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# Morning Brief :
# Scientific Review

*29 April 2020*

The purpose of the Morning Brief is to **summarise** and present key information, research articles and other relevant publications pertaining to critical care and COVID-19. We aim to prioritise information, articles and publications released in the preceding 24-48 hours.

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# Content

- World data
- South African update
- Topic discussed: International Severe Acute Respiratory and emerging Infection Consortium (ISARIC)

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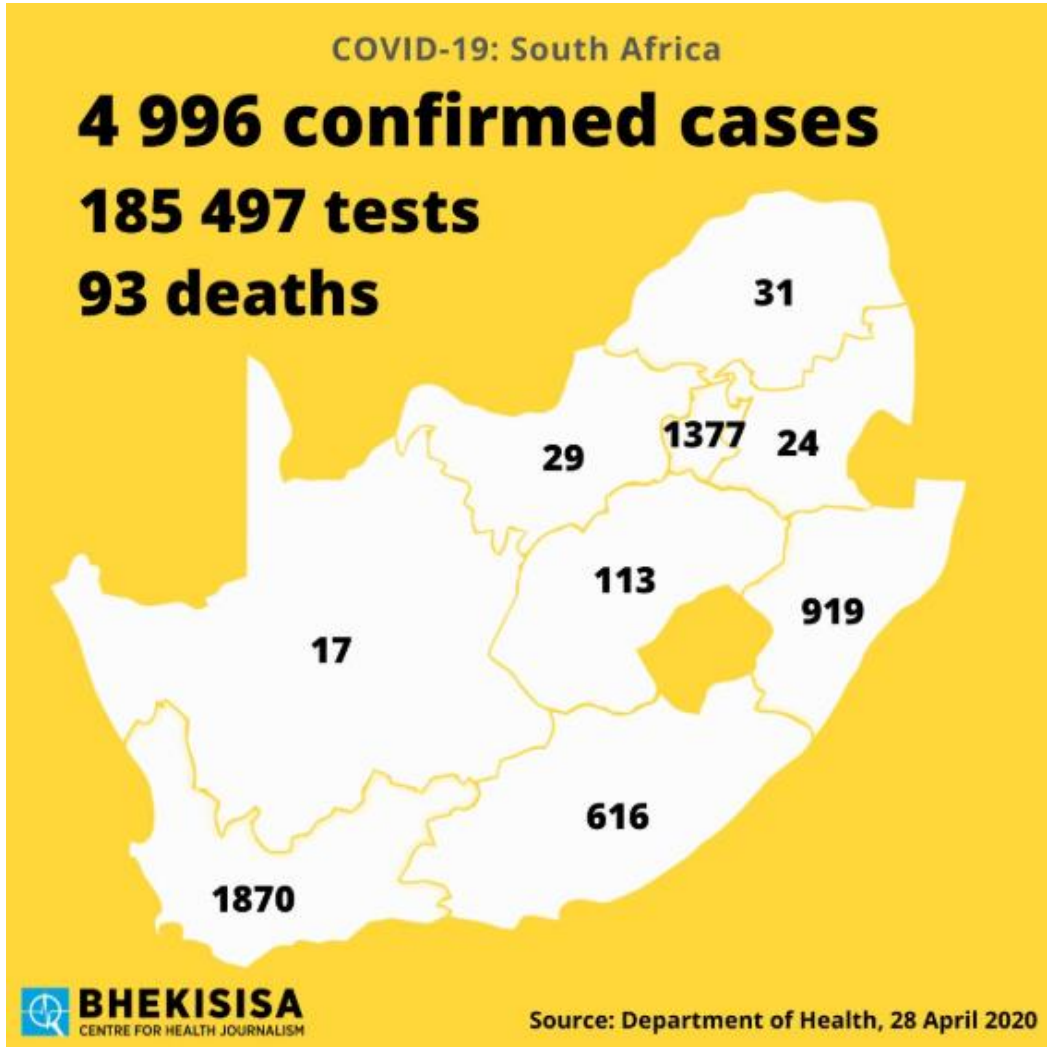
# Global data

- >3.1 million confirmed cases worldwide
- >940 000 recoveries and >215 000 deaths
- USA now over 1 million cases (1/3 of global cases)
- WHO has called on countries to ensure that usual immunization is maintained for vaccine-preventable diseases and is not disrupted during the ongoing pandemic


Source: Statistics - https://www.worldometers.info/coronavirus/
News update – WHO Newsroom https://www.who.int/health-topics/coronavirus#tab=tab_1

# South African update




"Food security, income security has been top of our minds. The decision to lockdown South Africa and to ease restrictions have been evidenced-based and the department believes the modelling used for this is sound."

