

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

Dynamic content updated: 2020-10-21 04:32:45.

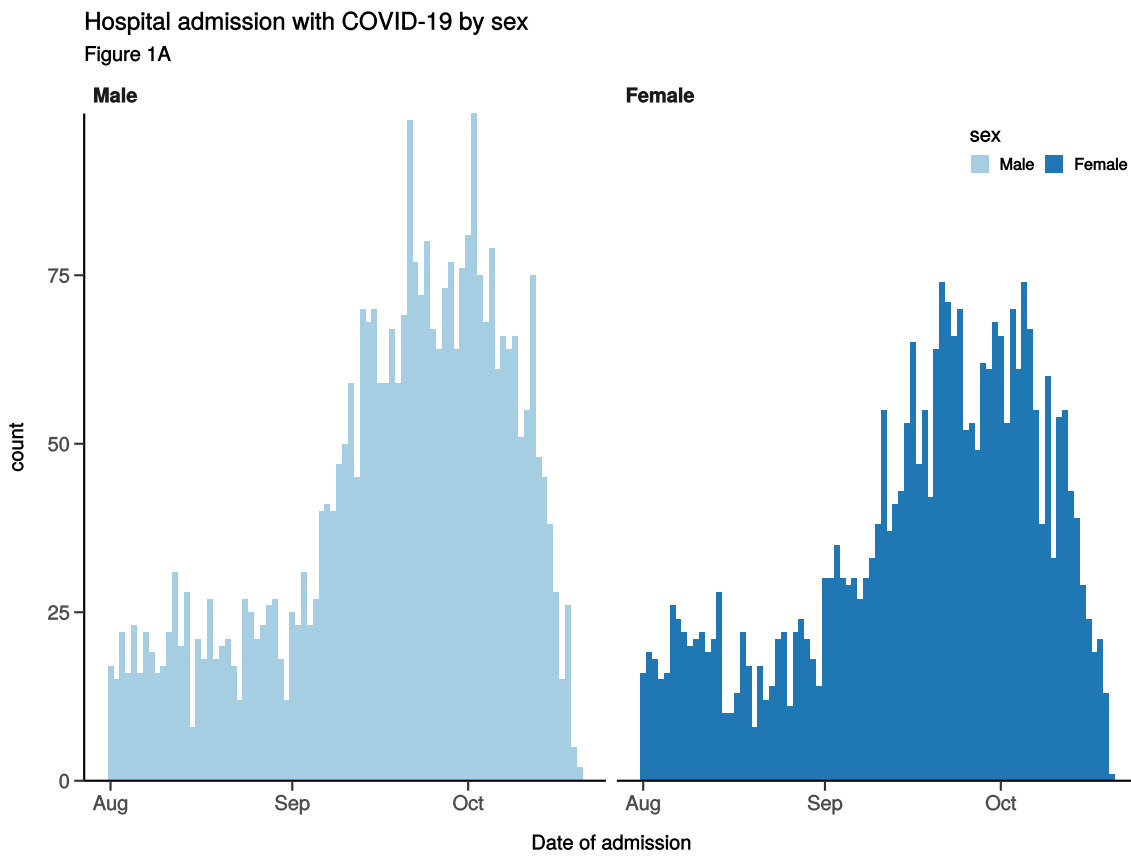
Executive summary

Includes patients admitted after 01 August 2020

There are 6314 patients included in CO-CIN. Of these, 685 patient(s) have died and 733 required ICU. 3193 have been discharged home.

