

Dynamic CO-CIN report to SAGE and NERVTAG

[OFFICIAL-SENSITIVE PROTECT]

Dynamic content updated: 2020-05-13 22:05:48.

Executive summary

The COVID-19 Clinical Information Network (CO-CIN) collated clinical information from the usual health care records of people of all ages admitted to hospital in the UK.

Up to 10th March people with positive swabs were admitted to hospital as part of the containment strategy. Since 10th March, admission is mostly based upon need for treatment of COVID-19 disease. The great majority of cases in the community do not require hospital admission.

In total up until 13 May 2020, CO-CIN has recruited **36978 patients** with confirmed Coronavirus (Figure 1).

The CO-CIN dataset represents 16.1% (36978/229,705) of cases of confirmed Coronavirus cases in the UK, per the PHE daily reports (last updated 9am on 13 May).

Patient data is collected and uploaded from start of admission, however a complete patient data set is not available until the episode of care is complete. This causes a predictable lag in available data influenced by the duration of admission which is greatest for the sickest patients.

The geographical location of our patients can be seen in Figure 2, of these 915 had travelled abroad recently, and 6258 reported visiting or working in a hospital where COVID-19 cases are being managed.

The median age is 73 (range: 0-105), Male/Female 18761/13251.

The most common symptoms were cough (67%), fever (66%) and shortness of breath (64%) (Figure 3A). 1281/29305 (4%) of patients have reported no symptoms. Comorbidity can be seen in Figure 3B. The most common comorbidities were chronic cardiac disease (30%), diabetes without complications (18%) and chronic pulmonary disease (17%). 14043/36978 (38%) of patients have reported no co morbidity. 155/2480 (6%) of women were recorded as being pregnant.

For patients not already in hospital, the median time from onset of symptoms to presentation at hospital was 4 days (range: 0 - 368894 days).

The median length of hospital stay was 8 days (interquartile range: 4-14, n = 22506). 3048/21581 (14%) patients required high-flow oxygen after day 1 of treatment.

Currently 8644 patient(s) have died and 4508 required ICU. 14039 have been discharged home.

Interpretation: The dataset is increasingly more representative of the burden of disease requiring hospitalisation and captures the early exponential rise of disease incidence that is now increasingly driven by domestic transmission events in the community.

Furthermore, we can now see 'hot spots' of disease incidence that largely reflect areas of high population density (most notably London) with a few exceptions to this. There are more men than women, consistent with reports from other countries. The proportion of pregnant women affected is broadly in line with the proportion of pregnant women in the general population.

The commonest comorbidity is chronic cardiac disease, reflecting patterns seen in other countries, although nearly a quarter of patients admitted do not have underlying comorbid disease.

Patients documented as being admitted to ICU are mainly 50-75 years old. When interpreting admission to ICU it is important to remember that we are currently unable to capture treatment limiting decisions regarding level of care.

Prof Calum Semple, Professor in Child Health and Outbreak Medicine, University of Liverpool.

Dr Annemarie Docherty, Academic Consultant Intensive Care University of Edinburgh.

Dr Chris Green, Academic Consultant Infectious Disease University of Birmingham.

Prof Ewen Harrison, Director Centre for Medical Informatics, Usher Institute, University of Edinburgh (analysis).

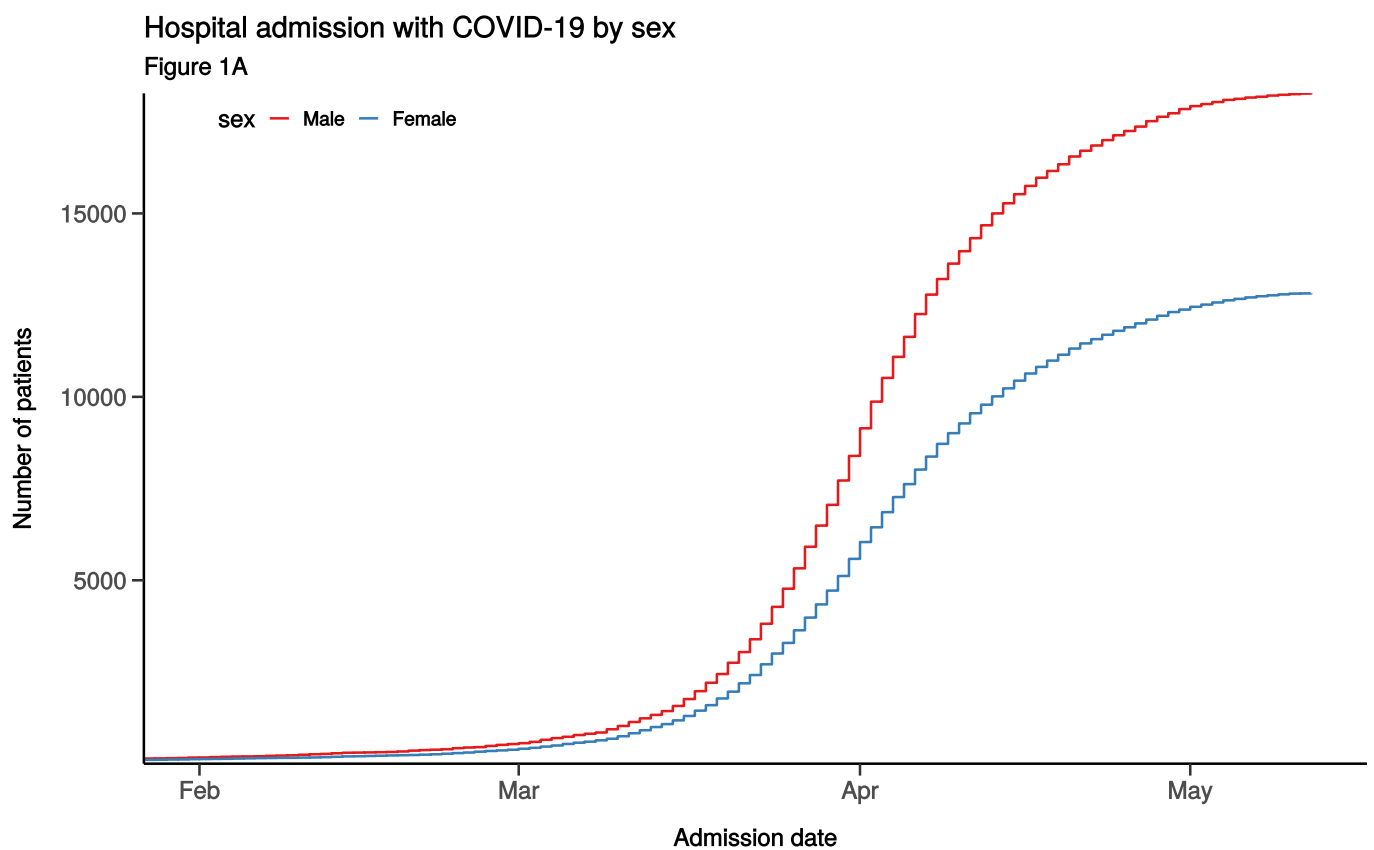
Professor Tom Solomon, Director HPRU Emerging and Zoonotic Infection.

ISARIC Investigators (Prof. Peter Horby, Prof. Peter Openshaw, Dr Gail Carson, and Dr Kenneth Baillie).

Analytics: Lisa Norman, Riinu Pius, Thomas Drake, Cameron Fairfield, Stephen Knight, Kenneth McLean, Katie Shaw.

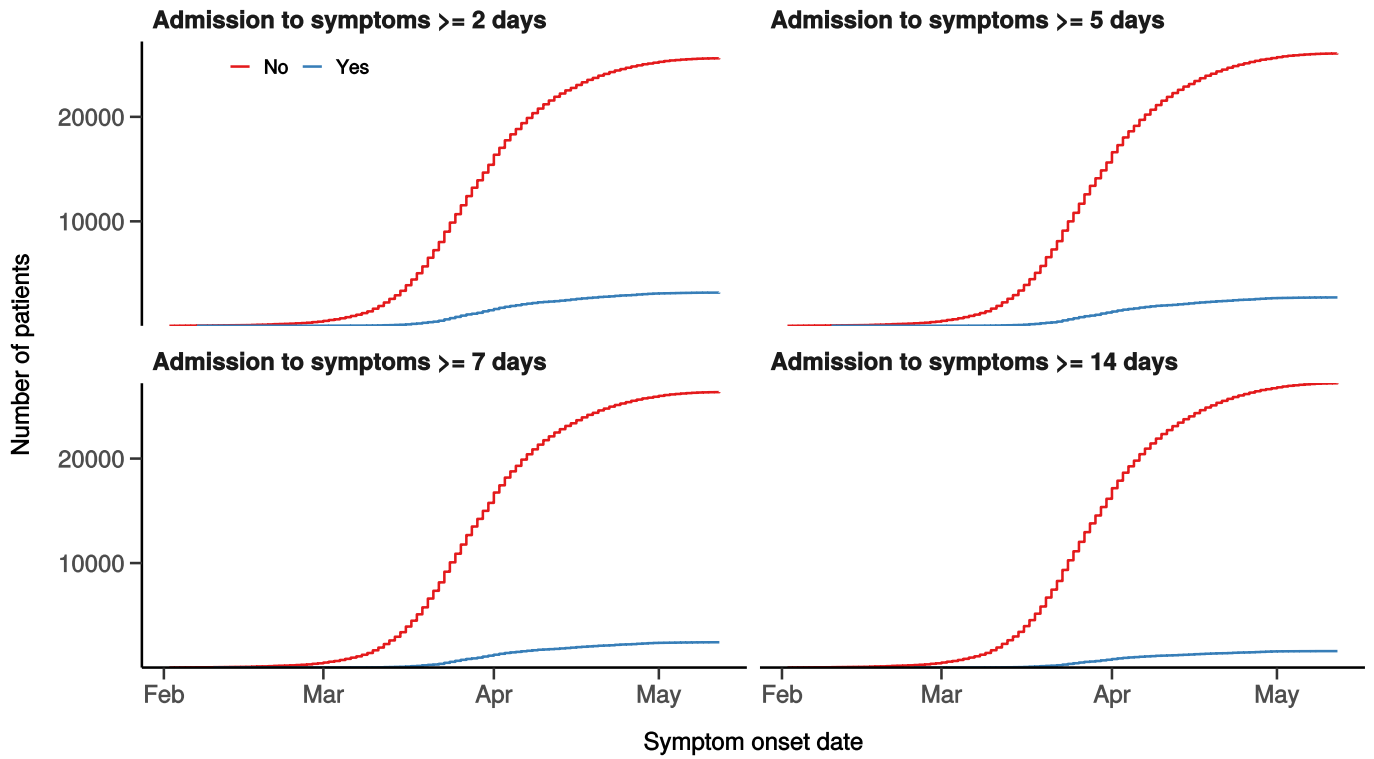
Admission

Figure 1



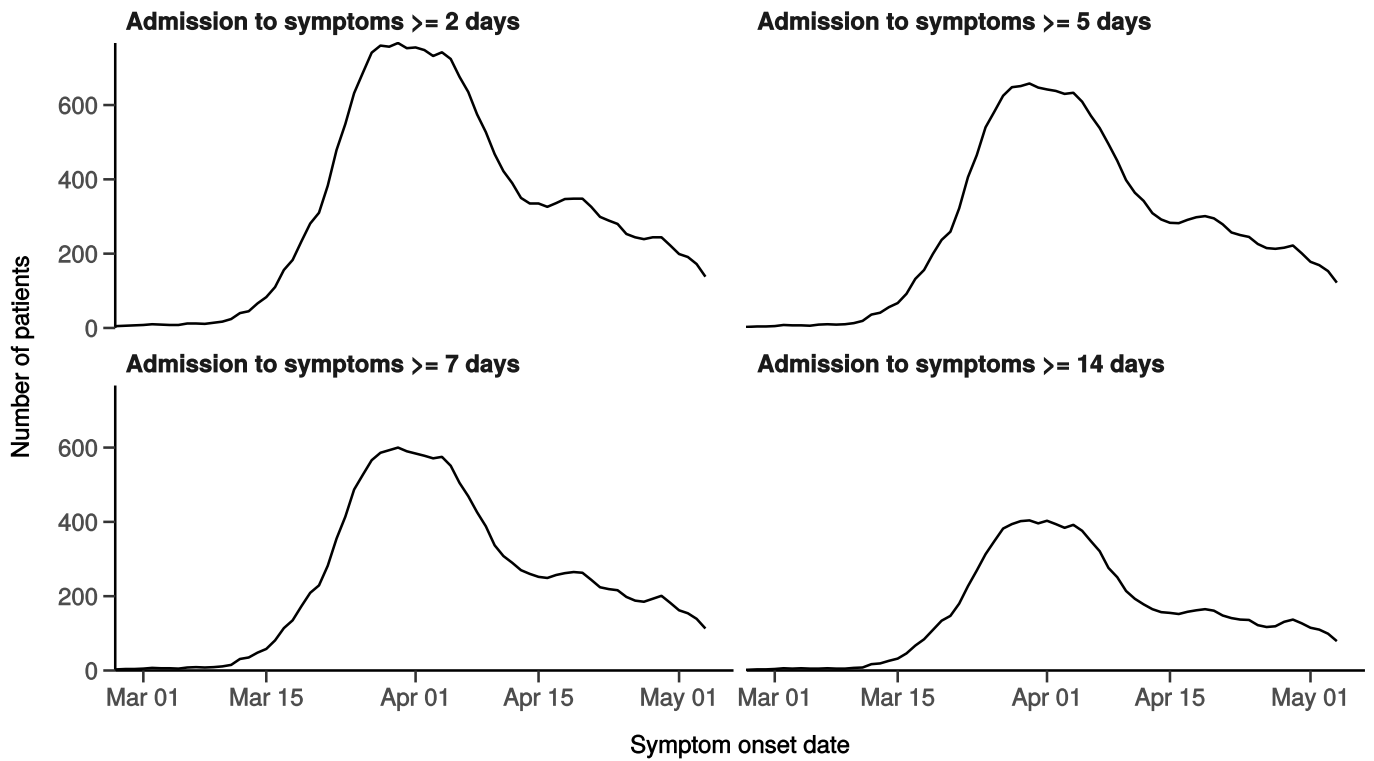
Number with symptom onset occurring after admission to hospital

Figure 1B



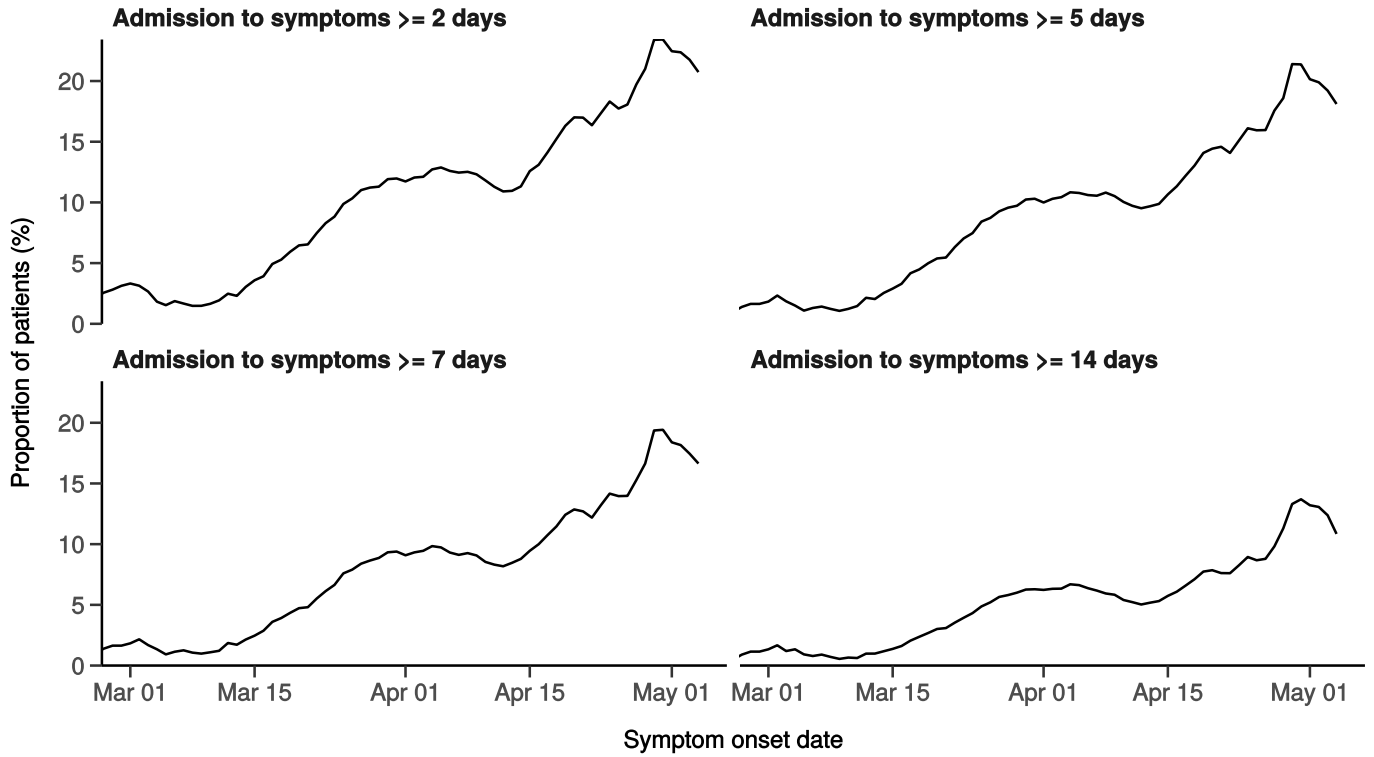
Number with symptom onset occurring after hospital admission

