Author's response to reviews

Title: Utilization of rehabilitation services for inpatient with cancer in Taiwan: A descriptive analysis from National Health Insurance database.

Authors:

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Author's response to reviews: see over
Dear editor:

We are very grateful to you and the editorial board for your comments on our manuscript, “Utilization of rehabilitation services for inpatient with cancer in Taiwan: A descriptive analysis from National Health Insurance database”. We appreciate your time and effort spent for the advancement of our field. To address your concerns, the manuscript was carefully revised. If we should have more revision to make it better, please don’t hesitate to let us know. The manuscript has also been extensively copyedited that is assisted by a professional copy editor (below, a certificate of English editing).

Please see the following summary of all changes we had made.

In anticipation of a favorable response,

Sincerely,

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Author’s response to reviews

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Title: Utilization of rehabilitation services for inpatient with cancer in Taiwan: A descriptive analysis from National Health Insurance database

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Author’s response to reviews: see over
Response-Letter to BMC Health Service Research

Editor’s comments:
Please clarify in your manuscript whether the NHIRD data used for your study is openly available or whether you received permission (and by who) to use this.

Author’s Response:
According to NHIR, only citizens of the Republic of China who fulfill the requirements of conducting research projects are eligible to apply for the National Health Insurance Research Database (NHIRD). The use of NHIRD is limited to research purposes only. Applicants must follow the Computer-Processed Personal Data Protection Law and related regulations of BNHI (Bureau of National Health Insurance) and NHRI (National Health Research Institutes), and an agreement must be signed by the applicant and his/her supervisor upon application submission. All applications are reviewed for approval of data release.

Responses to the reviewers’ recommendations:

Reviewer 1: Yu-Chun Chen

Reviewer’s comments:
This is an interesting study described the utilization pattern of rehabilitation services during cancer patients’ hospitalization. The strength of this study is the use of a nationwide database to investigate a less discussed topic on use of rehabilitation during ones’ cancer treatment course which might be sometimes neglected during the acute treatment phases. Although the limitations of the database precluded the investigators from performing more sophisticated analysis, this study demonstrated the underutilized rehabilitation service during hospitalization among cancer patients in Taiwan. However, there are few points that need the authors’ clarification to strengthen their arguments.

1. In the conclusion part of the abstract, ‘the utilization of rehabilitation services by cancer patients was relative low’ is not clear. Is it lower than that in other countries or than that among non-cancer admissions?
   
   Author's Response:
   
   It is lower than that among non-cancer admissions in Taiwan. We revised the sentence as follows:
   
   Although this trend was noted for cancer and non-cancer admissions, the utilization of rehabilitation services was generally greater by non-cancer admissions. (Please see page 4 lines 7-8)
2. It seems this study mixed ‘cases’ with ‘admissions’. A case is usually referred as a patient not an admission. The DD file of NHIRD is an admission-based sampling dataset instead of a patient-based sampling dataset. For the most parts of this study, ‘cases’ or ‘patients’ are actually ‘admissions’. The data processing part in methods and presentation of results needs further clarification.

Author's Response:
It is indeed confusing. We have revised the terms ‘cases’ and ‘patients’ into ‘admissions’. We have revised through methods, results and discussion parts.

3. In page 7, the first paragraph, the statement ‘a trend of an increasing number of inpatients diagnosed with cancer ….’ needs further clarification. A patient with many admissions during the study period may have more than one record in the dataset. Patients with more admissions are prone to have more weights than other patients. The increase of admissions with cancer diagnosis may be resulted from the increase of admission by every cancer patients but the increase of the number of patients with cancer.

Author's Response:
Indeed, the DD file of NHIRD is an admission-based sampling dataset instead of patient-based sampling dataset. It was impossible to estimate the actual number of cancer ‘patients’. The increase of admissions with cancer diagnosis may be resulted from the increase of admission by every cancer patients but the increase of the number of patients with cancer. We have revised the terms ‘cases’ and ‘patients’ into ‘admissions’ and have modified the sentence as follows:
The percentage of admissions with a cancer diagnosis was 14.01% in 2004, 14.94% in 2005, 15.61% in 2006, 16.50% in 2007, and 17.10% in 2008. (Please see page 9 lines 7-8)

4. In page 8, ‘The average medical expenditure for cancer patients was higher …’ needs further clarification. The number looks like the average expenditure of admissions with cancer diagnosis but cancer patients.

Author's Response:
We have revised the terms ‘cases’ and ‘patients’ into ‘admissions’. The paragraph was revised as follows:
The average medical expenditure for admissions with a cancer diagnosis was higher than those with a non-cancer diagnosis. However, the average
rehabilitation fee was lower for admissions with a cancer versus a non-cancer diagnosis (Table 3).
(Please see page 10 lines 6-10)

5. In page 8, the statement ‘High rehabilitation utilization was noted for rehabilitation, orthopedics, neurology, …. regardless of whether or not patients had cancer’ is not clear. Do you mean these departments had higher utilization rates for rehabilitation service in admission than other departments?

