Clinical characteristics of 2019 novel coronavirus pneumonia and risk factors for severe cases: a meta-analysis involving 5,729 patients

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Abstract

Objective: 2019 novel coronavirus (2019-nCov) has become a global health emergency. However, the clinical presentations are not well characterized. The study aimed to describe clinical characteristics of 2019-nCov pneumonia with meta-analytic approach, and to identify risk factors for developing severe cases.

Methods: The electronic databases of PubMed, Google Scholar and MedRxiv were searched from December 2019 to February 2020. Records were included if they reported clinical characteristics of 2019-nCov pneumonia. Studies using crowd sourcing data for mathematical modeling but not reporting clinical data were excluded. The study was reported according to the PRISMA guideline. Data were extracted by independent reviewers. Proportions and mean values were pooled across component studies by using the meta-analytic approach. Data were pooled with fixed or random-effects model as appropriate. Clinical characteristics such as age, gender, symptoms, treatment and mortality outcome were pooled across studies if appropriate. Risk factors for development of severe cases were reported.

Results: A total of 13 studies involving 5,729 patients were included for quantitative analysis. The mean age of the study population was 50 years (95% CI: 47 to 53). The most common initial symptoms were cough (68.0%; 95% CI: 65.6 to 70.4%), followed by fever (56.5%; 95% CI: 53.9 to 58.9%), fatigue (42.5%; 95% CI: 39.9 to 45.1%) and anorexia (31.7%; 95% CI: 26.5 to 38.4%). The severe cases accounts for 22.5% of the whole population (95% CI: 21.4 to 23.6%). The overall mortality rate was 1.8% (95% CI: 1.5 to 2.2%), which was consistent with the real time epidemic tracking data. There was substantial heterogeneity across included studies (O = 0.84; p < 0.001). A number of comorbidities and symptoms such as hypertension, COPD, dyspnea, elevated C-reactive protein and procalcitonin were found to be associated with increased risk of developing severe cases.

Conclusions: Our study described clinical characteristics of the 2019-nCov pneumonia in a systematic way. Multiple risk factors were identified for severe cases.

