Dynamic CO-CIN report to SAGE and NERVTAG

Dynamic content updated: 2020-05-18 22:06:00.

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 18 May 2020, CO-CIN has recruited **40303 patients** with confirmed Coronavirus (Figure 1).

The CO-CIN dataset represents 16.4% (40303/246,406) of cases of confirmed Coronovirus cases in the UK, per the PHE daily reports (last updated 9am on 18 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 935 had travelled abroad recently, and 6438 reported visiting or working in a hospital where COVID-19 cases are being managed.

The median age is 73 (range: 0-106), Male/Female 20566/14703.

The most common symptoms were cough (67%), fever (65%) and shortness of breath (64%) (Figure 3A). 1449/32353 (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%). 14966/40303 (37%) of patients have reported no co morbidity. 195/2766 (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 = 25660).
3519/24305 (14%) patients required high-flow oxygen after day 1 of treatment.

Currently 9713 patient(s) have died and 4943 required ICU. 15973 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.

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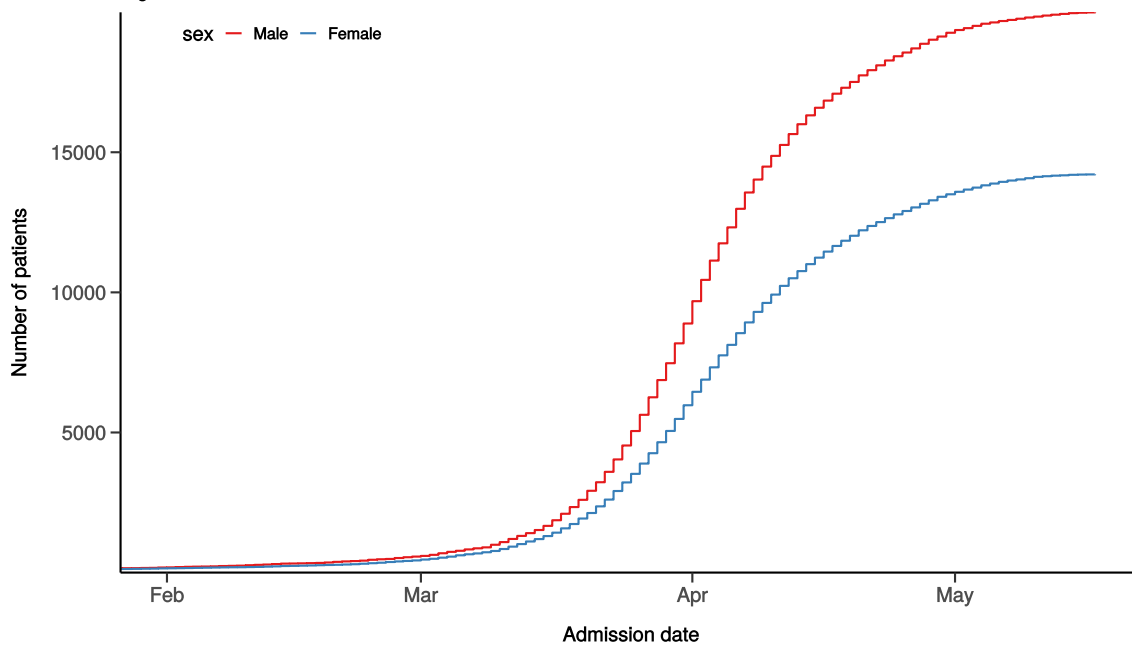Analytics: Lisa Norman, Riinu Pius, Thomas Drake, Cameron Fairfield, Stephen Knight, Kenneth McLean, Katie Shaw.
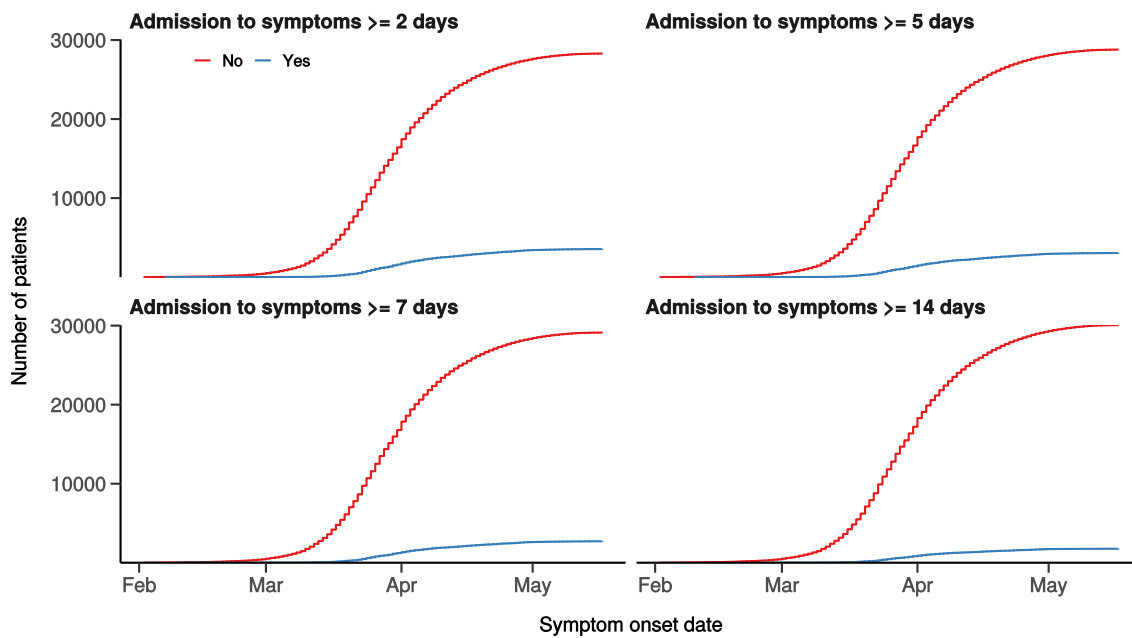
Admission

Figure 1

Hospital admission with COVID-19 by sex
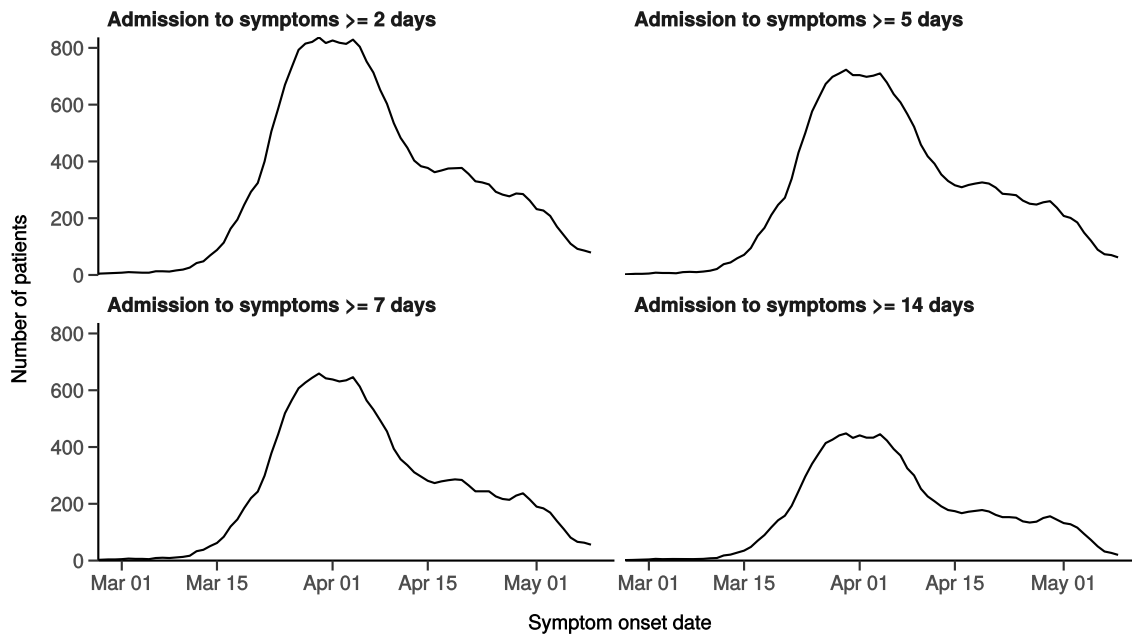### Figure 1A

Number with symptom onset occuring after admission to hospital
Figure 1B

Number with symptom onset occuring after hospital admission

Figure 1C - 7-day rolling count. n = 31846

Proportion with symptom onset occuring after hospital admission

Figure 1D - 7-day rolling percentage. n = 31846
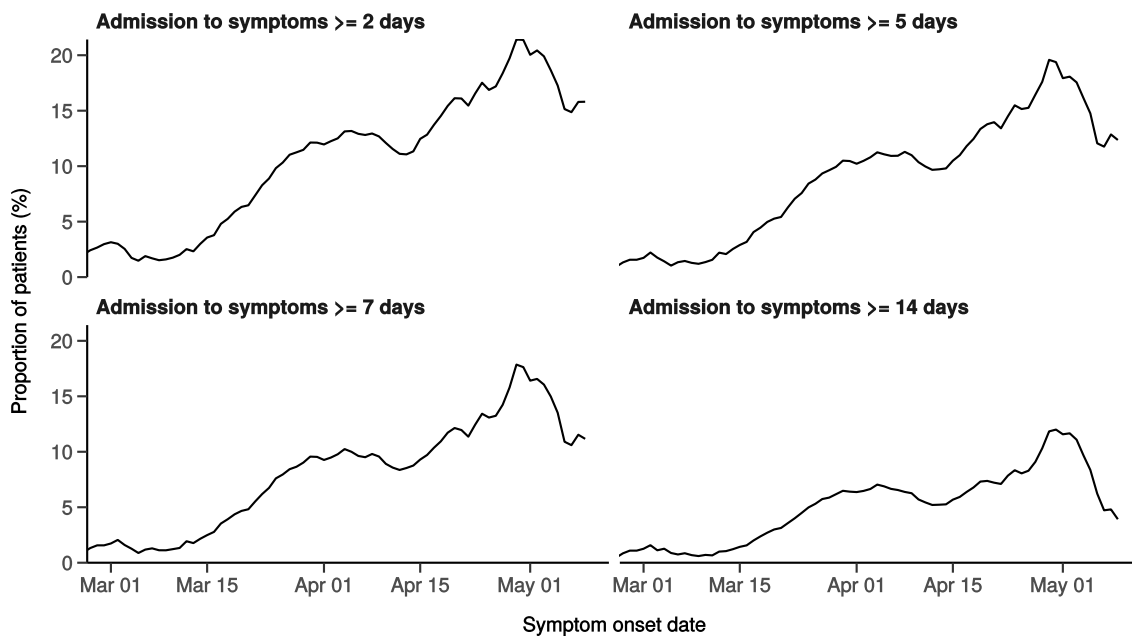
Patients with outcome stratified by age, and sex
Figure 1E

Legend: Discharged · On-going care · Died

Males 19384/33164 (58%)

Females 13780/33164 (42%)

