

Dynamic CO-CIN report to SAGE and NERVTAG (All cases)

Dynamic content updated: 2021-01-27 04:14:31.

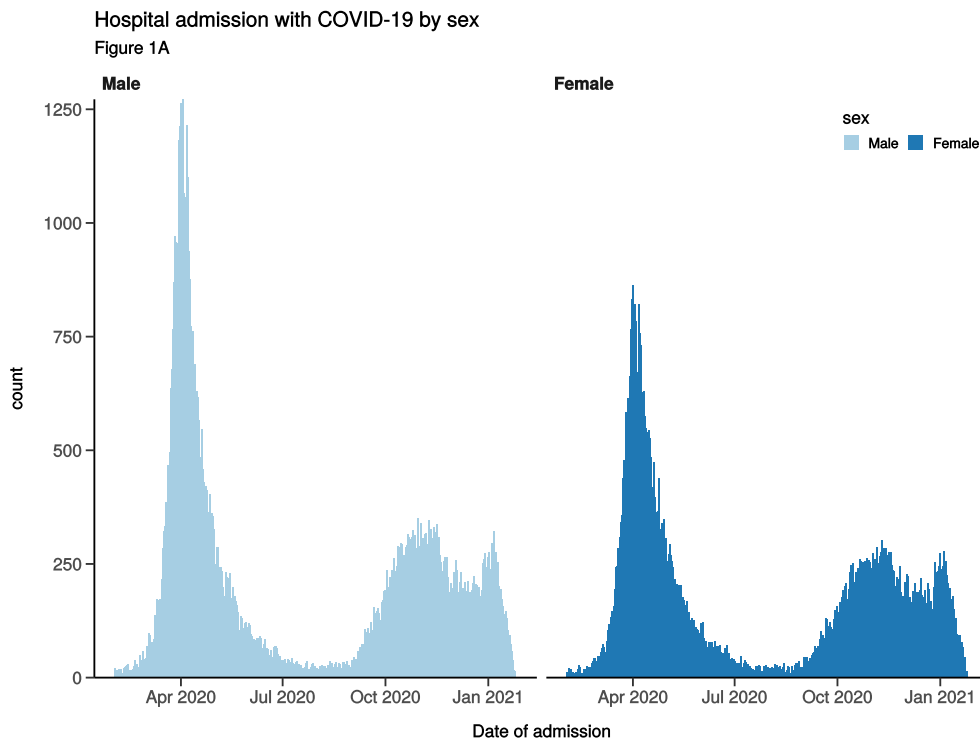
Executive summary

Includes all patients

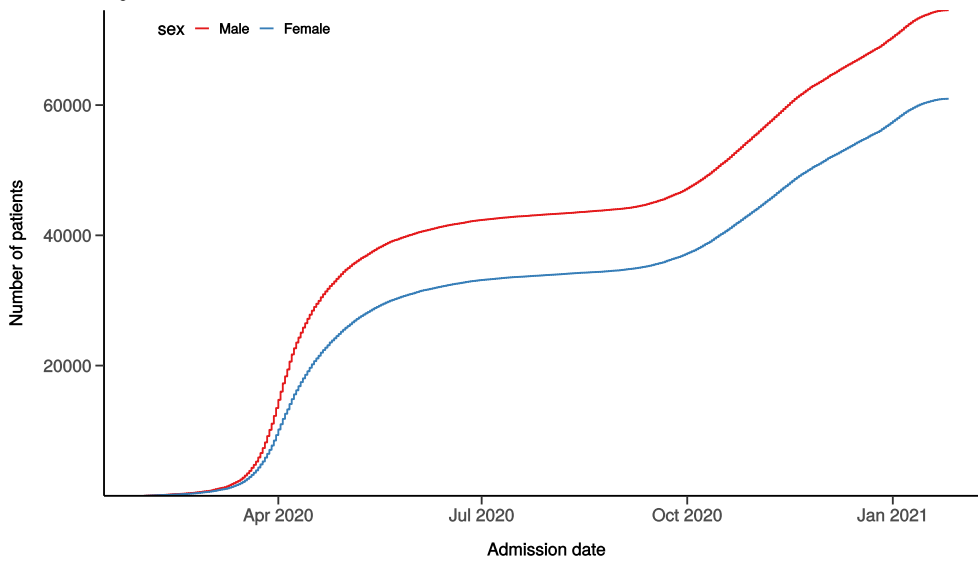
There are 165940 patients included in CO-CIN. Of these, 34175 patient(s) have died and 21004 required ICU. 77949 have been discharged home.

Admission

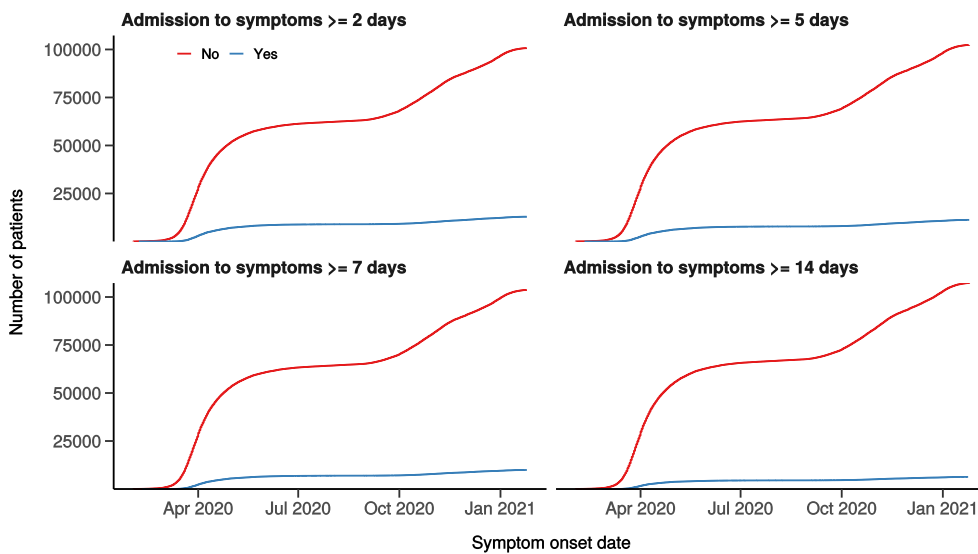
Figure 1



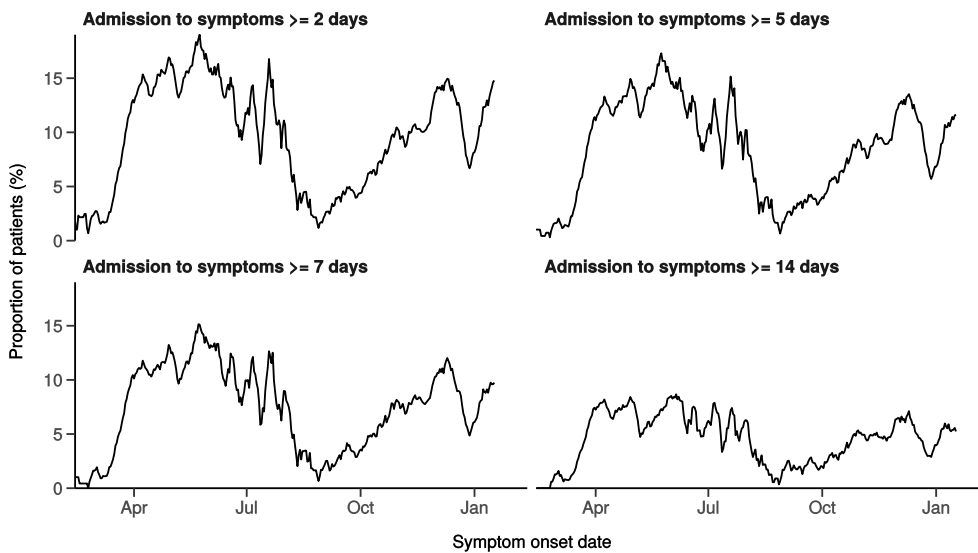
Hospital admission with COVID-19 by sex
Figure 1B



Number with symptom onset occurring after admission to hospital
Figure 1C

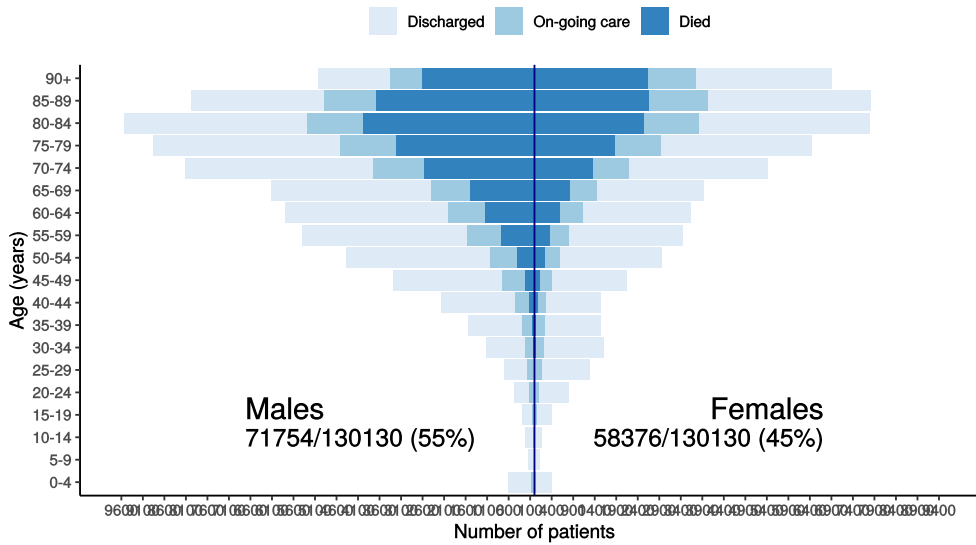


Proportion with symptom onset occurring after hospital admission
Figure 1D - 7-day rolling percentage. n = 113567