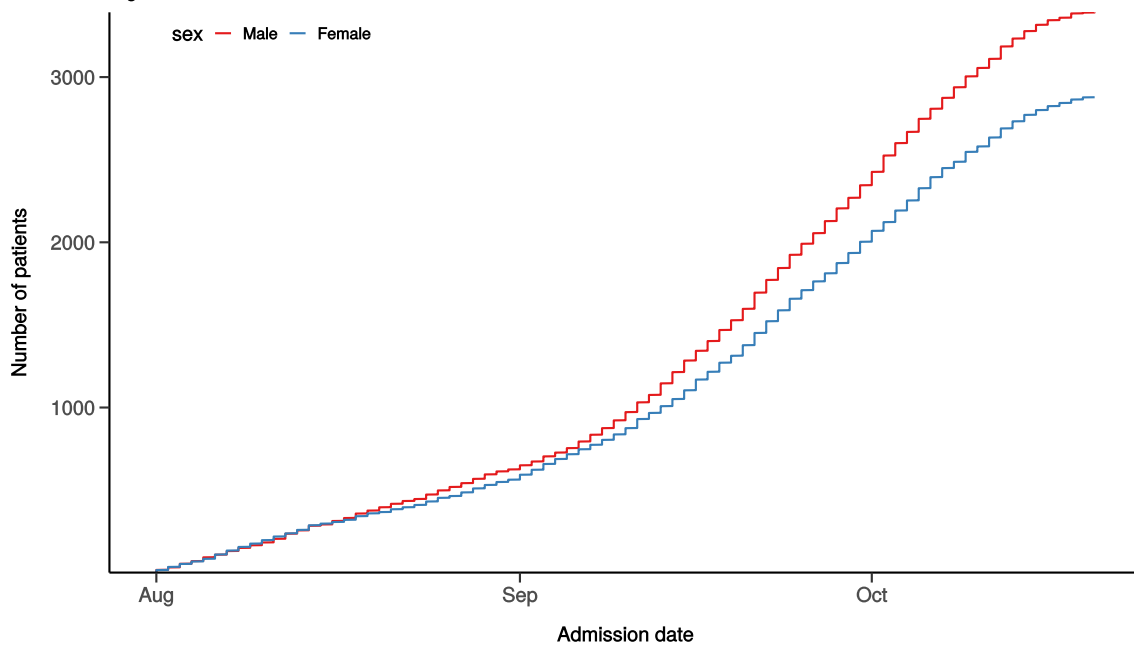
Admission

Figure 1



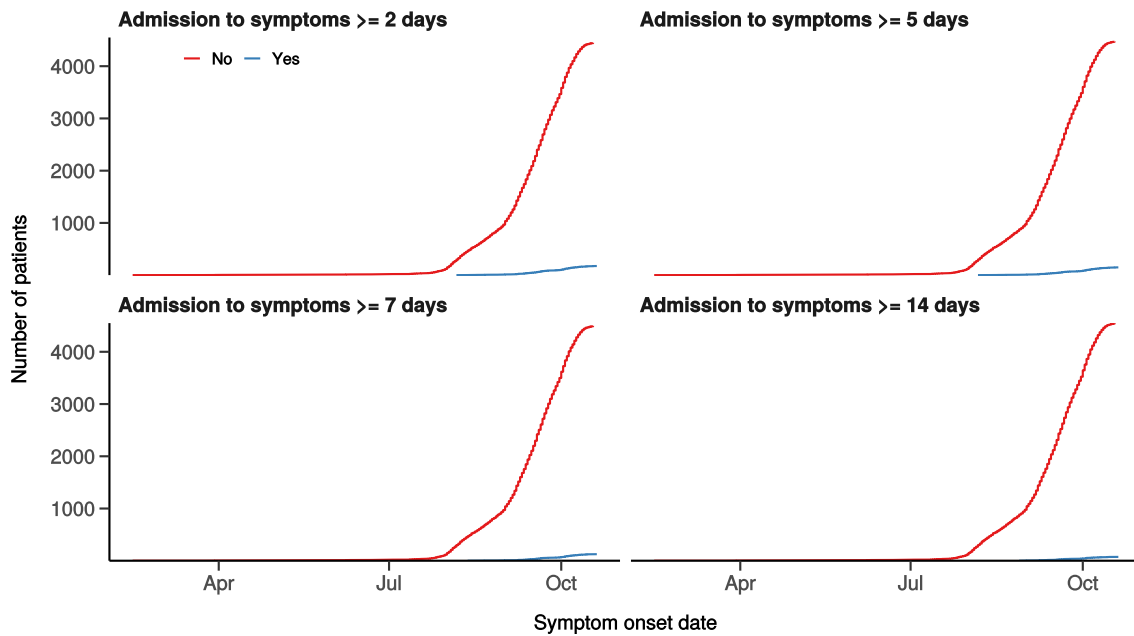
Hospital admission with COVID-19 by sex

Figure 1B



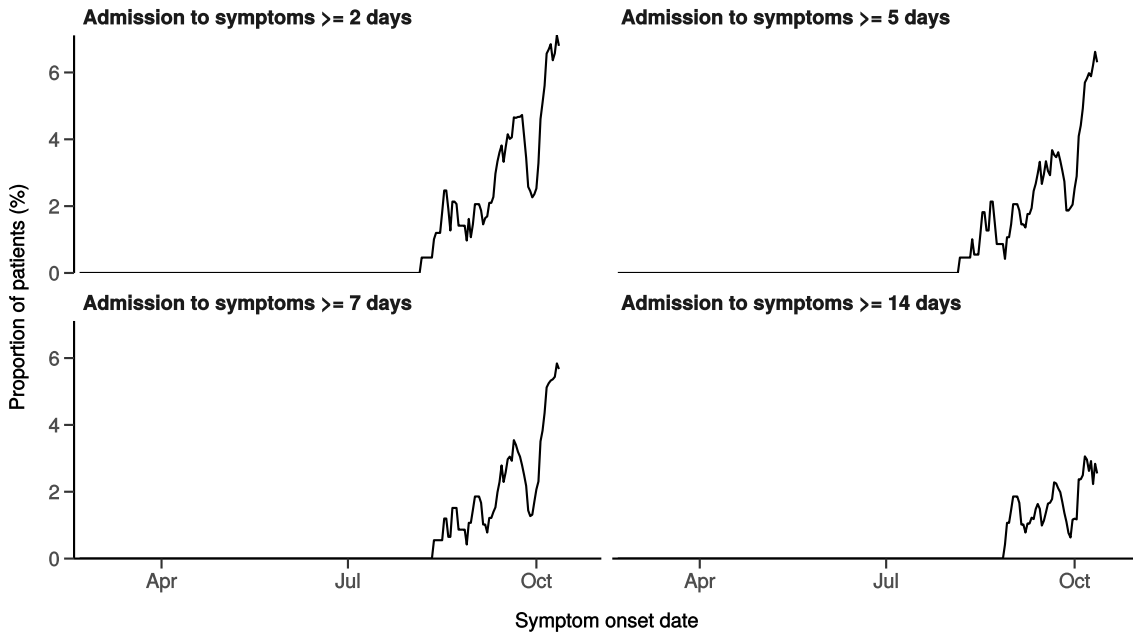
Number with symptom onset occurring after admission to hospital

Figure 1C



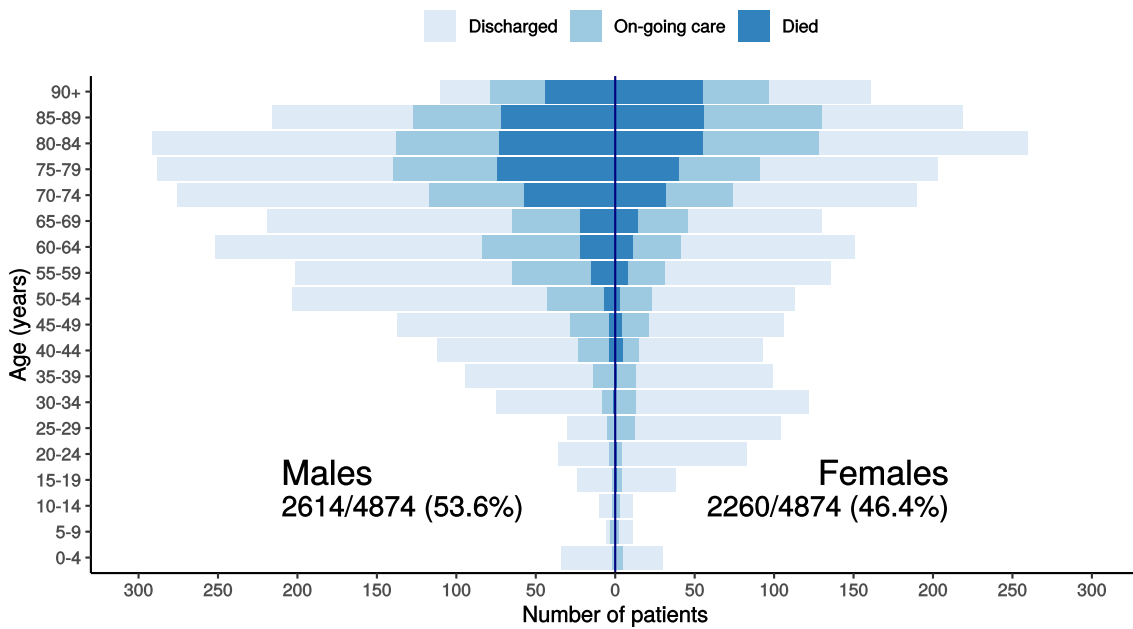
Proportion with symptom onset occurring after hospital admission

