



# WHO Global Clinical Platform for COVID-19

*Data for public health response*

## Report on the clinical characterization of COVID-19 Brazil



JUNE 2021



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# Acknowledgments

## Data contributors

Departamento de Atenção Hospitalar, Domiciliar e de Urgência - DAHU/SAES/MS, Ministry of Health, Brazil.  
Grupo Hospitalar Conceição- GHC/MS, Porto Alegre, Brazil

*Empresa Brasileira de Serviços Hospitalares-EBSERH/MEC, Brazil*

Hospital das Clínicas da UFMG, Brazil  
Hospital das Clínicas da UFPE, Brazil  
Hospital das Clínicas da UFTM, Brazil  
Hospital de Doenças Tropicais-HDT/UFT, Brazil  
Hospital Escola da UFPel, Brazil  
Hospital Universitário HEWAB/UNIVASF, Brazil  
Hospital Regional de Lagarto- HRL/UFS, Brazil  
Hospital Universitário Ana Bezerra-HUAB/UFRN, Brazil  
Hospital Universitário Alcides Carneiro-HUAC/UFCG, Brazil  
Hospital Universitário de Brasília-HUB/UNB, Brazil  
Hospital Universitário Cassiano Antônio Moraes- HUCAM/UFES, Brazil  
Hospital Universitário Antonio Pedro – HUAP/UFF, Brazil  
Hospital Universitário Gaffrée e Guinle-HUGG/UNIRIO, Brazil  
Hospital Universitário Júlio Bandeira-HUJB/UFCG, Brazil  
Hospital Universitário Lauro Wanderley-HULW/UFPB, Brazil  
Hospital Universitário Santa Maria-HUSM/UFMS, Brazil  
Hospital Universitário da Grande Dourados/UFGD, Brazil  
Hospital Universitário da UFJF, Brazil  
Hospital Universitário da Universidade Federal do Maranhão, Brazil  
Hospital Universitário Walter Cantídio – UFC, Brazil  
Hospital Maternidade-Escola Assis Chateaubriand – UFC, Brazil  
Hospital das Clínicas da Universidade Federal de Goiás-HC/UFG, Brazil  
Hospital Universitário da UFSCar, Brazil

Hospital de Clínicas de Porto Alegre - HCPA/UFRGS, Brazil  
Secretaria de Estado da Saúde do Ceará, Brazil

*Instituto de Saúde e Gestão Hospitalar, Fortaleza, Brazil*

Hospital Geral Dr Waldemar Alcântara, Brazil  
Hospital Regional do Cariri, Brazil  
Hospital Regional Norte, Brazil  
Hospital Regional do Sertão Central, Brazil  
Hospital Estadual Leonardo da Vinci, Brazil

*Secretaria de Saúde do Distrito Federal, Brazil*

Hospital da Criança de Brasília José Alencar, Brasília, Brazil

Secretaria de Estado da Saúde do Piauí, Brazil

*Fundação Estatal Piauiense de Serviços Hospitalares – FEPISERH, Brazil*

Hospital Getúlio Vargas - (HGV/FEPISERH), Brazil

Secretaria de Estado da Saúde do Paraná, Brazil

*Complexo Hospitalar do Trabalhador, Brazil*

Hospital do Trabalhador, Curitiba, Brazil  
Hospital do Reabilitação, Curitiba, Brazil  
Hospital Osvaldo Cruz, Curitiba, Brazil

Instituto de Infectologia Emilio Ribas, São Paulo, Brazil  
Nestor Goulart Reis Hospital, Sao Paulo, Brazil  
Hospital Especializado Octávio Mangabeira, Salvador, Brazil

## WHO Secretariat

The following members from the WHO Headquarters (HQ) were involved in the conception, analysis, writing, and publication of this report.

**HQ:** Dr Silvia Bertagnolio, Dr Janet Diaz, Dr Soe Soe Thwin, Dr Ronaldo Silva, Madeleine Crowe, Firdavs Kurbonov, Flaminia Sabbatucci, Dr Sairaman Nagarajan

WHO Regional Offices: Dr Ludovic Reveiz

WHO Country Office: Dr Monica Padilla, Rosane de Mendonça Gomes, Wellington Mendes, Fernando Leles, Iasmine Ventura and Sabrina Baiocco.



# 1. Executive summary

Between 1 January 2020 and 31 March 2021 anonymized clinical data of 19474 individuals hospitalized with suspected or confirmed COVID-19 were reported to the WHO Global Clinical Platform for COVID-19; representing 0.2% of the total number of COVID-19 cases reported in the country during the same time period.

Overall, 17.6% received a laboratory test for SARS-CoV-2, which was positive in 73.0% of the cases. The mean age was 58.9 years (SD  $\pm$  20.6), 4.5% of the cases were 0-18 years old, 19.6% were 19 to 45 years old, 32.6% were 46 to 65 years old, 20.3% cases were 66 to 75 years old, and 22.9% cases were over 75 years old. 60.4% of the cases were males, 0.0% of the cases were pregnant women and 1.2% were health care workers.

Among the reported cases, 73.1% were classified as severely or critically ill at hospital admission, 21.4% were classified as mild or moderately ill, and 5.5% did not report enough clinical information to allow a classification of severity at admission.

A severe or critical clinical presentation was recorded in 99.6% of cases 0-18 years old, in 94.9% of cases 19 to 45 years old, in 94.0% of cases 46 to 65 years old, in 95.1% of cases 66 to 75 years old, and in 96.3% of cases over 75 years old.

The most commonly reported symptom at hospital admission was unknown, reported in 7595 patients. The frequency and patterns of signs and symptoms at hospital admission varied greatly according to age and severity of illness at admission. The most prevalent symptom was seizures (77.8%) among people 0-18 years old, cough (64.8%) among people 19-45 years old, cough (63.2%) among people 46-65 years old, cough (57.0%) among people 66-75 years old, and inability to walk (85.6%) among people over 75 years old.

45.3% of cases reported no underlying conditions on admission, 40.0% reported having one or two underlying conditions, and 5.3% of the cases had 3 or more underlying conditions. A body-mass index (BMI) greater than 40 was reported in 5.5% of cases while malnutrition was reported in 0.5% of cases. The most prevalent underlying condition at hospital admission was hypertension (36.6%). The frequency of the underlying conditions varied greatly by age category.

During the hospital stay, over 90.0% of the cases reporting this information received antibiotics, 3.5% received chloroquine or hydroxychloroquine. Systemic anticoagulation/antithrombotic therapy was received in 73.2% of the cases reporting this information, and corticosteroids in 68.7% of the cases reporting this information. The use of therapeutics varied greatly according to the severity of illness at hospital admission and to age category to a lesser extent.

Overall, 99.0% patients received oxygen therapy at some time during their hospital stay, of which 27.7% received invasive ventilation, and 5.6% received non-invasive ventilation. In 63.8% of the patients, the type of ventilation received was not specified.

Results of laboratory blood tests conducted at hospital admission were available in 78.3% of the patients. Among hospitalized cases reporting diagnostic interventions, 28.7% of individuals received a chest radiograph (C-XRAY) or computerized tomography (CT) scan. Among patients who had results of diagnostic imaging reported, 63.5% showed pulmonary infiltrates.

The most frequent clinical manifestation(s) during hospital stay was/were pneumonia (83.3%). Across the age categories, the most prevalent clinical manifestation was/were pneumonia (97.4%) among people 0-18 years old, pneumonia (75.3%) among people 19-45 years old, pneumonia (77.9%) among people 46-65 years old, pneumonia (86.1%) among people 66-75 years old, anaemia (93.6%) among people over 75 years old.

The mean time from the onset of symptoms to admission to the healthcare facility was 8.7 (SD = 8.7) days, with a median of 7.0 days. The mean time from hospital admission to outcome was 8.7 days (SD  $\pm$  8.7), with a median of 7.0 days.

Overall, 53.6% of patients were admitted to the ICU at any time during their hospital stay. Among cases where the time data was recorded, 76.9% were admitted to the ICU on the same day as hospital admission, 13.9% were admitted to the ICU within five days of hospital admission, and 9.2% were admitted more than five days after hospital admission. The mean and median duration of ICU stay were 7.0 and 4.0 days, respectively.

Overall, 57.0% of patients were discharged alive, 33.1% died during their hospital stay, 4.3% were transferred to another healthcare facility, and 5.6% were still hospitalized at reporting. Overall, the case fatality ratio among all hospitalized patients was 36.7%, while amongst those admitted to the ICU was 50.7%. The age group and sex with consistently the highest case fatality ratio was age >75yrs (53.5%) and Males 34.3% vs Female 31.8%.

Focusing on the sub-population of HIV infected individuals, 0.7% of the cases were infected with HIV. Of those, 2.5% were 0-18 years old, 35.0% were 19-45 years old, 57.5% were 46-65 years old and 5.0% were 66-75 years old. 32.5% of patients with HIV presented with mild/moderate illness at hospital admission, and 65.0% had severe/critical illness. Among HIV infected individuals, the most frequent symptom at hospital admission was fever. 95% of HIV-positive cases were recorded as taking antiretroviral drugs (ART). 28.9% of HIV positive cases were admitted to an ICU during the hospital stay, and 16.2% of HIV infected cases died during the hospital stay, with a case fatality ratio of 17.6%.

## 1.1. Policy uptake to inform public health action

Recommendations on therapeutic options for patients hospitalized with COVID-19 are described in WHO clinical management guidelines and are explained in the table below. The observed frequency of use (proportion of patients using medication) relative to the recommended target frequency of use is presented in the table below.

Treatment type	Definition	Observed Frequency of Use	Target
Corticosteroid use	% of severe/critical patients who received corticosteroids	- 68.7% -	Green: >97% Orange: 50-97% Red: <50%
Hydroxychloroquine/ chloroquine use	% of all hospitalized patients who received hydroxychloroquine/ chloroquine	3.5% - -	Green: <6% Orange: 6-30% Red: >30%
Systemic anticoagulant use	% of all hospitalized patients who received a systemic anticoagulant	- 68.7% -	Green: >97% Orange: 50-97% Red: <50%
Lopinavir/Ritonavir use	% of non-HIV hospitalized patients who received lopinavir/ritonavir	0.0% -	Green: <1% Orange: 1-30% Red: >30%
Corticosteroid use (%)	Hydroxychloroquine/chloroquine use (%)	Lopinavir/Ritonavir use (%)	Systemic anticoagulation use (%)
68.7%	3.5%	0.0	68.7%

## 2. Background

### 2.1. Objectives

In response to the 2019 novel coronavirus (COVID-19) pandemic, the World Health Organization (WHO) launched the WHO Global Clinical Platform for COVID-19. This is intended to provide Member States with a standardized clinical data collection system to characterize the natural history of the disease, identify risk factors for severe disease and poor outcomes, describe treatment interventions and outcomes among adults and children, and in subpopulations, including pregnant women and HIV-infected individuals.

This report describes the demographics, clinical presentation, therapeutics, clinical manifestations, and outcomes among patients hospitalized for suspected or confirmed COVID-19 reported to the WHO Global Clinical Platform by healthcare facilities and stakeholders in the country. Please note that all subsequent mentions of COVID-19 refer to either clinically suspected, or laboratory confirmed cases of COVID-19.

### 2.2. Rationale

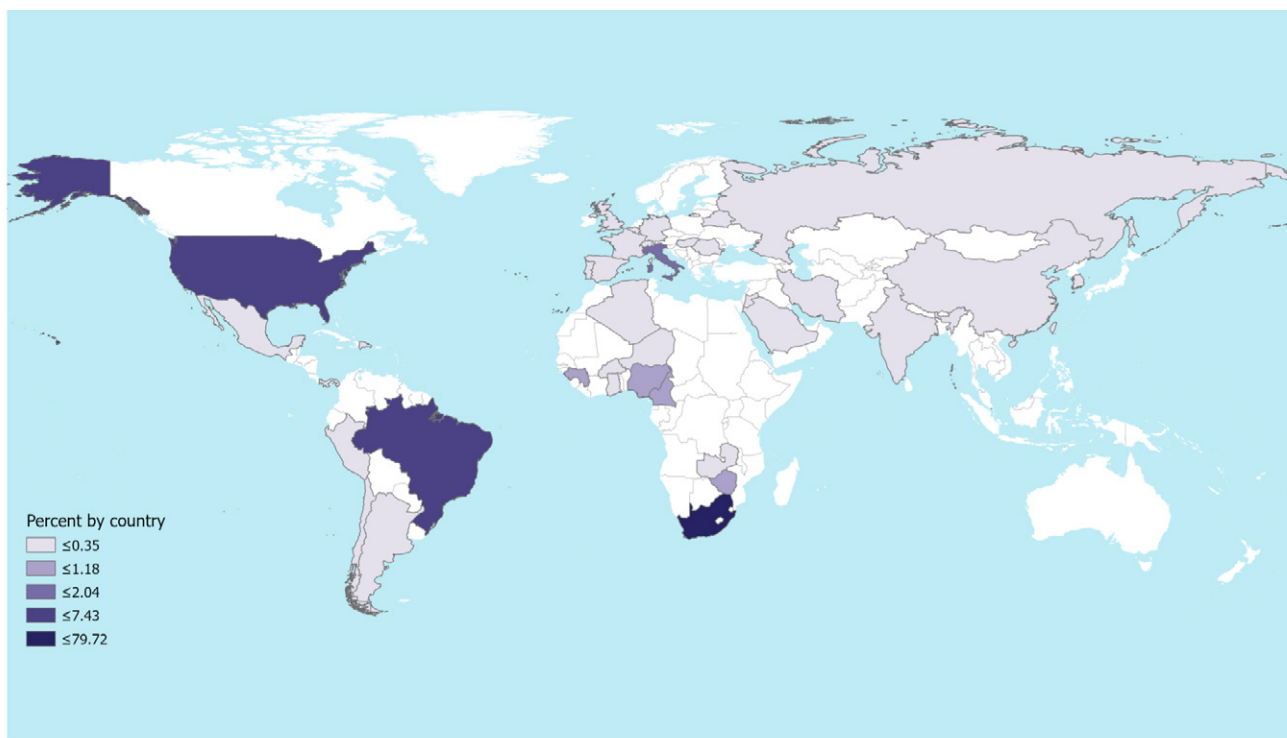
To inform appropriate clinical interventions, public health response and generation of evidence-based guidelines on clinical management of COVID-19 at the national, regional, and global levels.

### 2.3. Data source and contributors

Detailed anonymized clinical information from **19474** patients with suspected or confirmed COVID-19 admitted to healthcare facilities between **01 January 2020** and **31 March 2021** was submitted to the WHO COVID-19 Clinical Platform. Data was extracted for analysis on 24 June 2021.

Countries contributing data to the WHO Global Clinical Platform for COVID-19 are depicted in **Figure 1.1**. The individual contributors of anonymized clinical data are acknowledged on the platform URL: <https://www.who.int/teams/health-care-readiness-clinical-unit/covid-19/data-platform>.

**Figure 1.1** Contributors to the WHO Global Clinical Platform by country and relative data contribution



The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: Global COVID-19 Clinical Data Platform  
Map Production: SRH/RLC



## 2.4. Methods

A standardized case report form (CRF) is used to collect clinical information from adults and children hospitalized with COVID-19. The CRF can be downloaded from the platform URL: <https://www.who.int/teams/health-care-readiness-clinical-unit/covid-19/data-platform>. This tool enables clinical data to be compared over time and across geographic regions. Data from around the world can be aggregated and analyzed to gain a better understanding of the disease, inform the public health response, and prepare for large-scale clinical trials.

Briefly, a descriptive analysis is done on the entire population and for subgroups stratified by:

- age;
- severity of disease (mild/moderate, severe/critical); and
- subpopulations, including pregnancy and HIV status.

Descriptive data are presented as mean (standard deviation) and/or median (interquartile range) depending on the distribution patterns.

For each analysis, the denominator represents data reported. Some variables will be missing in entire data sets (for example, if collected retrospectively) or may be missing in some fields or domains. Due to heterogeneity of the data, imputation will not be done; but may be considered on a case-by-case basis.

The statistical analysis plan (SAP), can be found on the platform URL: <https://www.who.int/teams/health-care-readiness-clinical-unit/covid-19/data-platform>. See Table 2 of the SAP for the full list of demographic and clinical characteristics that are described in the report.

For the brevity of this report, supplementary information is included in the annexes. Please note that some data may be denoted as not available (NA) if not present in the analytic sample due to a lack of sufficient data contribution.

## 2.5. Limitations

Reported cases may be a convenience sample of individuals submitted by healthcare facilities and may not represent the population of patients with COVID-19 hospitalized in the country or the healthcare facility caseload of patients with COVID-19. For each analysis, individuals with missing or unknown data on the variables of interest shall be censored from the analysis. The denominator will represent data that is available.

Data related to treatment interventions may overlap.

## 2.6. Funding

The WHO Global Clinical Platform for COVID-19 was supported by WHO through R&D German grant.

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# 3. Report on COVID-19 clinical characterization

Of the **12534688** total confirmed COVID-19 cases reported in the country by **31 March 2021**, 0.2% are represented in the WHO Global Clinical platform. The total number of hospitalized cases in each country is not available to WHO.

A total of **3435** patients (**17.6%**) received a laboratory test for SARS-CoV-2, recorded as positive in **2508 (73.0%)**.

## 3.1. Demographics and clinical characteristics at hospital admission

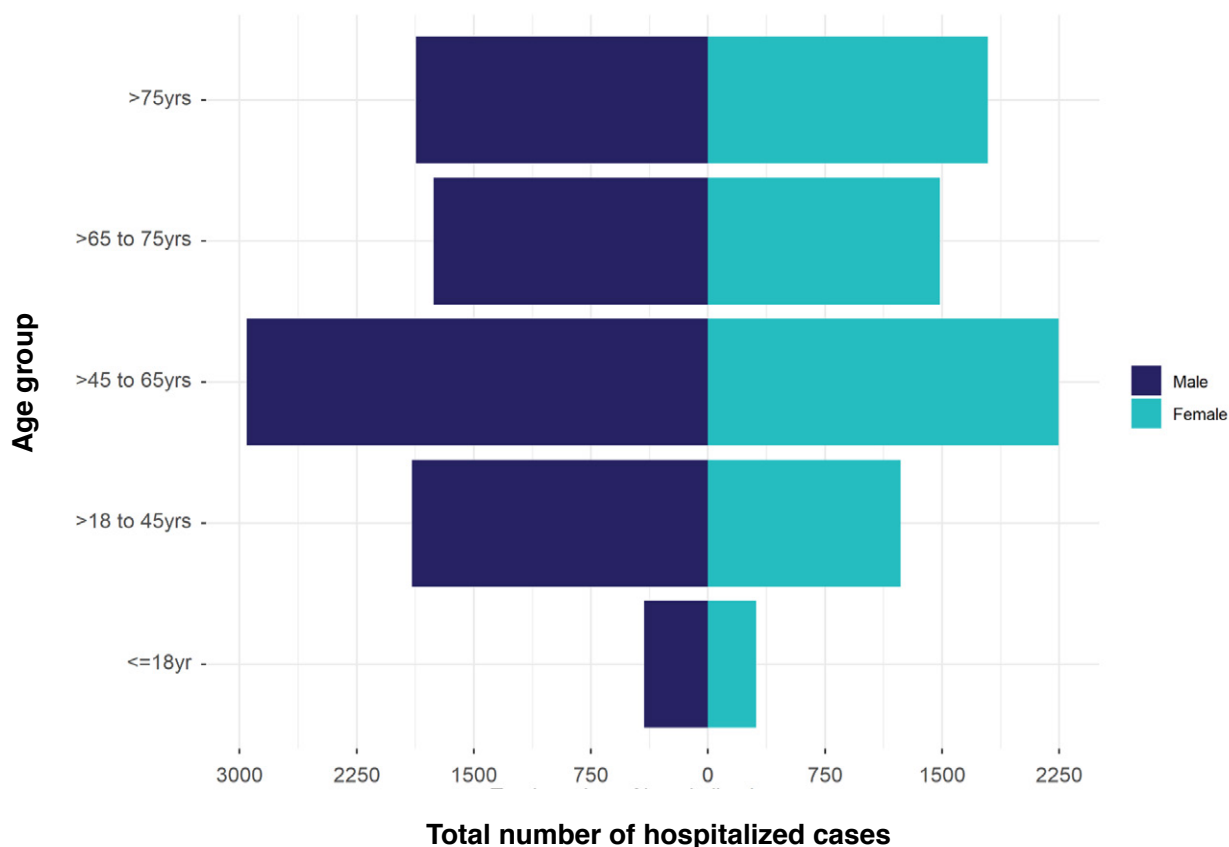
### 3.1.1. Age and sex

**Age.** The mean age of hospitalized patients with COVID-19 is **58.9** years (SD  $\pm$  **20.6**). From a total of **15967** individuals, **715 (4.5%)** cases were 0-18 years old, **3137 (19.6%)** cases were 19-45 years old, **5206 (32.6%)** cases were 46-65 years old, **3247 (20.3%)** cases were 66-75 years old, and **3662 (22.9%)** cases were over 75 years old. The age distribution over time is shown in **Annex 1.1**.

**Sex.** From a total of **17856** individuals, **10793 (60.4%)** reported sex as male. **Figure 2.1** shows the distribution of cases of COVID-19 by age group and sex.

**Figure 2.1** Number of hospitalized cases of COVID-19 by age group and sex

**Figure 2.1** Number of hospitalized cases of COVID-19 by age group and sex



### 3.1.2. Other demographics

Of the **17850** hospitalized cases reporting information on pregnancy status, 9 (0.0%) individuals were pregnant. Of the **14583** cases reporting occupational information, 171 (1.2%) were recorded as health care workers.

### 3.1.3. Monthly hospitalized reported cases

The number of case report forms (CRF) submitted to the WHO Global Clinical Platform by the month of hospital admission and the total number of confirmed COVID-19 cases in the country are shown in **Figure 2.2**.

Cases were defined as **severe or critical** if they met one or more of the following conditions at hospital admission:

- SpO<sub>2</sub>: <90%
- Respiratory rate: >30 breaths/minute in adults and children over 5 years old, ≥ 60 breaths/minute in children under 2 months old, ≥ 50 in children 2-11 months old, and ≥ 40 in children 1-5 years old
- Received extracorporeal membrane oxygenation (ECMO)
- Admitted to an Intensive Care Unit (ICU)
- Received an inotrope or vasopressor
- Received oxygen therapy, and either invasive or non-invasive ventilation

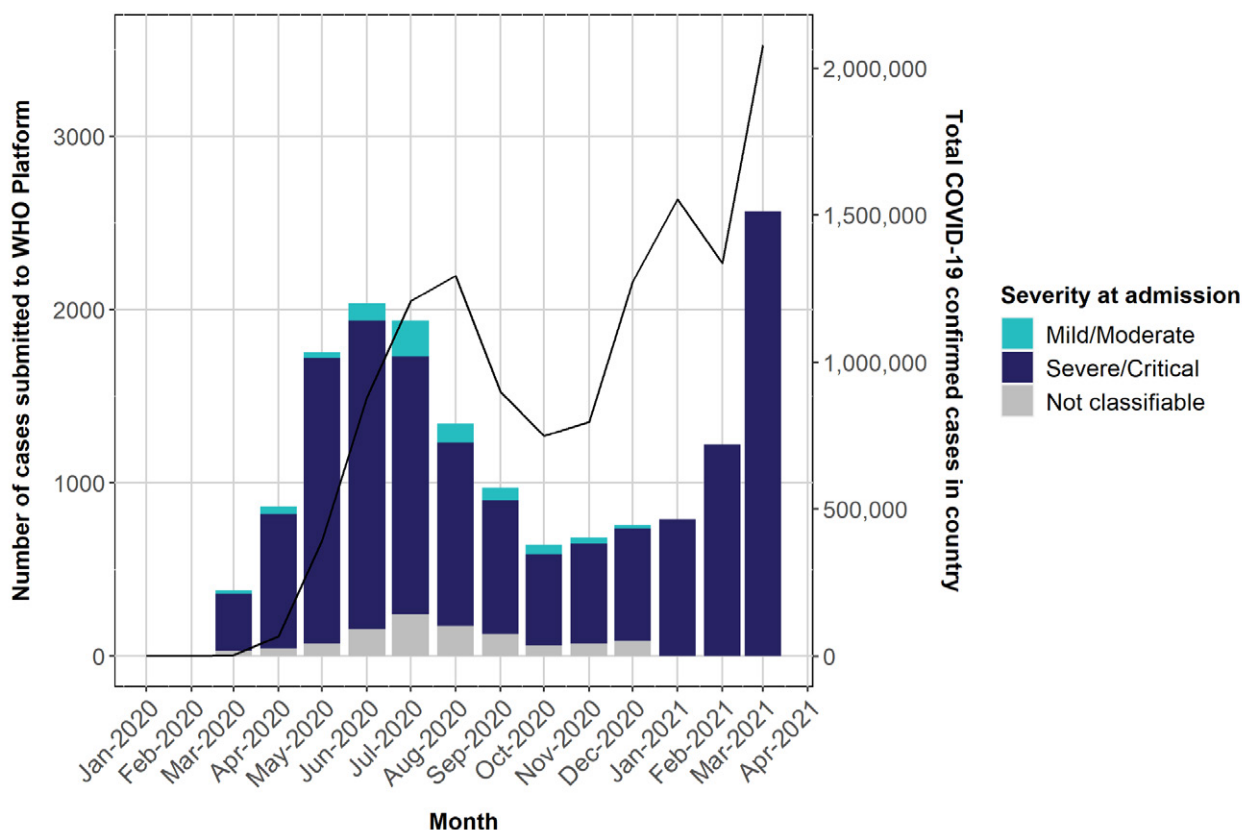
Cases not meeting all the conditions described above, and those meeting the conditions below were described as **mild or moderate**.

- SpO2:  $\geq 90\%$  without supplemental oxygen
- Respiratory rate:  $\leq 30$  breaths/minute in adults and children over 5 years old,  $< 60$  breaths/minute in children under 2 months old,  $< 50$  in children 2-11 months old, and  $< 40$  in children 1-5 years old
- Did not receive oxygen therapy, and either invasive or non-invasive ventilation

Among the reported cases, **14229 (73.1%)** were classified as severely or critically ill at hospital admission, **4176 (21.4%)** were classified as mild or moderately ill, and for **1069 (5.5%)** cases the severity could not be classified from the information reported to the WHO Global Clinical Platform.

Definitions of the severity of illness at hospital admission can be found from the WHO clinical management guidance (<https://www.who.int/publications/i/item/WHO-2019-nCoV-clinical-2021-1>).

Figure 2.2 Number of cases submitted to the WHO Global Clinical Platform by the month of hospital admission, severity of illness at admission, and the total number of confirmed COVID-19 cases in the country. Note that the last reported admission to the WHO platform was on **31 March 2021**, therefore the data for this month may be incomplete. Data for the total confirmed COVID-19 cases in the country are exported from: <https://worldhealthorg.shinyapps.io/cdei/>





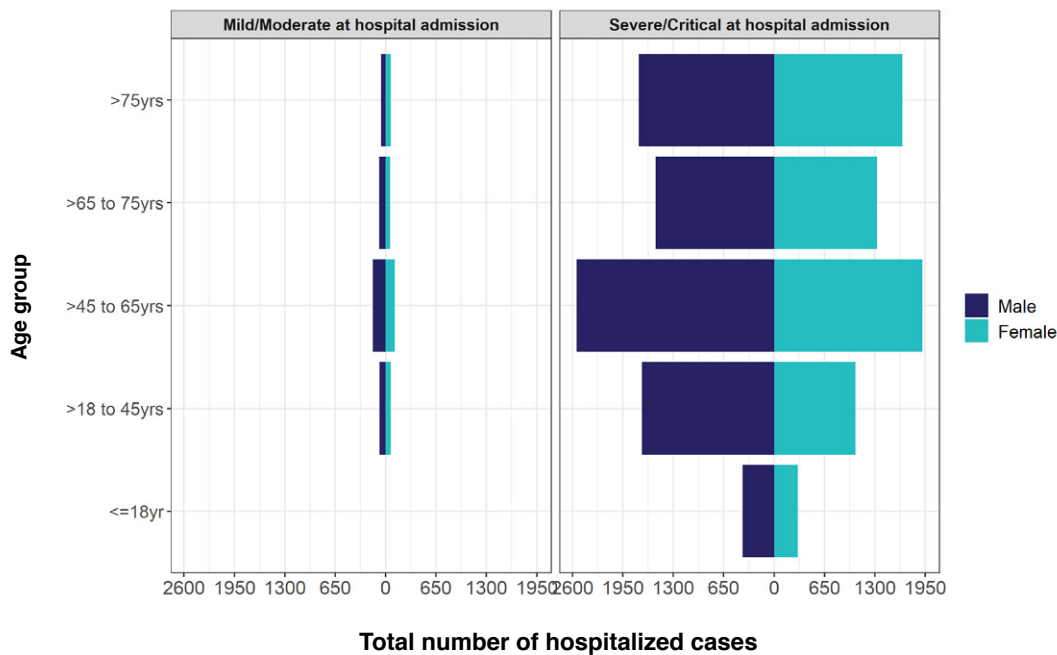
### 3.1.4. Age and sex distribution by severity of illness at hospital admission

Among hospitalized patients, the proportion of those classified with mild or moderate illness and severe or critical illness on admission within each age group was:

- among **715 cases 0-18 years old**, **3 (0.4%)** were classified as mild/moderate, and **712 (99.6%)** were classified as severe/critical
- among **2904 cases 19-45 years old**, **149 (5.1%)** were classified as mild/moderate, and **2755 (94.9%)** were classified as severe/critical
- among **4744 cases 46-65 years old**, **284 (6.0%)** were classified as mild/moderate, and **4460 (94.0%)** were classified as severe/critical
- among **3005 cases 66-75 years old**, **147 (4.9%)** were classified as mild/moderate, and **2858 (95.1%)** were classified as severe/critical, and
- among **3530 cases over 75 years old**, **129 (3.6%)** were classified as mild/moderate, and **3401 (96.3%)** were classified as severe/critical.