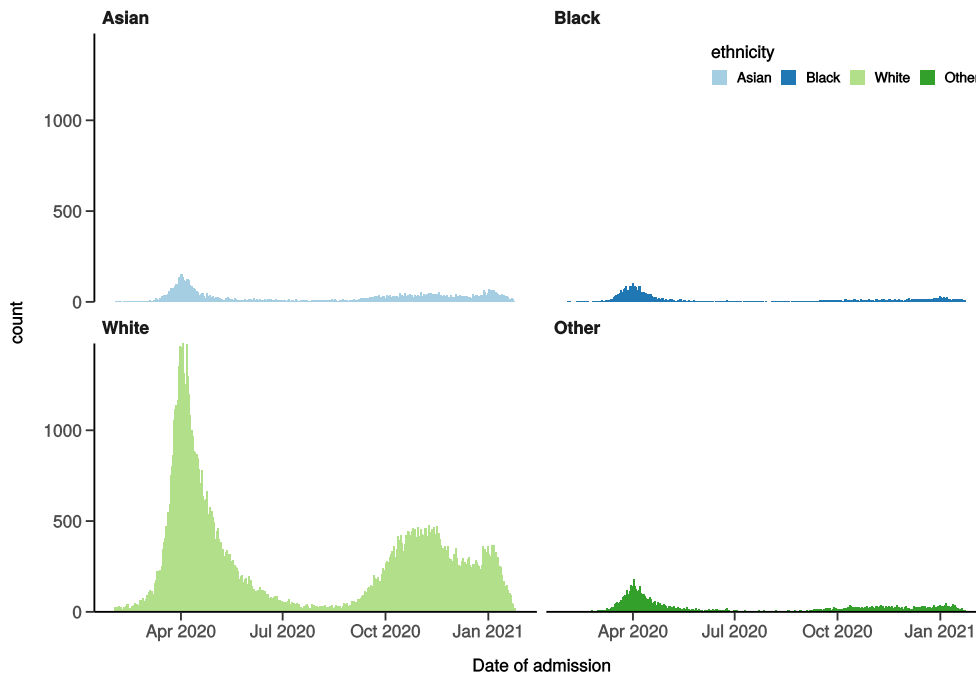
Patients with outcome stratified by age, and sex