Figure 1D - 7-day rolling percentage. n = 4623



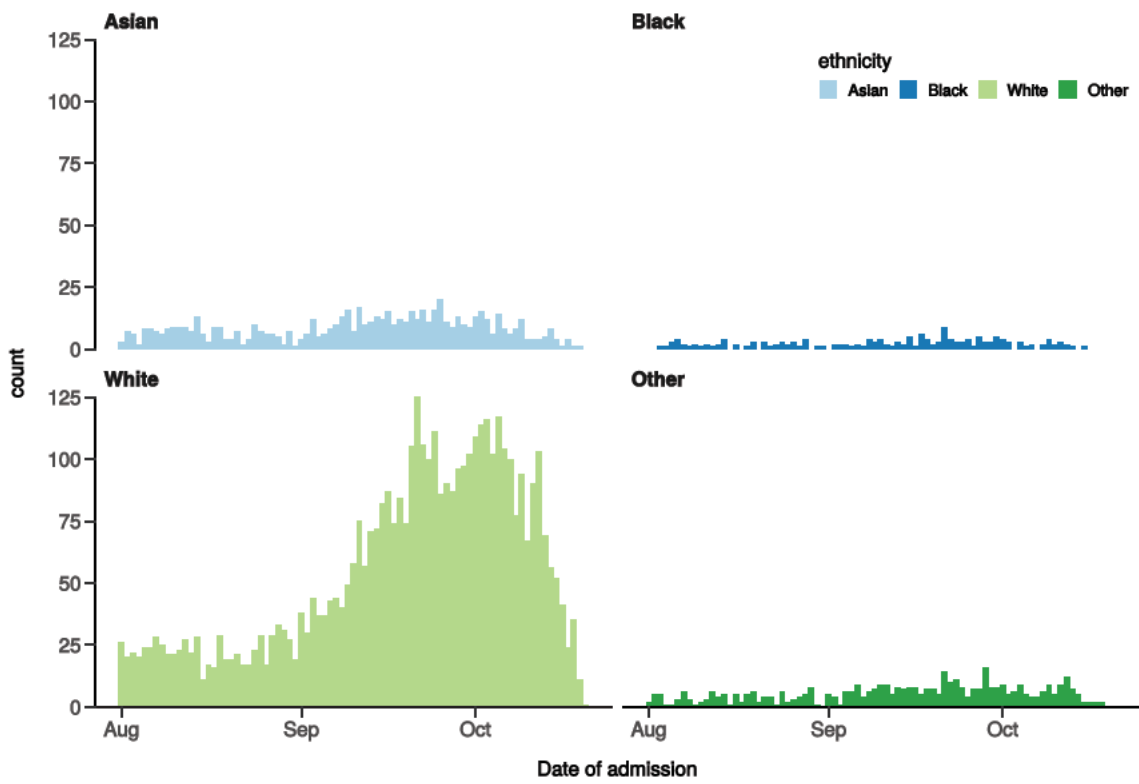
Patients with outcome stratified by age, and sex

