

Dynamic CO-CIN report to SAGE and NERVTAG

Dynamic content updated: 2020-05-21 11:49:13.

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 21 May 2020, CO-CIN has recruited **42971 patients** with confirmed Coronavirus (Figure 1).

The CO-CIN dataset represents 17.3% (42971/248,293) of cases of confirmed Coronavirus cases in the UK, per the PHE daily reports (last updated 9am on 20 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 944 had travelled abroad recently, and 6576 reported visiting or working in a hospital where COVID-19 cases are being managed.

The median age is 73 (range: 0-106), Male/Female 21972/15769.

The most common symptoms were cough (66%), fever (65%) and shortness of breath (64%) (Figure 3A). 1563/34672 (5%) 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%). 15780/42971 (37%) of patients have reported no co morbidity. 208/2973 (7%) 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: 4-15, n = 27981). 3973/26483 (15%) patients required high-flow oxygen after day 1 of treatment.

Currently 10496 patient(s) have died and 5276 required ICU. 17411 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).

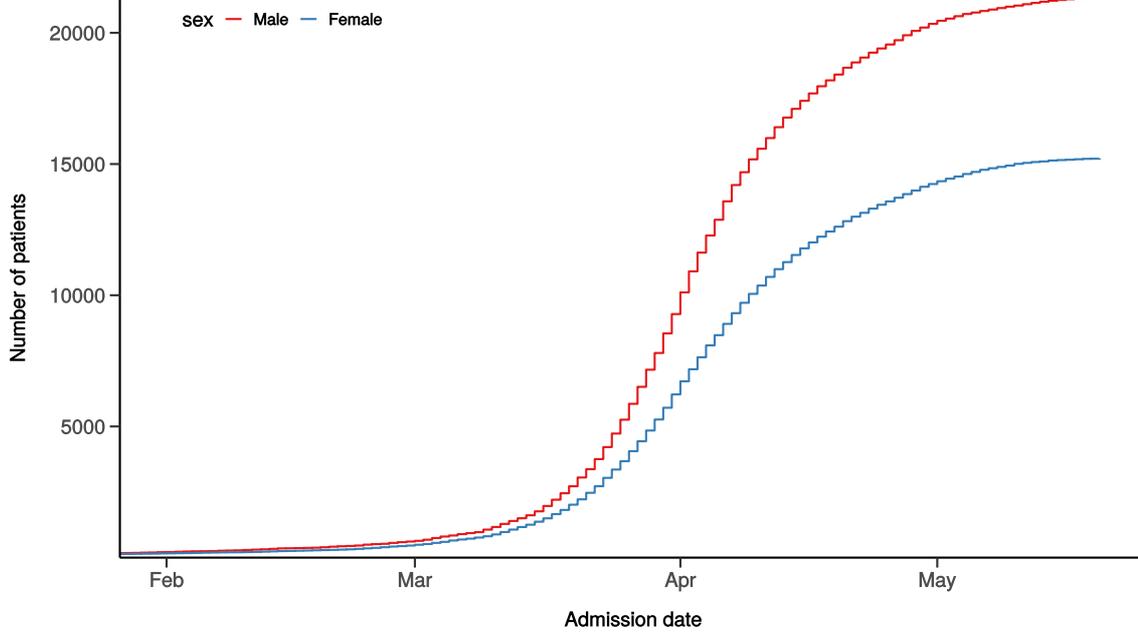
Analytics: Lisa Norman, Riinu Pius, Thomas Drake, Cameron Fairfield, Stephen Knight, Kenneth McLean, Katie Shaw.

Admission

Figure 1

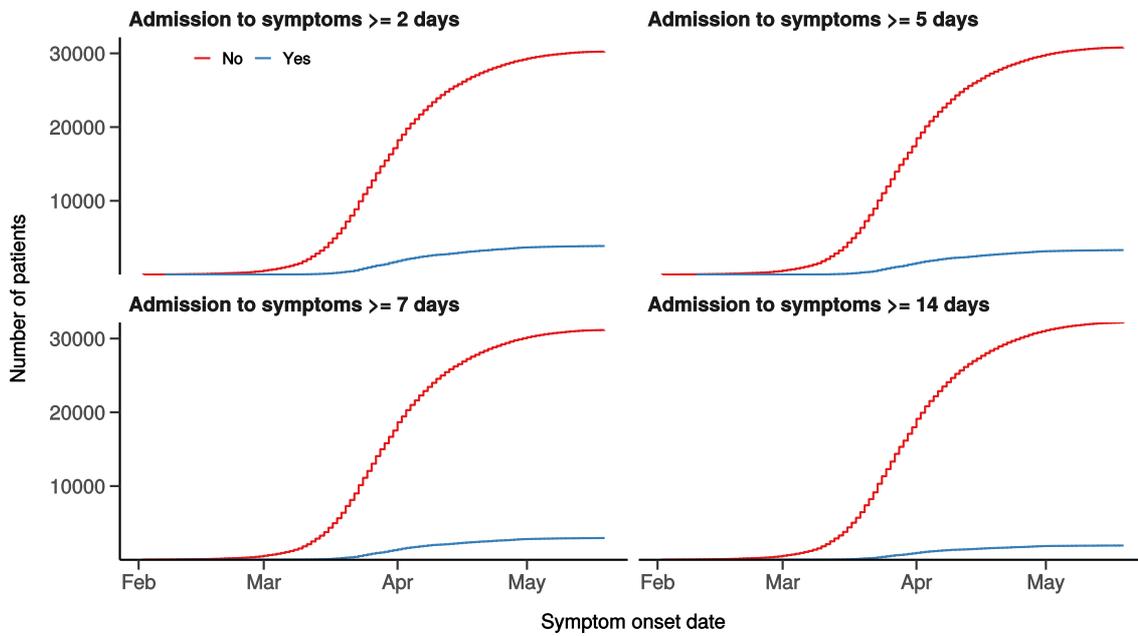
Hospital admission with COVID-19 by sex

Figure 1A



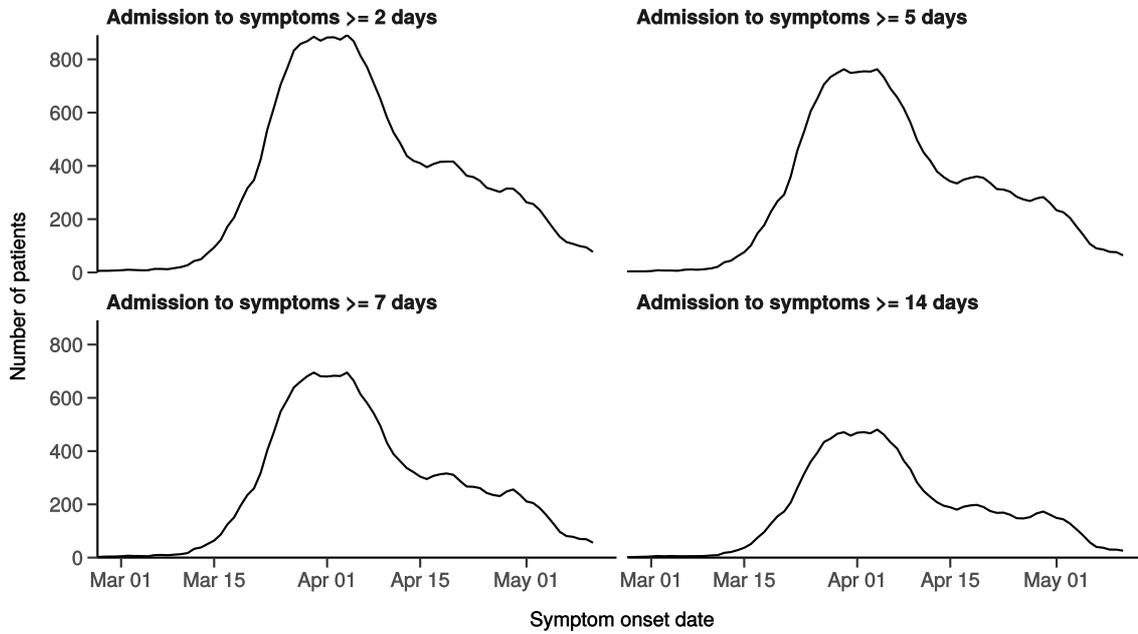
Number with symptom onset occurring after admission to hospital

Figure 1B



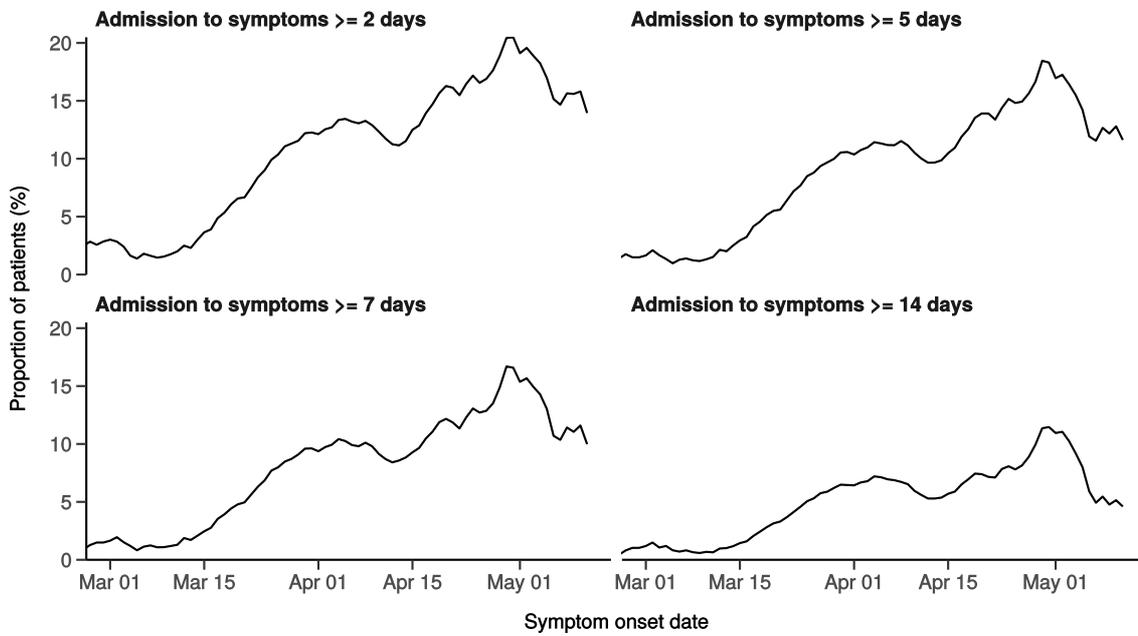
Number with symptom onset occurring after hospital admission

Figure 1C - 7-day rolling count. n = 34130



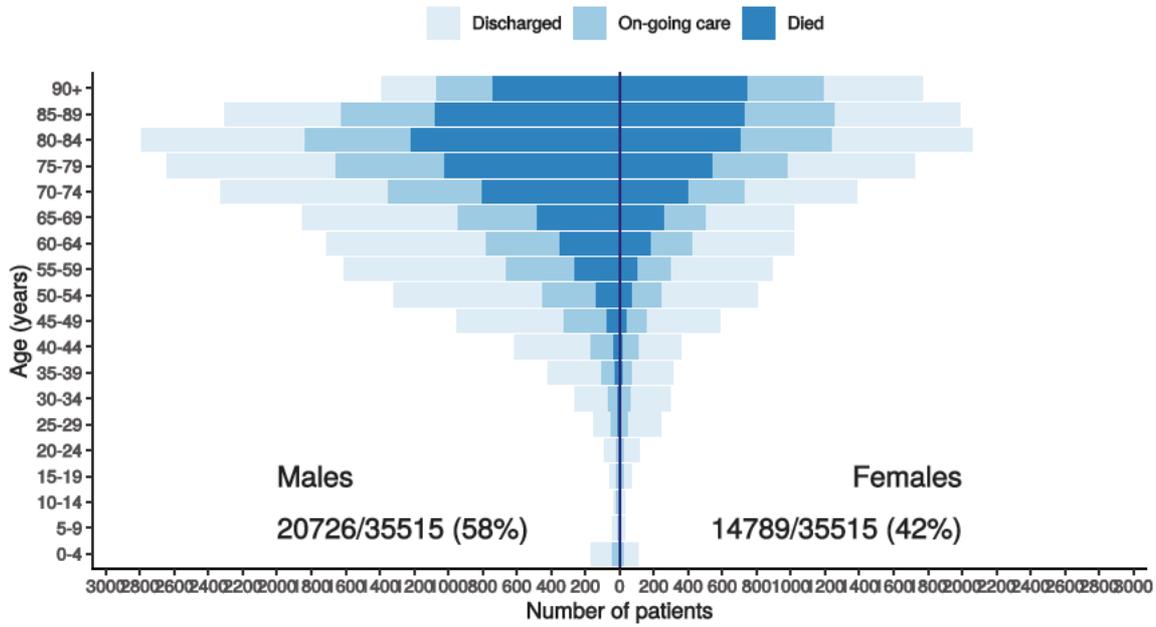
Proportion with symptom onset occurring after hospital admission