Figure 1C - 7-day rolling count. n = 28795



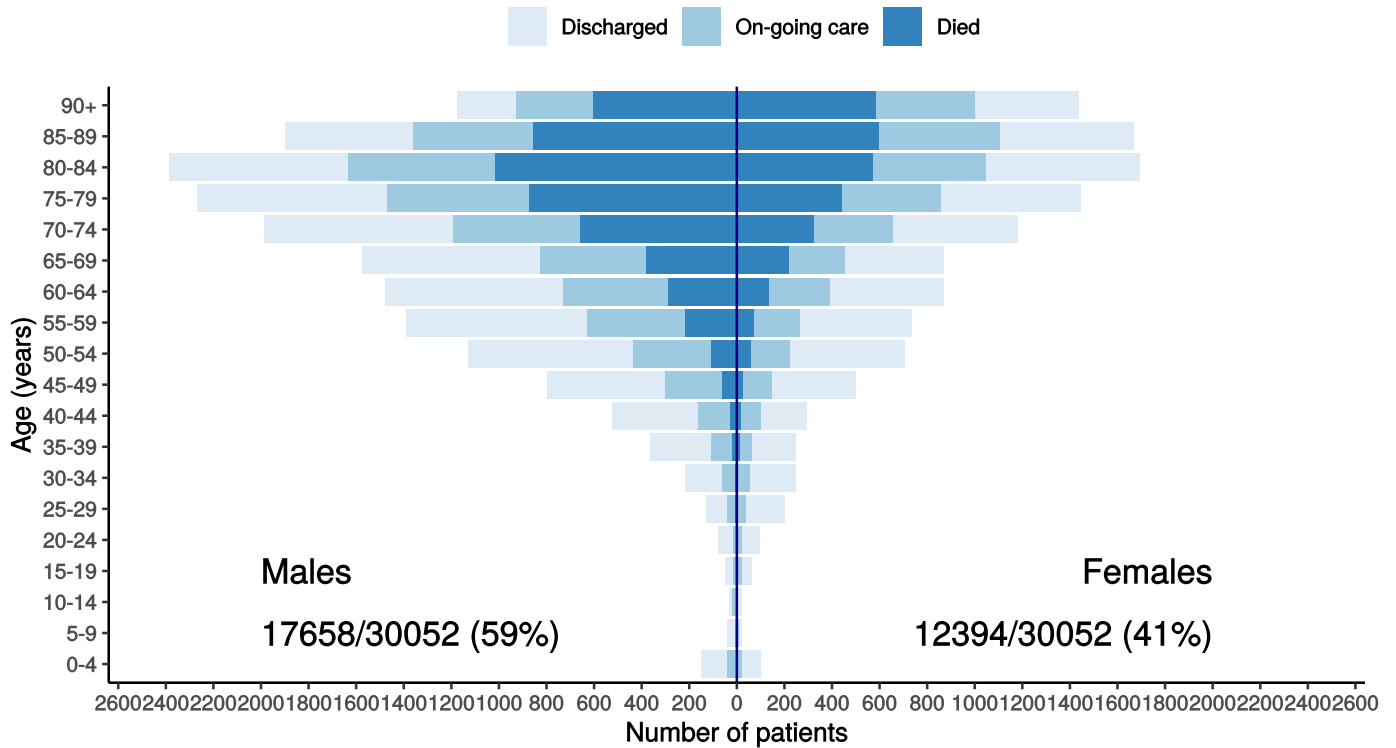
Proportion with symptom onset occurring after hospital admission

Figure 1D - 7-day rolling percentage. n = 28795



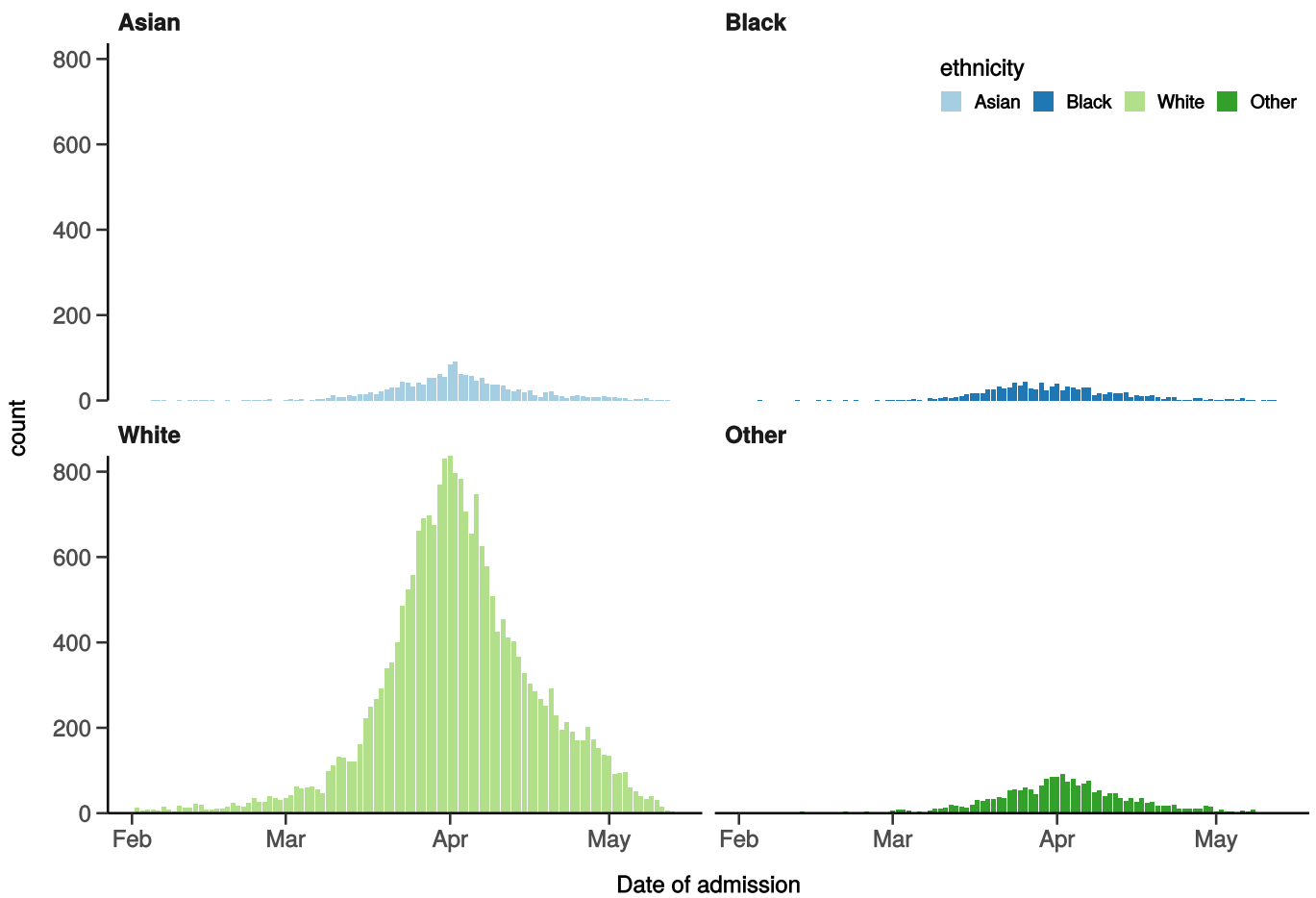
Patients with outcome stratified by age, and sex

Figure 1E



Hospital admission with COVID-19 by ethnicity

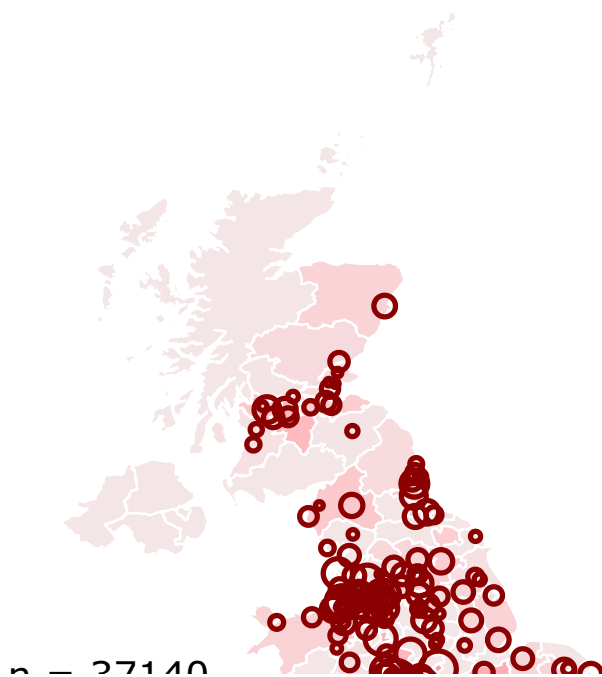
Figure 1F

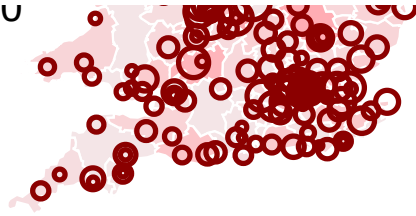


Location by CCG / Healthboard

Figure 2

Click and drag on map to zoom into area. Reset via toolbar at top of map.





Symptoms and comorbidity

Figure 3A

Symptoms on presentation to hospital (% patients, n = 29056)

Figure 3A

Comorbidity (% patients, n = 29105)

Figure 3B

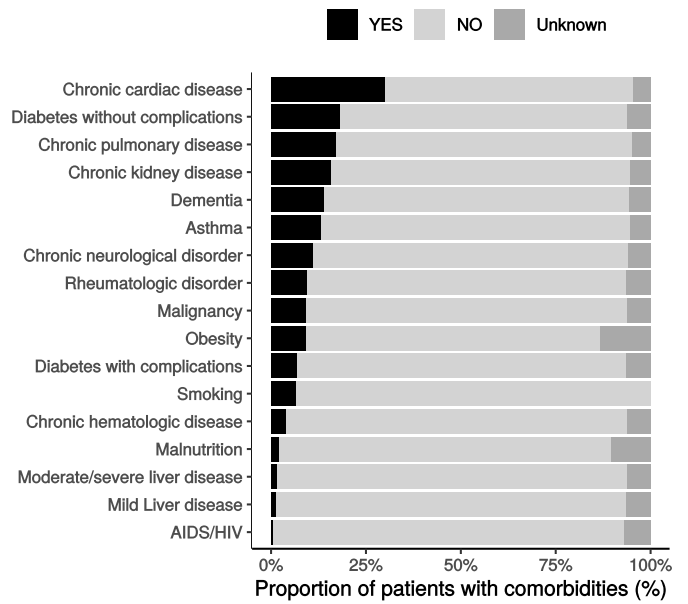
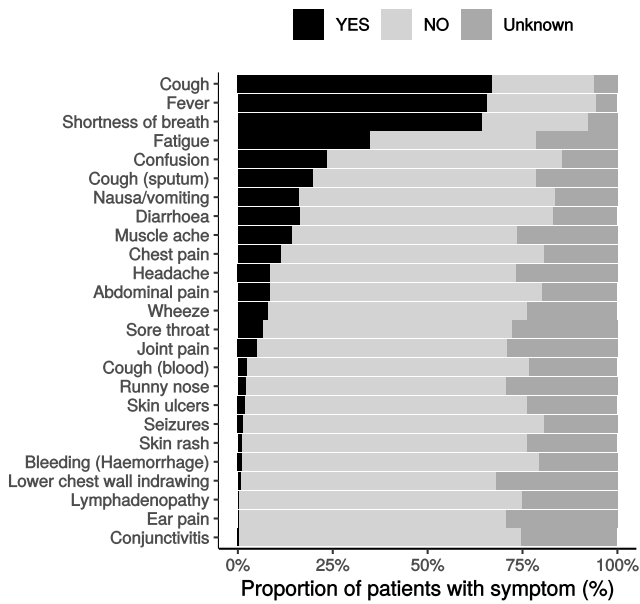
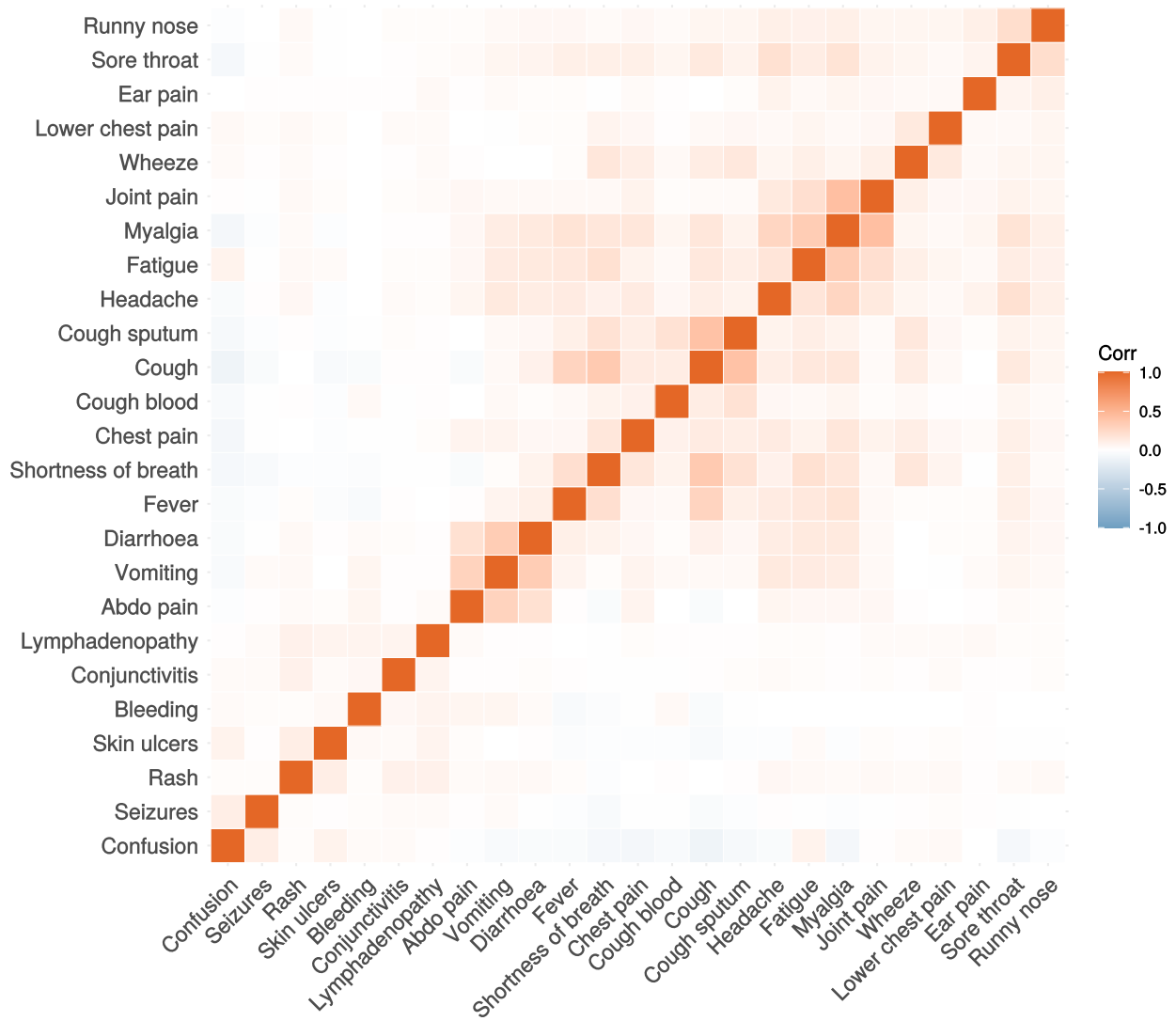


Figure 3C

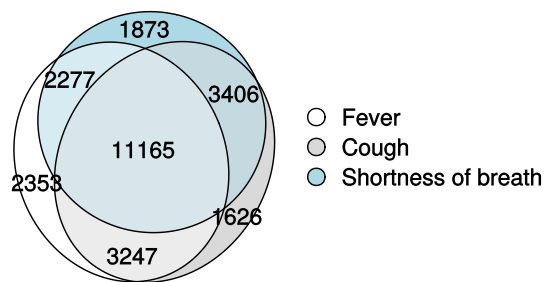
Correlation of symptoms in all pages. Note clusters, top right to bottom left, flu-like, coryzal, abdominal, respiratory, neurocutaneous.