Figure 1E



Hospital admission with COVID-19 by ethnicity

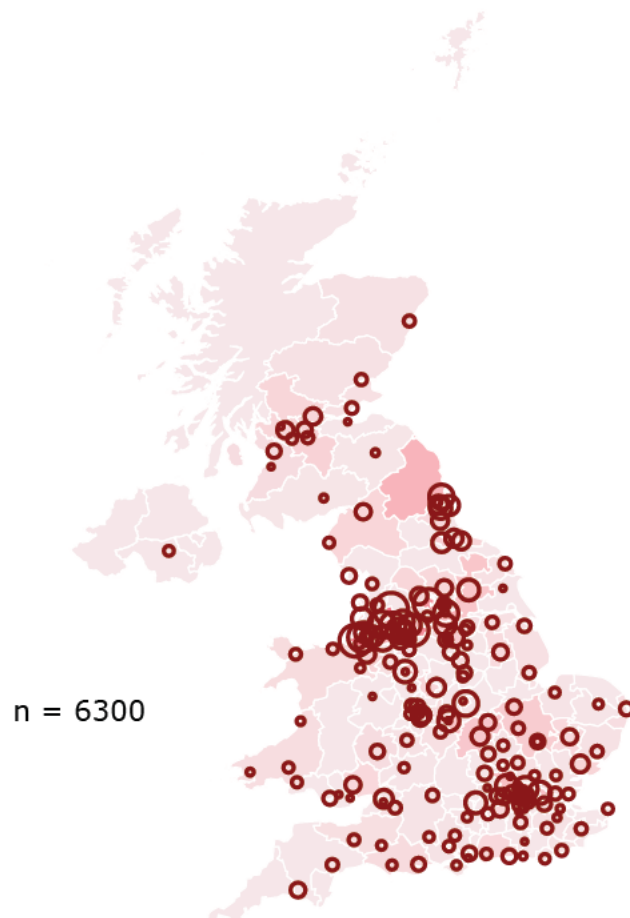
Figure 1F



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

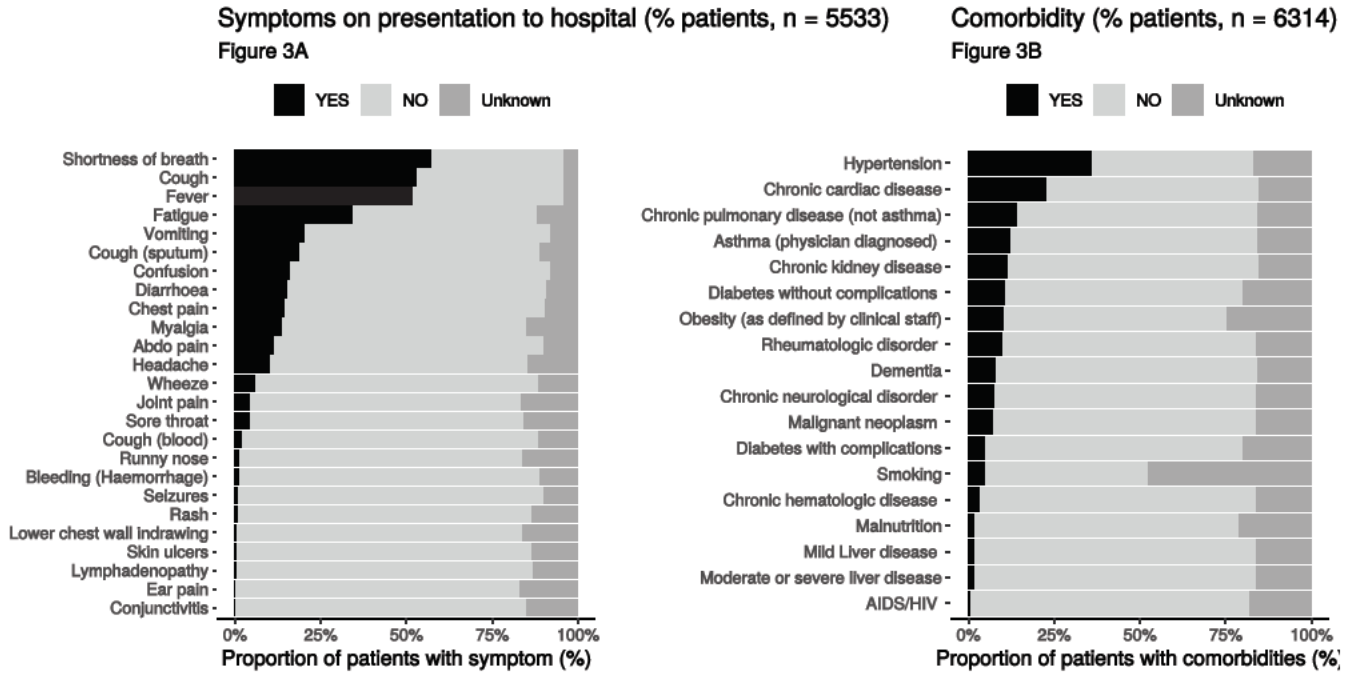
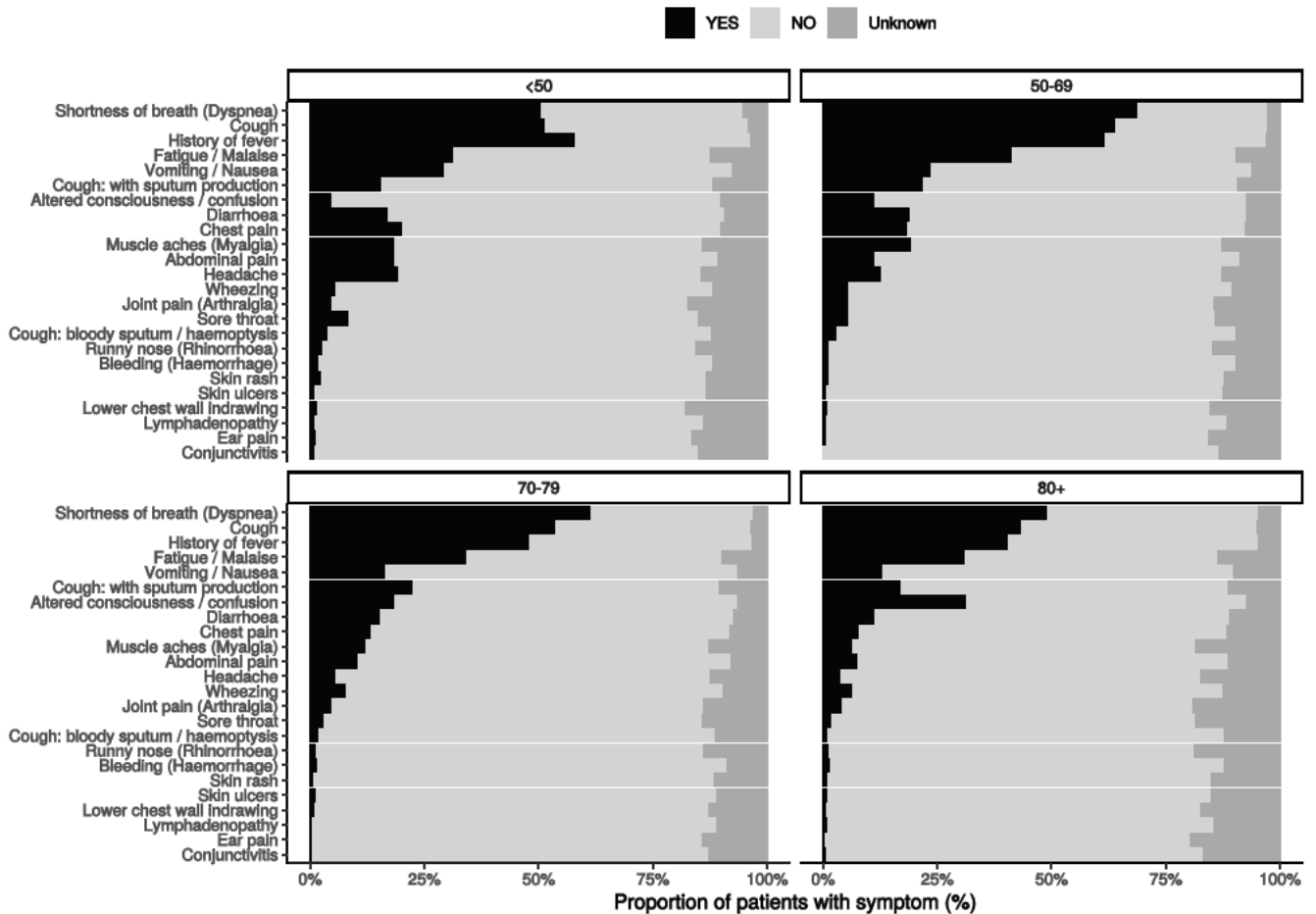


Figure 3B - Symptoms by Age

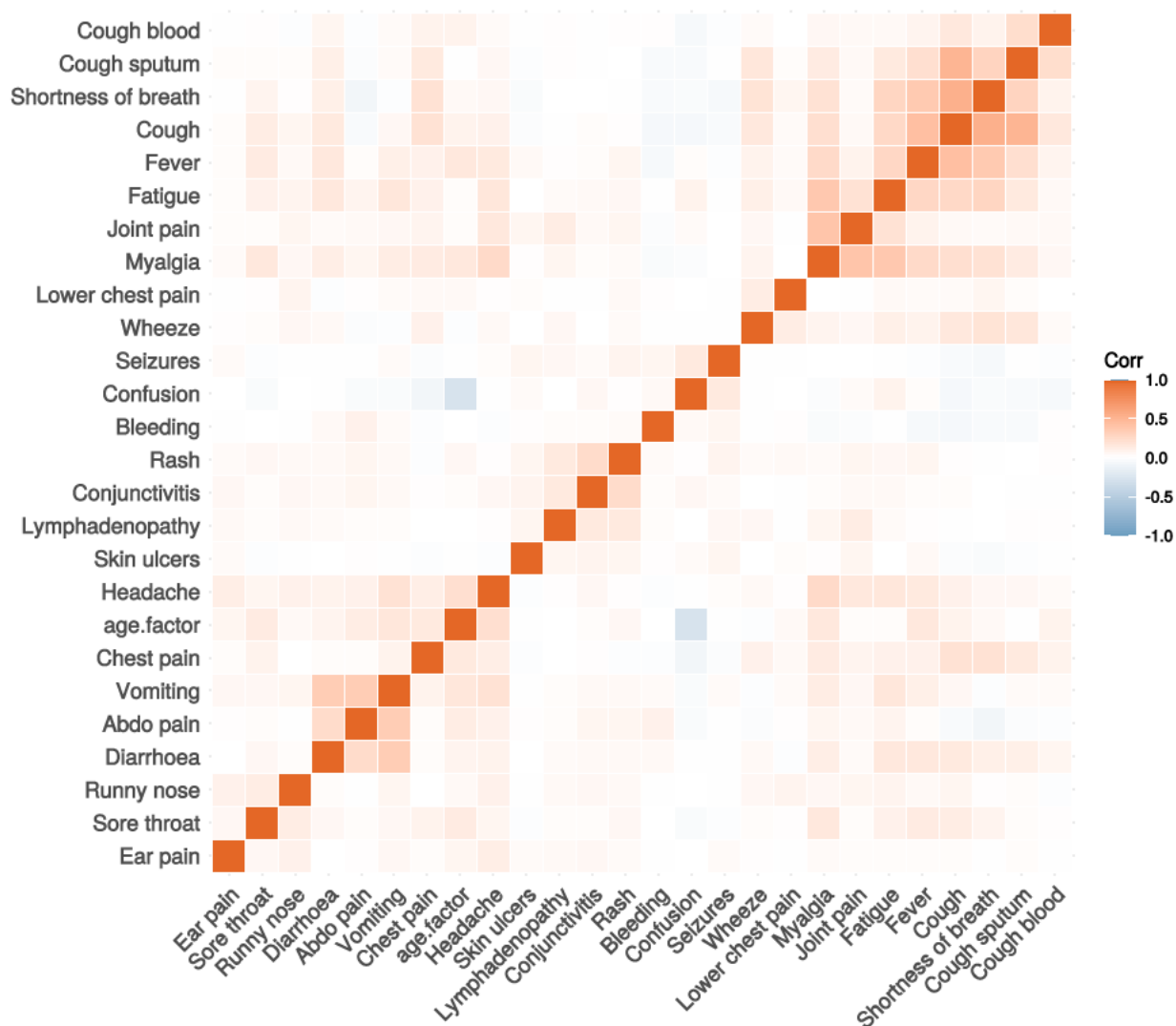


Age Group	Number of Patients included in Symptoms Plot
<50	1343

Age Group	Number of Patients included in Symptoms Plot
50-69	1636
70-79	1148
80+	1474