Health Minister Zwelini Mkhize

| Province | Deaths | Recoveries |
|---|---|---|
| Eastern Cape | 10 | 19 |
| Free State | 5 | 76 |
| Gauteng | 8 | 843 |
| KwaZulu-Natal | 30 | 241 |
| Limpopo | 2 | 24 |
| Mpumalanga | 0 | 15 |
| North West | 0 | 13 |
| Northern Cape | 0 | 6 |
| Western Cape | 38 | 236 |

Source: https://bhekisisa.org/ Accessed 28 April 2020
https://www.nicd.ac.za/

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# Mechanical ventilation in critically ill COVID-19 patients

- Invasive ventilation via an endotracheal tube was performed in 2.3% of the 1,099 patients with confirmed COVID-19 based on the patient cohort from 552 hospitals in mainland China (Guan et al, N Engl J Med 2020)
- Estimated that approximately 3.2 % of all confirmed COVID-19 cases in mainland China received intubation and invasive ventilation, as of February 29, 2020 (Meng et al, Anesthesiology 2020)
- Acute respiratory distress syndrome (ARDS) occurred in 20% of the 138 (lab confirmed SARS-CoV-2) patients hospitalised and in 61% of the 36 patients admitted to the ICU in Zhongnan Hospital in Wuhan(Wang et al, JAMA 2020)
  - 47% of ICU patients required endotracheal intubation and invasive mechanical ventilation
    - median age, 56 years [range, 22-92 years]; 54% male; comorbidities 46%
- ARDS observed in 67% of 52 ICU (lab confirmed SARS-CoV-2) patients in Jin Yin Tan Hospital in Wuhan (Yang et al, Lancet Respr Med 2020)
  - 71% of ICU admitted patients required mechanical ventilation, 42% invasive mechanical ventilation
    - mean age, 59.7 years [range, 30-≥80 years]; 67% male; chronic medical illness, 40%

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- Hong Kong - 75% of 8 ICU patients required mechanical ventilation (Ling et al, Crit care resusc 2020-abstract)
    - mean age, 64.5 years [range, 42-70 years]
- Washington state - In 71% of 21 (lab confirmed SARS-CoV-2) ICU patients ARDS was observed; required mechanical ventilation, (Arentz et al, JAMA 2020)
    - mean age, 70 years [range, 43-92 years]; 52% male; ≥ 1 comorbidity, 86%
- Seattle - 75% of 24 (lab confirmed SARS-CoV-2) ICU patients admitted with hypoxemic respiratory failure required invasive mechanical ventilation (Bhatraju et al, N Engl J Med 2020)
    - mean age, 64 years [range, 23-97]; 63% male; >1 comorbidity, 33%
- Lombardy, Italy - 99% of 1300 (lab confirmed SARS-CoV-2 ) ICU patients required invasive or non-invasive respiratory support (Grasselli et al, JAMA 2020)
    - 88% - endotracheal intubation and invasive mechanical ventilation
        - mean age, 63 years [range, 14-91]; 82% male; at least 1 comorbidity, 68%

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# International Severe Acute Respiratory and emerging Infection Consortium (ISARIC)