The distribution of age and sex among individuals classified as mild or moderate and severe or critical at hospital admission is shown in **Figure 2.3**.

**Figure 2.3** Number of COVID-19 hospitalized cases by severity of illness at hospital admission, by sex, and age group

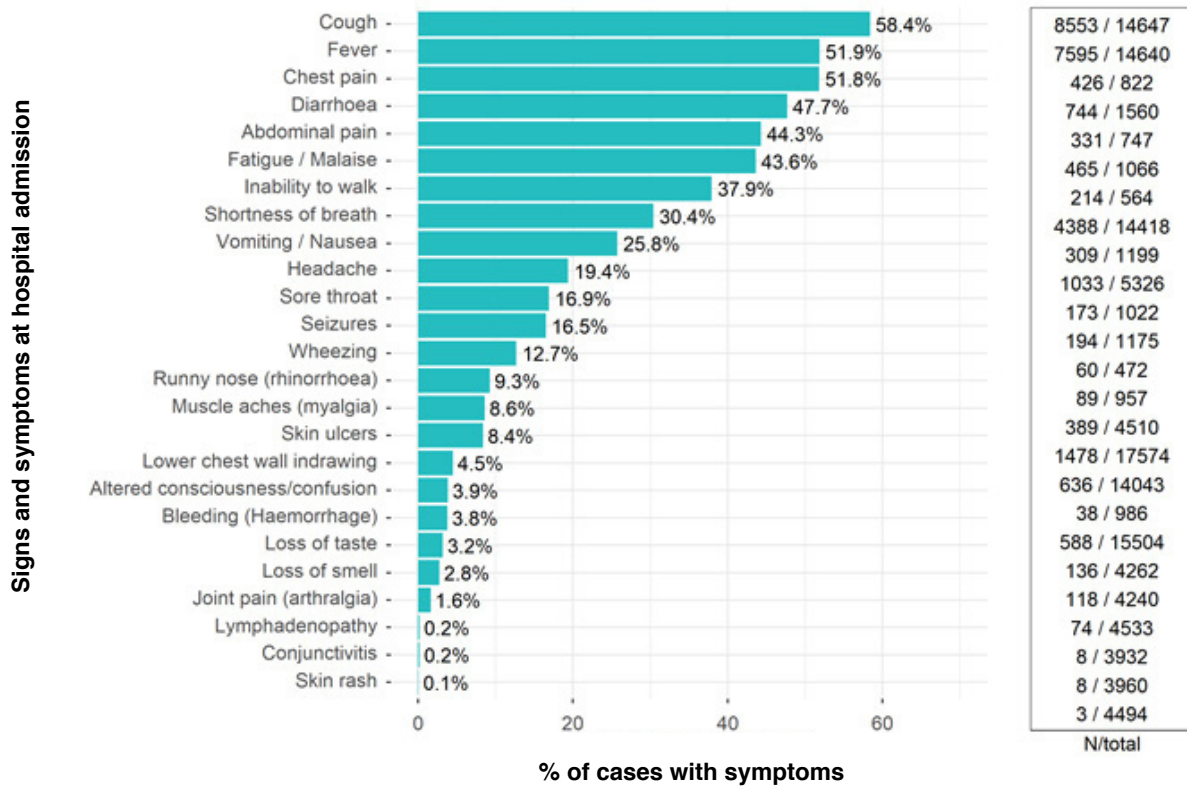


## 3.2. Signs and symptoms at hospital admission

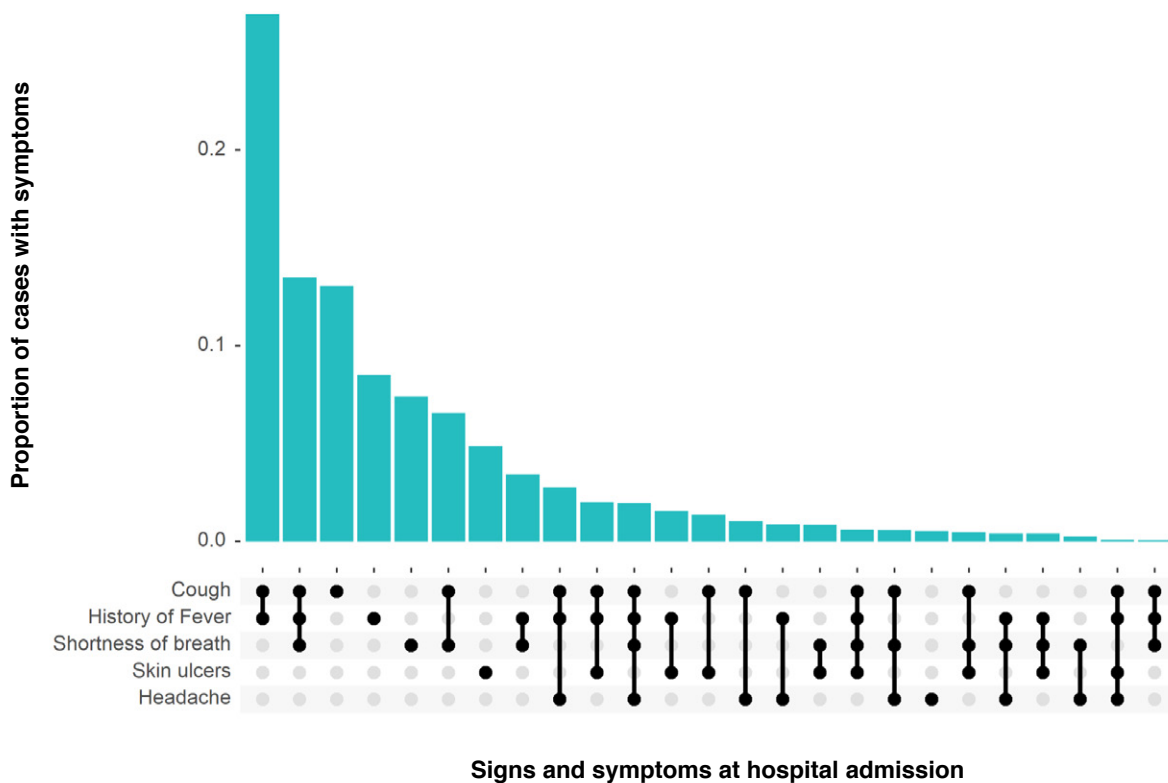
The most prevalent sign or symptom reported in absolute numbers was **cough (8553 cases)**. **Figure 3.1** shows the frequency of signs and symptoms at admission. **Figure 3.2** shows the top five signs and symptoms reported at admission and their different combinations. **Figure 3.3** shows the severity of COVID-19 illness at hospital admission among patients reporting clinical signs and symptoms.



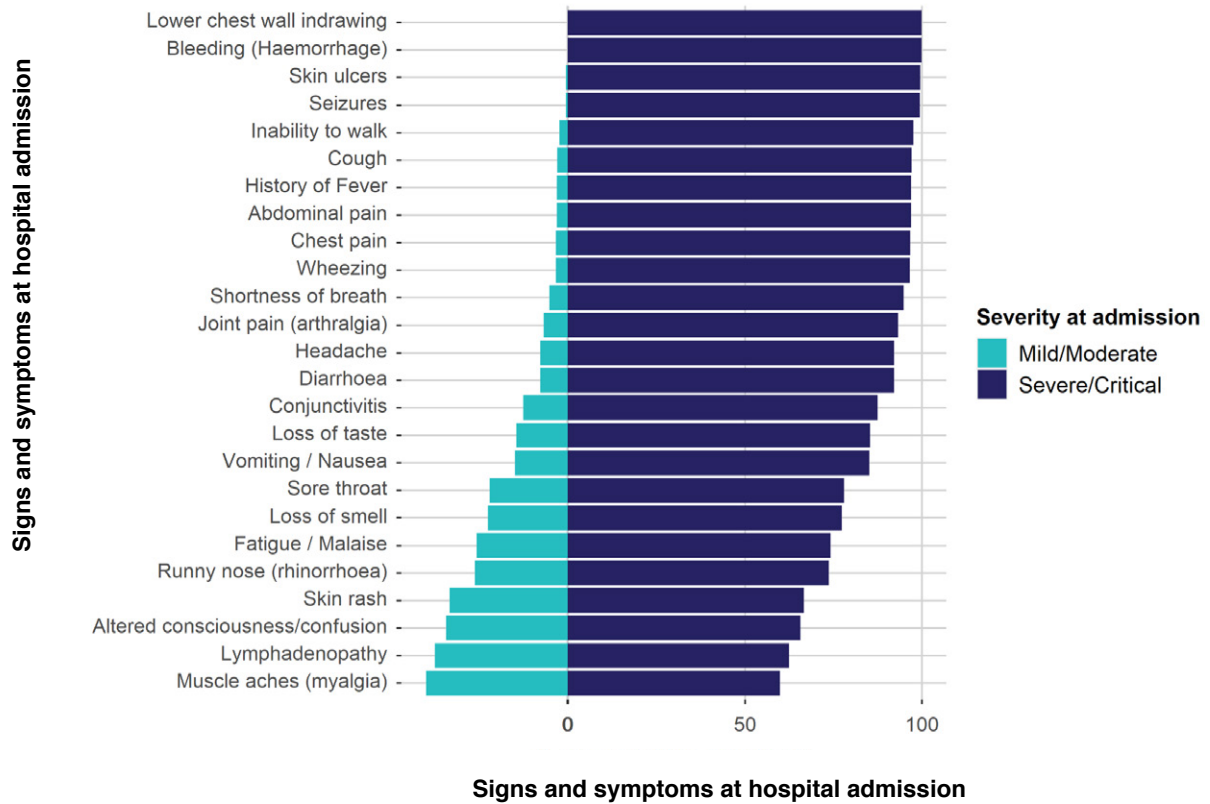
**Figure 3.1** Proportion of COVID-19 hospitalized cases presenting with clinical signs and symptoms at hospital admission



**Figure 3.2** Top five signs and symptoms reported at admission and their different combinations

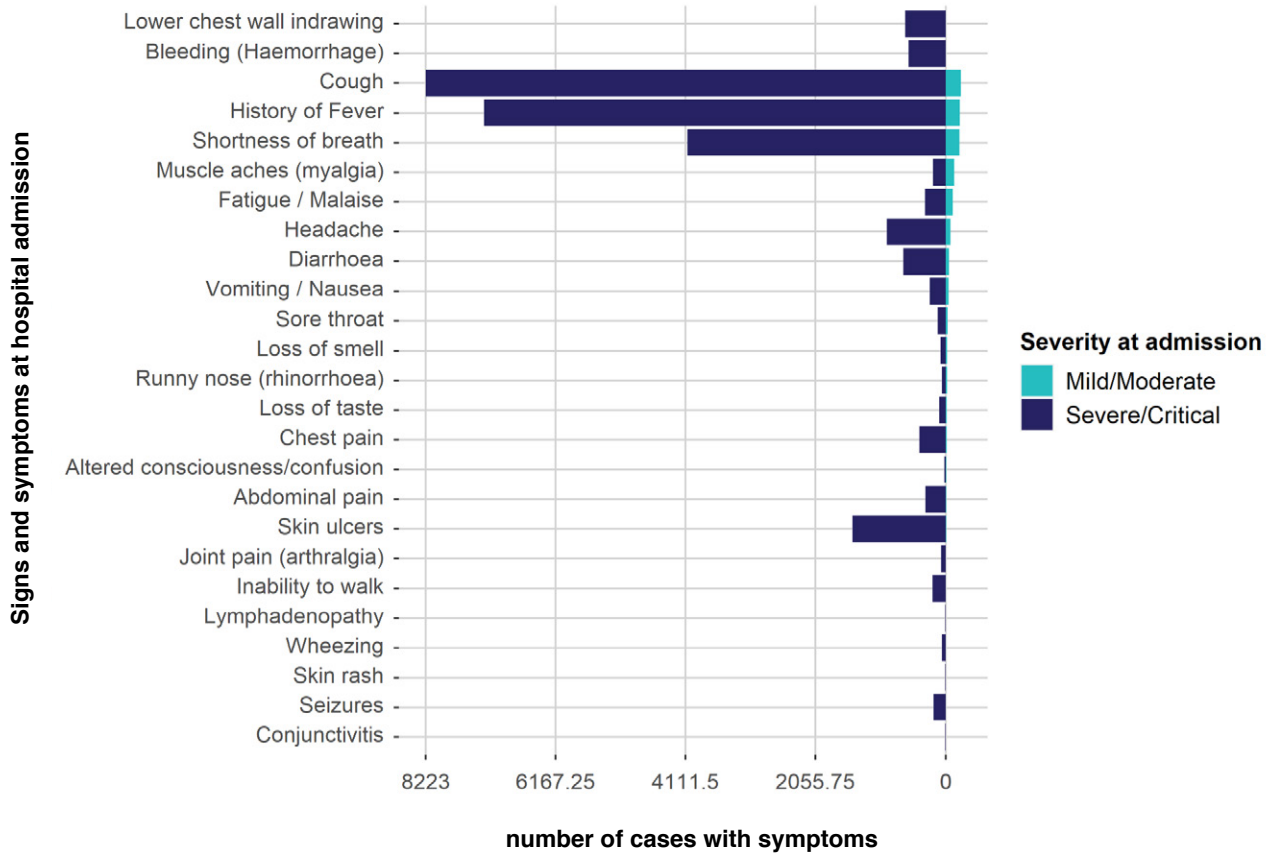


**Figure 3.3** Severity of illness among those reporting signs and symptoms at admission in patients with COVID-19

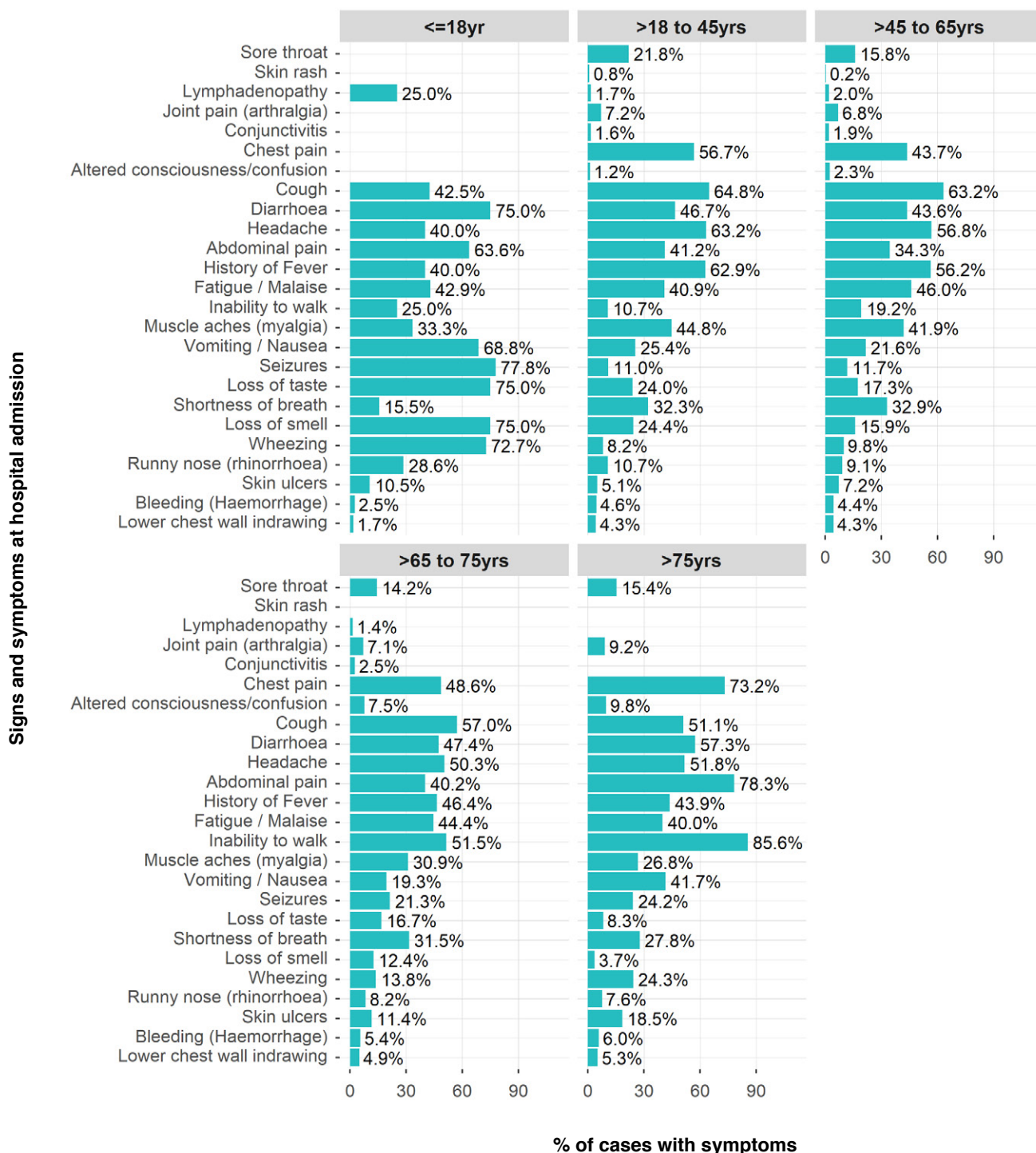


The clinical manifestation of COVID-19 varied according to the severity of illness at hospital admission. **Figure 3.4** shows the frequency of signs and symptoms among patients admitted to the hospital with mild/moderate and severe/critical illness. **Figure 3.5** shows the frequency of presenting symptoms in patients hospitalized with COVID-19 by age group.

**Figure 3.4** Frequency of clinical signs and symptoms present at admission among hospitalized patients with COVID-19 with mild/moderate illness compared to severe/critical illness (see **Annex Table 2.1** for source data).



**Figure 3.5** Frequency of presenting symptoms in patients hospitalized with COVID-19 by age group  
(See Annex Table 2.1 for source data)

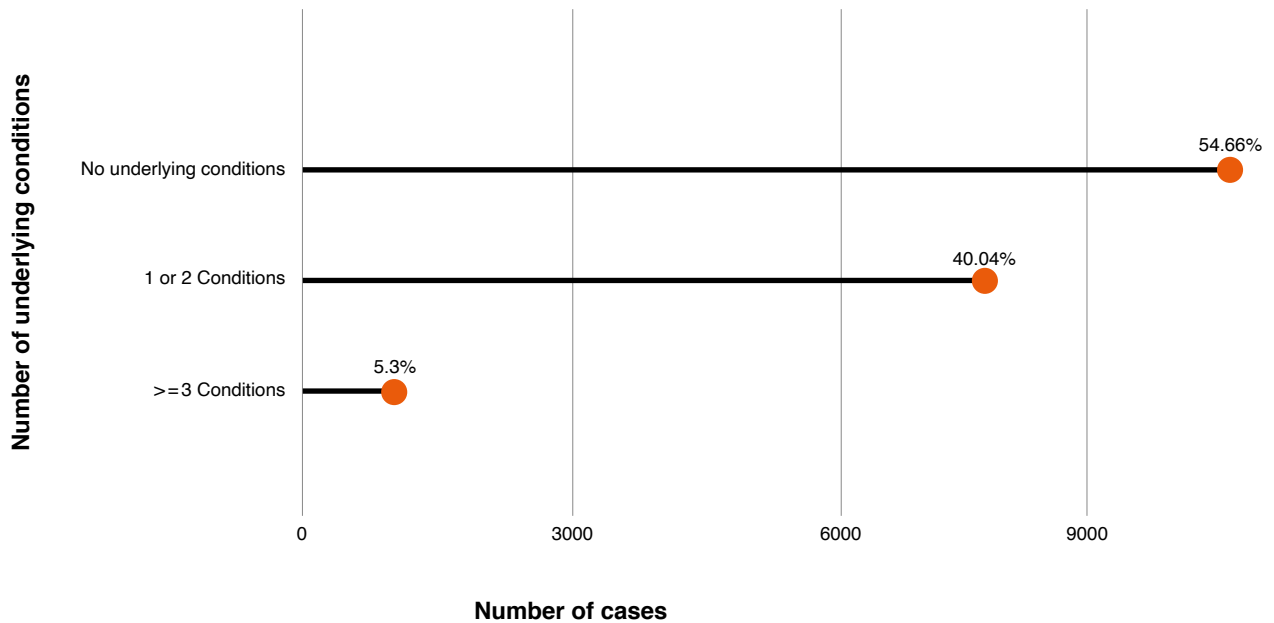


The most prevalent symptom relative to the total responses received for each variable was **seizures (77.8%)** among people 0-18 years old, **cough (64.8%)** among people 19-45 years old, **cough (63.2%)** among people 46-65 years old, **cough (57.0%)** among people 66-75 years old, and **inability to walk (85.6%)** among people over 75 years old (see Figure 3.5).

### 3.3. Underlying conditions at hospital admission

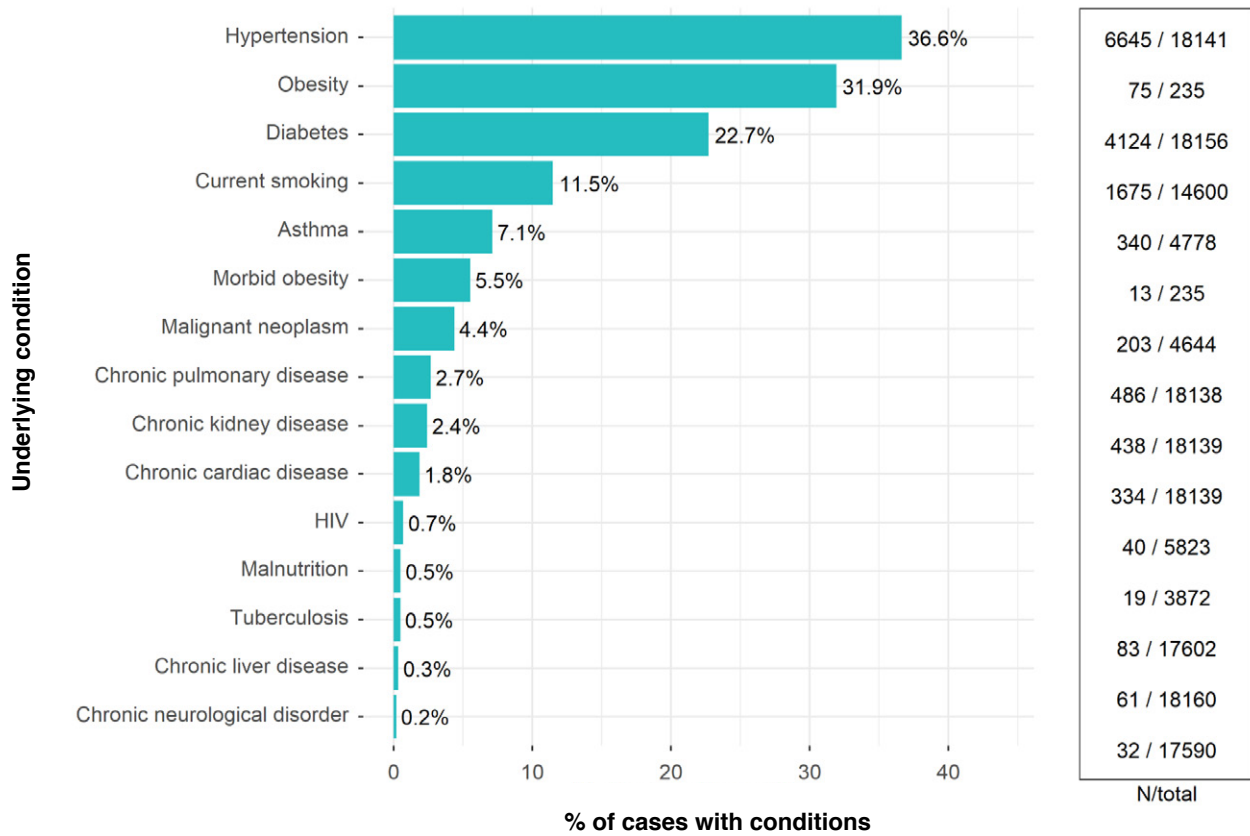
The proportion of hospitalized patients with the number of underlying conditions is shown in **Figure 4.1**, and the frequency of individual underlying conditions is reported in **Figure 4.2**. The most prevalent underlying condition at hospital admission reported in absolute numbers was **hypertension (6645 cases)**.

**Figure 4.1** Proportion of COVID-19 patients with number of underlying conditions present at hospital admission



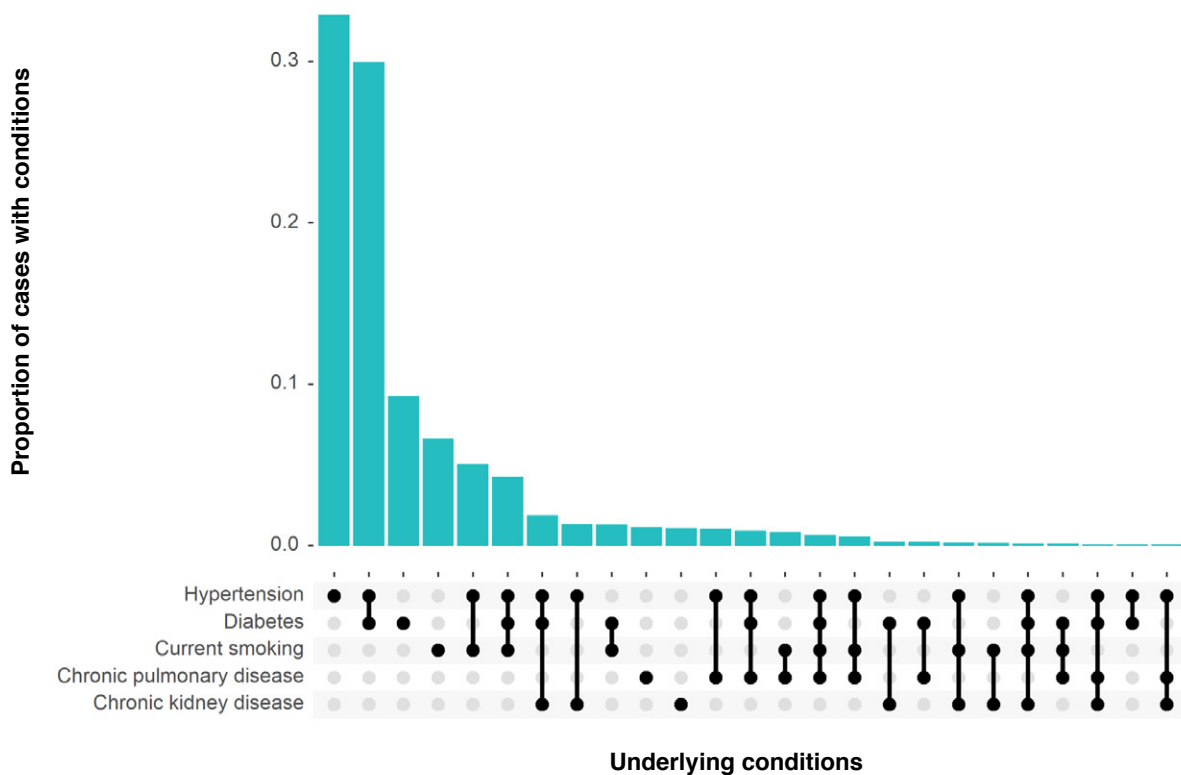
Morbid obesity (BMI greater than 40) was reported in **13/235 (5.5%)** of the cases reporting this information and **75/235 (31.9%)** were classified as obese (Obesity). Malnutrition was reported in **19/3872 (0.5%)** cases.