Author's Response:
Yes, ‘higher’ rehabilitation rate means both higher utilization rates in these departments than other departments and much higher than average utilization rate. The sentence was revised as follows:
Relatively higher rehabilitation utilization rates than other departments were noted in rehabilitation, orthopedics, neurology and neurosurgery departments in spite of the cancer diagnosis. (Please see page 11 Lines 2-4)

6. If the detailed records of rehabilitation services are available, does it make sense to explore the distributions of modalities of rehabilitation services such as physical therapy, occupational therapy, communication therapy and psychosocial rehabilitation treatments vary by departments? If such records are not available, please leave it in the limitation part.

Author's Response:
The distributions of PT, OT, and ST service units for cancer and non-cancer admissions by departments were listed and will be attached as an additional file (see additional file 1).
Each admission with rehabilitation services may receive several units of rehabilitation services. Total units of rehabilitation services and their contents, such as physical therapy (PT), occupational therapy (OT), and speech therapy (ST) were obtained by linking the DD and DO datasets. We had performed further analysis on distributions of total rehabilitation service units by departments. No psychosocial rehabilitation treatments were found in the sampled claim data. Only distribution of PT, OT and ST services by departments were analyzed.
We add one paragraph in results section as follows:
The department-specific components of rehabilitative services according for cancer patients receiving rehabilitation services in 2008 were also examined (See additional file 1). PT accounted for more than 70% of the rehabilitation
components, while speech therapy (ST) accounted for less than 5% among most departments. However, there were a few department-specific exceptions in the distributions of rehabilitative services. For instance, the proportions of PT, OT, and ST accounted for 49.02%, 40.93%, and 10.05%, respectively, of rehabilitative services offered in the PM&R department. In department of neurosurgery, PT, OT, and ST accounted for 65.35%, 30.60%, and 4.05% of rehabilitative services offered, respectively. As for department of family medicine, PT provided half of the rehabilitation components (53.01%) and another half by OT (46.18%).

(Please see page 11 line 11 to page 12 line 2)

7. Please give proper notation for Figure 1. I suppose Plastic should be ‘Plastic Surgery’ and Surgery should be ‘General Surgery’ and please add notation for the Y-axis.
   Author's Response:
   Yes, ‘Plastic’ means ‘plastic surgery’ and ‘surgery’ means ‘general surgery’. Notation has been added into the Y-axis in the Figure 1.

8. In page 9, line 8 of the first paragraph in the discussion. The statement ‘This correlates with the growing population of patients with cancer’ looks too straight. The previous analysis didn’t give any clue in increase of the number of cancer patients or any test in the correlation between the number of cancer patient and the utilization rates.
   Author's Response:
   We have revised the terms ‘cases’ and ‘patients’ into ‘admissions’. And the paragraph was revised as follows:
   We found a trend of increasing admission of patients with a cancer diagnosis from 2004 to 2008, as well as a trend of increasing utilization of rehabilitative services by cancer patients during hospitalization. This latter observation may indicate a growing awareness of the rehabilitative needs of cancer patients. The increase of cancer admissions claiming rehabilitation services was in line with the increase of admissions of cancer patients.
   (Please see page 11 lines 6-11)

9. In page 9, the meaning of the second paragraph is not clear. Do you suggest any relationship between utilization rates and the average rehabilitation fee? This paragraph reads like a part of results rather than discussion. Please give more explanation for this interesting finding.
   Author's Response:
We revised the paragraph as follows:

However, the utilization of rehabilitation services was much lower among cancer versus non-cancer admissions along with much lower rehabilitation utilization rate and fewer rehabilitative service. (Please see page 12 lines 11-13)

Additional information was given in result part and in table 3. The utilization rates of rehabilitation services were much lower for cancer versus non-cancer admissions (Table 1). (Please see page 9 lines 10-11)

In fact, the average rehabilitation fee for admissions with a cancer diagnosis was approximately 706 points lower than that for non-cancer admissions. The average number of rehabilitation service units for each admission was between 10.6 and 11.4 for cancer admissions, and between 12.1 and 13.1 units for non-cancer admissions (Table 3). (Please see page 10 lines 10-14)

10. In page 11, four departments including orthopedics, neurology, rehabilitation and neurosurgery had high utilization rates in admissions with cancer diagnosis. However, five departments with high utilization rates were indicated in page 8. For the department of plastic surgery, the utilization rate for rehabilitation in cancer admissions is much lower than that in non-cancer admission. In Taiwan, as the plastic surgeons are also allowed to request physical therapies, is there any explanation for this? For the last sentence, please give more references for the explanation.