Age (years) ranges from 0-4 up to 90+

X-axis: Number of patients (2800 to 0 to 2800)
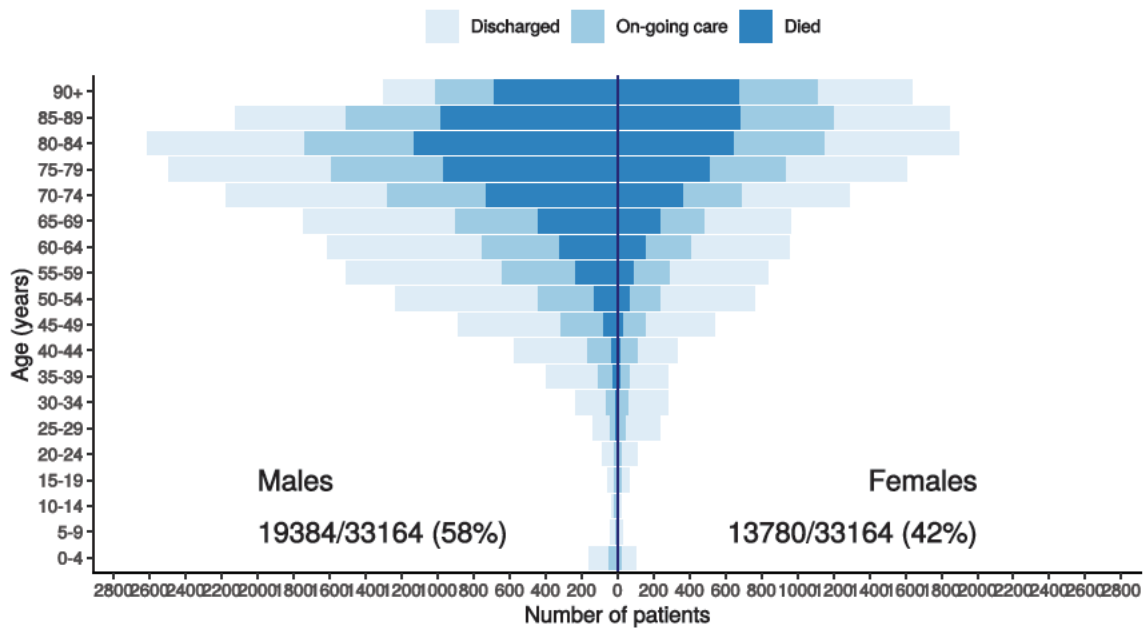
Hospital admission with COVID-19 by ethnicity
Figure 1F

ethnicity: Asian · Black · White · Other

Asian

Black

White

Other

Y-axis: count

X-axis: Date of admission (Feb, Mar, Apr, May)
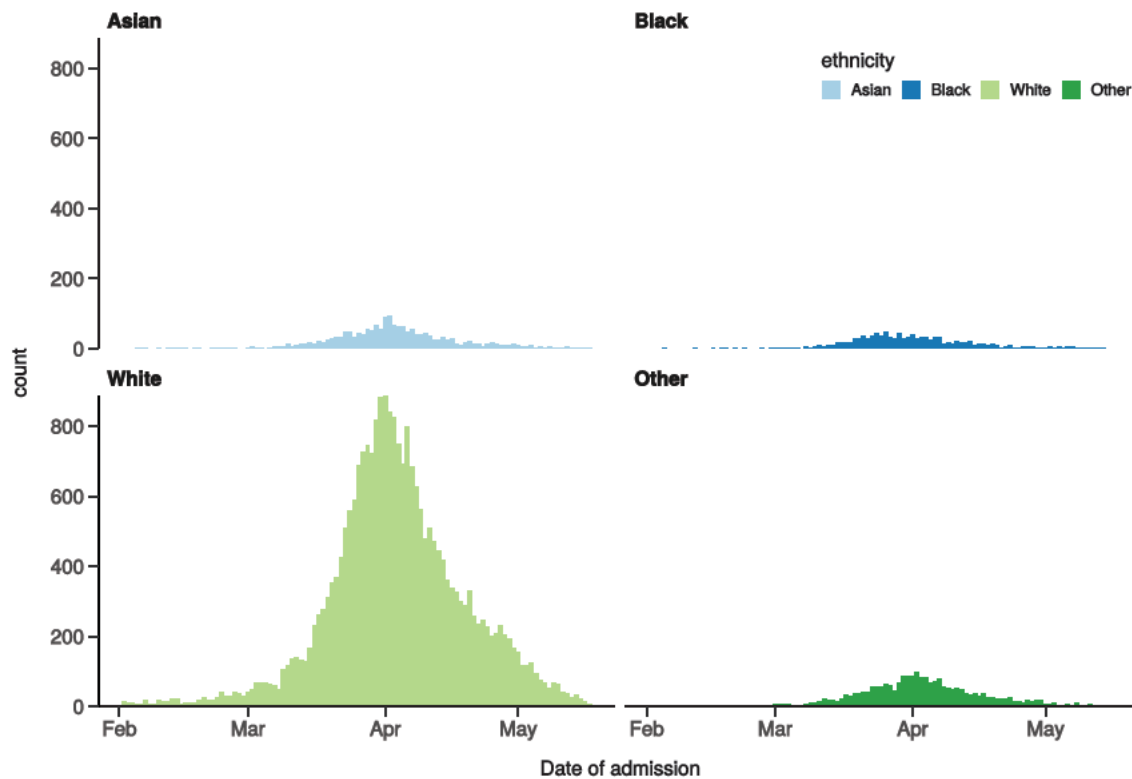
Location by CCG / Healthboard

Figure 2

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

n = 40516
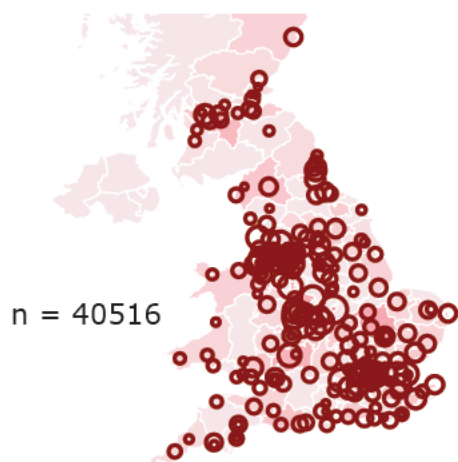
Symptoms and comorbidity

Figure 3A

Symptoms on presentation to hospital (% patients, n = 32092)
Figure 3A
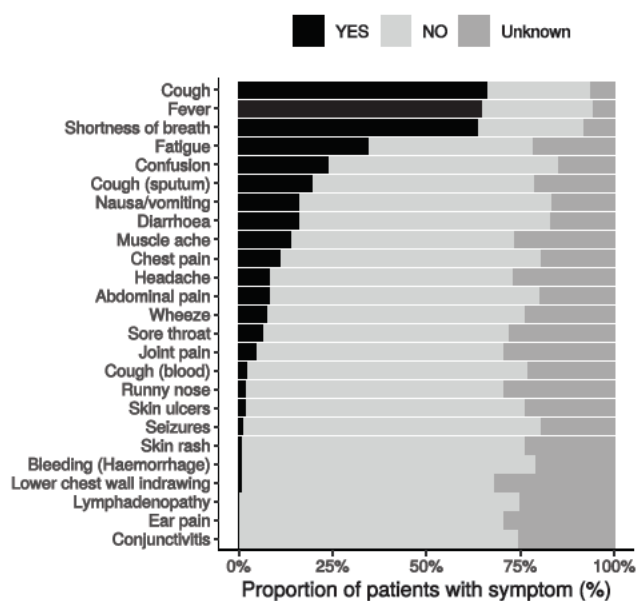
Comorbidity (% patients, n = 32141)
Figure 3B
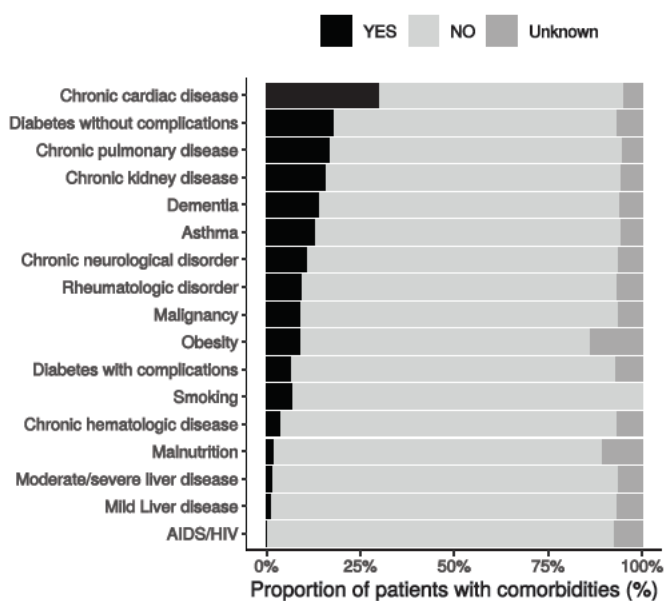
Figure 3C

Correlation of symtpoms in all pages. Note clusters, top right to bottom left, flu-like, coryzal, abdominal, respiratory, neurocutaneous.
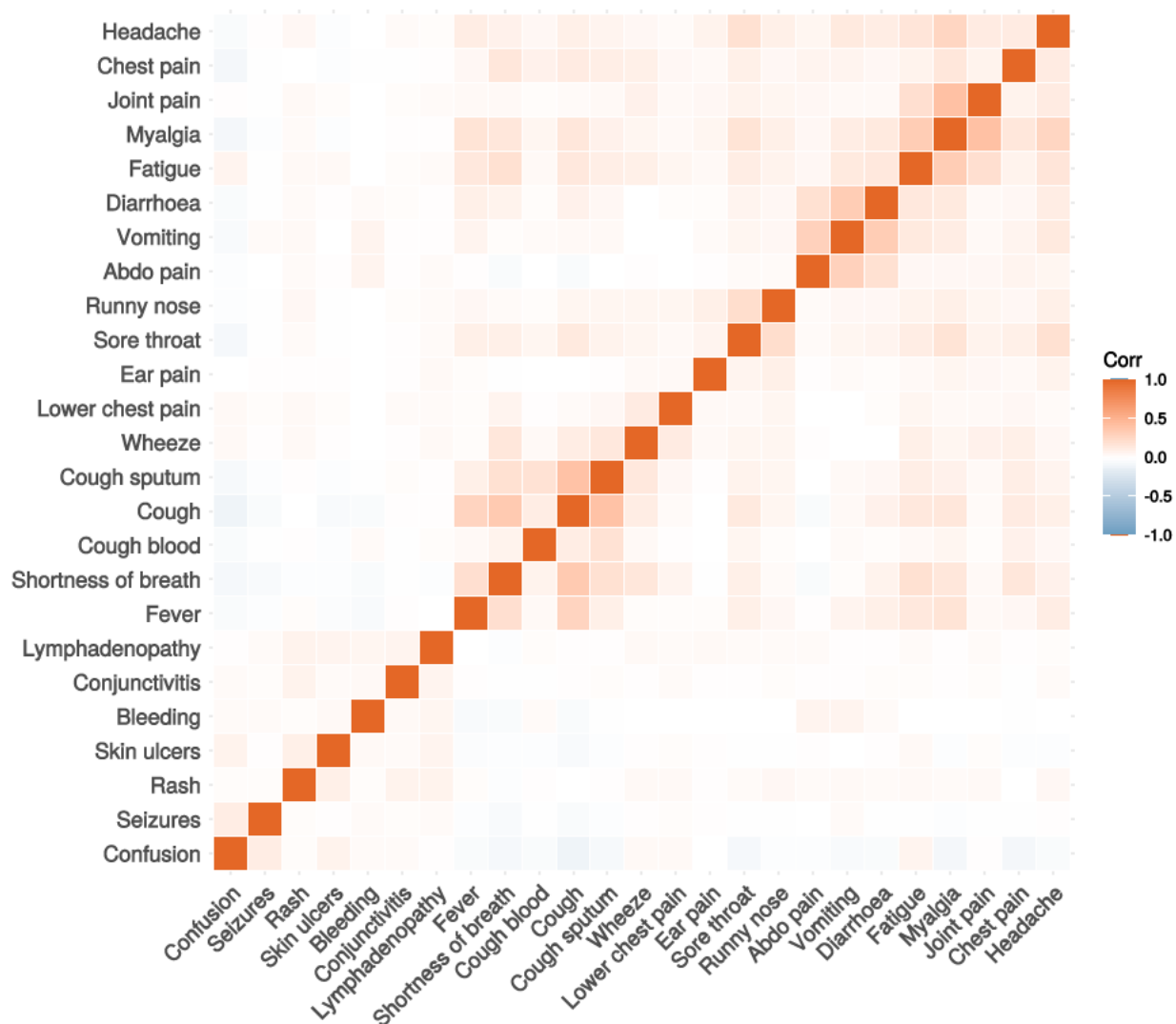
Symptoms (diagnostic criteria)