Figure 1D - 7-day rolling percentage. n = 34130



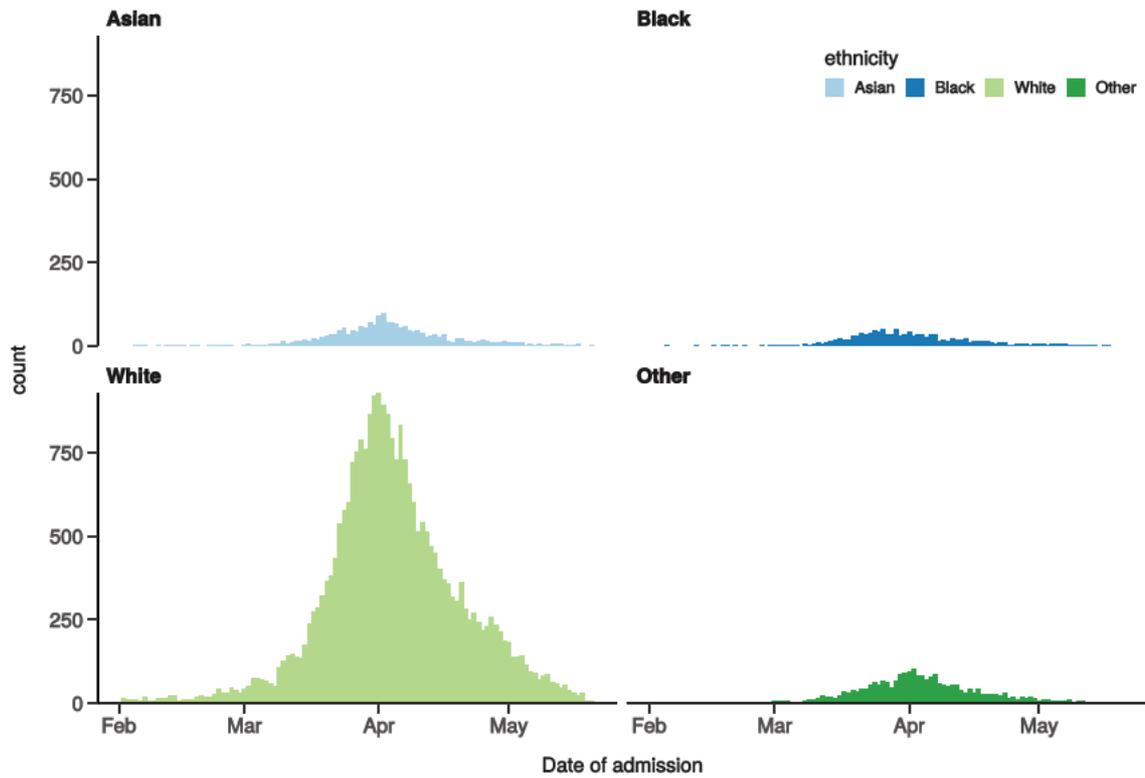
Patients with outcome stratified by age, and sex

Figure 1E



Hospital admission with COVID-19 by ethnicity

Figure 1F

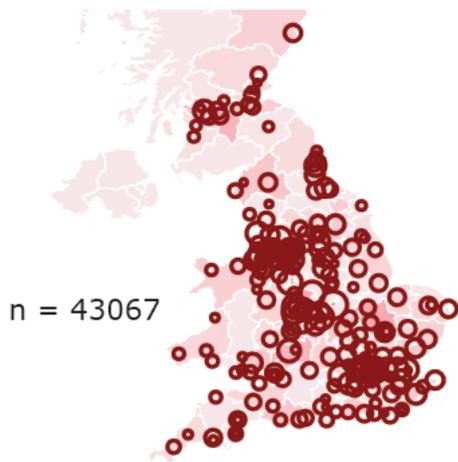


Location by CCG / Healthboard

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 = 34402)

Figure 3A

Comorbidity (% patients, n = 34472)

Figure 3B

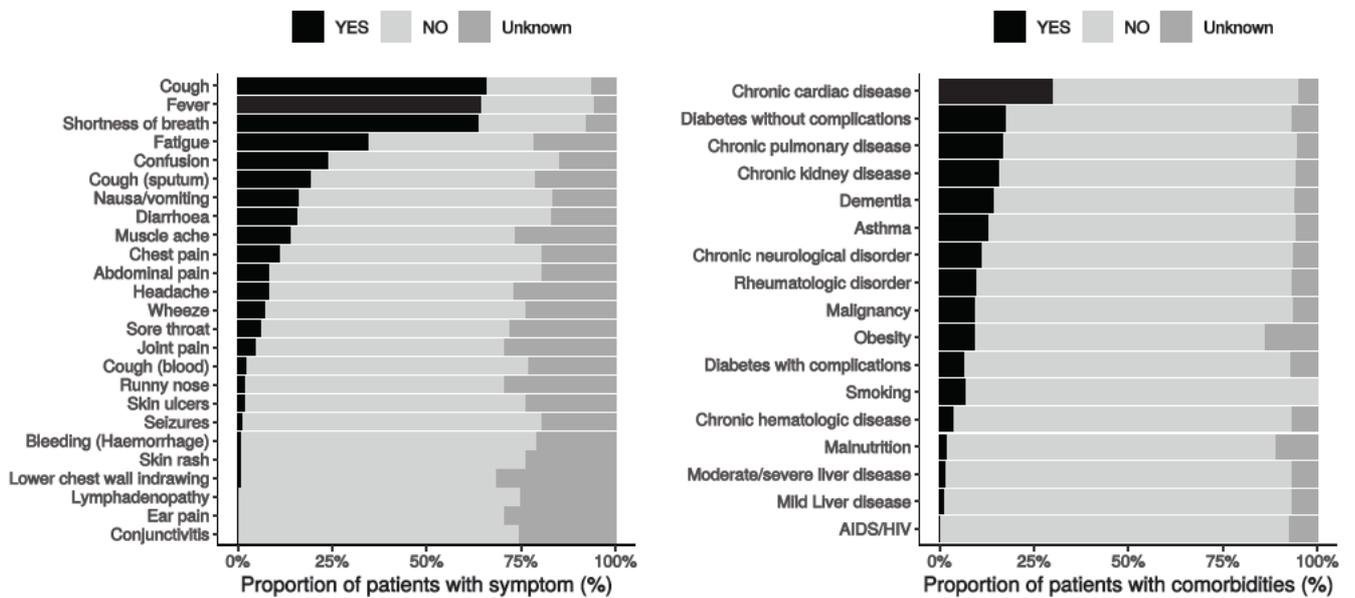
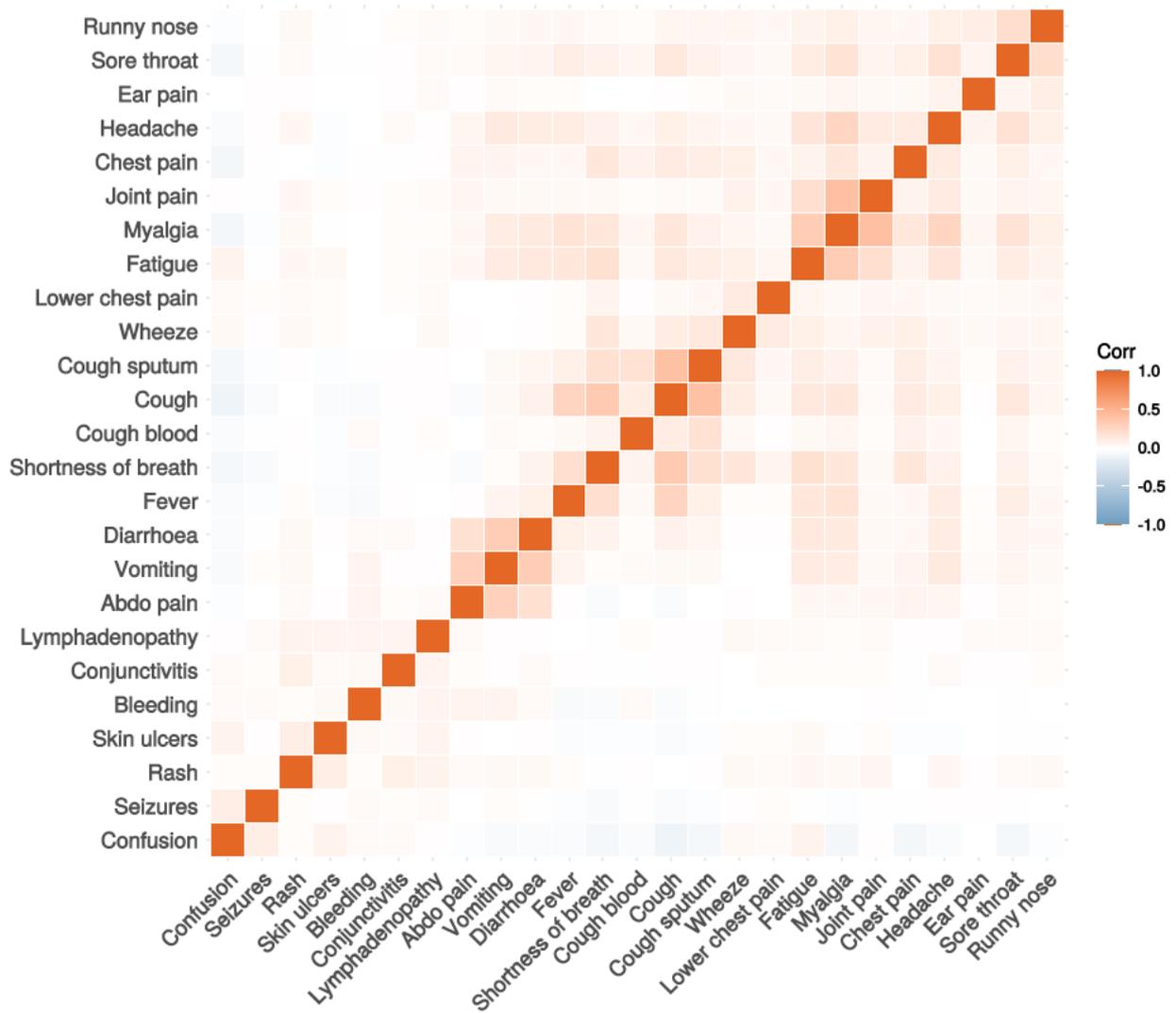


Figure 3C

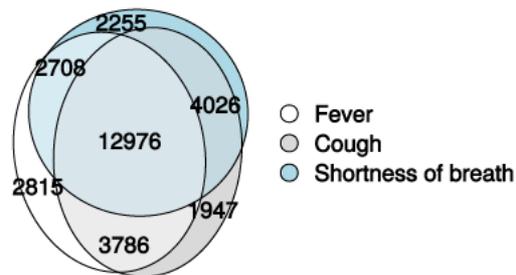
Correlation of symptoms in all pages. Note clusters, top right to bottom left, flu-like, coryzal, abdominal, respiratory, neurocutaneous.



