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ORIGINAL RESEARCH

Outcomes for emergency department patients with suspected and confirmed COVID-19: An analysis of the Australian experience in 2020 (COVED-5)

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Key findings

- For this report (COVED-5) from the COVED Project, data was available for 24 405 eligible patients (tested for SARS-CoV-2 in the ED) from 12 sites across four Australian states for the period from 1 April to 30 November 2020, of which 423 were SARS-CoV-2 positive.
- ED patients who tested positive for SARS-CoV-2 had higher odds of mechanical ventilation and death in hospital.
- The strongest predictors of death were age, a higher triage category, obesity and receiving immunosuppressive treatment.

Abstract

Objective: The aim of the present study was to describe the characteristics and outcomes of patients

presenting to Australian EDs with suspected and confirmed COVID-19 during 2020, and to determine the predictors of in-hospital death for SARS-CoV-2 positive patients.

Methods: This analysis from the COVED Project presents data from 12 sites across four Australian states for the period from 1 April to 30 November 2020. All adult patients who met local criteria for suspected COVID-19 and underwent testing for SARS-CoV-2 in the ED were eligible for inclusion. Study outcomes were mechanical ventilation and in-hospital mortality.

Results: Among 24 405 eligible ED presentations over the whole study period, 423 tested positive for SARS-CoV-2. During the 'second wave' from 1 July to 30 September 2020, 26 (6%) of 406 SARS-CoV-2 patients received invasive mechanical ventilation, compared to 175 (2%) of the 9024 SARS-CoV-2 negative patients (odds ratio [OR] 3.5; 95% confidence interval [CI] 2.3–5.2, $P < 0.001$), and 41 (10%) SARS-CoV-2 positive patients died in hospital compared to 312 (3%) SARS-CoV-2 negative patients (OR 3.2; 95% CI 2.2–4.4, $P = 0.001$). For SARS-CoV-2 positive patients, the strongest independent predictors of hospital death were age (OR 1.1; 95% CI 1.1–1.1, $P < 0.001$), higher triage category (OR 3.5; 95% CI 1.3–9.4, $P = 0.012$), obesity (OR 4.2; 95% CI 1.2–14.3, $P = 0.024$) and receiving immunosuppressive treatment (OR 8.2; 95% CI 1.8–36.7, $P = 0.006$).

Conclusions: ED patients who tested positive for SARS-CoV-2 had higher odds of mechanical ventilation and death in hospital. The strongest predictors of death were age, a higher triage category, obesity and receiving immunosuppressive treatment.

Key words: *COVID-19, emergency, isolation, quality improvement, registry.*

Introduction

The COVID-19 pandemic continues to have a global impact. Increasingly, 'variants of concern' are precipitating further waves of infection, leading to significant morbidity and mortality.[1–3] While Australia has been relatively successful in containing the spread of the virus, sporadic outbreaks continue to place pressure on the healthcare system.[4–6]

For Australian EDs, the cycle of intermittent regional surges has necessitated the ongoing use of rigorous infection prevention and control (IPC) precautions. This continues to impact the delivery of emergency care, particularly for patients who meet case definition criteria for COVID-19 and require SARS-CoV-2 testing and isolation in the ED.[6–9] In this context, there is a persisting need for data regarding the epidemiology and outcomes of patients with suspected and confirmed COVID-19. Understanding the clinical predictors of severe disease can help inform clinical care and disposition decisions.[10]

The COVID-19 ED (COVED) Quality Improvement Project was initiated in April 2020 to inform clinical decision making and system reforms in Australian EDs.[11] COVED-1 and COVED-2, which coincided with Australia's 'first wave', demonstrated a low positive test rate, with no SARS-CoV-2 positive patients receiving mechanical ventilation or dying in the ED of the single participating site.[12,13] These studies also identified a high number of patients meeting case definition criteria and requiring isolation.[12,13]

COVED-3 reported data across eight EDs during July 2020, and revealed no difference in the rates of mechanical ventilation and in-hospital death between SARS-CoV-2 positive and negative patients. The main clinical predictors of a COVID-19 diagnosis were subjective fever, bilateral infiltrates on chest X-ray (CXR), non-smoking status and absence of leucocytosis.[14]