Full Text

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Figures

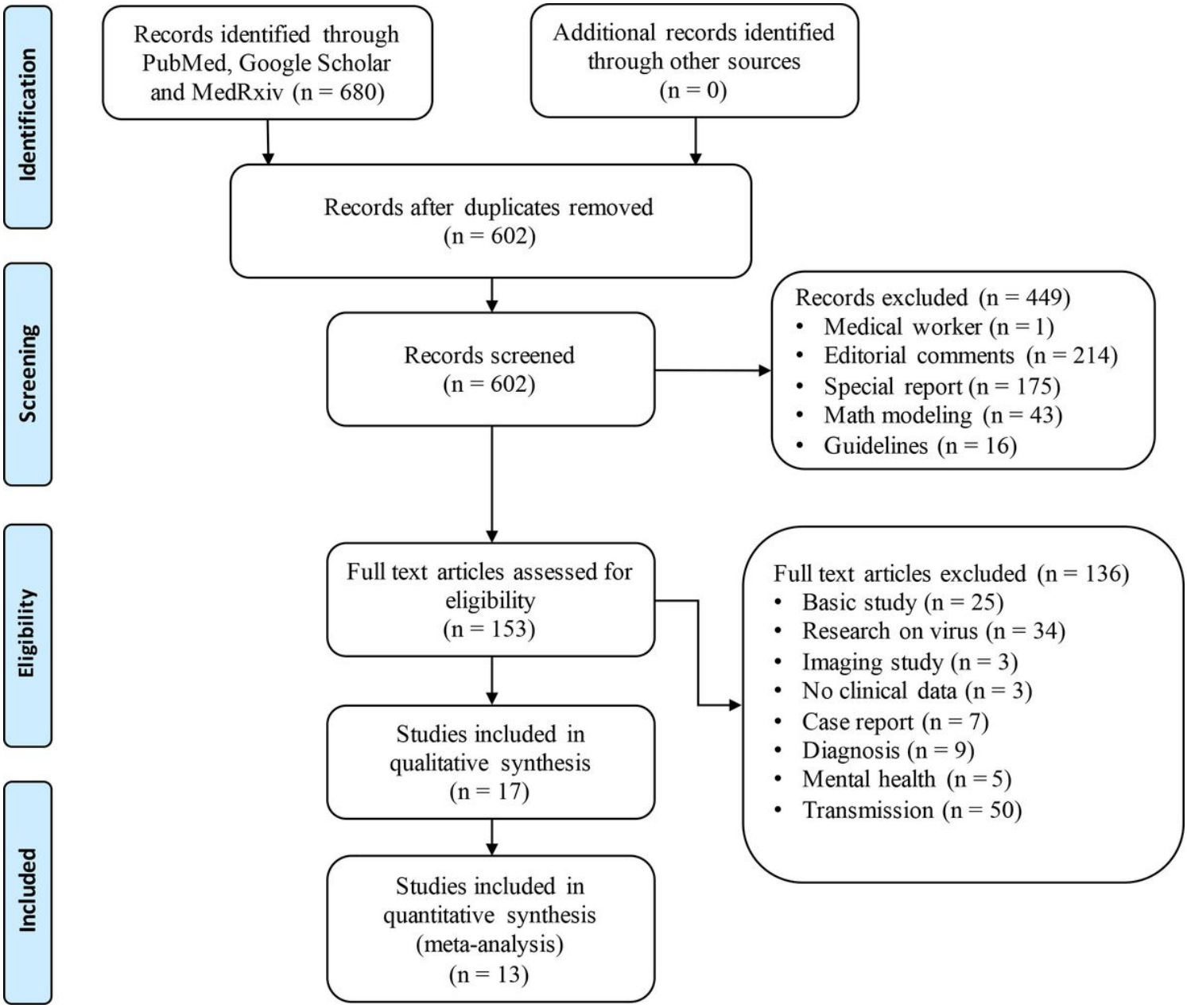

Figure 1

Flowchart of study selection.

