

---

## Peer Review File

Article information: <https://dx.doi.org/10.21037/tp-23-171>

### Reviewer A

The authors investigated the incubator caring standards and other risk factors that associated with the nosocomial infection. They found that the caring standards for incubators are important for protecting the newborns from nosocomial infection along with early gestational age. Furthermore, machine learning, XGBoost, predicted the newborn nosocomial infections most effectively.

#### Major comments

1. Is this study approved by the ethics committee? The ethics approval from the institution nor the informed consent from the patients are not provided.

Reply1: Thanks for the question, we added the ethics information in the article.  
Changes in the text: Line 94-96, page 4.

2. Study design is not clear. Is this a prospective study or retrospective study? When was the new standard introduced to the patient? Does the patient overlap between the conventional and the new standard? Were there any exclusion criteria?

Reply2: Thanks for the question, we added study design information in methods section.  
Changes in the text: Line 120-122, page 5.

3. How was the diagnosis of nosocomial infection made? Was it blood culture proven? What were the pathogens?

Reply3: Thanks for the question, we added the information for NI diagnosis.  
Changes in the text: Line 124-131, page 5.

4. The clinical data used in the statistical analysis are insufficient. The post-natal date of onset of infection, background disease of the infant, pregnancy complication of the mother, previous or ongoing medication (such as antibiotics, steroids, medical devices used) should also be considered.

Reply4: Thanks for the suggestion, the further details of clinical data were not recorded. We will make the clinical data complete in the future.  
Changes in the text: None.

5. The authors analyzed using machine learning. However, the data they used to are not written in the methods. What measurements were provided to the machine learning?

---

Reply5: Thanks for the suggestion, we add the variable input for ML.  
Changes in the text: Line 167—168, page 6.

## **Reviewer B**

First of all, my major concern regarding this study is that this study cannot answer the research question of the predictive accuracy of a prediction model, this is because there is no external validation sample to independently validate the model and the potential predictors and the outcome, infection, were assessed at the same time. For prediction, the predictors should be variables measured before the occurrence of the outcome, infection. The clinical question appropriate for the data is only the factors associated with infection. In this case, it is meaningless to compare the accuracy of different algorithms of machine learning. The paper needs substantial revisions and even complete re-writing.

Reply1: Thanks for the question, in the next research, we will add external data to validate the ML model. Actually, in this research, we divided the samples into 7:3, in which 70% samples were used for model training and 30% were used for validation. All the included covariates were factors before the outcome- nosocomial infection.  
Changes in the text: None.

Second, the title is problematic, which should reflect the research focus and the clinical research design of this study.

Reply2: Thanks for the question, we revised the title.  
Changes in the text: Line 3-4, page 1.

Third, the abstract needs to indicate the potential clinical significance and knowledge gap on this research focus in the background, describe the inclusion of subjects, the assessment of potential predictors, and main statistical methods for identifying associated factors in the methods, report the clinical characteristics of the two groups in the results, and the current conclusion is overstated.

Reply3: Thanks for the suggestion, we added the context in abstract.  
Changes in the text: Line 24-49, page 1-2.

Fourth, in the introduction of the main text, the objective was described as “whether appropriate health and safety standards for incubators effectively reduce the nosocomial infection rate in newborns”, which seems to focus on the efficacy and safety of an intervention, but the research focus is prediction or associated factors of infection, as described by the authors. This part needs to be re-written.

Reply4: Thanks for the suggestion, we rewrite the end of introduction.  
Changes in the text: Line 86-87, page 4.

Fifth, the methodology of the main text needs to describe the clinical research design and sample size estimation. The statistical analysis must serve for the research focus after the authors selected the correct research question.

Reply5: Thanks for the suggestion, we added the study design na sample size calculation in

---

methods section.

Changes in the text: Line 96-97, page 4.