**Figure 4.2** Proportion of COVID-19 cases with underlying conditions reported at admission



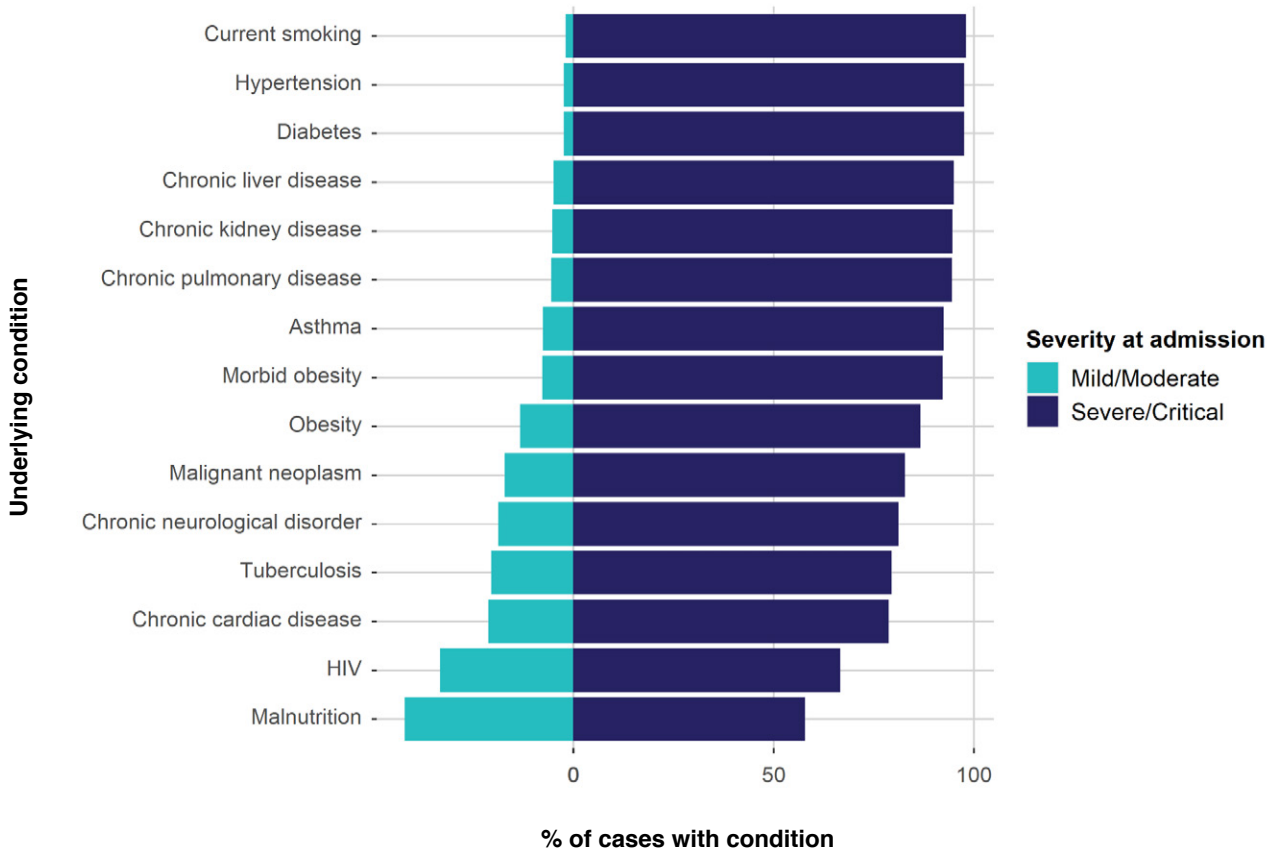
**Figure 4.3** shows the top five underlying conditions reported at admission and their different combinations.

**Figure 4.3** Top five underlying conditions reported at admission and their different combinations

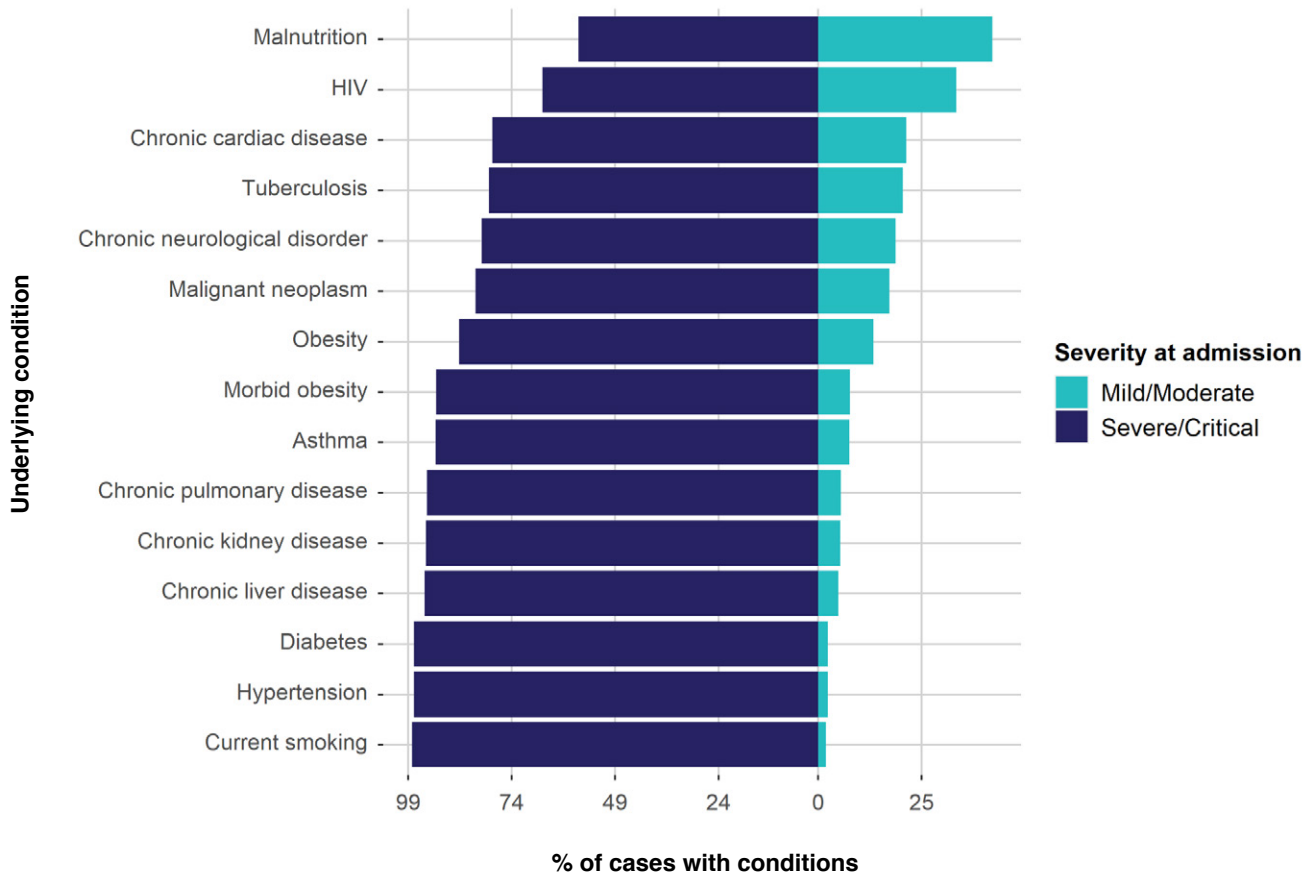


The severity of illness at hospital admission among patients with underlying conditions is shown in **Figure 4.4**, and the frequency of underlying conditions among people admitted with mild/moderate compared to severe/critical illness is presented in **Figure 4.5**.

**Figure 4.4** Severity of illness among those reporting an existing underlying condition at admission in patients with COVID-19



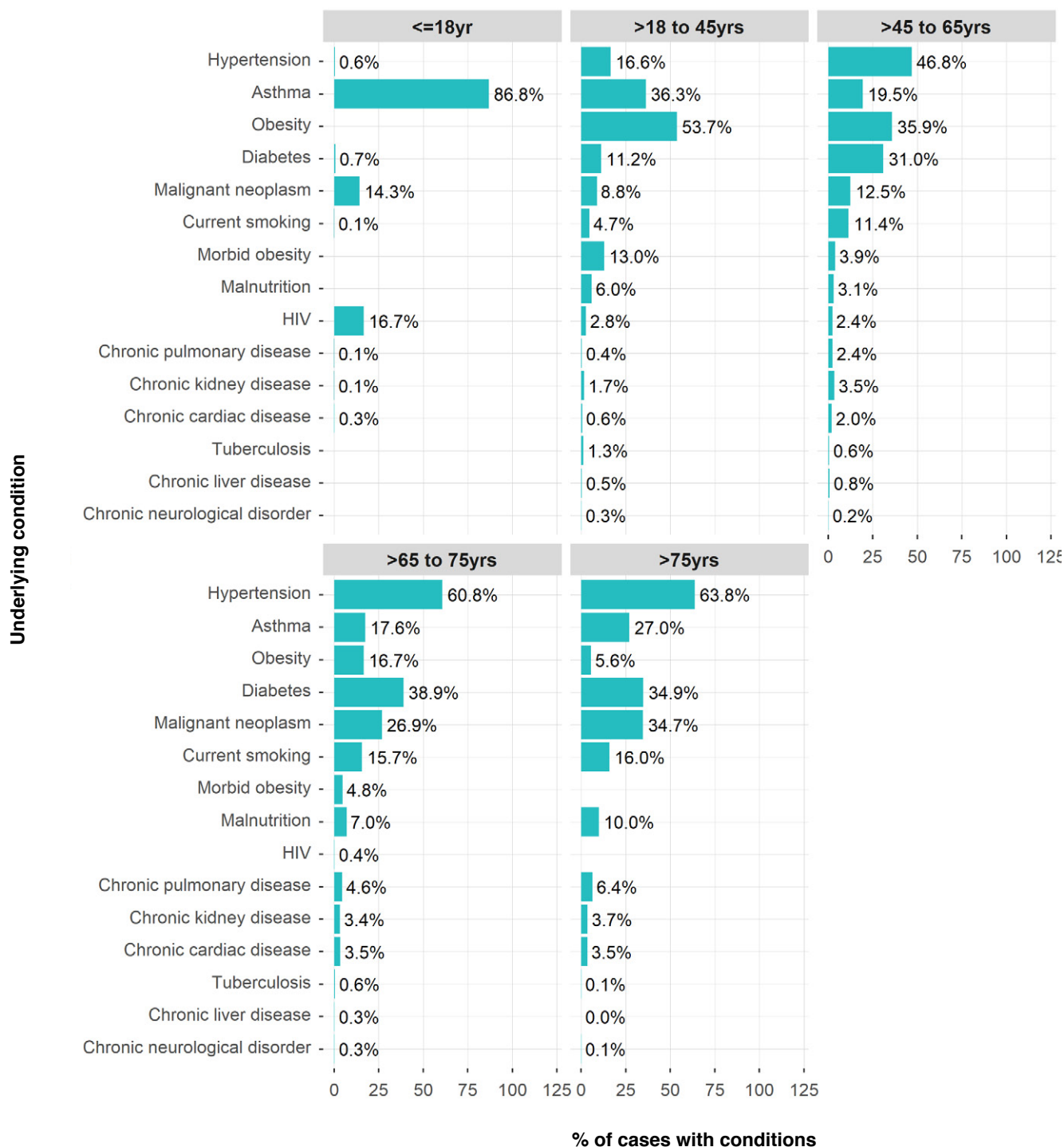
**Figure 4.5** Frequency of underlying conditions among COVID-19 cases admitted with mild/moderate illness compared to severe/critical illness (see **Annex Table 3.1** for source data)





The frequency of underlying conditions by age is presented in **Figure 4.6**.

**Figure 4.6** Proportion of COVID-19 cases with underlying conditions present on admission to hospital by age group (see **Annex Table 3.2** for source data).



The most prevalent underlying condition at hospital admission was **asthma (86.8%)** among people 0-18 years old, **obesity (53.7%)** among people 19-45 years old, **hypertension (46.8%)** among people 46-65 years old, **hypertension (60.8%)** among people 66-75 years old, and **hypertension (63.8%)** among people over 75 years old.

### 3.3.1. HIV

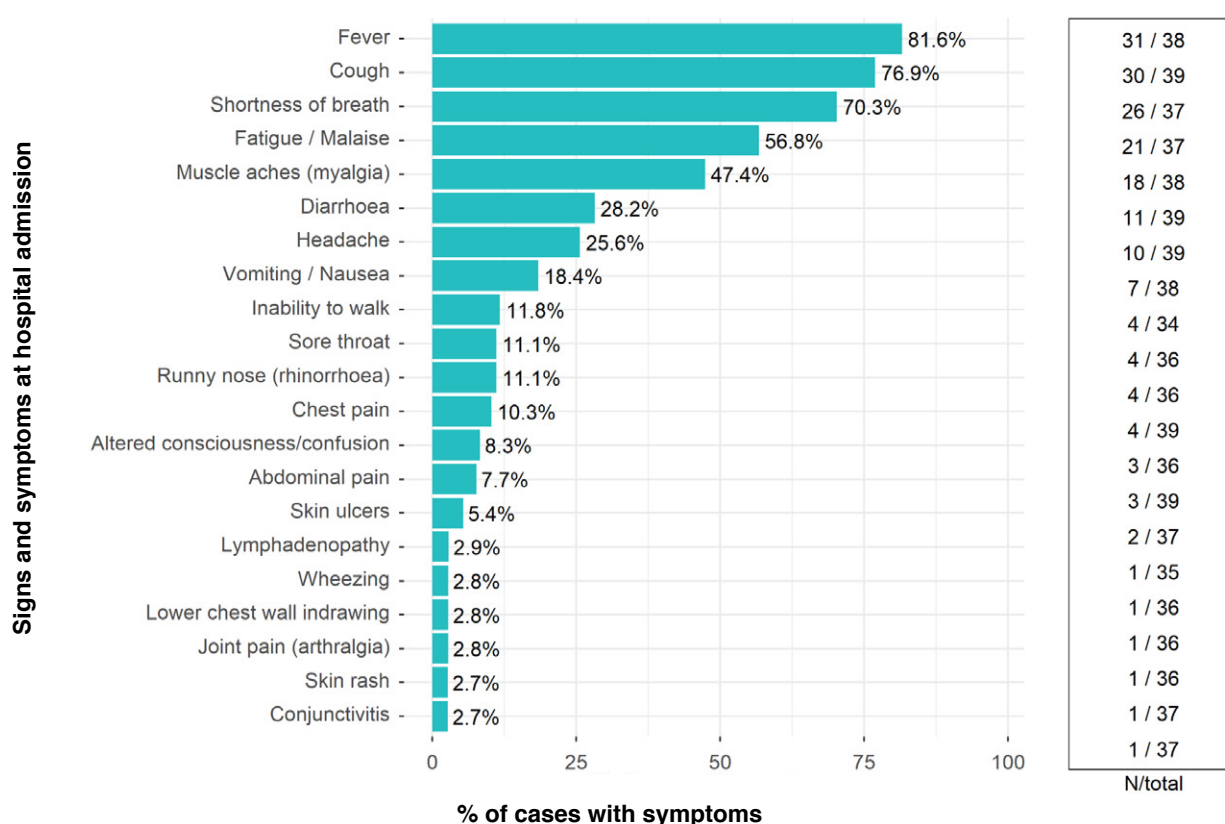
**40** patients had a positive HIV test (recorded at admission or on discharge). Of those, **1 (2.5%)** was 0-18 years old, **14 (35.0%)** were 19-45 years old, **23 (57.5%)** were 46-65 years old, and **2 (5.0%)** were 66-75 years old.

**13 (32.5%)** patients with HIV presented with mild/moderate illness at hospital admission, **26 (65.0%)** had severe/critical illness, and for **1 (2.5%)** cases the severity could not be classified from the information reported to the WHO Platform.

In absolute numbers, the most frequent symptom at hospital admission was **fever** (in **31** patients).

**Figure 4.7** shows the frequency of signs and symptoms at admission.

**Figure 4.7** Proportion of clinical signs and symptoms on admission in people living with HIV hospitalized with COVID-19 infection



**1 (100.0%)** patient with HIV and COVID-19 was discharged alive.

**38 (95.0%)** HIV positive cases were recorded as taking antiretroviral drugs (ART) for HIV.

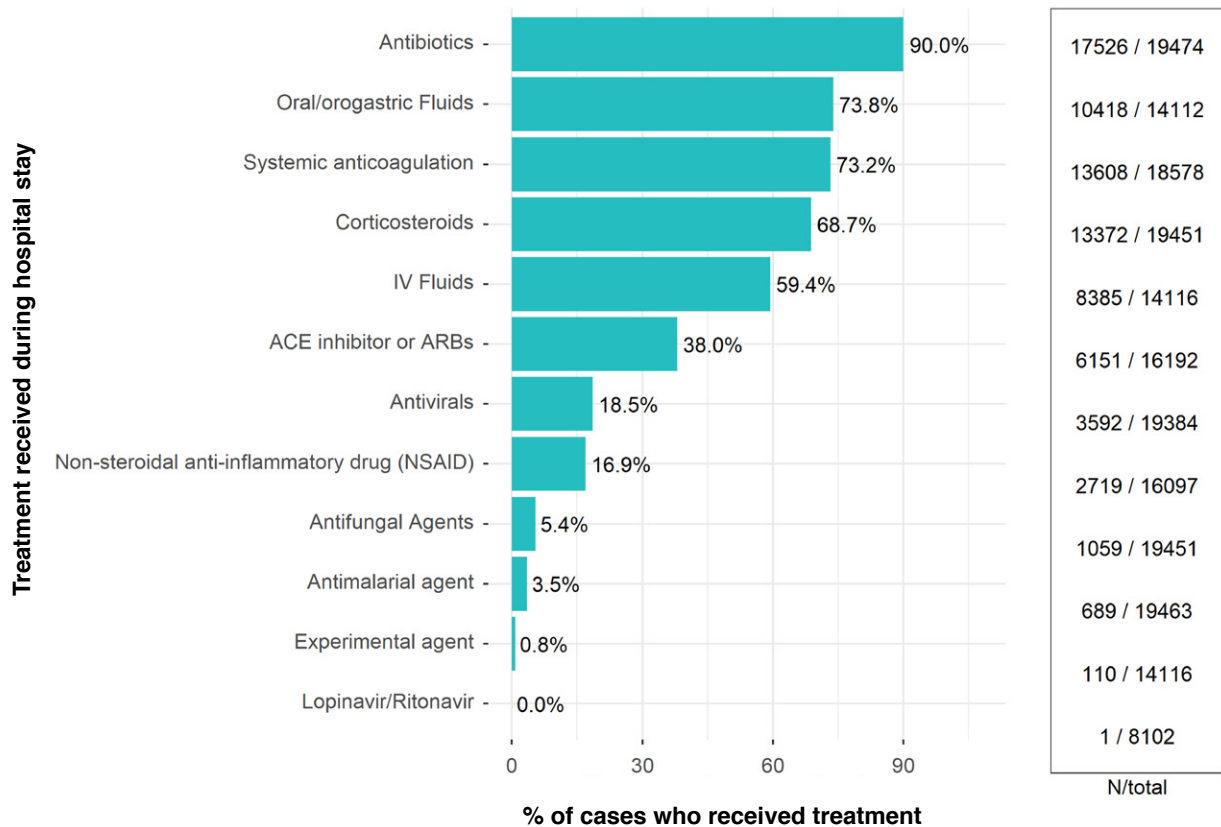
**11 (28.9%)** HIV positive cases were admitted to an ICU during the hospital stay.

**6 (16.2%)** people with HIV and COVID-19 died during the hospital admission, with a case fatality ratio of **17.6%**. **28 (75.7%)** people with HIV and COVID-19 were discharged alive, **2 (5.4%)** were transferred to another healthcare facility, and **1 (2.7%)** was still hospitalized at the time of reporting.

### 3.4. Treatment and care during the hospital stay

The most frequently received treatment by absolute number was **antibiotics**, given to **17526** patients. **Figure 5.1** shows the reported treatment received during the hospital stay. **Figure 5.2** shows the top five treatments that were received and their different combinations. Note that patients may have multiple treatment types recorded, and therefore the numbers will not add up.

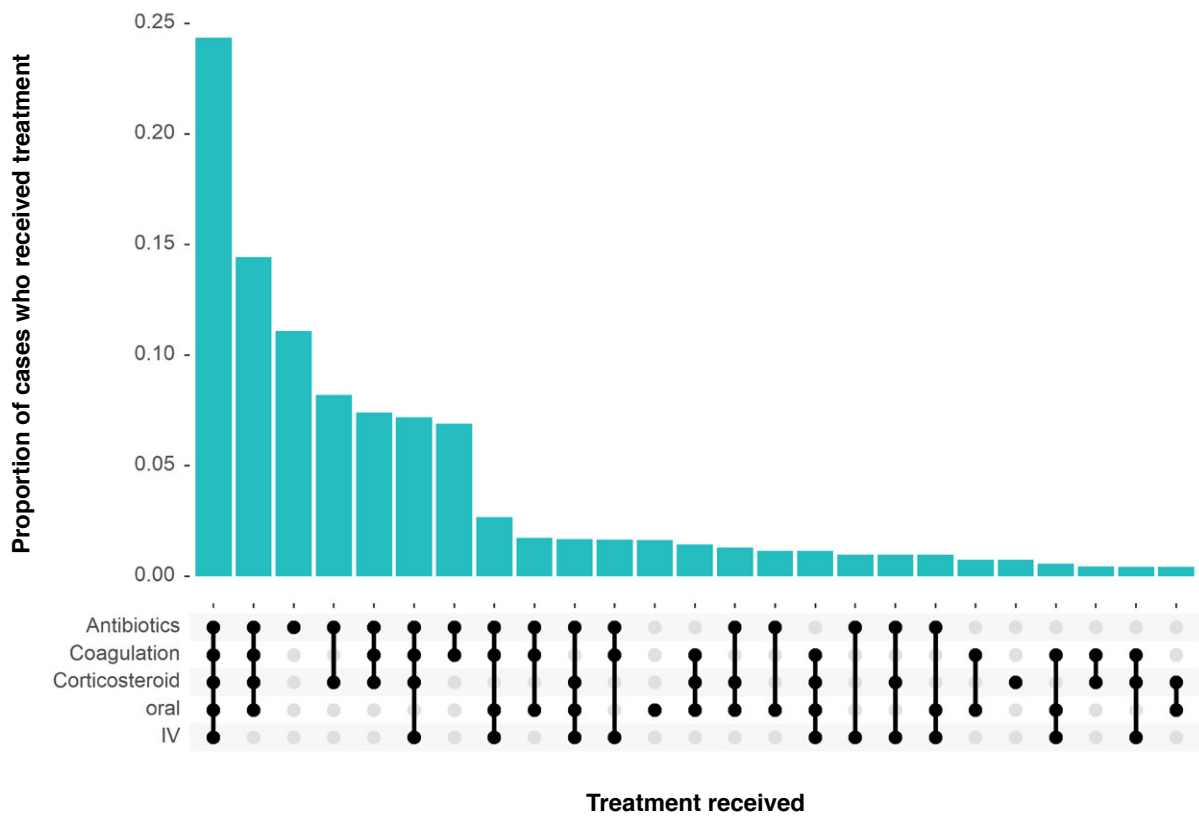
**Figure 5.1** Frequency of COVID-19 patients who received treatment at any time during the hospital stay



Of the **12493 (64.2%)** individuals that received corticosteroid medication, the breakdown by route of administration was unknown in 100.0% of patients. Future contributors should consider collecting and reporting information on the route of administration for corticosteroids.

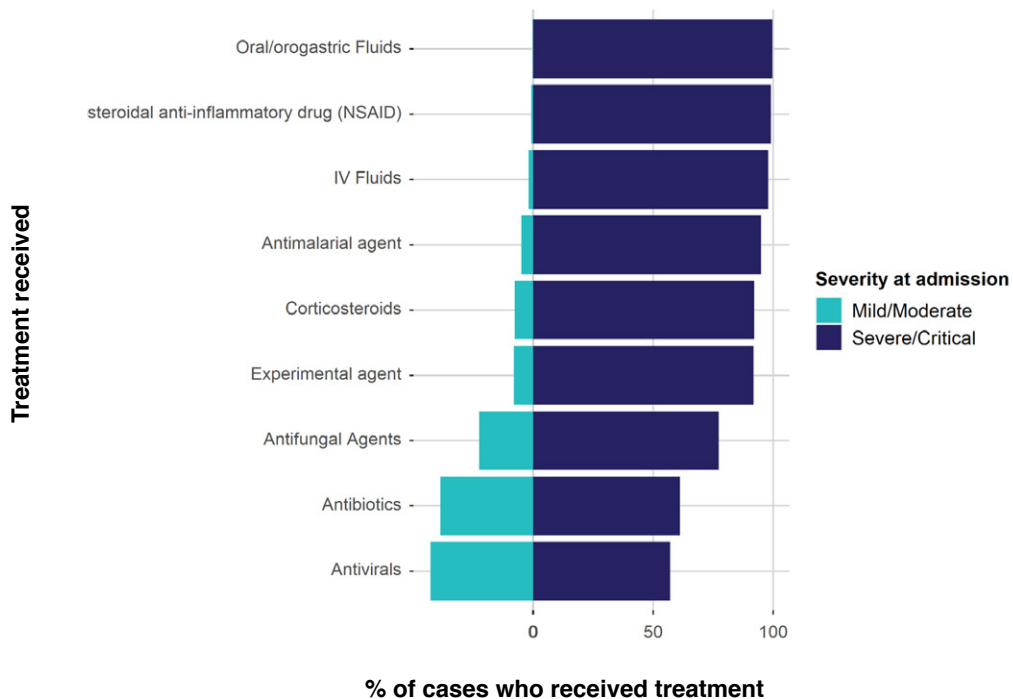
Route of administration	%	pct
Unknown	12,493	100

**Figure 5.2** Top five treatments received and their different combinations

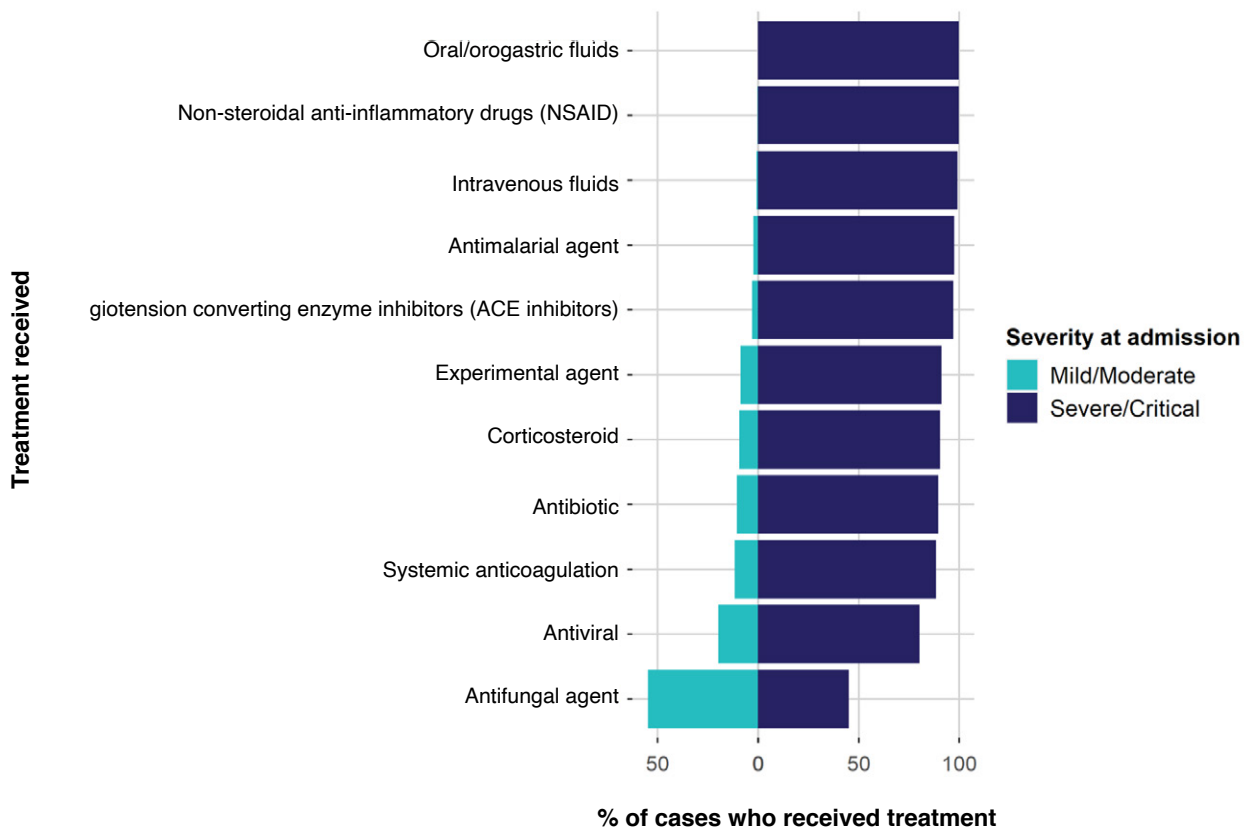


**Figure 5.3** shows the frequency of the reported treatment received by patients admitted to hospital with mild/moderate illness compared to severe/critical illness. The frequency of treatment received among individuals with mild/moderate compared to severe/critical illness is depicted in **Figure 5.4**.