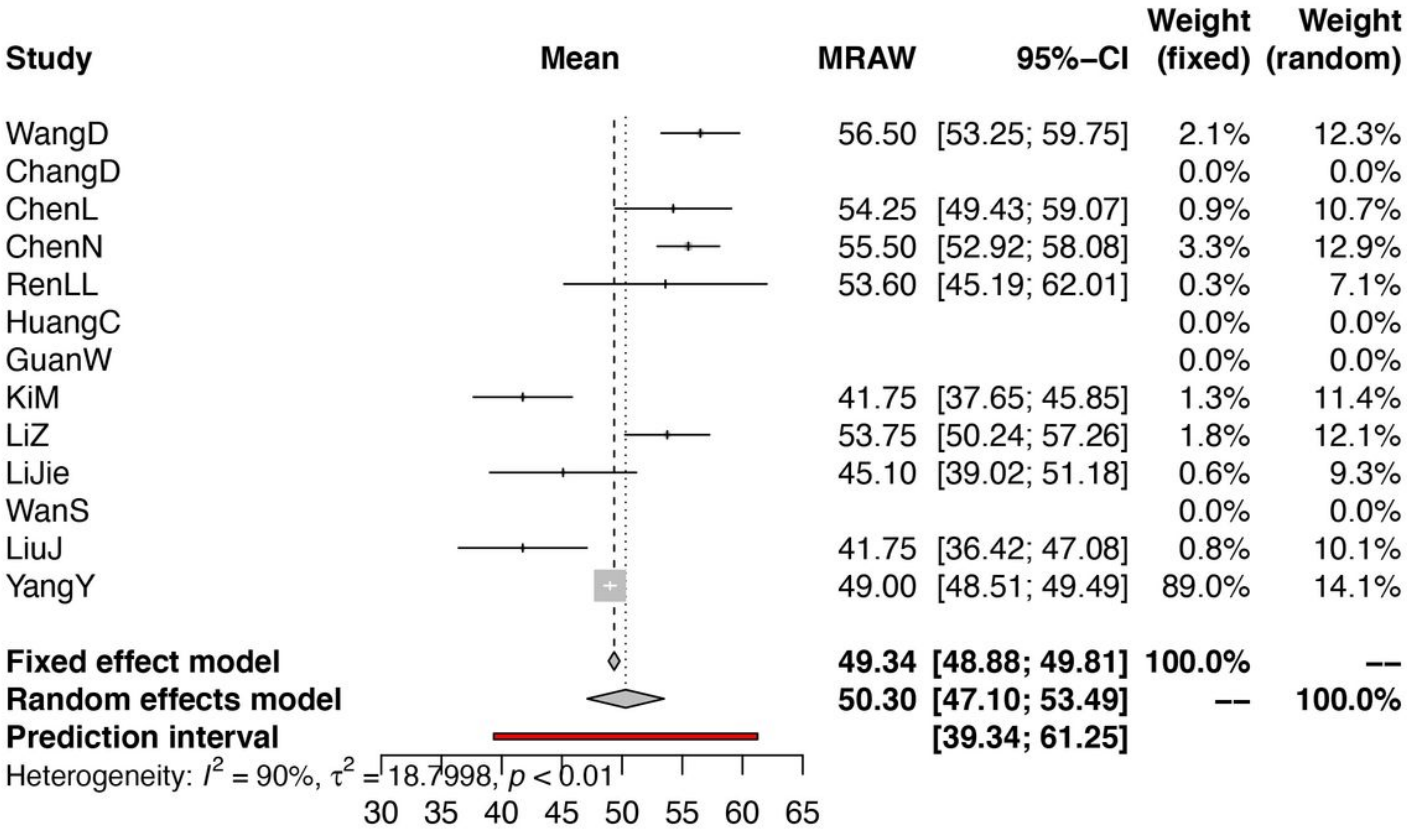

Figure 2

Meta-analysis of age across component studies.

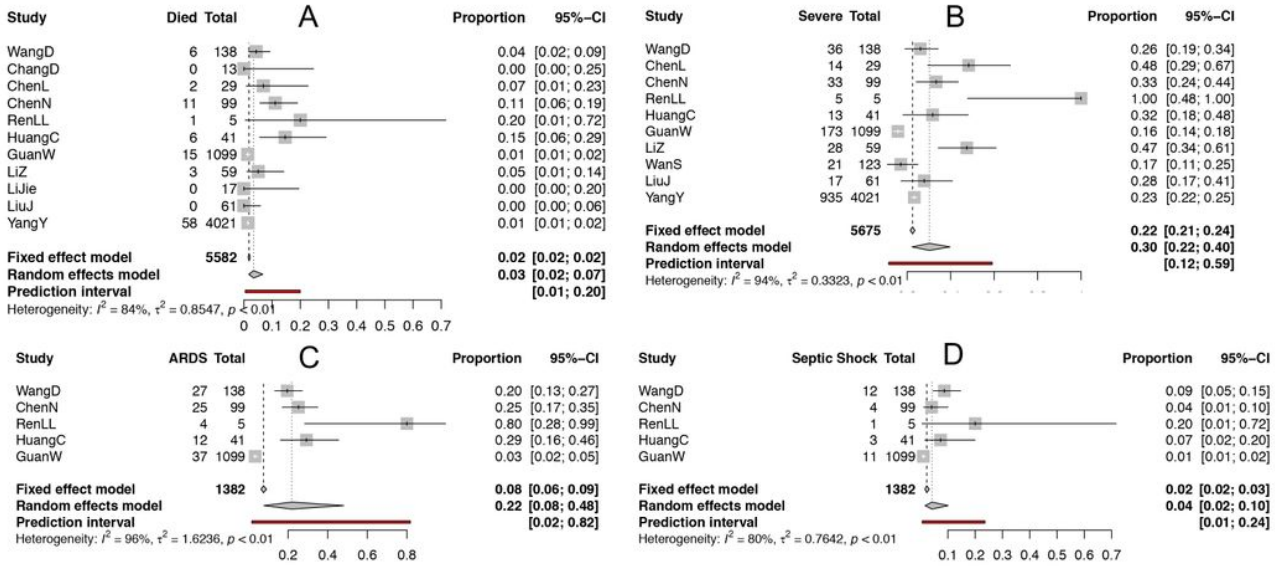

Figure 3

Forest plots showing important complications and outcomes of 2019-nCov pneumonia: A): The combined mortality rate with fixed effect was 1.8% (95% CI: 1.5 – 2.2%)□B) the severe case was reported

in 22% patients (95% CI: 21 – 24%); C) ARDS occurred in 8% (95% CI: 6 – 9%) patients; and D) septic shock occurred in 2% (95% CI: 2 – 3%) of the study population.