Symptoms (diagnostic criteria)

Figure 4A

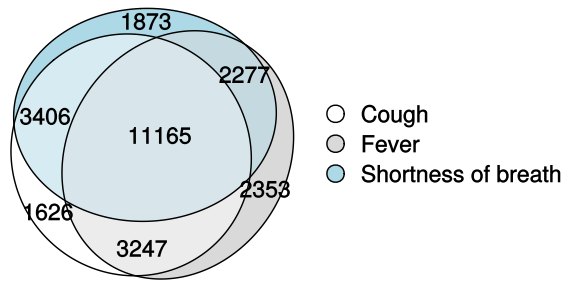
n = 29056



Symptoms (most common)

Figure 4B

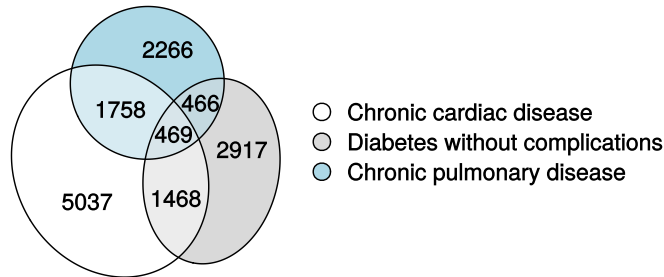
n = 29056



Comorbidity (most common)

Figure 4C

n = 29105



Medication prior to illness

Figure 5

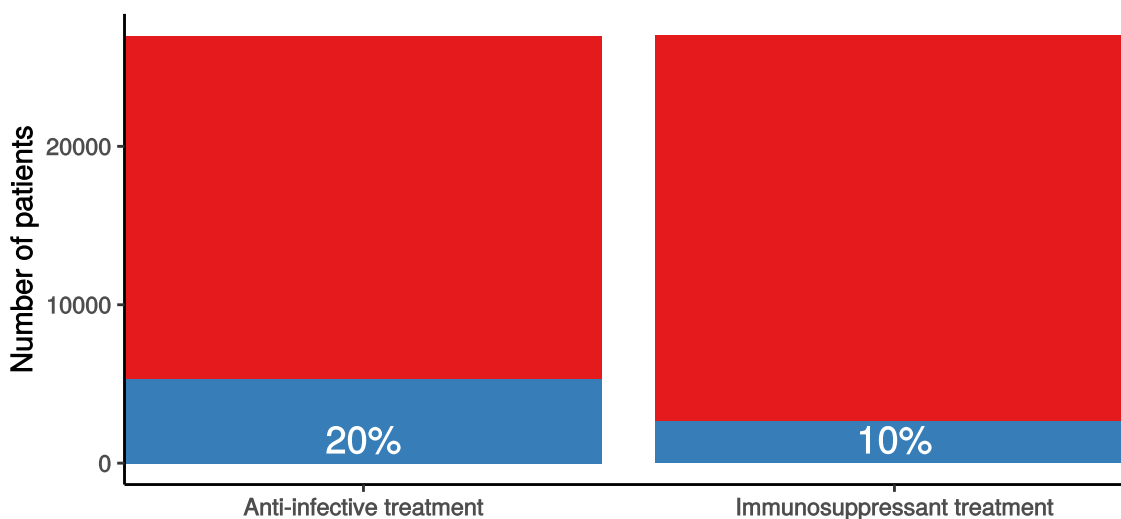
Preadmission treatment

Figure 5

Pre-admission treatment

Anti-infectives for illness episode (left) immunosuppressants including oral (not

■ No ■ Yes



Patient flow

Figure 6A - All patients

N = 30005

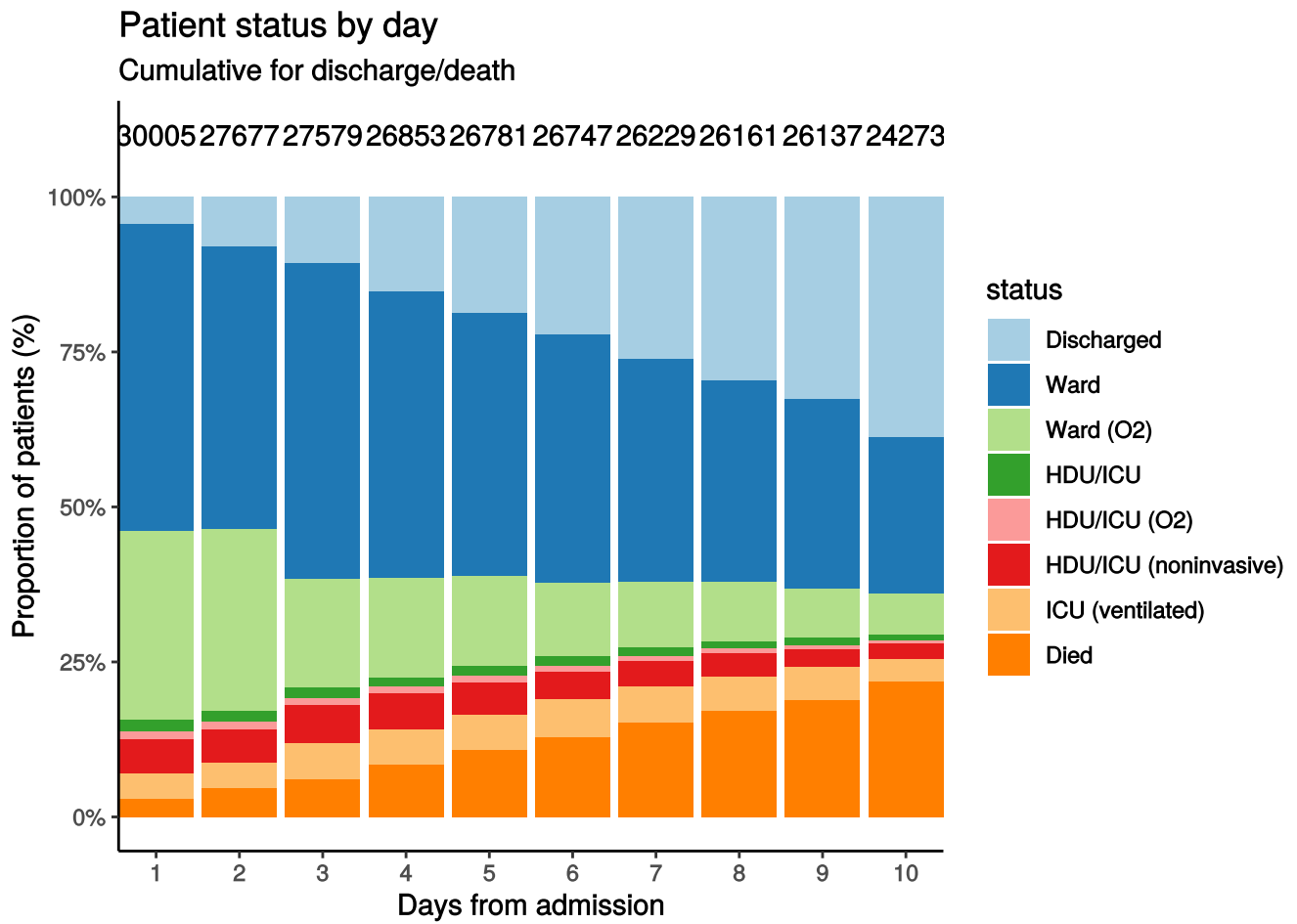
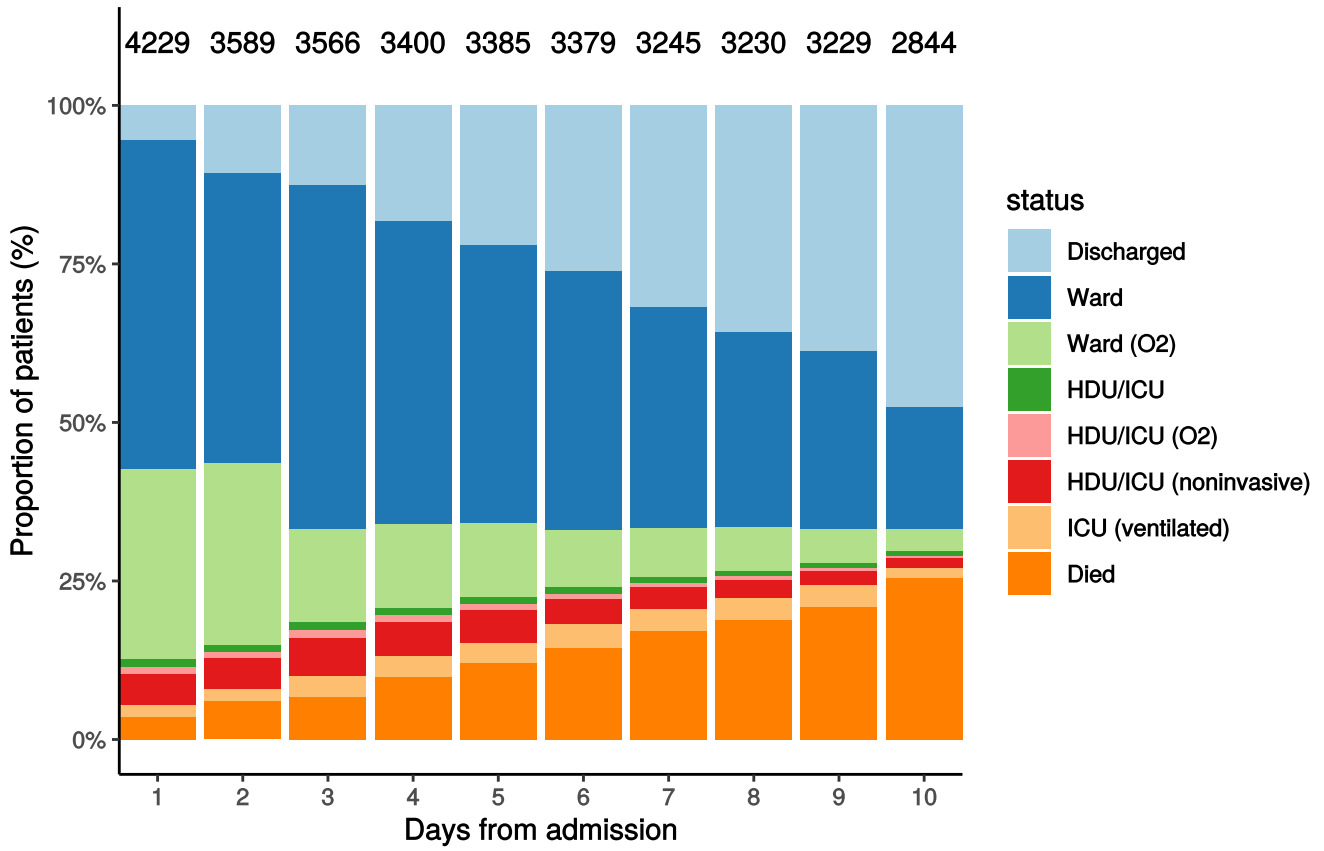


Figure 6B - Patients admitted ≥ 14 days and ≤ 28 days ago

N = 4229

Patient status by day

Cumulative for discharge/death



Oxygen requirement

Figure 7A - All patients

N = 27729

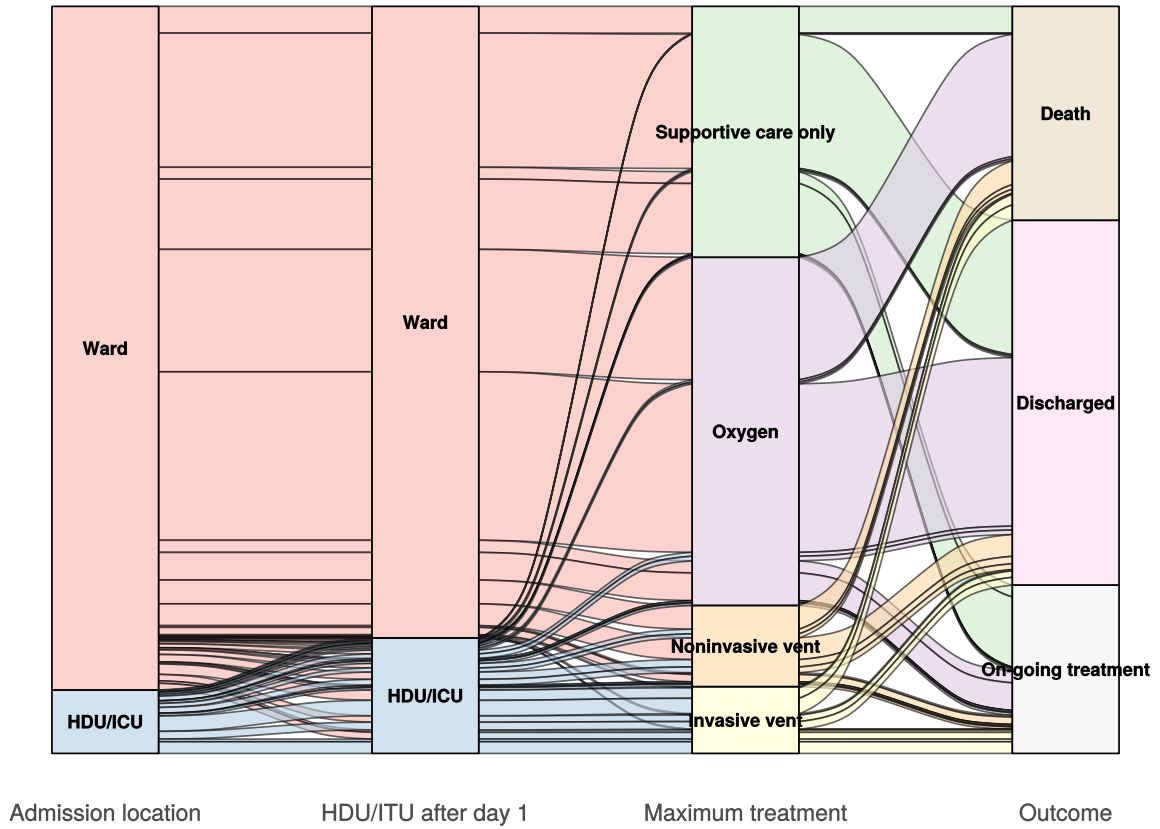
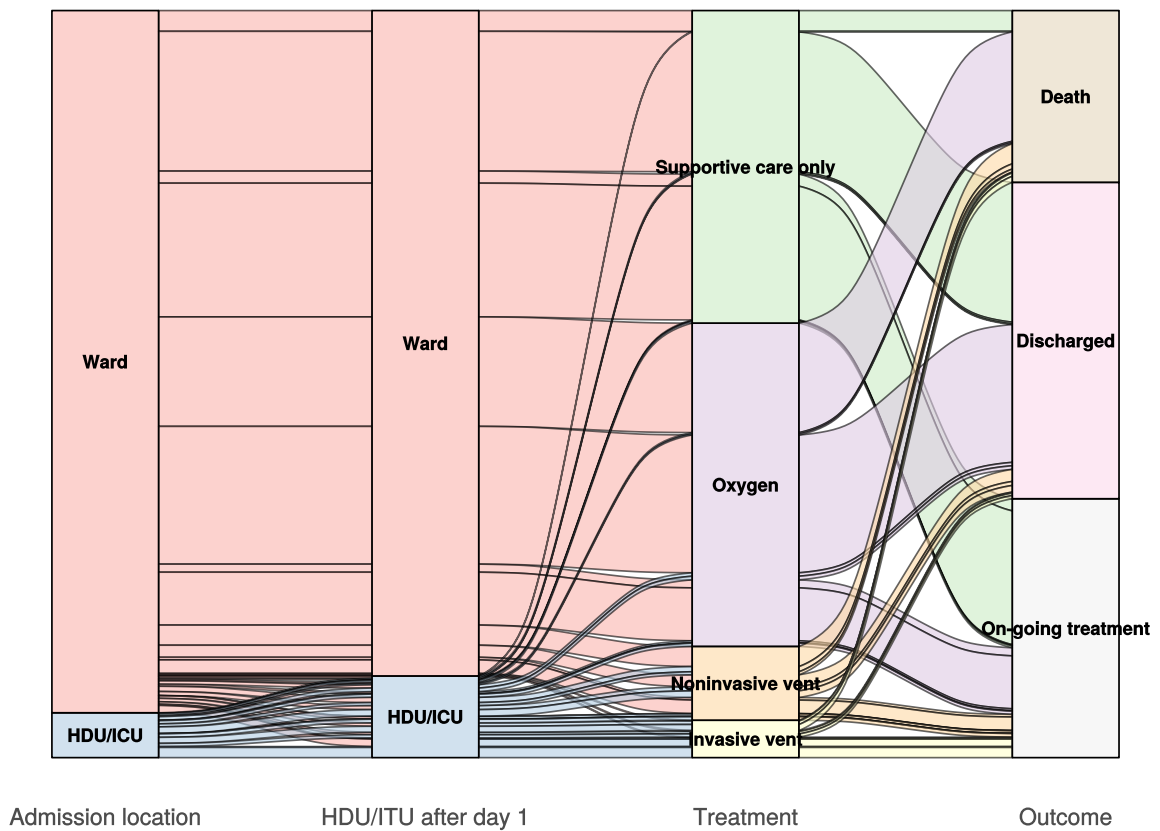