## Background

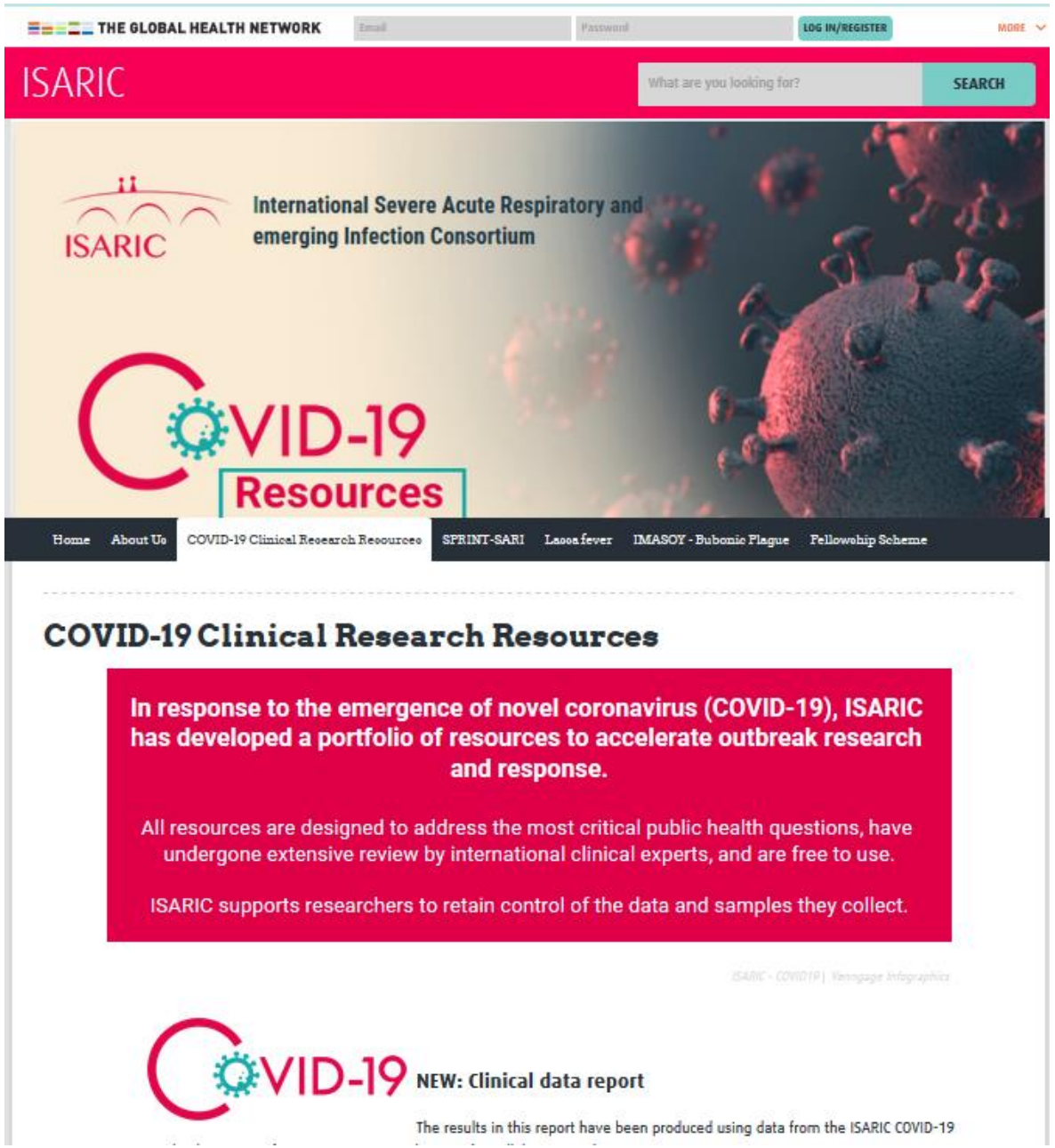
"To support the rapid implementation of standardised data collection and reporting, ISARIC hosts a data platform that includes an electronic data capture system, a secure repository and an analytic framework".

## Methods

Web-based RedCap database with standardised case report forms
Researchers can collaborate by uploading patient data
Weekly reports generted
Patients entered in the previous 14 days excluded, to include data for which outcomes captured more likely

## Limitations

Information incomplete for many who are still being treated
Severely ill patients overrepresented compared to less severe - proportion dying is not generalisable to population level
UK overrepresented




https://isaric.tghn.org/covid-19-clinical-research-resources/

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# Internationsal Severe Acute Respiratory and emerging Infection Consortium (ISARIC)

19809 individuals from 244 sites in 25 countries in the database

12188 individuals included in this report
6904 males (60%)
804 missing sex data
8967 PCR confirmed cases (74%)
Outcomes available in 6309 (3927 recoveries, 2382 deaths)

Median age 71 (range 0 – 104)
Mean duration from hospital admission to outcome (death or discharge)
8.7 days (SD 8.6) (N = 6801 complete records)
Median 6 days
Mean days from symptom onset to admission 10.9 (SD 7.4)
Median 5 days

Of 2117 admitted to ICU/high care and with complete records
622 died (30%)
444 discharged (21%)
1051 still admitted

1488/2416 (62%) of patients admitted to ICU were invasively mechanically ventilated
Duration (n = 663 complete records) mean 9.7 days (SD 6.4)

Proportions are presented in parantheses. Proportions have been rounded to two decimal places.