Figure 4A

n = 32092
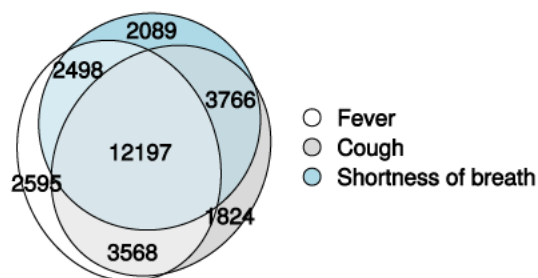
Symptoms (most common)

Figure 4B

n = 32092
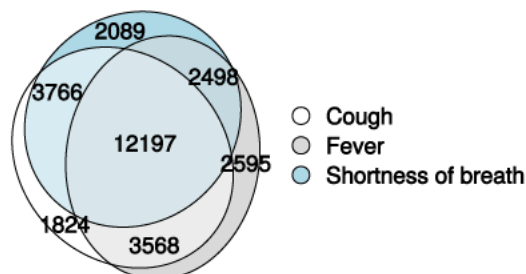
Comorbidity (most common)

Figure 4C
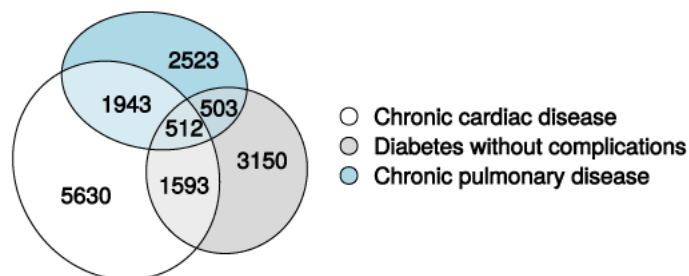
Medication prior to illness

Figure 5

Preadmission treatment

Figure 5

Pre-admission treatment
Anti-infectives for illness episode (left) immunosuppressants including oral (not
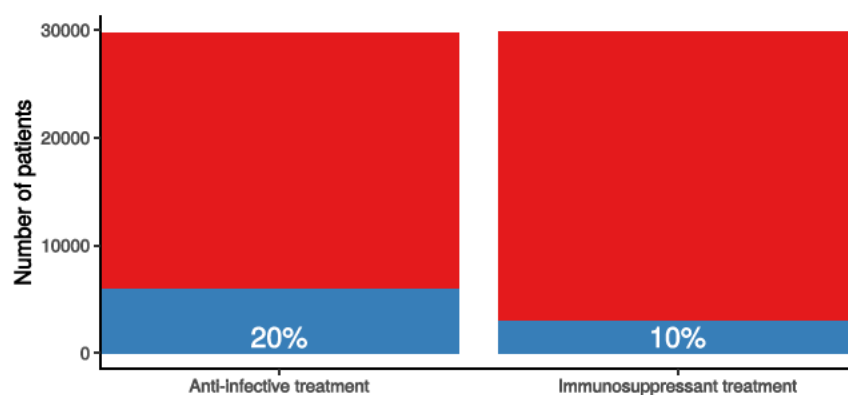
Patient flow

Figure 6A - All patients

N = 33207

Patient status by day
Cumulative for discharge/death
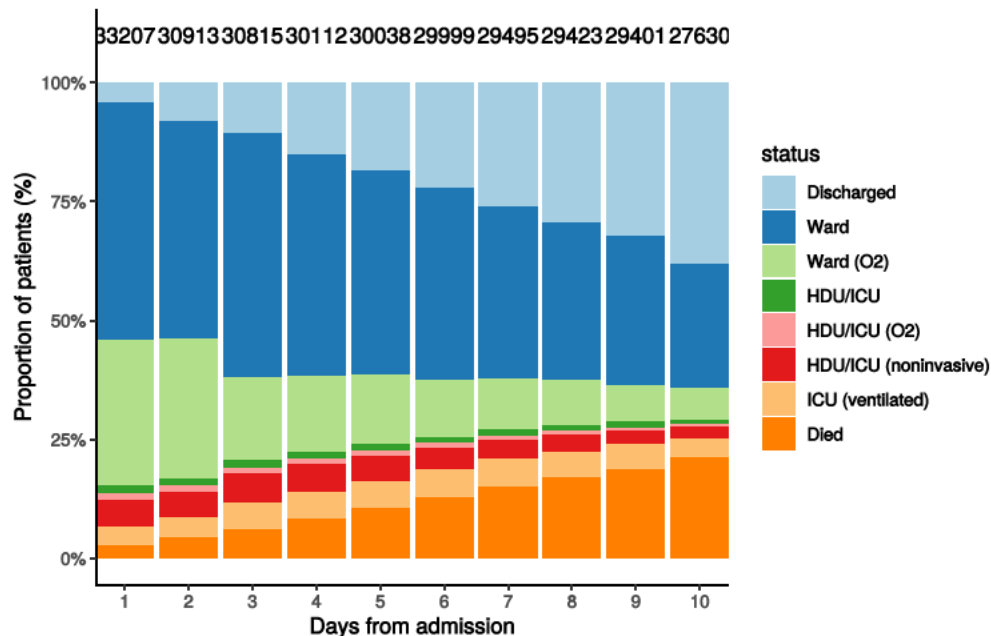
Figure 6B - Patients admitted >=14 days and <=28 days ago

N = 3606

Patient status by day
Cumulative for discharge/death
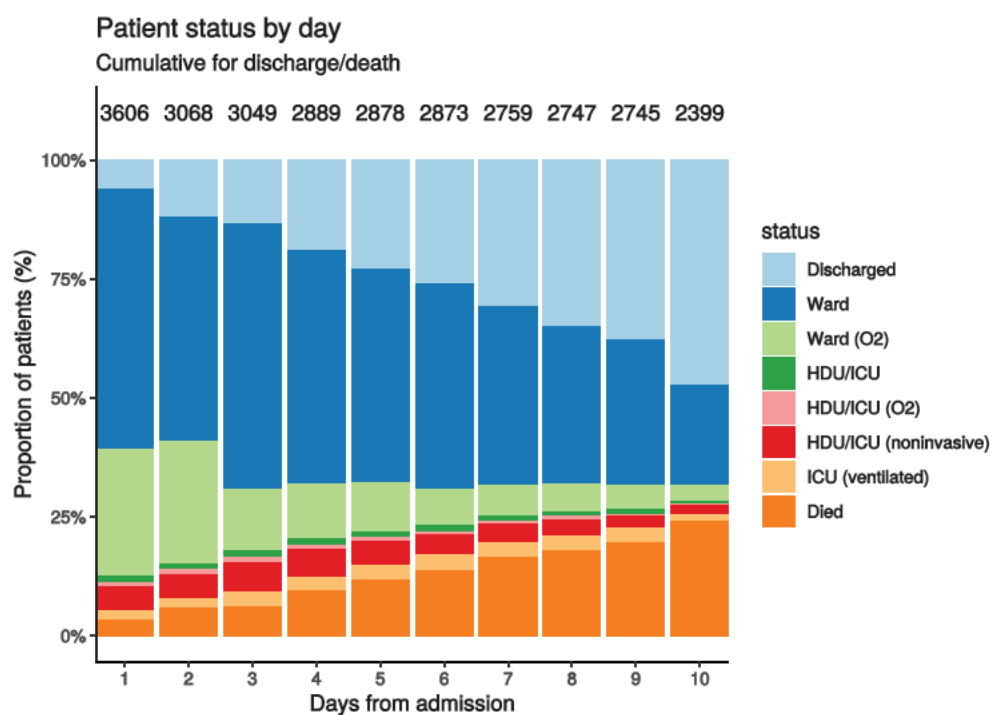
Oxygen requirement

Figure 7A - All patients

N = 30776
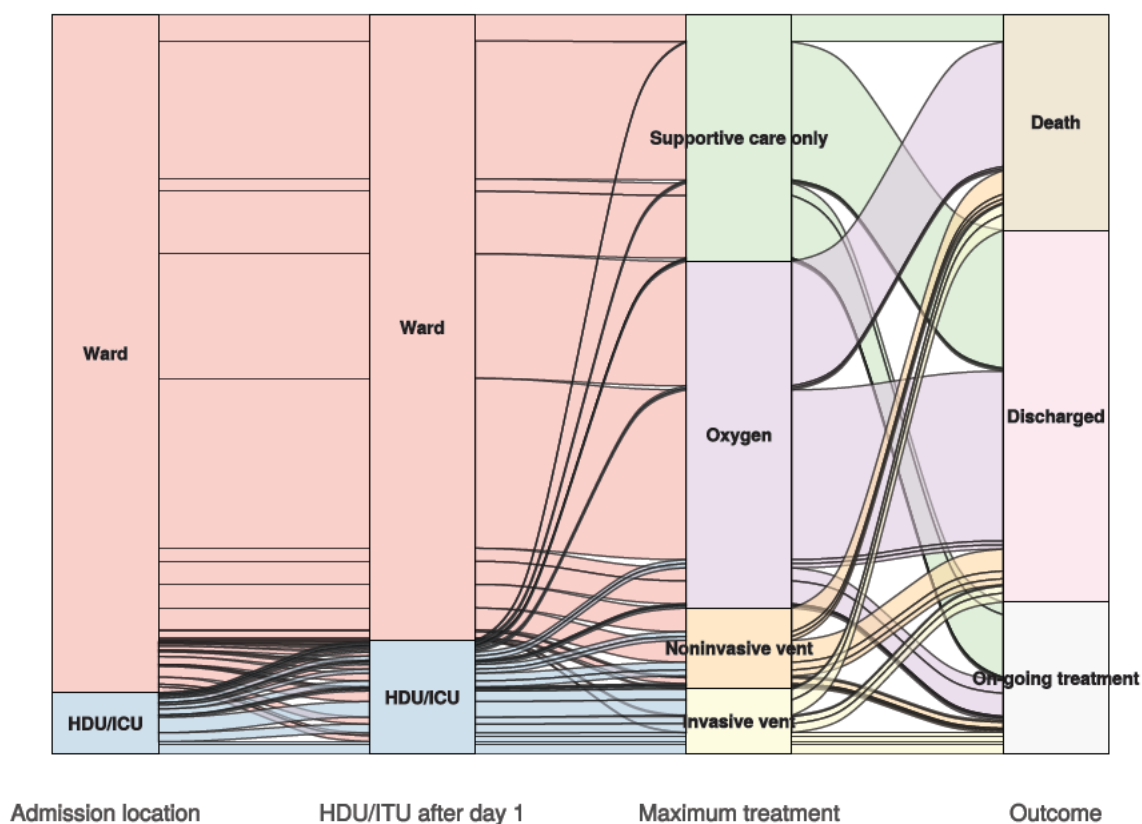
Figure 7B - Patients admitted >=14 days and <=28 days ago