COVED-4 reported data from 12 EDs in four Australian states across July and August 2020.[6] While the case-positivity rate remained relatively low, COVED-4 established that patients who were SARS-CoV-2 positive on ED testing were more likely than SARS-CoV-2 negative patients to require mechanical ventilation and/or die in hospital. Similar to COVED-3, strong clinical predictors of a positive SARS-CoV-2 test result were self-reported fever, bilateral infiltrates on CXR, absence of leucocytosis and sore throat.[6]

The aim of the present study (COVED-5) was to describe the ED experience of COVID-19 in Australia during 2020. Specifically, COVED-5 reports the epidemiology and outcomes of patients presenting to Australian EDs with suspected COVID-19, and, for the first time, establishes the predictors of in-hospital death among patients who return a positive SARS-CoV-2 test result.

Methods

The COVED Project is a prospective cohort study that commenced on 1 April 2020. The research protocol has been published previously.[11] The study includes adult patients who had a SARS-CoV-2 polymerase chain reaction (PCR) test requested in the ED and were managed with IPC precautions for 'suspected COVID-19'. Testing criteria were guided by the various health jurisdictions, and have evolved throughout the Project. These have been summarised in previous COVED publications.[6,14]

This analysis (COVED-5) describes study findings for eligible patients who presented to the 12 participating EDs (The Alfred Hospital, St Vincent's Hospital Melbourne, Austin Hospital, Box Hill Hospital, The Royal Melbourne Hospital, University Hospital Geelong, Royal Hobart Hospital, Launceston General Hospital, North-West Regional Hospital, Mersey Community Hospital, Sutherland Hospital Sydney and Townsville University Hospital) over the 8-month period from 1 April to 30 November 2020. The Project's study sites represent a mixture of urban and regional EDs across Victoria, Tasmania, New South Wales and Queensland, and commenced participation in the COVED Project at different stages during 2020 (Table 1). In all of these locations, alternative non-ED testing sites (e.g. screening clinics) were in operation for those with minor symptoms who did not require emergency care. Patients who presented to these clinics and were not assessed in the ED were excluded from the present study.

The present study (COVED-5) analysed the demographic and ED arrival data for the period 1 April to 30 November 2020. It then compared the outcomes of mechanical

TABLE 1. *Number of submitted cases for analysis and report by site over study period: 1 April to 30 November 2020*

Site	SARS-CoV-2 positive (*n*)	SARS-CoV-2 negative (*n*)	Date range for submitted case data reported in Table 4†,‡
The Alfred Hospital	59	7803	1 April to 30 November
Austin Hospital	104	1775	1 July to 8 October
Box Hill Hospital	24	1602	1 July to 30 September
Launceston General Hospital	0	331	1 July to 30 September
Mersey Community Hospital	0	92	1 April to 30 September
North-West Regional Hospital	0	97	1 July to 30 September
Royal Hobart Hospital	4	1000	1 April to 30 September
The Royal Melbourne Hospital	127	6685	1 July to 31 October
St Vincent's Hospital Melbourne	93	298	8 May to 30 September
Sutherland Hospital	0	1050	1 July to 31 October
Townsville University Hospital	0	2740	1 April to 30 November
University Hospital Geelong	12	509	1 July to 30 September
Total	423	23 982	

†Table 3 reports the outcome analyses from 1 July to 30 September 2020 across all sites, restricted to SARS-CoV-2 positive cases submitted by Austin Hospital, The Royal Melbourne Hospital and St Vincent's Hospital Melbourne. ‡All dates pertain to the year 2020.

ventilation and death between SARS-CoV-2 positive and negative patients (based on ED testing) during Australia's second wave, defined as 1 July to 30 September 2020. These dates were selected on the basis of a markedly increased frequency of SARS-CoV-2 positive test results during this period.