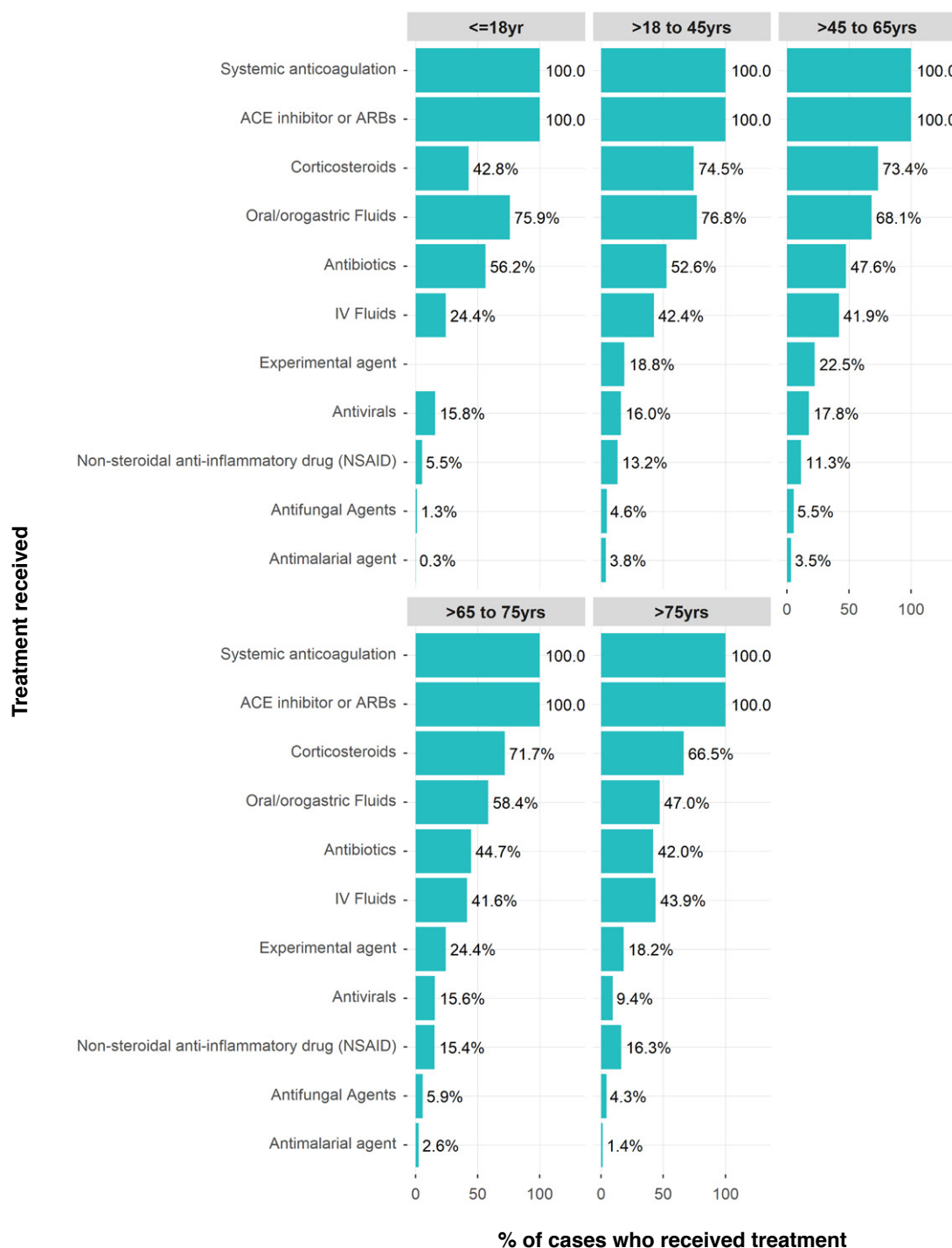
**Figure 5.3** Severity status of COVID-19 patients who received treatment during the hospital stay



**Figure 5.4** Frequency of treatment interventions received by COVID-19 patients with mild/moderate compared to severe/critical illness at hospital admission (see **Annex Table 4.1** for source data)



**Figure 5.5** Proportion of COVID-19 cases who received treatment during the hospital stay by age group (see Annex Table 4.2 for source data)



The most prevalent treatment(s) received at hospital admission were **oral/orogastric fluids (100.0%)** among people 0-18 years old, **ACEi or ARBs and systemic anticoagulation (100.0%)** among people 19-45 years old, **ACEi or ARBs and systemic anticoagulation (100.0%)** among people 46-65 years old, **ACEi or ARBs and systemic anticoagulation (100.0%)** among people 66-75 years old and **ACEi or ARBs and systemic anticoagulation (100.0%)** among people over 75 years old. Please note that these high estimates indicate the prevalence of use only amongst those reporting this information. For actual numbers of medication use, please refer **Fig 5.1**.

**14470/14615 (99.0%)** patients received oxygen therapy at any time during their hospital stay, of which **4409 (27.7%)** received invasive ventilation, **822 (5.6%)** received non-invasive ventilation, and for **9239 (63.8%)** patients, the type of ventilation received was unspecified.

## 3.5. Laboratory Markers

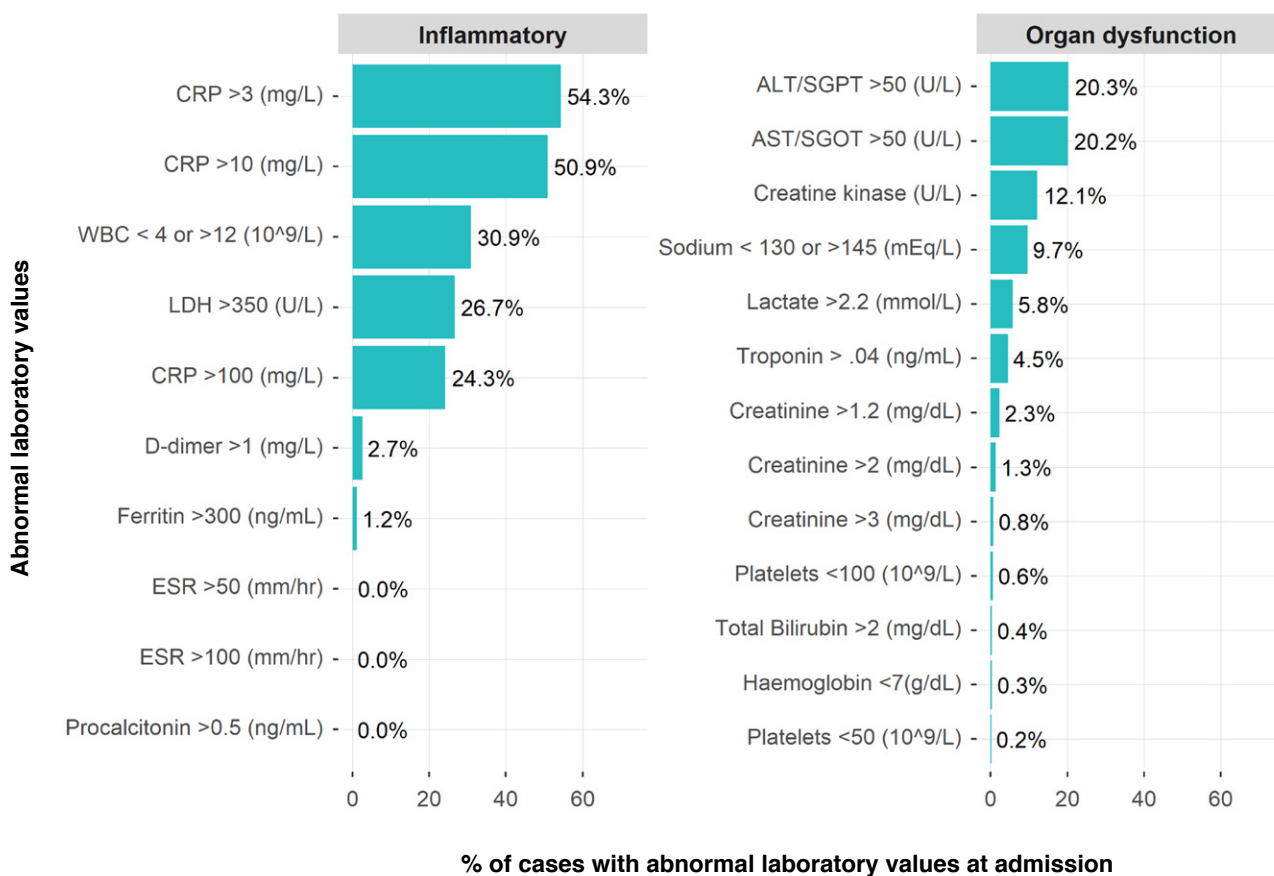
### 3.5.1. Laboratory markers at hospital admission

Results of any of the laboratory blood tests listed below conducted at hospital admission were available in **15237 (78.2%)** of the patients.

The mean, median, standard deviation, maximum and minimum values of laboratory blood tests at hospital admission are shown in **Table 6.1**.

Laboratory blood test	Total number of patients with test result recorded	Mean	StdDev	Q1	Median	Q3
Haemoglobin (g/dL)	1,718	12.22	2.64	10.70	12.60	14.10
Creatinine (mg/dL)	1,620	1.16	1.52	0.16	0.73	1.34
WBC (10 <sup>9</sup> /L)	14,349	13.03	29.09	7.70	10.60	14.50
Sodium (mEq/L)	12,852	138.95	6.44	135.00	139.00	142.00
Haematocrit (%)	13,636	37.27	6.68	33.60	37.80	41.60
Potassium (mEq/L)	12,816	4.34	0.78	3.90	4.30	4.70
Platelets (10 <sup>9</sup> /L)	1,767	230.76	103.53	163.00	217.00	283.00
Procalcitonin (ng/mL)	1	1.20	.	1.20	1.20	1.20
APTT/APTR	10,064	10.31	13.30	2.05	2.46	24.00
CRP (mg/L)	10,970	105.80	91.78	32.40	81.80	154.30
PT (seconds)	10,296	13.23	5.53	11.50	12.40	13.70
LDH (U/L)	7,273	626.45	735.96	330.00	493.00	742.00
INR	10,601	1.10	0.40	0.96	1.03	1.13
Creatine kinase (U/L)	6,983	434.78	2210.16	51.00	109.30	316.00
ALT/SGPT (U/L)	9,861	75.18	193.97	25.00	41.00	73.00
Troponin (ng/mL)	1,363	31.99	70.89	0.01	5.00	26.30
Total Bilirubin (mg/dL)	1,462	0.69	0.61	0.35	0.50	0.76
ESR (mm/hr)	12	72.25	41.58	39.50	67.50	111.50
AST/SGOT (U/L)	10,101	76.52	273.58	28.00	41.20	66.60
D-dimer (mg/L)	949	6.21	21.51	0.50	1.18	3.80
Urea (BUN) (mmol/L)	12,461	5.18	5.64	1.92	2.98	5.85
Ferritin (ng/mL)	254	1936.34	5777.81	398.70	743.00	1686.00
Lactate (mmol/L)	1,134	0.61	0.87	0.12	0.18	0.97
IL-6 (pg/mL)	0	.	.	.	.	.

**Figure 6.1** Proportion of COVID-19 cases with an abnormal laboratory blood test value on admission by type of clinical marker (see **Annex Table 5.2** for source data)



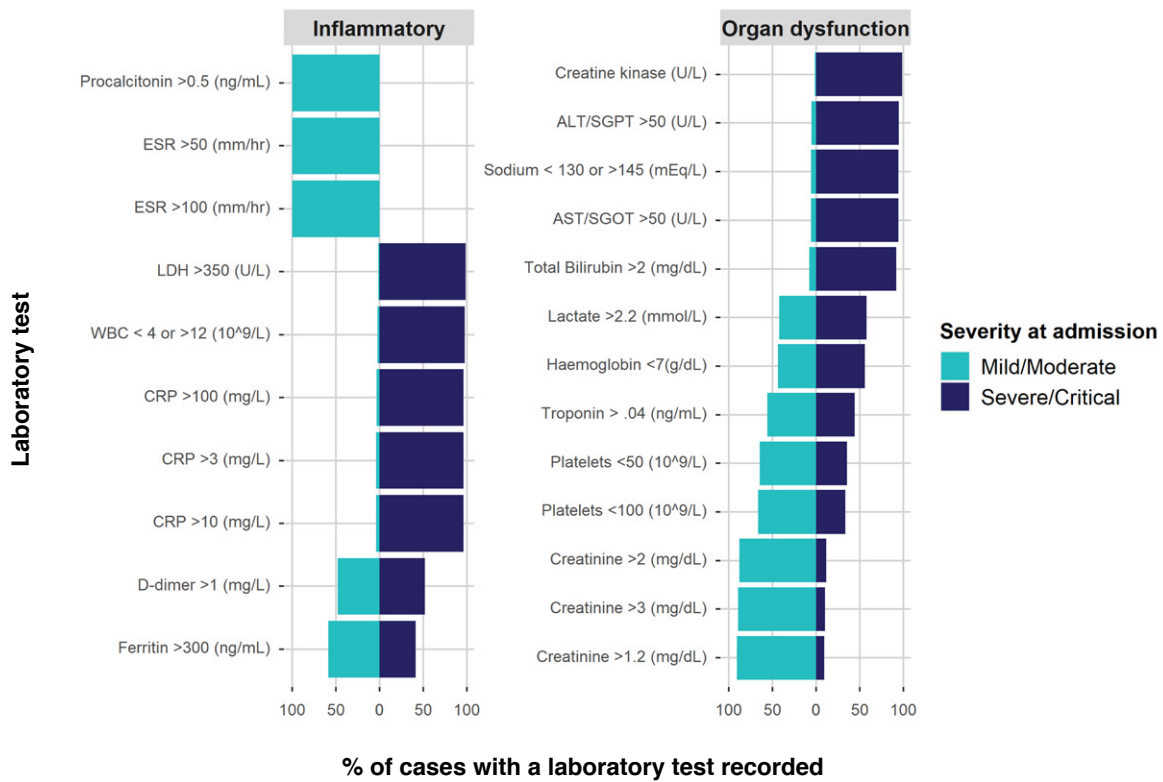
The availability of individual laboratory blood test results recorded on admission are graphically represented in **Annex 5.1 - 5.3** for the overall population and **5.3a - 5.3b** for laboratory results signifying inflammation vs organ dysfunction. **Annex Tables 5.1 - 5.3** show the frequency of laboratory results by severity of illness and age group.

### 3.5.2. Abnormal laboratory blood test results recorded during hospital stay

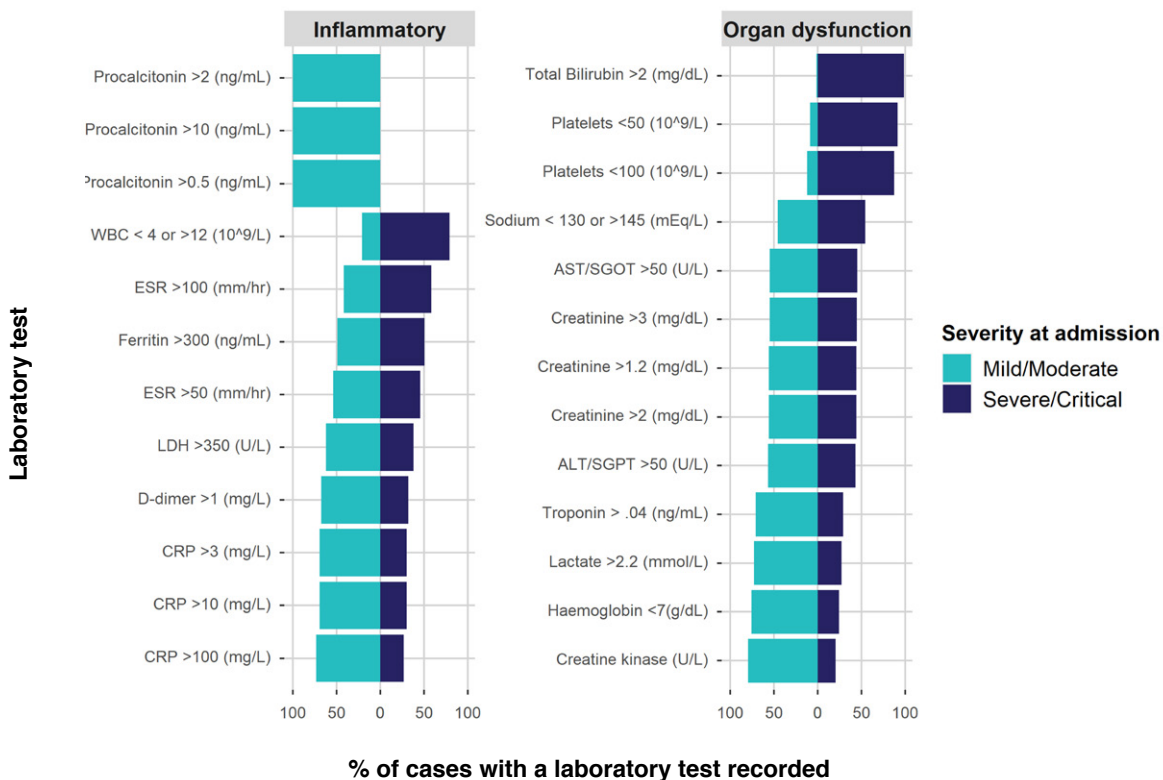
Elevated laboratory blood test values recorded during the hospital stay are reported in **Figure 6.2** and **Figure 6.3**. **Annexes 5.4a-b** show the most abnormal laboratory tests (inflammatory vs organ dysfunction) and **Annex Tables 5.4** and **5.5** show the most abnormal tests by severity of illness and categories of age.



**Figure 6.2** Severity of illness among those with abnormal laboratory test values recorded during hospital stay in patients with COVID-19



**Figure 6.3** Proportion of patients with abnormal laboratory blood test values recorded during hospital stay in patients with mild/moderate compared to severe/critical illness at hospital admission (see **Annex Table 5.4** for source data)



### 3.6. Diagnostic interventions

Among hospitalized cases (17912) reporting diagnostic interventions, 28.7% of individuals received a chest radiograph (C-XRAY) or computerized tomography (CT) scan. Among patients who had results of diagnostic imaging reported, 492 (63.5%) showed pulmonary infiltrates.

### 3.7. Clinical manifestations of COVID-19 during hospital stay

The most frequent clinical manifestation of COVID-19 patients was **pneumonia**, reported in (3239 cases). **Figure 7.1** shows the frequency of clinical manifestations or complications during hospital stay. Figure 7.2 shows the top five clinical manifestations and their different combinations. **Figures 7.3 and 7.4** depict the distribution of clinical manifestations or complications by the severity of illness at hospital admission, and **Figure 7.5** by age group, respectively.

**Figure 7.1** Proportion of COVID-19 cases with clinical manifestations or complications reported during hospital stay

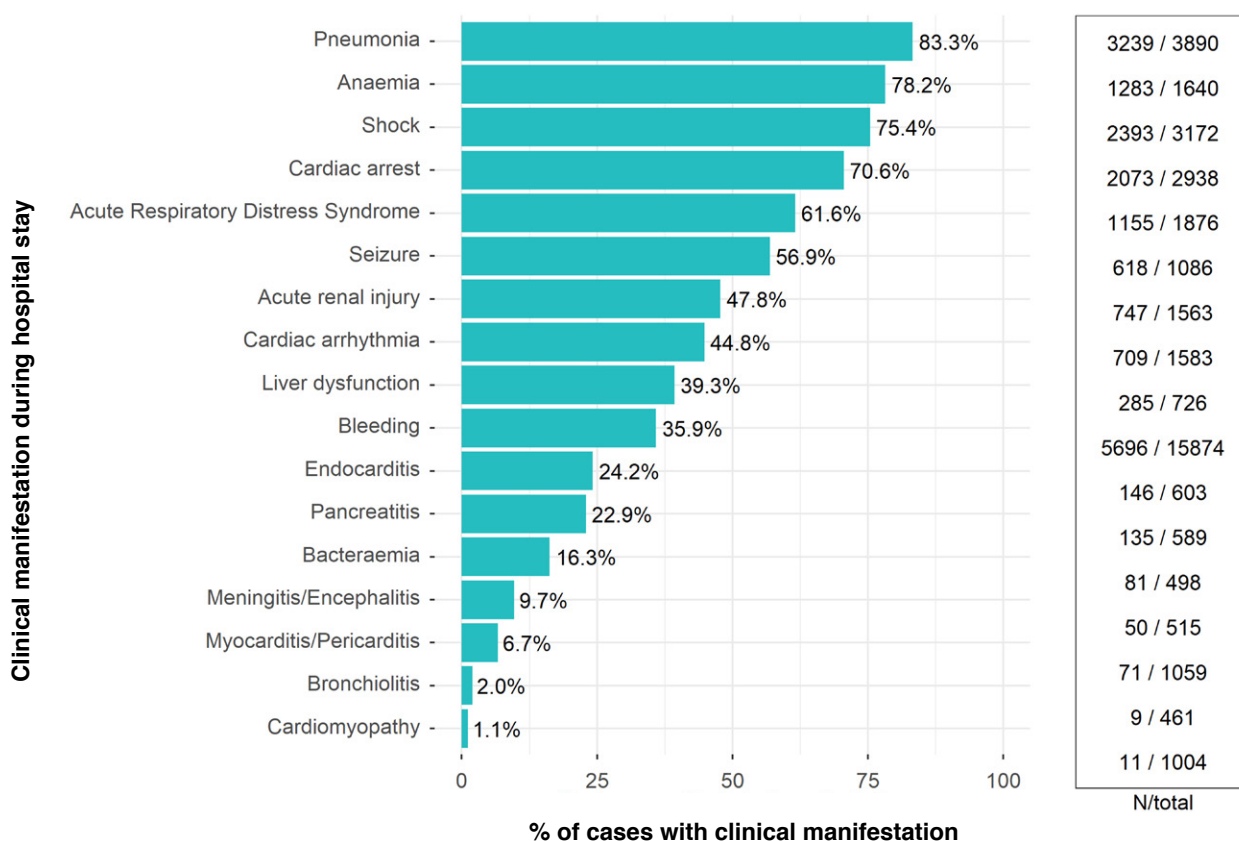


Figure 7.2 shows the top five clinical manifestations and their different combinations