Figure 1E



Hospital admission with COVID-19 by ethnicity

Figure 1F

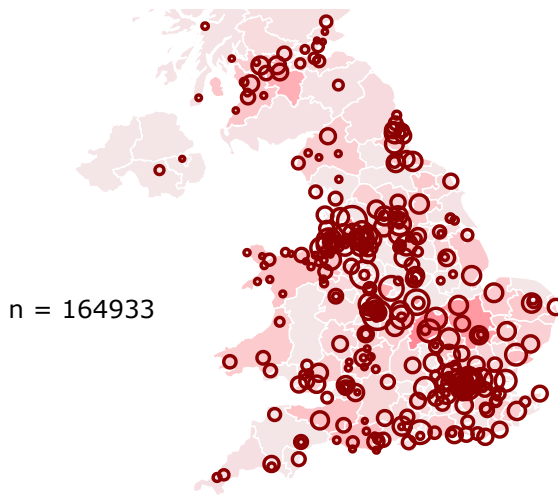


Location by CCG / Healthboard

Figure 2

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





Symptoms and comorbidity

Figure 3A

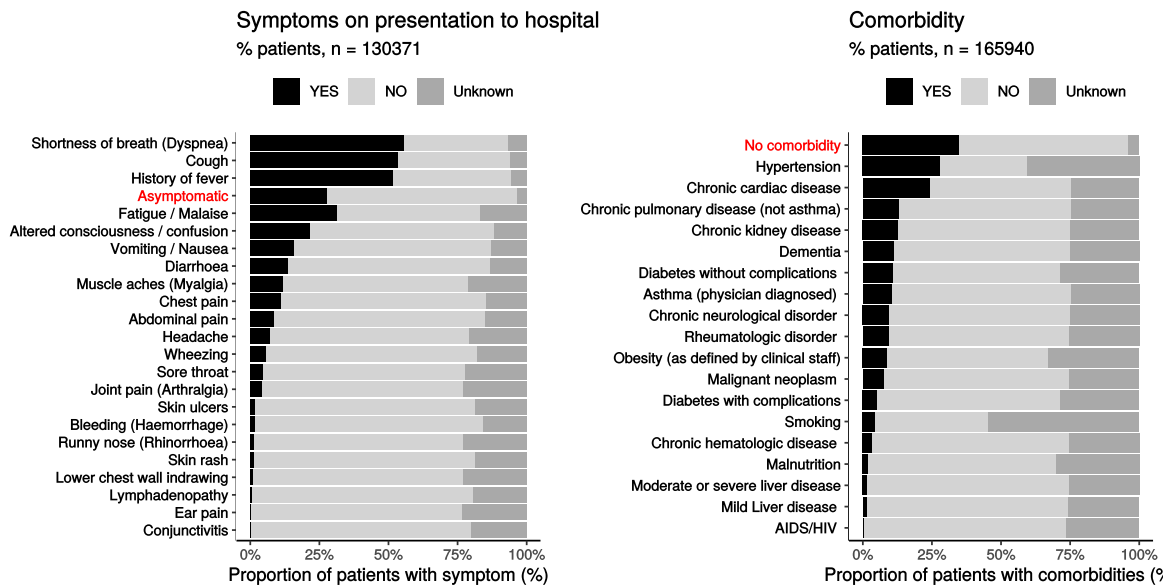


Figure 3B - Symptoms by Age

Symptoms on presentation to hospital
Stratified by age

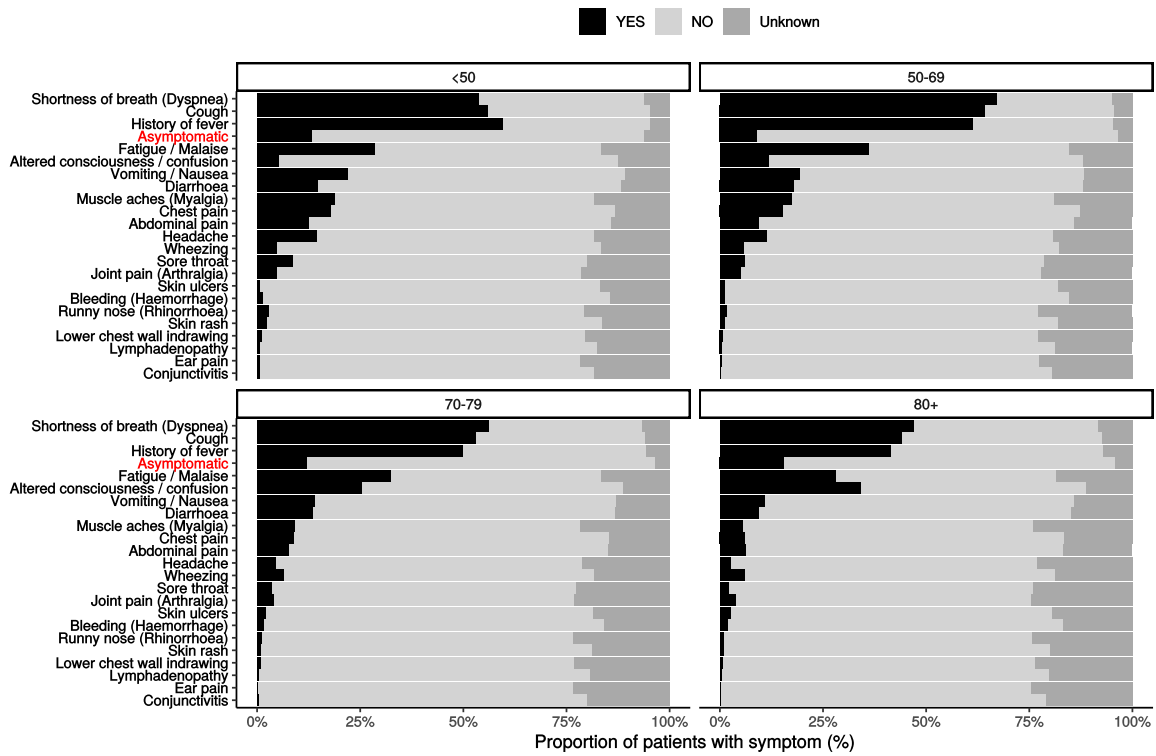
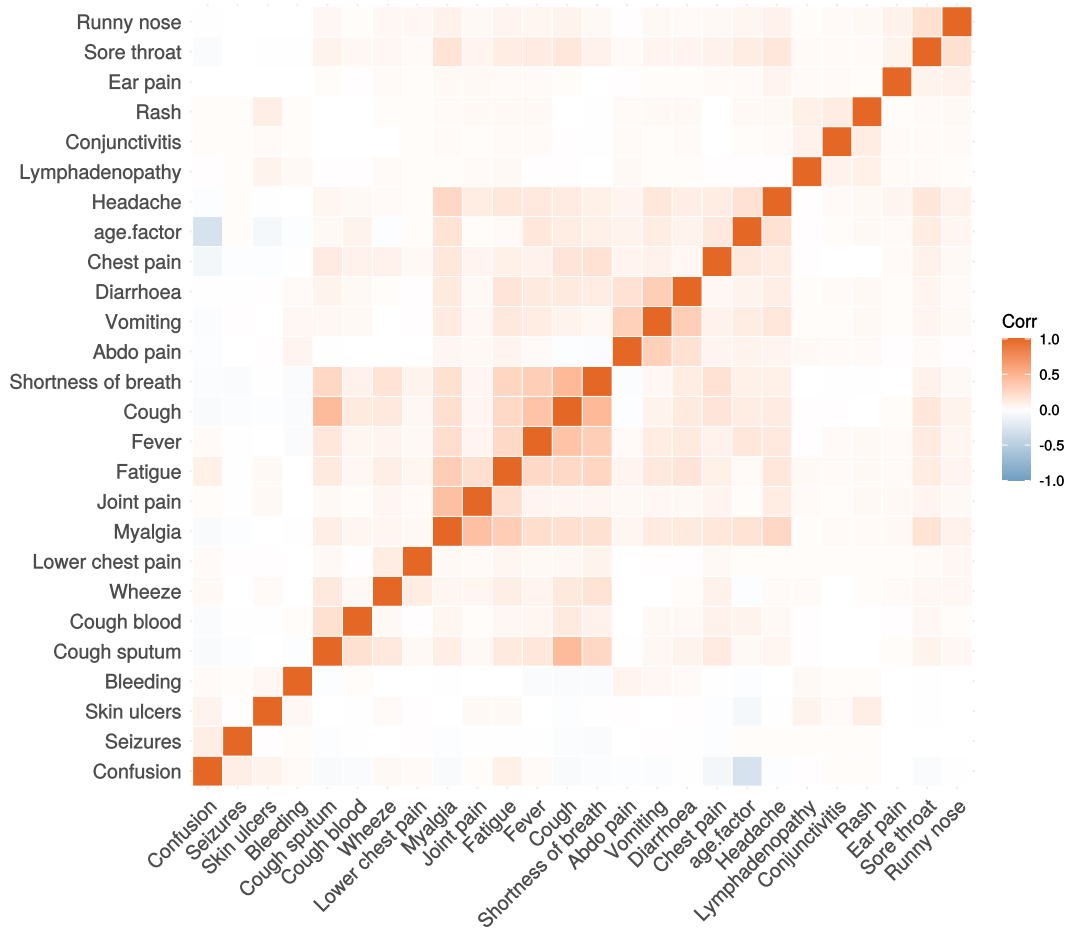


Figure 3C

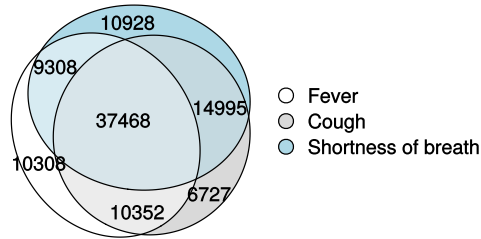
Correlation of symptoms in all pages. Note clusters, top right to bottom left, flu-like, coryzal, abdominal, respiratory, neurocutaneous.



Symptoms (diagnostic criteria)

Figure 4A

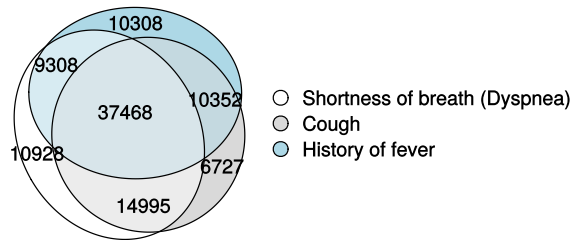
n = 130371



Symptoms (most common)

Figure 4B

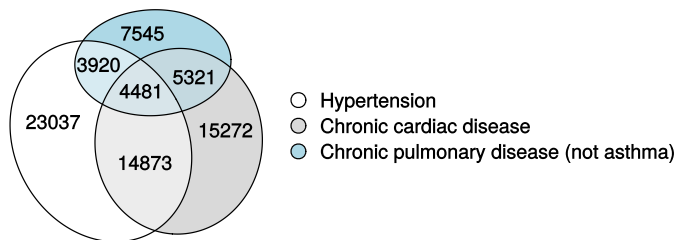
n = 130371



Comorbidity (most common)

