

CARDIAC MANIFESTATIONS INCLUDING HEART FAILURE AND MYOCARDIAL INFARCTION POST COVID-19 RECOVERY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction

- There has been a growing need to understand the incidence of cardiac manifestations, including heart failure (HF) and myocardial infarction (MI) in COVID-19 patients.
- This systematic literature review aimed to assess the incidence of these cardiac manifestations post-COVID-19 recovery.

Objectives

- The objective of the systematic review was to evaluate the incidence of HF and MI post-COVID-19 recovery.
- The sub-objective was to evaluate if there are any differences in the risk of developing HF and MI between COVID-19 patients vs non-COVID-19 patients.

Methods

- A comprehensive search strategy was designed for Medline and Embase databases to identify studies reporting the incidence of HF/MI post-COVID-19 recovery.
- Studies were assessed for inclusion/exclusion by two independent reviewers based on a pre-specified protocol. Any disagreement was resolved through consensus.
- Studies published in the English language reporting the incidence of HF/MI post-COVID-19 recovery were included using pre-defined eligibility criteria.
- Data were extracted from the relevant studies by a single reviewer and validated by another reviewer in a pre-designed extraction template.
- The incidence of HF/MI was combined using a random-effects model (REM) as *a priori*.
- Study heterogeneity was quantified based on the subgroups, Galbraith analysis and meta-influence analysis.
- Results are presented as pooled incidences and as risk of developing HF and MI between COVID-19 patients vs non-COVID-19 patients.

Results

- Of the 912 articles screened, a total of 6 population-based studies assessing 17,762,987 patients were included in the final analysis.