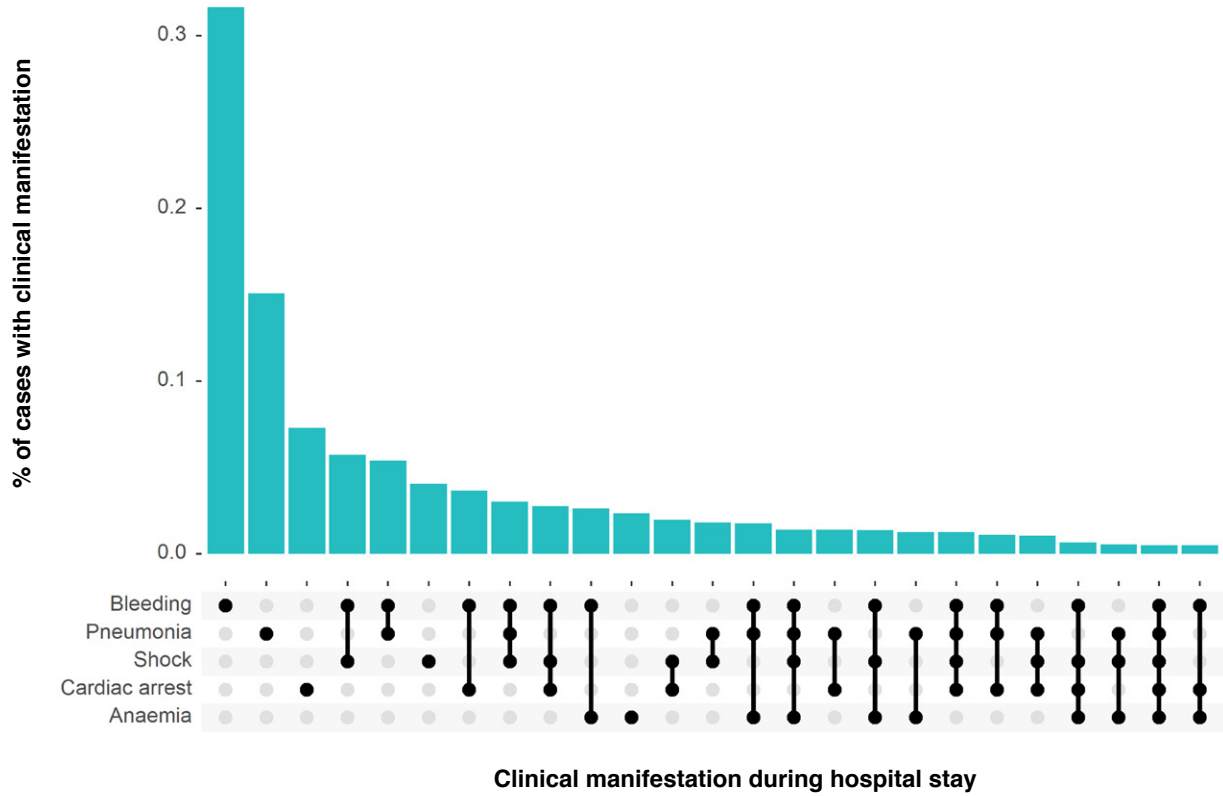
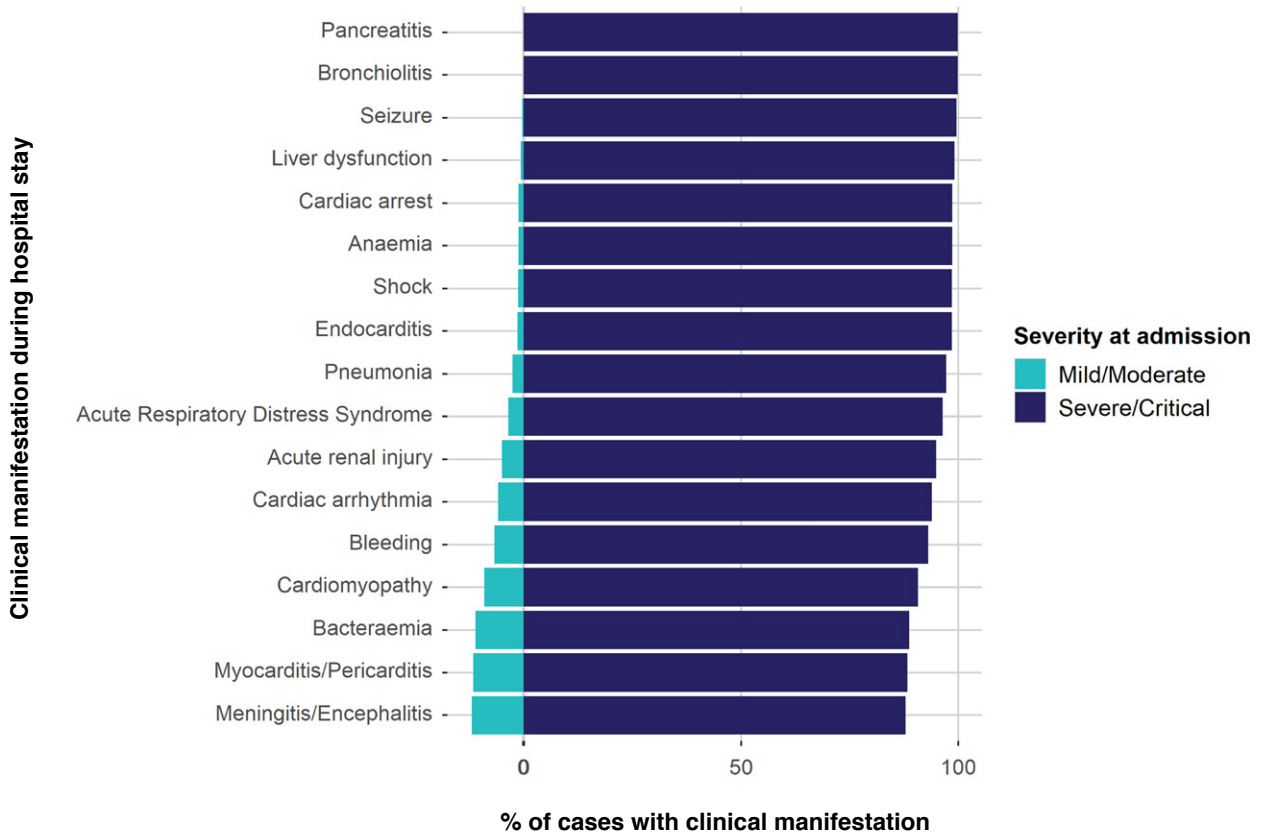
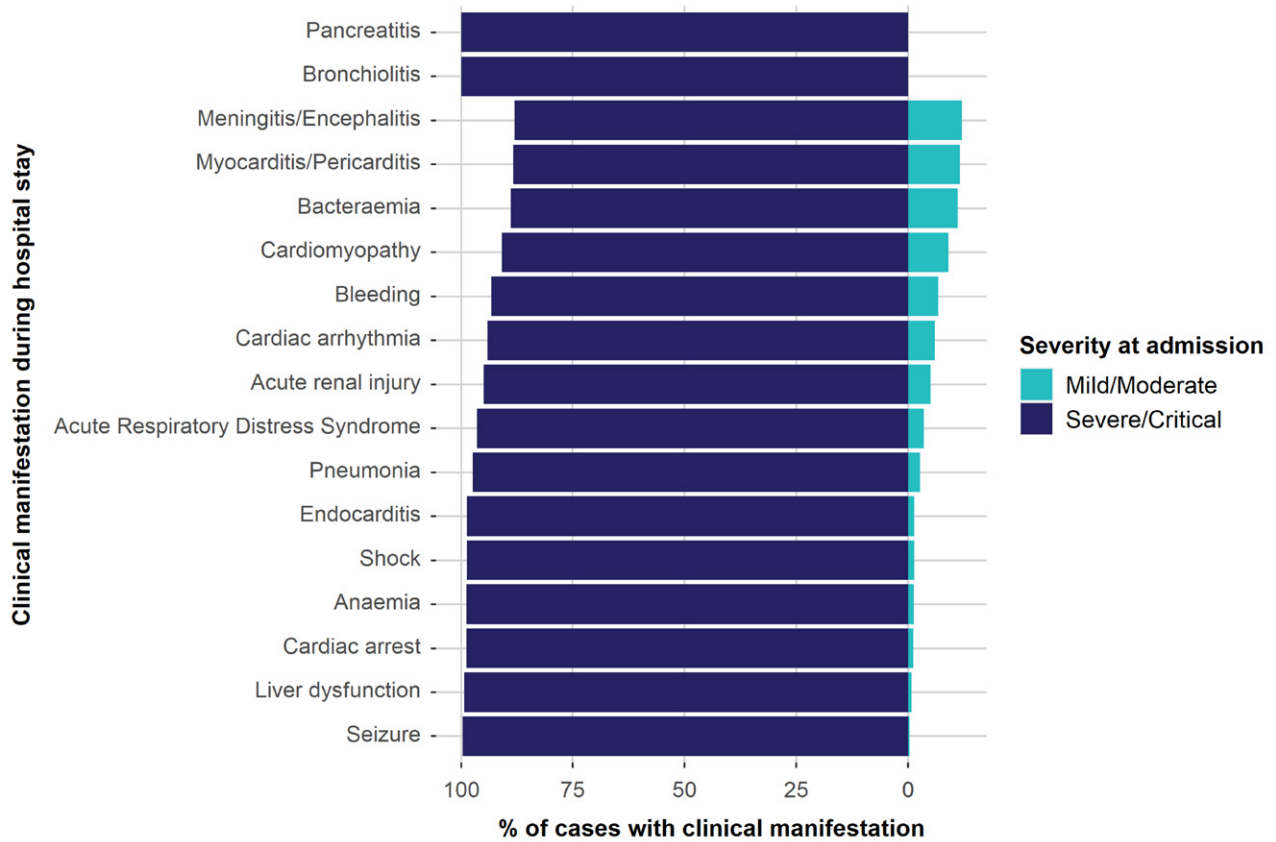


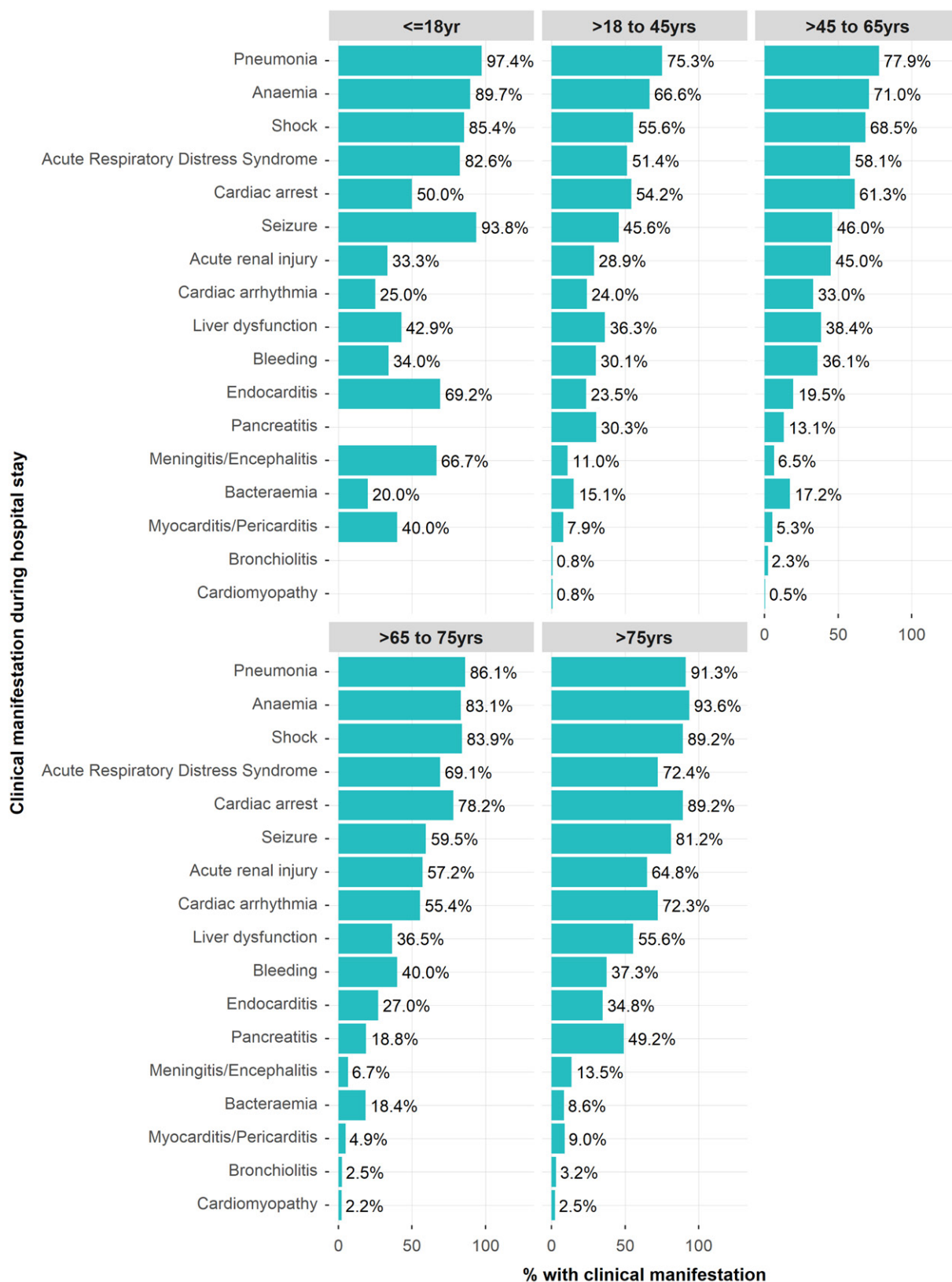
Figure 7.3 Severity of illness among those reporting a clinical manifestation or complication during hospital stay in patients with COVID-19



**Figure 7.4** Frequency of clinical manifestations or complications during the hospital stay among COVID-19 cases admitted with mild/moderate compared to severe/critical illness (see **Annex Table 6.1** for source data)



**Figure 7.5** Frequency of clinical manifestations or complications in patients hospitalized with COVID-19 by age group (See **Annex Table 6.2** for source data)



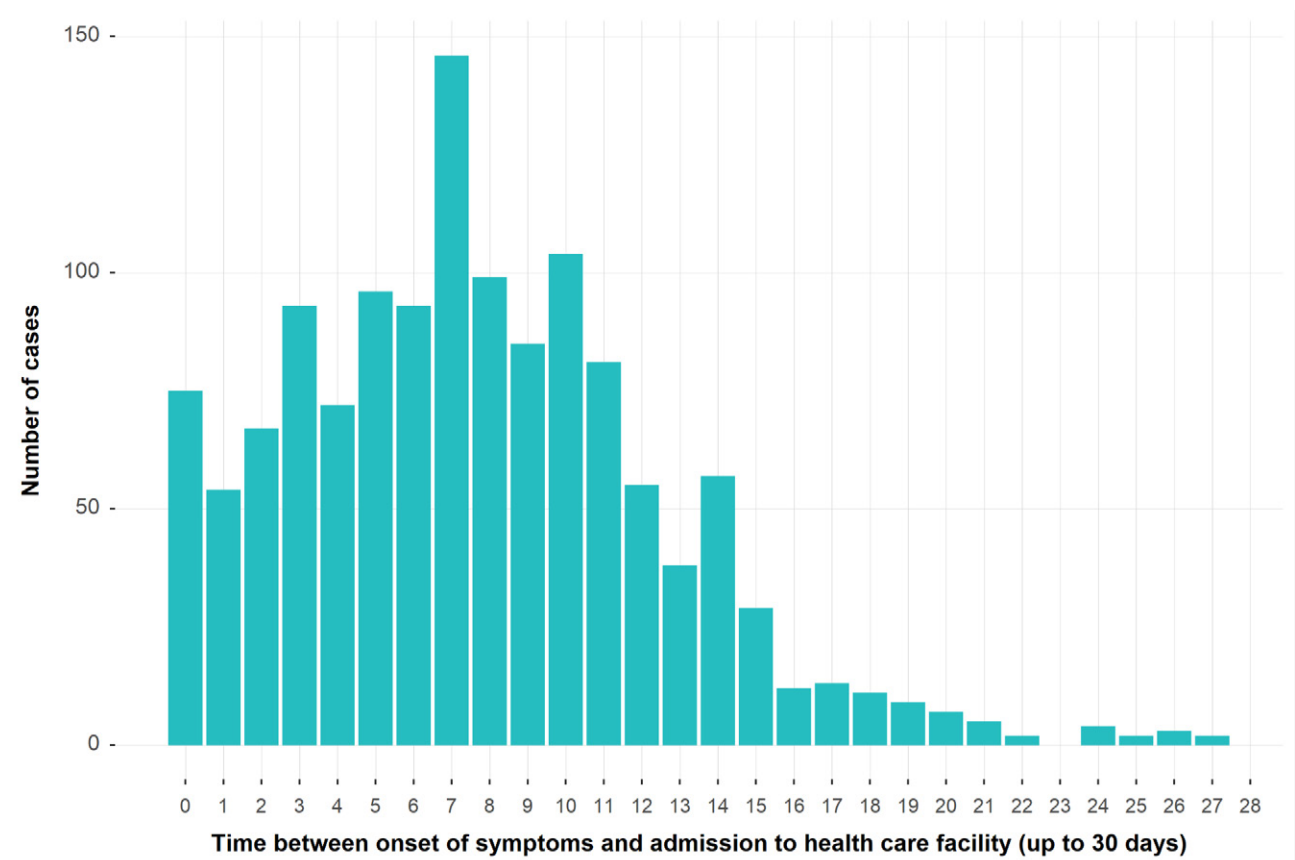
The most prevalent clinical manifestation(s) was/were **pneumonia (97.4%)** among people 0-18 years old, **pneumonia (75.3%)** among people 19-45 years old, **pneumonia (77.9%)** among people 46-65 years old, **pneumonia (86.1%)** among people 66-75 years old, and **anaemia (93.6%)** among people over 75 years old.

### 3.8. Disease progression and time variables

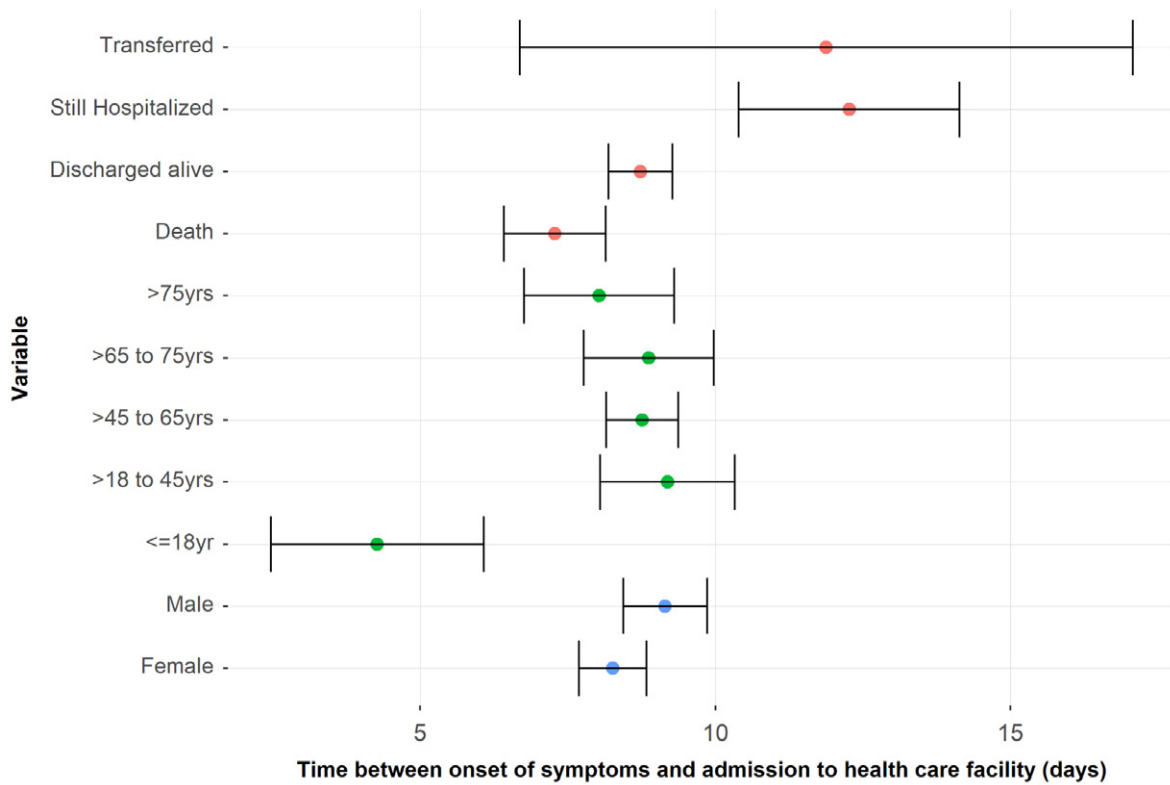
#### 3.8.1. Time from onset of symptoms to hospital admission

The mean time from the onset of symptoms to admission to the healthcare facility is 8.7 (SD = 8.7) days, with a median of 7.0 days. **Figure 8.1** shows the distribution of time (days) between the onset of symptoms and hospital admission. **Figure 8.2** shows the mean time between the onset of symptoms and admission to the health care facility, by sex, age group, the severity of illness at admission, and outcome.

**Figure 8.1** Time between onset of symptoms and admission to the healthcare facility (days) for patients with COVID-19

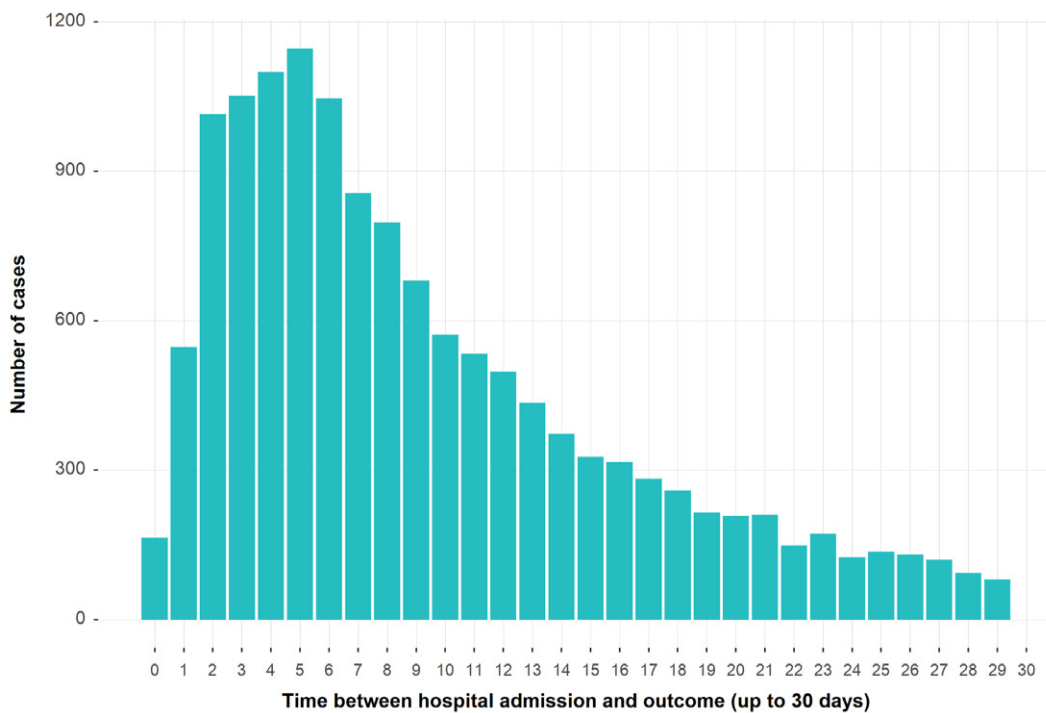


**Figure 8.2** Time (days) between the onset of symptoms and admission to the health care facility, by sex, age group, severity of illness at admission, and outcome status for patients with COVID-19 (mean and 95% confidence interval)



### 3.8.2. Duration of hospital stay

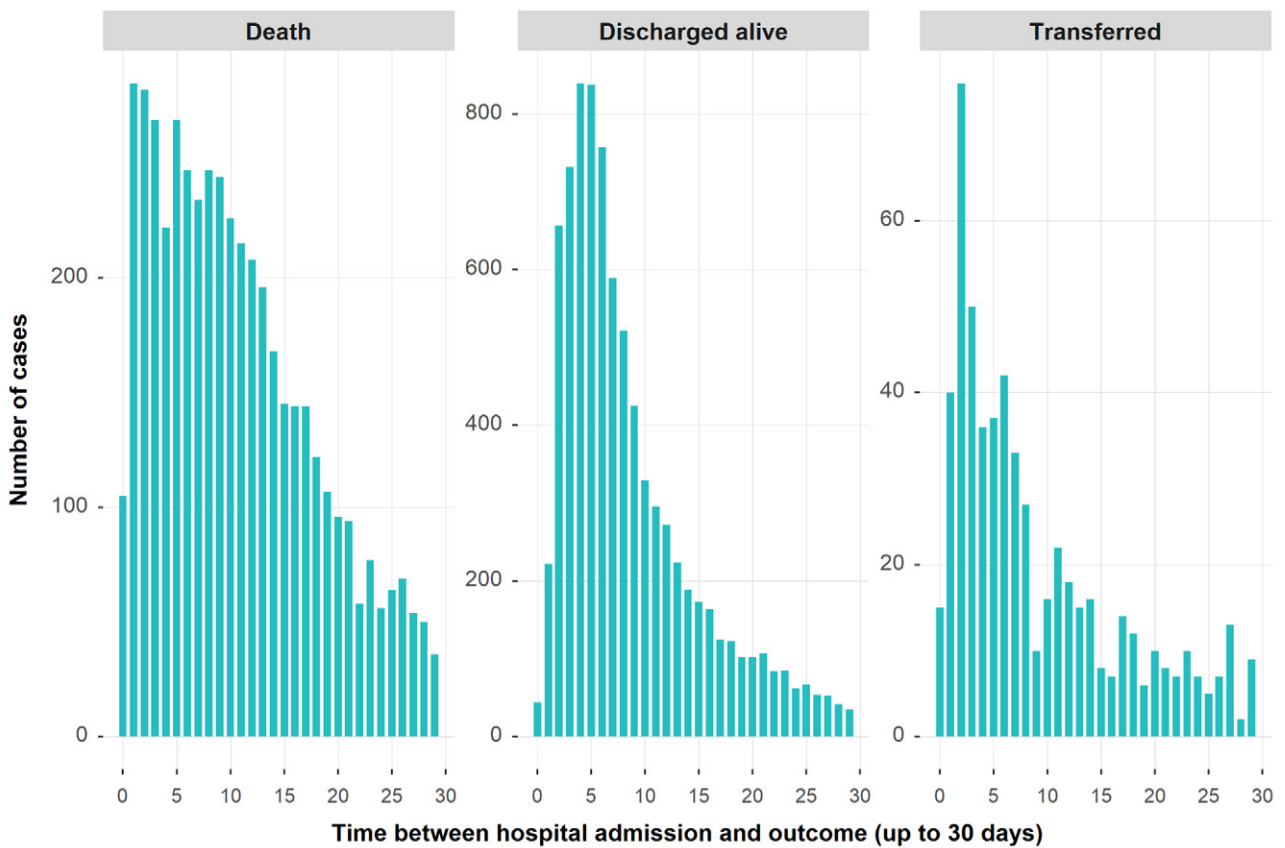
**Figure 8.3** Duration of hospital stay from time of admission to outcome (discharged alive, transferred or died, in days) for patients with COVID-19



The mean, median, and standard deviation of the duration of hospital stay was

- **11.8** and **7.0** days, with a standard deviation of  $\pm$  **13.9** days for patients who were discharged alive
- **15.0** and **8** days, with a standard deviation of  $\pm$  **18.7** days for patients who were transferred to another healthcare facility
- **14.0** and **11** days, with a standard deviation of  $\pm$  **13.8** days for patients who died in hospital.

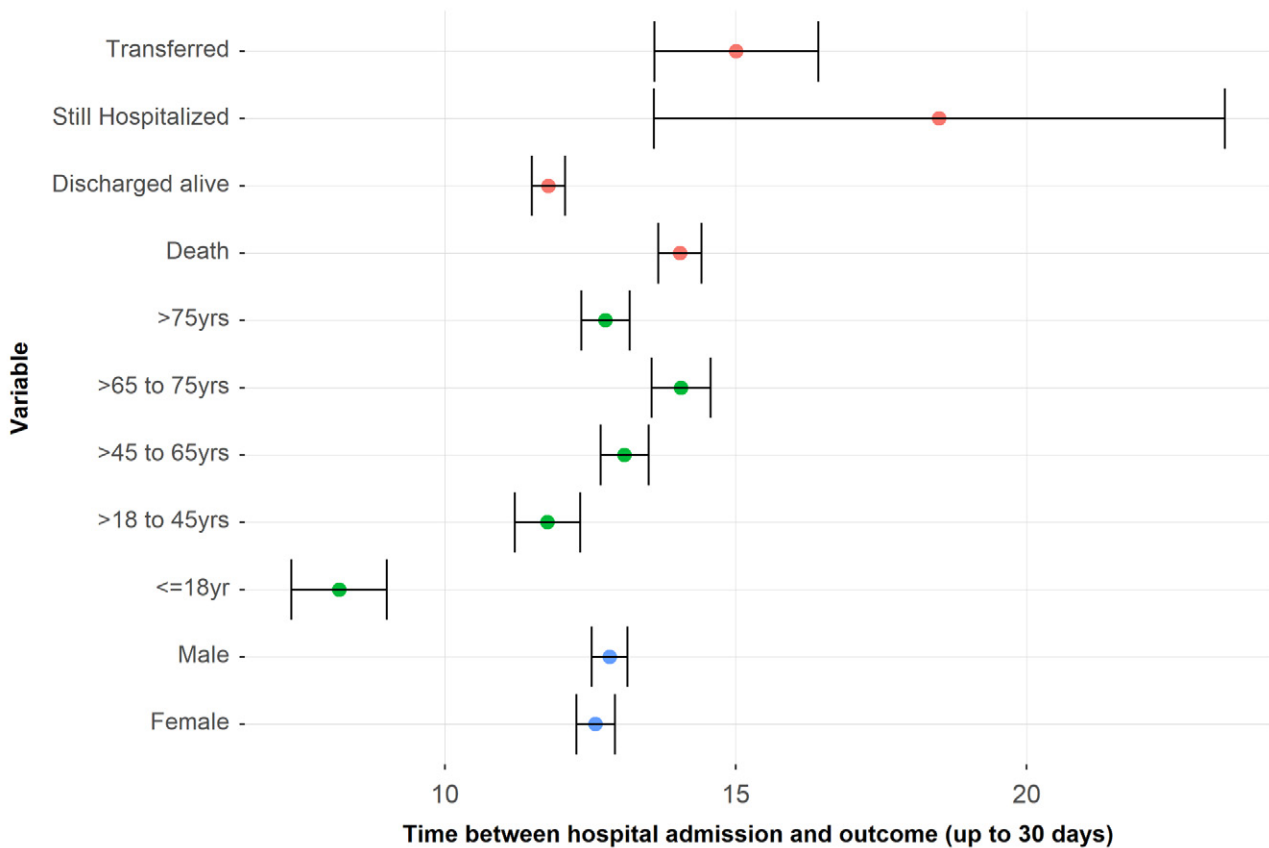
**Figure 8.4** Duration of hospital stay by outcome (discharged alive, transferred or died, in days) for patients hospitalized with COVID-19



The mean duration of hospital stay by age group, severity of illness at hospital admission, sex, and outcome is shown in **Figure 8.5**.