Figure 3C

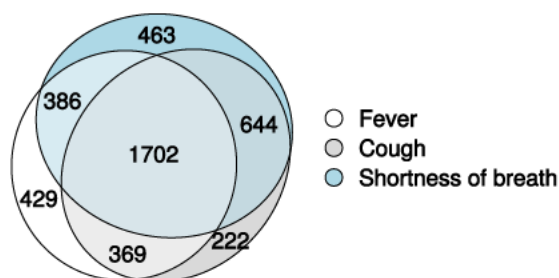
Correlation of symptoms in all pages. Note clusters, top right to bottom left, flu-like, coryzal, abdominal, respiratory, neurocutaneous.



Symptoms (diagnostic criteria)

Figure 4A

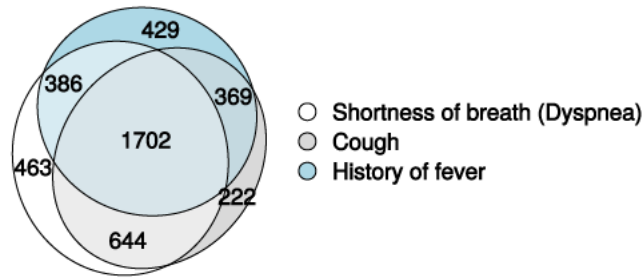
n = 5533



Symptoms (most common)

Figure 4B

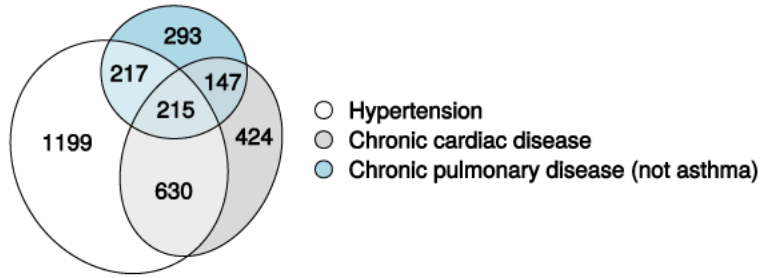
n = 5533



Comorbidity (most common)

