

## Peer Review File

Article information: <https://dx.doi.org/10.21037/jtd-23-1051>

### Reviewer A

**Comment 1:** Clearer structuring: The text could be organized from the beginning with clear headings and paragraphs to improve readability.

**Reply 1:** We have modified our text as advised.

**Changes in the text:**

Abstract includes 4 headings (Background, Methods, Results, and Conclusions)

Introduction includes 3 headings (Background, Rationale and knowledge gap, and Objective)

Methods includes 3 headings (Study area, Data collection, and Statistical analysis)

Results includes 4 headings (Statistic summary of data, Spearman correlation coefficient, Single-pollutant analysis, and Multi-pollutant analysis)

Discussion includes 4 headings (Key Findings, Explanations of findings, Strengths and limitations, and Implications and actions needed)

**Comment 2:** Introduction and objective: A brief introduction and clear statement of the objective could be included at the beginning of the text to engage the reader and set the tone.

**Reply 2:** We have modified our text as advised (see Page 4, line 92-100).

**Changes in the text:**

Page 4, line 92-100: As the aim of this study, it is to evaluate the association between short-term exposure to air pollutants and the count of hospital visits with pneumonia through the generalized additive model (GAM) method. We comprehensively explained the changes in air pollutants during the COVID-19 outbreak in 2020-2021 compared to those before the outbreak in 2018-2019 and estimated the relative risk attributable to the air pollutant variation in Khon Kaen, one of the most polluted provinces in Thailand. The findings of this study provided details on the dangers of air pollution and can be utilized as epidemiological evidence to demonstrate the risk factors for respiratory ailments. We presented this article in accordance with the **Transparent reporting of a multivariable prediction model for individual prognosis or diagnosis (TRIPOD checklist)**.

**Comment 3:** References: It would be helpful to cite the mentioned studies directly in the text by mentioning the authors and the publication year, instead of just using numbers in parentheses.

**Reply 3:** We have modified our text as advised (Introduction section: see Page 3, line 65) (Discussion section: see Page 10, line 251-257, line 266-268; see Page 11, line 281-288; see Page 12, line 302-319; see Page 13, line 327-332).

**Changes in the text:**

Page 13, line 327-332: As with previous findings, Ko *et al.* [2023] tried to clarify the

impact of the COVID-19 on a marked reduction in non-COVID pneumonia in Hong Kong. PM and influenza rates were mediators for changes in hospital admissions of non-COVID pneumonia before and during the COVID-19 pandemic (11% and 52%, respectively). The study provided supplementary evidence that mask-wearing rates were associated with respiratory illness. However, the report of Ko *et al.* did not assess the mask-wearing rates that would contribute to the pneumonia in the study (39).

**Comment 4:** Summary of findings: Adding a summary of the main results at the end of the text could assist readers in better understanding the key takeaways.

**Reply 4:** We added some data (see Page 9, line 223-228).

**Changes in the text:**

Page 9, line 223-228: This time-series study evaluated the association between short-term exposure to air pollutants (PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, and O<sub>3</sub>) and pneumonia before vs. during the COVID-19 outbreak using GAM. This finding indicated that the effect of PM<sub>10</sub>, PM<sub>2.5</sub>, and NO<sub>2</sub> were associated with hospital pneumonia visits. As highlighted in the multi-pollutant model, this study showed that the RRs of pneumonia associated with PM<sub>2.5</sub> were increased during the COVID-19 outbreak and the pneumonia risk from NO<sub>2</sub> was significantly greater during before-COVID-19 outbreak than during the outbreak.

**Comment 5:** Graphics and tables: Incorporating visuals such as graphs and tables to illustrate the findings could make the text more visually appealing and informative.

**Reply 5:** We cited figures in text in an ascending numeric order.

**Comment 6:** Clarity and conciseness: Sentences should be made shorter and more concise to enhance readability and comprehension.

**Reply 6:** We have modified our text as advised (Delete some sentences from the manuscript).

**Comment 7:** Grammar and spelling: Paying attention to proper grammar and spelling is essential to enhance the professionalism of the text.

**Reply 7:** We have reviewed and verified the text's grammar.

**Comment 8:** Discussion: Including a discussion of the results and their implications would round off the text and provide readers with a deeper understanding of the topic.