For those patients who were SARS-CoV-2 positive on ED testing, COVED-5 then investigated the associations between in-hospital death and a range of ED-relevant clinical variables, as listed in the COVED protocol.[11] Finally, the study identified variables to be included in a model predicting death for patients who tested positive for SARS-CoV-2 in the ED. All variables for which a univariable association with in-hospital death was demonstrated were candidates for model inclusion. Stepwise multivariable logistic regression was performed to arrive at the final prediction model.

Administrative and clinical data for study participants were collected from hospital electronic medical record (EMR) systems. Some variables were automatically extracted from data warehouses, however all sites relied on some degree of manual record review. Data have been entered into a novel COVED Registry utilising Research Electronic Data Capture (REDCap) tools, hosted and managed by Helix (Monash University).[15,16]

Symmetrical numerical data have been summarised using the mean and standard deviation; skewed and ordinal data have been summarised using the median and interquartile range; and categorical data have been summarised using frequency and percentage. Data were analysed using Stata statistical software (version 15.1; StataCorp, College Station, TX, USA). A *P*-value of <0.05 was defined to be statistically significant. Ethics approval was obtained from the Alfred Human Research Ethics Committee (Project No: 188/20).

Results

During the study period, there were 24 405 patient presentations to the participating EDs that met inclusion criteria and were available for analysis. Of these, 423 patients returned a positive SARS-CoV-2 test result and 23 982 were negative. The dates and case numbers for the data submitted from each site are summarised in Table 1.

Table 2 summarises the baseline demographic and ED arrival characteristics of included patients for both the overall study period (1 April to 30 November 2020) and the 'second wave' study period (1 July to 30 September 2020). There were no statistically significant differences in the distribution of age, sex, mode of arrival or triage category between SARS-CoV-2 positive and negative patients.

Patient outcomes for the period 1 July to 30 September 2020, representing Australia's second wave, are summarised in Table 3. Of the SARS-CoV-2 positive patients, 41 (10%) died in hospital compared to 312 (3%) of the SARS-CoV-2 negative patients (odds ratio [OR] 3.2; 95% confidence interval [CI] 2.2–4.4, $P = 0.001$). Twenty-six (6%) of the SARS-CoV-2 positive patients received invasive mechanical ventilation during their hospital admission, compared to 175 (2%) of the SARS-CoV-2 negative patients (OR 3.5; 95% CI 2.3–5.2, $P < 0.001$). SARS-CoV-2 positive

TABLE 2. *Baseline demographic and ED arrival details by SARS-CoV-2 result from ED PCR for the periods pertaining to Tables 3 and 4*

Variable	1 July to 30 September 2020 (Table 3)			1 April to 30 November 2020 (Table 4)		
	SARS-CoV-2 positive ($n = 406$)	SARS-CoV-2 negative ($n = 9024$)	OR (95% CI), *P*-value	SARS-CoV-2 positive ($n = 423$)	SARS-CoV-2 negative ($n = 23\,982$)	OR (95% CI), *P*-value
Age in years, mean (SD)	58 (22)	59 (22)	1.0 (1.0–1.0), 0.52	58 (22)	58 (22)	1.0 (1.0–1.0), 0.84
Sex, *n* (%)						
Male	200 (49)	4412 (49)	1.0 (0.8–1.2), 0.89	212 (50)	12 213 (51)	0.9 (0.8–1.1), 0.57
Mode of transport, *n* (%)						
Private transport/other	149 (37)	3631 (40)	Reference group	155 (37)	9299 (39)	Reference group
Ambulance – road	247 (61)	5073 (56)	1.2 (1.0–1.5), 0.11	258 (61)	13 852 (58)	1.1 (0.9–1.4), 0.28
Ambulance – helicopter	0 (0)	53 (1)	–	0 (0)	193 (1)	–
Public transport	10 (2)	257 (3)	0.9 (0.5–1.8), 0.87	10 (2)	628 (3)	1.0 (0.5–1.8), 0.89
Triage category, median (IQR)	3 (2,3)	3 (2,3)	–	3 (3,3)	3 (2,3)	–
Triage category, *n* (%)						
1	8 (2)	207 (2)	Reference group	8 (2)	736 (3)	Reference group
2	95 (23)	2178 (24)	1.1 (0.5–2.4), 0.75	97 (23)	5757 (24)	1.6 (0.8–3.2), 0.24
3	227 (56)	4596 (51)	1.3 (0.6–2.6), 0.50	237 (56)	12 362 (52)	1.8 (0.9–3.6), 0.12
4	74 (18)	1818 (20)	1.1 (0.5–2.2), 0.89	79 (19)	4632 (19)	1.6 (0.8–3.3), 0.23
5	2 (0)	212 (2)	0.2 (0.1–1.2), 0.08	2 (0)	479 (2)	0.4 (0.1–1.8), 0.23