Figure 7B - Patients admitted ≥ 14 days and ≤ 28 days ago

N = 3974

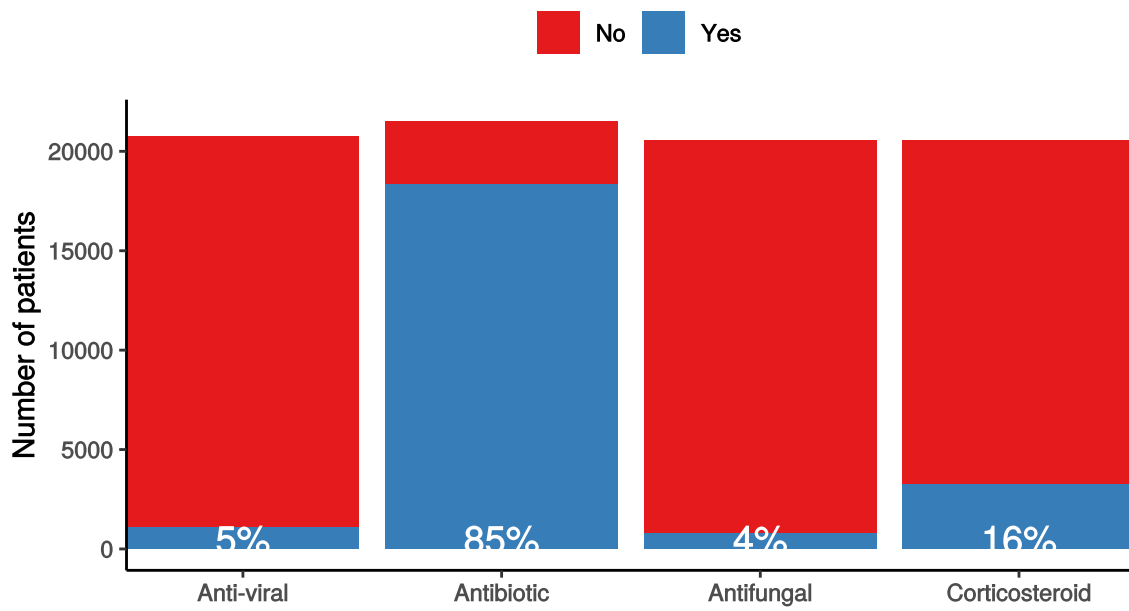


In-hospital medical treatment

Figure 8

In-hospital treatment

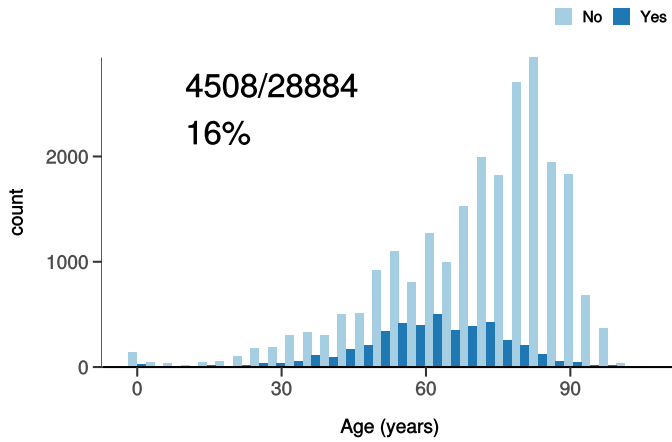
Anti-virals, antibiotics, corticosteroids, and anti-fungals for patients who have cc



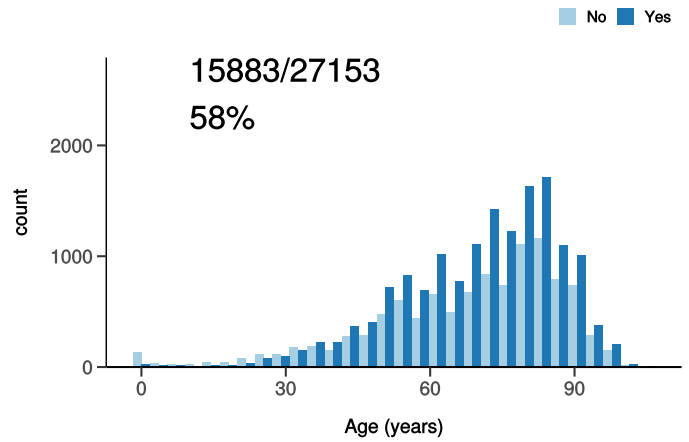
Treatment

Figure 9

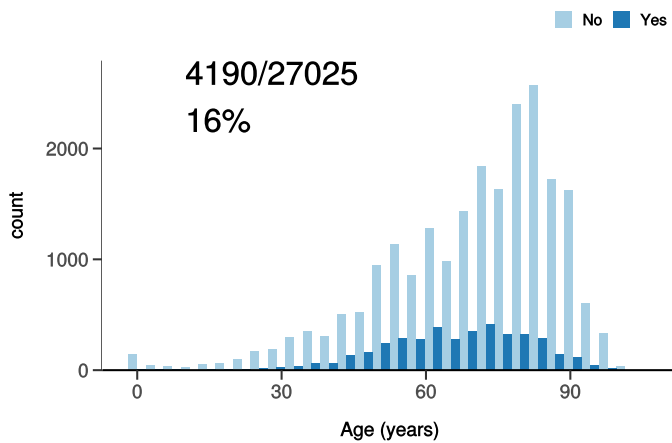
ICU/HDU admission
Figure 10A



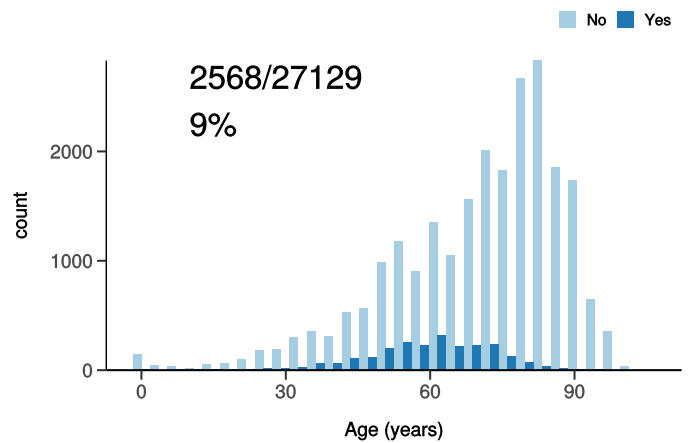
High flow oxygen
Figure 10B



Noninvasive ventilation
Figure 10C



Invasive ventilation
Figure 10D

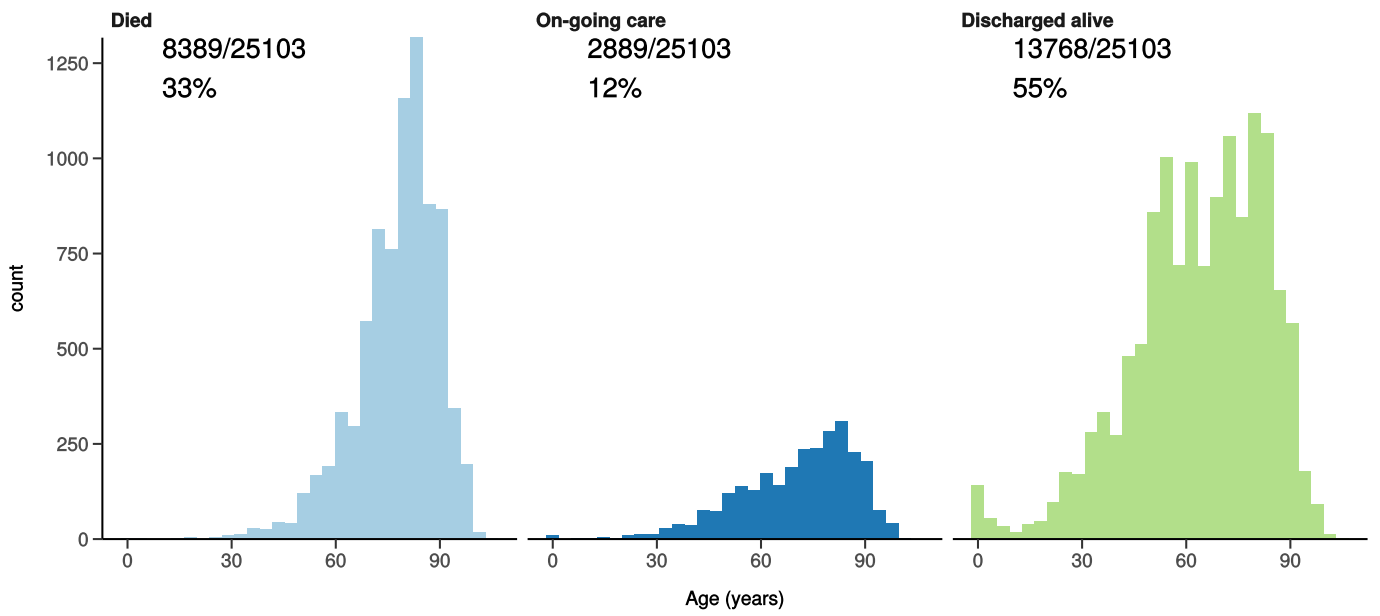


Status in patients admitted ≥ 14 days from today

Figure 10

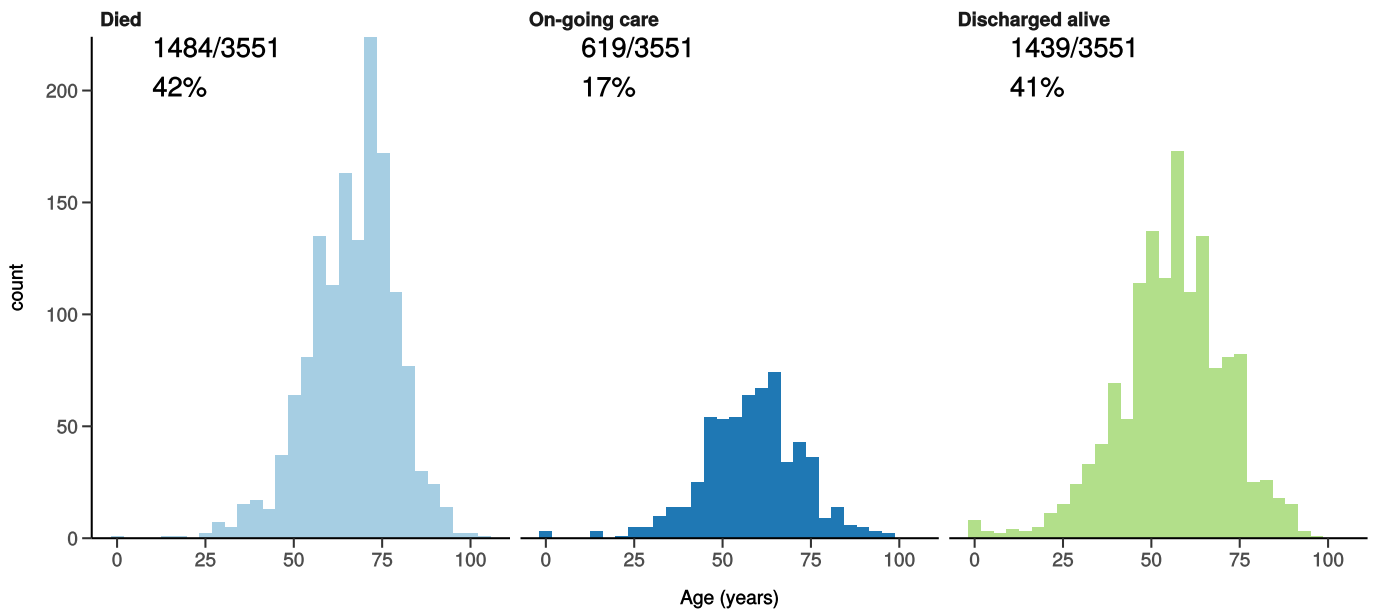
All: status in patients admitted ≥ 14 days ago

Figure 11A



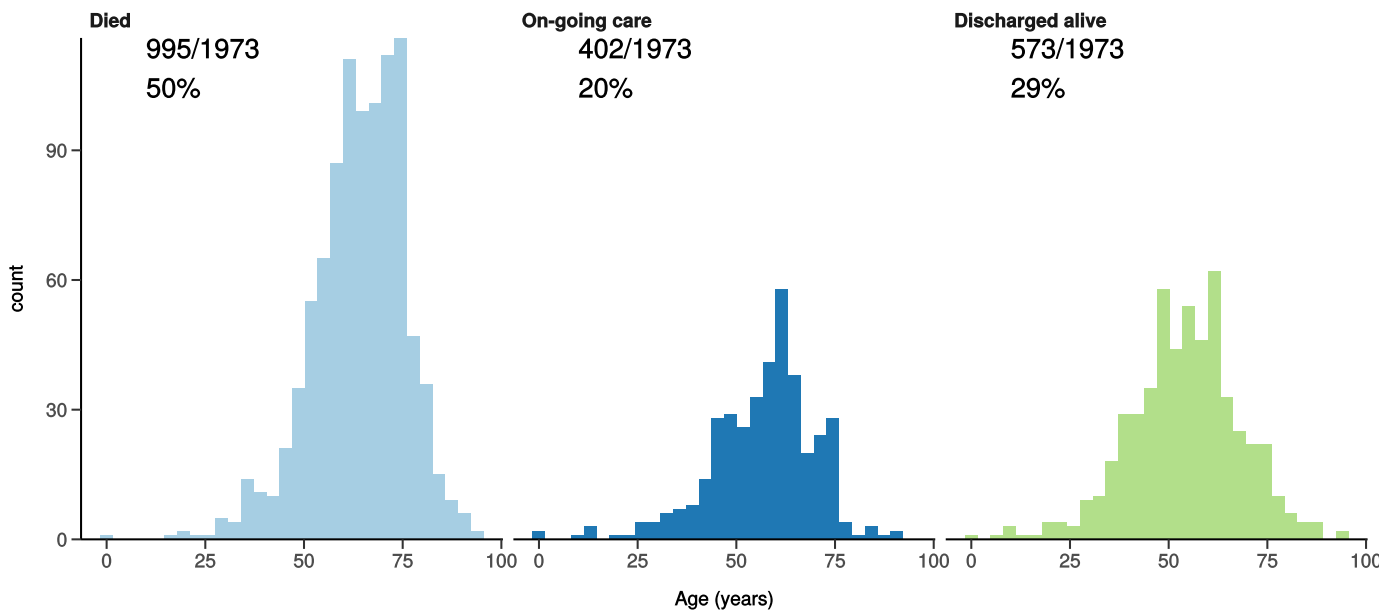
ICU/HDU admissions: status in patients admitted ≥ 14 days ago

