# Peer Review File

## Reviewer A

I think there is a basic bias in the construction of this paper: post operative length of stay is due to post-operative complications and it is not by itself a predictive criteria of poor outcomes. I think that the take - home message could be misleading as presented.

Reply: Thanks for your good comments. The length of stay is an important index of postoperative management of lung cancer. In addition, there is no information about complications in NCDB, so we wanted to use PLOS as a quantitative indictor of postoperative complications to explore whether it can be an independent prognostic factor for postoperative survival.

Changes in the text: We changed the title to"Association between length of stay and postoperative survival in patients with lung cancer: a propensity score matching analysis based on National Cancer Database", which may be less misleading. And we have added external explanation in introduction and discussion. (See Page 3, line 96 and Page 6, line 198-209)

## Reviewer B

Espite a large N, the lack of information about the reason for this length of stay can be a confounding factor in the conclusion of the study. Bearing in mind that patients may stay longer in the hospital for various reasons, with or without complications. Therefore, it would be interesting to describe a little more about the reason why the patients were hospitalized for a longer time, or simply separate whether there were major complications or not.

Reply: Thanks, we quite agree with you and made some additions in the discussion section.

Changes in the text: We have complemented reasons why the patients were hospitalized for a longer time in the Discussion section. (See Page 6, line 199-210)

Abstract
It is adequate and contains the essential information of the study.
Reply: Thank you very much.

Introduction
It is short and clearly explains the rationale and background information necessary for the reader to understand the topic and the objectives of the study.
Reply: Thank you very much.

Material and Methods

It would be interesting for the authors to describe which edition of the TNM they used to classify the patients and whether it was a clinical or pathological stage, it would also be interesting to describe what was the approach used in the surgery, for example robotic or thoracotomy.

Reply: Thanks for your good suggestions. We selected the data during 2004-2015 in NCDB, the clinical stage was stage I-III lung cancer patients, and the TNM stage was the 6th and 7th editions. In the NCDB database, most of the information about robot or thoracoscopic surgery was missing, so we did not include this one in the statistical analysis.

Changes in the text: We made the supplements in the Methods section. (See Page 4, line 115)

It would also be interesting to describe or categorize the complications or the reason why the patient stayed in the hospital longer, considering that this could be a confounding factor in the final result.

Reply: Thanks, we quite agree with you and make some additions in the discussion section.

Changes in the text: We have complemented the reasons why the patient stayed in the hospital longer in the Discussion section. (See Page 6, line 199-210)

The propensity matching score method is well described, as well as the rest of the analysis including survival analysis, univariate and multivariate analysis.

Reply: Thank you very much.

Results

The study has an adequate statistical analysis, with a propensity score being performed to remove the bias of a retrospective study, and also has a large n, which contributes to better results. However, if possible, the author could include more details of the patients who had a prolonged hospital stay, such as the reason for the length of stay, if there were complications and what they were. Because the simple fact of having major complications can be a confusing bias in decreasing the patient's survival, especially in the short term

Reply: Thank you for your comments. First of all, there is no relevant record of complications in the NCDB database, so we included length of stay as a surrogate indicator for complications. In the discussion, we added other factors that may lead to prolonged hospital stay.

Changes in the text: We have made supplementary improvements in the discussion section. (See Page 6, line 199-210)

The authors retrospectively investigate whether prolonged postoperative length of stay (LOS) impacts patient survival, particularly long-term survival. They found that the median survival of the PLOS group was significantly lower than that of the Non-PLOS group after PSM. They suggested that PLOS could be taken as the quantitative indicator of postoperative complications of lung cancer in NCDB.

I have the following concerns.

Comment 1

Title.

PLOS is an independent factor for poor prognosis, but there are various causes of PLOS. PLOS is affected by a complex set of factors. PLOS is not a disease name, but only a vague post-operative outcome. I personally feel uncomfortable with the use of the word "affect" in the title. I think it would be more appropriate to change the word "affect" in the title to "association".

Reply 1: Thank you for your suggestion, we have revised the title.

Changes in the text: We changed the title to"Association between length of stay and postoperative survival in patients with lung cancer: a propensity score matching analysis based on National Cancer Database". (See Page 1, line 2)

Comment 2

Smoking history and BMI are important prognostic factors after lung cancer surgery. Inclusion of these parameters is recommended.

Reply 2: Thanks for the suggestion, but sorry about that the records of Smoking history and BMI are missing in the NCDB database.

Comment 3

Please provide data on the breakdown of PLOS.

Again, what percentage of PLOS is accounted for by postoperative complications?

Reply 3: Thanks for your advice. We have added more data about range of LOS. In addition, there is no description of complications in the NCDB database, so we can not get the proportion of complications leading to longer hospital stay.

Changes in the text: we supplement the relevant data In the Methods section. (See Page 4, line 122)

Comment 4

In the statistical analysis method, the authors use "multivariate", but isn't it strictly "multivariable"?

Reply 4: Thanks for the suggestion, we have made the corrections.

Changes in the text: All corrections were made in the text. (See Page 4, line 138 and Page 5, line 148)

Comment 5

Excluded patients account for two-thirds of all patients.

Please add the possibility that the large number of excluded patients may have influenced the results of this study at the limitation.

Reply 5: Thanks for your comment. In order to obtain more accurate data, we screened out many cases that did not meet the requirements, such as missing key clinical information. The rest are still more than 80,000 cases, which is still a large amount of data.

Comment 6

In conclusion, the authors state that the use of PLOS as a surrogate for postoperative complications may worsen short- and long-term survival in lung cancer patients.

PLOS is seen as the culmination of a mixture of diverse causes and postoperative outcomes. Therefore, the part 'as a surrogate for postoperative complications' should be omitted from the sentence.

Reply 6: Thank you for your advice, we have made changes in revised paper.

Changes in the text: we have made changes in Conclusion session. (See Page 8, line 275-277)

Comment 7

Line 61: IN → In

Reply 7: Thank you for review. We have made corrections in revised paper.

Changes in the text: We have modified our text as advised (see Page 2, line 63).