–, category omitted from estimation because of perfect prediction (empty cell) or collinearity; CI, confidence interval; IQR, interquartile range; OR, odds ratio; SD, standard deviation.

patients were more likely to be admitted to the intensive care unit (26/406 [6%] *vs* 204/9024 [2%], OR 6.4; 95% CI 4.0–10.3, $P < 0.001$) or the general ward (247/406 [61%] *vs* 3777/9024 [42%], OR 3.3; 95% CI 2.5–4.3, $P < 0.001$) than SARS-CoV-2 negative patients respectively.

Table 4 describes the ED-relevant clinical features of the patients who were subsequently confirmed as SARS-CoV-2 positive on ED testing, comparing those who died in hospital to those who survived to hospital discharge. This analysis was conducted over the whole study period of 1 April to 30 November 2020. There was a statistically significant univariable association between hospital death and age (OR 1.1; 95% CI 1.1–1.1, $P < 0.001$). The strength of this association is further illustrated in Figure 1; specifically, there were no deaths among patients less than 50 years of age testing positive to SARS-CoV-2 in the ED. SARS-CoV-2 ED patients who were assigned a triage category of 1 or 2 (OR 3.7; 95% CI 2.0–7.1, $P < 0.001$) or presented from a residential aged care facility (OR 9.1; 95% CI 3.9–21.2, $P < 0.001$) had greater odds of death in hospital. Comorbidities associated with death were obesity (OR 3.2; 95% CI 1.2–8.4, $P = 0.02$), a chronic cardiac condition (OR 6.0; 95% CI 2.7–13.3, $P < 0.001$), chronic hypertension (OR 4.3; 95% CI 1.9–9.8, $P < 0.001$) and receiving immunosuppressive treatment (OR 3.6; 95% CI 1.1–12.3, $P = 0.04$). There was a statistically significant association between death in hospital and oxygen saturation (OR 0.9; 95% CI 0.9–1.0, $P = 0.01$), an increased white blood cell count (OR 1.1; 95% CI 1.0–1.2, $P = 0.04$), and thrombocytopaenia (OR 2.4; 95% CI 1.0–5.8, $P = 0.04$).

For those variables that demonstrated a univariable association between in-hospital death and a positive SARS-CoV-2 test result, Table 4 also provides the corresponding positive and negative likelihood ratios and summarises the parameters of a clinical prediction model for death in hospital. The final set of four clinical variables in the COVED model for predicting death in hospital were age, triage category of 1 or 2, obesity and receiving immunosuppressive treatment.

Discussion

The COVED Project represents the largest dataset of patients with suspected and confirmed COVID-19 in Australian EDs. The present study, COVED-5, provides: a summary of the demographics and baseline data for suspected and confirmed cases over the 8-month period between 1 April and 30 November 2020; a comparison of deaths and mechanical ventilation during Australia's second wave; and an analysis of the main determinants and predictors of death in hospital among SARS-CoV-2 positive patients.