Figure 11B



Invasive ventilation: status in patients admitted ≥ 14 days ago

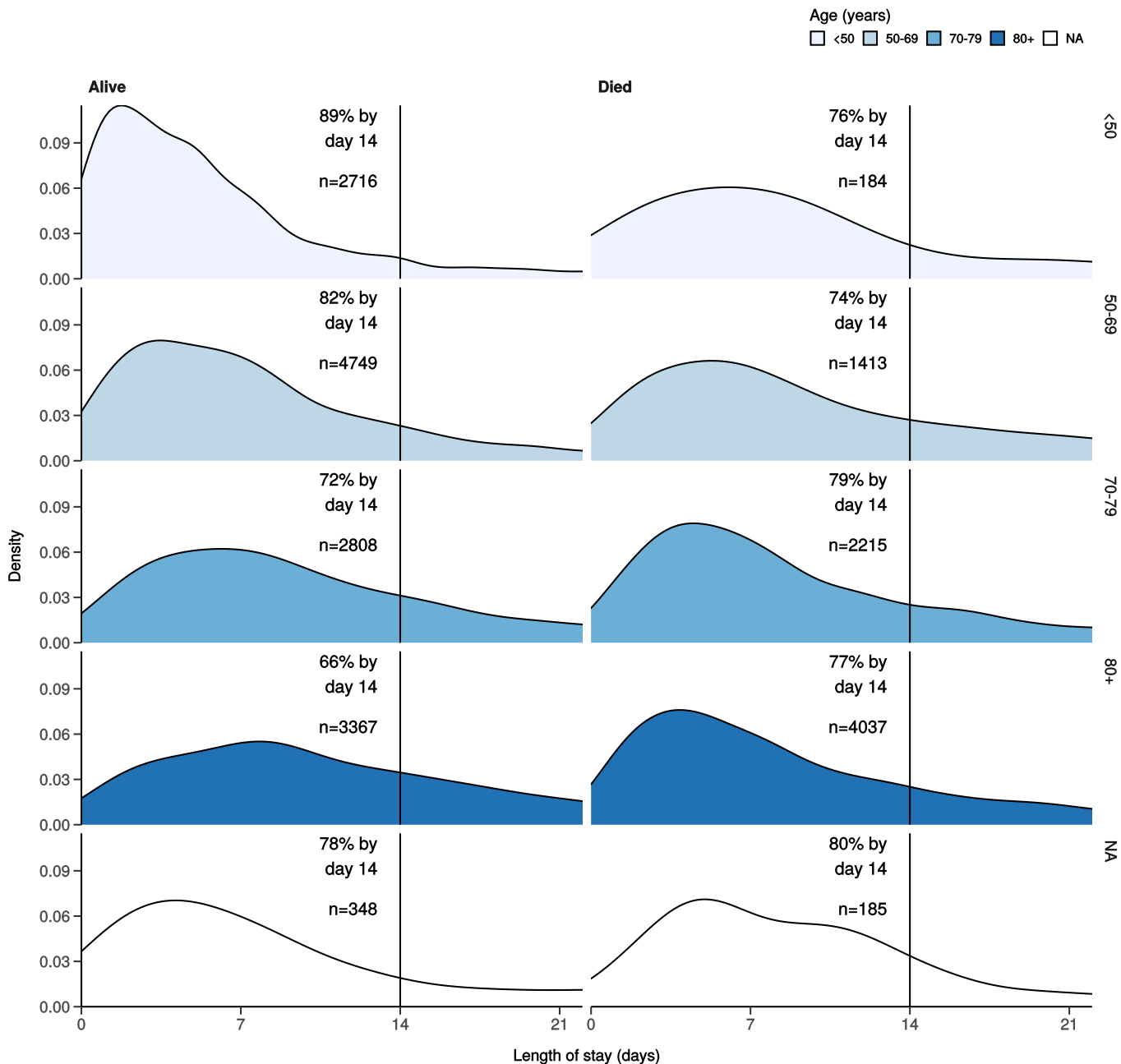
Figure 11c



Length of stay stratified by age

Figure 11

Length of stay stratified by age and mortality
Proportion who reach outcome by day 14 shown



Predictors of death: logistic regression multivariable model

Logistic regression model only includes patients admitted >14 days ago from today.

Dependent: death		No	Yes	OR (univariable)	OR (multivariable)
Age on admission (years)	<50	2982 (93.8)	198 (6.2)	•	•

Dependent: death		No	Yes	OR (univariable)	OR (multivariable)
	50-69	5045 (77.4)	1473 (22.6)	4.40 (3.77-5.15, p<0.001)	4.19 (3.52-5.03, p<0.001)
	70-79	2988 (56.6)	2289 (43.4)	11.54 (9.92-13.49, p<0.001)	9.63 (8.07-11.57, p<0.001)
	80+	3615 (46.2)	4214 (53.8)	17.56 (15.14-20.47, p<0.001)	14.46 (12.12-17.36, p<0.001)
Sex at Birth	Male	8502 (61.9)	5236 (38.1)	•	•
	Female	6479 (67.7)	3098 (32.3)	0.78 (0.73-0.82, p<0.001)	0.70 (0.65-0.75, p<0.001)
	Not specified	0 (NaN)	0 (NaN)	•	•
Chronic cardiac disease	NO	10448 (70.5)	4371 (29.5)	•	•
	YES	3508 (51.9)	3247 (48.1)	2.21 (2.08-2.35, p<0.001)	1.26 (1.17-1.35, p<0.001)
Chronic pulmonary disease	NO	11893 (67.3)	5773 (32.7)	•	•
	YES	2031 (53.1)	1792 (46.9)	1.82 (1.69-1.95, p<0.001)	1.29 (1.18-1.40, p<0.001)
Chronic neurological disorder	NO	12422 (66.2)	6352 (33.8)	•	•
	YES	1361 (54.7)	1126 (45.3)	1.62 (1.49-1.76, p<0.001)	1.26 (1.14-1.40, p<0.001)
Chronic hematologic disease	NO	13255 (65.4)	7008 (34.6)	•	•
	YES	488 (53.6)	422 (46.4)	1.64 (1.43-1.87, p<0.001)	1.32 (1.12-1.55, p=0.001)
Chronic kidney disease	NO	12031 (67.6)	5762 (32.4)	•	•
	YES	1813 (50.7)	1764 (49.3)	2.03 (1.89-2.18, p<0.001)	1.25 (1.14-1.36, p<0.001)
Dementia	NO	12401 (68.2)	5777 (31.8)	•	•

Dependent: death		No	Yes	OR (univariable)	OR (multivariable)
	YES	1414 (45.0)	1728 (55.0)	2.62 (2.43-2.83, p<0.001)	1.45 (1.32-1.59, p<0.001)
Obesity	NO	11291 (64.9)	6101 (35.1)	•	•
	YES	1443 (68.6)	662 (31.4)	0.85 (0.77-0.94, p=0.001)	1.39 (1.24-1.55, p<0.001)
Malignancy	NO	12659 (66.4)	6415 (33.6)	•	•
	YES	1104 (51.9)	1023 (48.1)	1.83 (1.67-2.00, p<0.001)	1.31 (1.18-1.46, p<0.001)

Number in dataframe = 30040, Number in model = 18211, Missing = 11829, AIC = 20425.9, C-statistic = 0.734, H&L = Chi-sq(8) 66.79 (p<0.001)

Figure 12 - Adjusted odds ratio plot

Death

Age on admission (years)	<50	-
	50-69	4.19 (3.52-5.03, p<0.001)
	70-79	9.63 (8.07-11.57, p<0.001)
	80+	14.46 (12.12-17.36, p<0.001)
Sex at Birth	Male	-
	Female	0.70 (0.65-0.75, p<0.001)
	Not specified	-
Chronic cardiac disease	YES	1.26 (1.17-1.35, p<0.001)
Chronic pulmonary disease	YES	1.29 (1.18-1.40, p<0.001)
Chronic neurological disorder	YES	1.26 (1.14-1.40, p<0.001)
Chronic hematologic disease	YES	1.32 (1.12-1.55, p=0.001)
Chronic kidney disease	YES	1.25 (1.14-1.36, p<0.001)
Dementia	YES	1.45 (1.32-1.59, p<0.001)
Obesity	YES	1.39 (1.24-1.55, p<0.001)
Malignancy	YES	1.31 (1.18-1.46, p<0.001)

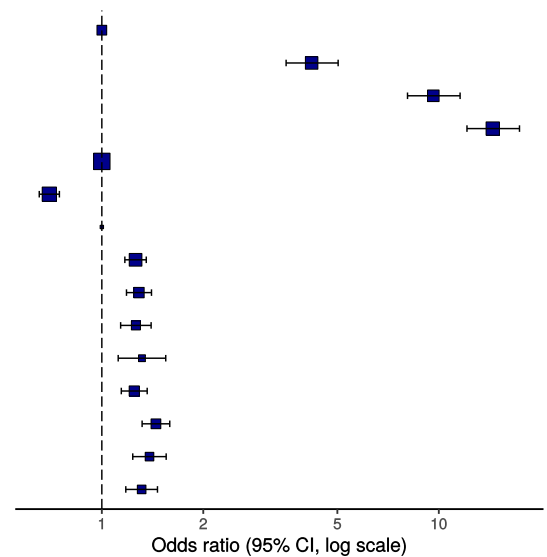
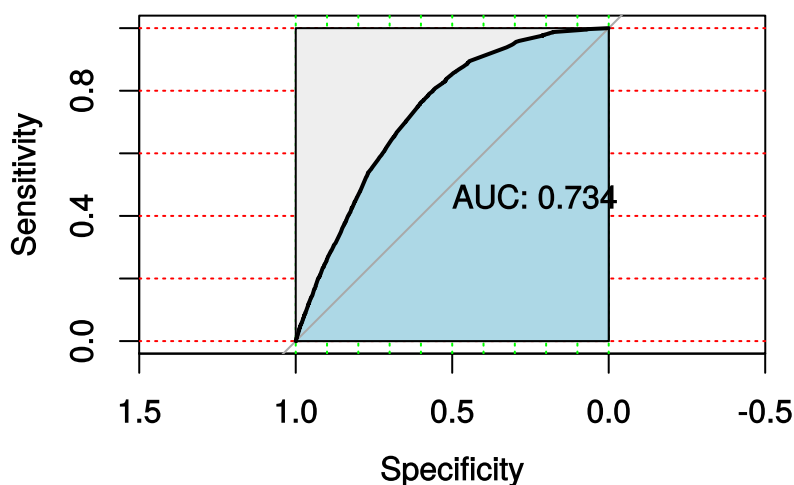


Figure 13 - ROC

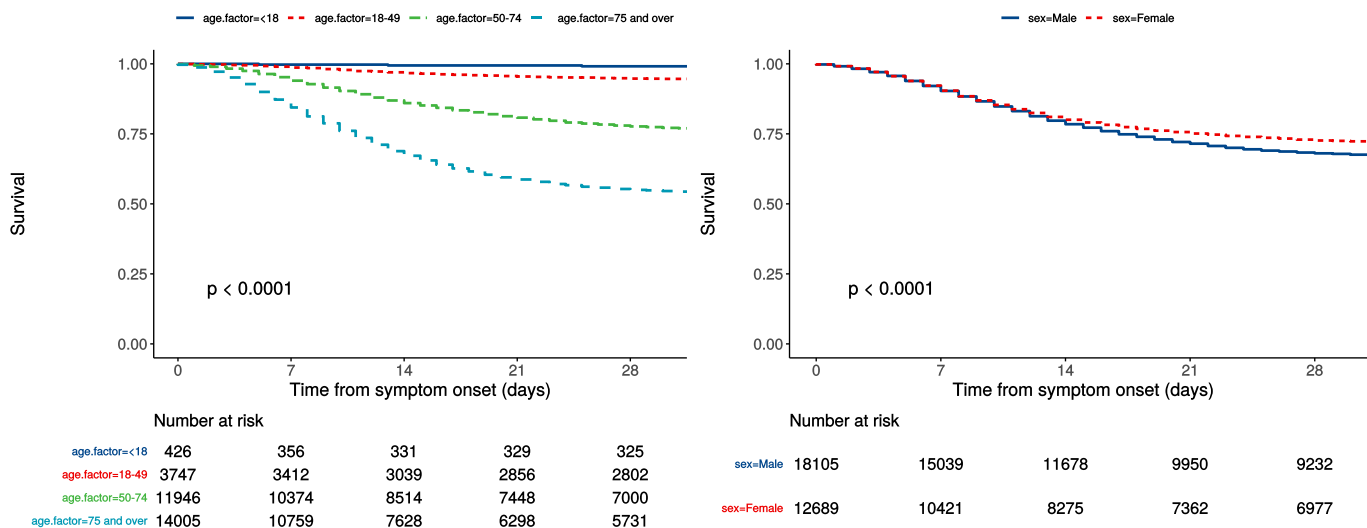


Survival models

Kaplan-Meier plots for survival from symptom onset stratified by age (left) and sex (right)

Figure 14

P-value is log-rank test.



Cox proportional hazards model

The methodology for this is now up and running, but models are still being explored. **What is presented here is not a final model, but to demonstrate methodology.** The results are correct, but important variables have not yet been included.

Time from symptom onset.