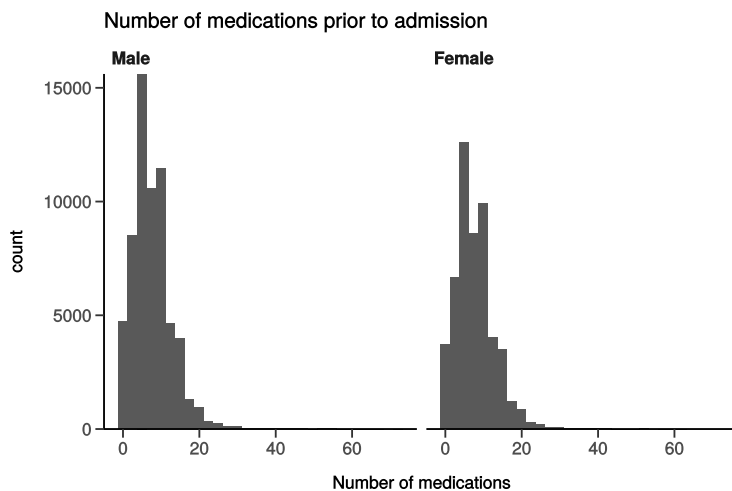
Figure 4C

n = 165940



Medication prior to illness

Figure 5

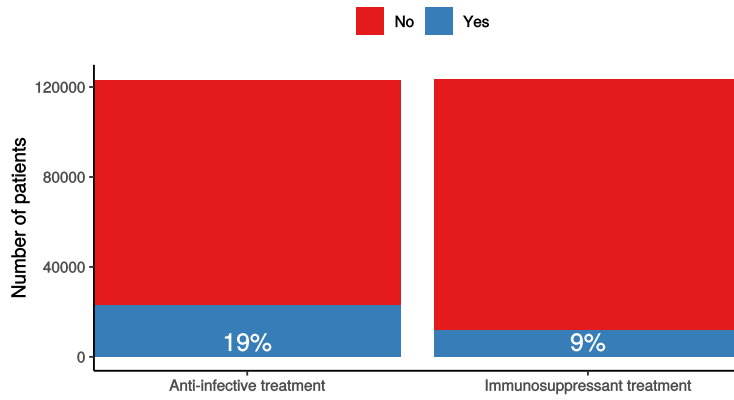


Preadmission treatment

Figure 6

Pre-admission treatment

Anti-infectives for illness episode (left) immunosuppressants including oral (no



Patient flow

Figure 7A - All patients

N = 134268

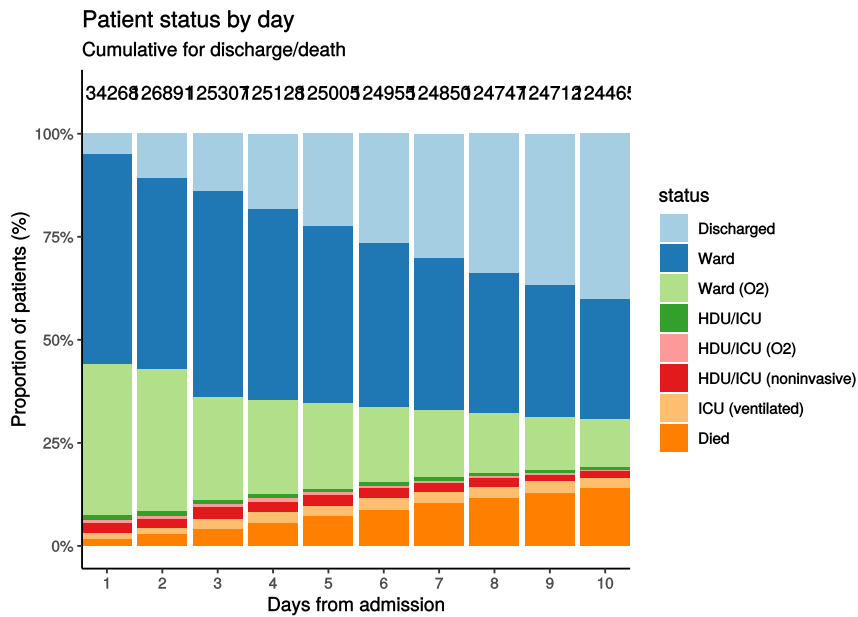
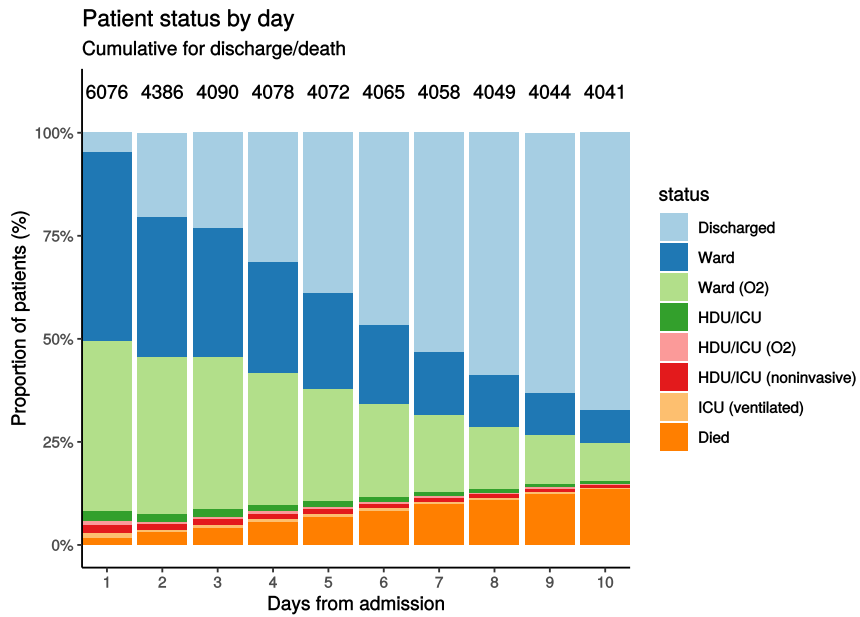


Figure 7B - Patients admitted ≥ 14 days and ≤ 28 days ago

N = 6076



Oxygen requirement

Figure 8A - All patients

N = 126978

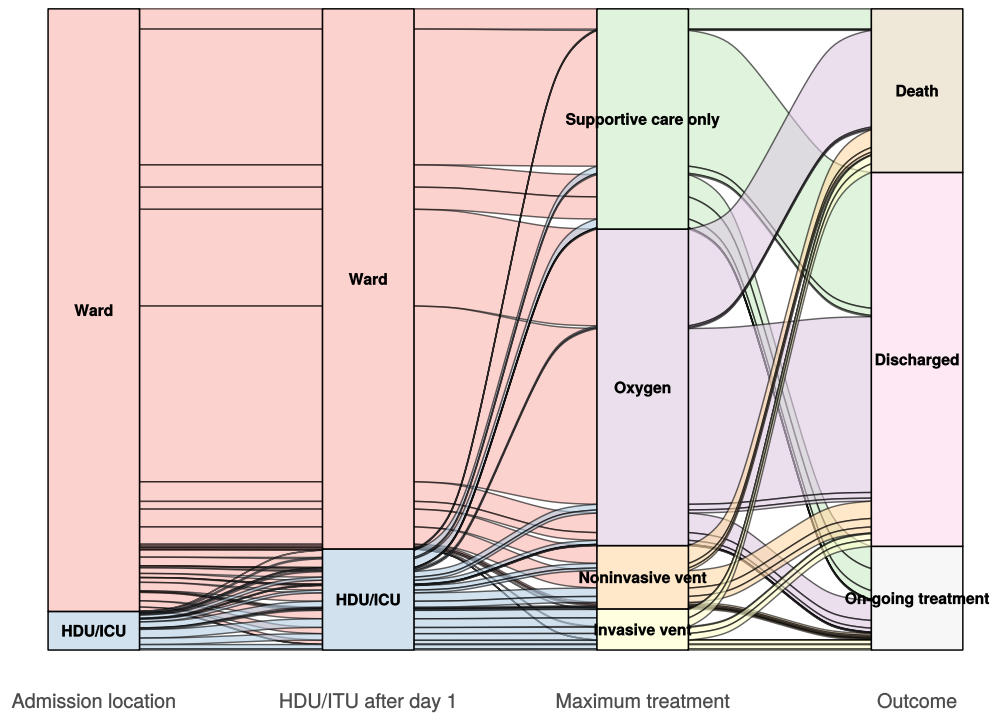


Figure 8B - Patients admitted ≥ 14 days and ≤ 28 days ago

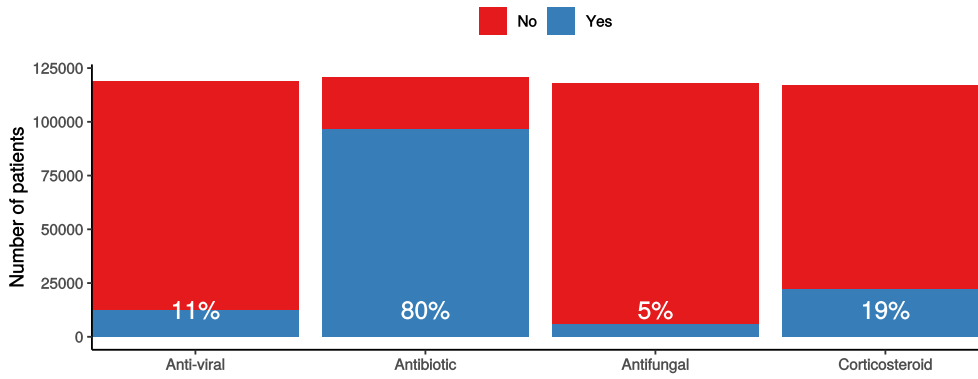
N = 5774

In-hospital medical treatment

Figure 9

In-hospital treatment

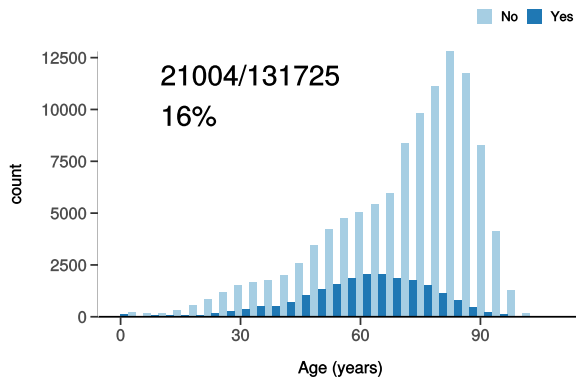
Anti-virals, antibiotics, corticosteroids, and anti-fungals for patients who have completed journey.