Symptoms (diagnostic criteria)

Figure 4A

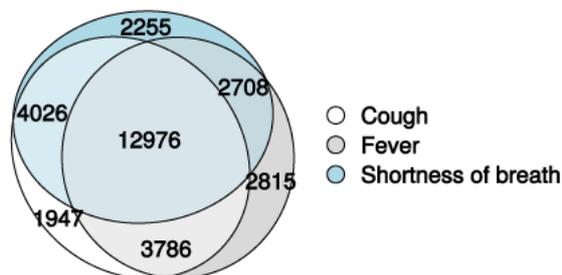
n = 34402



Symptoms (most common)

Figure 4B

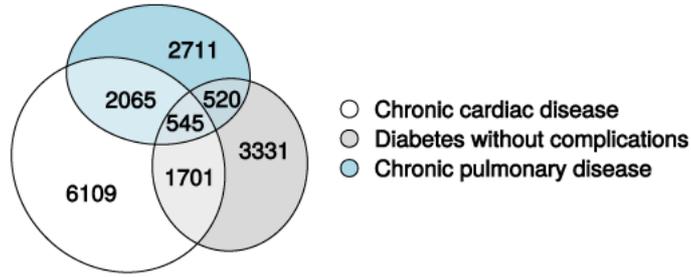
n = 34402



Comorbidity (most common)

Figure 4C

n = 34472



Medication prior to illness

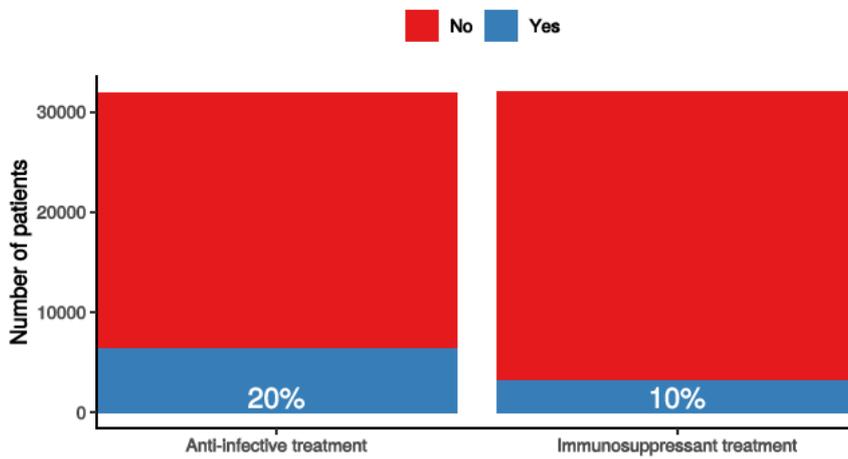
Figure 5

Preadmission treatment

Figure 5

Pre-admission treatment

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



Patient flow

Figure 6A - All patients

N = 35644

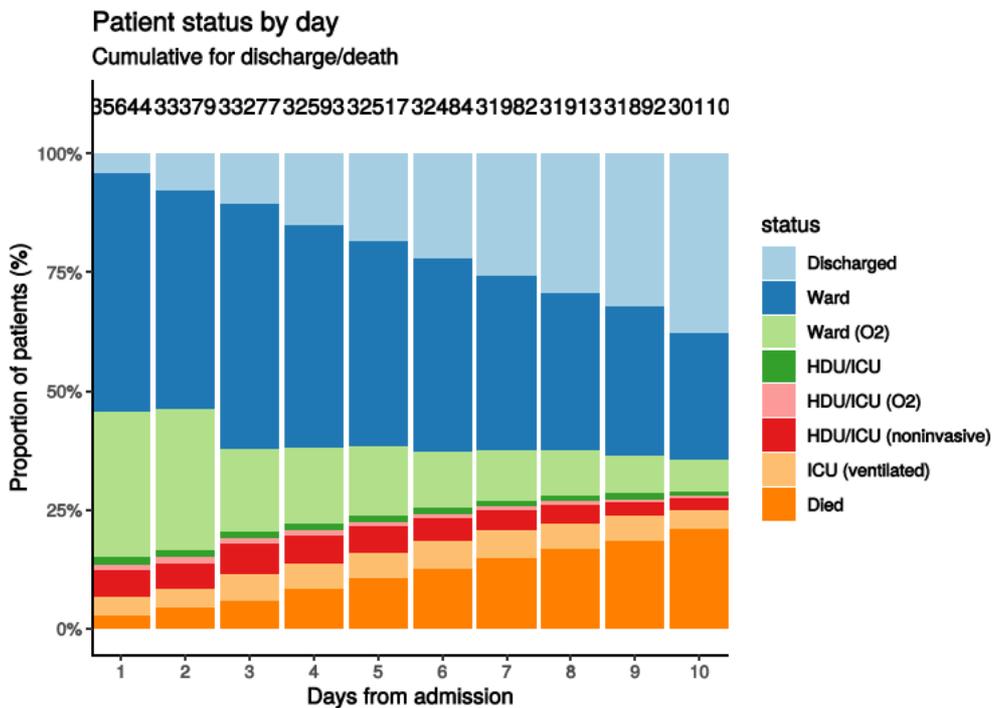
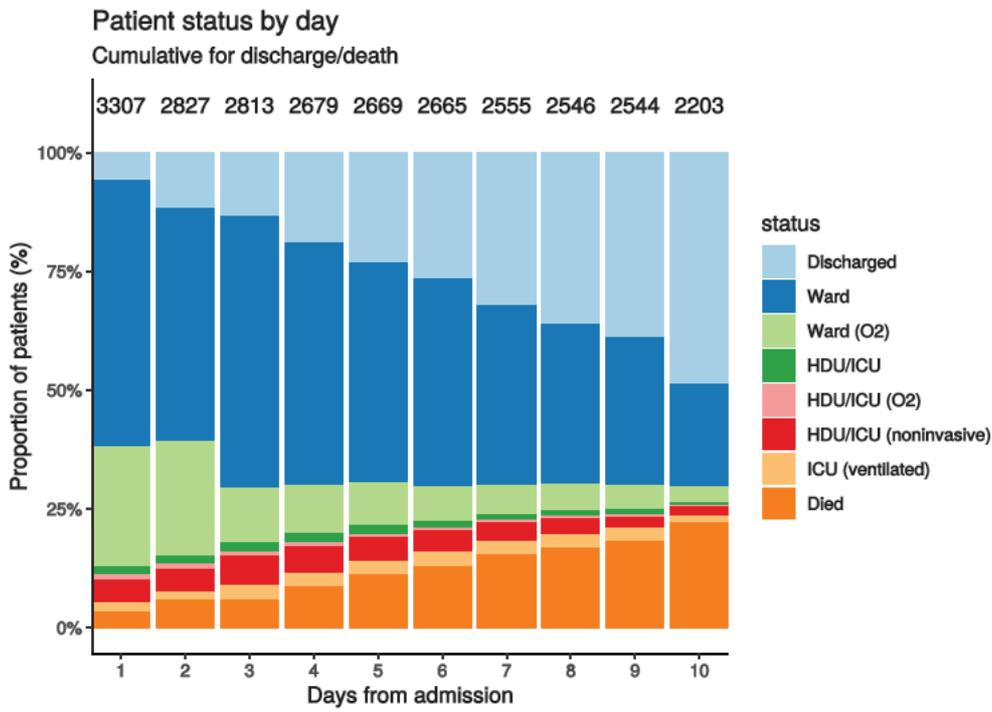


Figure 6B - Patients admitted ≥ 14 days and ≤ 28 days ago

N = 3307



Oxygen requirement

Figure 7A - All patients

N = 33091

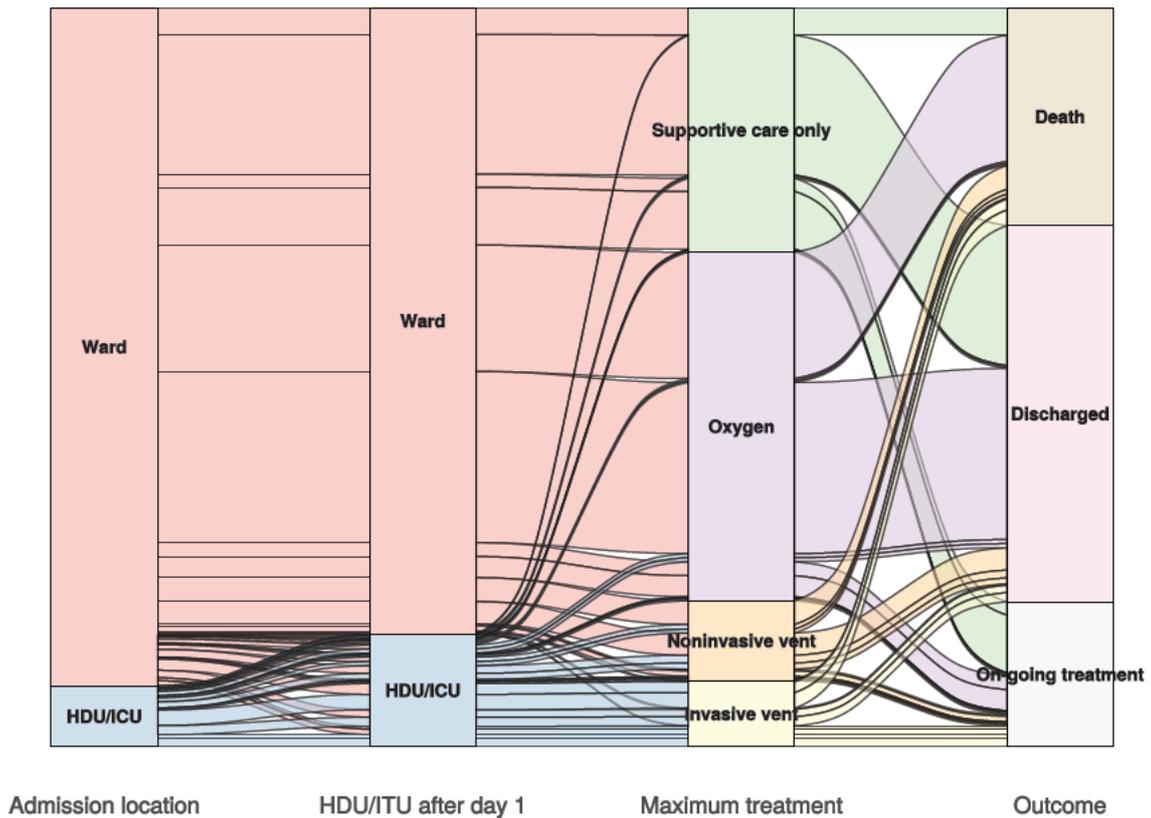
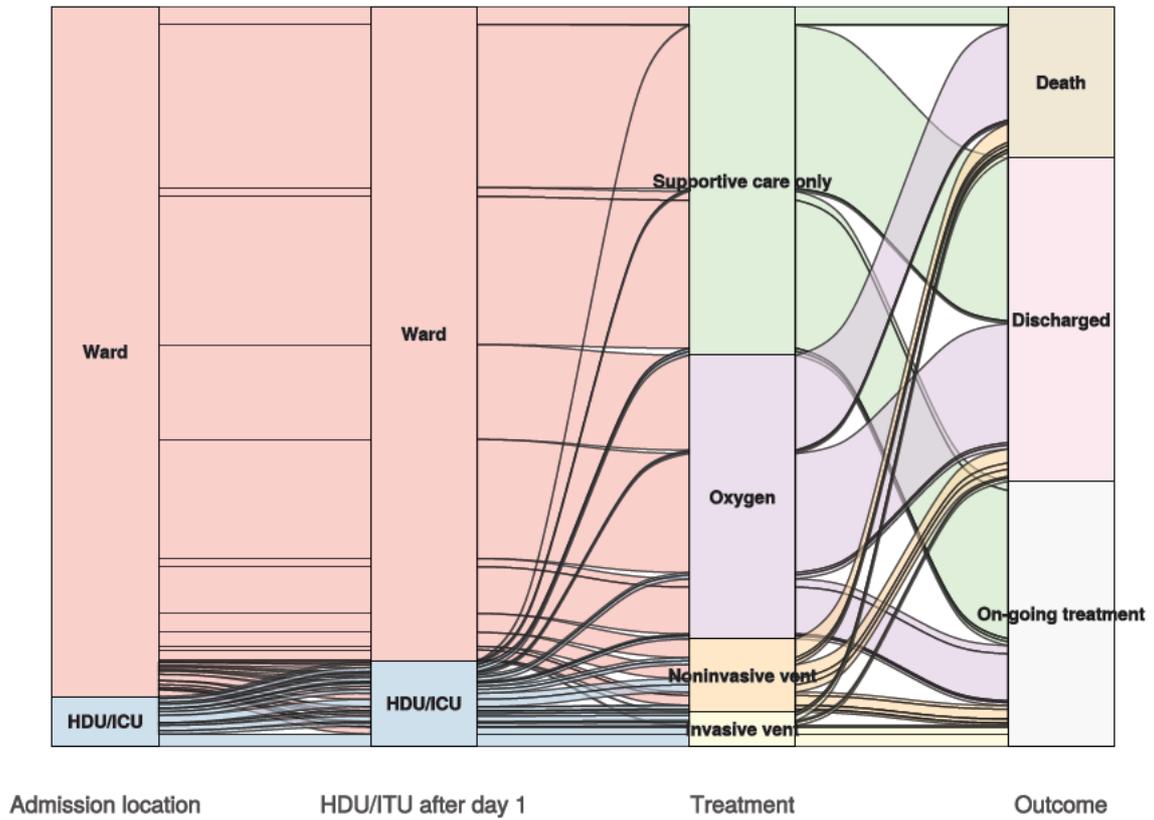