Compared to SARS-CoV-2 negative patients, SARS-CoV-2 positive patients presenting to an ED were more likely to require mechanical ventilation or die in hospital. This confirms previous data regarding the increased risk of poor outcomes among patients with COVID-19, relative to other ED patients with similar symptoms.[6]

TABLE 3. *Outcomes by result of ED SARS-CoV-2 test for the period: 1 July to 30 September 2020*

Variable	SARS-CoV-2 positive ($n = 406$)	SARS-CoV-2 negative ($n = 9024$)	OR (95% CI)	*P*-value
Disposition destination from ED, *n* (%)				
Home	67 (17)	3369 (37)	Reference group	
Died in ED	1 (0)	16 (0)	3.2 (0.4–24.1)	0.27
ICU	26 (6)	204 (2)	6.4 (4.0–10.3)	<0.001
OT	1 (0)	62 (1)	0.8 (0.1–6.0)	0.84
Ward (not ICU)	247 (61)	3777 (42)	3.3 (2.5–4.3)	<0.001
ED Short Stay Unit	61 (15)	1167 (13)	2.6 (1.9–3.8)	<0.001
Transfer to other hospital	3 (1)	300 (3)	0.5 (0.2–1.6)	0.25
Discharge against medical advice	0 (0)	82 (1)	–	–
Other	0 (0)	31 (0)	–	–
Invasive mechanical ventilation in hospital, *n* (%)				
Yes	26 (6)	175 (2)	3.5 (2.3–5.2)	<0.001
Discharge destination from hospital, *n* (%)				
Home	290 (71)	7213 (80)	Reference group	
Died in hospital	41 (10)	310 (3)	3.2 (2.3–4.7)	<0.001
Residential care facility	31 (8)	474 (5)	1.6 (1.1–2.4)	0.01
Transfer to other hospital	35 (9)	728 (8)	1.2 (0.8–1.7)	0.33
Discharge against medical advice	1 (0)	190 (2)	0.1 (0.0–0.9)	0.04
Hospital in the home	5 (1)	45 (1)	2.8 (1.1–7.0)	0.03
Other	3 (1)	53 (1)	1.4 (0.4–4.5)	0.57

–, category omitted from estimation because of perfect prediction (empty cell); CI, confidence interval; ICU, intensive care unit; OR, odds ratio; OT, operating theatre.

Among patients who tested positive for SARS-CoV-2 in an ED, the odds of dying in hospital increased with age, being resident in an aged care facility, a triage assignment of category 1 or 2, lower oxygen saturations on arrival, obesity, receiving immunosuppressive treatment, thrombocytopaenia, a higher white blood cell count and a history of cardiac disease. The strongest model for predicting death combined the following risk factors: age, triage category of 1 or 2, obesity and receiving immunosuppressive therapy.

A reasonable interpretation of this COVED death prediction model is that age captures the univariable association with chronic cardiac conditions, hypertension and living in a residential aged care facility, but not the independent associations with obesity nor receiving immunosuppressive treatment. Similarly, triage effectively captures patients who are subsequently confirmed as being hypoxic. It is important to note that each of these variables independently contributes to an increased odds of death in hospital. For example, adjusted for age, there is an independent increase in the odds of death in hospital from being obese, receiving immunosuppressive treatment or having a high triage assignment.

These results are broadly consistent with the findings of overseas analyses, particularly in relation to the association of age, obesity and co-morbidities with poor outcomes.[10,17–21] Globally, a large number of studies have used data of this nature to derive and validate COVID-19 severity prediction tools. A living systematic review has identified more than 100 prognostic models,[19] including the 4C mortality score and the QCOVID living risk prediction algorithm.[17,18] Specific severity rules have also been developed for ED populations, including the Quick COVID-19 Severity Index and PRIEST score.[10,22,23]

In addition to these *de novo* approaches, the performance of existing pneumonia and sepsis assessment tools has been assessed.[10,24,25] In general, these instruments rely heavily on clinical data, such as vital signs, to calculate the risk of severe disease. A recent study using data from 70 EDs in the UK suggests that the combination of