Dependent: Surv(time, status)		all	HR (univariable)	HR (multivariable)
Age on admission (years)	<50	4173 (13.9)	•	•
	50-69	8770 (29.1)	3.93 (3.38-4.56, p<0.001)	3.88 (3.21-4.68, p<0.001)
	70-79	6894 (22.9)	8.94 (7.73-10.35, p<0.001)	8.19 (6.80-9.88, p<0.001)
	80+	10287 (34.1)	12.56 (10.88-14.50, p<0.001)	11.11 (9.23-13.39, p<0.001)
Sex at Birth	Male	18105 (58.8)	•	•
	Female	12689 (41.2)	0.84 (0.80-0.87, p<0.001)	0.81 (0.77-0.86, p<0.001)

Dependent: Surv(time, status)		all	HR (univariable)	HR (multivariable)
qSOFA score on admission	0	9218 (40.0)	•	•
	1	10884 (47.2)	1.53 (1.45-1.62, p<0.001)	1.64 (1.54-1.75, p<0.001)
	2	2661 (11.5)	3.07 (2.86-3.30, p<0.001)	2.85 (2.63-3.09, p<0.001)
	3	292 (1.3)	4.95 (4.25-5.76, p<0.001)	3.93 (3.30-4.69, p<0.001)
Symptomatic at presentation	No symptoms	719 (2.5)	•	•
	Symptoms	28259 (97.5)	1.08 (0.93-1.26, p=0.292)	•
Chronic cardiac disease	NO	18848 (68.6)	•	•
	YES	8629 (31.4)	1.90 (1.82-1.99, p<0.001)	1.21 (1.14-1.28, p<0.001)
Chronic kidney disease	NO	22667 (83.3)	•	•
	YES	4535 (16.7)	1.78 (1.68-1.87, p<0.001)	1.18 (1.11-1.27, p<0.001)
Moderate/severe liver disease	NO	26462 (98.2)	•	•
	YES	486 (1.8)	1.37 (1.17-1.59, p<0.001)	1.51 (1.24-1.83, p<0.001)
Chronic neurological disorder	NO	23848 (88.2)	•	•
	YES	3184 (11.8)	1.51 (1.42-1.61, p<0.001)	•
Malignancy	NO	24260 (90.0)	•	•
	YES	2697 (10.0)	1.61 (1.50-1.72, p<0.001)	1.27 (1.17-1.37, p<0.001)
Chronic hematologic disease	NO	25782 (95.8)	•	•

Dependent: Surv(time, status)		all	HR (univariable)	HR (multivariable)
	YES	1121 (4.2)	1.50 (1.36-1.65, p<0.001)	•
Obesity	NO	22131 (89.3)	•	•
	YES	2661 (10.7)	0.86 (0.79-0.93, p<0.001)	1.21 (1.10-1.33, p<0.001)
Diabetes without complications	NO	21770 (80.5)	•	•
	YES	5261 (19.5)	1.21 (1.14-1.28, p<0.001)	•
Rheumatologic disorder	NO	24091 (89.8)	•	•
	YES	2746 (10.2)	1.23 (1.15-1.32, p<0.001)	•
Dementia	NO	23074 (85.1)	•	•
	YES	4042 (14.9)	2.23 (2.11-2.35, p<0.001)	1.21 (1.13-1.30, p<0.001)
Malnutrition	NO	25062 (97.5)	•	•
	YES	637 (2.5)	1.63 (1.43-1.84, p<0.001)	•
smoking_mhyn_2levels	NO	19104 (93.3)	•	•
	YES	1369 (6.7)	0.92 (0.82-1.02, p=0.126)	•

Number in dataframe = 31033, Number in model = 18626, Missing = 12407, Number of events = 5247, Concordance = 0.728 (SE = 0.003), R-squared = 0.165(Max possible = 0.995), Likelihood ratio test = 3356.267 (df = 13, p = 0.000)

Figure 15a - Multivariable Cox proportional hazards model

Survival: HR (95% CI, p-value)

Age on admission (years)	<50	-
	50-69	3.88 (3.21-4.68, p<0.001)
	70-79	8.19 (6.80-9.88, p<0.001)
	80+	11.11 (9.23-13.39, p<0.001)
Sex at Birth	Female	0.81 (0.77-0.86, p<0.001)
qSOFA score on admission	0	-
	1	1.64 (1.54-1.75, p<0.001)
	2	2.85 (2.63-3.09, p<0.001)
	3	3.93 (3.30-4.69, p<0.001)
Chronic cardiac disease	YES	1.21 (1.14-1.28, p<0.001)
Chronic kidney disease	YES	1.18 (1.11-1.27, p<0.001)
Moderate/severe liver disease	YES	1.51 (1.24-1.83, p<0.001)
Malignancy	YES	1.27 (1.17-1.37, p<0.001)
Obesity	YES	1.21 (1.10-1.33, p<0.001)
Dementia	YES	1.21 (1.13-1.30, p<0.001)

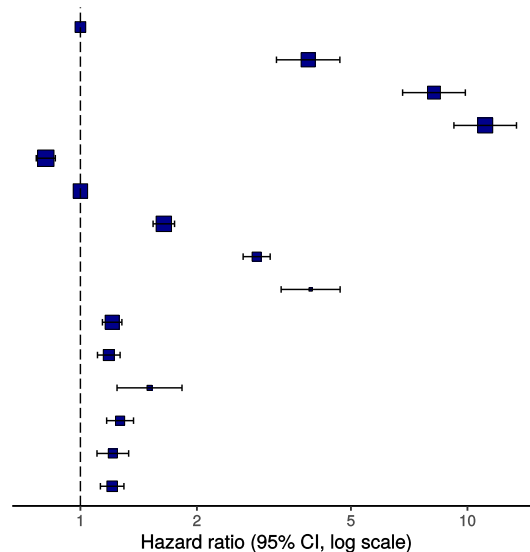
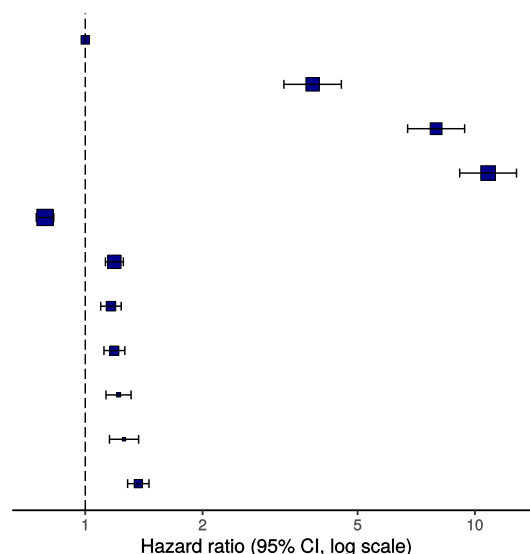


Figure 15b - Multivariable Cox proportional hazards model (age, sex, comorbidities only)

Survival: HR (95% CI, p-value)

Age on admission (years)	<50	-
	50-69	3.83 (3.23-4.54, p<0.001)
	70-79	7.95 (6.72-9.41, p<0.001)
	80+	10.81 (9.14-12.79, p<0.001)
Sex at Birth	Female	0.79 (0.75-0.83, p<0.001)
Chronic cardiac disease	YES	1.19 (1.13-1.25, p<0.001)
Chronic pulmonary disease	YES	1.16 (1.10-1.24, p<0.001)
Chronic kidney disease	YES	1.19 (1.12-1.26, p<0.001)
Malignancy	YES	1.22 (1.13-1.31, p<0.001)
Obesity	YES	1.26 (1.15-1.37, p<0.001)
Dementia	YES	1.37 (1.28-1.46, p<0.001)



ROC = 0.7286317

Figure 16 - Predictions calibration plot

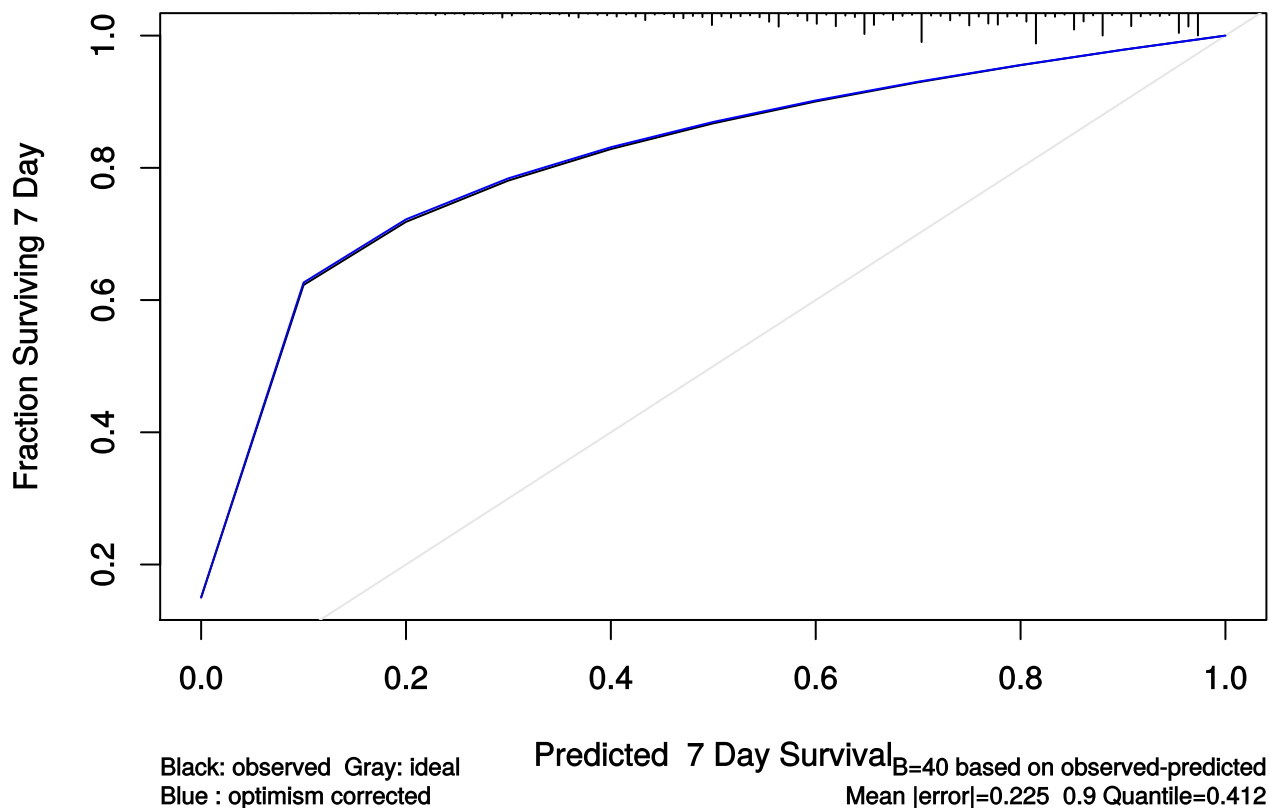


Figure 17 - Prognostic model predictions

Again, for demonstration of methods.