N = 3419

| Admission location | HDU/ITU after day 1 | Treatment | Outcome |
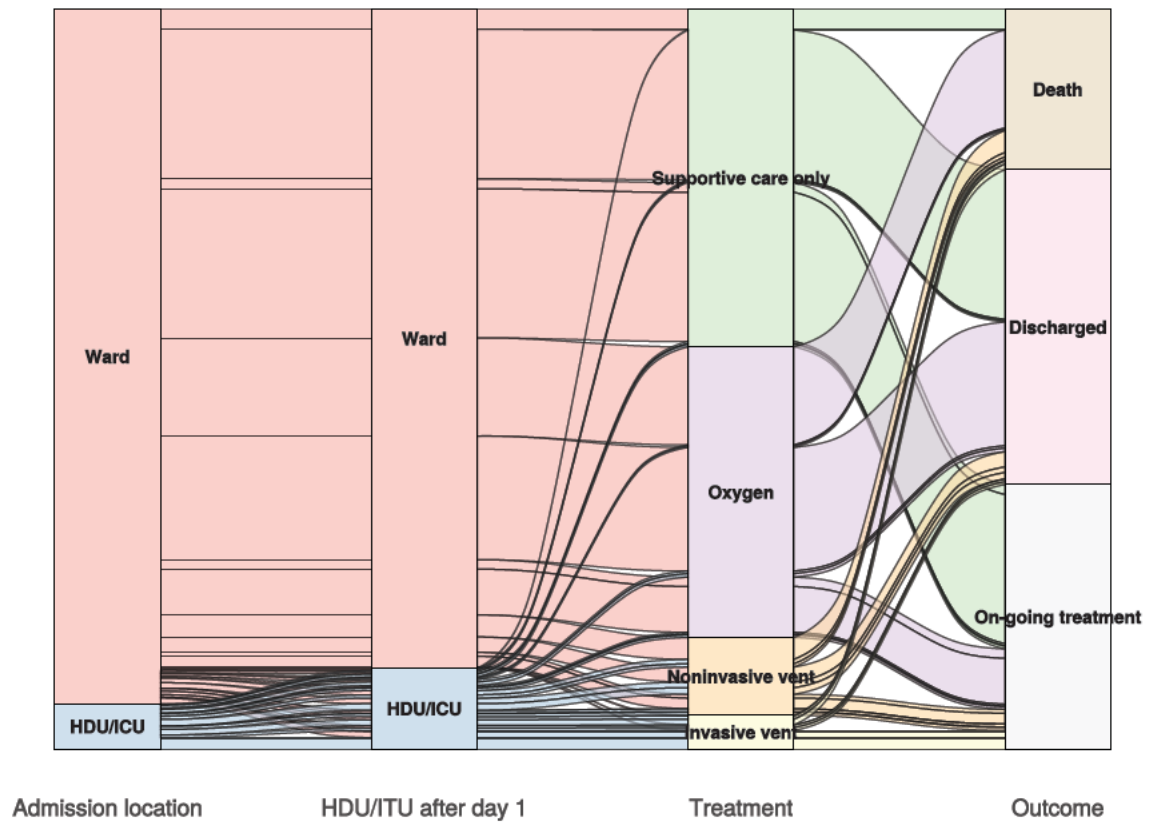
In-hospital medical treatment

Figure 8

In-hospital treatment

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

Legend: No (red), Yes (blue)

Y-axis: Number of patients

| Anti-viral | Antibiotic | Antifungal | Corticosteroid |
| 5% | 85% | 4% | 16% |
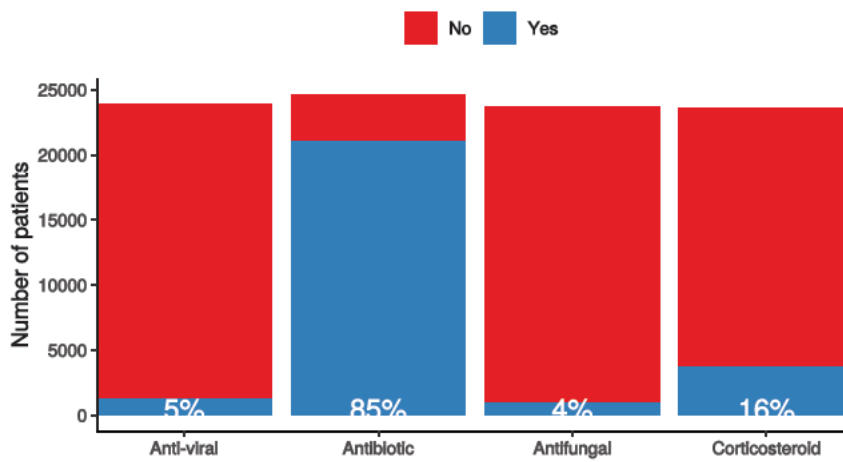
Treatment

Figure 9

ICU/HDU admission
Figure 10A

4943/31920
15%
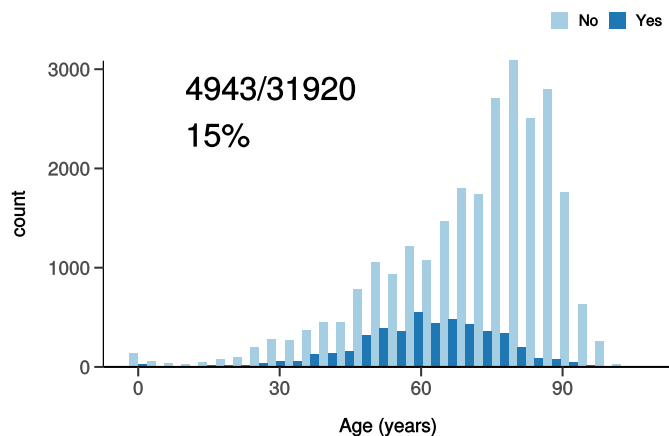
High flow oxygen
Figure 10B

18029/30200
60%

Noninvasive ventilation
Figure 10C

4682/30042
16%
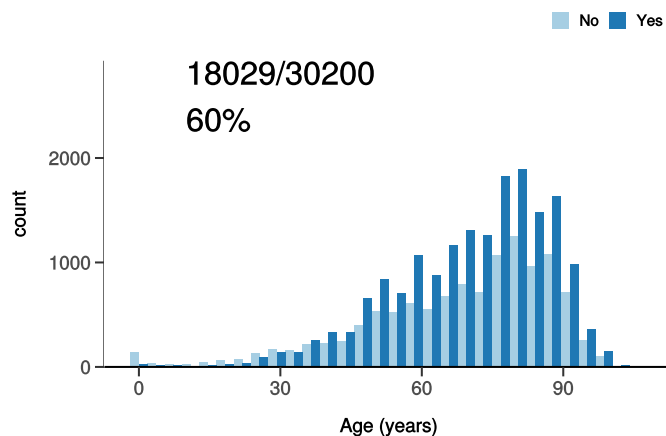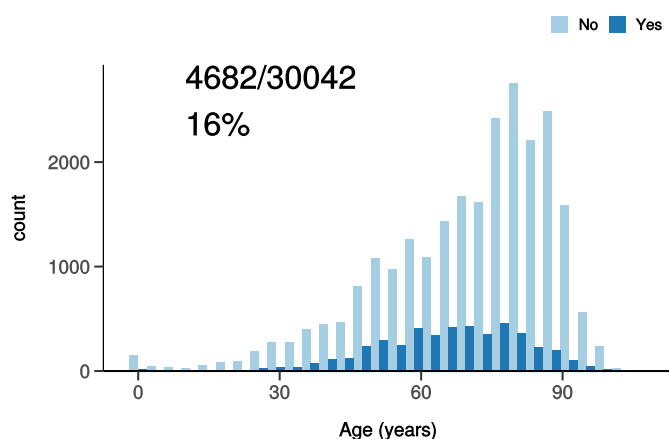
Invasive ventilation
Figure 10D

2847/30153
9%
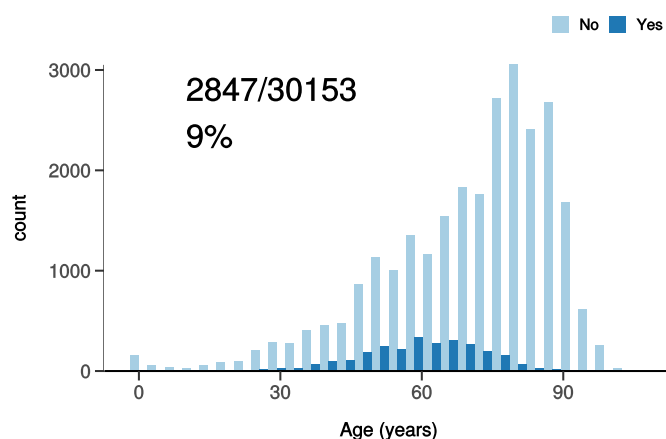
Status in patients admitted >=14 days from today

Figure 10

All: status in patients admitted >=14 days ago
Figure 11A

Died
9505/28537
33%

On-going care
3229/28537
11%

Discharged alive
15741/28537
55%
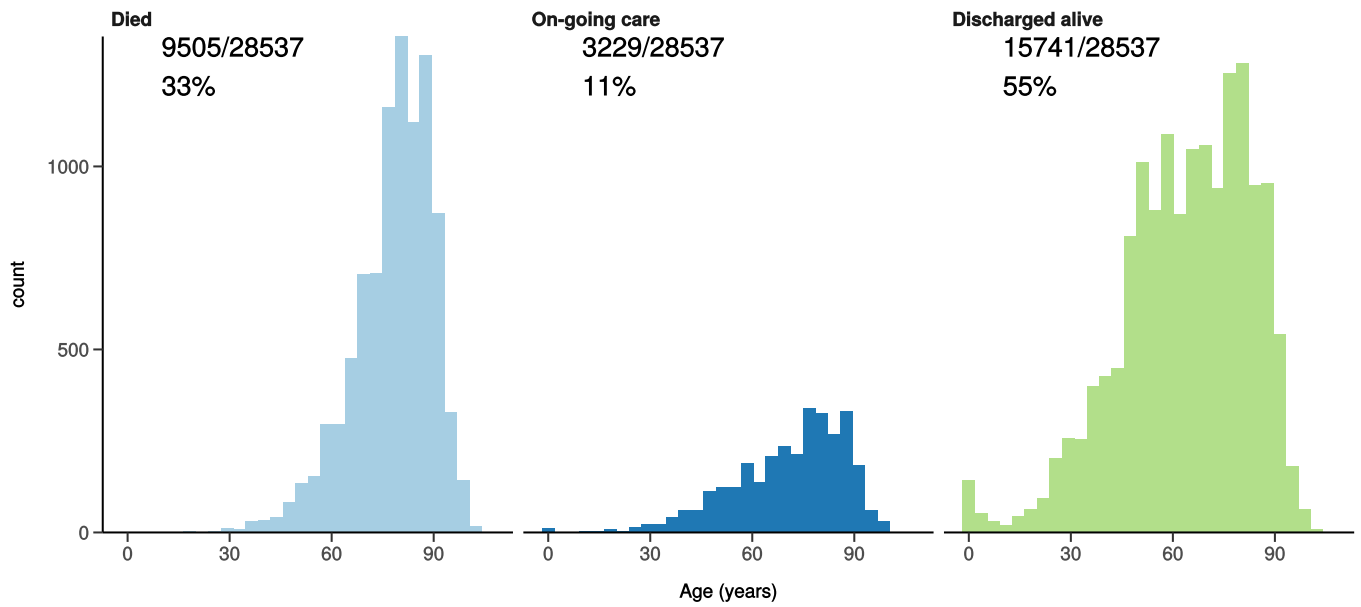
ICU/HDU admissions: status in patients admitted >=14 days ago
Figure 11B