Figure 7B - Patients admitted ≥ 14 days and ≤ 28 days ago

N = 3144

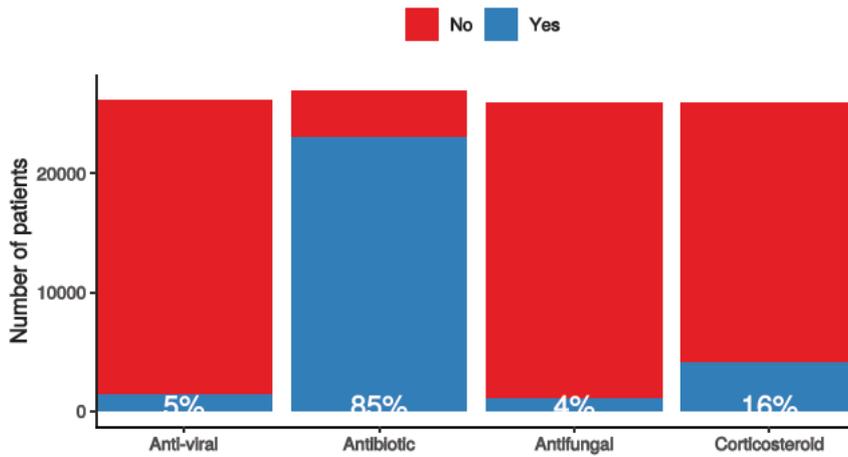


In-hospital medical treatment

Figure 8

In-hospital treatment

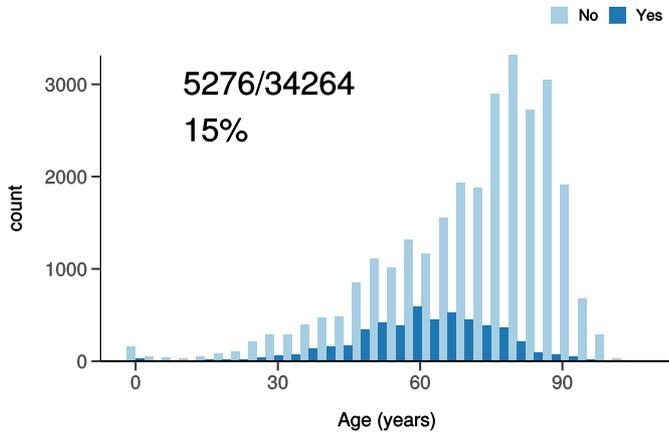
Anti-virals, antibiotics, corticosteroids, and anti-fungals for patients who have cc



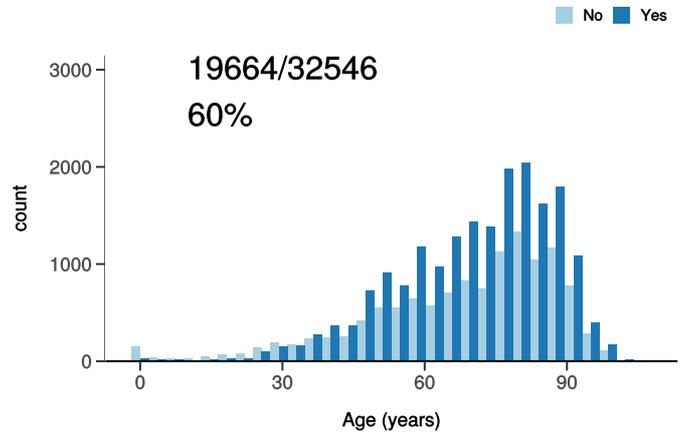
Treatment

Figure 9

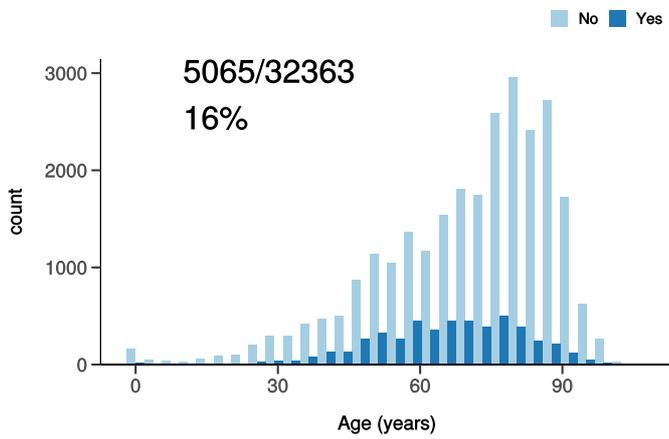
ICU/HDU admission
Figure 10A



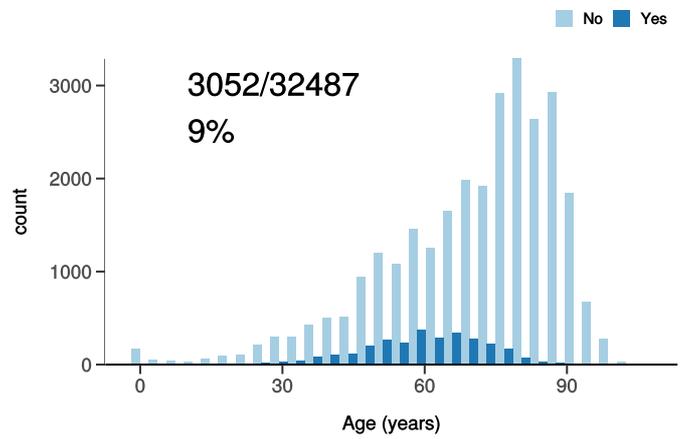
High flow oxygen
Figure 10B



Noninvasive ventilation
Figure 10C



Invasive ventilation
Figure 10D

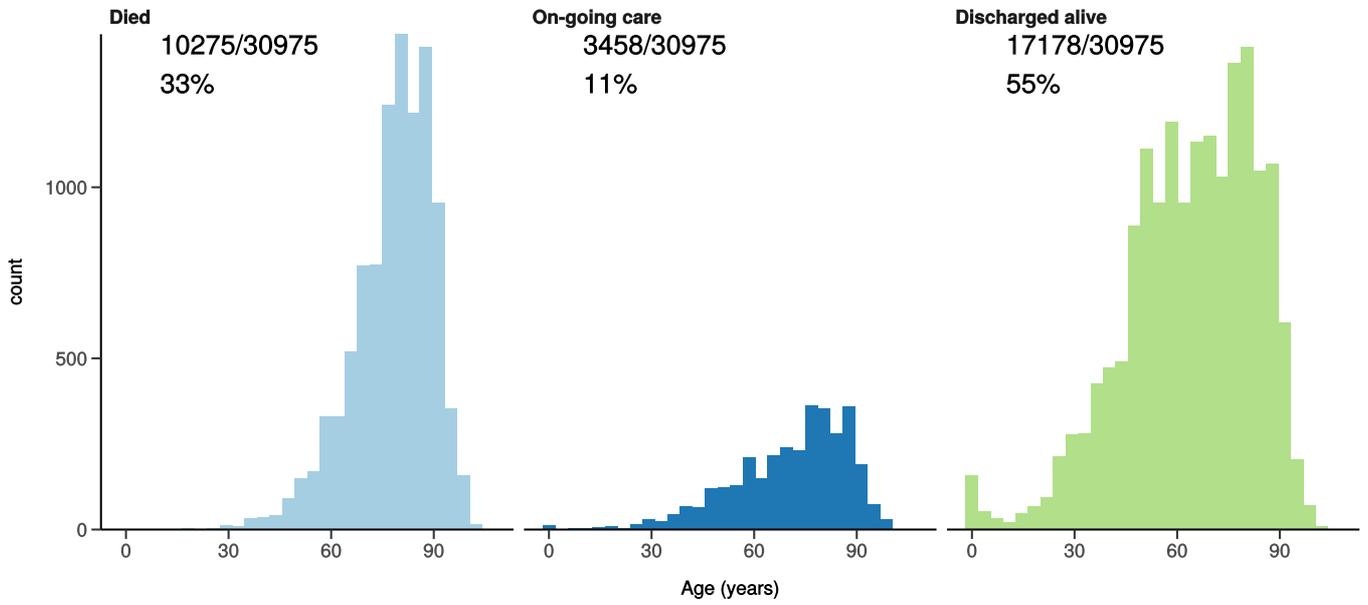


Status in patients admitted ≥ 14 days from today

Figure 10

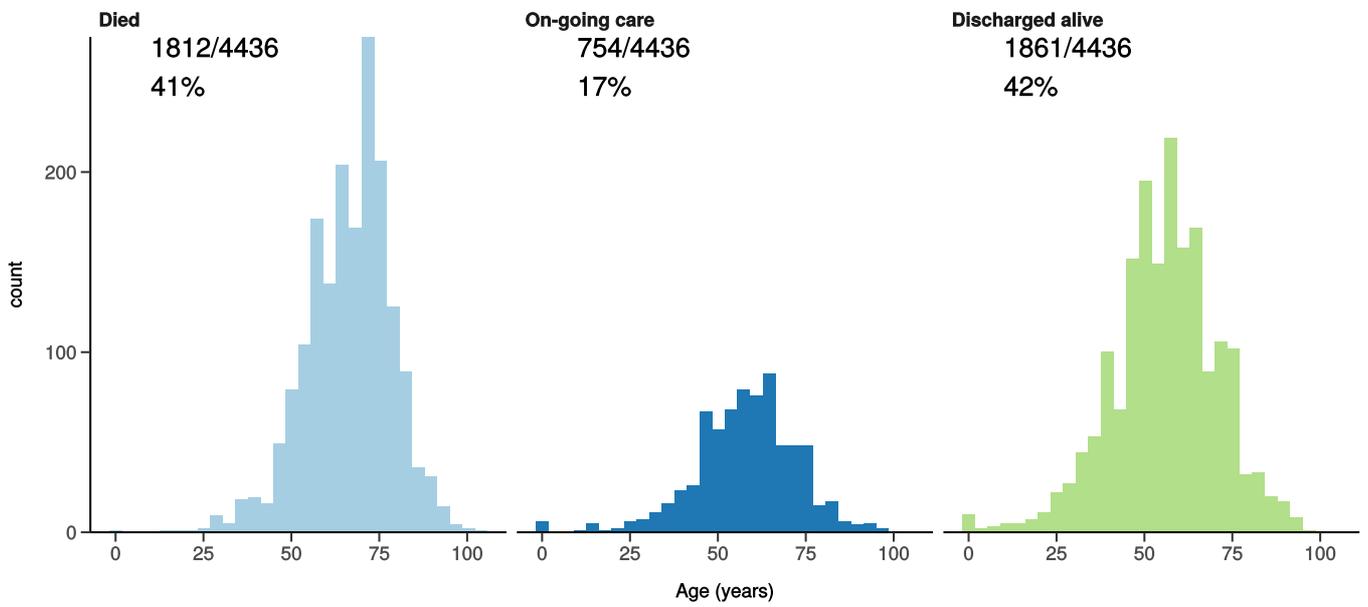
All: status in patients admitted ≥ 14 days ago