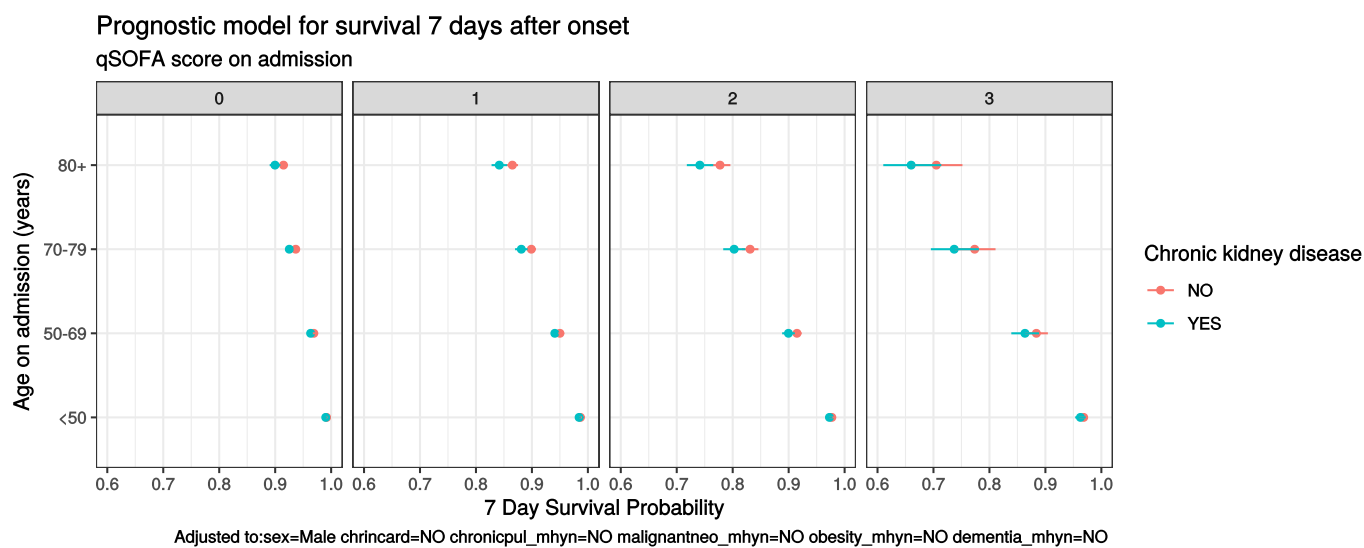


Figure 18 - Death by severity (NEWS) on admission

Number of deaths by NEWS score at admission

Alive Died

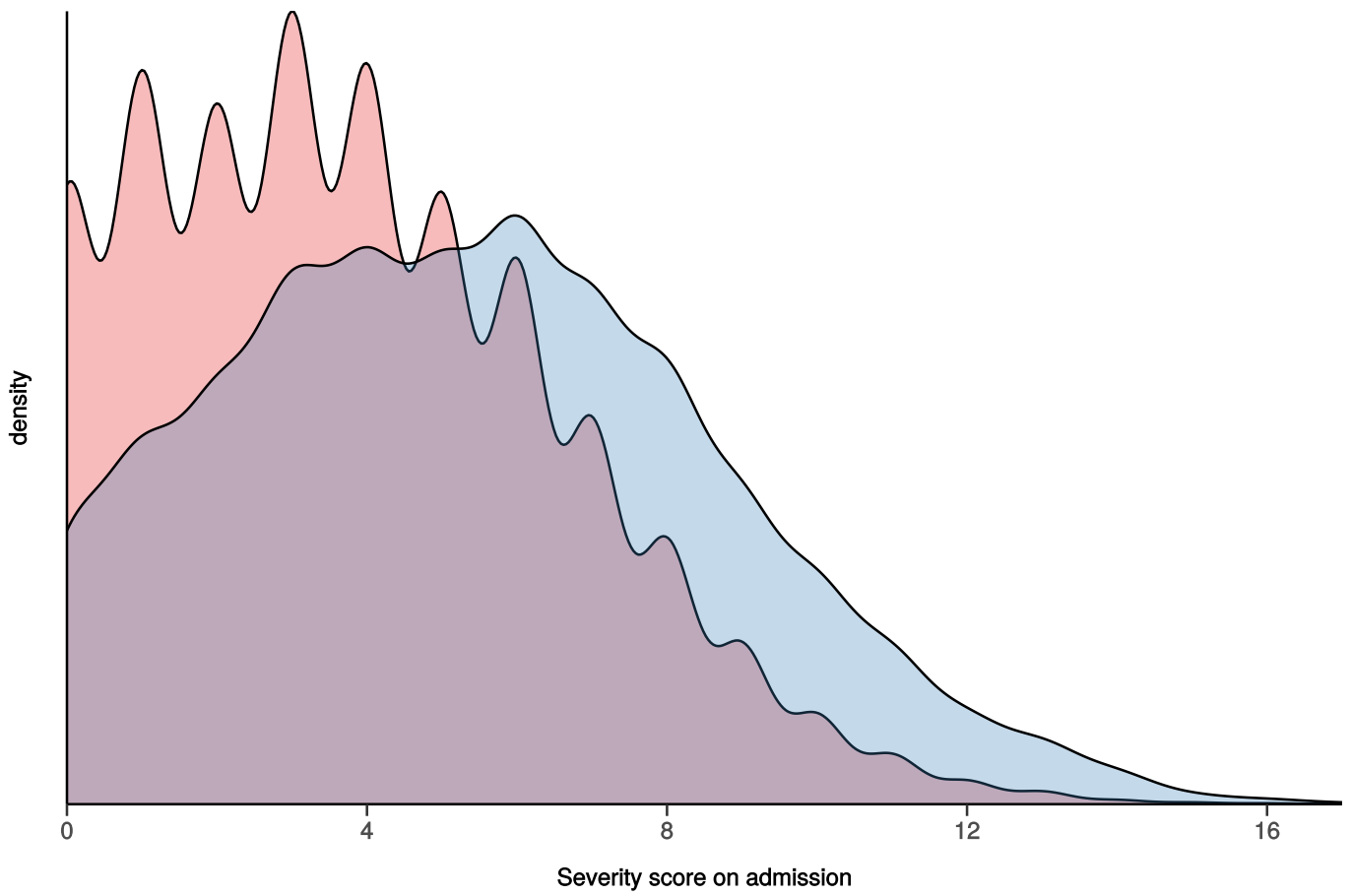


Figure 19 - Death by severity (NEWS) on admission stratified by age

Number of deaths by NEWS score at admission

Stratified by age

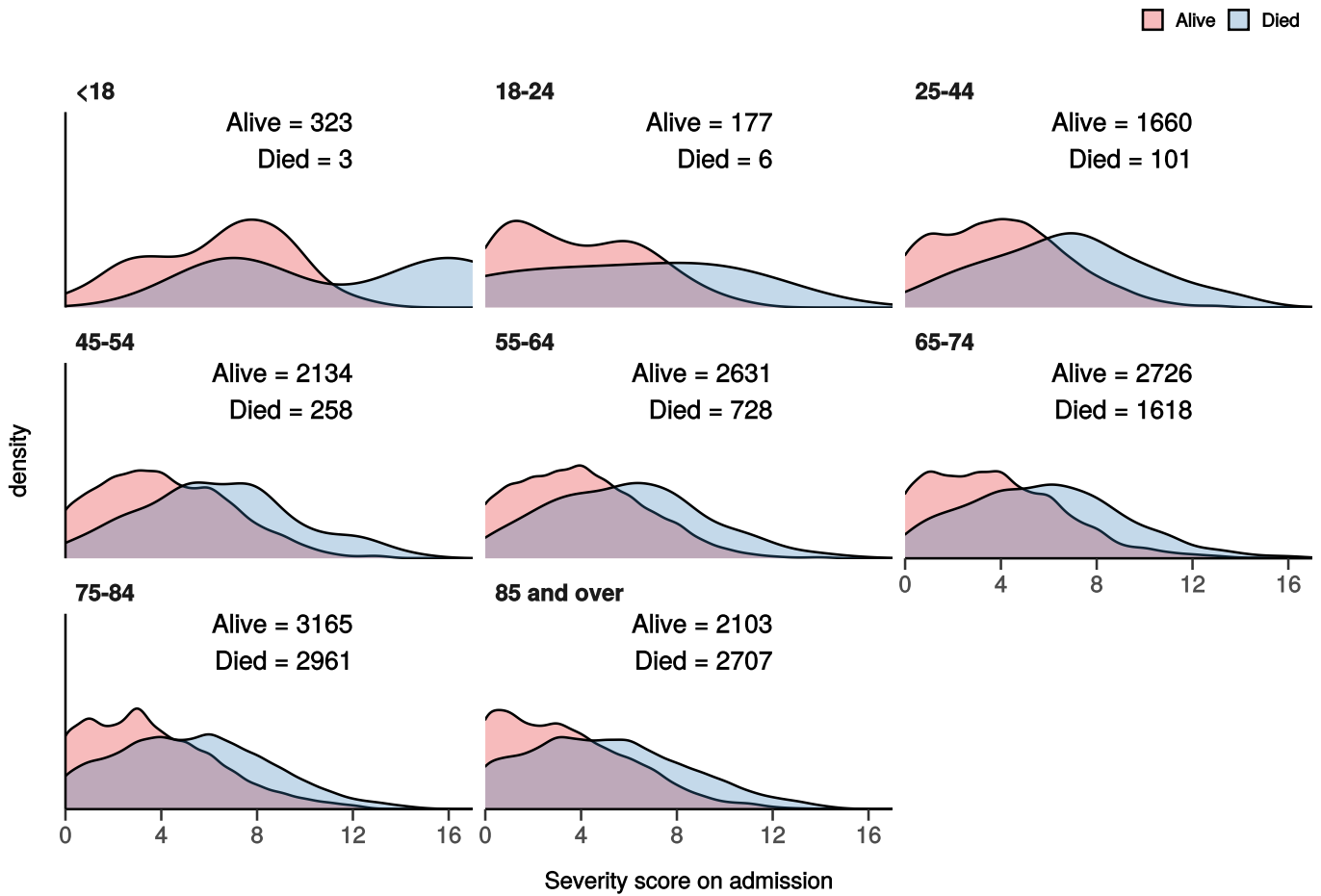
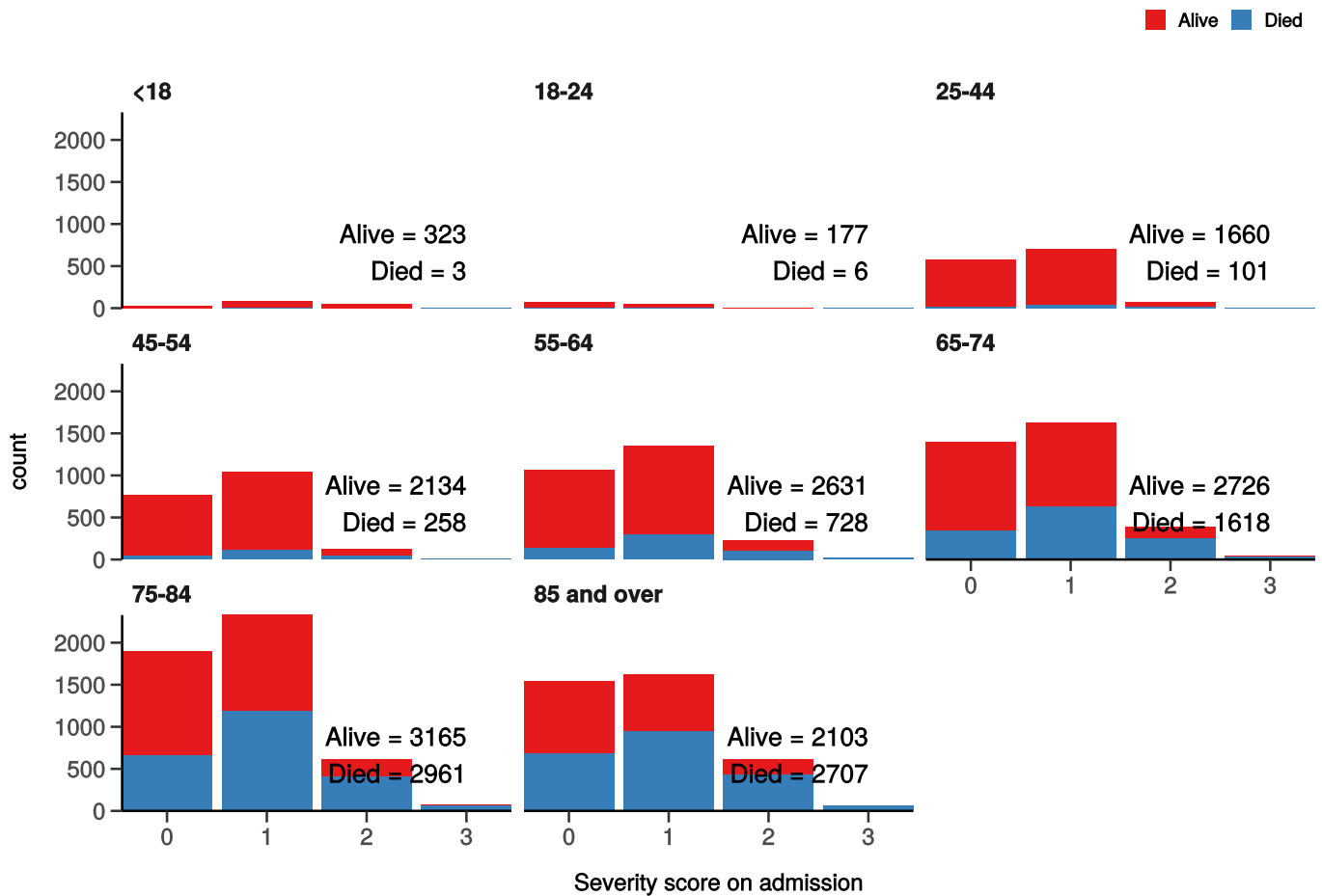


Figure 20 - Death by severity (qSOFA) on admission stratified by age

Number of deaths by qSOFA score at admission

Stratified by age



Healthcare workers

Healthcare worker		NO	YES	p
Total N (%)		26576 (94.9)	1440 (5.1)	
NEWS score on admission	Median (IQR)	4.0 (4.0)	4.0 (4.0)	0.757
Death	No	12404 (61.7)	999 (93.4)	<0.001
	Yes	7702 (38.3)	71 (6.6)	

Admission (detail)

Table 1

label	levels	all
Total N (%)		36978 (100.0)
Age on admission (years)	Mean (SD)	69.2 (18.1)

label	levels	all
Sex at Birth	Male	18761 (50.7)
	Female	13251 (35.8)
	Not specified	51 (0.1)
	(Missing)	4915 (13.3)
Healthcare worker	YES	1440 (3.9)
	NO	26576 (71.9)
	N/A	3159 (8.5)
	(Missing)	5803 (15.7)
Microbiology lab worker	YES	76 (0.2)
	NO	21242 (57.4)
	N/A	2511 (6.8)
	(Missing)	13149 (35.6)
Onset to admission (days)	Mean (SD)	17.4 (2209.1)
Transfer from other facility	Yes-facility is a study site	553 (1.5)
	Yes-facility is not a study site	1644 (4.4)
	No	27011 (73.0)
	N/A	984 (2.7)
	(Missing)	6786 (18.4)
Travel in 14 d prior to symptoms	Yes	743 (2.0)
	No	18408 (49.8)
	N/A	3529 (9.5)
	(Missing)	14298 (38.7)
Country	Afghanistan	0 (0.0)
	Albania	0 (0.0)
	Algeria	0 (0.0)
	Andorra	1 (0.0)
	Angola	0 (0.0)

label	levels	all
	Antigua and Barbuda	3 (0.0)
	Argentina	1 (0.0)
	Armenia	0 (0.0)
	Aruba	0 (0.0)
	Australia	3 (0.0)
	Austria	19 (0.1)
	Azerbaijan	2 (0.0)
	The	0 (0.0)
	Bahrain	0 (0.0)
	Bangladesh	1 (0.0)
	Barbados	17 (0.0)
	Belarus	0 (0.0)
	Belgium	2 (0.0)
	Belize	0 (0.0)
	Benin	0 (0.0)
	Bhutan	0 (0.0)
	Bolivia	0 (0.0)
	Bosnia and Herzegovina	0 (0.0)
	Botswana	0 (0.0)
	Brazil	3 (0.0)
	Brunei	0 (0.0)
	Bulgaria	3 (0.0)
	Burkina Faso	0 (0.0)
	Burma	0 (0.0)
	Burundi	0 (0.0)
	Cambodia	1 (0.0)
	Cameroon	1 (0.0)

label	levels	all
	Canada	2 (0.0)
	Cabo Verde	1 (0.0)
	Central African Republic	0 (0.0)
	Chad	0 (0.0)
	Chile	1 (0.0)
	China	2 (0.0)
	Colombia	0 (0.0)
	Comoros	0 (0.0)
	Republic of the	0 (0.0)
	Costa Rica	0 (0.0)
	Cote dlvoire	0 (0.0)
	Croatia	0 (0.0)
	Cuba	1 (0.0)
	Curacao	0 (0.0)
	Cyprus	26 (0.1)
	Czechia	2 (0.0)
	Denmark	0 (0.0)
	Djibouti	0 (0.0)
	Dominica	0 (0.0)
	Dominican Republic	3 (0.0)
	Ecuador	0 (0.0)
	Egypt	8 (0.0)
	El Salvador	0 (0.0)
	Equatorial Guinea	0 (0.0)
	Eritrea	0 (0.0)
	Estonia	0 (0.0)
	Ethiopia	0 (0.0)

label	levels	all
	Fiji	0 (0.0)
	Finland	0 (0.0)
	France	32 (0.1)
	Gabon	0 (0.0)
	Georgia	0 (0.0)
	Germany	8 (0.0)
	Ghana	1 (0.0)
	Greece	1 (0.0)
	Grenada	0 (0.0)
	Guatemala	0 (0.0)
	Guinea	0 (0.0)
	Guinea-Bissau	0 (0.0)
	Guyana	0 (0.0)
	Haiti	0 (0.0)
	Holy See	0 (0.0)
	Honduras	0 (0.0)
	Hong Kong	0 (0.0)
	Hungary	2 (0.0)
	Iceland	1 (0.0)
	India	9 (0.0)
	Indonesia	1 (0.0)
	Iran	6 (0.0)
	Iraq	0 (0.0)
	Ireland	6 (0.0)
	Israel	0 (0.0)
	Italy	84 (0.2)
	Jamaica	2 (0.0)

label	levels	all
	Japan	6 (0.0)
	Jordan	0 (0.0)
	Kazakhstan	0 (0.0)
	Kenya	1 (0.0)
	Kiribati	0 (0.0)
	South	0 (0.0)
	Kosovo	0 (0.0)
	Kuwait	1 (0.0)
	Kyrgyzstan	0 (0.0)
	Laos	0 (0.0)
	Latvia	0 (0.0)
	Lebanon	0 (0.0)
	Lesotho	0 (0.0)
	Liberia	0 (0.0)
	Libya	0 (0.0)
	Liechtenstein	0 (0.0)
	Lithuania	0 (0.0)
	Luxembourg	0 (0.0)
	Macau	0 (0.0)
	Macedonia	0 (0.0)
	Madagascar	1 (0.0)
	Malawi	0 (0.0)
	Malaysia	4 (0.0)
	Maldives	1 (0.0)
	Mali	0 (0.0)
	Malta	0 (0.0)
	Marshall Islands	0 (0.0)

label	levels	all
	Mauritania	0 (0.0)
	Mauritius	1 (0.0)
	Mexico	4 (0.0)
	Micronesia	0 (0.0)
	Moldova	0 (0.0)
	Monaco	0 (0.0)
	Mongolia	0 (0.0)
	Montenegro	0 (0.0)
	Morocco	3 (0.0)
	Mozambique	0 (0.0)
	Namibia	0 (0.0)
	Nauru	0 (0.0)
	Nepal	3 (0.0)
	Netherlands	9 (0.0)
	New Zealand	2 (0.0)
	Nicaragua	0 (0.0)
	Niger	0 (0.0)
	Nigeria	2 (0.0)
	North Korea	0 (0.0)
	Norway	2 (0.0)
	Oman	0 (0.0)
	Pakistan	9 (0.0)
	Palau	0 (0.0)
	Palestinian Territories	0 (0.0)
	Panama	0 (0.0)
	Papua New Guinea	0 (0.0)
	Paraguay	0 (0.0)

label	levels	all
	Peru	0 (0.0)
	Philippines	5 (0.0)
	Poland	3 (0.0)
	Portugal	19 (0.1)
	Qatar	1 (0.0)
	Romania	6 (0.0)
	Russia	0 (0.0)
	Rwanda	0 (0.0)
	Saint Kitts and Nevis	0 (0.0)
	Saint Lucia	0 (0.0)
	Saint Vincent and the Grenadines	0 (0.0)
	Samoa	0 (0.0)
	San Marino	0 (0.0)
	Sao Tome and Principe	0 (0.0)
	Saudi Arabia	2 (0.0)
	Senegal	0 (0.0)
	Serbia	0 (0.0)
	Seychelles	0 (0.0)
	Sierra Leone	0 (0.0)
	Singapore	4 (0.0)
	Sint Maarten	0 (0.0)
	Slovakia	1 (0.0)
	Slovenia	0 (0.0)
	Solomon Islands	0 (0.0)
	Somalia	2 (0.0)
	South Africa	9 (0.0)
	South Korea	1 (0.0)

label	levels	all
	South Sudan	0 (0.0)
	Spain	179 (0.5)
	Sri Lanka	0 (0.0)
	Sudan	0 (0.0)
	Suriname	0 (0.0)
	Swaziland	1 (0.0)
	Sweden	0 (0.0)
	Switzerland	8 (0.0)
	Syria	0 (0.0)
	Taiwan	0 (0.0)
	Tajikistan	0 (0.0)
	Tanzania	0 (0.0)
	Thailand	8 (0.0)
	Timor-Leste	0 (0.0)
	Togo	0 (0.0)
	Tonga	0 (0.0)
	Trinidad and Tobago	0 (0.0)
	Tunisia	0 (0.0)
	Turkey	7 (0.0)
	Turkmenistan	0 (0.0)
	Tuvalu	0 (0.0)
	Uganda	0 (0.0)
	Ukraine	0 (0.0)
	United Arab Emirates	9 (0.0)
	United Kingdom	107 (0.3)
	Uruguay	0 (0.0)
	Uzbekistan	0 (0.0)

label	levels	all
	Vanuatu	0 (0.0)
	Venezuela	0 (0.0)
	Vietnam	0 (0.0)
	Yemen	1 (0.0)
	Zambia	0 (0.0)
	Zimbabwe	1 (0.0)
	(Missing)	36299 (98.2)
Country 2	Afghanistan	0 (0.0)
	Albania	0 (0.0)
	Algeria	1 (0.0)
	Andorra	0 (0.0)
	Angola	0 (0.0)
	Antigua and Barbuda	1 (0.0)
	Argentina	0 (0.0)
	Armenia	0 (0.0)
	Aruba	1 (0.0)
	Australia	3 (0.0)
	Austria	4 (0.0)
	Azerbaijan	0 (0.0)
	The	0 (0.0)
	Bahrain	0 (0.0)
	Bangladesh	0 (0.0)
	Barbados	2 (0.0)
	Belarus	0 (0.0)
	Belgium	0 (0.0)
	Belize	0 (0.0)
	Benin	0 (0.0)

label	levels	all
	Bhutan	0 (0.0)
	Bolivia	0 (0.0)
	Bosnia and Herzegovina	0 (0.0)
	Botswana	0 (0.0)
	Brazil	0 (0.0)
	Brunei	0 (0.0)
	Bulgaria	2 (0.0)
	Burkina Faso	0 (0.0)
	Burma	0 (0.0)
	Burundi	0 (0.0)
	Cambodia	0 (0.0)
	Cameroon	0 (0.0)
	Canada	1 (0.0)
	Cabo Verde	0 (0.0)
	Central African Republic	0 (0.0)
	Chad	0 (0.0)
	Chile	0 (0.0)
	China	0 (0.0)
	Colombia	0 (0.0)
	Comoros	0 (0.0)
	Republic of the	0 (0.0)
	Costa Rica	0 (0.0)
	Cote dlvoire	0 (0.0)
	Croatia	0 (0.0)
	Cuba	0 (0.0)
	Curacao	0 (0.0)
	Cyprus	4 (0.0)