**Figure 8.5** Duration of hospital stay by sex, age group, the severity of illness on admission, and outcome status for patients with COVID-19 (mean and 95% confidence interval)

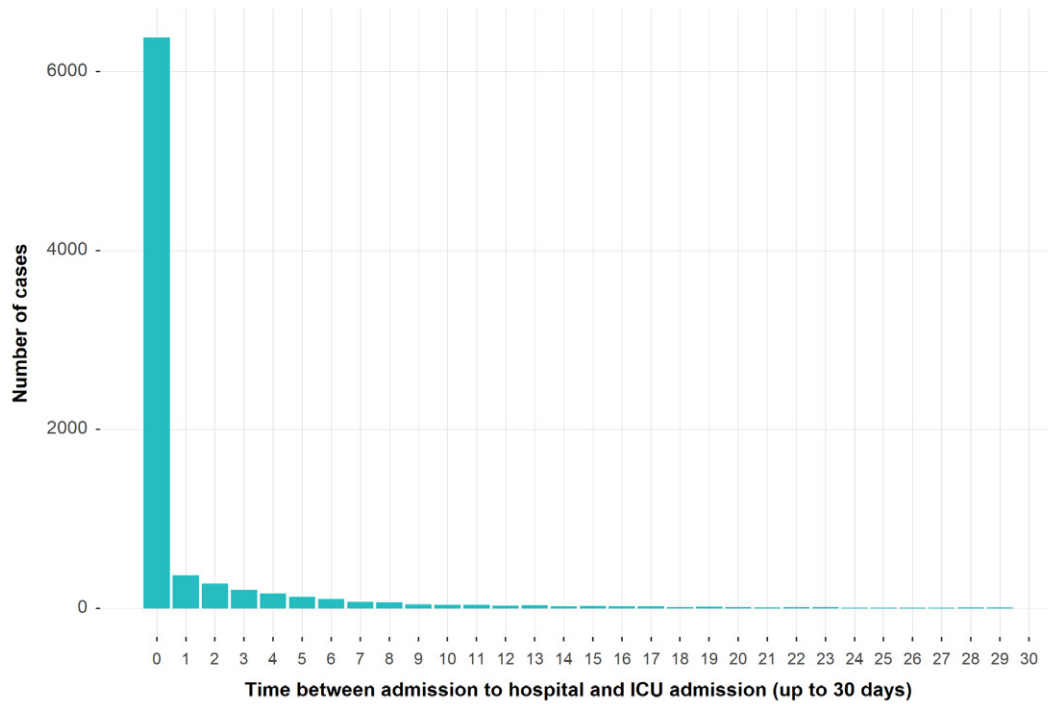


### 3.8.3. Time from admission to hospital to admission to an Intensive Care Unit (ICU)

The mean and median time from admission to the hospital to admission to the ICU was **1.8** and **0** days, with a standard deviation of  $\pm 5.8$  days. The time distribution is shown in Figure 8.6.

Among cases where the time data was recorded (**15853** cases), **1154 (13.9%)** were admitted to the ICU on the same day as hospital admission, **1154 (13.9%)** were admitted to the ICU within five days of hospital admission, and **766 (9.2%)** were admitted to the ICU more than five days after hospital admission.

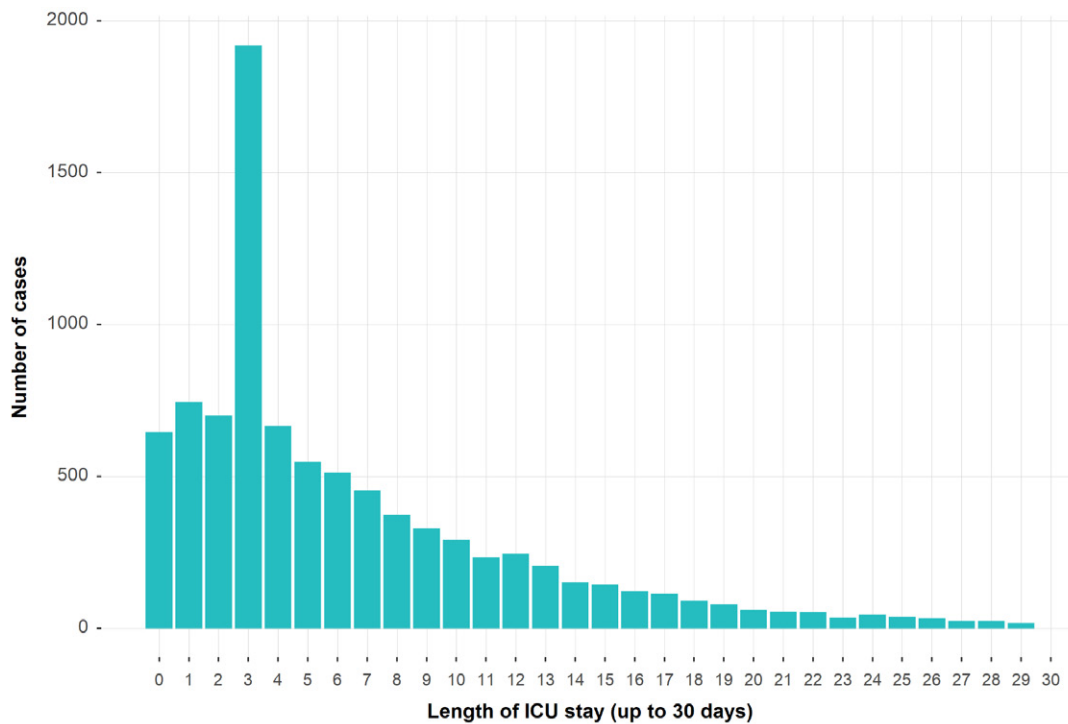
**Figure 8.6** Time from admission to hospital and admission to an Intensive Care Unit (ICU, days) for patients with COVID-19



### 3.8.4. Length of stay in Intensive Care (ICU)

The mean and median duration of ICU stay was **7.0** and **4** days, with a standard deviation of  $\pm 7.4$  days. The distribution of duration is shown in **Figure 8.7**.

**Figure 8.7** Length of stay in the Intensive Care Unit (ICU, days) for patients with COVID-19

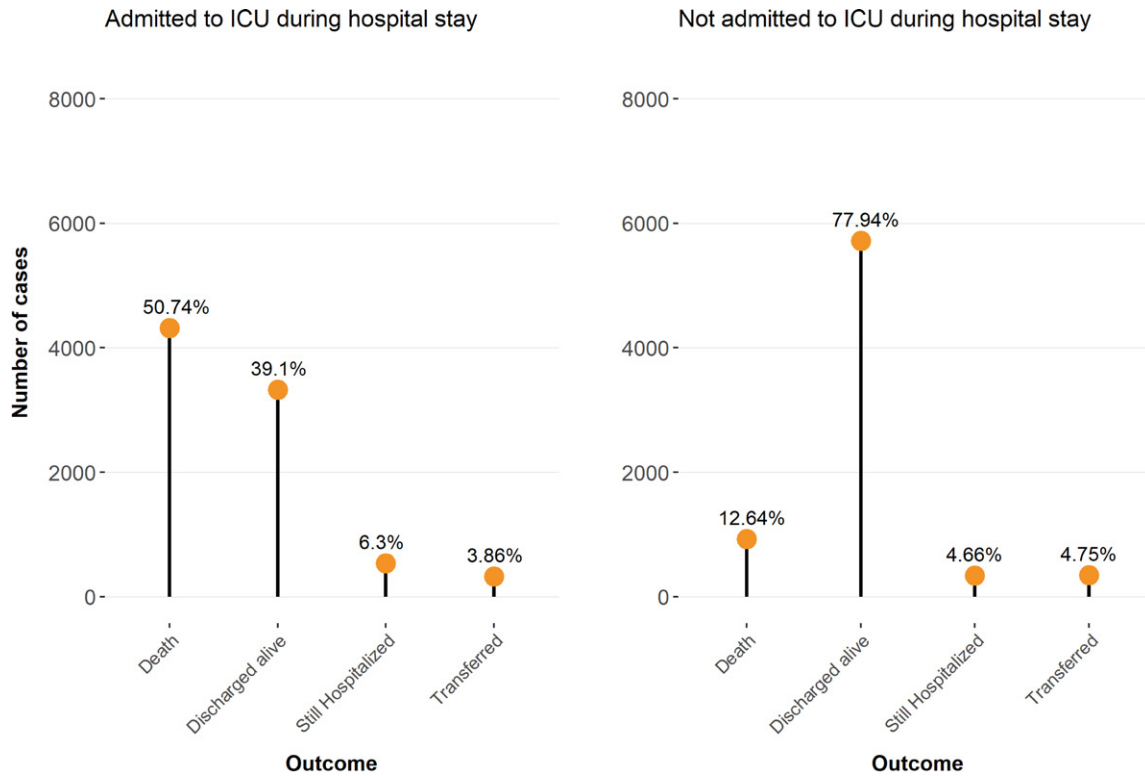


Amongst people who survived, the mean length of ICU stay was **6.0 (5.8-6.3)** days. Amongst people who had died, the mean length of ICU stay was **7.8 (7.5-8.0)** days.

### 3.8.5. Admission to an Intensive Care Unit (ICU)

A total of **8503 (53.6%)** patients were admitted to the ICU at any time during their hospital stay. The frequency of ICU admission by individual outcome status is shown in **Figure 9.1**.

**Figure 9.1** Proportion of outcomes for COVID-19 patients by level of hospital care received (Intensive care admission compared to non-intensive care)



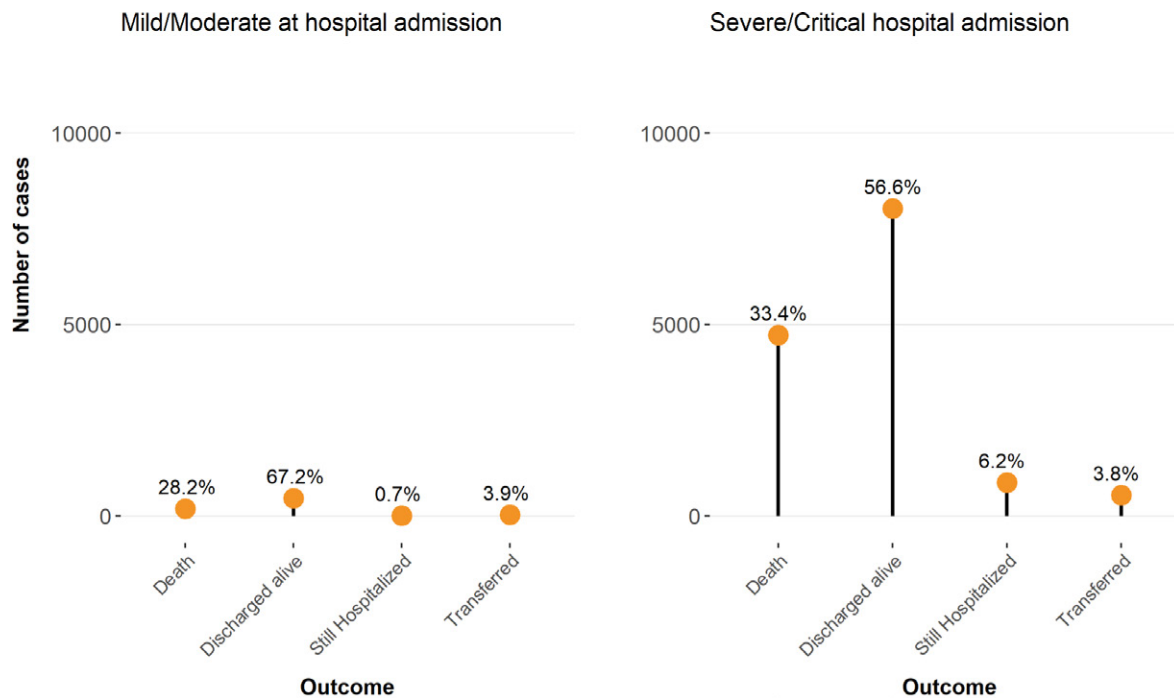
### 3.9. Patient outcomes

From a total of **15886 (81.6%)** cases reporting on patient outcomes:

- **9060 (57.0%)** patients were discharged alive
- **5264 (33.1%)** died during their hospital admission
- **678 (4.3%)** were transferred to another healthcare facility, and
- **884 patients (5.6%)** were still hospitalized at reporting.

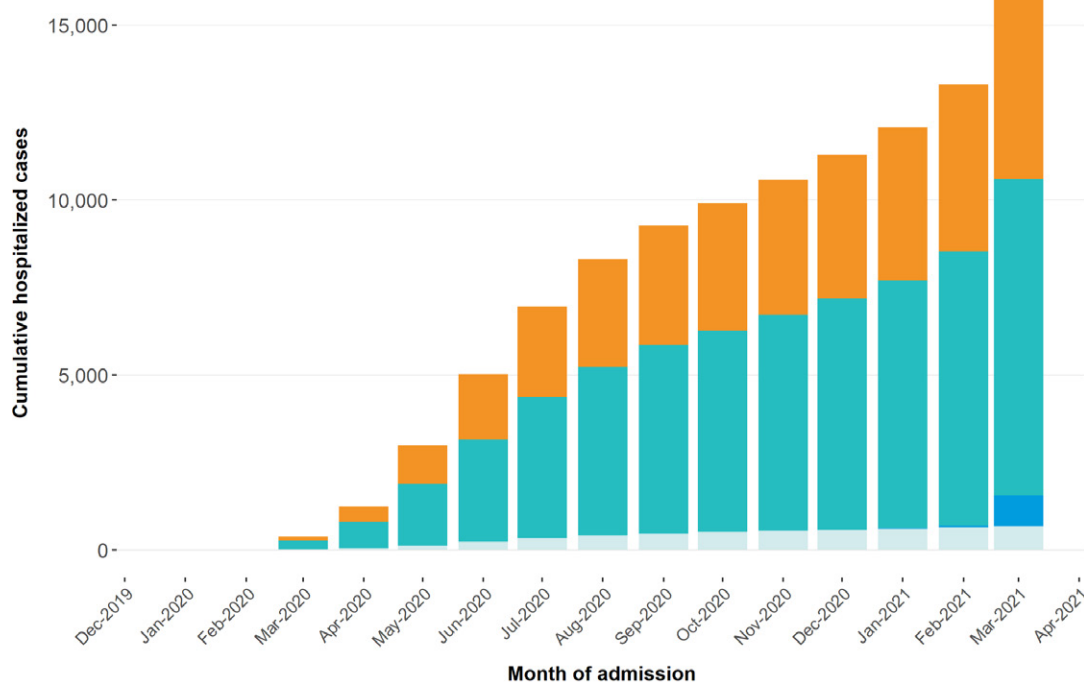
Outcome status by severity at admission is reported in **Figure 10.1**.

**Figure 10.1** Outcome status of patients with COVID-19 by the severity of illness at admission to hospital



The cumulative number of hospitalized cases submitted to the WHO Global Clinical Platform for COVID-19 with clinical information, disaggregated by outcome status and month of hospital admission is shown in **Figure 10.2**.

**Figure 10.2** Total number of cases with outcome status reported to the WHO Global Clinical Platform for COVID-19 by the month of hospital admission



### 3.9.1. Case fatality ratio

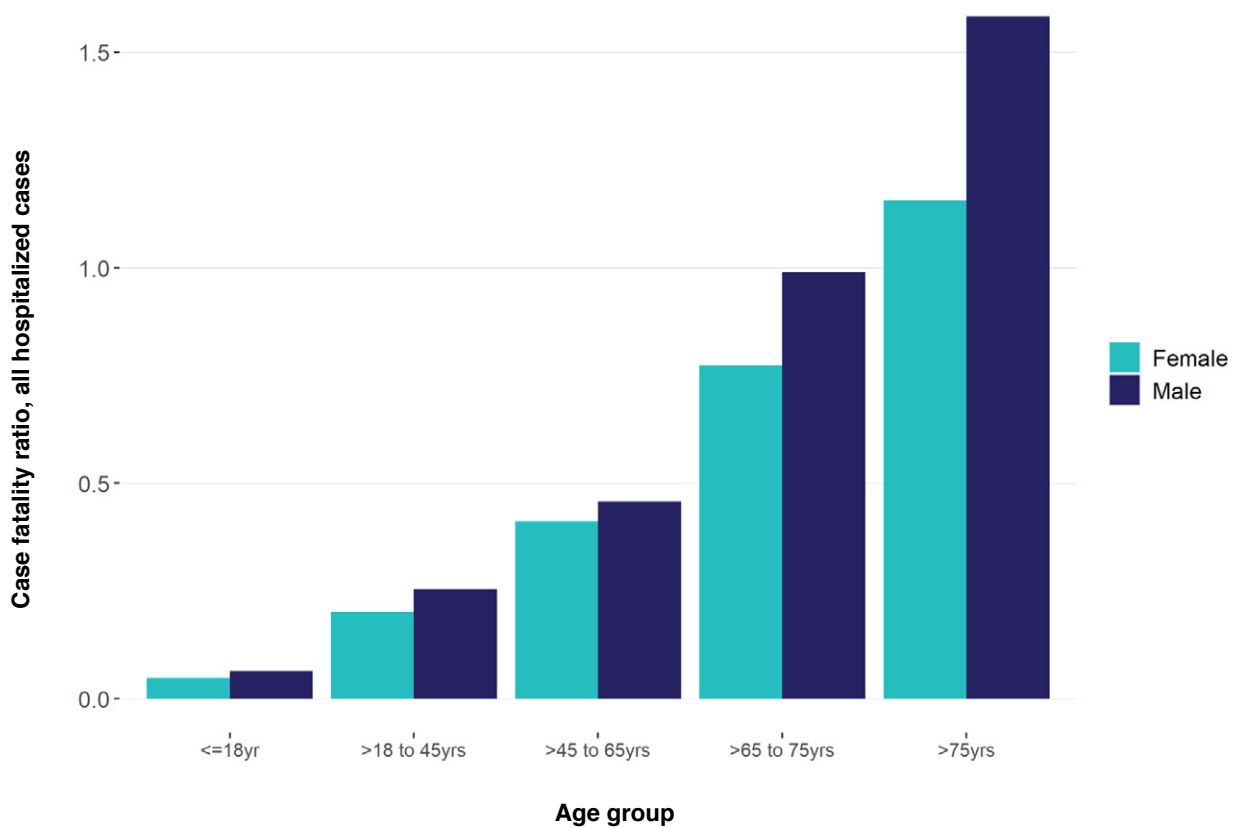
Overall, the case fatality ratio (number of deaths/patients discharged alive or **dead**) among

- all hospitalized patients was **36.7%**,
- amongst those admitted to the ICU was **56.7%**.

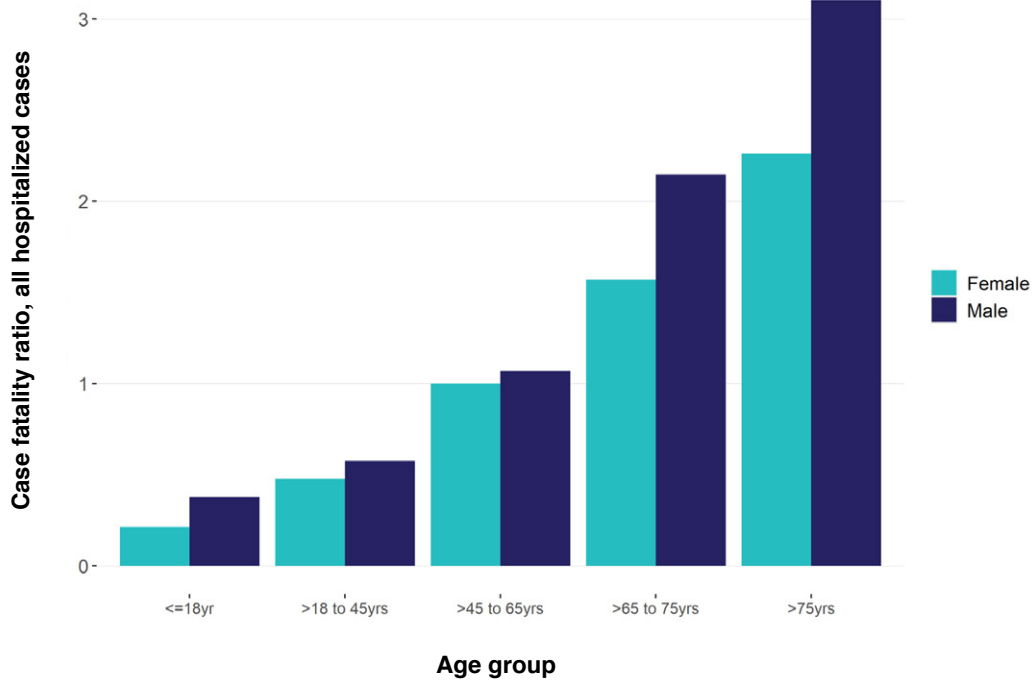
The age group and sex with consistently the highest case fatality ratio (in brackets) was **>75yrs (1.4%)** and male (**0.6%**).

The case fatality ratio by sex and age for all hospitalized patients is shown in **Figure 10.3**, and for those admitted to the ICU in **Figure 10.4**.

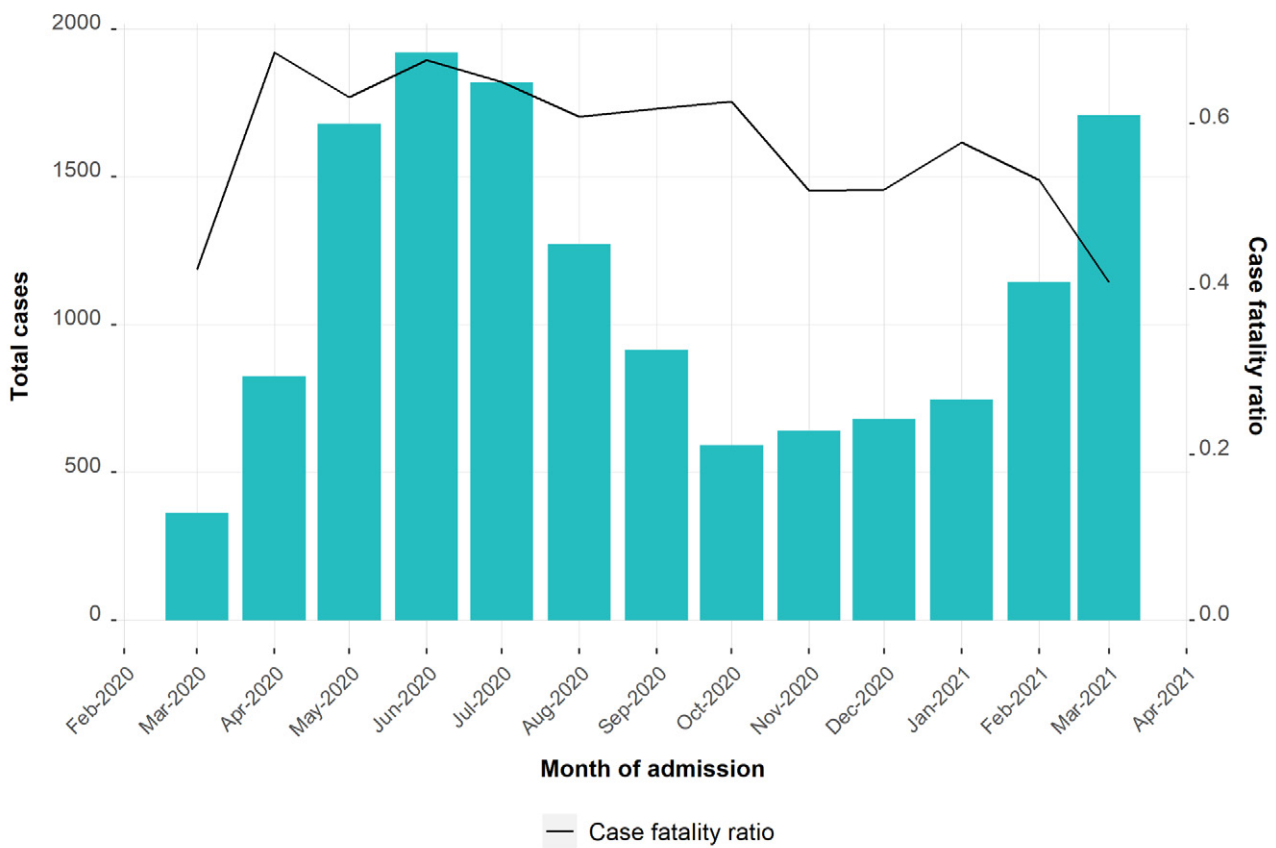
**Figure 10.3** Case fatality ratio of all hospitalized COVID-19 cases by age group and sex (standardized to age category)



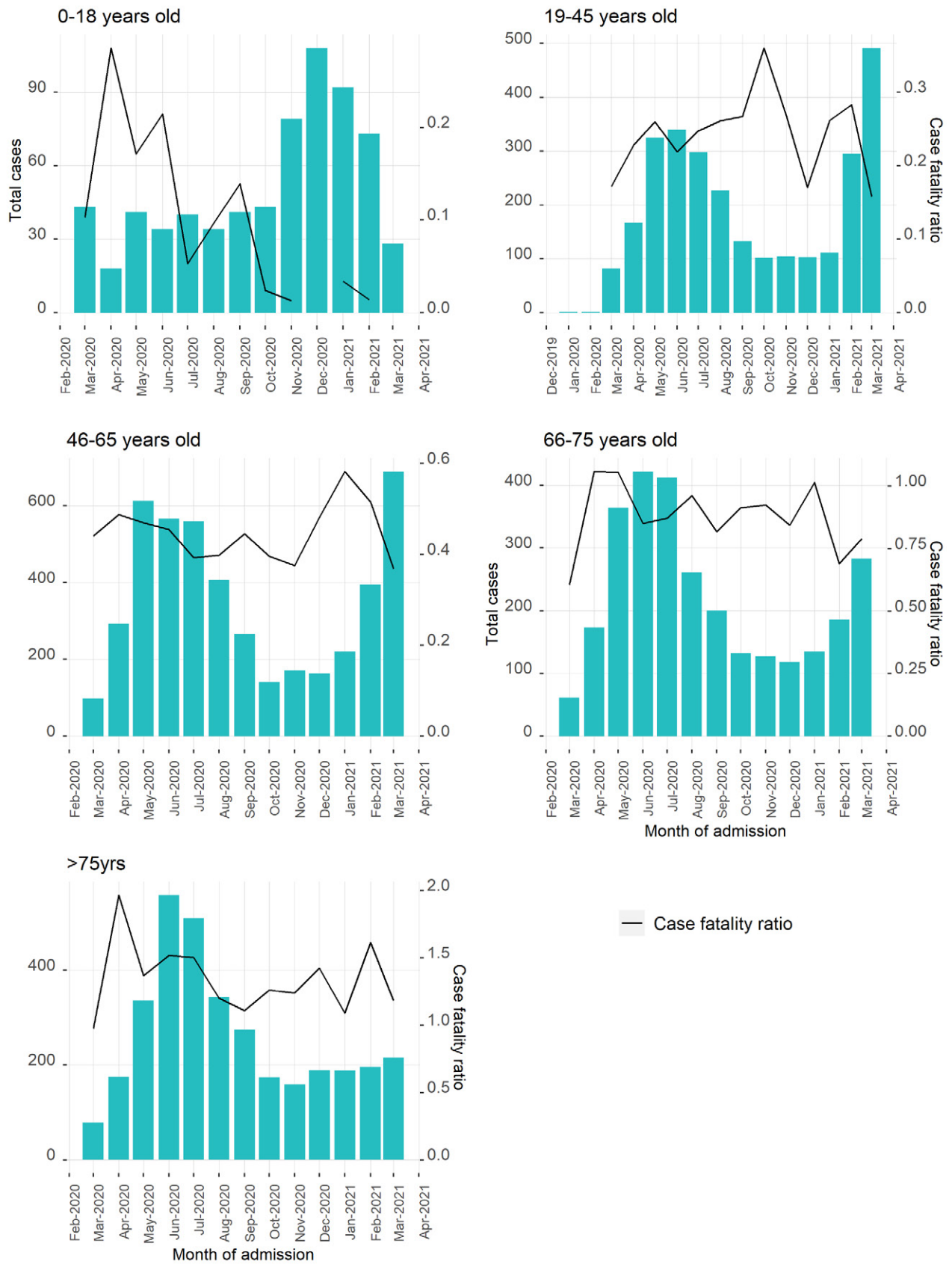
**Figure 10.4** Case fatality ratio of hospitalized COVID-19 cases admitted to the ICU by age group and sex (standardized to age category)



**Figure 10.5** Number of Case Report Forms submitted to the WHO Global Clinical Platform for COVID-19 by month of hospital admission and case fatality ratio



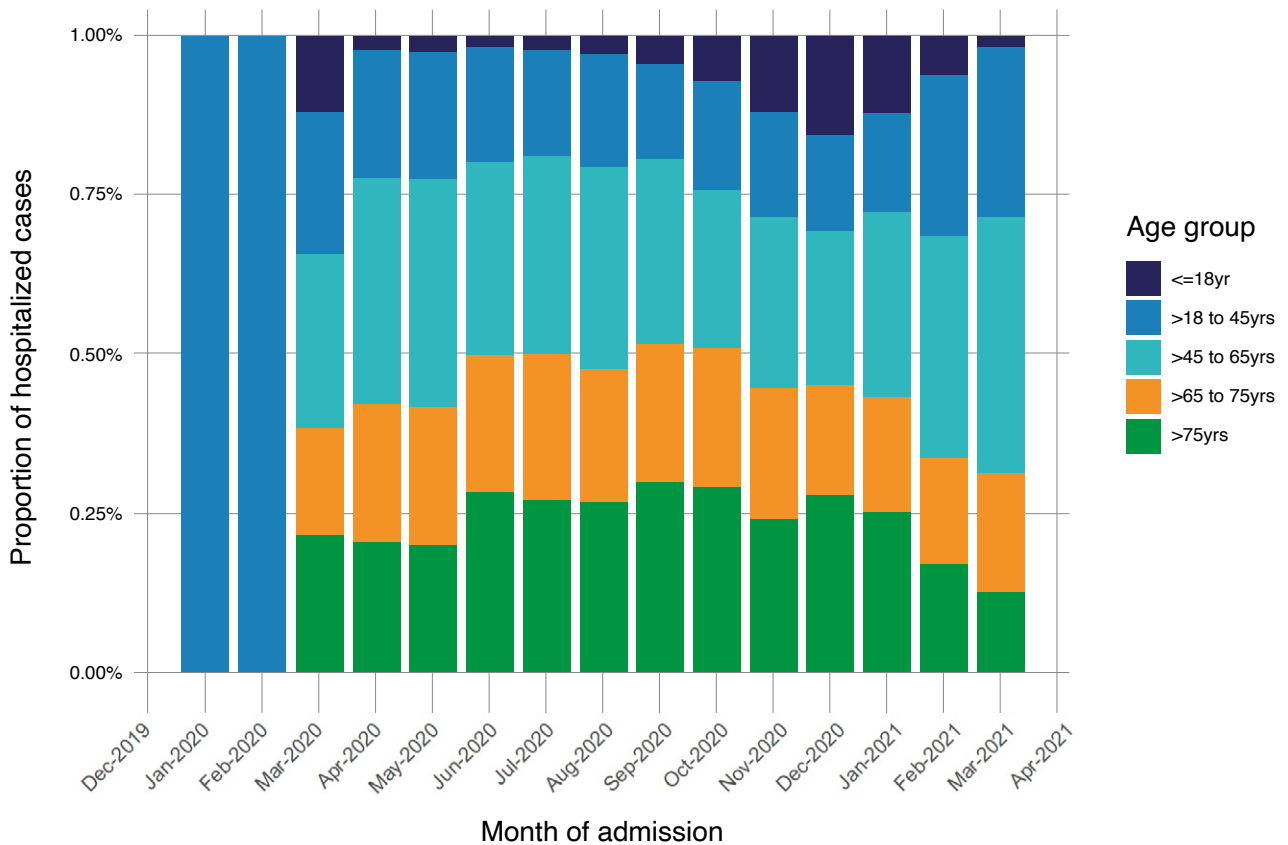
**Figure 10.6** Case fatality ratio by month of hospital admission and age group



# 4. Supplementary information

## 4.1. Annex 1: Age distribution over time

**Annex 1.1** Age distribution of hospitalized COVID-19 patients over time





## 4.2. Annex 2: Signs or symptoms at hospital admission

**Annex Table 2.1** Number and proportion of COVID-19 patients with presenting signs or symptoms with mild/moderate illness and with severe/critical illness at hospital admission.