Figure 11A



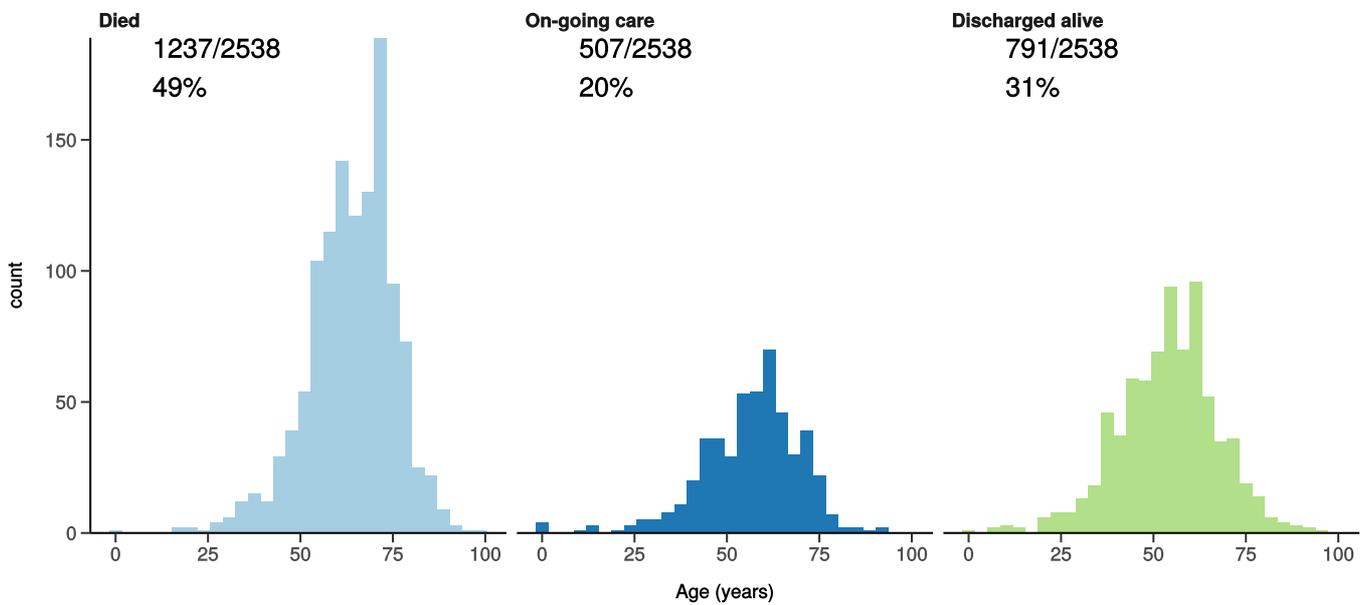
ICU/HDU admissions: status in patients admitted ≥ 14 days ago

Figure 11B



Invasive ventilation: status in patients admitted ≥ 14 days ago

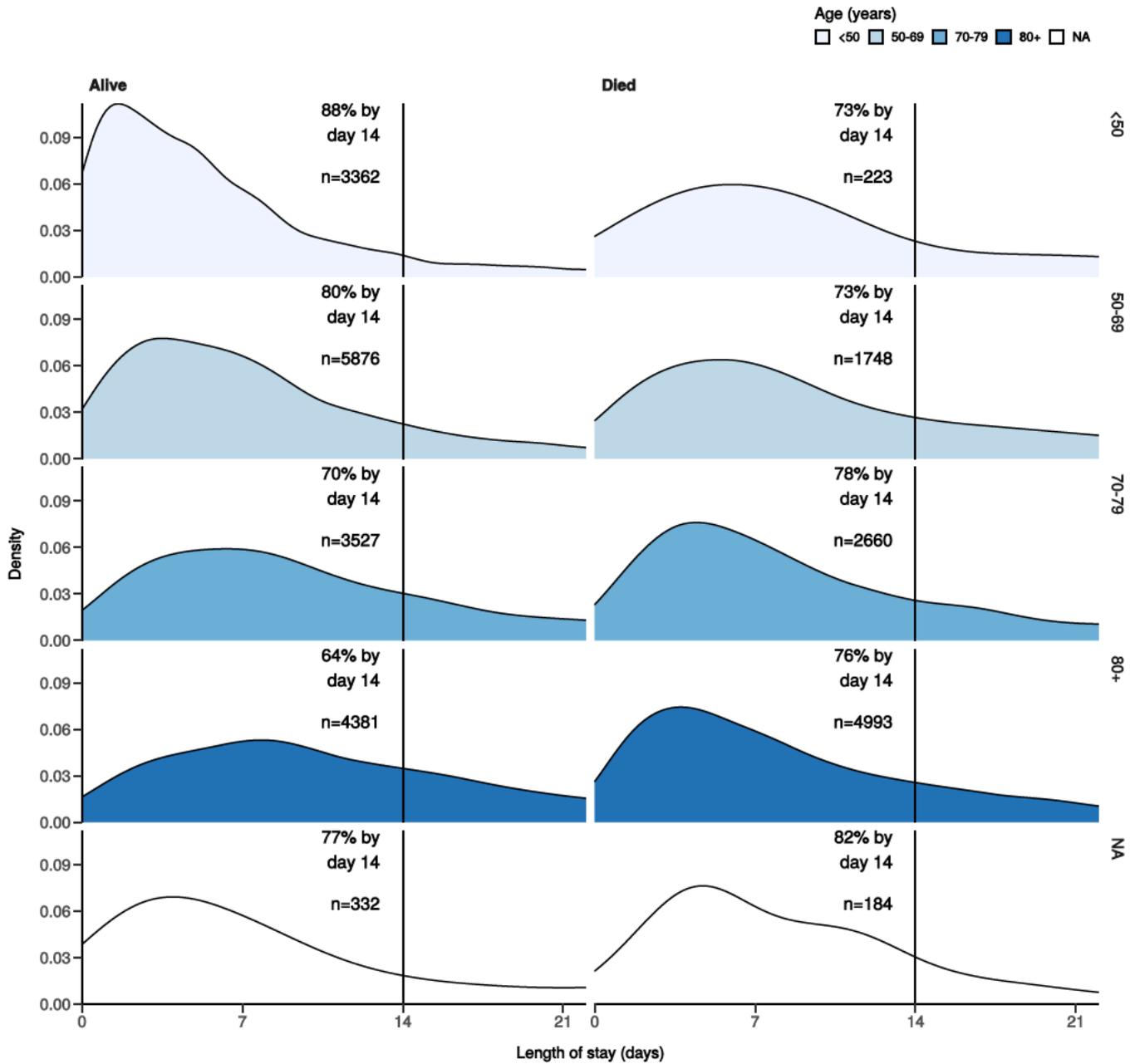
Figure 11c



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	3724 (94.0)	237 (6.0)	•	•
	50-69	6289 (77.5)	1829 (22.5)	4.57 (3.98-5.27, p<0.001)	4.37 (3.73-5.15, p<0.001)
	70-79	3789 (57.8)	2767 (42.2)	11.47 (10.00-13.23, p<0.001)	9.73 (8.29-11.50, p<0.001)
	80+	4704 (47.4)	5221 (52.6)	17.44 (15.24-20.05, p<0.001)	14.65 (12.47-17.30, p<0.001)
Sex at Birth	Male	10629 (62.5)	6366 (37.5)	•	•
	Female	8218 (68.1)	3853 (31.9)	0.78 (0.75-0.82, p<0.001)	0.70 (0.66-0.75, p<0.001)

Dependent: death		No	Yes	OR (univariable)	OR (multivariable)
	Not specified	0 (NaN)	0 (NaN)	•	•
Chronic cardiac disease	NO	13041 (70.8)	5368 (29.2)	•	•
	YES	4495 (52.8)	4017 (47.2)	2.17 (2.06-2.29, p<0.001)	1.23 (1.15-1.32, p<0.001)
Chronic pulmonary disease	NO	14952 (67.7)	7129 (32.3)	•	•
	YES	2556 (53.7)	2200 (46.3)	1.81 (1.69-1.92, p<0.001)	1.28 (1.19-1.38, p<0.001)
Chronic neurological disorder	NO	15559 (66.5)	7827 (33.5)	•	•
	YES	1768 (56.0)	1388 (44.0)	1.56 (1.45-1.68, p<0.001)	1.23 (1.12-1.34, p<0.001)
Chronic hematologic disease	NO	16661 (65.8)	8643 (34.2)	•	•
	YES	622 (54.4)	521 (45.6)	1.61 (1.43-1.82, p<0.001)	1.27 (1.10-1.47, p=0.001)
Chronic kidney disease	NO	15107 (68.2)	7046 (31.8)	•	•
	YES	2298 (50.7)	2231 (49.3)	2.08 (1.95-2.22, p<0.001)	1.30 (1.21-1.41, p<0.001)
Dementia	NO	15438 (68.6)	7052 (31.4)	•	•
	YES	1909 (46.4)	2206 (53.6)	2.53 (2.36-2.71, p<0.001)	1.40 (1.29-1.52, p<0.001)
Obesity	NO	14144 (65.4)	7473 (34.6)	•	•
	YES	1843 (68.7)	839 (31.3)	0.86 (0.79-0.94, p=0.001)	1.39 (1.26-1.54, p<0.001)
Malignancy	NO	15900 (66.9)	7883 (33.1)	•	•
	YES	1402 (52.0)	1292 (48.0)	1.86 (1.72-2.01, p<0.001)	1.36 (1.23-1.50, p<0.001)

Number in dataframe = 35727, Number in model = 22784, Missing = 12943, AIC = 25516.6, C-statistic = 0.731, H&L = Chi-sq(8) 59.16 (p<0.001)

Figure 12 - Adjusted odds ratio plot

Death

Age on admission (years)	<50	-
	50-69	4.37 (3.73-5.15, p<0.001)
	70-79	9.73 (8.29-11.50, p<0.001)
	80+	14.65 (12.47-17.30, p<0.001)
Sex at Birth	Male	-
	Female	0.70 (0.66-0.75, p<0.001)
	Not specified	-
Chronic cardiac disease	YES	1.23 (1.15-1.32, p<0.001)
Chronic pulmonary disease	YES	1.28 (1.19-1.38, p<0.001)
Chronic neurological disorder	YES	1.23 (1.12-1.34, p<0.001)
Chronic hematologic disease	YES	1.27 (1.10-1.47, p=0.001)
Chronic kidney disease	YES	1.30 (1.21-1.41, p<0.001)
Dementia	YES	1.40 (1.29-1.52, p<0.001)
Obesity	YES	1.39 (1.26-1.54, p<0.001)
Malignancy	YES	1.36 (1.23-1.50, p<0.001)

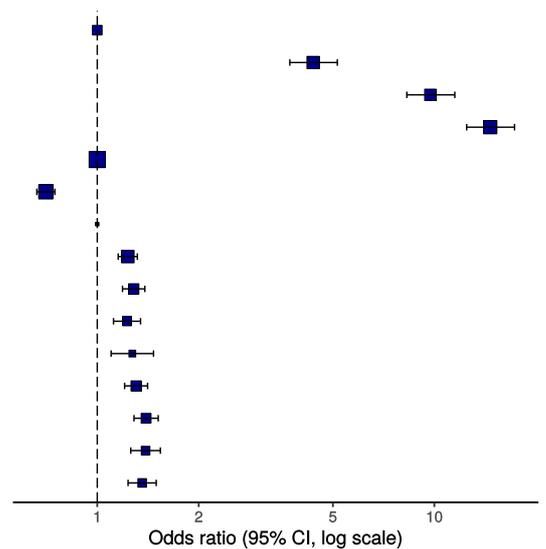
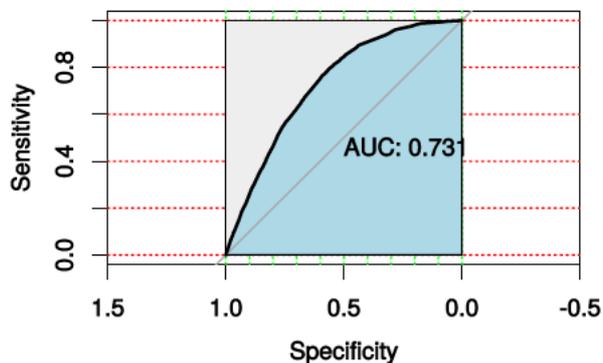


