionals. The training program for neonatal specialists has just started this year.

What do the authors mean with the 'ability of performing intra-uterine transport': is the availability of a dedicated transport team used an criterion?

Answer: We mean a transport team with cooperation between obstetrics and neonatal doctor and the ability to carry out intrauterine transport of premature infants.

One conclusion drawn on the 'unbalanced' availability may be better illustrated by providing some data on the ratio bed/population or bed/number of deliveries? between different regions? Is this solution 'only' to set up a neonatal classification system, but also to be creative (short stabilization units, out of hospital teams like 'search and rescue' teams?)
Answer: This imbalance is reflected in the fact that although they are all tertiary hospitals, their beds, personnel and technical capabilities are quite different. This imbalance exists even among different hospitals in the same area. We think that the main reason is the lack of good NICU classification, which leads to the low utilization rate of medical resources, especially intensive care medical resources. We also hope to have other innovative explorations to solve this problem.

Introduction: please check the mortality rate (33 % or 33 ‰) ? 33 percent of 33 pro mille ? and perhaps the decrease is more likely related to better perinatal care and better newborn care, with the development of neonatal departments as a tool to achieve this?

Answer: Sorry, there is a mistake here, it is 33‰. Yes, the decline in neonatal mortality has benefited from many factors, but the development of NICU is an important reason.

Sorry to read that the survey has been done in 2012, it almost calls for an update.

Answer: We are so sorry for that.

Can the authors provide information on the age used of prematurity and extreme preterm birth?

Answer: Preterm infants are defined as having a gestational age of less than 37w, and extremely preterm infants are defined as having a gestational age of less than 28w.

ADDITIONAL REQUESTS/SUGGESTIONS:

cf mentioned earlier

Note: This reviewer report can be downloaded - see attached pdf file.

Agnes Van Den Hoogen, PhD (Reviewer 3): A nationwide survey on neonatal medical resources in mainland China: current status and future challenges

Dear Editor and authors

We reviewed the Manuscript Number: BPED-D-18-00711R1:

The authors concluded that, Neonatal Department development in mainland China is not balanced and still faces many problems, such as staff shortage, inadequate facilities, and imperfect transport. It is urgent to set up a NICU classification system to improve the prognosis of critically ill.

General:

This paper gives a nice overview of the status of neonatal departments in mainland China on staff, facilities, technologies, transport systems and treatment quality.

However overall this paper is incomplete and important details of concepts are missing through the whole paper. This makes it for the reader difficult to understand and interpret results & outcome. It is hard to understand and interpret the manuscript when levels of ND are not clear. When are the results related to an intensive care, and of which level, and when are the results coming from general neonatal wards? Differentiation is not made and outcomes are presented in an overall general way. This raises the question what this study add for others than China.

Answer : The lack of a clear NICU classification is indeed an important problem facing China's neonatal medical care. This also leads to the lack of clarity in the definition and classification of some data in this survey. We are also deeply aware of these deficiencies. However, we still hope that the data we have investigated can provide some useful information for the world to understand the development of neonatal medical care in China.

Specific:

Abstract.

What is extreme premature? Which gestational age. Missing the levels of the different ND's included in the survey.

Answer : extremely premature infants is defined as premature infants with gestational age less than 28w. China has no a clear NICU classification now.

Same as in the abstract is in the introduction. Concepts need to be clarified and referred to recent literature and guidelines. In addition the introduction needs more depth of the problem written in a funnel. Start with general information and narrow to the problem and aim of the study.

The method section is limited. The survey was performed in 2012 which is 7 years ago and I assume and hope that things are changed. Also the questionnaire is not described or referred to. What questions were asked in detail is what helps the reader to understand.

Answer : We have done our best to revise it.
Results

To understand the results one should know the levels of the different wards included and what kind of neonatal wards they were? Surgical, cardiology or what? In the discussion this is mentioned but this is far too late.

Answer : We have done our best to revise it.

Discussion

The discussion clarifies some questions mentioned above. This should not be the case and should have written in introduction, method and result sections. A lot of repetition is written in this part of the paper.

The limitations under the heading conclusion should be in the discussion section.

Answer : We have done our best to revise it according your suggestion

Overall

Clarify main concepts in introduction

Be consistent in writing and specific

Refer in a proper way

Use comma's when necessary

Answer : Thanks, We have revised it carefully.