Died
1682/4062
41%

On-going care
680/4062
17%

Discharged alive
1691/4062
42%
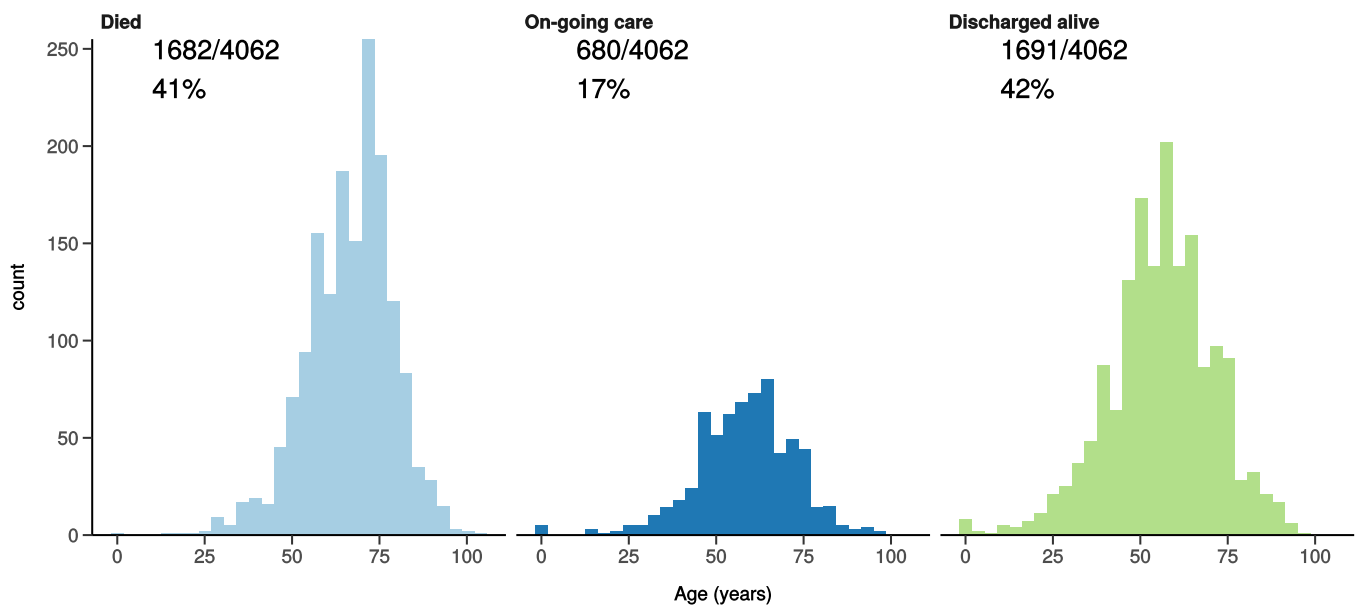
Invasive ventilation: status in patients admitted >=14 days ago
Figure 11c

Died
1136/2303
49%

On-going care
458/2303
20%

Discharged alive
706/2303
31%
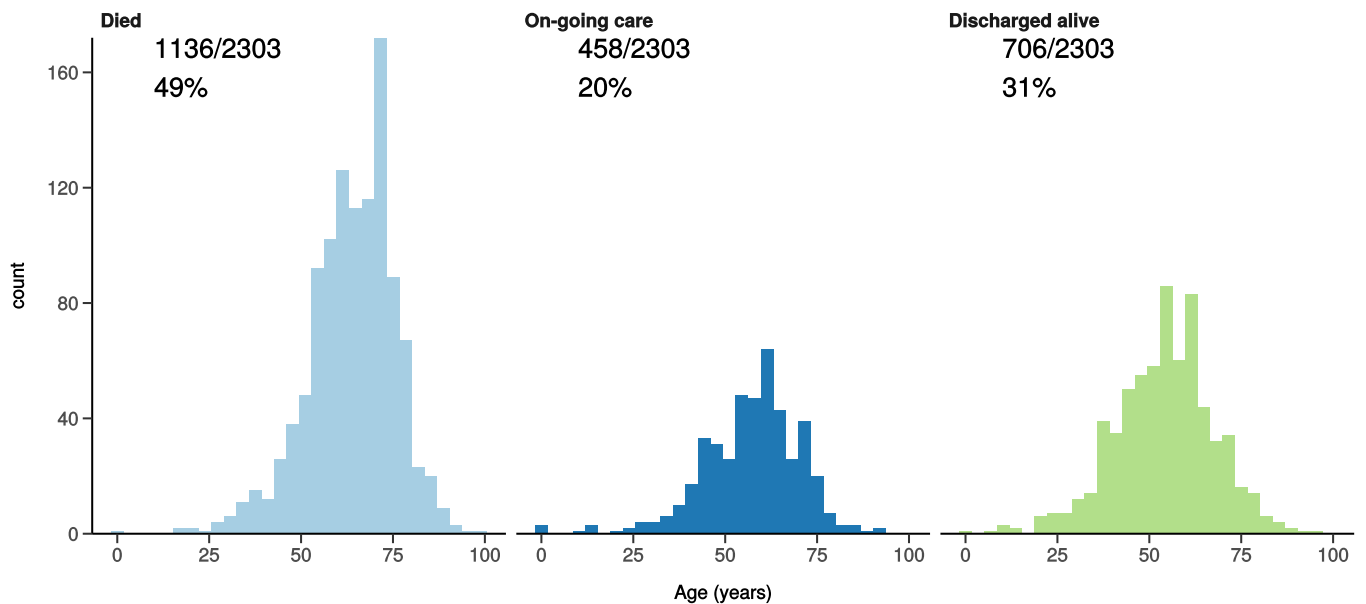
Length of stay stratified by age

Figure 11

Length of stay stratified by age and mortality
Proportion who reach outcome by day 14 shown
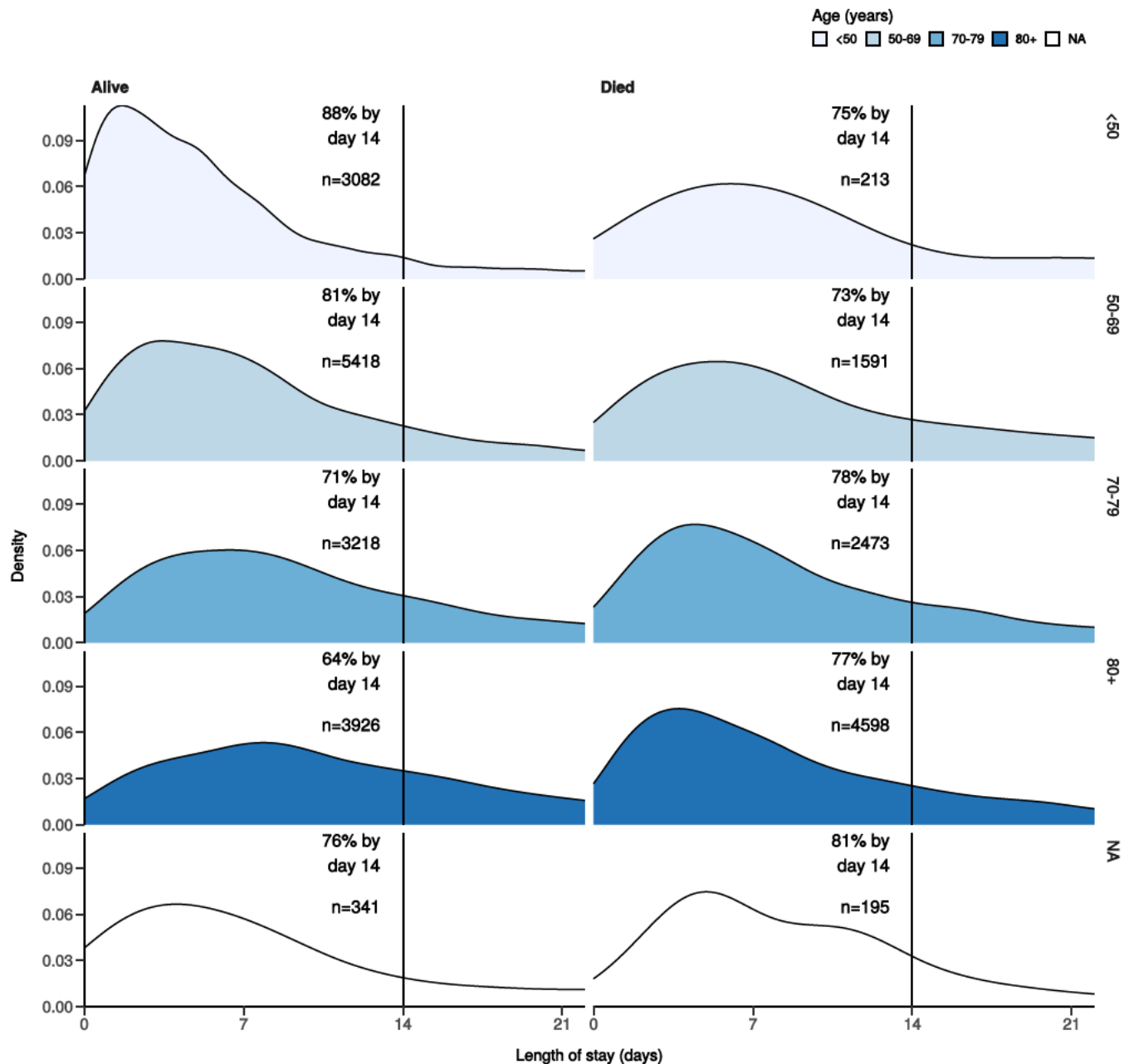
Predictors of death: logistic regression multivariable model

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	3410 (93.8)	227 (6.2)	•	•
	50-69	5774 (77.7)	1660 (22.3)	4.32 (3.74-5.00, p<0.001)	4.14 (3.51-4.90, p<0.001)
	70-79	3453 (57.3)	2576 (42.7)	11.21 (9.73-12.97, p<0.001)	9.52 (8.07-11.29, p<0.001)
	80+	4225 (46.7)	4813 (53.3)	17.11 (14.90-19.74, p<0.001)	14.26 (12.09-16.91, p<0.001)
Sex at Birth	Male	9734 (62.3)	5898 (37.7)	•	•
	Female	7481 (67.8)	3552 (32.2)	0.78 (0.74-0.82, 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	11922 (70.6)	4955 (29.4)	•	•
	YES	4085 (52.4)	3706 (47.6)	2.18 (2.07-2.31, p<0.001)	1.23 (1.15-1.32, p<0.001)
Chronic pulmonary disease	NO	13640 (67.5)	6577 (32.5)	•	•
	YES	2337 (53.5)	2029 (46.5)	1.80 (1.68-1.92, p<0.001)	1.29 (1.19-1.39, p<0.001)
Chronic neurological disorder	NO	14224 (66.3)	7227 (33.7)	•	•
	YES	1579 (55.3)	1274 (44.7)	1.59 (1.47-1.72, p<0.001)	1.25 (1.13-1.38, p<0.001)
Chronic hematologic disease	NO	15197 (65.6)	7981 (34.4)	•	•
	YES	559 (54.1)	474 (45.9)	1.61 (1.42-1.83, p<0.001)	1.27 (1.09-1.48, p=0.002)
Chronic kidney disease	NO	13797 (68.0)	6505 (32.0)	•	•
	YES	2084 (50.3)	2060 (49.7)	2.10 (1.96-2.24, p<0.001)	1.30 (1.20-1.42, p<0.001)
Dementia	NO	14138 (68.4)	6542 (31.6)	•	•
	YES	1683 (45.8)	1991 (54.2)	2.56 (2.38-2.75, p<0.001)	1.41 (1.29-1.53, p<0.001)
Obesity	NO	12916 (65.2)	6909 (34.8)	•	•
	YES	1678 (68.7)	763 (31.3)	0.85 (0.78-0.93, p<0.001)	1.39 (1.25-1.55, p<0.001)
Malignancy	NO	14521 (66.6)	7292 (33.4)	•	•
	YES	1258 (51.8)	1172 (48.2)	1.86 (1.71-2.02, p<0.001)	1.35 (1.22-1.49, p<0.001)

Number in dataframe = 33405, Number in model = 20824, Missing = 12581, AIC = 23335.9, C-statistic = 0.733, H&L = Chi-sq(8) 65.28 (p<0.001)

