



Australian  
National  
University

RAPID REVIEW: OUTCOMES AND CHARACTERISTICS OF PEOPLE  
WITH COVID-19

Dr Ellie Paige

ANU College of Health and Medicine COVID-19 Evidence Team

Suggested Citation: Paige E, 2020. Rapid review: Outcomes and characteristics of people with COVID-19. ANU College of Health and Medicine COVID-19 Evidence Team, Canberra, Australia.

Correspondence to:  
Ellie Paige; [ellie.paige@anu.edu.au](mailto:ellie.paige@anu.edu.au)

Data on the outcomes of people who test positive for SARS-CoV-2 are scarce, with evidence available to date coming primarily from China, Italy and the US, countries that are further along in the pandemic than Australia. In the US, among 4,226 people with confirmed COVID-19 as at 16 March 2020, 12% had been hospitalised, 2.9% admitted to ICU and 0.9% had died (1). Of 1099 people admitted to hospital with laboratory confirmed COVID-19 from across 30 regions in China, 5% were admitted to ICU, 2.3% received mechanical ventilation and 1.4% died (2). Italy has seen a much higher proportion of people admitted to ICU and a greater fatality rate, potentially due in part to an older population. Within the first two weeks of the epidemic, 16% of those who were positive for COVID-19 were admitted to ICU (3), with an overall fatality rate of ~7%.

Fatality rates have varied between countries from ~1% in China to ~7 in Italy (4, 5), but are difficult to accurately estimate during the pandemic as the denominator often includes people with unknown outcomes. There is substantial variation in outcomes by age, with younger people generally experiencing milder forms of disease, with a greater proportion of those with severe disease or death being older or with comorbidities. There have been very few deaths reported in those <19 years, but proportion of deaths increases with age, with case-fatality rates of ~10-20% for those aged 70 years or older (1, 4).

This age-related variation to some extent reflects comorbidities. Evidence emerging following the outbreak in China suggests that people with comorbidities are more likely to experience severe disease than those without. In a study of 1590 of the first confirmed cases from China, 33% of severe cases had at least one co-morbidity compared to 10% of non-severe cases, with hypertension, diabetes and cardiovascular disease (CVD) being the most common (6). A meta-analysis of eight studies including 46,248 patients found that patients with severe disease had greater odds of having a comorbidity than non-severe patients, including 3.42 relative odds of CVD (OR 3.42, 95% CI: 1.88-6.22), 2.46 for respiratory system disease (OR 2.46, 95% CI: 1.76-3.44) and 2.46 for hypertension (OR 2.36, 95% CI: 1.46-3.83) (7). In a study of 41 hospital admitted patients in China with confirmed COVID-19 and pneumonia, 15% had CVD (8), and COVID-19 patients with CVD have been found to be at increased risk of mortality compared to those without CVD (9). A meta-analysis of six studies with 1527 patients found that CVD incidence was three times higher in ICU patients compared to those not in the ICU and 8% of those diagnosed with COVID-19 had an acute cardiac injury (10). SARS-CoV-2 causes infection by binding to Angiotensin-converting enzyme 2 (ACE2), which is highly expressed in lung and heart cells and is important in heart function (11). It is hypothesised that increased secretion of ACE2 in people with existing CVD may explain more severe disease outcomes in these people (11).

Australian-specific data is essential as we continue through the epidemic as outcomes are dependent on a number of country-specific factors including population profile, health system factors and the public health actions taken by individuals and Government.

## References

1. U.S. Department of Health and Human Services. Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19) — United States, February 12–March 16, 2020. *MMWR Morb Mortal Wkly Rep*. 2020.
2. Guan W-j, Ni Z-y, Hu Y, Liang W-h, Ou C-q, He J-x, et al. Clinical characteristics of coronavirus disease 2019 in China. *New England Journal of Medicine*. 2020.

3. Grasselli G, Pesenti A, Cecconi M. Critical care utilization for the COVID-19 outbreak in Lombardy, Italy: early experience and forecast during an emergency response. *Jama*. 2020.
4. Livingston E, Bucher K. Coronavirus disease 2019 (COVID-19) in Italy. *Jama*. 2020.
5. Onder G, Rezza G, Brusaferro S. Case-fatality rate and characteristics of patients dying in relation to COVID-19 in Italy. *JAMA*.
6. Guan W-j, Liang W-h, Zhao Y, Liang H-r, Chen Z-s, Li Y-m, et al. Comorbidity and its impact on 1590 patients with Covid-19 in China: A Nationwide Analysis. *European Respiratory Journal*. 2020.
7. Yang J, Zheng Y, Gou X, Pu K, Chen Z, Guo Q, et al. Prevalence of comorbidities in the novel Wuhan coronavirus (COVID-19) infection: a systematic review and meta-analysis. *Int J Infect Dis*. 2020.
8. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet*. 2020;395(10223):497-506.
9. Peng YD, Meng K, Guan HQ, Leng L, Zhu RR, Wang BY, et al. [Clinical characteristics and outcomes of 112 cardiovascular disease patients infected by 2019-nCoV]. *Zhonghua Xin Xue Guan Bing Za Zhi*. 2020;48(0):E004.
10. Li B, Yang J, Zhao F, Zhi L, Wang X, Liu L, et al. Prevalence and impact of cardiovascular metabolic diseases on COVID-19 in China. *Clinical Research in Cardiology*. 2020:1-8.
11. Zheng Y-Y, Ma Y-T, Zhang J-Y, Xie X. COVID-19 and the cardiovascular system. *Nature Reviews Cardiology*. 2020:1-2.