**Table 1:** Patient Characteristics

| Description | Value |
|---|---|
| Size of cohort | 12188 |
| **By sex** | |
| Male | 6904 (0.57) |
| Female | 4480 (0.37) |
| Unknown | 804 (0.06) |
| **By outcome status** | |
| Dead | 2382 (0.2) |
| Recovered (discharged alive) | 3927 (0.32) |
| Still in hospital | 5215 (0.43) |
| Tranferred to another facility | 318 (0.03) |
| Unknown | 346 (0.03) |
| **By COVID-19 status** | |
| Positive (laboratory-confirmed) | 8967 (0.74) |
| Suspected | 3221 (0.26) |
| **By age group** | |
| 0-9 | 137 (0.01) |
| 10-19 | 98 (0.01) |
| 20-29 | 239 (0.02) |
| 30-39 | 509 (0.04) |
| 40-49 | 905 (0.07) |
| 50-59 | 1612 (0.13) |
| 60-69 | 1896 (0.16) |
| 70+ | 5897 (0.48) |
| Unknown | 895 (0.07) |

ISARIC COVID-19 Report: 20 April 2020, available on https://isaric.tghn.org/covid-19-clinical-research-resources/

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**Figure 21**: Distribution of patients by country and outcome

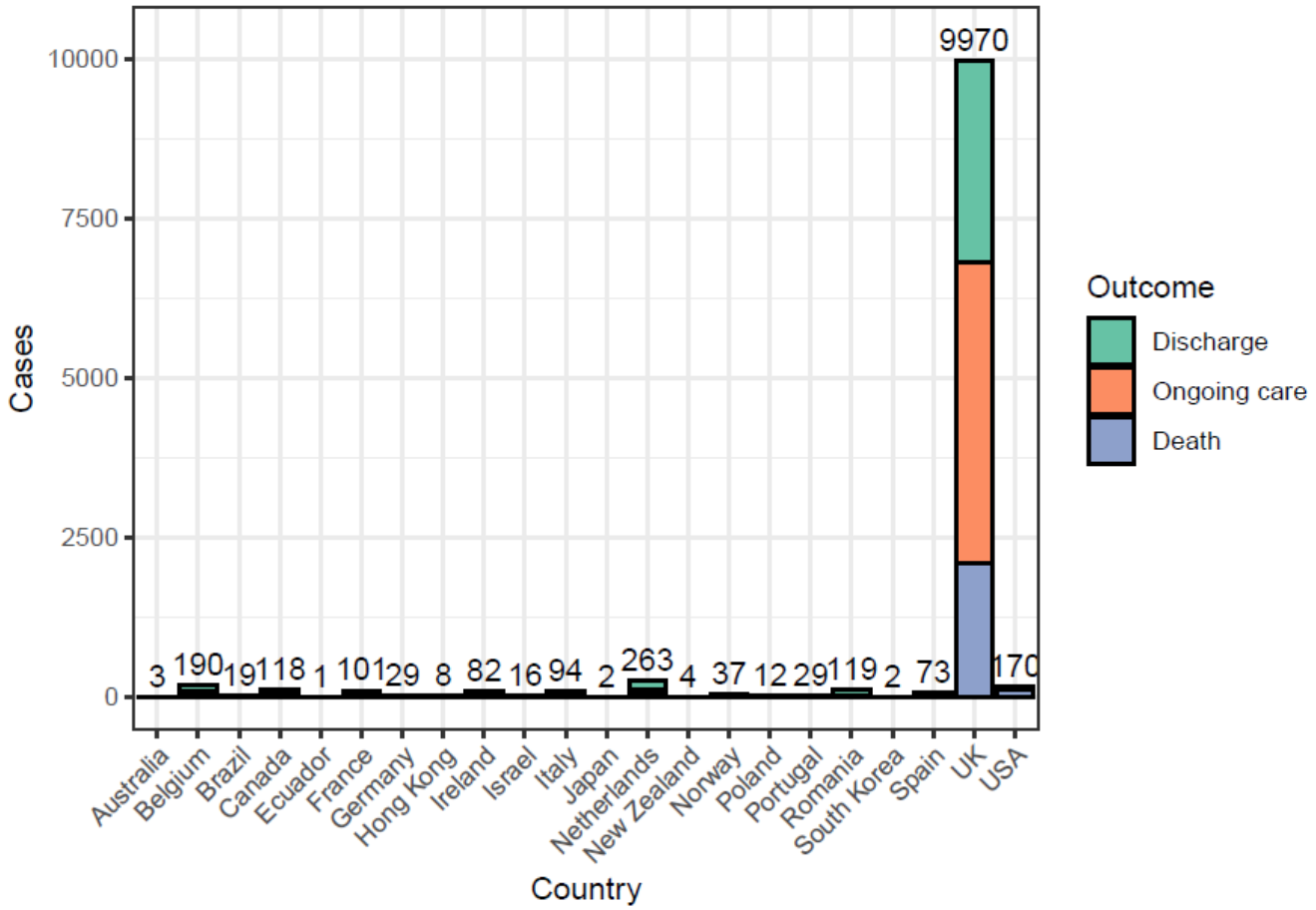