label	levels	all
	Czechia	1 (0.0)
	Denmark	0 (0.0)
	Djibouti	0 (0.0)
	Dominica	0 (0.0)
	Dominican Republic	0 (0.0)
	Ecuador	0 (0.0)
	Egypt	2 (0.0)
	El Salvador	0 (0.0)
	Equatorial Guinea	0 (0.0)
	Eritrea	0 (0.0)
	Estonia	0 (0.0)
	Ethiopia	0 (0.0)
	Fiji	0 (0.0)
	Finland	0 (0.0)
	France	8 (0.0)
	Gabon	0 (0.0)
	Georgia	0 (0.0)
	Germany	3 (0.0)
	Ghana	0 (0.0)
	Greece	0 (0.0)
	Grenada	0 (0.0)
	Guatemala	0 (0.0)
	Guinea	0 (0.0)
	Guinea-Bissau	0 (0.0)
	Guyana	0 (0.0)
	Haiti	0 (0.0)
	Holy See	0 (0.0)

label	levels	all
	Honduras	0 (0.0)
	Hong Kong	0 (0.0)
	Hungary	0 (0.0)
	Iceland	0 (0.0)
	India	2 (0.0)
	Indonesia	1 (0.0)
	Iran	0 (0.0)
	Iraq	0 (0.0)
	Ireland	0 (0.0)
	Israel	0 (0.0)
	Italy	15 (0.0)
	Jamaica	1 (0.0)
	Japan	0 (0.0)
	Jordan	0 (0.0)
	Kazakhstan	0 (0.0)
	Kenya	0 (0.0)
	Kiribati	0 (0.0)
	South	0 (0.0)
	Kosovo	0 (0.0)
	Kuwait	0 (0.0)
	Kyrgyzstan	0 (0.0)
	Laos	0 (0.0)
	Latvia	0 (0.0)
	Lebanon	0 (0.0)
	Lesotho	0 (0.0)
	Liberia	0 (0.0)
	Libya	0 (0.0)

label	levels	all
	Liechtenstein	0 (0.0)
	Lithuania	0 (0.0)
	Luxembourg	0 (0.0)
	Macau	0 (0.0)
	Macedonia	0 (0.0)
	Madagascar	0 (0.0)
	Malawi	0 (0.0)
	Malaysia	0 (0.0)
	Maldives	0 (0.0)
	Mali	0 (0.0)
	Malta	0 (0.0)
	Marshall Islands	0 (0.0)
	Mauritania	0 (0.0)
	Mauritius	0 (0.0)
	Mexico	0 (0.0)
	Micronesia	0 (0.0)
	Moldova	0 (0.0)
	Monaco	0 (0.0)
	Mongolia	0 (0.0)
	Montenegro	0 (0.0)
	Morocco	1 (0.0)
	Mozambique	0 (0.0)
	Namibia	0 (0.0)
	Nauru	0 (0.0)
	Nepal	0 (0.0)
	Netherlands	2 (0.0)
	New Zealand	0 (0.0)

label	levels	all
	Nicaragua	0 (0.0)
	Niger	0 (0.0)
	Nigeria	0 (0.0)
	North Korea	0 (0.0)
	Norway	0 (0.0)
	Oman	0 (0.0)
	Pakistan	1 (0.0)
	Palau	0 (0.0)
	Palestinian Territories	0 (0.0)
	Panama	0 (0.0)
	Papua New Guinea	0 (0.0)
	Paraguay	0 (0.0)
	Peru	0 (0.0)
	Philippines	0 (0.0)
	Poland	0 (0.0)
	Portugal	2 (0.0)
	Qatar	1 (0.0)
	Romania	0 (0.0)
	Russia	0 (0.0)
	Rwanda	0 (0.0)
	Saint Kitts and Nevis	0 (0.0)
	Saint Lucia	0 (0.0)
	Saint Vincent and the Grenadines	0 (0.0)
	Samoa	0 (0.0)
	San Marino	0 (0.0)
	Sao Tome and Principe	0 (0.0)
	Saudi Arabia	0 (0.0)

label	levels	all
	Senegal	0 (0.0)
	Serbia	0 (0.0)
	Seychelles	0 (0.0)
	Sierra Leone	0 (0.0)
	Singapore	0 (0.0)
	Sint Maarten	0 (0.0)
	Slovakia	0 (0.0)
	Slovenia	0 (0.0)
	Solomon Islands	0 (0.0)
	Somalia	0 (0.0)
	South Africa	1 (0.0)
	South Korea	0 (0.0)
	South Sudan	0 (0.0)
	Spain	19 (0.1)
	Sri Lanka	0 (0.0)
	Sudan	0 (0.0)
	Suriname	0 (0.0)
	Swaziland	0 (0.0)
	Sweden	0 (0.0)
	Switzerland	1 (0.0)
	Syria	0 (0.0)
	Taiwan	0 (0.0)
	Tajikistan	0 (0.0)
	Tanzania	0 (0.0)
	Thailand	1 (0.0)
	Timor-Leste	0 (0.0)
	Togo	0 (0.0)

label	levels	all
	Tonga	0 (0.0)
	Trinidad and Tobago	0 (0.0)
	Tunisia	0 (0.0)
	Turkey	4 (0.0)
	Turkmenistan	0 (0.0)
	Tuvalu	0 (0.0)
	Uganda	0 (0.0)
	Ukraine	0 (0.0)
	United Arab Emirates	0 (0.0)
	United Kingdom	0 (0.0)
	Uruguay	0 (0.0)
	Uzbekistan	0 (0.0)
	Vanuatu	0 (0.0)
	Venezuela	0 (0.0)
	Vietnam	1 (0.0)
	Yemen	0 (0.0)
	Zambia	0 (0.0)
	Zimbabwe	0 (0.0)
	(Missing)	36892 (99.8)
Animal, raw meat, insect bites 14 d prior	Yes	104 (0.3)
	No	8715 (23.6)
	Unknown	12621 (34.1)
	N/A	1479 (4.0)
	(Missing)	14059 (38.0)
Animal / insect	2 Budgerigars and 26 Cats at home	1 (1.0)
	2 dogs	1 (1.0)
	Bee Sting	1 (1.0)

label	levels	all
	Bird (pet)	1 (1.0)
	bird (pigeon)	1 (1.0)
	Birds at home	1 (1.0)
	budgies	1 (1.0)
	cat	2 (2.0)
	Cat	1 (1.0)
	CAT	1 (1.0)
	Cat (pet)	1 (1.0)
	Cat / Dog	1 (1.0)
	Cat, Dog (pets)	1 (1.0)
	cats	2 (2.0)
	Cats	1 (1.0)
	chicken & beef	1 (1.0)
	Chickens	2 (2.0)
	COWS	1 (1.0)
	cows, rabbits, pigs goats	1 (1.0)
	DAILY CONTACT WITH DOMESTIC PET CAT	1 (1.0)
	dog	5 (5.0)
	Dog	12 (11.9)
	DOG	3 (3.0)
	DOG FAMILY PET	1 (1.0)
	Dog, domestic animla living in their home.	1 (1.0)
	Dogs	1 (1.0)
	dogs and cats	1 (1.0)
	Dogs at home	1 (1.0)
	domestic	1 (1.0)
	Domestic pet dog	1 (1.0)

label	levels	all
	DOMESTIC ANIMAL	2 (2.0)
	Domestic animal and faeces/nest	1 (1.0)
	domestic animal living in his home	1 (1.0)
	domestic animals	1 (1.0)
	Domestic animals living in his/her home	1 (1.0)
	Domestic Animals living in his/her home	1 (1.0)
	Domestic animals living in home	1 (1.0)
	Domestic cats	1 (1.0)
	domestic dog	1 (1.0)
	domestic Dog	1 (1.0)
	Domestic Per (dog)	1 (1.0)
	Domestic pest (cats)	1 (1.0)
	Domestic Pet	5 (5.0)
	Domestic Pet (Dog)	6 (5.9)
	Domestic pet cat	1 (1.0)
	Domestic pet Dog	1 (1.0)
	Domestic pet, dog	1 (1.0)
	Domestic pets	1 (1.0)
	Domestic Pets	2 (2.0)
	Domestic pets (dog)	1 (1.0)
	Domestic Pets Cat and Dog	1 (1.0)
	FARM ANIMALS - LAMBS	1 (1.0)
	Farm animals, cattle	1 (1.0)
	Guinea Pig	1 (1.0)
	HORSES	1 (1.0)
	mosquito	1 (1.0)
	pet dog	2 (2.0)

label	levels	all
	Pet dog	1 (1.0)
	Pet dog -ongoing daily contact	1 (1.0)
	Pet dog ongoing daily contact	1 (1.0)
	Prepared raw chicken	1 (1.0)
	raw chicken	1 (1.0)
	Raw Chicken	1 (1.0)
	Rodent	1 (1.0)
	Rodent - hamster,	1 (1.0)
	she has a cat	1 (1.0)
	Sheep & Cattle	1 (1.0)
	Two cats	1 (1.0)
	unknown	1 (1.0)

Symptoms (detail)

Table 2

Stratified: all		all
Total N (%)		36978 (100.0)
Fever	YES	19042 (51.5)
	NO	8418 (22.8)
	Unknown	1596 (4.3)
	(Missing)	7922 (21.4)
Cough	YES	19444 (52.6)
	NO	7837 (21.2)
	Unknown	1761 (4.8)
	(Missing)	7936 (21.5)
Cough (sputum)	YES	5749 (15.5)

Stratified: all**all**

	NO	16929 (45.8)
	Unknown	6182 (16.7)
	(Missing)	8118 (22.0)
Cough (blood)	YES	724 (2.0)
	NO	21434 (58.0)
	Unknown	6671 (18.0)
	(Missing)	8149 (22.0)
Sore throat	YES	1934 (5.2)
	NO	18911 (51.1)
	Unknown	8003 (21.6)
	(Missing)	8130 (22.0)
Runny nose	YES	649 (1.8)
	NO	19710 (53.3)
	Unknown	8488 (23.0)
	(Missing)	8131 (22.0)
Ear pain	YES	107 (0.3)
	NO	20247 (54.8)
	Unknown	8483 (22.9)
	(Missing)	8141 (22.0)
Wheeze	YES	2262 (6.1)
	NO	19762 (53.4)
	Unknown	6831 (18.5)
	(Missing)	8123 (22.0)
Chest pain	YES	3321 (9.0)
	NO	19934 (53.9)
	Unknown	5608 (15.2)
	(Missing)	8115 (21.9)

Stratified: all**all**

Muscle ache	YES	4159 (11.2)
	NO	17072 (46.2)
	Unknown	7611 (20.6)
	(Missing)	8136 (22.0)
Joint pain	YES	1449 (3.9)
	NO	18954 (51.3)
	Unknown	8404 (22.7)
	(Missing)	8171 (22.1)
Fatigue	YES	10094 (27.3)
	NO	12573 (34.0)
	Unknown	6187 (16.7)
	(Missing)	8124 (22.0)
Shortness of breath	YES	18721 (50.6)
	NO	8051 (21.8)
	Unknown	2280 (6.2)
	(Missing)	7926 (21.4)
Lower chest wall indrawing	YES	286 (0.8)
	NO	19307 (52.2)
	Unknown	9232 (25.0)
	(Missing)	8153 (22.0)
Headache	YES	2449 (6.6)
	NO	18660 (50.5)
	Unknown	7729 (20.9)
	(Missing)	8140 (22.0)
Confusion	YES	6850 (18.5)
	NO	17831 (48.2)
	Unknown	4216 (11.4)

Stratified: all**all**

	(Missing)	8081 (21.9)
Seizures	YES	387 (1.0)
	NO	22840 (61.8)
	Unknown	5599 (15.1)
	(Missing)	8152 (22.0)
Abdominal pain	YES	2407 (6.5)
	NO	20757 (56.1)
	Unknown	5699 (15.4)
	(Missing)	8115 (21.9)
Nausea/vomiting	YES	4694 (12.7)
	NO	19426 (52.5)
	Unknown	4760 (12.9)
	(Missing)	8098 (21.9)
Diarrhoea	YES	4694 (12.7)
	NO	19327 (52.3)
	Unknown	4860 (13.1)
	(Missing)	8097 (21.9)
Conjunctivitis	YES	84 (0.2)
	NO	21466 (58.1)
	Unknown	7278 (19.7)
	(Missing)	8150 (22.0)
Skin rash	YES	345 (0.9)
	NO	21660 (58.6)
	Unknown	6831 (18.5)
	(Missing)	8142 (22.0)
Skin ulcers	YES	542 (1.5)
	NO	21456 (58.0)

Stratified: all		all
	Unknown	6834 (18.5)
	(Missing)	8146 (22.0)
Lymphadenopathy	YES	139 (0.4)
	NO	21456 (58.0)
	Unknown	7223 (19.5)
	(Missing)	8160 (22.1)
Bleeding (Haemorrhage)	YES	317 (0.9)
	NO	22525 (60.9)
	Unknown	5973 (16.2)
	(Missing)	8163 (22.1)
If Bleeding (others)	YES	394 (1.1)
	NO	16867 (45.6)
	Unknown	4751 (12.8)
	(Missing)	14966 (40.5)

Comorbidity (detail)

Table 3

Stratified: all		all
Total N (%)		36978 (100.0)
Chronic cardiac disease	YES	8732 (23.6)
	NO	19029 (51.5)
	Unknown	1344 (3.6)
	(Missing)	7873 (21.3)
Chronic pulmonary disease	YES	4959 (13.4)
	NO	22674 (61.3)
	Unknown	1443 (3.9)

Stratified: all**all**

	(Missing)	7902 (21.4)
Asthma	YES	3838 (10.4)
	NO	23658 (64.0)
	Unknown	1543 (4.2)
	(Missing)	7939 (21.5)
Chronic kidney disease	YES	4587 (12.4)
	NO	22888 (61.9)
	Unknown	1574 (4.3)
	(Missing)	7929 (21.4)
Moderate/severe liver disease	YES	494 (1.3)
	NO	26725 (72.3)
	Unknown	1804 (4.9)
	(Missing)	7955 (21.5)
Mild Liver disease	YES	408 (1.1)
	NO	26748 (72.3)
	Unknown	1865 (5.0)
	(Missing)	7957 (21.5)
Chronic neurological disorder	YES	3227 (8.7)
	NO	24071 (65.1)
	Unknown	1728 (4.7)
	(Missing)	7952 (21.5)
Malignancy	YES	2739 (7.4)
	NO	24487 (66.2)
	Unknown	1803 (4.9)
	(Missing)	7949 (21.5)
Chronic hematologic disease	YES	1130 (3.1)
	NO	26040 (70.4)

Stratified: all		all
	Unknown	1830 (4.9)
	(Missing)	7978 (21.6)
AIDS/HIV	YES	122 (0.3)
	NO	26897 (72.7)
	Unknown	1999 (5.4)
	(Missing)	7960 (21.5)
Obesity	YES	2685 (7.3)
	NO	22345 (60.4)
	Unknown	3875 (10.5)
	(Missing)	8073 (21.8)
Diabetes with complications	YES	2012 (5.4)
	NO	25182 (68.1)
	Unknown	1855 (5.0)
	(Missing)	7929 (21.4)
Diabetes without complications	YES	5320 (14.4)
	NO	21979 (59.4)
	Unknown	1765 (4.8)
	(Missing)	7914 (21.4)
Rheumatologic disorder	YES	2780 (7.5)
	NO	24330 (65.8)
	Unknown	1880 (5.1)
	(Missing)	7988 (21.6)
Dementia	YES	4090 (11.1)
	NO	23298 (63.0)
	Unknown	1653 (4.5)
	(Missing)	7937 (21.5)
Malnutrition	YES	642 (1.7)

Stratified: all

all

	NO	25310 (68.4)
	Unknown	2991 (8.1)
	(Missing)	8035 (21.7)
Smoking	YES	1385 (3.7)
	NO	19268 (52.1)
	(Missing)	16325 (44.1)