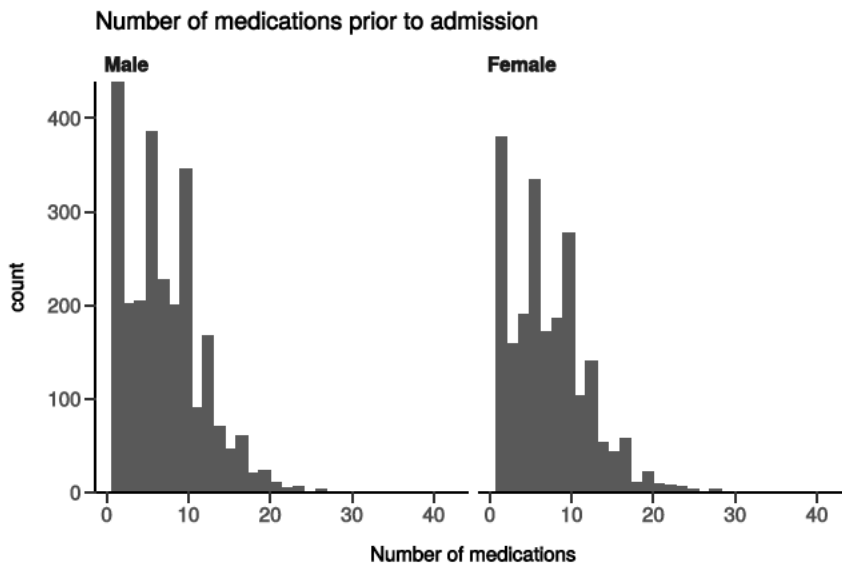
Figure 4C

n = 6314



Medication prior to illness

Figure 5

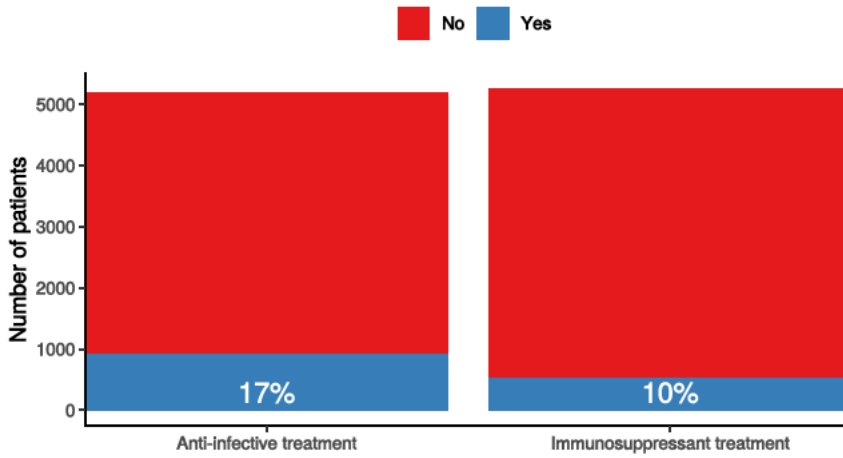


Preadmission treatment

Figure 6

Pre-admission treatment

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



Patient flow

Figure 7A - All patients

N = 5649

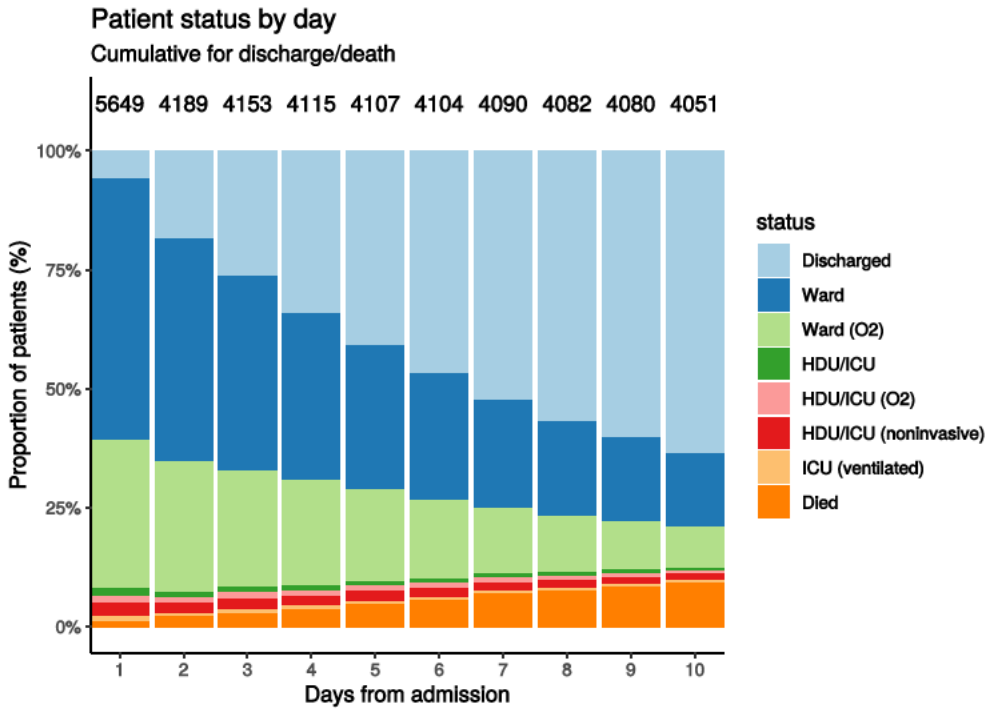
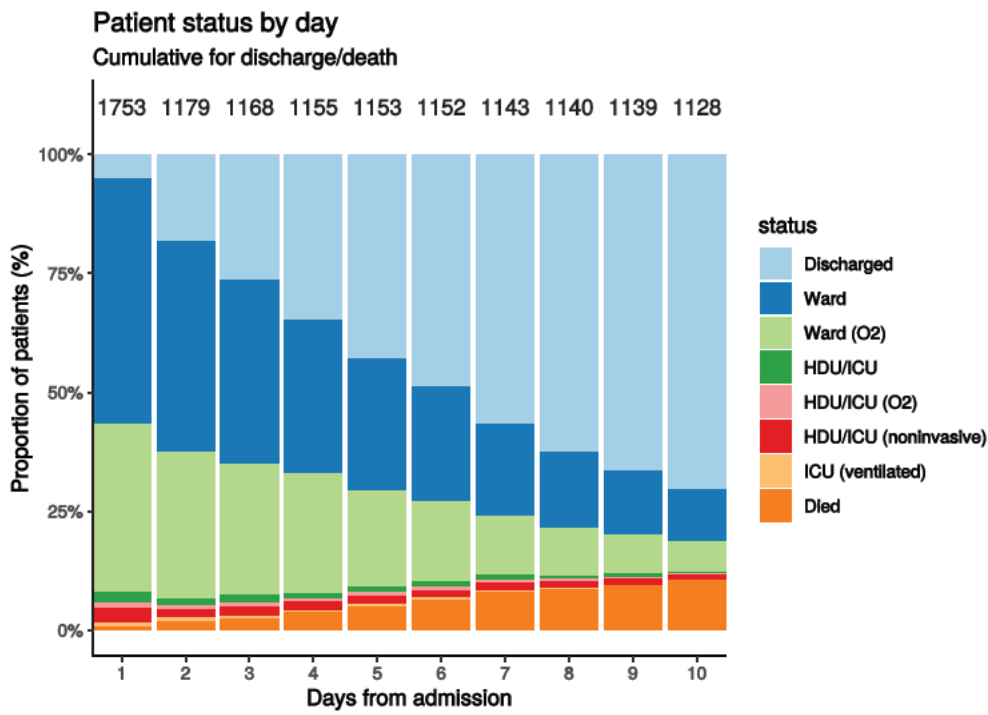