Figure 12 - Adjusted odds ratio plot

Death

Age on admission (years)	<50	-	
	50-69	4.14 (3.51-4.90, p<0.001)	
	70-79	9.52 (8.07-11.29, p<0.001)	
	80+	14.26 (12.09-16.91, 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	1.29 (1.19-1.39, p<0.001)	
Chronic neurological disorder	YES	1.25 (1.13-1.38, p<0.001)	
Chronic hematologic disease	YES	1.27 (1.09-1.48, p=0.002)	
Chronic kidney disease	YES	1.30 (1.20-1.42, p<0.001)	
Dementia	YES	1.41 (1.29-1.53, p<0.001)	
Obesity	YES	1.39 (1.25-1.55, p<0.001)	
Malignancy	YES	1.35 (1.22-1.49, p<0.001)	

Odds ratio (95% CI, log scale)
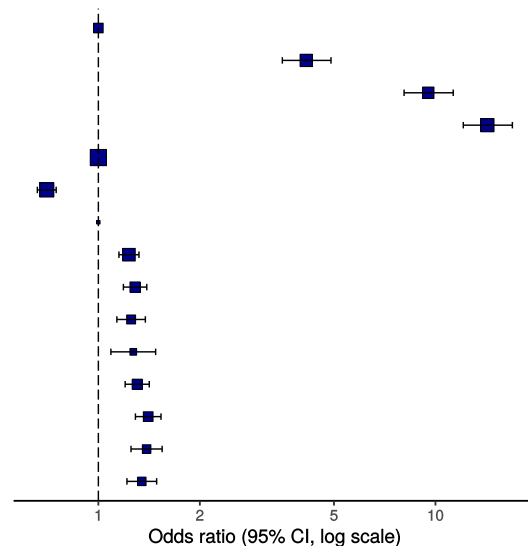
Figure 13 - ROC
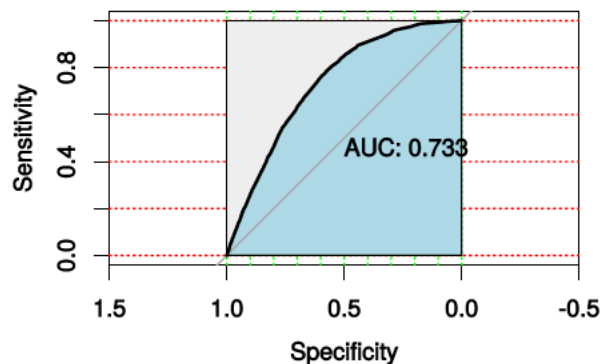
Survival models

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

Figure 14

P-value is log-rank test.

Number at risk					
age.factor=<18	443	367	339	337	332
age.factor=18-49	4156	3820	3458	3273	3216
age.factor=50-74	13097	11484	9581	8483	7990
age.factor=75 and over	15545	12091	8730	7251	6628

Number at risk					
sex=Male	19822	16628	13130	11291	10509
sex=Female	14080	11678	9407	8423	8002
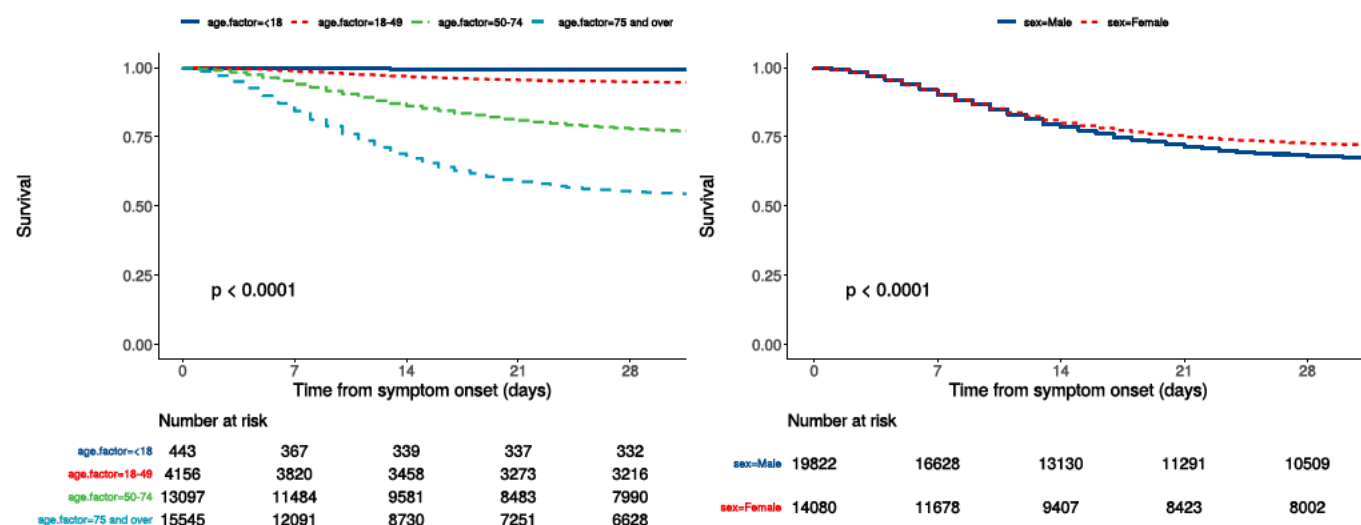
Cox proportional hazards model

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	4599 (13.8)	•	•
	50-69	9623 (28.9)	3.82 (3.33-4.39, p<0.001)	3.86 (3.23-4.61, p<0.001)
	70-79	7581 (22.8)	8.62 (7.52-9.88, p<0.001)	8.17 (6.86-9.74, p<0.001)
	80+	11438 (34.4)	12.20 (10.68-13.95, p<0.001)	11.17 (9.38-13.31, p<0.001)
Sex at Birth	Male	19822 (58.5)	•	•
	Female	14080 (41.5)	0.84 (0.81-0.88, p<0.001)	0.82 (0.77-0.86, p<0.001)
qSOFA score on admission	0	10355 (40.2)	•	•
	1	12104 (47.0)	1.53 (1.45-1.61, p<0.001)	1.65 (1.55-1.75, p<0.001)

Dependent: Surv(time, status)		all	HR (univariable)	HR (multivariable)
	2	2981 (11.6)	3.08 (2.88-3.29, p<0.001)	2.88 (2.68-3.11, p<0.001)
	3	327 (1.3)	4.82 (4.18-5.56, p<0.001)	4.02 (3.41-4.73, p<0.001)
Symptomatic at presentation	No symptoms	823 (2.6)	•	•
	Symptoms	31194 (97.4)	1.08 (0.94-1.24, p=0.281)	•
Chronic cardiac disease	NO	20770 (68.5)	•	•
	YES	9568 (31.5)	1.89 (1.81-1.97, p<0.001)	1.19 (1.13-1.26, p<0.001)
Chronic kidney disease	NO	25026 (83.2)	•	•
	YES	5038 (16.8)	1.82 (1.73-1.91, p<0.001)	1.23 (1.16-1.31, p<0.001)
Moderate/severe liver disease	NO	29238 (98.2)	•	•
	YES	543 (1.8)	1.35 (1.17-1.56, p<0.001)	1.52 (1.27-1.82, p<0.001)
Chronic neurological disorder	NO	26327 (88.2)	•	•
	YES	3531 (11.8)	1.48 (1.39-1.57, p<0.001)	•
Malignancy	NO	26832 (90.1)	•	•
	YES	2955 (9.9)	1.62 (1.52-1.72, p<0.001)	1.27 (1.18-1.37, p<0.001)
Chronic hematologic disease	NO	28493 (95.8)	•	•
	YES	1240 (4.2)	1.47 (1.34-1.61, p<0.001)	•
Obesity	NO	24389 (89.1)	•	•
	YES	2977 (10.9)	0.86 (0.79-0.92, p<0.001)	1.19 (1.09-1.30, p<0.001)
Diabetes without complications	NO	24056 (80.8)	•	•
	YES	5700 (19.2)	1.22 (1.16-1.28, p<0.001)	•
Rheumatologic disorder	NO	26573 (89.6)	•	•
	YES	3089 (10.4)	1.23 (1.15-1.32, p<0.001)	•
Dementia	NO	25407 (84.8)	•	•
	YES	4543 (15.2)	2.19 (2.08-2.30, p<0.001)	1.18 (1.11-1.26, p<0.001)
Malnutrition	NO	27617 (97.5)	•	•
	YES	719 (2.5)	1.55 (1.38-1.75, p<0.001)	•
smoking_mhyn_2levels	NO	20607 (93.1)	•	•
	YES	1528 (6.9)	0.90 (0.81-1.00, p=0.055)	•

Number in dataframe = 34136, Number in model = 20846, Missing = 13290, Number of events = 5999, Concordance = 0.728 (SE = 0.003), R-squared = 0.169(Max possible = 0.996), Likelihood ratio test = 3847.943 (df = 13, p = 0.000)

Figure 15a - Multivariable Cox proportional hazards model

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

		HR (95% CI, p-value)
Age on admission (years)	<50	-
	50-69	3.86 (3.23-4.61, p<0.001)
	70-79	8.17 (6.86-9.74, p<0.001)
	80+	11.17 (9.38-13.31, p<0.001)
Sex at Birth	Female	0.82 (0.77-0.86, p<0.001)
qSOFA score on admission	0	-
	1	1.65 (1.55-1.75, p<0.001)
	2	2.88 (2.68-3.11, p<0.001)
	3	4.02 (3.41-4.73, p<0.001)
Chronic cardiac disease	YES	1.19 (1.13-1.26, p<0.001)
Chronic kidney disease	YES	1.23 (1.16-1.31, p<0.001)
Moderate/severe liver disease	YES	1.52 (1.27-1.82, p<0.001)
Malignancy	YES	1.27 (1.18-1.37, p<0.001)
Obesity	YES	1.19 (1.09-1.30, p<0.001)
Dementia	YES	1.18 (1.11-1.26, p<0.001)

Hazard ratio (95% CI, log scale)
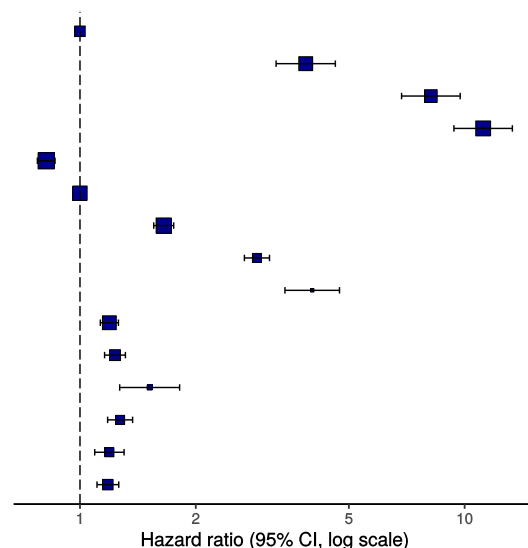
Figure 15b - Multivariable Cox proportional hazards model (age, sex, comorbidities only)

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

		HR (95% CI, p-value)
Age on admission (years)	<50	-
	50-69	3.77 (3.22-4.42, p<0.001)
	70-79	7.79 (6.65-9.12, p<0.001)
	80+	10.69 (9.14-12.51, p<0.001)
Sex at Birth	Female	0.79 (0.75-0.83, p<0.001)
Chronic cardiac disease	YES	1.17 (1.11-1.23, 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 (1.14-1.32, p<0.001)
Obesity	YES	1.25 (1.15-1.36, p<0.001)
Dementia	YES	1.34 (1.26-1.42, p<0.001)