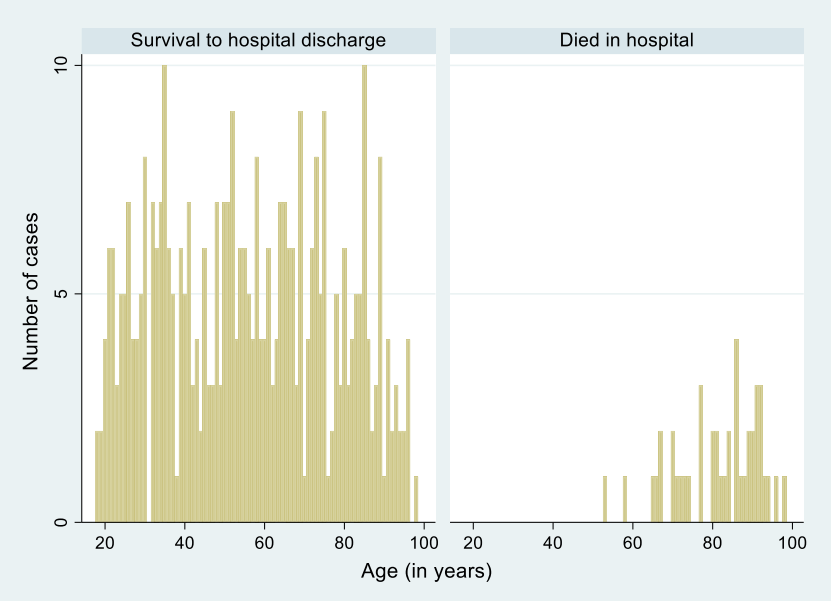

Figure 1. *Number of cases who died in hospital* versus *survived to hospital discharge by age.*

the NEWS2 scoring system and demographic data (age, sex and performance status) can identify patients at risk of adverse outcomes with a high degree of sensitivity.[10]

Until now, the low number of COVID-19 cases in the COVED registry had prohibited this type of analysis. COVED-5, therefore, provides the first local data in relation to the risk of poor outcomes for Australian patients testing positive for SARS-CoV-2 in the ED. This is highly relevant given the substantial global variation in COVID-19 experience to date, and Australia's relatively unique position in the world.

There are several considerations important to the interpretation of the present study. First, for several participating sites, data on SARS-CoV-2 negative patients were not available (Table 1). Second, as described in Table 4, multiple clinical (presenting complaint and comorbidity) variables were missing more than 20% of observations. Third, the COVED Project's inclusion criteria remain defined by being tested for SARS-CoV-2 in the ED. Fourth, some of the data used in the previous analyses (COVED studies 1 to 4) have been incorporated into this overarching cumulative analysis of an expanded dataset (8 months and 12 EDs). Fifth, some of the clinical variables capturing presenting complaint, co-morbidities and clinical examination were necessarily subjective in definition, including obesity and receiving immunosuppressive treatment. Sixth, the findings of COVED-5 cannot be separated from the existing public health context over much of the study period; strict lockdowns where almost half of the participating EDs are situated (i.e. Melbourne, Australia) will have been a factor in the case-mix of ED presentations and generalisability of the results. Specifically, that no-one aged less than 50 years died from SARS-CoV-2 in the present study precludes any detailed analysis of risk factors for death in this age group. Finally, the present study does not describe the characteristics and outcomes of patients presenting to Australian EDs with the Delta variant of SARS-CoV-2, which has been associated with higher rates of hospitalisation.[3] This 'variant of concern' is now emerging as the predominant strain worldwide, including in Australia.[1,4] Further research is required to define how infection with the Delta variant influences disease progression and outcomes among patients presenting to the ED.

Notwithstanding these considerations, COVED-5 provides important information on the outcomes of Australian ED patients who test positive for SARS-CoV-2. The findings will inform clinical judgement and decision-making regarding the goals, location, processes and systems of care for patients with suspected and confirmed COVID-19.

Conclusion

Among patients with suspected COVID-19 presenting to Australian EDs, those testing positive to SARS-CoV-2 had higher odds of mechanical ventilation and death in hospital compared with SARS-CoV-2 negative patients. For SARS-CoV-2 positive patients, age, triage category, obesity and immunosuppressive treatment were predictive of in-hospital death. These findings will help inform clinical decisions and processes in Australian EDs.