Figure 7B - Patients admitted ≥ 14 days and ≤ 28 days ago

N = 1753



Oxygen requirement

Figure 8A - All patients

N = 5396

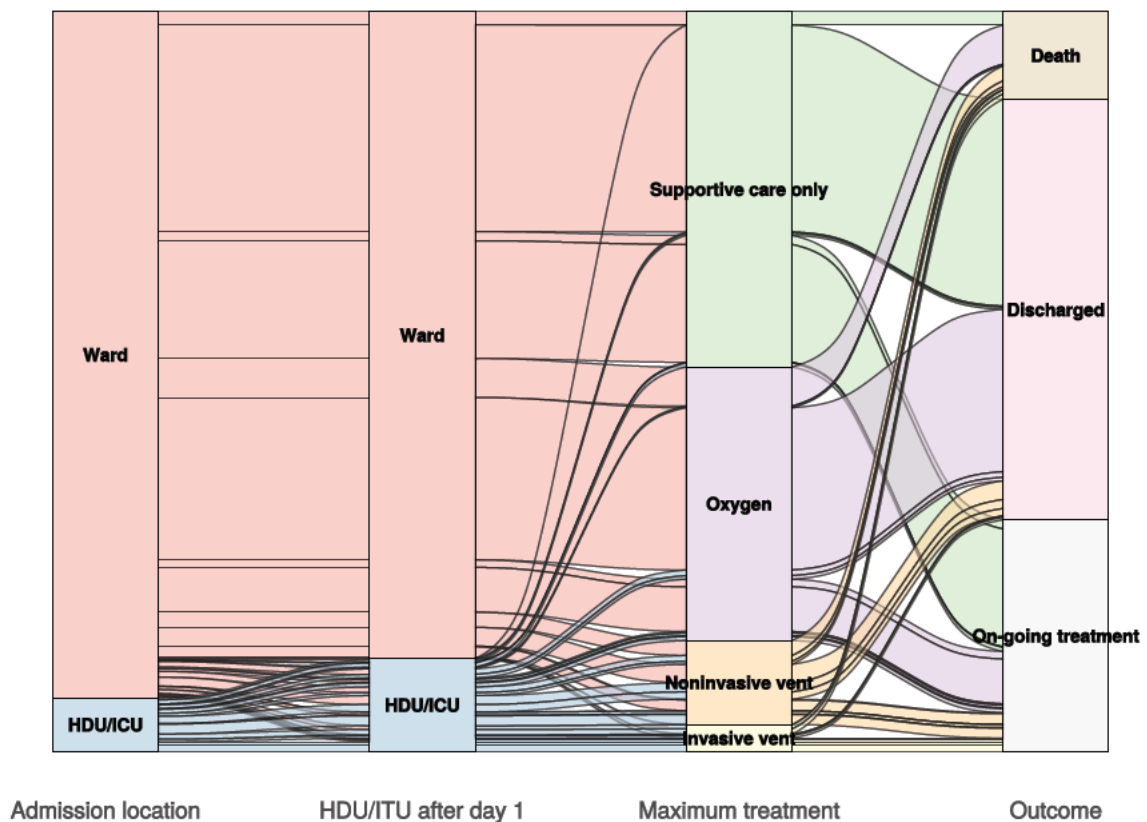


Figure 8B - Patients admitted ≥ 14 days and ≤ 28 days ago

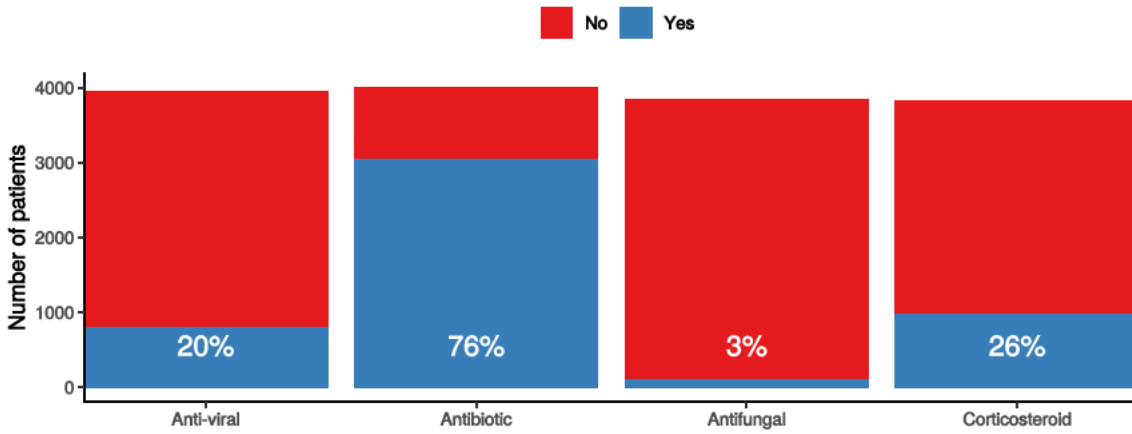
N = 1694

In-hospital medical treatment

Figure 9

In-hospital treatment

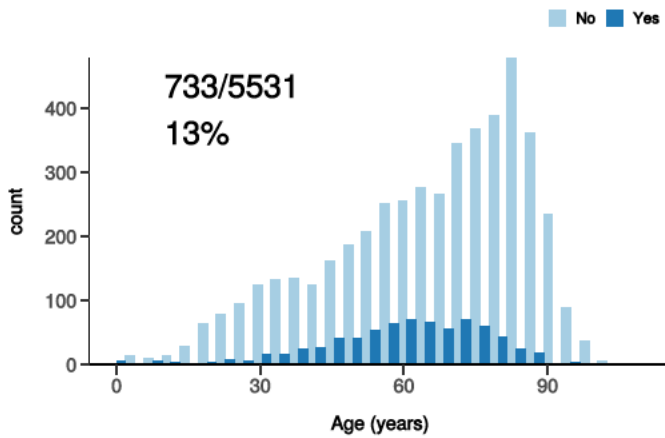
Anti-virals, antibiotics, corticosteroids, and anti-fungals for patients who have completed journey.



