Particulate matter air pollution and COVID-19 infection, severity, and mortality: A systematic review and meta-analysis

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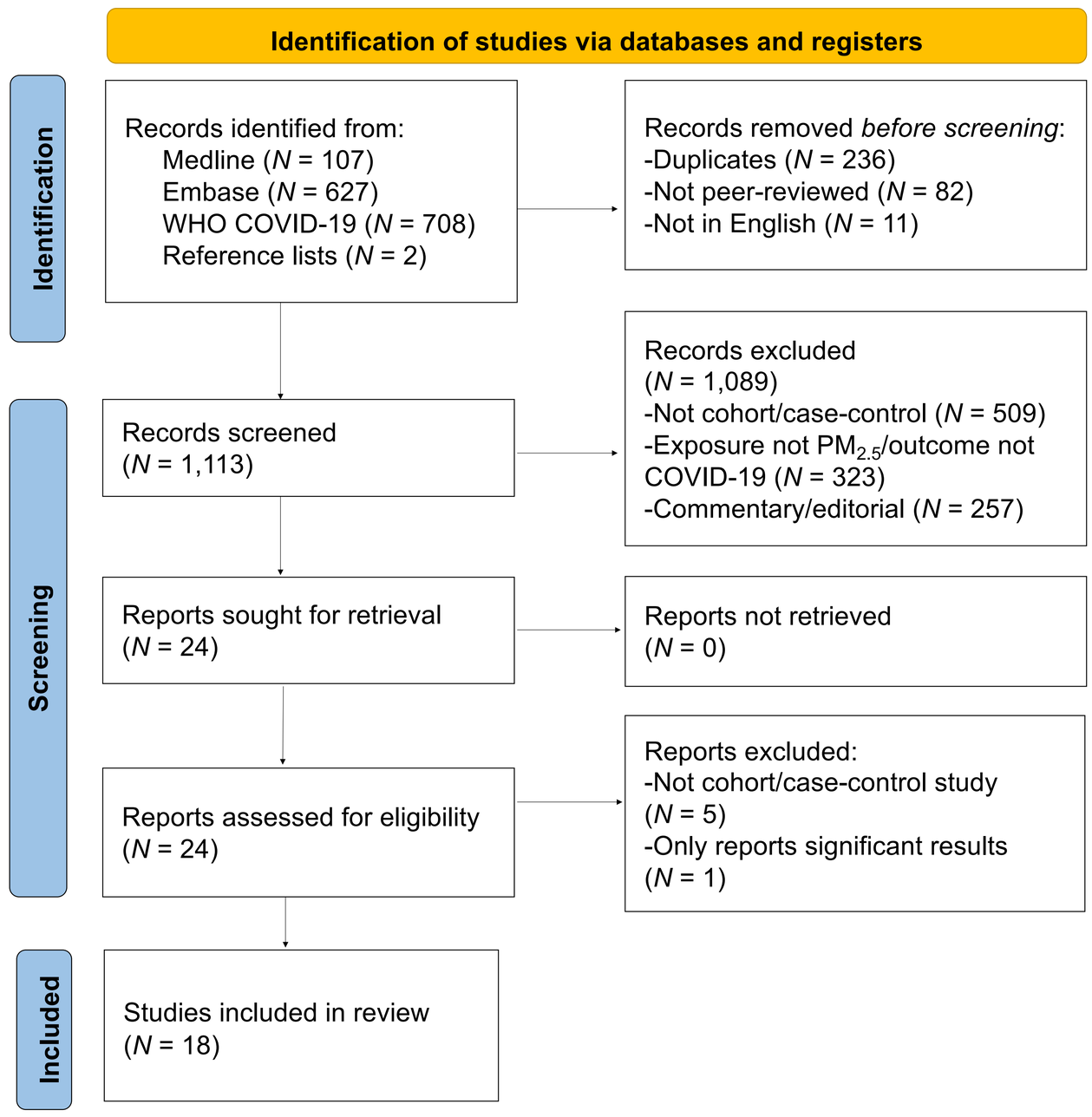
Pre-print link