Figure 13 - ROC

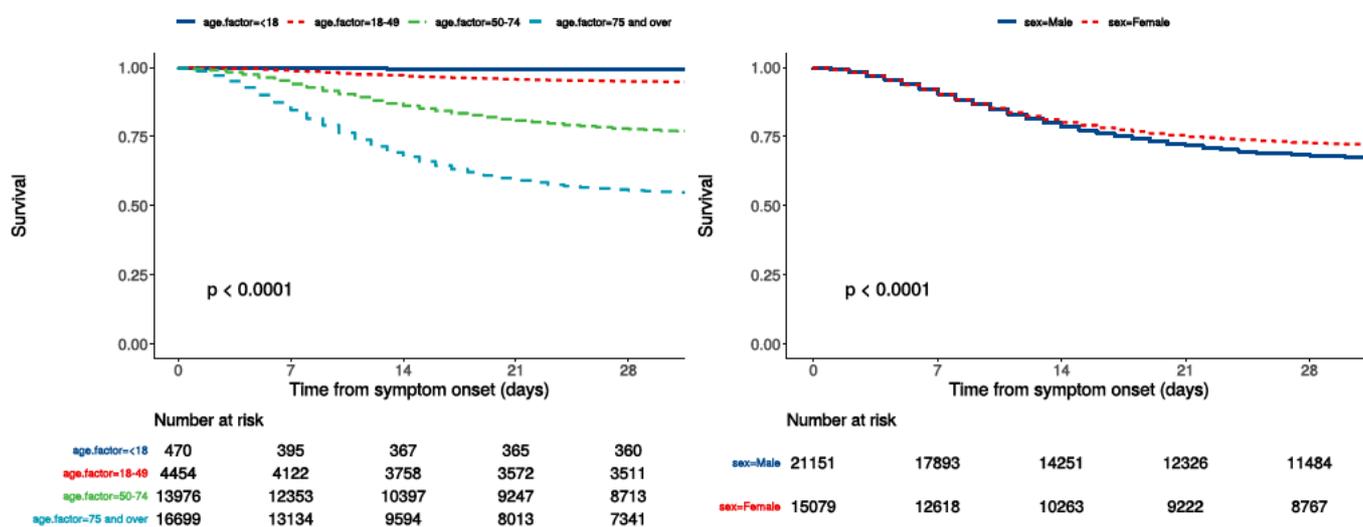


Survival models

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	4924 (13.8)	•	•
	50-69	10249 (28.8)	4.03 (3.52-4.62, p<0.001)	4.11 (3.45-4.88, p<0.001)
	70-79	8096 (22.7)	8.87 (7.77-10.13, p<0.001)	8.41 (7.08-9.98, p<0.001)
	80+	12330 (34.6)	12.45 (10.92-14.18, p<0.001)	11.46 (9.66-13.59, p<0.001)
Sex at Birth	Male	21151 (58.4)	•	•
	Female	15079 (41.6)	0.84 (0.81-0.88, p<0.001)	0.81 (0.77-0.86, p<0.001)
qSOFA score on admission	0	11195 (40.2)	•	•
	1	13079 (47.0)	1.54 (1.46-1.62, p<0.001)	1.64 (1.55-1.74, p<0.001)

Dependent: Surv(time, status)		all	HR (univariable)	HR (multivariable)
	2	3215 (11.5)	3.04 (2.86-3.24, p<0.001)	2.84 (2.65-3.06, p<0.001)
	3	360 (1.3)	4.74 (4.14-5.44, p<0.001)	3.94 (3.37-4.60, p<0.001)
Symptomatic at presentation	No symptoms	896 (2.6)	•	•
	Symptoms	33433 (97.4)	1.08 (0.94-1.23, p=0.276)	•
Chronic cardiac disease	NO	22216 (68.3)	•	•
	YES	10305 (31.7)	1.88 (1.80-1.96, p<0.001)	1.19 (1.13-1.25, p<0.001)
Chronic kidney disease	NO	26787 (83.1)	•	•
	YES	5434 (16.9)	1.81 (1.72-1.90, p<0.001)	1.24 (1.17-1.32, p<0.001)
Moderate/severe liver disease	NO	31317 (98.2)	•	•
	YES	587 (1.8)	1.38 (1.20-1.58, p<0.001)	1.55 (1.31-1.84, p<0.001)
Chronic neurological disorder	NO	28171 (88.0)	•	•
	YES	3845 (12.0)	1.46 (1.38-1.55, p<0.001)	•
Malignancy	NO	28723 (90.0)	•	•
	YES	3209 (10.0)	1.62 (1.53-1.72, p<0.001)	1.27 (1.19-1.37, p<0.001)
Chronic hematologic disease	NO	30536 (95.8)	•	•
	YES	1343 (4.2)	1.47 (1.34-1.60, p<0.001)	•
Obesity	NO	26075 (89.0)	•	•
	YES	3231 (11.0)	0.86 (0.80-0.92, p<0.001)	1.17 (1.08-1.27, p<0.001)
Diabetes without complications	NO	25804 (81.0)	•	•
	YES	6037 (19.0)	1.24 (1.18-1.30, p<0.001)	•
Rheumatologic disorder	NO	28444 (89.4)	•	•
	YES	3355 (10.6)	1.23 (1.15-1.31, p<0.001)	•
Dementia	NO	27140 (84.5)	•	•
	YES	4979 (15.5)	2.18 (2.08-2.29, p<0.001)	1.20 (1.13-1.28, p<0.001)
Malnutrition	NO	29578 (97.5)	•	•
	YES	768 (2.5)	1.54 (1.37-1.73, p<0.001)	•
smoking_mhyn_2levels	NO	21878 (93.0)	•	•
	YES	1645 (7.0)	0.89 (0.80-0.99, p=0.025)	•

Number in dataframe = 36465, Number in model = 22553, Missing = 13912, Number of events = 6542, Concordance = 0.726 (SE = 0.003), R-squared = 0.167 (Max possible = 0.997), Likelihood ratio test = 4133.385 (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	4.11 (3.45-4.88, p<0.001)
	70-79	8.41 (7.08-9.98, p<0.001)
	80+	11.46 (9.66-13.59, p<0.001)
Sex at Birth	Female	0.81 (0.77-0.86, p<0.001)
qSOFA score on admission	0	-
	1	1.64 (1.55-1.74, p<0.001)
	2	2.84 (2.65-3.06, p<0.001)
	3	3.94 (3.37-4.60, p<0.001)
Chronic cardiac disease	YES	1.19 (1.13-1.25, p<0.001)
Chronic kidney disease	YES	1.24 (1.17-1.32, p<0.001)
Moderate/severe liver disease	YES	1.55 (1.31-1.84, p<0.001)
Malignancy	YES	1.27 (1.19-1.37, p<0.001)
Obesity	YES	1.17 (1.08-1.27, p<0.001)
Dementia	YES	1.20 (1.13-1.28, p<0.001)

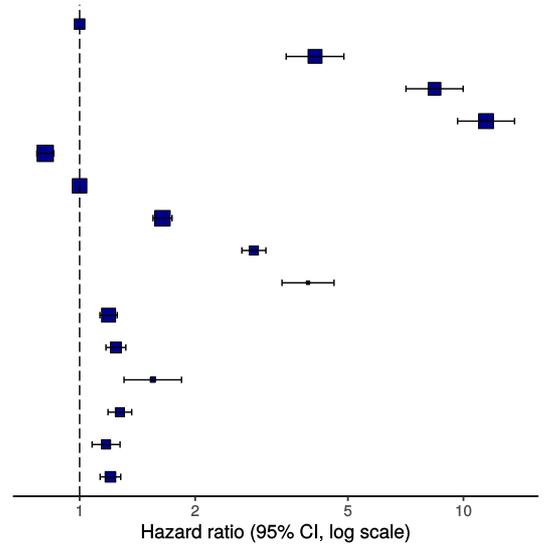
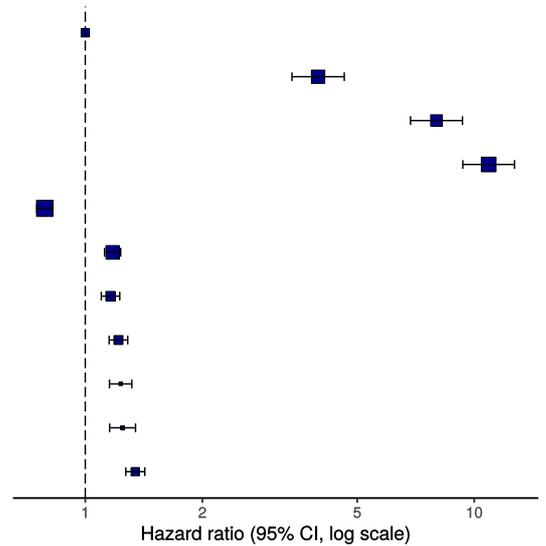


Figure 15b - Multivariable Cox proportional hazards model (age, sex, comorbidities only)

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

Age on admission (years)	<50	-
	50-69	3.97 (3.40-4.63, p<0.001)
	70-79	8.00 (6.86-9.33, p<0.001)
	80+	10.89 (9.34-12.69, p<0.001)
Sex at Birth	Female	0.79 (0.75-0.82, p<0.001)
Chronic cardiac disease	YES	1.18 (1.12-1.23, p<0.001)
Chronic pulmonary disease	YES	1.16 (1.10-1.23, p<0.001)
Chronic kidney disease	YES	1.22 (1.15-1.29, p<0.001)
Malignancy	YES	1.23 (1.15-1.32, p<0.001)
Obesity	YES	1.25 (1.15-1.35, p<0.001)
Dementia	YES	1.34 (1.27-1.42, p<0.001)



ROC = 0.7265929

Figure 16 - Predictions calibration plot

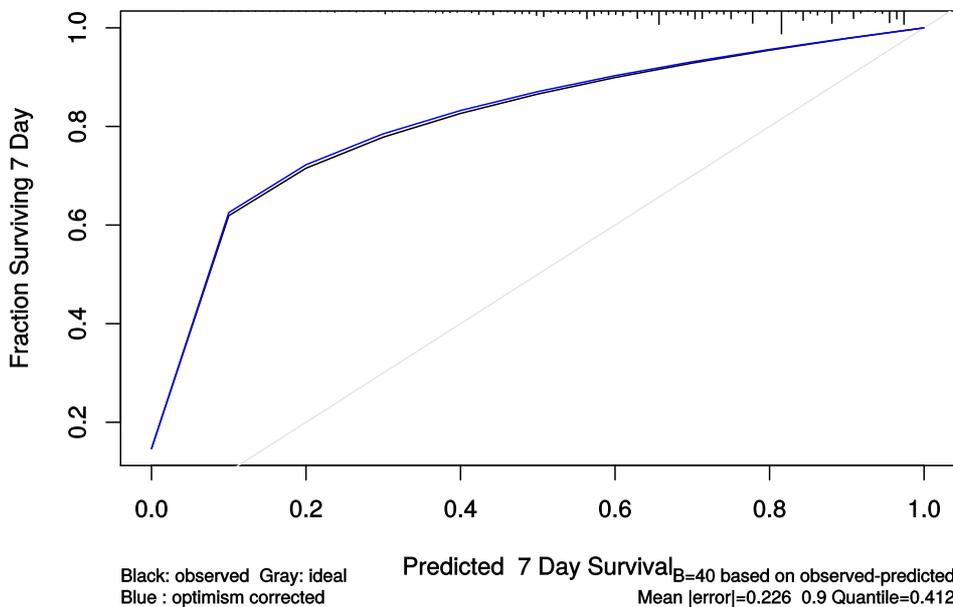


Figure 17 - Prognostic model predictions

Again, for demonstration of methods.