Hazard ratio (95% CI, log scale)
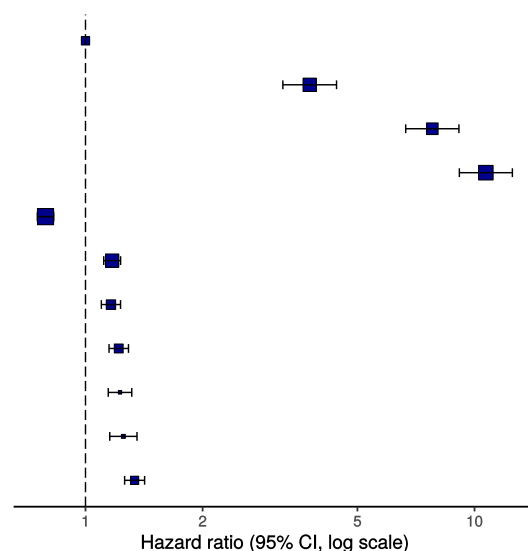
ROC = 0.7285335

Figure 16 - Predictions calibration plot

Black: observed Gray: ideal
Blue : optimism corrected

Predicted 7 Day Survival B=40 based on observed-predicted
Mean |error|=0.223 0.9 Quantile=0.409
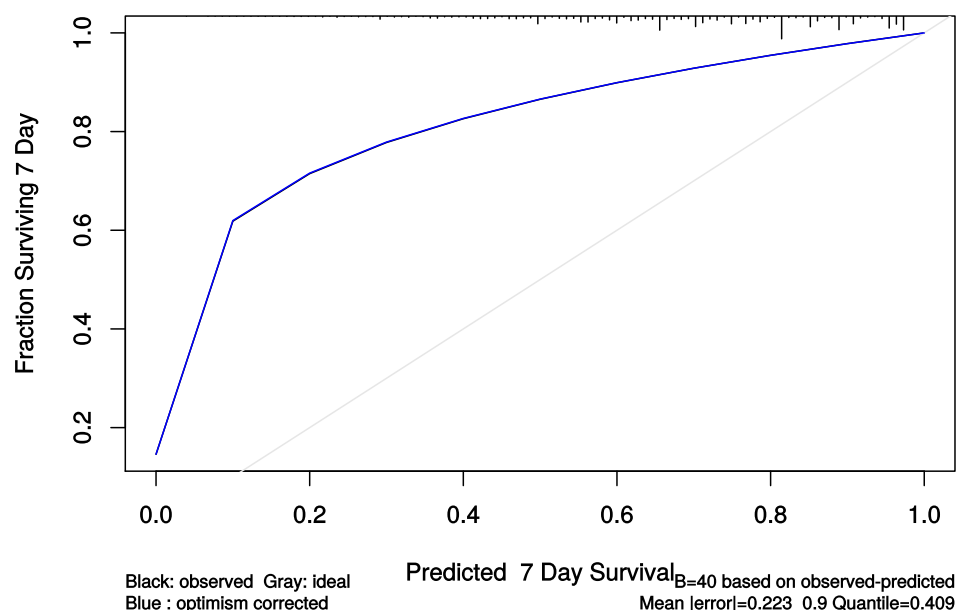
Figure 17 - Prognostic model predictions

Again, for demonstration of methods.

Prognostic model for survival 7 days after onset
qSOFA score on admission

Adjusted to:sex=Male chrincard=NO chronicpul_mhyn=NO malignantneo_mhyn=NO obesity_mhyn=NO dementia_mhyn=NO
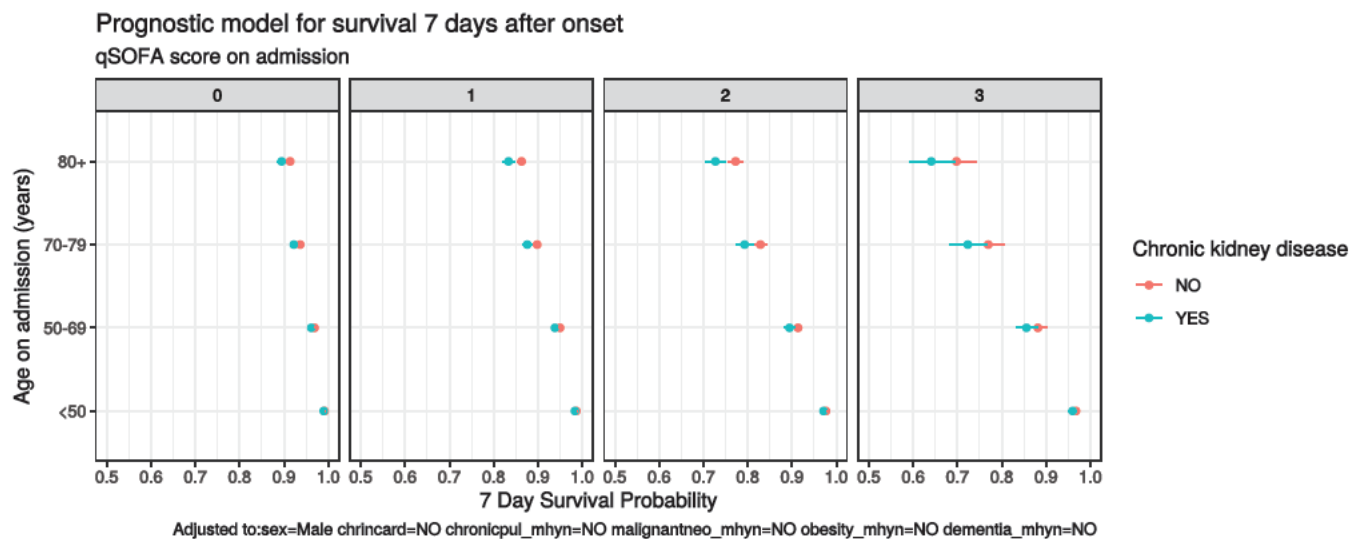
Figure 18 - Death by severity (NEWS) on admission

Number of deaths by NEWS score at admission
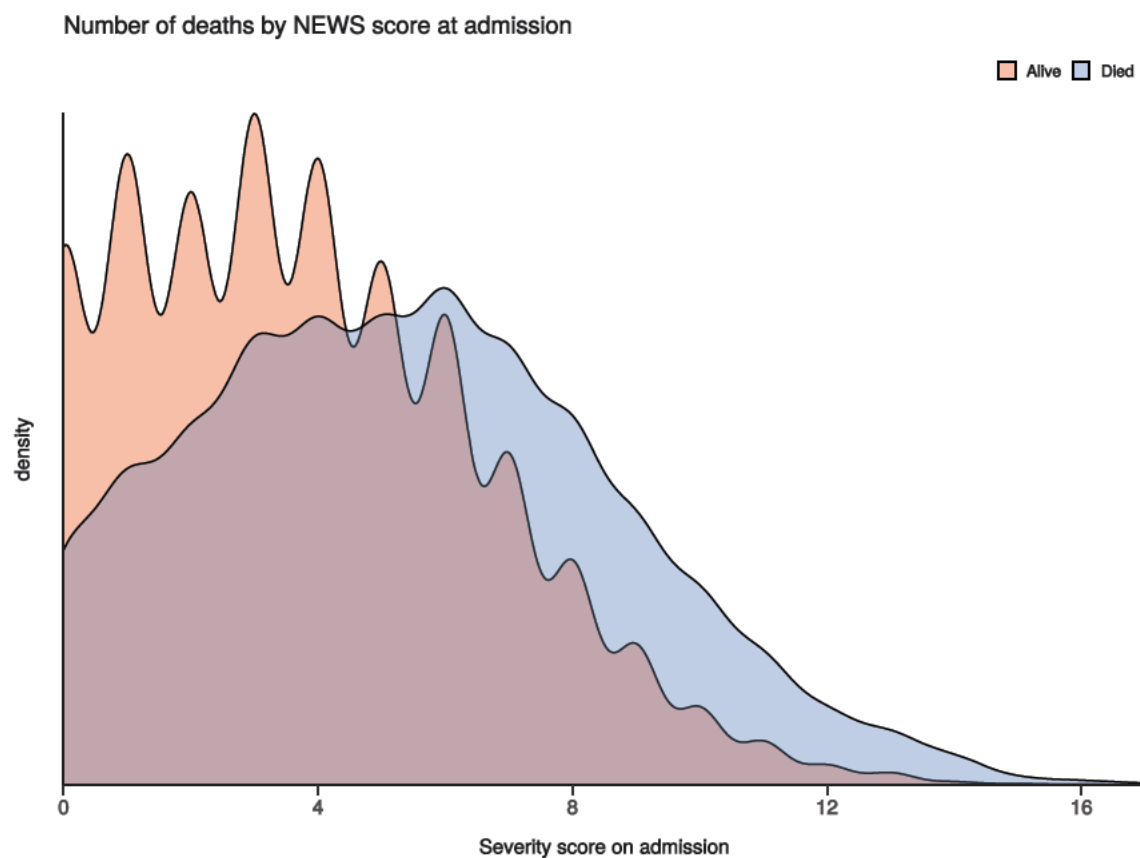
Figure 19 - Death by severity (NEWS) on admission stratified by age

Number of deaths by NEWS score at admission
Stratified by age
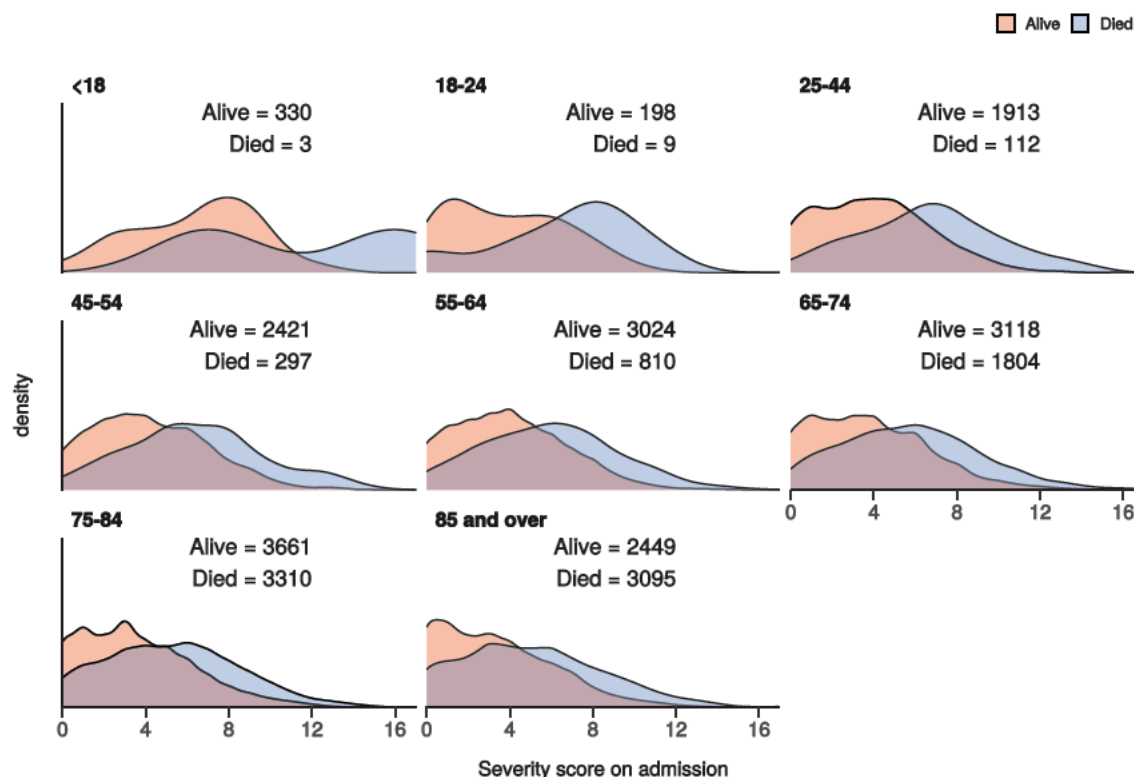
Figure 20 - Death by severity (qSOFA) on admission stratified by age