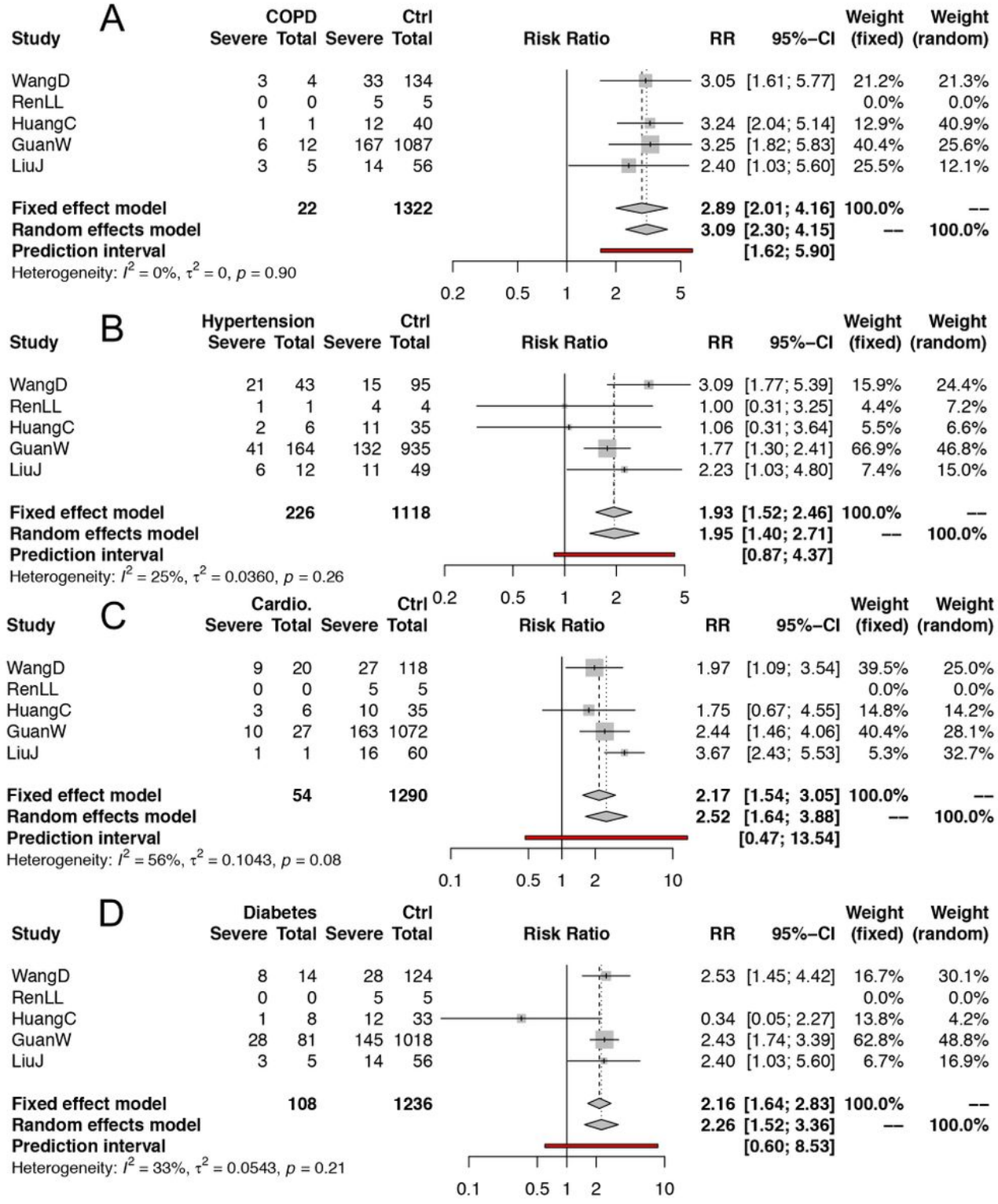

Figure 4

Forest plots showing risk factors for severe cases.