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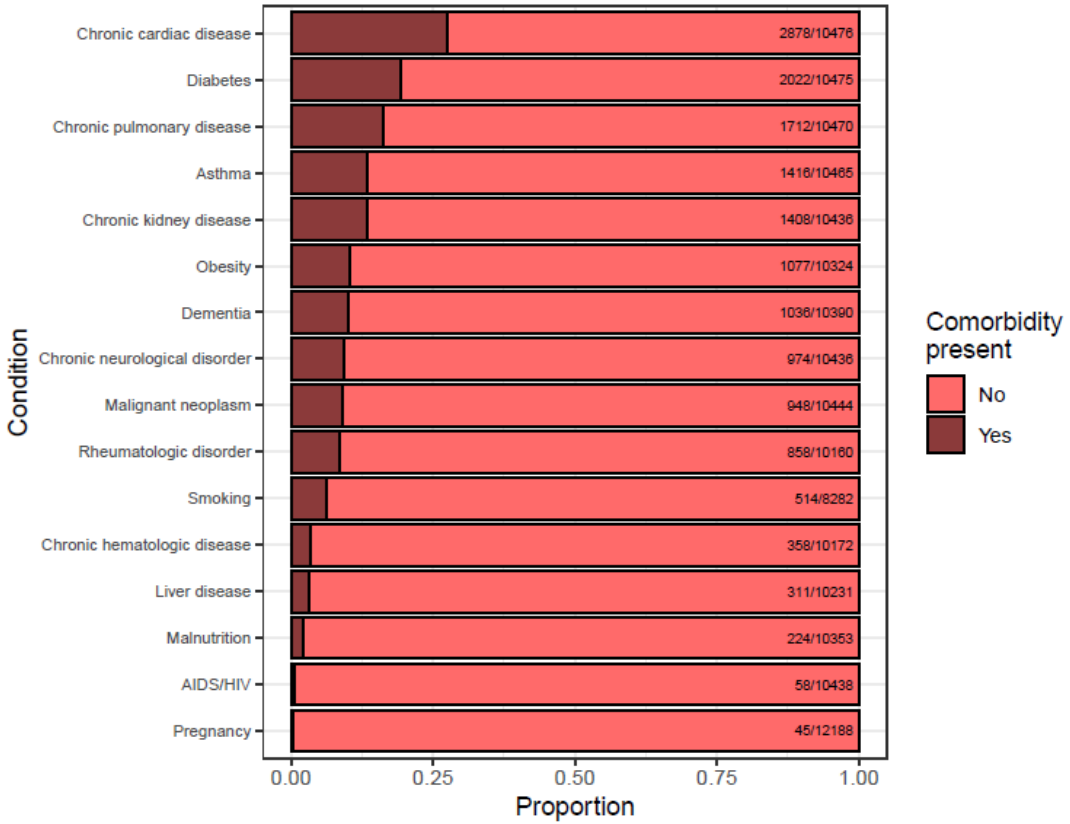
**Figure 3**: Top: Frequency of comorbidities seen at admission amongst COVID-19 patients. Bars are annotated with a fraction representing the number of patients presenting with this comorbidity over the number of patients for whom presence or absence of this comorbidity was recorded. Bottom: The distribution of combinations of the four most common comorbidities, amongst all patients for whom these data were recorded. Filled and empty circles below the x-axis indicate the presence or absence of each comorbidity. The "Any other" category contains all remaining comorbidities in the top plot, and any other comorbidities recorded as free text by clinical staff.




## Variables by age

**Figure 4**: Comorbidities stratified by age group. Numbers on the plot show the number with the comorbidity and the number in the age group (numbers are not displayed if <5). Denominators vary between plots due to data completeness.