Symptom at hospital admission	Mild-Moderate cases with symptom / Total Mild or Moderate cases (%)	Severe-Critical cases with symptom / Total Severe or Critical cases (%)
Headache	78 / 3841 (2%)	928 / 1354 (68.5%)
Diarrhoea	56 / 375 (14.9%)	665 / 1054 (63.1%)
Cough	244 / 380 (64.2%)	8223 / 14136 (58.2%)
Chest pain	14 / 94 (14.9%)	412 / 723 (57%)
Fatigue / Malaise	113 / 366 (30.9%)	326 / 574 (56.8%)
History of Fever	228 / 367 (62.1%)	7302 / 14147 (51.6%)
Abdominal pain	10 / 96 (10.4%)	320 / 646 (49.5%)
Inability to walk	5 / 79 (6.3%)	209 / 485 (43.1%)
Muscle aches (myalgia)	134 / 3841 (3.5%)	201 / 538 (37.4%)
Vomiting / Nausea	44 / 375 (11.7%)	252 / 693 (36.4%)
Shortness of breath	221 / 365 (60.5%)	4084 / 13927 (29.3%)
Seizures	1 / 366 (0.3%)	193 / 683 (28.3%)
Loss of taste	17 / 3782 (0.4%)	100 / 354 (28.2%)
Loss of smell	23 / 3782 (0.6%)	79 / 332 (23.8%)
Sore throat	35 / 358 (9.8%)	124 / 538 (23%)
Wheezing	2 / 79 (2.5%)	58 / 393 (14.8%)
Runny nose (rhinorrhoea)	21 / 358 (5.9%)	59 / 473 (12.5%)
Joint pain (arthralgia)	5 / 3836 (0.1%)	69 / 566 (12.2%)
Skin ulcers	7 / 3545 (0.2%)	1471 / 14029 (10.5%)
Bleeding (Haemorrhage)	NA / 3553 (NA%)	588 / 11951 (4.9%)
Altered consciousness/confusion	12 / 366 (3.3%)	23 / 494 (4.7%)
Lower chest wall indrawing	NA / 77 (NA%)	636 / 13966 (4.6%)
Conjunctivitis	1 / 3550 (0%)	7 / 410 (1.7%)
Lymphadenopathy	3 / 3541 (0.1%)	5 / 391 (1.3%)
Skin rash	1 / 3830 (0%)	2 / 538 (0.4%)

**Annex Table 2.2** Symptoms at hospital admission for patients with COVID-19 by age group

Symptom	# of cases with symptom / total cases 0-18 years old (%)	# of cases with symptom / total cases 19-45 years old (%)	# of cases with symptom / total cases 46-65 years old (%)	# of cases with symptom / total cases 66-75 years old (%)	# of cases with symptom / total cases over 7y years old (%)
Abdominal pain	7 / 11 (63.6%)	80 / 194 (41.2%)	103 / 300 (34.3%)	51 / 127 (40.2%)	90 / 115 (78.3%)
Altered consciousness/ confusion	NA / 6 (NA%)	3 / 254 (1.2%)	10 / 431 (2.3%)	13 / 173 (7.5%)	12 / 122 (9.8%)
Bleeding (Haemorrhage)	17 / 688 (2.5%)	107 / 2312 (4.6%)	165 / 3768 (4.4%)	130 / 2399 (5.4%)	169 / 2830 (6%)
Chest pain	NA / 4 (NA%)	144 / 254 (56.7%)	142 / 325 (43.7%)	69 / 142 (48.6%)	71 / 97 (73.2%)
Conjunctivitis	NA / 4 (NA%)	2 / 128 (1.6%)	4 / 214 (1.9%)	2 / 79 (2.5%)	NA / 28 (NA%)
Cough	304 / 715 (42.5%)	1870 / 2884 (64.8%)	2944 / 4661 (63.2%)	1666 / 2923 (57%)	1769 / 3464 (51.1%)
Diarrhoea	18 / 24 (75%)	177 / 379 (46.7%)	273 / 626 (43.6%)	135 / 285 (47.4%)	141 / 246 (57.3%)
Fatigue / Malaise	3 / 7 (42.9%)	110 / 269 (40.9%)	212 / 461 (46%)	84 / 189 (44.4%)	56 / 140 (40%)
Headache	4 / 10 (40%)	320 / 506 (63.2%)	441 / 777 (56.8%)	152 / 302 (50.3%)	116 / 224 (51.8%)
History of Fever	286 / 715 (40%)	1811 / 2880 (62.9%)	2622 / 4662 (56.2%)	1355 / 2919 (46.4%)	1521 / 3464 (43.9%)
Inability to walk	1 / 4 (25%)	13 / 121 (10.7%)	41 / 213 (19.2%)	52 / 101 (51.5%)	107 / 125 (85.6%)
Joint pain (arthralgia)	NA / 6 (NA%)	19 / 264 (7.2%)	30 / 443 (6.8%)	13 / 183 (7.1%)	12 / 130 (9.2%)
Loss of smell	3 / 4 (75%)	48 / 197 (24.4%)	47 / 296 (15.9%)	16 / 129 (12.4%)	4 / 107 (3.7%)
Loss of taste	3 / 4 (75%)	49 / 204 (24%)	53 / 306 (17.3%)	22 / 132 (16.7%)	9 / 109 (8.3%)
Lower chest wall indrawing	12 / 713 (1.7%)	119 / 2740 (4.3%)	189 / 4415 (4.3%)	138 / 2809 (4.9%)	178 / 3366 (5.3%)
Lymphadenopathy	1 / 4 (25%)	2 / 118 (1.7%)	4 / 200 (2%)	1 / 72 (1.4%)	NA / 31 (NA%)
Muscle aches (myalgia)	2 / 6 (33.3%)	116 / 259 (44.8%)	183 / 437 (41.9%)	55 / 178 (30.9%)	33 / 123 (26.8%)
Runny nose (rhinorrhoea)	2 / 7 (28.6%)	26 / 243 (10.7%)	38 / 419 (9.1%)	14 / 170 (8.2%)	9 / 118 (7.6%)
Seizures	21 / 27 (77.8%)	31 / 283 (11%)	57 / 488 (11.7%)	46 / 216 (21.3%)	39 / 161 (24.2%)
Shortness of breath	111 / 714 (15.5%)	926 / 2863 (32.3%)	1508 / 4585 (32.9%)	898 / 2854 (31.5%)	945 / 3402 (27.8%)
Skin rash	NA / 6 (NA%)	2 / 254 (0.8%)	1 / 430 (0.2%)	NA / 174 (NA%)	NA / 123 (NA%)
Skin ulcers	75 / 713 (10.5%)	141 / 2747 (5.1%)	319 / 4420 (7.2%)	321 / 2816 (11.4%)	622 / 3371 (18.5%)
Sore throat	NA / 6 (NA%)	57 / 261 (21.8%)	70 / 442 (15.8%)	26 / 183 (14.2%)	20 / 130 (15.4%)
Vomiting / Nausea	11 / 16 (68.8%)	75 / 295 (25.4%)	108 / 501 (21.6%)	40 / 207 (19.3%)	75 / 180 (41.7%)
Wheezing	8 / 11 (72.7%)	10 / 122 (8.2%)	21 / 215 (9.8%)	12 / 87 (13.8%)	9 / 37 (24.3%)

### 4.3. Annex 3: Underlying conditions at hospital admission

**Annex Table 3.1** Frequency of underlying conditions among people admitted with mild/moderate illness compared to severe/critical illness

Underlying condition	Mild-Moderate cases with condition / Total Mild or Moderate cases (%)	Severe-Critical cases with condition / Total Severe or Critical cases (%)
Hypertension	155 / 3831 (4%)	6438 / 14184 (45.4%)
Diabetes	25 / 3831 (0.7%)	306 / 821 (37.3%)
BMI >30	10 / 43 (23.3%)	65 / 192 (33.9%)
Chronic cardiac disease	97 / 3844 (2.5%)	3989 / 14181 (28.1%)
Current smoking	33 / 3831 (0.9%)	159 / 687 (23.1%)
Chronic kidney disease	32 / 372 (8.6%)	1636 / 14097 (11.6%)
Chronic neurological disorder	1 / 43 (2.3%)	12 / 192 (6.2%)
Chronic pulmonary disease	13 / 4162 (0.3%)	26 / 597 (4.4%)
Asthma	8 / 3542 (0.2%)	11 / 330 (3.3%)
Malnutrition	26 / 3831 (0.7%)	450 / 14181 (3.2%)
BMI >40	23 / 3831 (0.6%)	410 / 14182 (2.9%)
Chronic liver disease	67 / 3831 (1.7%)	248 / 14182 (1.7%)
HIV	16 / 3548 (0.5%)	62 / 14049 (0.4%)
Malignant neoplasm	3 / 3844 (0.1%)	58 / 14185 (0.4%)
Tuberculosis	6 / 3545 (0.2%)	26 / 14045 (0.2%)
Asplenia	NA / 3538 (NA%)	NA / 409 (NA%)

**Annex Table 3.2** Underlying conditions present at admission for COVID-19 patients by age group

Condition	# of cases with condition / total cases 0-18 years old (%)	# of cases with condition / total cases 19-45 years old (%)	# of cases with condition / total cases 46-65 years old (%)	# of cases with condition / total cases 66-75 years old (%)	# of cases with condition / total cases over 75 years old (%)
Asthma	33 / 38 (86.8%)	127 / 350 (36.3%)	101 / 519 (19.5%)	36 / 205 (17.6%)	43 / 159 (27%)
Chronic cardiac disease	2 / 715 (0.3%)	16 / 2880 (0.6%)	93 / 4657 (2%)	101 / 2916 (3.5%)	121 / 3464 (3.5%)
Chronic kidney disease	1 / 715 (0.1%)	49 / 2880 (1.7%)	161 / 4657 (3.5%)	98 / 2916 (3.4%)	128 / 3464 (3.7%)
Chronic liver disease		14 / 2887 (0.5%)	36 / 4664 (0.8%)	10 / 2922 (0.3%)	1 / 3465 (0%)
Chronic neurological disorder		8 / 2748 (0.3%)	11 / 4431 (0.2%)	8 / 2819 (0.3%)	5 / 3372 (0.1%)
Chronic pulmonary disease	1 / 715 (0.1%)	11 / 2880 (0.4%)	113 / 4656 (2.4%)	135 / 2916 (4.6%)	221 / 3464 (6.4%)
Current smoking	1 / 714 (0.1%)	134 / 2872 (4.7%)	530 / 4635 (11.4%)	457 / 2916 (15.7%)	553 / 3463 (16%)
Diabetes	5 / 715 (0.7%)	322 / 2886 (11.2%)	1447 / 4662 (31%)	1137 / 2921 (38.9%)	1211 / 3465 (34.9%)
HIV	1 / 6 (16.7%)	14 / 505 (2.8%)	23 / 975 (2.4%)	2 / 507 (0.4%)	
Hypertension	4 / 715 (0.6%)	478 / 2880 (16.6%)	2182 / 4659 (46.8%)	1772 / 2916 (60.8%)	2209 / 3464 (63.8%)
Malignant neoplasm	1 / 7 (14.3%)	24 / 272 (8.8%)	59 / 472 (12.5%)	58 / 216 (26.9%)	59 / 170 (34.7%)
Malnutrition		6 / 100 (6%)	5 / 161 (3.1%)	5 / 71 (7%)	3 / 30 (10%)
Morbid obesity		7 / 54 (13%)	4 / 103 (3.9%)	2 / 42 (4.8%)	
Obesity		29 / 54 (53.7%)	37 / 103 (35.9%)	7 / 42 (16.7%)	2 / 36 (5.6%)
Tuberculosis		35 / 2751 (1.3%)	26 / 4433 (0.6%)	17 / 2826 (0.6%)	5 / 3372 (0.1%)

## 4.4. Annex 4: Treatment at any time during hospital admission

**Annex Table 4.1** Frequency of treatment interventions received during hospital stay among individuals with mild/moderate illness compared to severe/critical illness

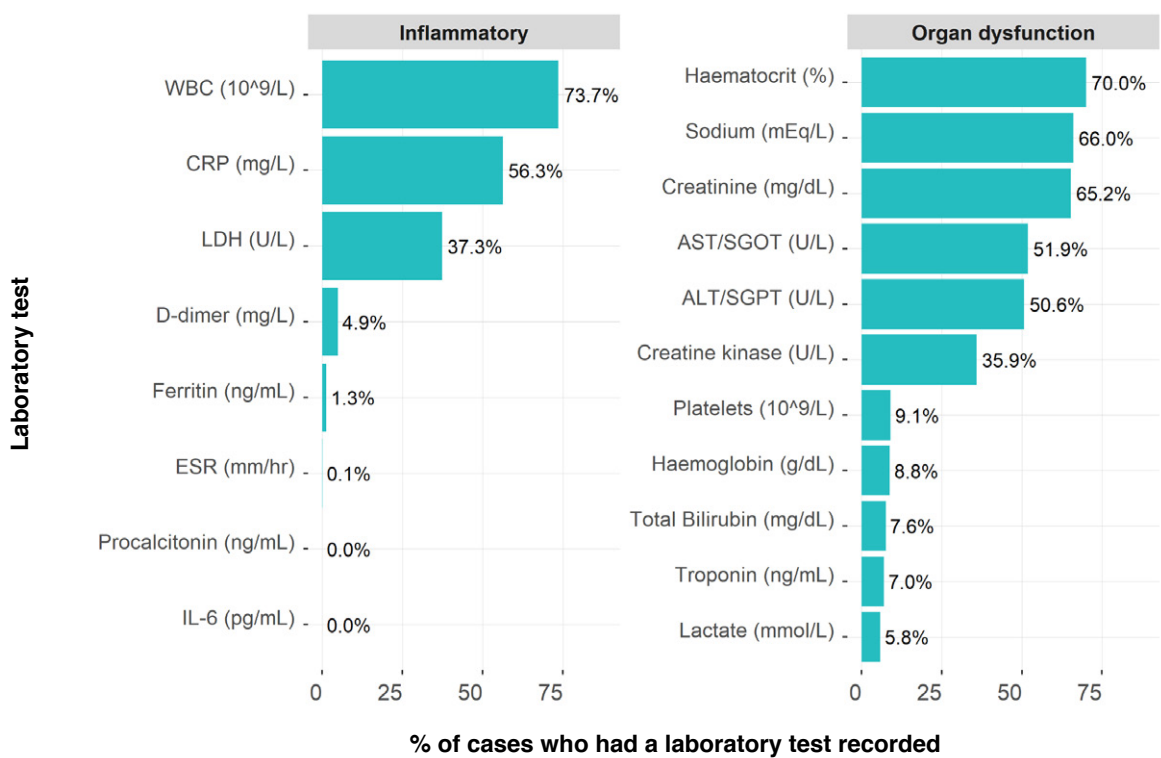
Treatment received	Mild-Moderate cases treated / Total Mild or Moderate cases (%)	Severe-Critical cases treated / Total Severe or Critical cases (%)
ACE inhibitor or ARBs	831 / 831 (100%)	4089 / 4089 (100%)
Systemic anticoagulation	1774 / 1774 (100%)	10039 / 10039 (100%)
Corticosteroids	492 / 691 (71.2%)	9986 / 14177 (70.4%)
Oral/orogastric Fluids	11 / 88 (12.5%)	8908 / 14018 (63.5%)
Antibiotics	4043 / 4176 (96.8%)	6287 / 14229 (44.2%)
IV Fluids	57 / 90 (63.3%)	5807 / 14022 (41.4%)
Experimental agent	8 / 89 (9%)	94 / 389 (24.2%)
Non-steroidal anti-inflammatory drug (NSAID)	164 / 836 (19.6%)	2099 / 14180 (14.8%)
Antivirals	860 / 1087 (79.1%)	1014 / 14178 (7.2%)
Antifungal Agents	343 / 935 (36.7%)	497 / 14182 (3.5%)
Antimalarial agent	11 / 687 (1.6%)	429 / 14178 (3%)

**Annex Table 4.2** Frequency of treatment interventions received during hospital stay for COVID-19 patients by age group

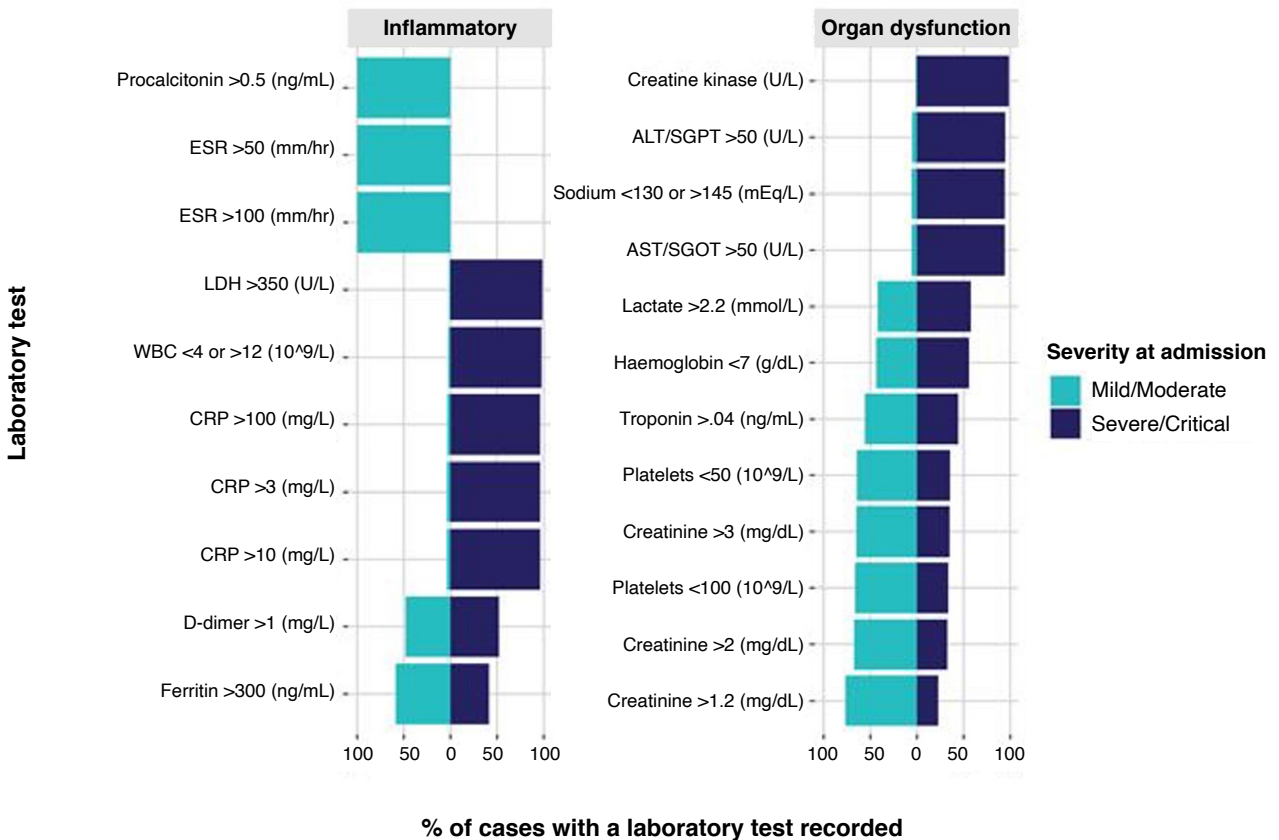
Treatment	# of cases with condition / total cases 0-18 years old (%)	# of cases with condition / total cases 19-45 years old (%)	# of cases with condition / total cases 46-65 years old (%)	# of cases with condition / total cases 66-75 years old (%)	# of cases with condition / total cases over 75 years old (%)
ACE inhibitor or ARBs	26 / 26 (100%)	623 / 623 (100%)	1467 / 1467 (100%)	1057 / 1057 (100%)	1128 / 1128 (100%)
Antibiotics	402 / 715 (56.2%)	1650 / 3137 (52.6%)	2479 / 5206 (47.6%)	1452 / 3247 (44.7%)	1538 / 3662 (42%)
Antifungal Agents	9 / 715 (1.3%)	143 / 3121 (4.6%)	287 / 5174 (5.5%)	189 / 3220 (5.9%)	157 / 3653 (4.3%)
Antimalarial agent	2 / 715 (0.3%)	120 / 3120 (3.8%)	183 / 5169 (3.5%)	85 / 3217 (2.6%)	51 / 3653 (1.4%)
Antivirals	113 / 715 (15.8%)	499 / 3120 (16%)	919 / 5169 (17.8%)	502 / 3216 (15.6%)	345 / 3653 (9.4%)
Corticosteroids	306 / 715 (42.8%)	2326 / 3123 (74.5%)	3799 / 5176 (73.4%)	2313 / 3227 (71.7%)	2429 / 3654 (66.5%)
Experimental agent		25 / 133 (18.8%)	50 / 222 (22.5%)	21 / 86 (24.4%)	6 / 33 (18.2%)
IV Fluids	174 / 713 (24.4%)	1170 / 2757 (42.4%)	1863 / 4443 (41.9%)	1175 / 2826 (41.6%)	1482 / 3373 (43.9%)
Non-steroidal anti-inflammatory drug (NSAID)	39 / 715 (5.5%)	413 / 3120 (13.2%)	586 / 5168 (11.3%)	495 / 3217 (15.4%)	594 / 3653 (16.3%)
Oral/orogastric Fluids	541 / 713 (75.9%)	2116 / 2754 (76.8%)	3025 / 4441 (68.1%)	1651 / 2825 (58.4%)	1586 / 3373 (47%)
Systemic anticoagulation	62 / 62 (100%)	2008 / 2008 (100%)	3360 / 3360 (100%)	2140 / 2140 (100%)	2481 / 2481 (100%)

## 4.5. Annex 5a: Laboratory blood test results at hospital admission

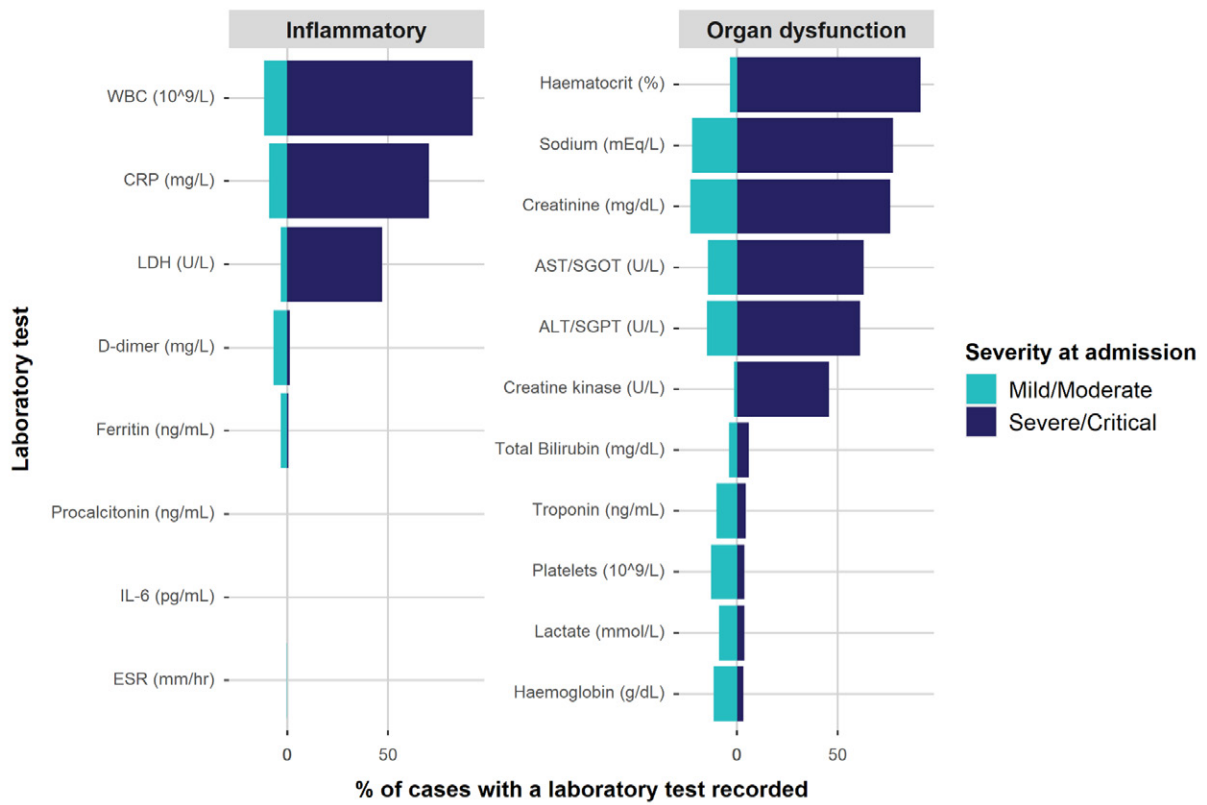
**Annex 5.1** Frequency of laboratory blood tests signifying inflammation vs organ dysfunction at hospital admission for patients with COVID-19



**Annex 5.2** Severity of illness among those patients with a laboratory blood test signifying inflammation vs organ dysfunction on admission.



**Annex 5.3** Frequency of laboratory blood tests signifying inflammation vs organ dysfunction among individuals with mild/moderate illness compared to severe/critical illness at hospital admission (source data shown below).



**Annex Table 5.1** Frequency of laboratory blood test recorded on admission by severity of illness at hospital admission.