**Reply 8:** We added some data (see Page 14, line 364-370)

**Changes in the text:**

Page 14, line 364-370: As mentioned above, the key finding of this study has shown that the respiratory health impacts were related to air pollutants. PM and NO<sub>2</sub> model showed the association between hospital visits with pneumonia. Additionally, pneumonia risks of air pollution displayed declined during the COVID-19 period. A better quality of air pollutants along with public health policies during the pandemic was evidence to support the changes in risks of pneumonia. The findings of this study would support raising awareness about measures and policies to preserve the air quality to decrease respiratory ailments.

**Comment 9:** Conclusion: A brief conclusion that summarizes the main findings once again and highlights potential implications for practice or further research could conclude the text.

**Reply 9:** We have modified our text as advised (see Page 14, line 373-379)

**Changes in the text:**

Page 14, line 373-379: The effect of PM and NO<sub>2</sub> modeled had significantly related to pneumonia in Khon Kaen, Thailand. Specifically, our findings showed the influence of air pollutants on pneumonia was higher through cumulative exposure days before the COVID-19 outbreak than during the outbreak. This was consistent with several studies showing greater decreases in air pollutants concentrations because of the control of the COVID-19 measures, which could provide more useful information for environmental policies and measurements to reduce the emission sources of air pollution. The human health benefits can be achieved if control measures are taken to reduce air pollution.

**Reviewer B**

**Major comment**

**Comment 1:** The authors measured PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, and O<sub>3</sub> in the air and investigated their correlation with the incidence of pneumonia. The frequency of pneumonia is influenced by various factors such as reduced human flow due to the lockdown and the use of face masks. I suggest to consider including those factors in the analysis.

**Reply 1:** We added some data (see Page 13, line 327-337; see Page 13-14, line 351-362)

**Comment 2:** Also, in order to understand this manuscript, the background explanation is important. How the COVID-19 epidemic led to limited access to healthcare and tight healthcare situations in the Khon Kaen region or not?

**Reply 2:** We added some data (see Page 10, line 243-248)

**Changes in the text:**

Page 10, line 243-248: Thailand was the first nation to report a verified COVID-19 case outside of China. Thailand's government enacted the Public Administration in Emergency Situation. A national lockdown policy, almost all hospitals had limited health care service, for example, by solely opening some wards, sending medication to the patient's house rather than having them pick it up at the hospital, and use the phone to contact a doctor, which resulted in a drop in the daily number of patients during an early lock down phase but alleviating for following phases.

**Comment 3:** The manuscript primarily focuses on data from Khon Kaen, Thailand. To enhance the generalizability of your findings, I recommend that you conduct additional analyses that compare the results with data from other regions in Thailand or any other country. This would help determine if the observed association between air pollution and pneumonia is a localized phenomenon or holds true across different geographic

areas. If there are difficulty for this additional analysis, I recommend that you discuss the manuscript with previously published reports from other regions.

**Reply 3:** We added some data (see Page 12, line 301-319; see Page 13, line 327-337)

### **Minor Comment**

**Comment 1:** I would like to know the Khon Kaen city (Please provide details about the city's population, the gender and age distribution in the city, and the city's industries.)

**Reply 1:** We added some data (see Page 5, line 105-113)

#### **Changes in the text:**

Page 5, line 105-113: In 2021, its population was 1.79 million, with a higher proportion of females than males (50.9% vs. 49.1%). Classifications of age group were as follows: 0-12 years old (12.8%), 13-24 years old (14.6%), 25-44 years old (29.5%), 45-64 years old (30.2%), and above 65 years old (12.9%). The province is known as a great educational province surrounded by business districts resulting in the traffic congestion in large areas. The major industries were found in the non-metallic, metal, food, and transportation. There were some air pollution sources from productions of power, ethanol, natural gas, industrial rock, mineral deposit extraction, and a center for the distribution of fuel and gas for northeastern region of Thailand. Moreover, this city has a large agricultural industry with an agricultural area of 6,752 sq.km (62% of the total area).

**Comment 2:** I am wondering if the citation style is correct. (Citation from the Homepage; "In text references should be identified using numbers in round brackets. Where more than one number is required, they should appear consecutively [e.g., "cancer-related mortality (19)"; "adenocarcinoma (29,30)"]. References should be numbered consecutively according to the order in which they first appear in the text.")

**Reply 2:** We have modified our text as advised.

#### **Changes in the text:**

Example: Ambika *et al.* [2021] observed that a significant decrease in particulate matter and health risk (cancer risk, acute, and chronic health index) during the lockdown is due to a corresponding decrement in air pollution in India (12).

—