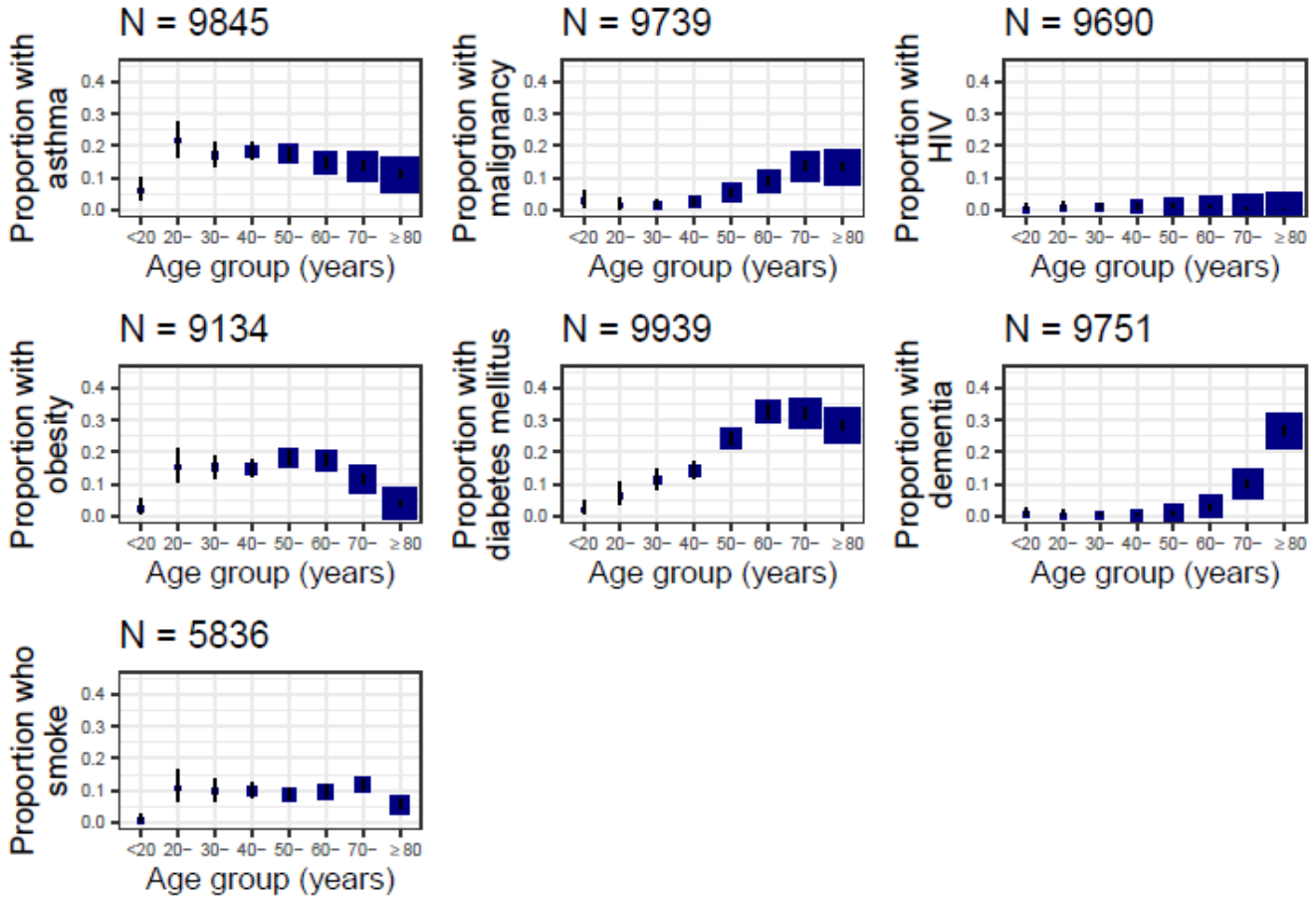


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**Figure 7**: Box and whisker plots for laboratory results within 24 hours of hospital presentation stratified by age group. Outliers are omitted. N is the number of individuals included in the plot (this varies between plots due to data completeness). ALT, Alanine transaminase; APTT, Activated partial thromboplastin time; CRP, C-reactive protein; WCC, white cell count