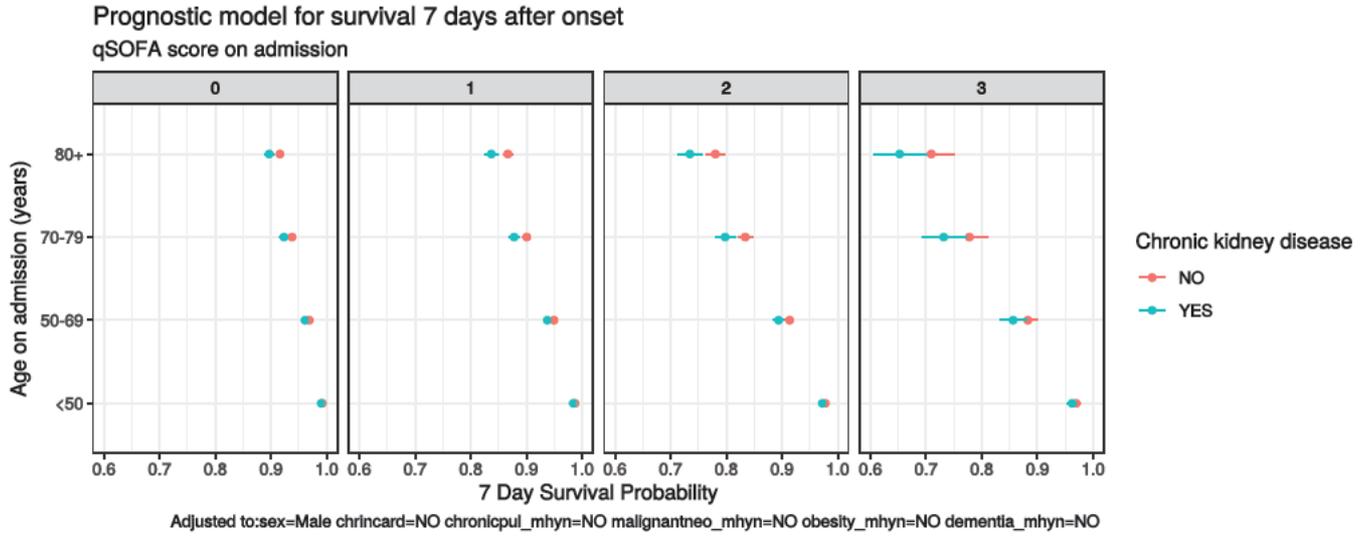


Figure 18 - Death by severity (NEWS) on admission

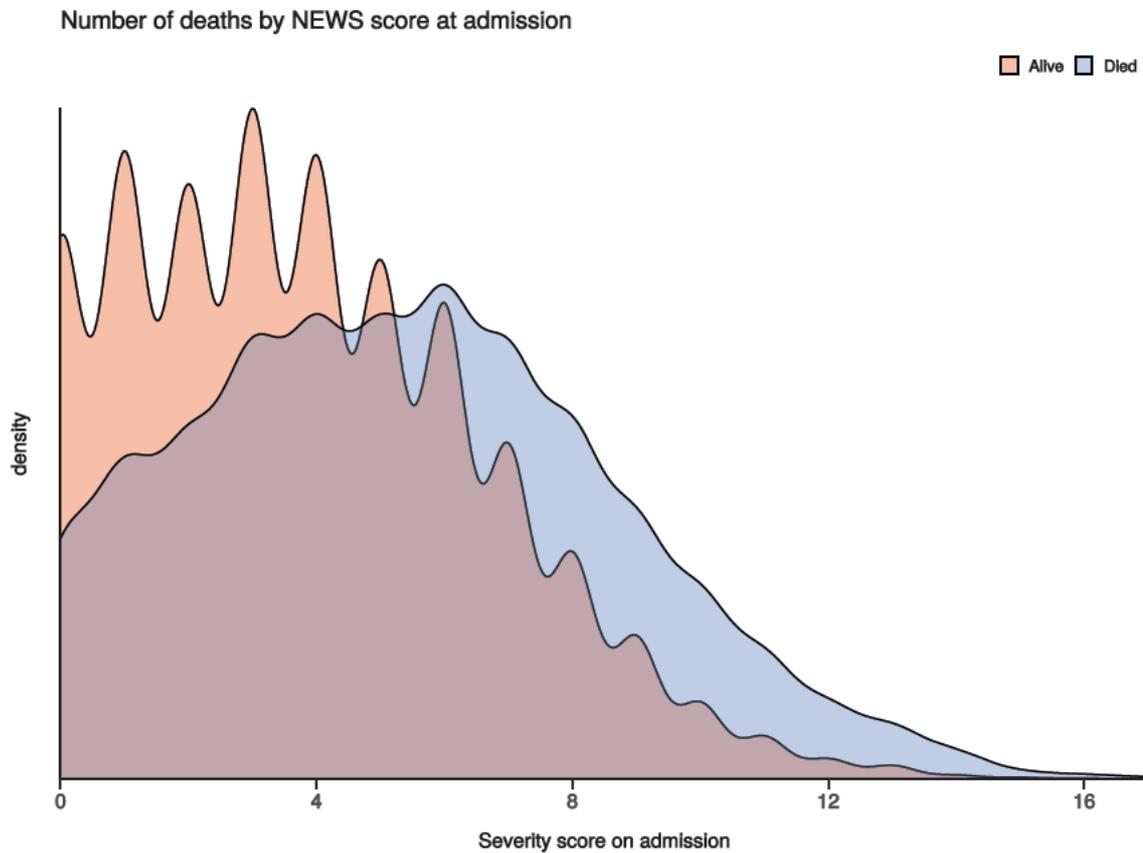


Figure 19 - Death by severity (NEWS) on admission stratified by age

Number of deaths by NEWS score at admission
Stratified by age

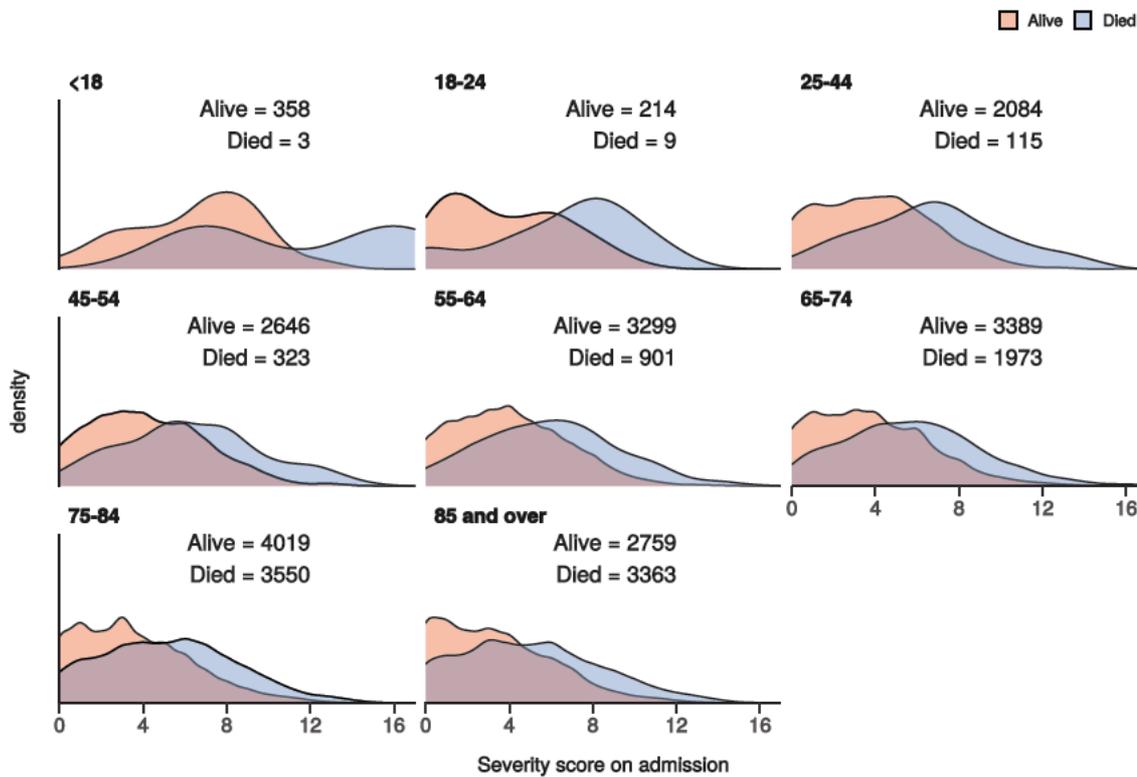
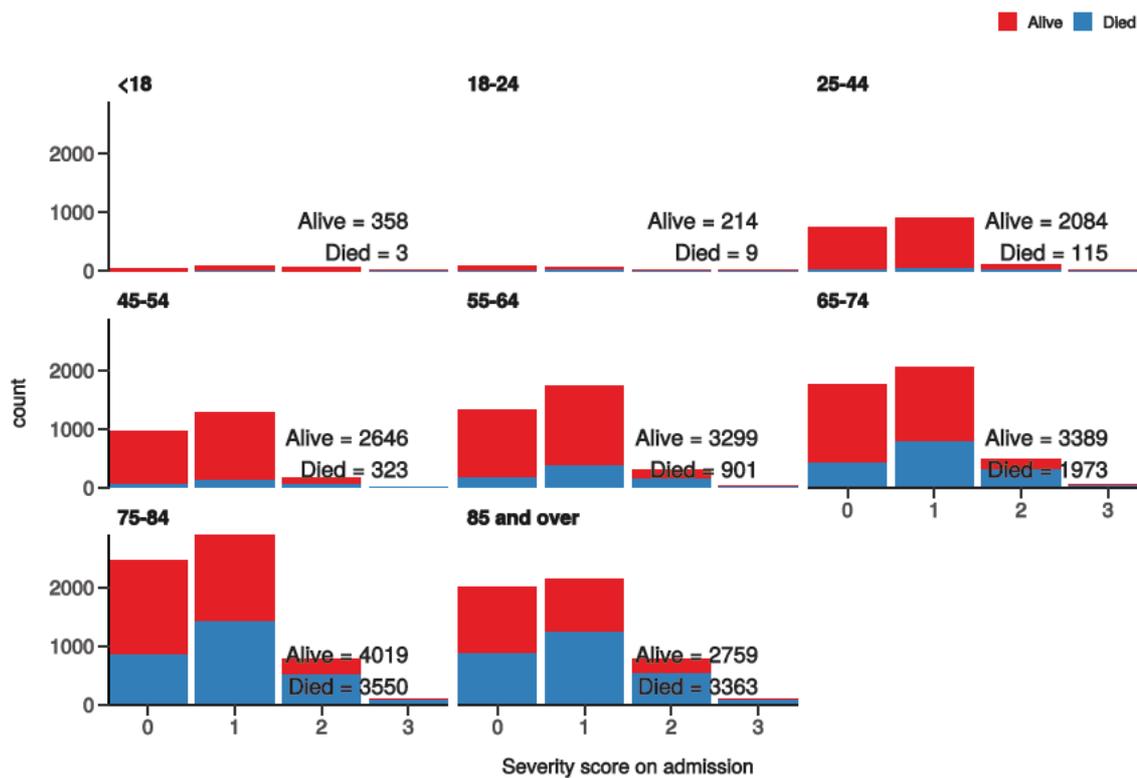


Figure 20 - Death by severity (qSOFA) on admission stratified by age

Number of deaths by qSOFA score at admission
Stratified by age



Healthcare workers

Healthcare worker		NO	YES	p
Total N (%)		31424 (94.9)	1699 (5.1)	
NEWS score on admission	Median (IQR)	4.0 (4.0)	4.0 (4.0)	0.631

Healthcare worker		NO	YES	p
Death	No	15561 (62.3)	1253 (93.1)	<0.001
	Yes	9406 (37.7)	93 (6.9)	

Admission (detail)