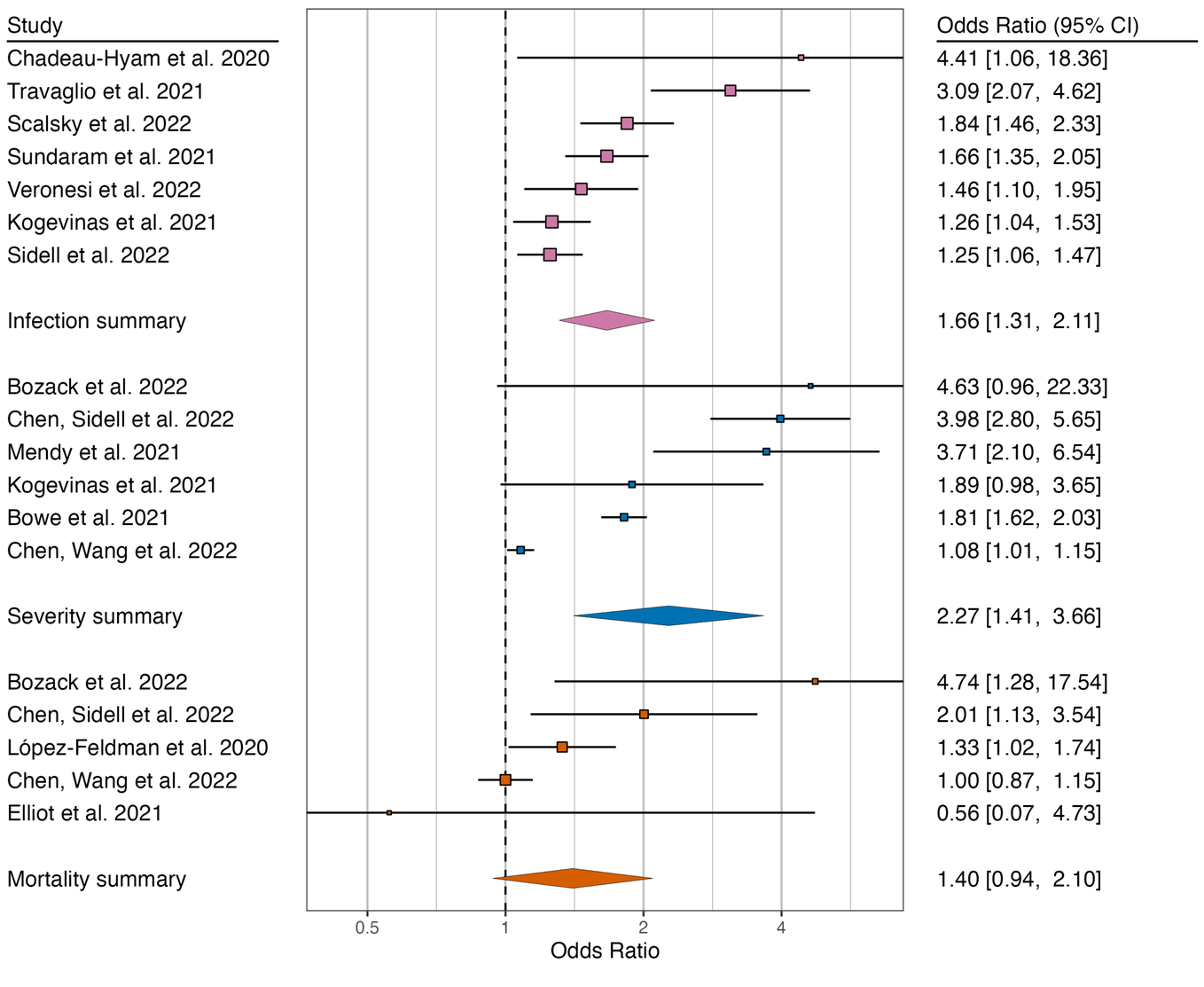
Background

- Areas with higher $PM_{2.5}$ concentrations have more COVID-19 infections, severe disease, and death.
- Yet such ecological evidence could be confounded by socioeconomic factors.
- We reviewed studies with individual-level data to find effect of ambient and acute $PM_{2.5}$ on COVID-19 infections, severe disease, and death

Methods

- Searched Medline, Embase, and WHO COVID-19 research databases
- Limited to case-control and cohort studies
- Study quality assessed with Newcastle-Ottawa Scale
- Random effects meta-analysis to pool results
- Egger's regression, funnel plots to test for publication bias





Results

- No eligible studies on acute exposure, all ambient $PM_{2.5}$
- Most studies rated "good" quality (14/18)
- Pooled results indicate $PM_{2.5}$ increase risk of COVID-19 infection and severe disease; non-significant for mortality but still suggestive of increased risk
- Evidence of publication bias for infection studies (p = 0.012)

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