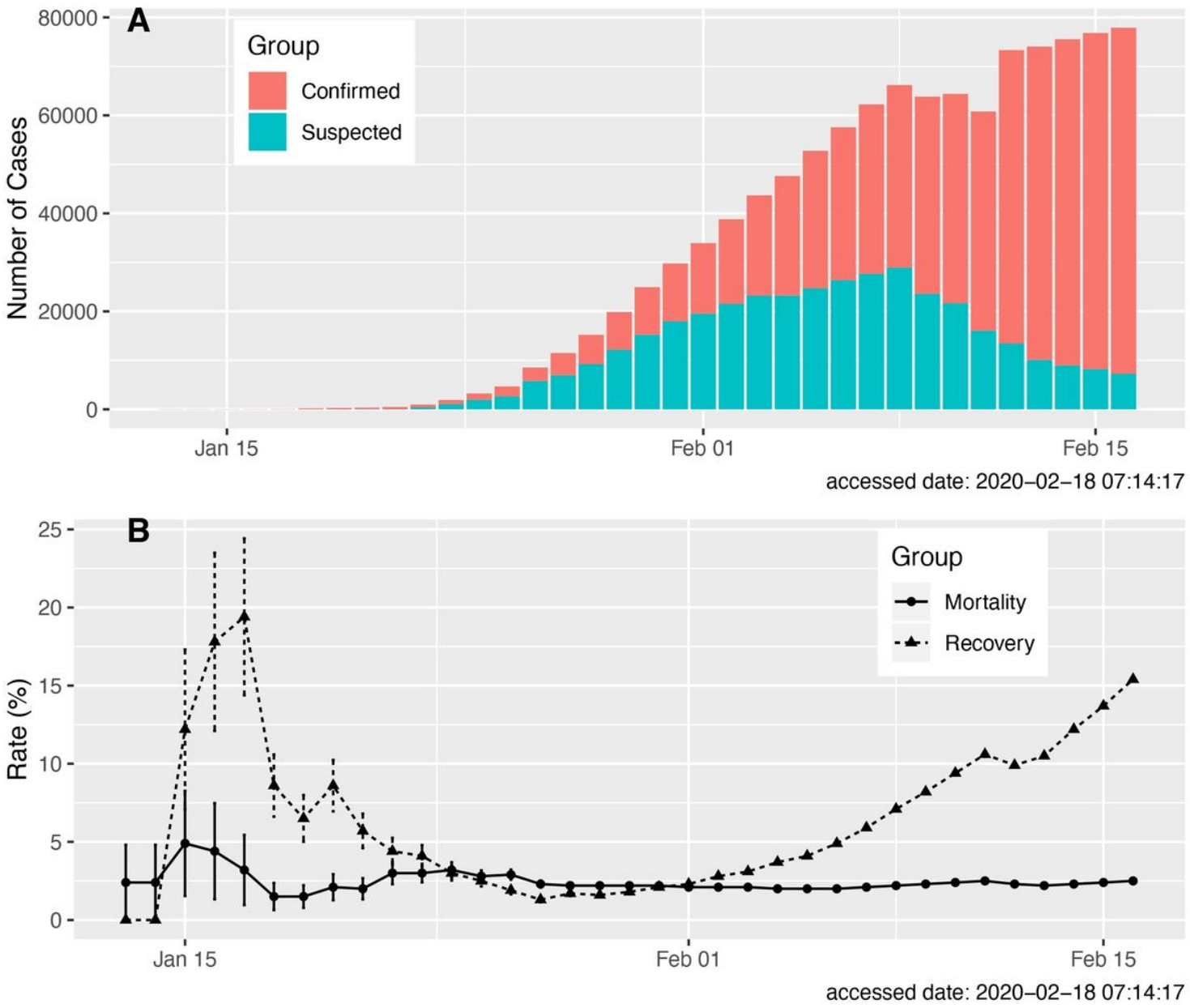

Figure 5

Temporal trend of the 2019-nCov epidemic. A) Temporal trend of the number of confirmed and suspected cases; and B) the mortality and recovery rate over time. The short bar indicates the standard deviation. Data were accessed on February 18th, 2020.

Supplementary Files

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- Table1.docx
- Table3.docx
- Table2.docx