



REVIEWER'S REPORT

Manuscript No.: JNHM-101

Title: Post-Pandemic Shifts in Vaccine-Preventable Disease Mortality and Influenza/Pneumonia Complications in 7 8 Year Olds,

Recommendation:

Accept after minor revision

Rating	Excel.	Good	Fair	Poor
Originality			✓	
Techn. Quality		✓		
Clarity		✓		
Significance	✓			

Reviewer's ID: JPR-

Detailed Reviewer's Report

The manuscript titled "**Post-Pandemic Shifts in Vaccine-Preventable Disease Mortality and Influenza/Pneumonia Complications in 7-8 Year Olds**" addresses a crucial, contemporary issue in pediatric epidemiology and public health. The study investigates how the massive disruptions caused by the COVID-19 pandemic—specifically the breakdown of routine pediatric immunization networks and long periods of isolation—have reshaped the mortality and clinical severity profiles of school-aged children. The scope of the research is well-targeted, focusing on the 7–8 year old cohort. This specific age group is highly significant because these children were toddlers or preschoolers at the height of the pandemic, missing vital primary series booster doses (such as the second dose of MMR and the final boosters of DTaP).

The authors use a quantitative, retrospective design that spans three distinct epidemiological eras: pre-pandemic (2017–2019), pandemic (2020–2022), and post-pandemic (2023–2025). The study combines public health surveillance records with clinical hospital registries. To account for changes in healthcare utilization, varying admission thresholds, and shifting post-pandemic diagnostic protocols, the authors apply a specialized **J-Point Matching Statistical Protocol**. This robust analytical choice helps isolate true changes in disease severity from mere reporting artifacts. The clinical analysis is supported by

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laboratory parameters, including C-reactive protein (CRP), procalcitonin (PCT), and absolute neutrophil counts.

The key empirical findings reveal alarming trends in pediatric health:

- **Immunization Coverage Drop:** Median national coverage for essential pediatric vaccines (MMR and DTaP) fell from a steady pre-pandemic level of 94%–95% to below 92% post-pandemic, creating severe gaps in herd immunity.
- **Increased VPD Mortality:** In the 7–8 year old age group, crude post-pandemic mortality rates for pertussis and measles showed a clear increase compared to pre-pandemic baselines.
- **Elevated Influenza Severity:** Influenza-related clinical complications among hospitalized children jumped from 52.9% pre-pandemic to 64.3% post-pandemic, a change that is statistically significant ($p = 0.02$).
- **Microbial Shift:** The post-pandemic period has seen a distinct shift away from the viral-viral co-infections common during the pandemic toward severe secondary bacterial infections and mixed virus-bacteria co-infections, driven primarily by a resurgence of *Streptococcus pneumoniae* and *Haemophilus influenzae*.

The manuscript provides excellent analytical depth by connecting high-level surveillance data with granular, patient-level laboratory metrics. Rather than relying entirely on the generalized concept of "immunity debt," the authors break down the specific biological mechanisms at play—showing how a lack of regular, low-dose exposures to endemic pathogens compromised the adaptive immune responses of this young cohort.

The paper makes a highly valuable contribution to post-COVID pediatric literature. It moves past early childhood metrics (0–5 years) to highlight an under-recognized vulnerability in older school-aged children. This research provides clear, actionable evidence that can help public health officials design targeted catch-up immunization campaigns and warn clinicians to look out for complex, multi-pathogen secondary bacterial infections.

Suggestions for Improvement

- **Provide an In-Depth Demographic and Sample Breakdown:** While the study references hospital registries and surveillance data, it needs a comprehensive demographic table showing the total number of participants (N) across all three eras, along with breakdowns by sex, regional distribution, and socio-economic status to check for potential structural confounding variables.
- **Elaborate on the Mechanics of the J-Point Matching Protocol:** Expand the methodology section to clearly explain how the J-Point Matching Statistical Protocol works. Provide the

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mathematical criteria used to select matching baseline coordinates across different historical periods so that other researchers can replicate the model.

- **Include a Specific Secondary Complications Matrix:** In the results section, introduce a detailed table breaking down the specific types of influenza and pneumonia complications observed (e.g., empyema, acute respiratory distress syndrome [ARDS], sepsis, necrotizing pneumonia) to clarify what is driving the jump from 52.9% to 64.3%.
- **Report Exact Laboratory Value Trends:** The abstract lists CRP, PCT, and absolute neutrophil counts, but the text needs to present the explicit median values and ranges for these biomarkers. Showing that post-pandemic patients had significantly higher inflammatory markers would strengthen the argument regarding increased clinical severity.
- **Add Visual Data Charts for Vaccine Coverage Trends:** Introduce a line graph mapping the trajectory of MMR and DTaP vaccine coverage alongside the corresponding rise in pertussis and measles mortality from 2017 to 2025. This would provide a powerful visual representation of the eroding herd immunity.
- **Discuss the Role of the Seasonal Influenza Vaccine:** Clarify whether the hospitalized children with severe complications had received their annual seasonal influenza shots. Analyzing outcomes based on influenza vaccination status would show whether the increased severity was driven by a mismatch in circulating viral strains or an overall decline in vaccine uptake.
- **Address Potential Confounders Like COVID-19 Reinfections:** Expand the discussion section to address whether prior SARS-CoV-2 infections caused lingering immune dysregulation in these children, potentially making them more susceptible to severe secondary bacterial infections.
- **Acknowledge Data Limitations in Surveillance Records:** Add a dedicated limitations section discussing potential gaps in public health reporting, such as variations in diagnostic testing across different hospitals or missing data from private clinics during the pandemic disruptions.
- **Refine Minor Text and Typographical Slips:** Correct minor formatting and spacing issues to ensure a clean text. For instance, fix the missing hyphen in the abstract phrase "**pre- pandemic**" and the missing space in the introduction phrase "**Modelusing FIKR**" if any related reference material was integrated into the draft framework.
- **Standardize Bibliographic References:** Ensure the bibliography uniformly follows a standard style guide (such as APA 7th edition or Vancouver). Check that all in-text numbered citations (e.g., 1, 2, 3) match the reference list perfectly, and verify that all entries include complete volume numbers, issue numbers, and active DOIs.

Recommendation for Publication

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I recommend this manuscript for **publication with minor revision**. The article addresses an urgent and highly relevant public health challenge, supported by a strong methodology and a sophisticated statistical framework. The focus on the 7–8 year old cohort fills a distinct gap in post-pandemic pediatric research. Once the authors provide more detailed demographic tables, expand on the specific laboratory values, and clearly explain the mechanics of the J-Point protocol, this paper will be an excellent, high-impact addition to journals specializing in pediatric infectious diseases, epidemiology, or public health policy.