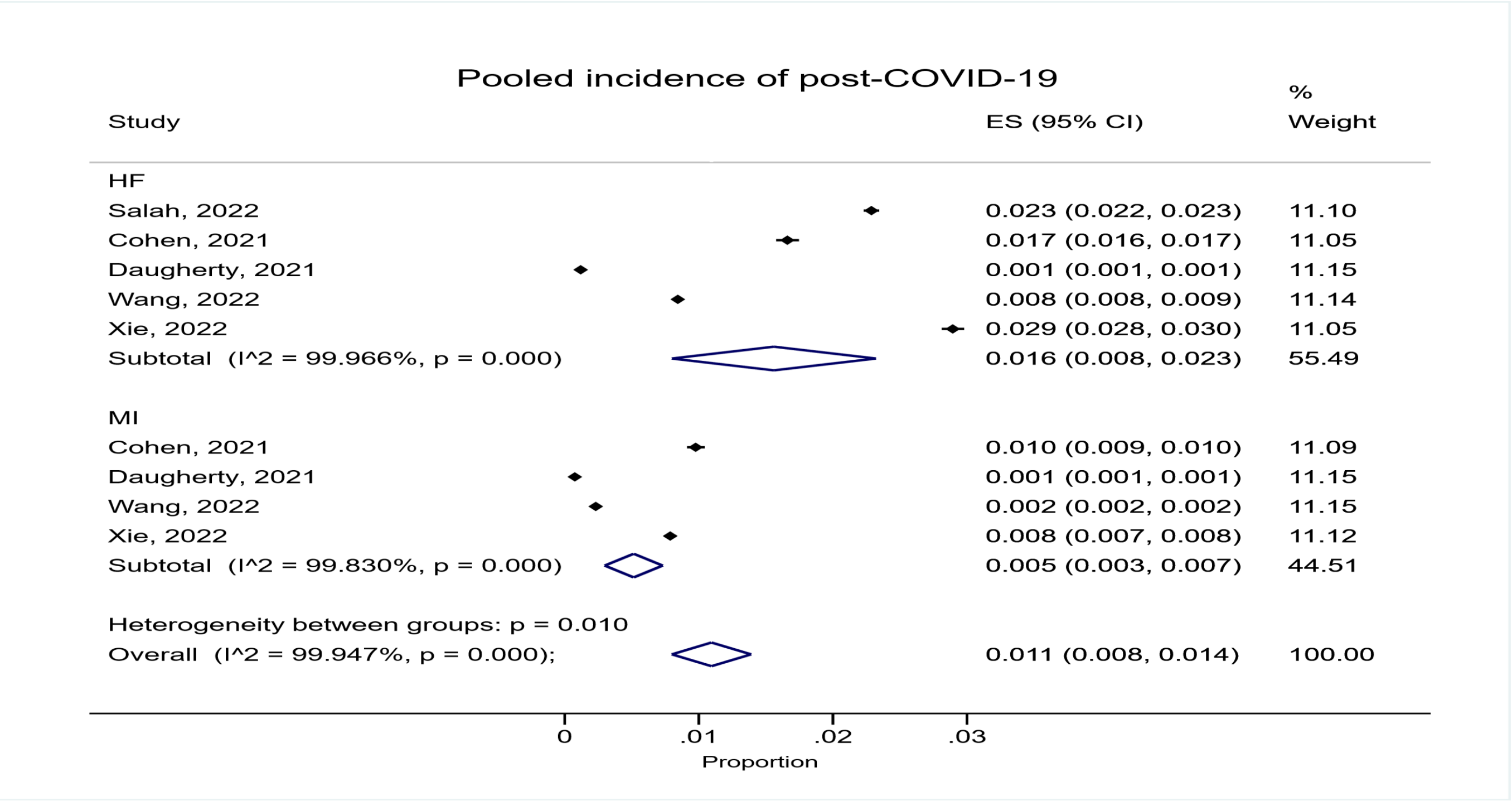


Figure 1: Pooled incidence of post-COVID-19 HF and MI

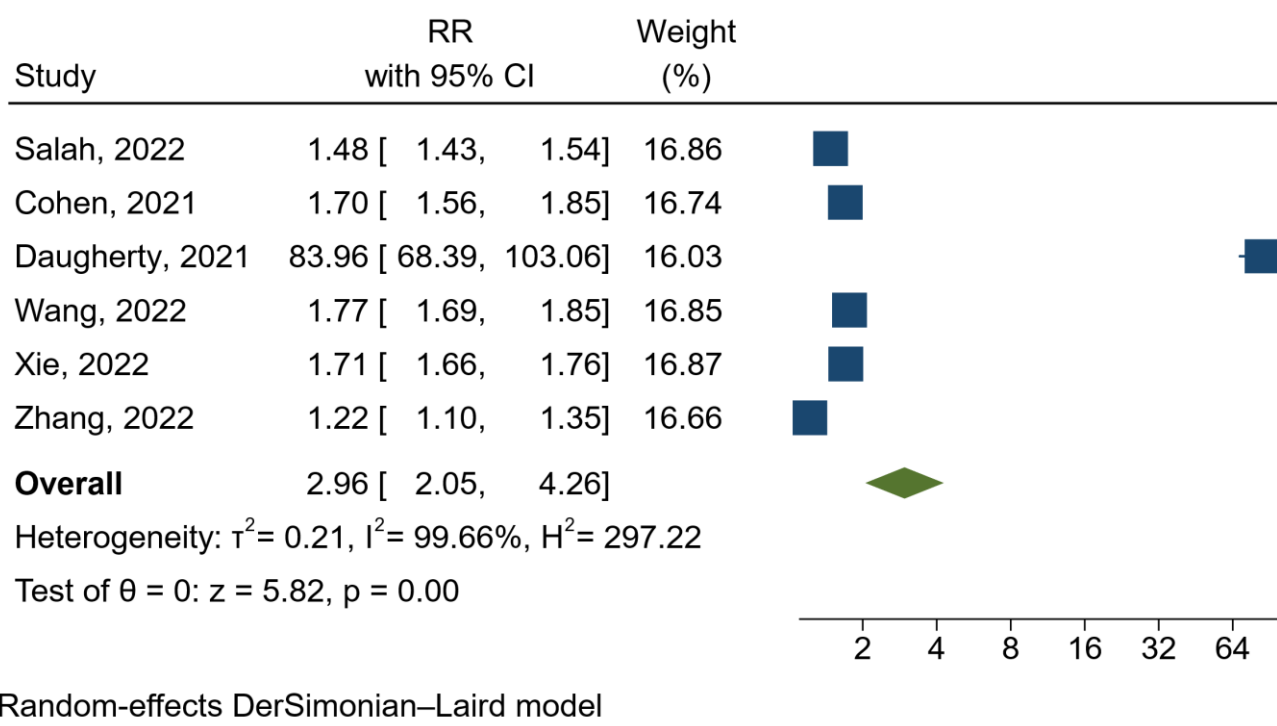


Figure 2: HF incidence in COVID-19 vs non-COVID-19

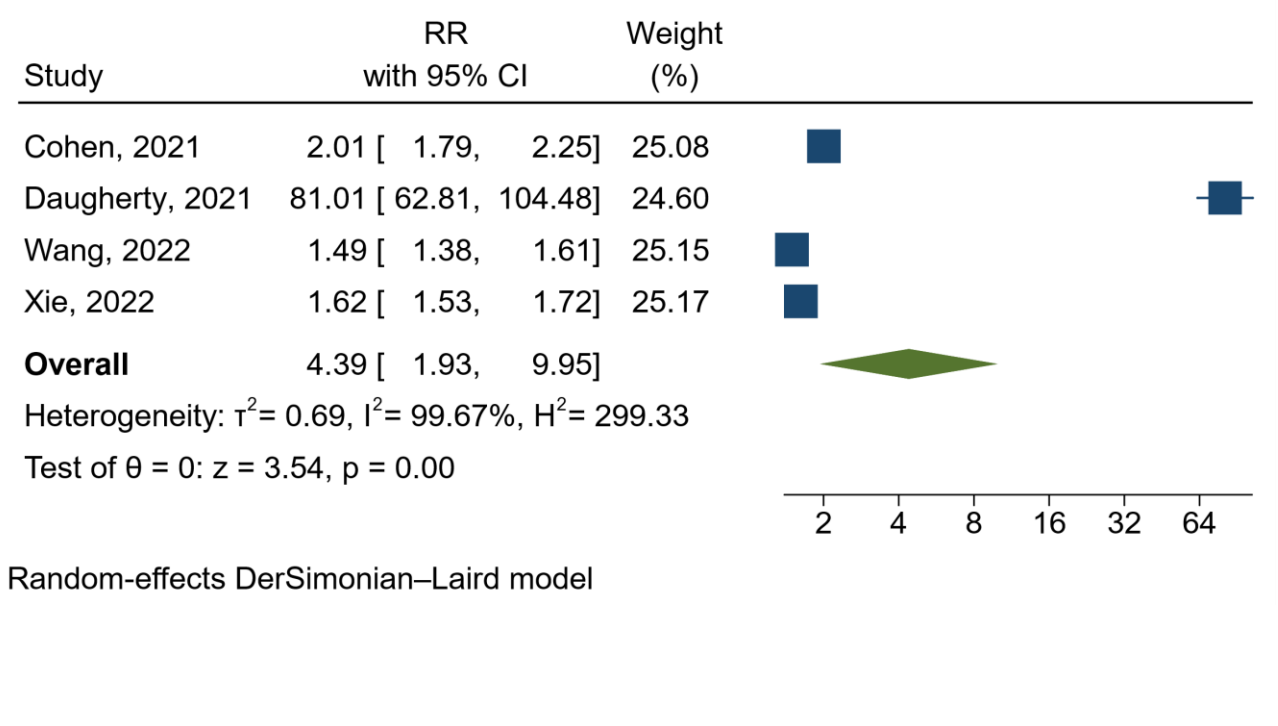


Figure 3: MI incidence in COVID-19 vs non-COVID-19

- A total of 1,530,882 patients had confirmed COVID-19 infection, while 16,232,105 patients represented the control group.
- Based on a REM, pooled incidence of post-COVID-19 HF was 0.016 (95% CI: 0.008, 0.023) and for MI was 0.005 (0.003, 0.007) as shown in Figure 1.
- A significant increase in the risk of developing HF (Risk ratio [RR], 95% CI: 2.96 [2.05, 4.26] $p < 0.0001$, I-square=99%) and MI (4.39 [1.94, 9.95] $p < 0.0001$, I-square=99%) was observed in COVID-19 group vs the control group (Figure 2 and Figure 3, respectively).
- Based on the reported HR, a 90% increase in the incidence of HF (HR [95% CI]: 1.90 [1.55, 2.35], $p < 0.0001$, I-square=98%) and a 94% increase in the incidence of MI (1.94 [1.66, 2.28], $p < 0.0001$, I-square=98%) was observed in COVID-19 group vs non-COVID-19.
- Meta-influence analyses did not identify any outlier studies suggesting the base case results are robust to the variability in the baseline characteristics.

Conclusions

COVID-19 survivors showed a significantly increased risk of developing HF and MI compared to non-COVID-19 controls.

Reference

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