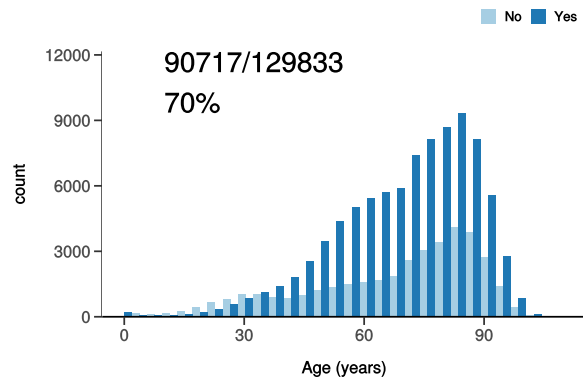
Treatment

Figure 10

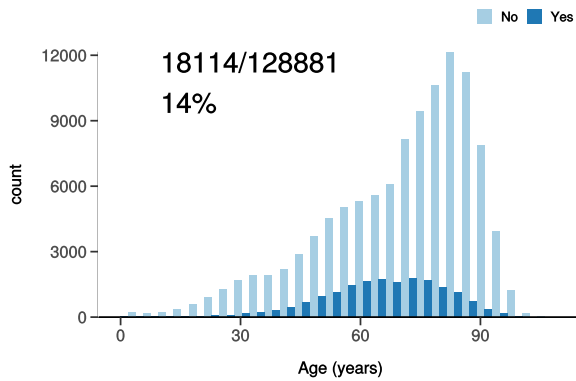
ICU/HDU admission
Figure 10A



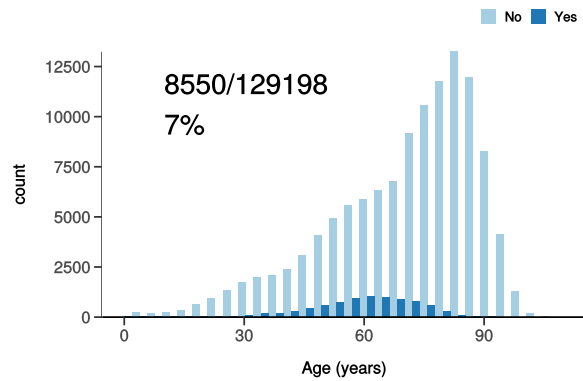
High flow oxygen
Figure 10B



Noninvasive ventilation
Figure 10C



Invasive ventilation
Figure 10D

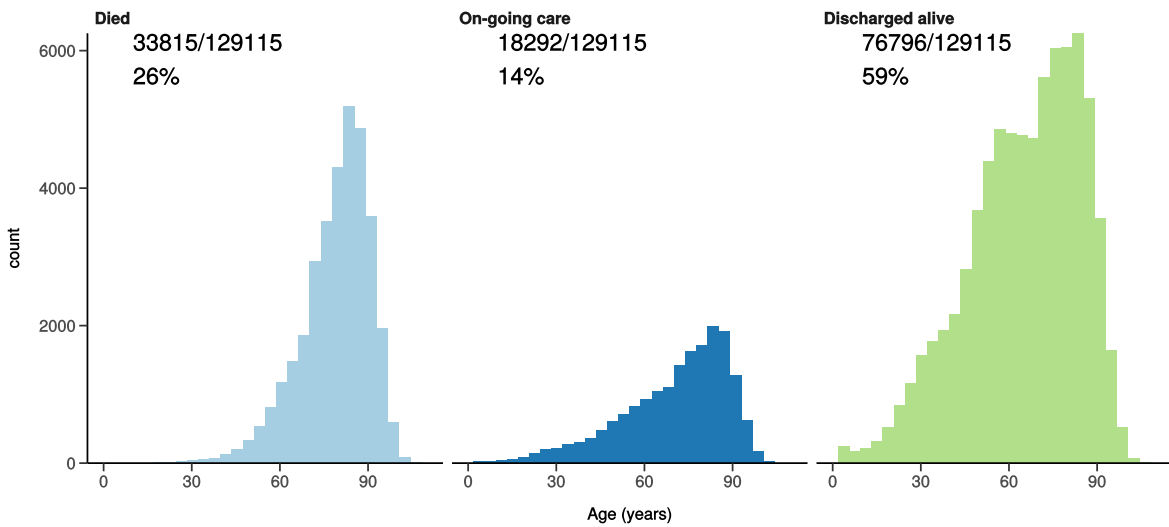


Status in patients admitted ≥ 14 days from today

Figure 11

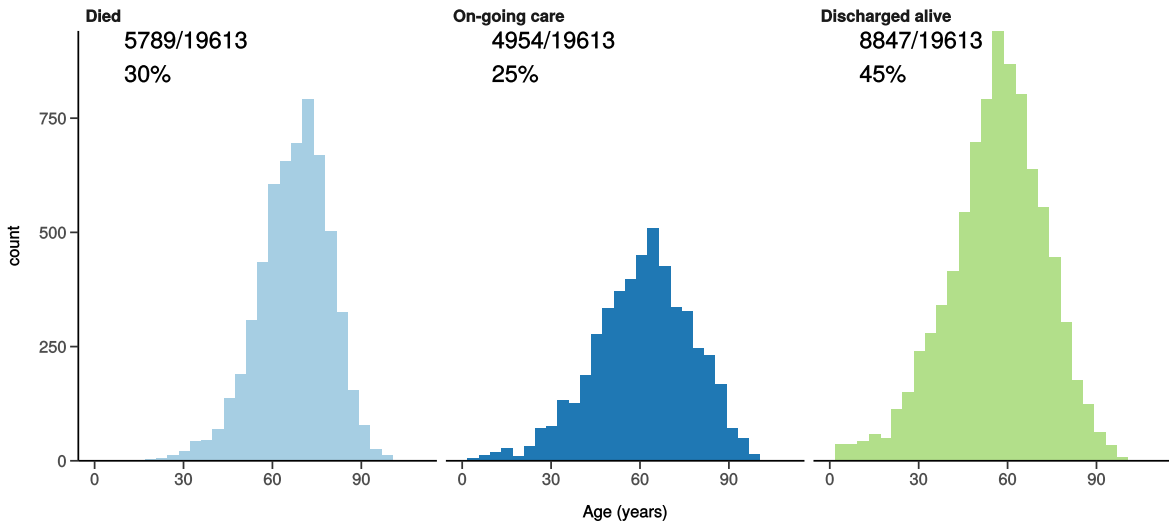
All: status in patients admitted ≥ 14 days ago

Figure 11A



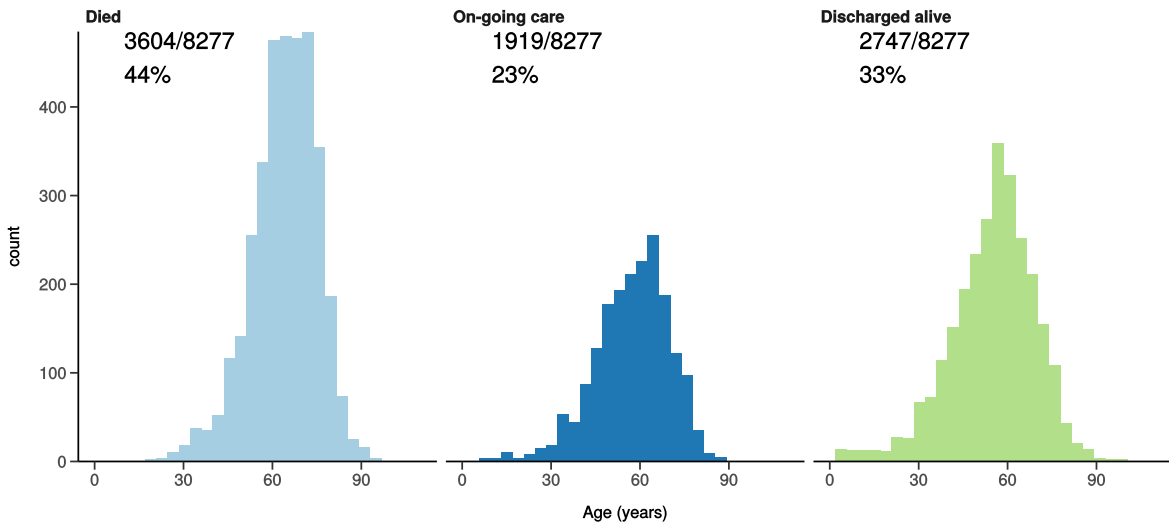
ICU/HDU admissions: status in patients admitted ≥ 14 days ago