Author's Response:

We add more explanation in the paragraph as follows:

We noted a discrepancy in the rate of rehabilitative service utilization between cancer and non-cancer patients in the department of plastic surgery. Rehabilitation services for patients in the department of plastic surgery predominantly consisted of OT for splints, which accounted for 59% of total rehabilitation service units for the department. Conversely, a very small number of cancer patients admitted to this department received rehabilitation services. (Please see page 14 lines 7-11)

11. In page 11, the second paragraph. Does the increasing utilization trend noted in the department of family medicine (hospice-care unit) only or also in other department (such as department of ENT and thoracic surgery)? The author may consider moving this interesting finding in the results section and leave more discussion on the findings here.
Author's Response:
We add more discussion in the paragraph as follows:
In the otolaryngology department, 91% of the rehabilitation services were used by cancer patients. The utilization rate of rehabilitation services by cancer patients in the otolaryngology department increased from 3.28% in 2004 to 4.37% in 2008. The increased utilization of rehabilitation services in this group may be explained by the fact that head and neck cancer are relatively common in Taiwan.

(Please see page 15 lines 3-8)

12. In page 12, some arguments in the conclusion are too straight. The author may consider using ‘inpatient rehabilitation service was underutilized among cancer patients’ instead of the statement ‘However, rehabilitation interventions for cancer patients are still overlooked and underutilized…’.
The study does clearly demonstrate the underutilized rehabilitation service among hospitalizations with cancer diagnosis. However, the patients did not use inpatient rehabilitation service may still use rehabilitation service in the outpatient sector. As the dataset limited the further analysis, the author may consider using a more conservative conclusion. Moreover, we cannot tell if an interdisciplinary team, as the last sentence suggested, increases the utilization rate for rehabilitation unless the association had been explored in this study.

Author's Response:
Thank you for your constructive recommendation. We revised the paragraph as follows:
This study documented a rise in the utilization of rehabilitation services during hospitalization by cancer patients in Taiwan. However, the utilization of inpatient rehabilitation services was relatively low among cancer as compared with non-cancer admissions. The distributions of rehabilitation service types among different departments vary between cancer and non-cancer admissions. Further research regarding the delivery of services to meet cancer-specific rehabilitation needs is warranted.

(Please refer to page 16 lines 6-11)

13. The author may consider consulting English editing service to check their manuscript.

Author's Response:
We have consulted English editing service to check the revised manuscript. The certification is attached in the end of this letter.
Reviewer 2: Ming-Hwai Lin

Reviewer's comments:

Major Compulsory Revisions

1. If the cancer patient admitted just for 2-3 day’s scheduled chemotherapy, no rehabilitation program would be arranged. Try to omit this population, and compare the relationship between length of hospital stay and rehabilitation.

   Author’s Response:
   Indeed, the length of hospital stay may be a factor of rehabilitation usage. Cancer patients during their active treatment periods may have multiple admissions and may stay for only few days. However, the datasets were sampled systematically by monthly basis. Some of the sampling data were lacking of admission date or discharge date which may be due to they were hospitalized for more than one month or just crossing months. It was difficult to compare the relationship between length of hospital stay and rehabilitation by using the datasets in this study. In the future, we consider using the longitudinal patient-based sampling dataset for further analysis.

2. The comparisons of rehabilitation service between different cancer admissions (breast cancer, lung cancer, gastric cancer……) were important, though data for metastatic site were difficult to collect in this study.

   Author’s Response:
   Thank you for your inspiring recommendation. Initially, we tried to analyze the rehabilitation service utilization by cancer types. Besides, cancer admissions may be coded with multiple cancer types. We could not decide either which was primary cancer nor metastatic cancer. So, we decided to compare the utilization patterns between cancer and non-cancer admissions, as well as to analyze the distributions of rehabilitation services by departments.

3. Further comparison of rehabilitation service across different hospital setting #academic medical centers, metropolitan hospitals, local community hospitals#were also important.

   Author’s Response:
   It is worthy to compare the rehabilitation service across different hospital settings. But it is impossible because of data in the National Health Insurance Research Database (NHIRD) that could be used to identify patients or care providers, including medical institutions and physicians, is scrambled before being sent to
the National Health Research Institutes for database construction and is further scrambled before being released to each researcher. Theoretically, it is impossible to query the data alone to identify individuals at any level using this database. All researchers who wish to use the NHIRD and its data subsets are required to sign a written agreement declaring that they have no intention of attempting to obtain information that could potentially violate the privacy of patients or care providers. We leave it in the limitation part of discussion as follows:

According to the Computer-Processed Personal Data Protection Law and related regulations of BNHI and NHRI, data in NHIRD that could be used to identify patients or care providers is scrambled before being released to each researcher. Therefore, we could not compare the rate of rehabilitation service utilization across different hospital settings.

(Please see page 15 lines 15-18)

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

**Author's Response:**

We have consulted English editing service to check the revised manuscript. The certification is attached in the end of this letter.
E11120901B

Date of Issue: June 15, 2012

CERTIFICATION

This is to certify that a medical editor who is a native English speaker associated with MedCom Asia, Inc., has edited the manuscript entitled “Utilization of rehabilitation services for inpatient with cancer in Taiwan: A descriptive analysis from National Health Insurance database”.

This manuscript has been sent back to the author on June 15, 2012. If there is any change on the manuscript by the author after the above mentioned date, this certificate is invalid.

The medical editor who edited the manuscript has been a professional editor and writer for several years and is a member of American Medical Writers Association.

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