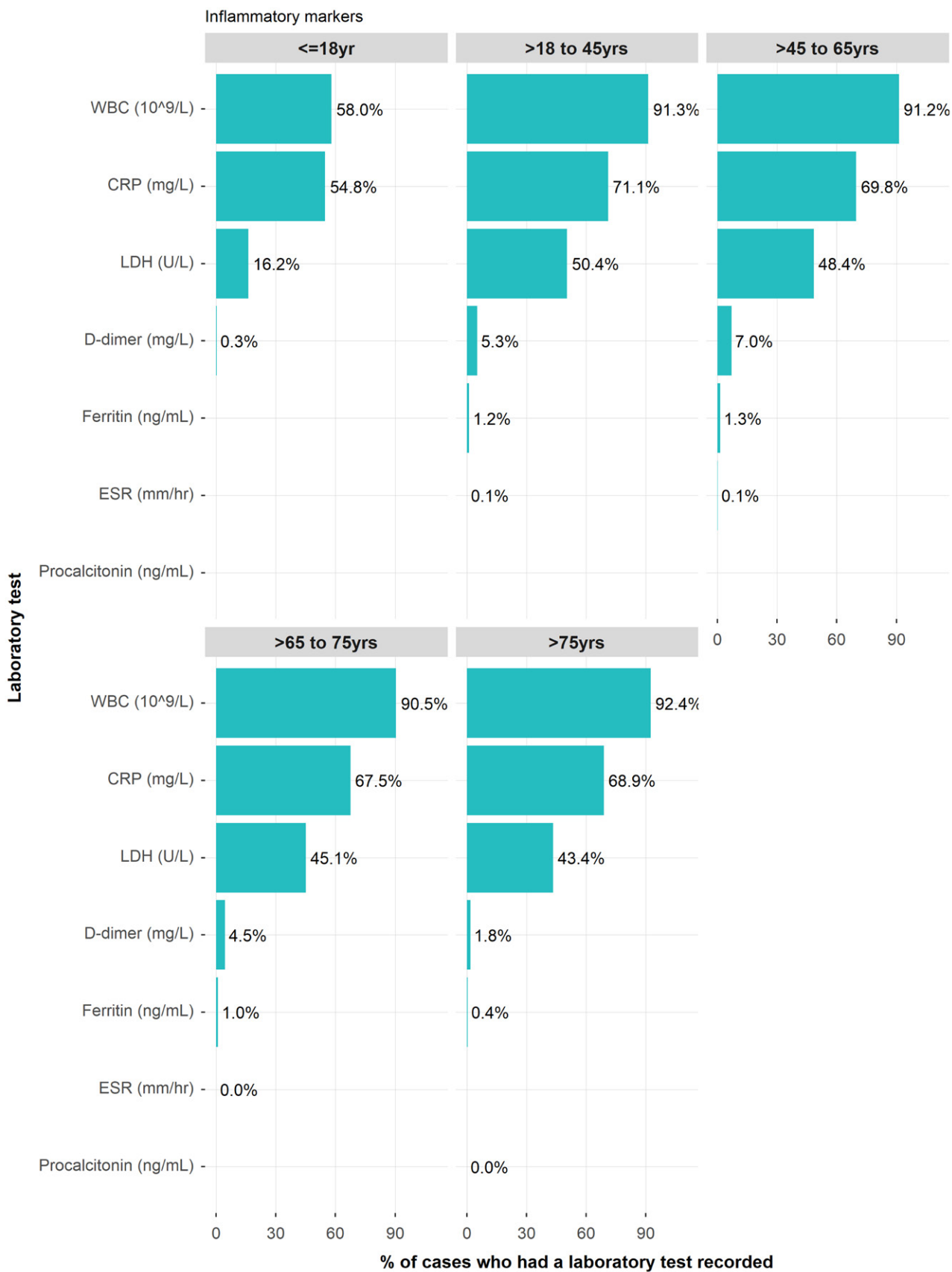
Laboratory test	Mild-Moderate cases with a recorded laboratory test / Total Mild or Moderate cases (%)	Severe-Critical cases with a recorded laboratory test / Total Severe or Critical cases (%)
WBC (10 <sup>9</sup> /L)	485 / 4176 (11.6%)	13145 / 14229 (92.4%)
Haematocrit (%)	147 / 4176 (3.5%)	12993 / 14229 (91.3%)
Potassium (mEq/L)	880 / 4176 (21.1%)	11062 / 14229 (77.7%)
Sodium (mEq/L)	932 / 4176 (22.3%)	11053 / 14229 (77.7%)
Urea (BUN) (mmol/L)	871 / 4176 (20.9%)	10894 / 14229 (76.6%)
CRP (mg/L)	379 / 4176 (9.1%)	10050 / 14229 (70.6%)
INR	365 / 4176 (8.7%)	9625 / 14229 (67.6%)
PT (seconds)	269 / 4176 (6.4%)	9514 / 14229 (66.9%)
APTT/APTR	290 / 4176 (6.9%)	9318 / 14229 (65.5%)
AST/SGOT (U/L)	612 / 4176 (14.7%)	8982 / 14229 (63.1%)
ALT/SGPT (U/L)	623 / 4176 (14.9%)	8727 / 14229 (61.3%)
LDH (U/L)	137 / 4176 (3.3%)	6725 / 14229 (47.3%)
Creatine kinase (U/L)	64 / 4176 (1.5%)	6518 / 14229 (45.8%)
Total Bilirubin (mg/dL)	165 / 4176 (4%)	835 / 14229 (5.9%)
Troponin (ng/mL)	432 / 4176 (10.3%)	595 / 14229 (4.2%)
Platelets (10 <sup>9</sup> /L)	539 / 4176 (12.9%)	514 / 14229 (3.6%)
Lactate (mmol/L)	373 / 4176 (8.9%)	511 / 14229 (3.6%)
Haemoglobin (g/dL)	491 / 4176 (11.8%)	451 / 14229 (3.2%)
Creatinine (mg/dL)	540 / 4176 (12.9%)	280 / 14229 (2%)
D-dimer (mg/L)	281 / 4176 (6.7%)	191 / 14229 (1.3%)
Ferritin (ng/mL)	132 / 4176 (3.2%)	91 / 14229 (0.6%)
Procalcitonin (ng/mL)	1 / 4176 (0%)	0 / 14229 (0%)
ESR (mm/hr)	7 / 4176 (0.2%)	0 / 14229 (0%)
IL-6 (pg/mL)	0 / 4176 (0%)	0 / 14229 (0%)



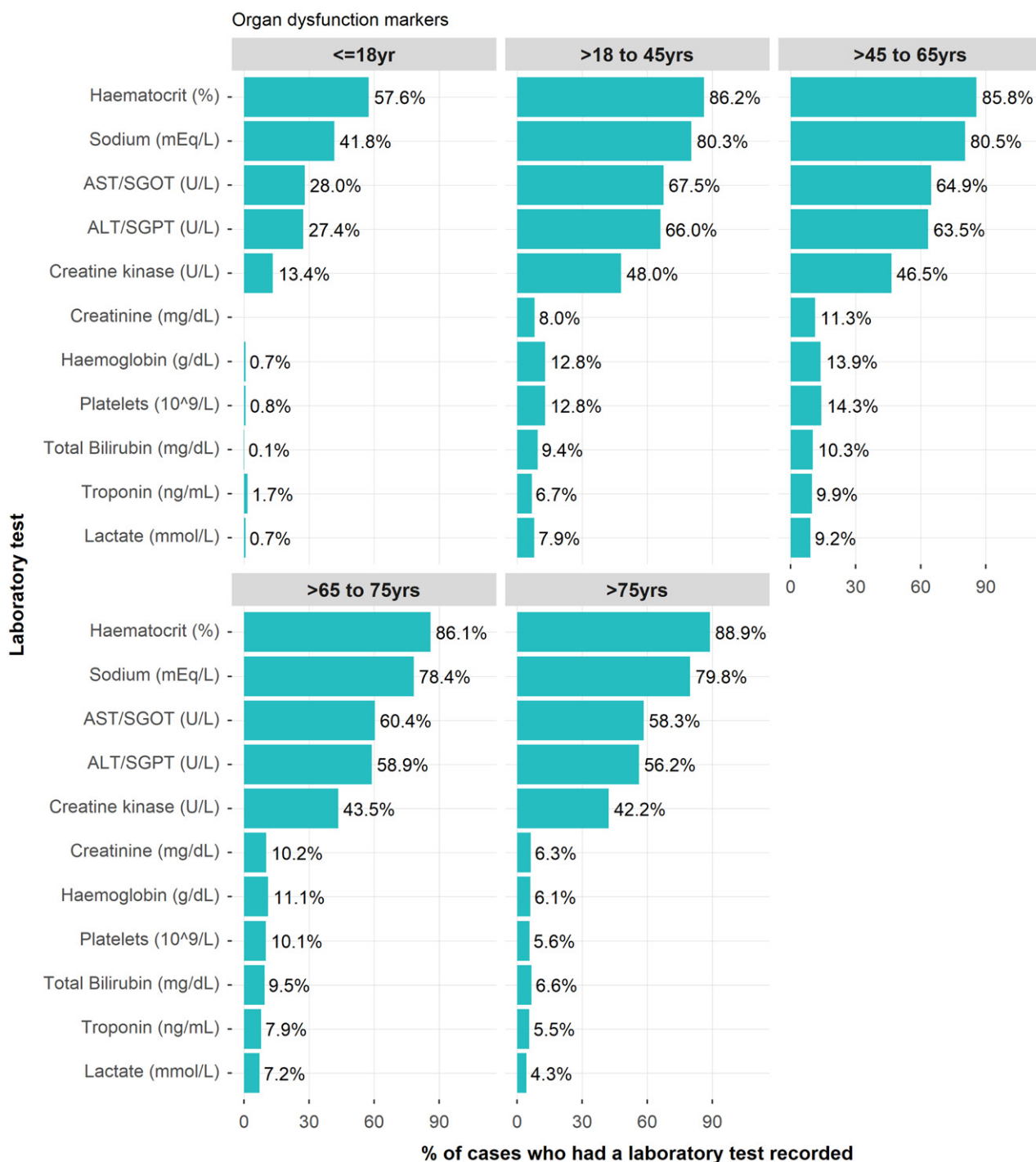
**Annex Table 5.2** Frequency of abnormal laboratory blood test results amongst all hospitalized COVID-19 cases presenting with mild/moderate vs severe/critical illness.

Laboratory test	Cases with abnormal laboratory test result / Total cases with recorded laboratory test (%)
Lactate >2.2 (mmol/L)	1134 / 1134 (100%)
Procalcitonin >0.5 (ng/mL)	1 / 1 (100%)
CRP >3 (mg/L)	10582 / 10970 (96.5%)
Ferritin >300 (ng/mL)	237 / 254 (93.3%)
CRP >10 (mg/L)	9903 / 10970 (90.3%)
ESR >50 (mm/hr)	9 / 12 (75%)
LDH >350 (U/L)	5201 / 7273 (71.5%)
Troponin > .04 (ng/mL)	880 / 1363 (64.6%)
D-dimer >1 (mg/L)	519 / 949 (54.7%)
CRP >100 (mg/L)	4725 / 10970 (43.1%)
WBC < 4 or >12 (10 <sup>9</sup> /L)	6012 / 14349 (41.9%)
ALT/SGPT >50 (U/L)	3961 / 9861 (40.2%)
AST/SGOT >50 (U/L)	3925 / 10101 (38.9%)
Creatine kinase (U/L)	2364 / 6983 (33.9%)
ESR >100 (mm/hr)	4 / 12 (33.3%)
Creatinine >1.2 (mg/dL)	449 / 1620 (27.7%)
Creatinine >2 (mg/dL)	259 / 1620 (16%)
Sodium < 130 or >145 (mEq/L)	1884 / 12852 (14.7%)
Creatinine >3 (mg/dL)	147 / 1620 (9.1%)
Platelets <100 (10 <sup>9</sup> /L)	113 / 1767 (6.4%)
Total Bilirubin >2 (mg/dL)	70 / 1462 (4.8%)
Haemoglobin <7(g/dL)	66 / 1716 (3.8%)
Platelets <50 (10 <sup>9</sup> /L)	32 / 1767 (1.8%)

**Annex 5.3a** Proportion of patients with COVID-19 with a laboratory blood test for inflammatory markers by age group



**Annex 5.3b** Proportion of patients with COVID-19 with a laboratory blood test for organ dysfunction markers by age group



**Annex Table 5.3** Frequency of recorded laboratory blood tests by age group amongst all patients in that age groups.

Lab test	# of lab test / total cases 0-18 years old (%)	# of lab test / total cases 19-45 years old (%)	# of lab test / total cases 46-65 years old (%)	# of lab test / total cases 66-75 years old (%)	# of lab test / total cases over 75 years old (%)
ALT/SGPT (U/L)	196 / 715 (27.4%)	2071 / 3137 (66%)	3306 / 5206 (63.5%)	1912 / 3247 (58.9%)	2059 / 3662 (56.2%)
AST/SGOT (U/L)	200 / 715 (28%)	2119 / 3137 (67.5%)	3378 / 5206 (64.9%)	1960 / 3247 (60.4%)	2136 / 3662 (58.3%)
Creatine kinase (U/L)	96 / 715 (13.4%)	1506 / 3137 (48%)	2423 / 5206 (46.5%)	1411 / 3247 (43.5%)	1547 / 3662 (42.2%)
Creatinine (mg/dL)	0 / 715 (0%)	252 / 3137 (8%)	587 / 5206 (11.3%)	332 / 3247 (10.2%)	230 / 3662 (6.3%)
CRP (mg/L)	392 / 715 (54.8%)	2230 / 3137 (71.1%)	3632 / 5206 (69.8%)	2193 / 3247 (67.5%)	2523 / 3662 (68.9%)
D-dimer (mg/L)	2 / 715 (0.3%)	167 / 3137 (5.3%)	367 / 5206 (7%)	147 / 3247 (4.5%)	66 / 3662 (1.8%)
ESR (mm/hr)	0 / 715 (0%)	2 / 3137 (0.1%)	5 / 5206 (0.1%)	1 / 3247 (0%)	0 / 3662 (0%)
Ferritin (ng/mL)	0 / 715 (0%)	38 / 3137 (1.2%)	69 / 5206 (1.3%)	31 / 3247 (1%)	13 / 3662 (0.4%)
Haematocrit (%)	412 / 715 (57.6%)	2704 / 3137 (86.2%)	4469 / 5206 (85.8%)	2796 / 3247 (86.1%)	3255 / 3662 (88.9%)
Haemoglobin (g/dL)	5 / 715 (0.7%)	402 / 3137 (12.8%)	726 / 5206 (13.9%)	362 / 3247 (11.1%)	223 / 3662 (6.1%)
IL-6 (pg/mL)	0 / 715 (0%)	0 / 3137 (0%)	0 / 5206 (0%)	0 / 3247 (0%)	0 / 3662 (0%)
Lactate (mmol/L)	5 / 715 (0.7%)	248 / 3137 (7.9%)	478 / 5206 (9.2%)	234 / 3247 (7.2%)	159 / 3662 (4.3%)
LDH (U/L)	116 / 715 (16.2%)	1582 / 3137 (50.4%)	2522 / 5206 (48.4%)	1464 / 3247 (45.1%)	1589 / 3662 (43.4%)
Platelets (10 <sup>9</sup> /L)	6 / 715 (0.8%)	402 / 3137 (12.8%)	742 / 5206 (14.3%)	328 / 3247 (10.1%)	205 / 3662 (5.6%)
Procalcitonin (ng/mL)	0 / 715 (0%)	0 / 3137 (0%)	0 / 5206 (0%)	0 / 3247 (0%)	1 / 3662 (0%)
Sodium (mEq/L)	299 / 715 (41.8%)	2518 / 3137 (80.3%)	4190 / 5206 (80.5%)	2547 / 3247 (78.4%)	2923 / 3662 (79.8%)
Total Bilirubin (mg/dL)	1 / 715 (0.1%)	296 / 3137 (9.4%)	537 / 5206 (10.3%)	307 / 3247 (9.5%)	241 / 3662 (6.6%)
Troponin (ng/mL)	12 / 715 (1.7%)	209 / 3137 (6.7%)	517 / 5206 (9.9%)	257 / 3247 (7.9%)	203 / 3662 (5.5%)
WBC (10 <sup>9</sup> /L)	415 / 715 (58%)	2863 / 3137 (91.3%)	4750 / 5206 (91.2%)	2938 / 3247 (90.5%)	3383 / 3662 (92.4%)

## 4.6. Annex 5b: Most abnormal reported laboratory blood test results

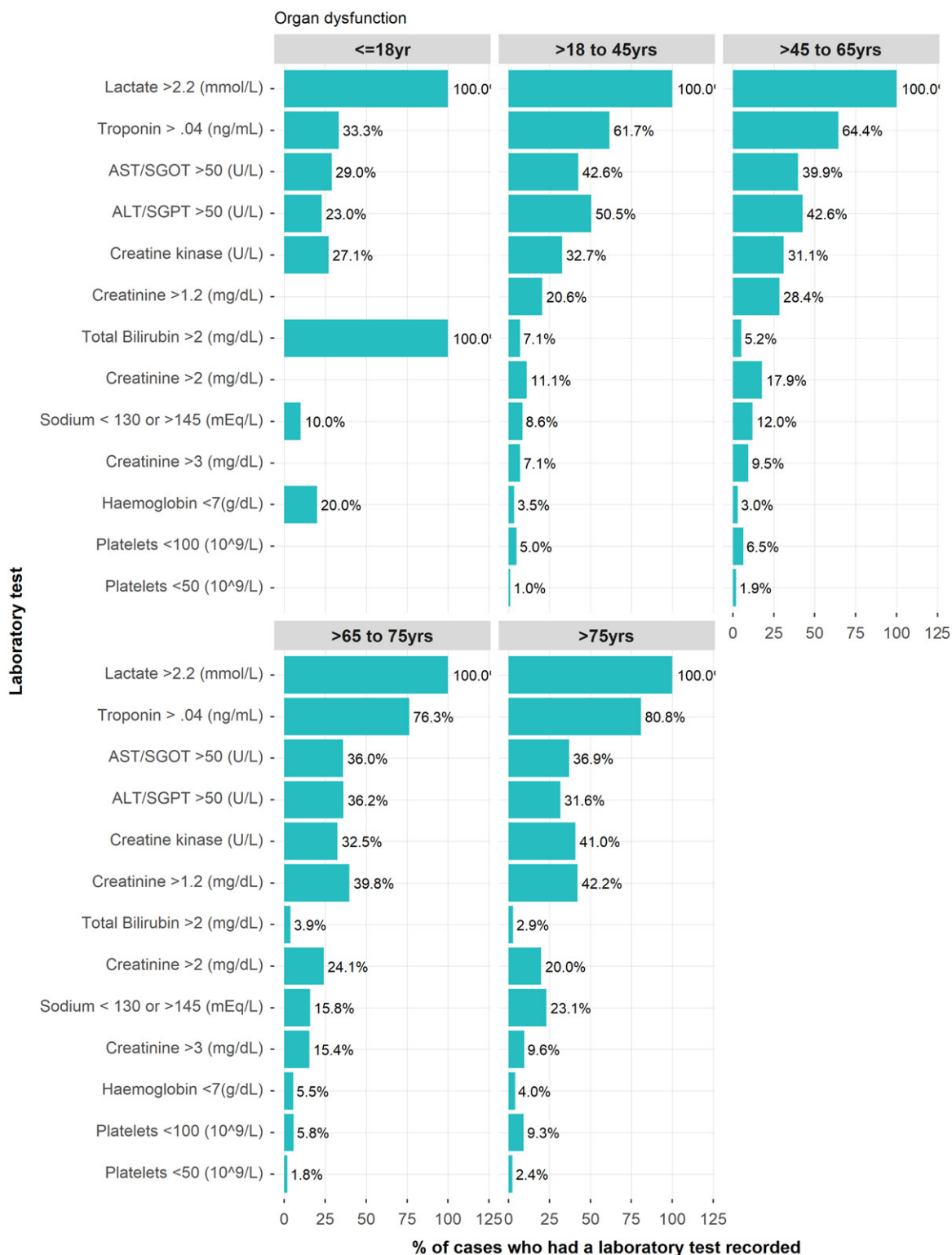
**Annex Table 5.4** Frequency of most abnormal reported laboratory blood test results presenting with mild/moderate vs severe/critical illness amongst all patients in specified severity classification

Laboratory test	Mild-Moderate cases with a recorded laboratory test / Total Mild or Moderate cases (%)	Severe-Critical cases with a recorded laboratory test / Total Severe or Critical cases (%)
WBC (10 <sup>9</sup> /L)	1582 / 4176 (37.9%)	6043 / 14229 (42.5%)
Platelets (10 <sup>9</sup> /L)	1290 / 4176 (30.9%)	5988 / 14229 (42.1%)
Haematocrit (%)	1229 / 4176 (29.4%)	5885 / 14229 (41.4%)
Total Bilirubin (mg/dL)	517 / 4176 (12.4%)	4549 / 14229 (32%)
APTT/APTR	812 / 4176 (19.4%)	3154 / 14229 (22.2%)
PT (seconds)	828 / 4176 (19.8%)	2937 / 14229 (20.6%)
Urea (BUN) (mmol/L)	1042 / 4176 (25%)	792 / 14229 (5.6%)
Creatinine (mg/dL)	1063 / 4176 (25.5%)	790 / 14229 (5.6%)
Sodium (mEq/L)	1024 / 4176 (24.5%)	769 / 14229 (5.4%)
Potassium (mEq/L)	1006 / 4176 (24.1%)	727 / 14229 (5.1%)
AST/SGOT (U/L)	670 / 4176 (16%)	594 / 14229 (4.2%)
ALT/SGPT (U/L)	643 / 4176 (15.4%)	453 / 14229 (3.2%)
CRP (mg/L)	799 / 4176 (19.1%)	354 / 14229 (2.5%)
D-dimer (mg/L)	520 / 4176 (12.5%)	329 / 14229 (2.3%)
Lactate (mmol/L)	589 / 4176 (14.1%)	222 / 14229 (1.6%)
Ferritin (ng/mL)	203 / 4176 (4.9%)	221 / 14229 (1.6%)
LDH (U/L)	312 / 4176 (7.5%)	211 / 14229 (1.5%)
Creatine kinase (U/L)	258 / 4176 (6.2%)	192 / 14229 (1.3%)
Troponin (ng/mL)	308 / 4176 (7.4%)	187 / 14229 (1.3%)
INR	504 / 4176 (12.1%)	126 / 14229 (0.9%)
Haemoglobin (g/dL)	489 / 4176 (11.7%)	76 / 14229 (0.5%)
ESR (mm/hr)	23 / 4176 (0.6%)	19 / 14229 (0.1%)
Procalcitonin (ng/mL)	1 / 4176 (0%)	0 / 14229 (0%)
IL-6 (pg/mL)	0 / 4176 (0%)	0 / 14229 (0%)

**Annex 5.4a** Proportion of COVID-19 cases with abnormal laboratory blood test values signifying inflammation vs organ dysfunction for inflammatory markers recorded during admission by age group.



**Annex 5.4b** Proportion of COVID-19 cases with abnormal laboratory blood test values for organ dysfunction recorded during admission by age group.



## 4.7. Annex 6: Clinical manifestations or complications during hospital stay

**Annex Table 6.1** Frequency of clinical manifestations or complications during the hospital stay among patients with mild/moderate illness compared to severe/critical illness

Clinical manifestation or complications during hospital stay	Mild-Moderate cases with clinical manifestation / Total Mild or Moderate cases (%)	Severe-Critical cases with clinical manifestation / Total Severe or Critical cases (%)
Pneumonia	85 / 366 (23.2%)	3139 / 3399 (92.4%)
Shock	32 / 366 (8.7%)	2345 / 2681 (87.5%)
Cardiac arrest	25 / 366 (6.8%)	2035 / 2447 (83.2%)
Anaemia	16 / 87 (18.4%)	1267 / 1553 (81.6%)
Acute Respiratory Distress Syndrome	40 / 366 (10.9%)	1097 / 1385 (79.2%)
Acute renal injury	37 / 366 (10.1%)	701 / 1072 (65.4%)
Seizure	2 / 89 (2.2%)	616 / 997 (61.8%)
Cardiac arrhythmia	41 / 366 (11.2%)	653 / 1092 (59.8%)
Liver dysfunction	2 / 78 (2.6%)	283 / 648 (43.7%)
Bleeding	325 / 686 (47.4%)	4485 / 14178 (31.6%)
Endocarditis	2 / 78 (2.6%)	144 / 525 (27.4%)
Pancreatitis	0 / 75 (0%)	135 / 514 (26.3%)
Bacteraemia	9 / 86 (10.5%)	72 / 412 (17.5%)
Myocarditis/Pericarditis	8 / 366 (2.2%)	61 / 568 (10.7%)
Meningitis/Encephalitis	6 / 88 (6.8%)	44 / 427 (10.3%)
Bronchiolitis	0 / 79 (0%)	9 / 382 (2.4%)
Cardiomyopathy	1 / 366 (0.3%)	10 / 513 (1.9%)



**Annex Table 6.2** Clinical manifestations or complications during the hospital stay among patients with COVID-19, by age group

Clinical manifestation or complications	# of cases with clinical manifestation / total cases 0-18 years old (%)	# of cases with clinical manifestation / total cases 19-45 years old (%)	# of cases with clinical manifestation / total cases 46-65 years old (%)	# of cases with clinical manifestation / total cases 66-75 years old (%)	# of cases with clinical manifestation / total cases over 75 years old (%)
Acute renal injury	3 / 9 (33.3%)	93 / 322 (28.9%)	282 / 626 (45%)	179 / 313 (57.2%)	190 / 293 (64.8%)
Acute Respiratory Distress Syndrome	19 / 23 (82.6%)	214 / 416 (51.4%)	429 / 739 (58.1%)	260 / 376 (69.1%)	233 / 322 (72.4%)
Anaemia	26 / 29 (89.7%)	203 / 305 (66.6%)	413 / 582 (71%)	291 / 350 (83.1%)	350 / 374 (93.6%)
Bacteraemia	1 / 5 (20%)	21 / 139 (15.1%)	40 / 232 (17.2%)	16 / 87 (18.4%)	3 / 35 (8.6%)
Bleeding	243 / 715 (34%)	938 / 3120 (30.1%)	1864 / 5169 (36.1%)	1287 / 3217 (40%)	1364 / 3653 (37.3%)
Bronchiolitis		1 / 128 (0.8%)	5 / 218 (2.3%)	2 / 80 (2.5%)	1 / 31 (3.2%)
Cardiac arrest	6 / 12 (50%)	292 / 539 (54.2%)	625 / 1020 (61.3%)	495 / 633 (78.2%)	655 / 734 (89.2%)
Cardiac arrhythmia	2 / 8 (25%)	74 / 308 (24%)	190 / 576 (33%)	185 / 334 (55.4%)	258 / 357 (72.3%)
Cardiomyopathy		2 / 260 (0.8%)	2 / 437 (0.5%)	4 / 179 (2.2%)	3 / 122 (2.5%)
Endocarditis	9 / 13 (69.2%)	39 / 166 (23.5%)	52 / 267 (19.5%)	30 / 111 (27%)	16 / 46 (34.8%)
Liver dysfunction	3 / 7 (42.9%)	69 / 190 (36.3%)	127 / 331 (38.4%)	46 / 126 (36.5%)	40 / 72 (55.6%)
Meningitis/ Encephalitis	8 / 12 (66.7%)	16 / 146 (11%)	15 / 230 (6.5%)	6 / 90 (6.7%)	5 / 37 (13.5%)
Myocarditis/ Pericarditis	4 / 10 (40%)	22 / 277 (7.9%)	24 / 455 (5.3%)	9 / 184 (4.9%)	12 / 133 (9%)
Pancreatitis		54 / 178 (30.3%)	32 / 245 (13.1%)	19 / 101 (18.8%)	30 / 61 (49.2%)
Pneumonia	191 / 196 (97.4%)	542 / 720 (75.3%)	978 / 1256 (77.9%)	676 / 785 (86.1%)	852 / 933 (91.3%)
Seizure	61 / 65 (93.8%)	109 / 239 (45.6%)	185 / 402 (46%)	125 / 210 (59.5%)	138 / 170 (81.2%)
Shock	35 / 41 (85.4%)	280 / 504 (55.6%)	749 / 1094 (68.5%)	610 / 727 (83.9%)	719 / 806 (89.2%)



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