Number of deaths by qSOFA score at admission
Stratified by age
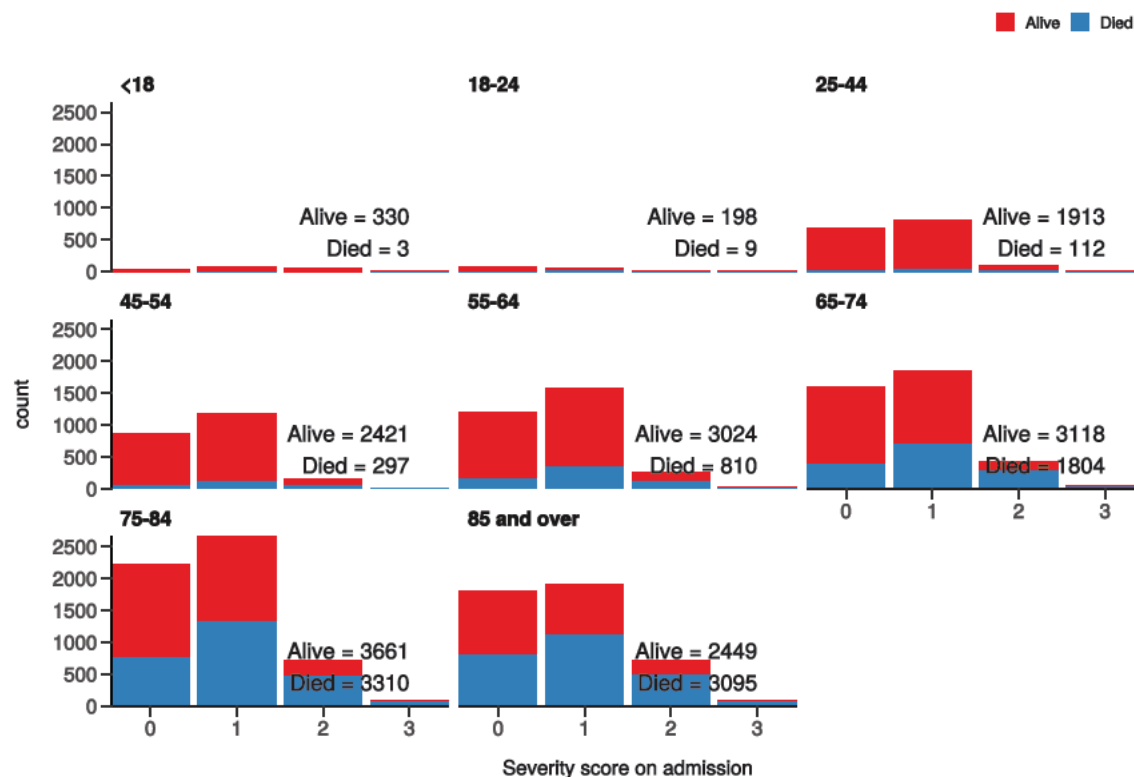
Healthcare workers

Healthcare worker		NO	YES	p
Total N (%)		29387 (94.9)	1582 (5.1)	
NEWS score on admission	Median (IQR)	4.0 (4.0)	4.0 (4.0)	0.650

Healthcare worker		NO	YES	p
Death	No	14228 (62.1)	1141 (93.2)	<0.001
	Yes	8682 (37.9)	83 (6.8)	

Admission (detail)

Table 1

label	levels	all
Total N (%)		40303 (100.0)
Age on admission (years)	Mean (SD)	69.3 (18.1)
Sex at Birth	Male	20566 (51.0)
	Female	14703 (36.5)
	Not specified	51 (0.1)
	(Missing)	4983 (12.4)
Healthcare worker	YES	1582 (3.9)
	NO	29387 (72.9)
	N/A	3459 (8.6)
	(Missing)	5875 (14.6)
Microbiology lab worker	YES	81 (0.2)
	NO	21852 (54.2)
	N/A	2563 (6.4)
	(Missing)	15807 (39.2)
Onset to admission (days)	Mean (SD)	15.8 (2101.7)
Transfer from other facility	Yes-facility is a study site	617 (1.5)
	Yes-facility is not a study site	1848 (4.6)
	No	29550 (73.3)
	N/A	1194 (3.0)
	(Missing)	7094 (17.6)
Travel in 14 d prior to symptoms	Yes	751 (1.9)
	No	18946 (47.0)
	N/A	3638 (9.0)
	(Missing)	16968 (42.1)
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	20 (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 dIvoire	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	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)

label	levels	all
	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	85 (0.2)
	Jamaica	2 (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	183 (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)

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	108 (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)	39612 (98.3)
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 dIvoire	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	0 (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)	40216 (99.8)

label	levels	all
Animal, raw meat, insect bites 14 d prior	Yes	106 (0.3)
	No	8983 (22.3)
	Unknown	12963 (32.2)
	N/A	1527 (3.8)
	(Missing)	16724 (41.5)
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 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)

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 (%)		40303 (100.0)
Fever	YES	20858 (51.8)
	NO	9466 (23.5)
	Unknown	1768 (4.4)
	(Missing)	8211 (20.4)
Cough	YES	21355 (53.0)
	NO	8785 (21.8)
	Unknown	1944 (4.8)
	(Missing)	8219 (20.4)
Cough (sputum)	YES	6308 (15.7)
	NO	18831 (46.7)
	Unknown	6763 (16.8)
	(Missing)	8401 (20.8)
Cough (blood)	YES	778 (1.9)
	NO	23771 (59.0)
	Unknown	7323 (18.2)
	(Missing)	8431 (20.9)
Sore throat	YES	2091 (5.2)
	NO	20941 (52.0)
	Unknown	8844 (21.9)
	(Missing)	8427 (20.9)
Runny nose	YES	693 (1.7)
	NO	21821 (54.1)
	Unknown	9354 (23.2)
	(Missing)	8435 (20.9)
Ear pain	YES	122 (0.3)
	NO	22392 (55.6)
	Unknown	9348 (23.2)

Stratified: all		all
	(Missing)	8441 (20.9)
Wheeze	YES	2442 (6.1)
	NO	21923 (54.4)
	Unknown	7506 (18.6)
	(Missing)	8432 (20.9)
Chest pain	YES	3643 (9.0)
	NO	22079 (54.8)
	Unknown	6164 (15.3)
	(Missing)	8417 (20.9)
Muscle ache	YES	4542 (11.3)
	NO	18904 (46.9)
	Unknown	8410 (20.9)
	(Missing)	8447 (21.0)
Joint pain	YES	1576 (3.9)
	NO	20958 (52.0)
	Unknown	9291 (23.1)
	(Missing)	8478 (21.0)
Fatigue	YES	11132 (27.6)
	NO	13900 (34.5)
	Unknown	6837 (17.0)
	(Missing)	8434 (20.9)
Shortness of breath	YES	20550 (51.0)
	NO	9001 (22.3)
	Unknown	2521 (6.3)
	(Missing)	8231 (20.4)
Lower chest wall indrawing	YES	318 (0.8)
	NO	21412 (53.1)
	Unknown	10108 (25.1)
	(Missing)	8465 (21.0)
Headache	YES	2686 (6.7)
	NO	20658 (51.3)
	Unknown	8512 (21.1)
	(Missing)	8447 (21.0)
Confusion	YES	7675 (19.0)
	NO	19570 (48.6)
	Unknown	4674 (11.6)

Stratified: all		all
	(Missing)	8384 (20.8)
Seizures	YES	421 (1.0)
	NO	25240 (62.6)
	Unknown	6185 (15.3)
	(Missing)	8457 (21.0)
Abdominal pain	YES	2669 (6.6)
	NO	22965 (57.0)
	Unknown	6265 (15.5)
	(Missing)	8404 (20.9)
Nausa/vomiting	YES	5248 (13.0)
	NO	21410 (53.1)
	Unknown	5255 (13.0)
	(Missing)	8390 (20.8)
Diarrhoea	YES	5184 (12.9)
	NO	21364 (53.0)
	Unknown	5355 (13.3)
	(Missing)	8400 (20.8)
Conjunctivitis	YES	96 (0.2)
	NO	23704 (58.8)
	Unknown	8052 (20.0)
	(Missing)	8451 (21.0)
Skin rash	YES	377 (0.9)
	NO	23922 (59.4)
	Unknown	7565 (18.8)
	(Missing)	8439 (20.9)
Skin ulcers	YES	623 (1.5)
	NO	23676 (58.7)
	Unknown	7556 (18.7)
	(Missing)	8448 (21.0)
Lymphadenopathy	YES	153 (0.4)
	NO	23710 (58.8)
	Unknown	7983 (19.8)
	(Missing)	8457 (21.0)
Bleeding (Haemorrhage)	YES	366 (0.9)
	NO	24881 (61.7)
	Unknown	6599 (16.4)

Stratified: all		all
	(Missing)	8457 (21.0)
If Bleeding (others)	YES	410 (1.0)
	NO	17385 (43.1)
	Unknown	4904 (12.2)
	(Missing)	17604 (43.7)

Comorbidity (detail)

Table 3

Stratified: all		all
Total N (%)		40303 (100.0)
Chronic cardiac disease	YES	9678 (24.0)
	NO	20945 (52.0)
	Unknown	1518 (3.8)
	(Missing)	8162 (20.3)
Chronic pulmonary disease	YES	5481 (13.6)
	NO	25027 (62.1)
	Unknown	1624 (4.0)
	(Missing)	8171 (20.3)
Asthma	YES	4232 (10.5)
	NO	26118 (64.8)
	Unknown	1738 (4.3)
	(Missing)	8215 (20.4)
Chronic kidney disease	YES	5097 (12.6)
	NO	25243 (62.6)
	Unknown	1762 (4.4)
	(Missing)	8201 (20.3)
Moderate/severe liver disease	YES	550 (1.4)
	NO	29504 (73.2)
	Unknown	2029 (5.0)
	(Missing)	8220 (20.4)
Mild Liver disease	YES	454 (1.1)
	NO	29520 (73.2)
	Unknown	2102 (5.2)
	(Missing)	8227 (20.4)
Chronic neurological disorder	YES	3576 (8.9)
	NO	26550 (65.9)

Stratified: all		all
	Unknown	1957 (4.9)
	(Missing)	8220 (20.4)
Malignancy	YES	2999 (7.4)
	NO	27062 (67.1)
	Unknown	2022 (5.0)
	(Missing)	8220 (20.4)
Chronic hematologic disease	YES	1251 (3.1)
	NO	28751 (71.3)
	Unknown	2058 (5.1)
	(Missing)	8243 (20.5)
AIDS/HIV	YES	126 (0.3)
	NO	29669 (73.6)
	Unknown	2286 (5.7)
	(Missing)	8222 (20.4)
Obesity	YES	2999 (7.4)
	NO	24608 (61.1)
	Unknown	4357 (10.8)
	(Missing)	8339 (20.7)
Diabetes with complications	YES	2214 (5.5)
	NO	27706 (68.7)
	Unknown	2179 (5.4)
	(Missing)	8204 (20.4)
Diabetes without complications	YES	5758 (14.3)
	NO	24270 (60.2)
	Unknown	2078 (5.2)
	(Missing)	8197 (20.3)
Rheumatologic disorder	YES	3121 (7.7)
	NO	26818 (66.5)
	Unknown	2117 (5.3)
	(Missing)	8247 (20.5)
Dementia	YES	4600 (11.4)
	NO	25628 (63.6)
	Unknown	1881 (4.7)
	(Missing)	8194 (20.3)
Malnutrition	YES	726 (1.8)
	NO	27865 (69.1)

Stratified: all		all
	Unknown	3407 (8.5)
	(Missing)	8305 (20.6)
Smoking	YES	1544 (3.8)
	NO	20773 (51.5)
	(Missing)	17986 (44.6)