Table 1

label	levels	all	
Total N (%)		42971 (100.0)	
Age on admission (years)	Mean (SD)	69.3 (18.1)	
Sex at Birth	Male	21972 (51.1)	
	Female	15769 (36.7)	
	Not specified	59 (0.1)	
	(Missing)	5171 (12.0)	
Healthcare worker	YES	1699 (4.0)	
	NO	31424 (73.1)	
	N/A	3739 (8.7)	
	(Missing)	6109 (14.2)	
Microbiology lab worker	YES	82 (0.2)	
	NO	22182 (51.6)	
	N/A	2616 (6.1)	
	(Missing)	18091 (42.1)	
Onset to admission (days)	Mean (SD)	14.3 (2031.0)	
Transfer from other facility	Yes-facility is a study site	684 (1.6)	
	Yes-facility is not a study site	1968 (4.6)	
	No	31534 (73.4)	
	N/A	1324 (3.1)	
	(Missing)	7461 (17.4)	
Travel in 14 d prior to symptoms	Yes	759 (1.8)	
	No	19261 (44.8)	
	N/A	3718 (8.7)	
	(Missing)	19233 (44.8)	
Country	Afghanistan	0 (0.0)	
	Albania	0 (0.0)	
	Algeria	0 (0.0)	
	Andorra	1 (0.0)	
	Angola	0 (0.0)	
	Antigua and Barbuda	4 (0.0)	

label	levels	all
	Argentina	1 (0.0)
	Armenia	0 (0.0)
	Aruba	0 (0.0)
	Australia	3 (0.0)
	Austria	21 (0.0)
	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	3 (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)
	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)

label	levels	all
	Cote d'Ivoire	0 (0.0)
	Croatia	0 (0.0)
	Cuba	1 (0.0)
	Curacao	0 (0.0)
	Cyprus	26 (0.1)
	Czechia	2 (0.0)
	Denmark	1 (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)
	Fiji	0 (0.0)
	Finland	0 (0.0)
	France	31 (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)

label	levels	all
	India	9 (0.0)
	Indonesia	1 (0.0)
	Iran	6 (0.0)
	Iraq	0 (0.0)
	Ireland	7 (0.0)
	Israel	0 (0.0)
	Italy	86 (0.2)
	Jamaica	3 (0.0)
	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)
	Mauritania	0 (0.0)

label	levels	all
	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	3 (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)
	Peru	0 (0.0)
	Philippines	5 (0.0)
	Poland	3 (0.0)
	Portugal	20 (0.0)
	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)

label	levels	all
	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)
	South Sudan	0 (0.0)
	Spain	185 (0.4)
	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)

label	levels	all
	Turkmenistan	0 (0.0)
	Tuvalu	0 (0.0)
	Uganda	0 (0.0)
	Ukraine	0 (0.0)
	United Arab Emirates	9 (0.0)
	United Kingdom	109 (0.3)
	Uruguay	0 (0.0)
	Uzbekistan	0 (0.0)
	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)	42274 (98.4)
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)
	Bhutan	0 (0.0)

label	levels	all
	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 d'Ivoire	0 (0.0)
	Croatia	0 (0.0)
	Cuba	0 (0.0)
	Curacao	0 (0.0)
	Cyprus	4 (0.0)
	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)

label	levels	all
	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)
	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	1 (0.0)
	Israel	1 (0.0)
	Italy	16 (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)

label	levels	all
	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)
	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)
	Nicaragua	0 (0.0)

label	levels	all
	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)
	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)

label	levels	all
	South Africa	1 (0.0)
	South Korea	0 (0.0)
	South Sudan	0 (0.0)
	Spain	19 (0.0)
	Sri Lanka	0 (0.0)
	Sudan	0 (0.0)
	Suriname	0 (0.0)
	Swaziland	0 (0.0)
	Sweden	0 (0.0)
	Switzerland	0 (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)
	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)	42883 (99.8)

label	levels	all
Animal, raw meat, insect bites 14 d prior	Yes	106 (0.2)
	No	9136 (21.3)
	Unknown	13157 (30.6)
	N/A	1566 (3.6)
	(Missing)	19006 (44.2)
Animal / insect	2 Budgerigars and 26 Cats at home	1 (1.0)
	2 cats	1 (1.0)
	2 dogs	1 (1.0)
	Bee Sting	1 (1.0)
	Bird (pet)	1 (1.0)
	bird (pigeon)	1 (1.0)
	Birds at home	1 (1.0)
	Budgie	1 (1.0)
	budgies	1 (1.0)
	cat	2 (1.9)
	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 (1.9)
	Cats	1 (1.0)
	chicken & beef	1 (1.0)
	Chickens	2 (1.9)
	COWS	1 (1.0)
	cows, rabbits, pigs goats	1 (1.0)
	DAILY CONTACT WITH DOMESTIC PET CAT	1 (1.0)
	dog	5 (4.9)
	Dog	12 (11.7)
	DOG	3 (2.9)
	DOG FAMILY PET	1 (1.0)
	Dog, domestic anima 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)	

label	levels	all
	Domestic pet dog	1 (1.0)
	DOMESTIC ANIMAL	2 (1.9)
	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 (4.9)
	Domestic Pet (Dog)	6 (5.8)
	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 (1.9)
	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 (1.9)
	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)

label	levels	all
	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 (%)		42971 (100.0)
Fever	YES	22285 (51.9)
	NO	10244 (23.8)
	Unknown	1873 (4.4)
	(Missing)	8569 (19.9)
Cough	YES	22735 (52.9)
	NO	9570 (22.3)
	Unknown	2088 (4.9)
	(Missing)	8578 (20.0)
Cough (sputum)	YES	6708 (15.6)
	NO	20283 (47.2)
	Unknown	7224 (16.8)
	(Missing)	8756 (20.4)
Cough (blood)	YES	818 (1.9)
	NO	25547 (59.5)
	Unknown	7820 (18.2)
	(Missing)	8786 (20.4)
Sore throat	YES	2212 (5.1)
	NO	22494 (52.3)
	Unknown	9485 (22.1)
	(Missing)	8780 (20.4)
Runny nose	YES	734 (1.7)
	NO	23419 (54.5)
	Unknown	10026 (23.3)
	(Missing)	8792 (20.5)
Ear pain	YES	130 (0.3)
	NO	24021 (55.9)
	Unknown	10025 (23.3)

Stratified: all**all**

	(Missing)	8795 (20.5)
Wheeze	YES	2593 (6.0)
	NO	23560 (54.8)
	Unknown	8033 (18.7)
	(Missing)	8785 (20.4)
Chest pain	YES	3903 (9.1)
	NO	23716 (55.2)
	Unknown	6579 (15.3)
	(Missing)	8773 (20.4)
Muscle ache	YES	4838 (11.3)
	NO	20288 (47.2)
	Unknown	9043 (21.0)
	(Missing)	8802 (20.5)
Joint pain	YES	1714 (4.0)
	NO	22458 (52.3)
	Unknown	9967 (23.2)
	(Missing)	8832 (20.6)
Fatigue	YES	11943 (27.8)
	NO	14916 (34.7)
	Unknown	7335 (17.1)
	(Missing)	8777 (20.4)
Shortness of breath	YES	21965 (51.1)
	NO	9749 (22.7)
	Unknown	2690 (6.3)
	(Missing)	8567 (19.9)
Lower chest wall indrawing	YES	348 (0.8)
	NO	23016 (53.6)
	Unknown	10787 (25.1)
	(Missing)	8820 (20.5)
Headache	YES	2853 (6.6)
	NO	22183 (51.6)
	Unknown	9137 (21.3)
	(Missing)	8798 (20.5)
Confusion	YES	8310 (19.3)
	NO	20928 (48.7)
	Unknown	5003 (11.6)

Stratified: all		all
	(Missing)	8730 (20.3)
Seizures	YES	464 (1.1)
	NO	27077 (63.0)
	Unknown	6624 (15.4)
	(Missing)	8806 (20.5)
Abdominal pain	YES	2884 (6.7)
	NO	24642 (57.3)
	Unknown	6686 (15.6)
	(Missing)	8759 (20.4)
Nausea/vomiting	YES	5647 (13.1)
	NO	22970 (53.5)
	Unknown	5616 (13.1)
	(Missing)	8738 (20.3)
Diarrhoea	YES	5516 (12.8)
	NO	22976 (53.5)
	Unknown	5726 (13.3)
	(Missing)	8753 (20.4)
Conjunctivitis	YES	105 (0.2)
	NO	25433 (59.2)
	Unknown	8634 (20.1)
	(Missing)	8799 (20.5)
Skin rash	YES	410 (1.0)
	NO	25666 (59.7)
	Unknown	8104 (18.9)
	(Missing)	8791 (20.5)
Skin ulcers	YES	669 (1.6)
	NO	25408 (59.1)
	Unknown	8092 (18.8)
	(Missing)	8802 (20.5)
Lymphadenopathy	YES	162 (0.4)
	NO	25451 (59.2)
	Unknown	8551 (19.9)
	(Missing)	8807 (20.5)
Bleeding (Haemorrhage)	YES	411 (1.0)
	NO	26702 (62.1)
	Unknown	7052 (16.4)

Stratified: all		all
	(Missing)	8806 (20.5)
If Bleeding (others)	YES	421 (1.0)
	NO	17710 (41.2)
	Unknown	5000 (11.6)
	(Missing)	19840 (46.2)

Comorbidity (detail)

Table 3

Stratified: all		all
Total N (%)		42971 (100.0)
Chronic cardiac disease	YES	10420 (24.2)
	NO	22397 (52.1)
	Unknown	1655 (3.9)
	(Missing)	8499 (19.8)
Chronic pulmonary disease	YES	5841 (13.6)
	NO	26844 (62.5)
	Unknown	1774 (4.1)
	(Missing)	8512 (19.8)
Asthma	YES	4548 (10.6)
	NO	27981 (65.1)
	Unknown	1886 (4.4)
	(Missing)	8556 (19.9)
Chronic kidney disease	YES	5501 (12.8)
	NO	27011 (62.9)
	Unknown	1920 (4.5)
	(Missing)	8539 (19.9)
Moderate/severe liver disease	YES	592 (1.4)
	NO	31599 (73.5)
	Unknown	2214 (5.2)
	(Missing)	8566 (19.9)
Mild Liver disease	YES	481 (1.1)
	NO	31624 (73.6)
	Unknown	2297 (5.3)
	(Missing)	8569 (19.9)
Chronic neurological disorder	YES	3897 (9.1)
	NO	28402 (66.1)

Stratified: all		all
	Unknown	2114 (4.9)
	(Missing)	8558 (19.9)
Malignancy	YES	3252 (7.6)
	NO	28967 (67.4)
	Unknown	2191 (5.1)
	(Missing)	8561 (19.9)
Chronic hematologic disease	YES	1355 (3.2)
	NO	30808 (71.7)
	Unknown	2230 (5.2)
	(Missing)	8578 (20.0)
AIDS/HIV	YES	133 (0.3)
	NO	31791 (74.0)
	Unknown	2483 (5.8)
	(Missing)	8564 (19.9)
Obesity	YES	3252 (7.6)
	NO	26311 (61.2)
	Unknown	4733 (11.0)
	(Missing)	8675 (20.2)
Diabetes with complications	YES	2375 (5.5)
	NO	29637 (69.0)
	Unknown	2409 (5.6)
	(Missing)	8550 (19.9)
Diabetes without complications	YES	6097 (14.2)
	NO	26027 (60.6)
	Unknown	2304 (5.4)
	(Missing)	8543 (19.9)
Rheumatologic disorder	YES	3385 (7.9)
	NO	28705 (66.8)
	Unknown	2292 (5.3)
	(Missing)	8589 (20.0)
Dementia	YES	5033 (11.7)
	NO	27377 (63.7)
	Unknown	2030 (4.7)
	(Missing)	8531 (19.9)
Malnutrition	YES	776 (1.8)
	NO	29839 (69.4)

Stratified: all

all

	Unknown	3715 (8.6)
	(Missing)	8641 (20.1)
Smoking	YES	1662 (3.9)
	NO	22052 (51.3)
	(Missing)	19257 (44.8)