Author's response to reviews

Title: Current Status and Determinants of Inappropriate Admissions to Township Hospitals under the New Rural Cooperative Medical System of China: a Cross-sectional Study

Authors:

Zhang Yan Dr. (yanzhang@hust.edu.cn)
Liang Zhang Pro. (zhangyan1604@163.com)
Xiang Zhang Pro. (zhangchxiang@163.com)
Yingchun Chen Pro. (chenyingchun@mail.hust.edu.cn)

Version: 2 Date: 9 October 2014

Author's response to reviews: see over
Response to Reviewer Comments

Professor Li and Niehoff,

Thank you for your efforts thus far in the review of our manuscript. We have made a revision in accordance with your comments and advice, and would like to re-submit our revised manuscript. We would also like to express our gratitude to you for your valuable input.

Our responses to your comments are written below:

1. Please make the title more specific. What are the main objectives of the paper? Are the main objectives the criteria for inappropriate admissions, the rate of inappropriate admissions, or the determinants?

A: We adjusted the title to focus on the status and the determinants. The main objectives are the rate of inappropriate admissions and determinants. The criteria, AEP is just a way to identify the inappropriate admissions and examine the status.

(page 1, line 1-3; page 6, line 154-156)

2. The introductory part should be improved, eg.
2.1 What are the determinants of inappropriate admissions according to the existing studies?

A: There are many researches about the determinants of inappropriate admissions, which including gender, age, economic conditions, nation, admission criteria, length of stay, diagnosis, and payment. Benjamin Mozes et al found that inappropriate admissions appeared much higher in operation group and children group than other groups with explicit-diagnosis specific criteria[1]. Giulio De Marco et al also demonstrated that inappropriate admissions were easier appeared in children group, especially in children with influenza-like illness [2]. But R. Barker Bausell also gave out that the elder have a high inappropriate admissions rate in theory[3]. C Pileggi et
al. demonstrated that emergency patients were at high risk in inappropriate admissions [4]. Brown P H also found that insurance reimbursement ratio, insurance limited line per day also had a significant influence in the admission appropriateness [5].

2.2 What are the differences between the existing studies on inappropriate admissions of NRCMS and this paper?
A: There is no the existing research aimed at inappropriate admissions, the existing studies closely on NRCMS more focused on health-seeking behavior or fund efficiency. This paper aims to make clear the inappropriate admissions in Chinese township hospitals. (page 5, line143-144)

2.3 In the fourth paragraph, are there any references for the “three reasons”?
A: We have add 2 references for the “three reasons”[6, 7] (page 4, line 94-97)

2.4 The introductory doesn’t state clearly what are the main objectives? What is the assumption?
A: We aim to make clear the status and determinants of inappropriate admissions in Chinese township hospitals by establishing AEP criteria. (page 6, line154-156)

3.1 In the method, what are the revisions of the international AEP?
A: The revisions of the international AEP, such as United States[8], EU countries[9], didn’t give out here, and all indices in the 3 revisions of international AEP was collected in the preliminary AEP libraries.(page 6, line160-164)

3.2 Please list the results of inappropriate admissions by a crosstab using the two methods, AEP and implicit criteria, because the establishment of the new AEP criteria is an important part of the paper.
A: Table 2 shows the results of inappropriate admissions by a crosstab using the two methods, (page 20, line 490-491)

3.3 Are all the patients covered by NRCMS?
A: All the sampling patients were covered by NRCMS, and had got reimbursement. (page 7, line 194-195)

3.4 In the data source of the method, although the authors stated that they collect sociological characteristics, inpatient admission information, and other patient data, they should give more detailed information.
A: According the previous researches we pick up possible determinants including gender, age, department, admitted severity, length of stay, disease category, complication and the payment[1, 3-5]. (page 8, line 203-205)

4. Please provide flow-diagram of sample design. How do you calculate the sample size?

A: The sample size was calculated with the inappropriate admission rate in township hospital. The estimated inappropriate admission rate P is 16% according to the existing researches, error excepted $d=0.1 P=1.6\%$, and $a=0.05$ here. So, $n = \left( \frac{Z_a}{d} \right)^2 P \left( 1-P \right) = (1.96/1.6\%)^2 * 16\% \times (1-16\%) = 2016.84 \approx 2018$, $n$ means the calculated medical record size, considering the AEP could not judge all medical records, 10% $n$ is added in the final sampling, total 2220 medical records.

5. Does the medical record cover all the items in the international AEP?

A: Every medical record concludes some indices, and part of those indices in inpatient medical record would cover some items in the international AEP, and patients who do not meet any items were deemed inappropriately admitted. (page 8, line 216-217)

6. Please list the two-level variables. How do you choose the independent variables? How about the multi-collinearity in the model?

A: The WLwiN2.30 software was used to obtain the multi-level zero test data, and the medical records were supposed to be level 1, the township hospitals level 2, and the county level 3 to test the level variation in all data. A two-level binomial logistic regression model as below.

\[
\logit (P_{ij}) = (\beta_0 + \mu_{0j}) + \beta_1 x_{ij}
\]

\[
\mu_{0j} = \beta_0 - \beta_0
\]

\[
\mu_{0j} \sim N(0, \sigma^2_{\mu_0}), \quad \text{var} (P_{ij}) = \delta \pi_{ij} (1 - \pi_{ij}) / n_{ij}
\]

And this model has a good function to deal with multi-collinearity in the regression. (page 9, line 248-249)
7. In the second paragraph in the part of the AEP criteria in the result, both the Cronbach coefficient and kappa coefficient are 0.729, please check.
A: It’s our fault, we have fixed it. (page 8, line 224)

8. The two sentences are confusing. There is contradiction.
(1) In the second paragraph in the part of the AEP criteria in the result. “Results show that the ultimate AEP criterion was consistent with the current status of inpatients in Chinese rural township hospitals to a degree of 86.8%. Thus, the experts found that the criteria can cover more than 80% of the township hospital inpatients.”
A: We have fixed it. The applicability of the new AEP criteria was investigated by 32 experts, 28 experts (87.5%) claimed the criteria could be suitable with more than 80% of the township hospital inpatients. (page 8, line 219-221)

(2) In the first paragraph in 3.3, “A total of 26.5% of the records indicated inappropriate admissions”
A: We have fixed it. A total of 26.5% of the records indicated inappropriate admissions. (page 9, line 234)

Professor Niehoff,
It needs some additional activities of the readers to become closer to the particular regulars and conditions of the fast developing health services and its financing system. This kind of knowledge can certainly not become included into this paper.
A: Thanks for your suggestion. It’s useful to discussion on the regulars and conditions of the health services and its financing system. (page 12, line 310-320; 329-336)

References


5. Brown PH, Theoharides C: Health-seeking behavior and hospital choice in China’s New Cooperative Medical System. *Health Econ* 2009, **18 Suppl 2**:S47-64.