Figure 11B



Invasive ventilation: status in patients admitted ≥ 14 days ago

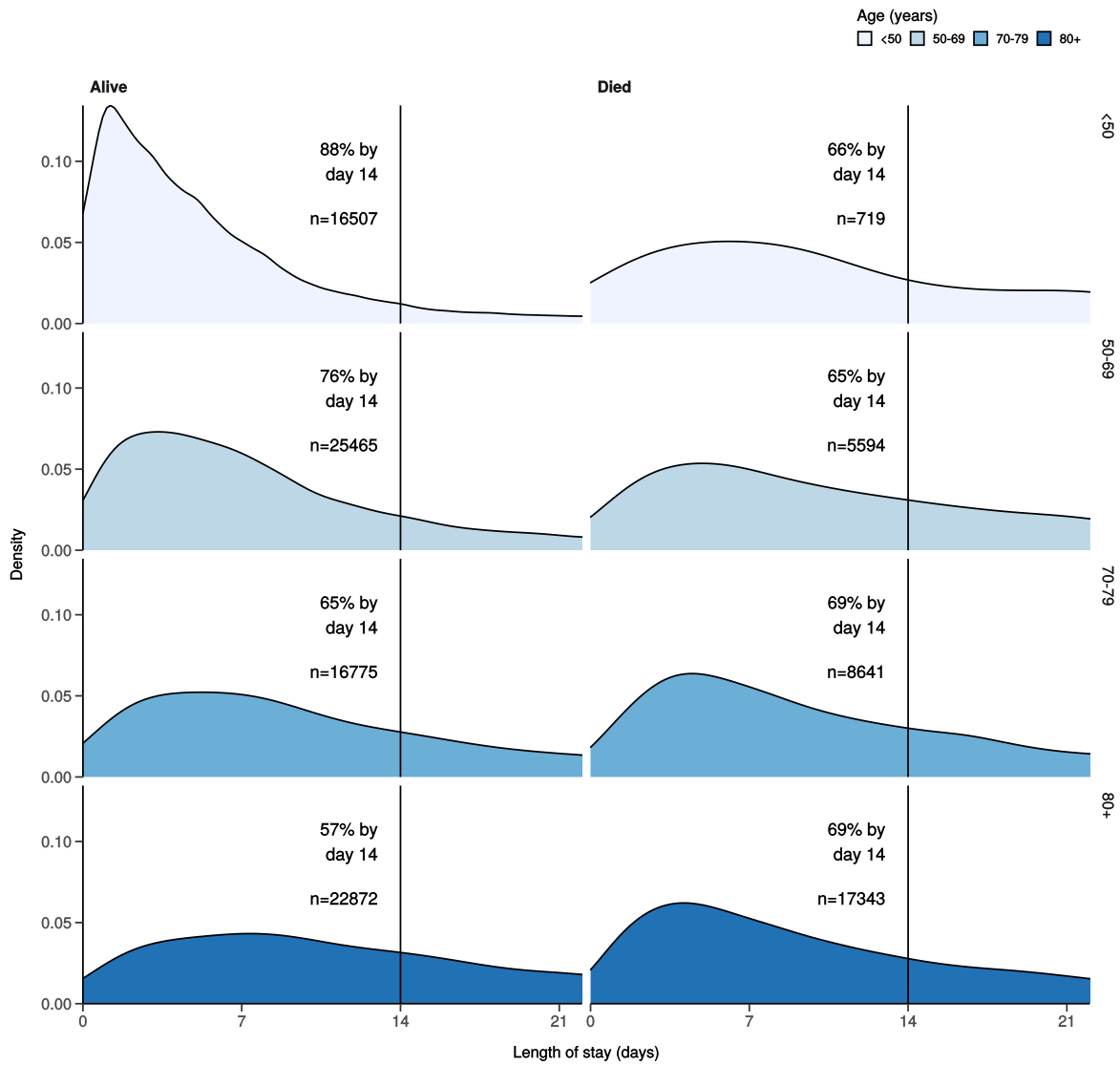
Figure 11c



Length of stay stratified by age

Figure 12

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	18693 (96.1)	766 (3.9)	•	•
	50-69	27875 (82.7)	5835 (17.3)	5.11 (4.73-5.52, p<0.001)	4.63 (4.25-5.06, p<0.001)
	70-79	18417 (67.2)	8995 (32.8)	11.92 (11.05-12.88, p<0.001)	9.63 (8.83-10.51, p<0.001)
	80+	24996 (58.0)	18119 (42.0)	17.69 (16.43-19.08, p<0.001)	14.11 (12.95-15.40, p<0.001)
Sex at Birth	Male	47892 (70.2)	20357 (29.8)	•	•
	Female	42149 (75.9)	13383 (24.1)	0.75 (0.73-0.77, p<0.001)	0.69 (0.67-0.71, p<0.001)
	Not specified	0 (NaN)	0 (NaN)	•	•

Dependent: death		No	Yes	OR (univariable)	OR (multivariable)
Chronic cardiac disease	NO	61439 (77.7)	17604 (22.3)	•	•
	YES	23214 (62.4)	13995 (37.6)	2.10 (2.05-2.16, p<0.001)	1.15 (1.12-1.19, p<0.001)
Chronic pulmonary disease (not asthma)	NO	72299 (75.1)	23937 (24.9)	•	•
	YES	12268 (62.1)	7494 (37.9)	1.85 (1.79-1.91, p<0.001)	1.34 (1.29-1.39, p<0.001)
Chronic neurological disorder	NO	74488 (74.0)	26199 (26.0)	•	•
	YES	9590 (65.9)	4957 (34.1)	1.47 (1.42-1.53, p<0.001)	1.12 (1.07-1.17, p<0.001)
Chronic hematologic disease	NO	80470 (73.3)	29283 (26.7)	•	•
	YES	3398 (65.9)	1759 (34.1)	1.42 (1.34-1.51, p<0.001)	1.05 (0.98-1.12, p=0.206)
Chronic kidney disease	NO	72539 (75.6)	23438 (24.4)	•	•
	YES	11814 (59.9)	7896 (40.1)	2.07 (2.00-2.14, p<0.001)	1.30 (1.25-1.36, p<0.001)
Dementia	NO	74302 (75.8)	23709 (24.2)	•	•
	YES	9744 (56.7)	7433 (43.3)	2.39 (2.31-2.47, p<0.001)	1.39 (1.34-1.45, p<0.001)
Obesity (as defined by clinical staff)	NO	65727 (72.9)	24465 (27.1)	•	•
	YES	10340 (77.3)	3034 (22.7)	0.79 (0.75-0.82, p<0.001)	1.17 (1.11-1.23, p<0.001)
Malignant neoplasm	NO	76992 (74.5)	26313 (25.5)	•	•
	YES	6945 (59.3)	4773 (40.7)	2.01 (1.93-2.09, p<0.001)	1.50 (1.43-1.57, p<0.001)

Number in dataframe = 134887, Number in model = 98705, Missing = 36182, AIC = 100275.5, C-statistic = 0.728, H&L = Chi-sq(8) 176.75 (p<0.001)

Figure 13 - Adjusted odds ratio plot

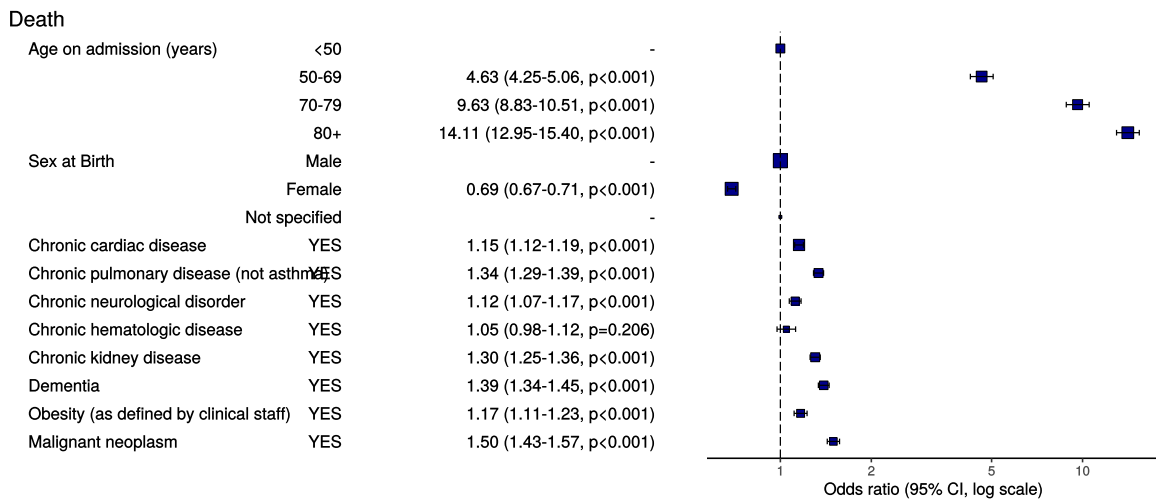
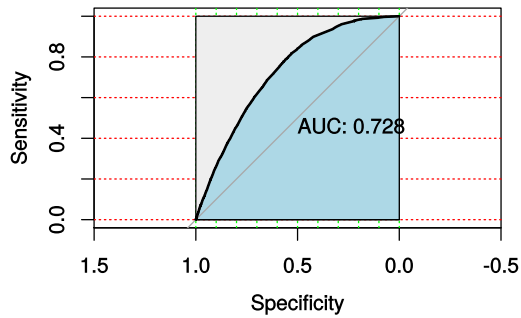


Figure 14 - ROC

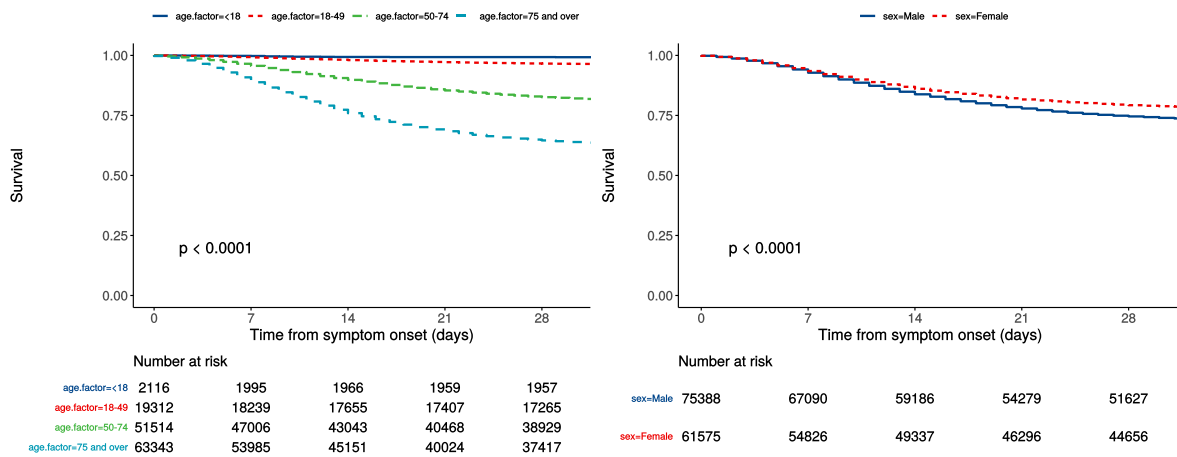


Survival models

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

Figure 15

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	21428 (15.7)	•	•
	50-69	37321 (27.4)	4.69 (4.35-5.06, p<0.001)	4.27 (3.90-4.67, p<0.001)
	70-79	30335 (22.3)	9.92 (9.21-10.68, p<0.001)	8.76 (8.01-9.59, p<0.001)
	80+	47213 (34.6)	13.85 (12.88-14.89, p<0.001)	12.01 (10.98-13.13, p<0.001)
Sex at Birth	Male	75388 (55.0)	•	•
	Female	61575 (45.0)	0.79 (0.77-0.80, p<0.001)	0.77 (0.75-0.80, p<0.001)
qSOFA score on admission	0	52962 (46.4)	•	•
	1	49497 (43.4)	1.65 (1.61-1.70, p<0.001)	1.78 (1.73-1.84, p<0.001)
	2	10572 (9.3)	3.30 (3.19-3.42, p<0.001)	3.06 (2.94-3.18, p<0.001)
	3	1051 (0.9)	5.62 (5.19-6.08, p<0.001)	5.01 (4.58-5.48, p<0.001)
Symptomatic at presentation	No symptoms	13745 (10.5)	•	•