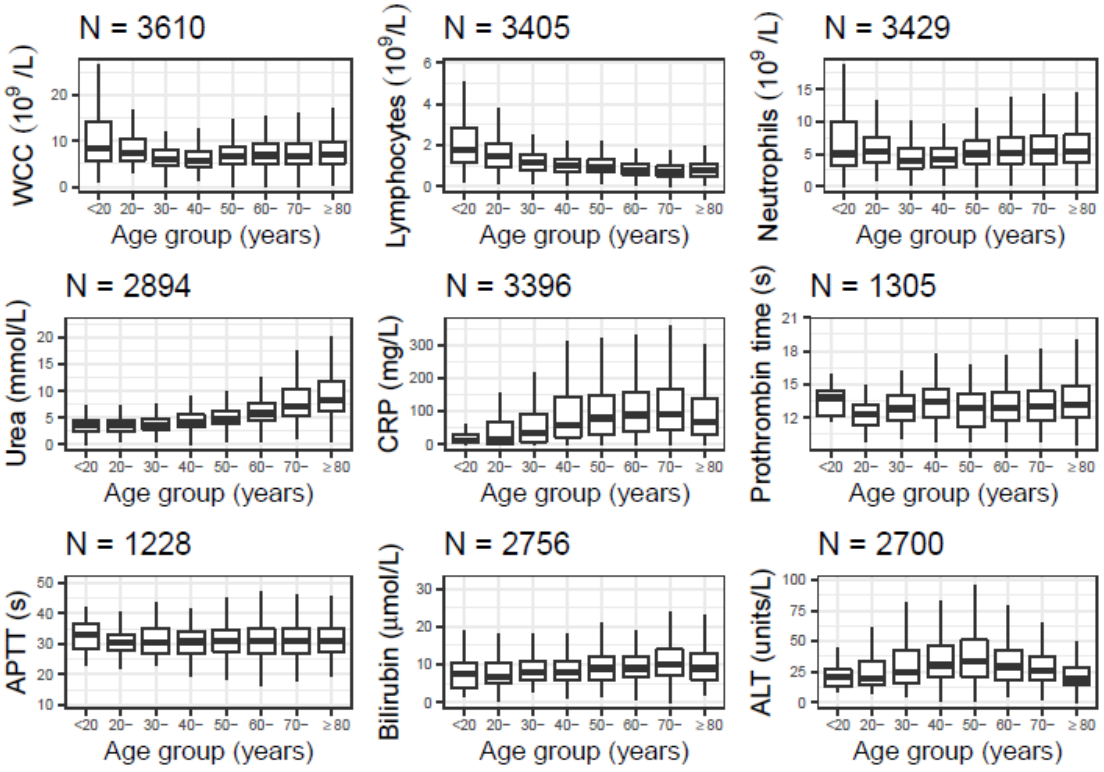


**Figure 9**: Distribution of length of hospital stay, according to patient age group. This only includes cases with reported outcomes. The coloured areas indicate the kernel probability density of the observed data and the box plots show the median and interquartile range of the variable of interest.