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TABLE 4. *Results of analysis to determine univariable association and predictive performance of ED variables with death in hospital among SARS-CoV-2 positive patients on ED testing (for the study period: 1 April to 30 November 2020)*

Variable	Missing >20% (yes/no)	Died in hospital ($n = 43$)	Survived to hospital discharge ($n = 380$)	OR (95% CI), *P*-value	Positive likelihood ratio	Negative likelihood ratio	Prediction model† OR (95% CI), *P*-value
Demographics							
Age in years, mean (SD)	No	81 (11)	56 (22)	1.1 (1.1–1.1), <0.001	–	–	1.1 (1.1–1.1), <0.001
Sex, male, *n* (%)	No	25 (58)	187 (49)	1.4 (0.7–2.7), 0.28	–	–	–
Arrival details							
Mode of transport, *n* (%)	No						
Private transport/other		12 (28)	143 (38)	Reference group			
Ambulance – road		31 (72)	227 (60)	1.6 (0.8–3.3), 0.17	–	–	–
Ambulance – helicopter		0 (0)	0 (0)	–	–	–	–
Public transport		0 (0)	10 (3)	–	–	–	–
Triage category, median (IQR)	No	2 (2,3)	3 (3,3)	<0.001	–	–	–
Triage category, *n* (%)	No						
1		3 (7)	5 (1)	Reference group			
2		19 (44)	78 (21)	0.4 (0.9–1.9), 0.24	–	–	–
3		15 (35)	222 (58)	0.1 (0.0–0.5), 0.005	–	–	–
4		6 (14)	73 (19)	0.1 (0.0–0.7), 0.02	–	–	–
5		0 (0)	2 (1)	–	–	–	–
Triage category of 1 or 2, *n* (%)	No	22 (51)	83 (22)	3.7 (2.0–7.1), <0.001	2.3	0.6	3.5 (1.3–9.4), 0.012
Presenting complaint, *n* (%)							
Shortness of breath	Yes	15 (52)	143 (457)	0.8 (0.4–1.7), 0.58	–	–	–
Cough	Yes	14 (52)	150 (61)	0.7 (0.3–1.5), 0.35	–	–	–
Anosmia or dysgeusia	Yes	1 (6)	35 (18)	0.3 (0.0–2.1), 0.21	–	–	–
Sore throat	Yes	2 (30)	63 (29)	0.3 (0.1–1.1), 0.07	–	–	–
Runny nose	Yes	1 (4)	44 (21)	0.2 (0.0–1.3), 0.09	–	–	–
Fever	Yes	14 (52)	146 (59)	0.8 (0.3–1.7), 0.48	–	–	–

(*Continues*)

TABLE 4. *Continued*

Variable	Missing >20% (yes/no)	Died in hospital ($n = 43$)	Survived to hospital discharge ($n = 380$)	OR (95% CI), *P*-value	Positive likelihood ratio	Negative likelihood ratio	Prediction model† OR (95% CI), *P*-value
Fatigue	Yes	13 (57)	105 (49)	1.3 (0.6–3.2), 0.51	–	–	–
Myalgia	Yes	3 (14)	74 (35)	0.3 (0.1–1.1), 0.07	–	–	–
Diarrhoea	Yes	2 (9)	43 (20)	0.4 (0.1–1.7), 0.15	–	–	–
Other relevant history, *n* (%)							
Residential aged care facility	Yes	20 (69)	50 (20)	9.1 (3.9–21.2), <0.001	3.5	0.4	–
Comorbidities, *n* (%)							
Chronic respiratory	Yes	10 (36)	55 (22)	2.0 (0.9–4.6), 0.10	–	–	–
Obesity	Yes	7 (25)	22 (9)	3.2 (1.2–8.4), 0.02	2.7	0.8	4.2 (1.2–14.3), 0.024
Smoker	Yes	7 (30)	44 (20)	1.8 (0.7–4.6), 0.23	–	–	–
Chronic cardiac	Yes	16 (55)	43 (17)	6.0 (2.7–13.3), <0.001	3.2	0.5	–
Hypertension	Yes	19 (66)	77 (30)	4.3 (1.9–9.8), <0.001	2.2	0.5	–
Diabetes mellitus	Yes	9 (32)	61 (24)	1.5 (0.6–3.5), 0.35	–	–	–
Malignant neoplasm	Yes	2 (7)	13 (5)	1.4 (0.3–6.6), 0.66	–	–	–
Immunosuppressive pharmacotherapy	Yes	4 (14)	11 (4)	3.6 (1.1–12.3), 0.04	3.3	0.9	8.2 (1.8–36.7), 0.006
Examination – first vital signs in ED							
Temperature (°C), mean (SD)	No	37.3 (1.3)	37.2 (1.0)	1.0 (0.8–1.4), 0.85	–	–	–
Fever recorded (temperature ≥38°C), *n* (%)		14 (33)	96 (26)	1.4 (0.7–2.8), 0.31	–	–	–
SaO_2 (%), mean (SD)	No	94 (5)	96 (4)	0.9 (0.9–1.0), 0.01	–	–	–
Hypoxia (SaO_2 <92%), *n* (%)		8 (20)	35 (10)	2.3 (1.0–5.5), 0.047	2.1	0.9	–
Systolic blood pressure (mmHg), mean (SD)	No	130 (30)	132 (23)	1.0 (1.0–1.0), 0.54	–	–	–
Hypotension (SBP <100 mmHg), *n* (%)		4 (10)	18 (5)	2.1 (0.7–6.4), 0.21	–	–	–