Dependent: Surv(time, status)		all	HR (univariable)	HR (multivariable)
	Symptoms	116776 (89.5)	1.87 (1.79-1.96, p<0.001)	•
Chronic cardiac disease	NO	85071 (68.2)	•	•
	YES	39750 (31.8)	1.89 (1.85-1.93, p<0.001)	1.14 (1.11-1.18, p<0.001)
Chronic kidney disease	NO	103208 (83.1)	•	•
	YES	20994 (16.9)	1.85 (1.80-1.90, p<0.001)	1.23 (1.20-1.27, p<0.001)
Moderate or severe liver disease	NO	120684 (98.0)	•	•
	YES	2433 (2.0)	1.35 (1.25-1.45, p<0.001)	1.46 (1.34-1.60, p<0.001)
Chronic neurological disorder	NO	108150 (87.4)	•	•
	YES	15543 (12.6)	1.39 (1.35-1.44, p<0.001)	•
Malignant neoplasm	NO	111030 (89.9)	•	•
	YES	12466 (10.1)	1.76 (1.71-1.82, p<0.001)	1.38 (1.33-1.43, p<0.001)
Chronic hematologic disease	NO	117887 (95.6)	•	•
	YES	5437 (4.4)	1.34 (1.28-1.41, p<0.001)	•
Obesity (as defined by clinical staff)	NO	96736 (87.1)	•	•
	YES	14388 (12.9)	0.81 (0.78-0.84, p<0.001)	1.10 (1.05-1.15, p<0.001)
Diabetes without complications	NO	100647 (85.1)	•	•
	YES	17597 (14.9)	1.26 (1.23-1.30, p<0.001)	•
Rheumatologic disorder	NO	107764 (87.6)	•	•
	YES	15324 (12.4)	1.16 (1.12-1.20, p<0.001)	•
Dementia	NO	105480 (85.3)	•	•
	YES	18186 (14.7)	2.12 (2.07-2.18, p<0.001)	1.18 (1.15-1.22, p<0.001)
Malnutrition	NO	112435 (97.4)	•	•
	YES	3004 (2.6)	1.53 (1.44-1.62, p<0.001)	•
smoking_mhyn_2levels	NO	67124 (52.5)	•	•
	YES	7181 (5.6)	0.85 (0.81-0.90, p<0.001)	•
	N/K	53479 (41.9)	1.13 (1.10-1.16, p<0.001)	•

Number in dataframe = 137522, Number in model = 93260, Missing = 44262, Number of events = 23138, Concordance = 0.732 (SE = 0.002), R-squared = 0.155 (Max possible = 0.996), Likelihood ratio test = 15754.409 (df = 13, p = 0.000)

Figure 16a - Multivariable Cox proportional hazards model

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

Age on admission (years)	<50	-
	50-69	4.27 (3.90-4.67, p<0.001)
	70-79	8.76 (8.01-9.59, p<0.001)
	80+	12.01 (10.98-13.13, p<0.001)
Sex at Birth	Female	0.77 (0.75-0.80, p<0.001)
qSOFA score on admission	0	-
	1	1.78 (1.73-1.84, p<0.001)
	2	3.06 (2.94-3.18, p<0.001)
	3	5.01 (4.58-5.48, p<0.001)
Chronic cardiac disease	YES	1.14 (1.11-1.18, p<0.001)
Chronic kidney disease	YES	1.23 (1.20-1.27, p<0.001)
Moderate or severe liver disease	YES	1.46 (1.34-1.60, p<0.001)
Malignant neoplasm	YES	1.38 (1.33-1.43, p<0.001)
Obesity (as defined by clinical staff)	YES	1.10 (1.05-1.15, p<0.001)
Dementia	YES	1.18 (1.15-1.22, p<0.001)

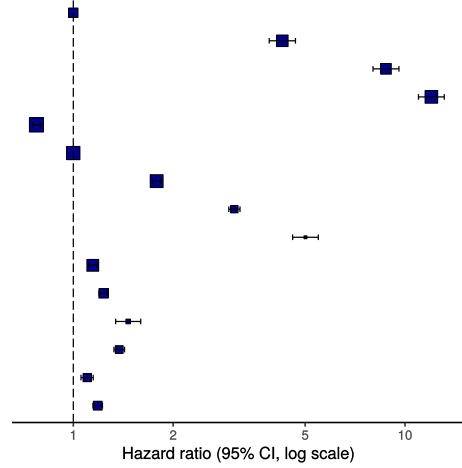
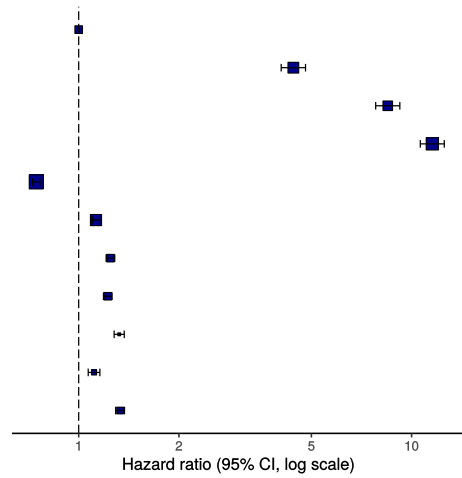


Figure 16b - Multivariable Cox proportional hazards model (age, sex, comorbidities only)

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

Age on admission (years)	<50	-
	50-69	4.41 (4.06-4.80, p<0.001)
	70-79	8.48 (7.80-9.22, p<0.001)
	80+	11.54 (10.62-12.54, p<0.001)
Sex at Birth	Female	0.75 (0.73-0.76, p<0.001)
Chronic cardiac disease	YES	1.13 (1.10-1.16, p<0.001)
Chronic pulmonary disease (not asthma)	YES	1.25 (1.21-1.28, p<0.001)
Chronic kidney disease	YES	1.22 (1.19-1.26, p<0.001)
Malignant neoplasm	YES	1.32 (1.28-1.37, p<0.001)
Obesity (as defined by clinical staff)	YES	1.11 (1.07-1.16, p<0.001)
Dementia	YES	1.33 (1.29-1.37, p<0.001)



ROC = 0.7320741

Figure 17 - Predictions calibration plot

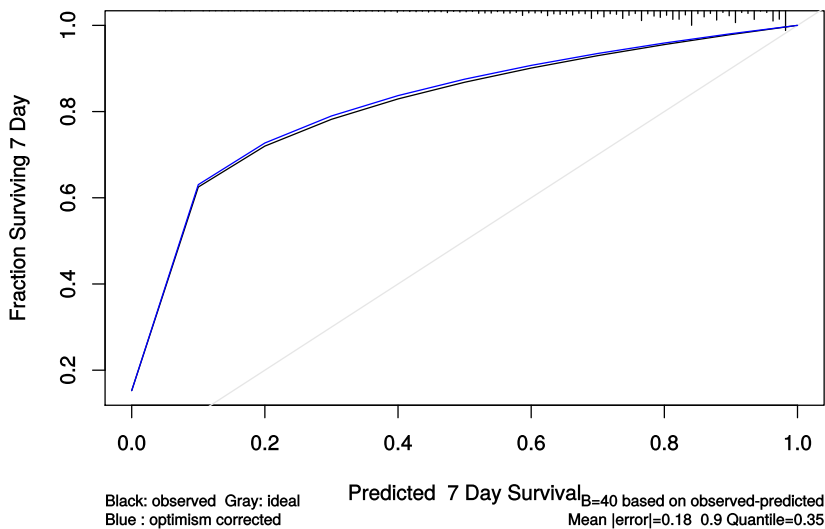


Figure 18 - Prognostic model predictions

Again, for demonstration of methods.