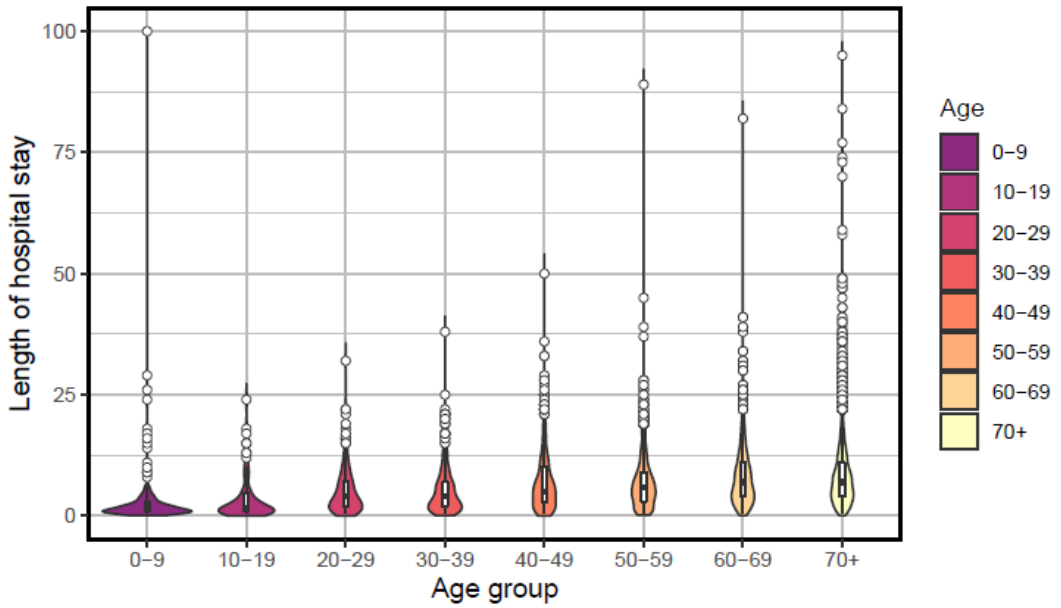

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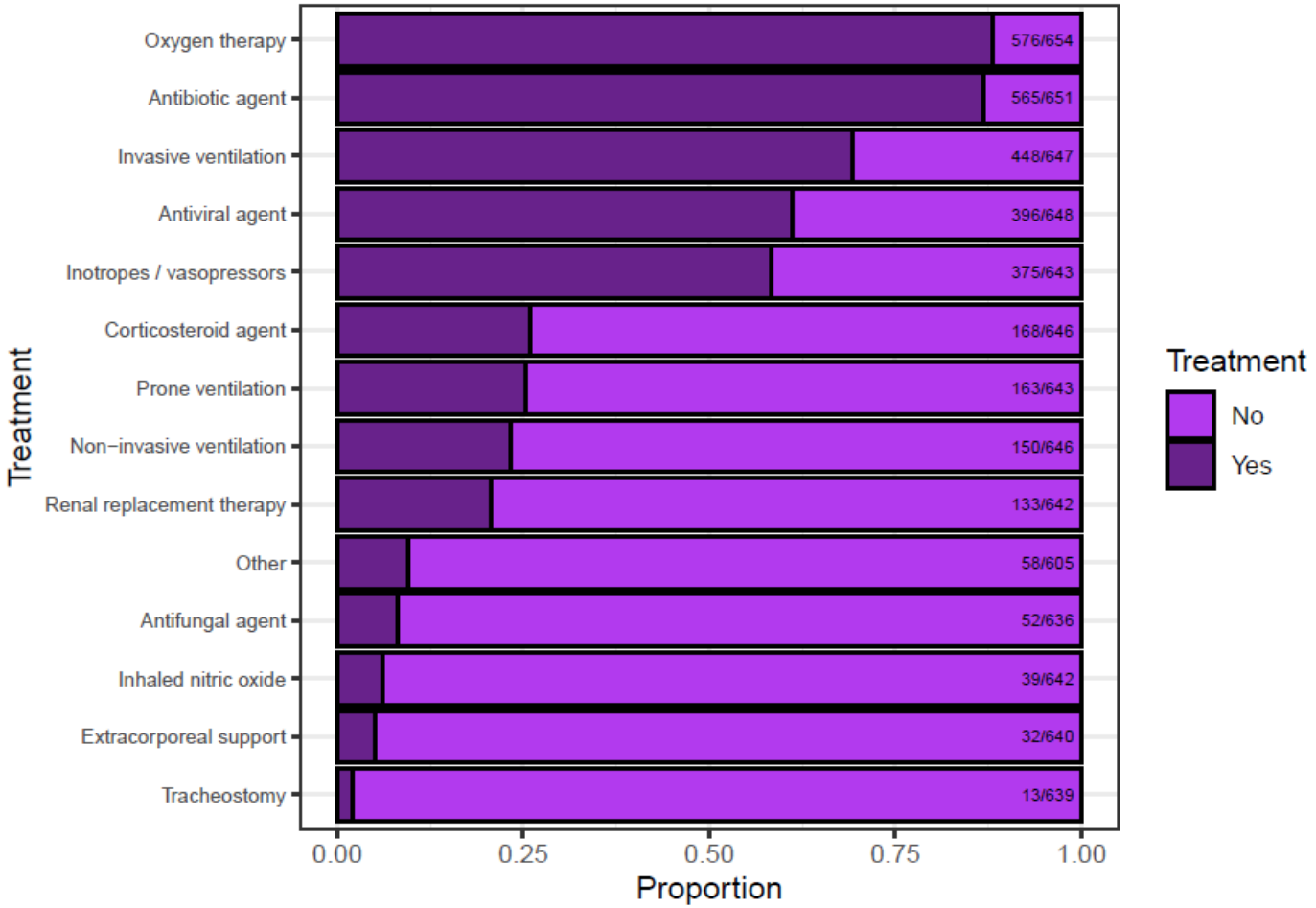
**Figure 14**: Treatments used amongst patients admitted to the ICU. This only includes patients for whom this information was recorded.

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