TABLE 4. *Continued*

Variable	Missing >20% (yes/no)	Died in hospital ($n = 43$)	Survived to hospital discharge ($n = 380$)	OR (95% CI), *P*-value	Positive likelihood ratio	Negative likelihood ratio	Prediction model† OR (95% CI), *P*-value
Examination – other							
Abnormality on chest auscultation, *n* (%)‡	Yes	15 (54)	91 (41)	1.7 (0.7–3.7), 0.23	–	–	–
Investigations – imaging‡							
CXR report, *n* (%)	Yes	10 (34)	84 (38)	Reference	–	–	–
Yes – bilateral infiltrates		9 (31)	101 (46)	0.7 (0.3–1.9), 0.55	–	–	–
Yes – other abnormality		10 (34)	37 (17)	2.3 (0.3–1.9), 0.09	–	–	–
Investigations – blood tests‡							
White blood cell count ($\times 10^9$/L), mean (SD)	No	8 (4)	7 (3)	1.1 (1.0–1.2), 0.04	–	–	–
Leucocytosis (WCC >11.0 [$\times 10^9$/L]), *n* (%)		5 (15)	26 (9)	1.8 (0.3–4.9), 0.28	–	–	–
Platelet count ($\times 10^9$/L), mean (SD)	No	205 (84)	232 (96)	1.0 (1.0–1.0), 0.16	–	–	–
Thrombocytopaenia (platelet count <150 $\times 10^9$/L), *n* (%)		9 (32)	44 (16)	2.4 (1.0–5.8), 0.04	2.0	0.8	–
						AIC	116
						AUROC	0.89 (0.84–0.94)

†Clinical variables with a statistically significant univariable association with dying in hospital. ‡May not have been performed. –, not meeting criteria for calculation of likelihood ratios (no statistically significant association with SARS-CoV-2 test result) and/or not included in final prediction model; AIC, Akaike information criteria; AUROC, area under the receiver operating characteristic curve; CI, confidence interval; IQR, interquartile range; OR, odds ratio; SBP, systolic blood pressure; WCC, white blood cell count.

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Author contributions

All authors listed have contributed to the concept and design of this Original Research, including its analysis plan, and have critically reviewed the Original Research for content.

Competing interests

GMOR, BM, VT and PAC are section editors for *Emergency Medicine Australasia*.

Ethics approval

Ethics approval was obtained from the Alfred Human Research Ethics Committee (Project No: 188/20) on 26 March 2020 and approved as a multi-site project (63444) on 9 April 2020. The requirement for patient consent was waived.

Data availability statement

Data that support the findings of this study may be available upon reasonable request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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