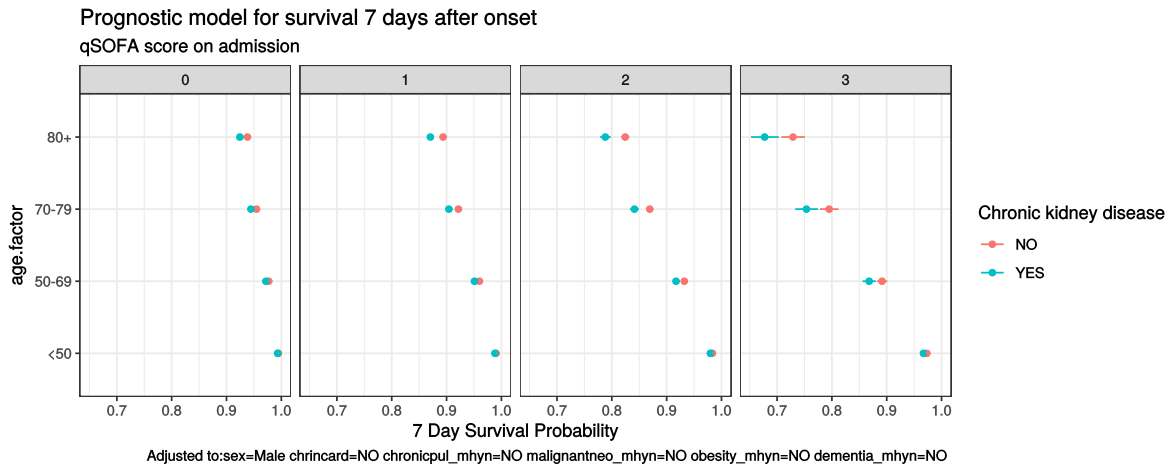


Figure 19 - Death by severity (NEWS) on admission

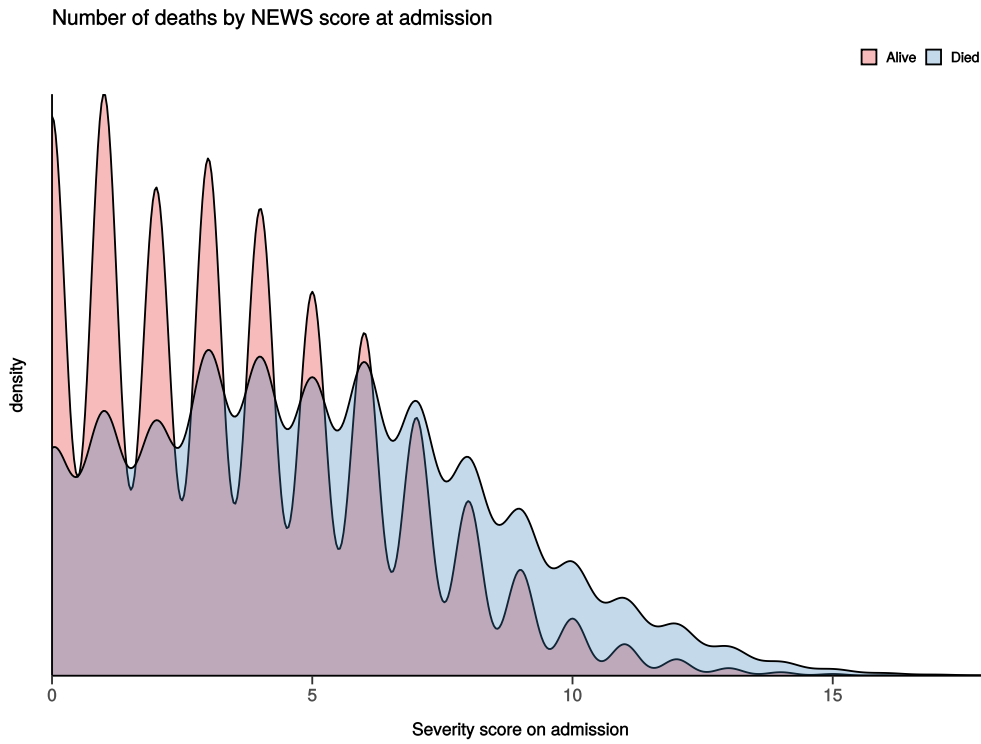


Figure 20 - Death by severity (NEWS) on admission stratified by age

Number of deaths by NEWS score at admission
Stratified by age

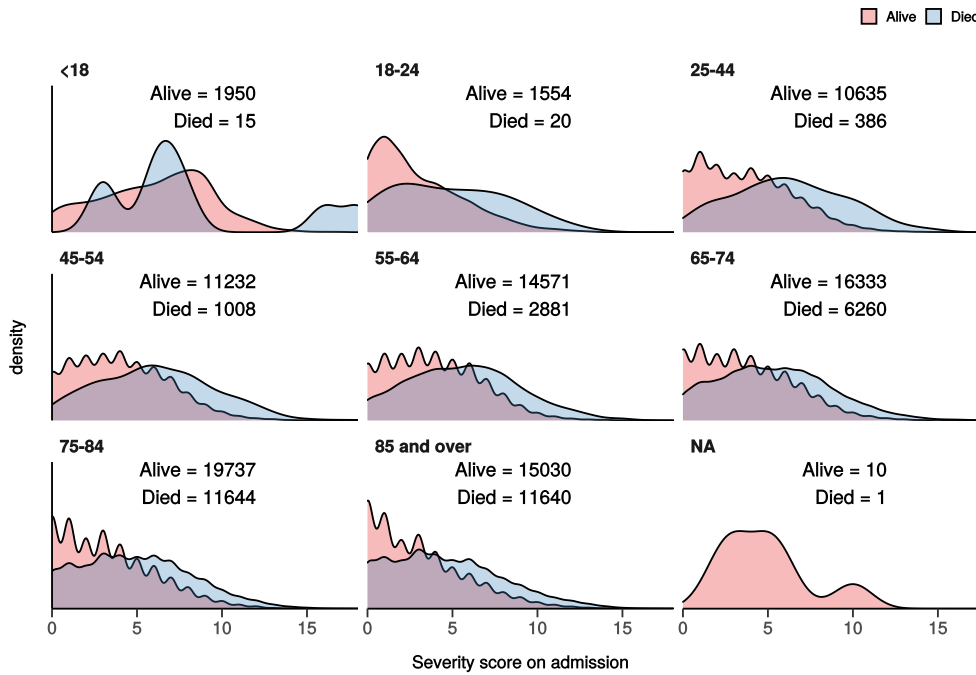
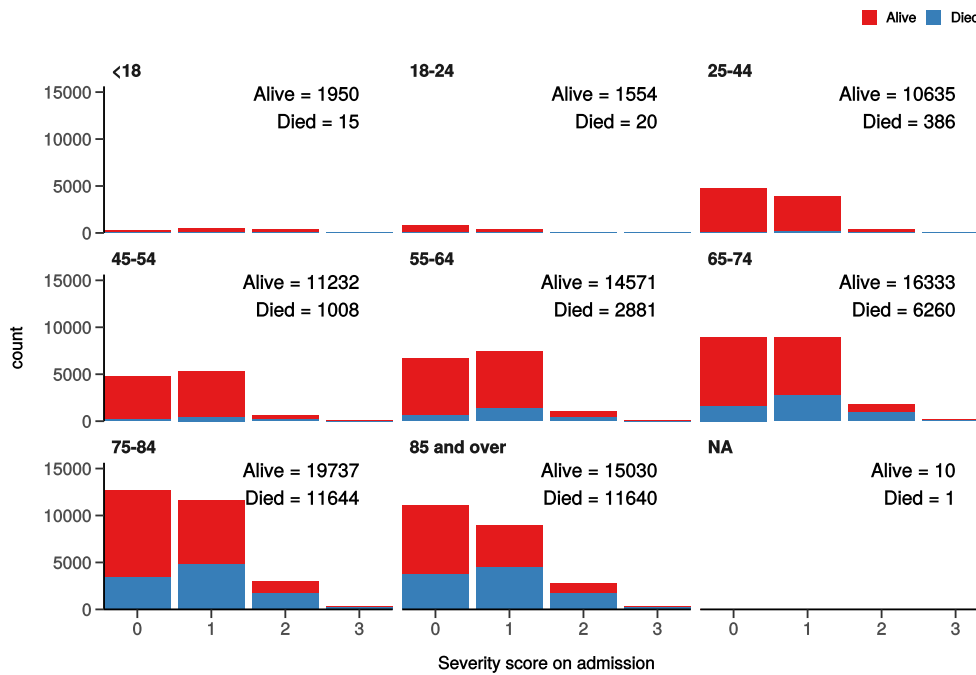


Figure 21 - Death by severity (qSOFA) on admission stratified by age

Number of deaths by qSOFA score at admission
Stratified by age



Healthcare workers

Employed as a healthcare worker?		NO	YES	p
Total N (%)		115611 (96.2)	4599 (3.8)	
NEWS score on admission	Median (IQR)	3.0 (5.0)	4.0 (4.0)	<0.001
Death	No	72518 (70.2)	4030 (93.1)	<0.001
	Yes	30750 (29.8)	300 (6.9)	