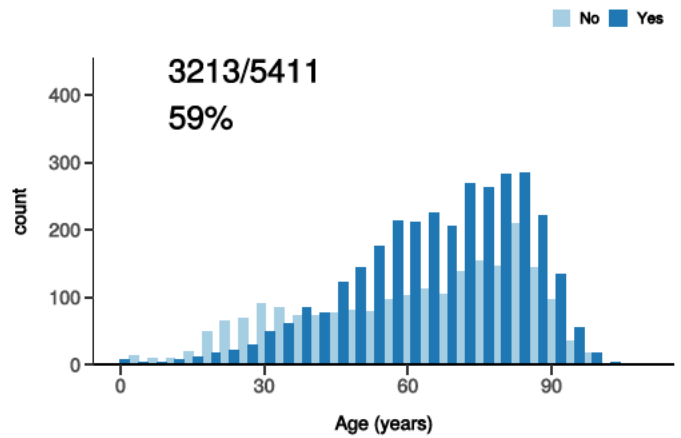
Treatment

Figure 10

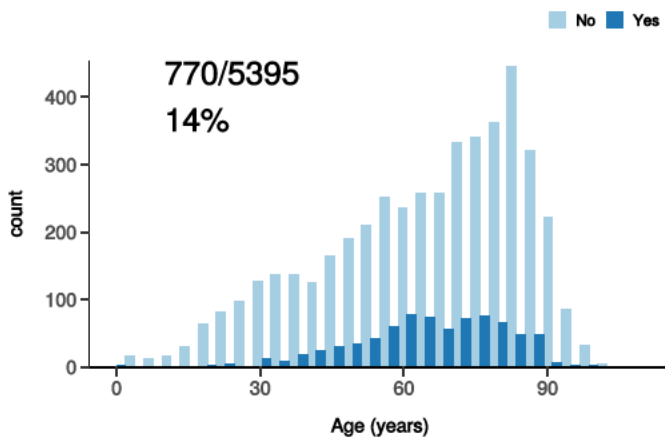
ICU/HDU admission
Figure 10A



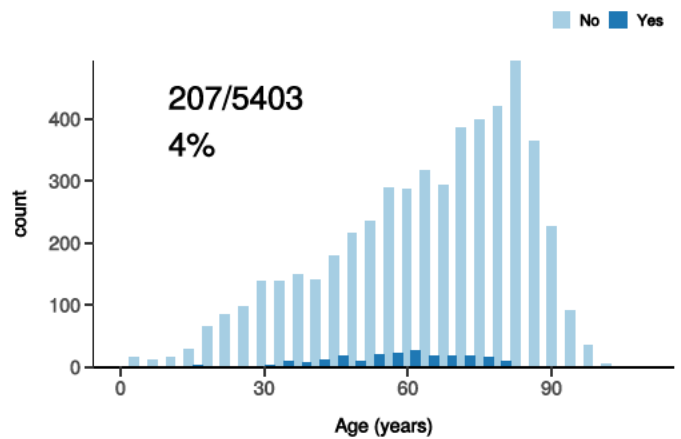
High flow oxygen
Figure 10B



Noninvasive ventilation
Figure 10C



Invasive ventilation
Figure 10D

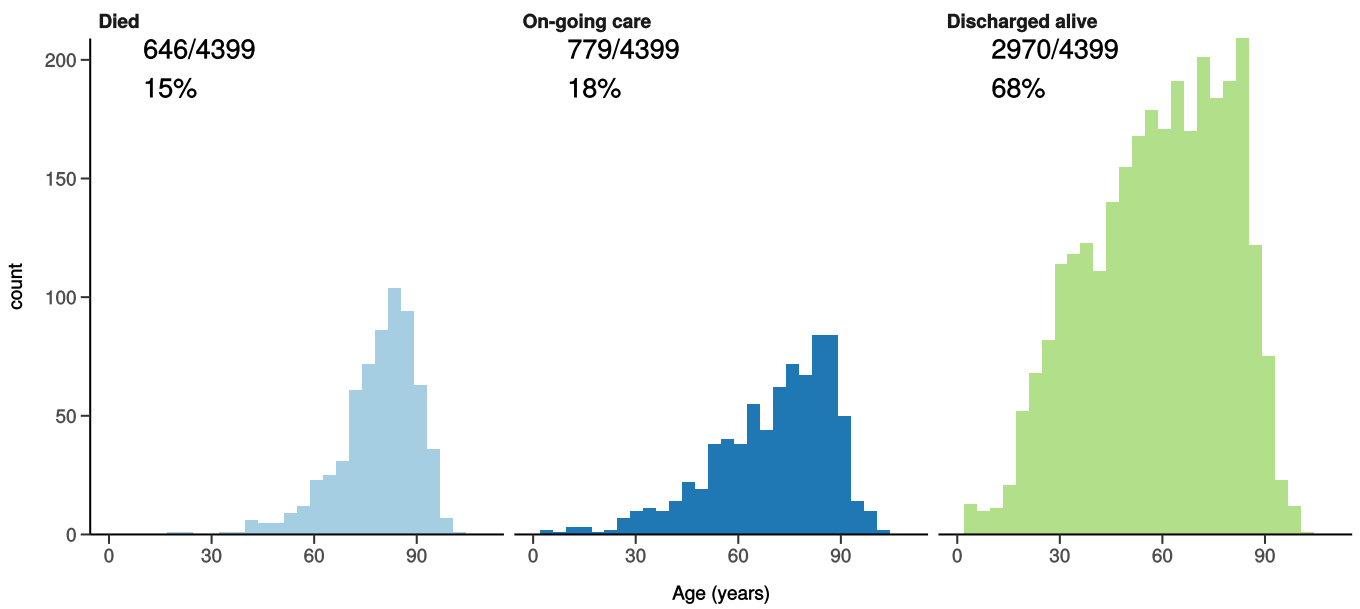


Status in patients admitted ≥ 14 days from today

Figure 11

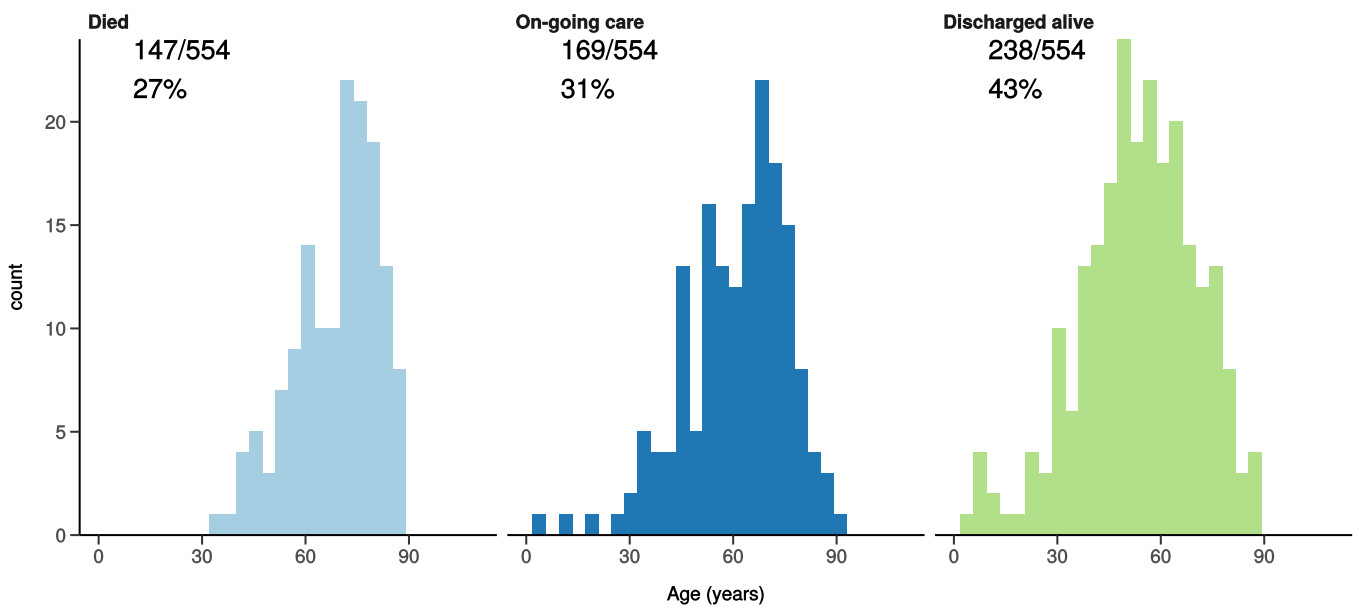
All: status in patients admitted ≥ 14 days ago

Figure 11A



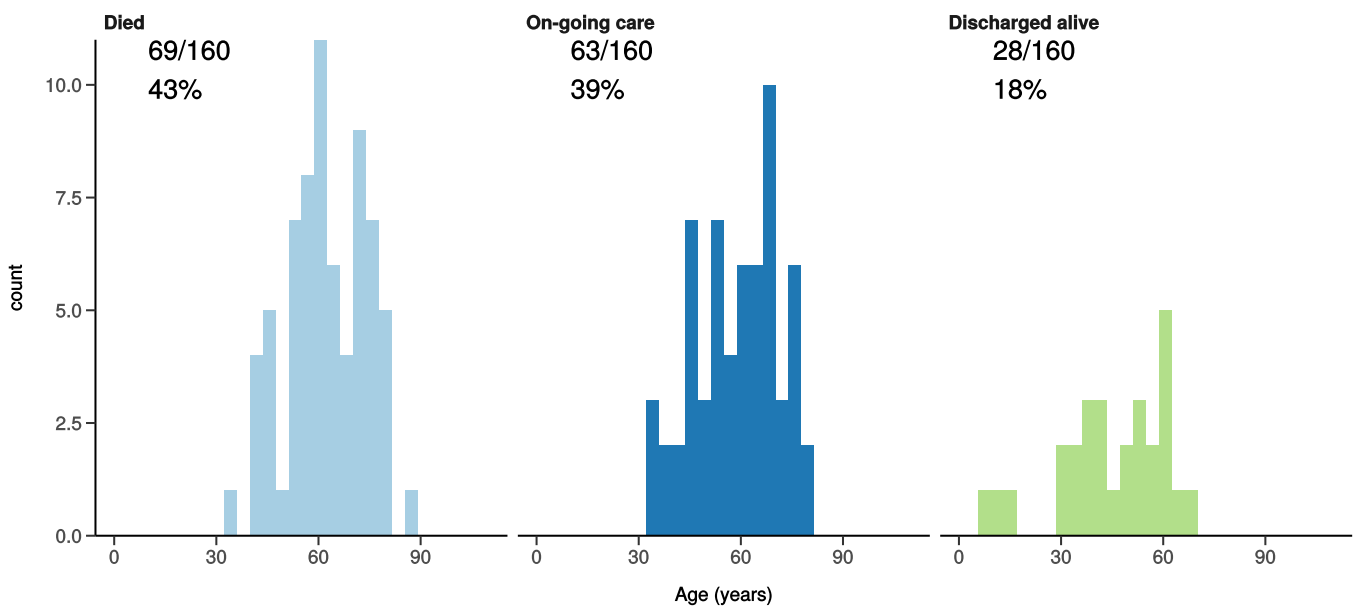
ICU/HDU admissions: status in patients admitted ≥ 14 days ago

Figure 11B



Invasive ventilation: status in patients admitted ≥ 14 days ago

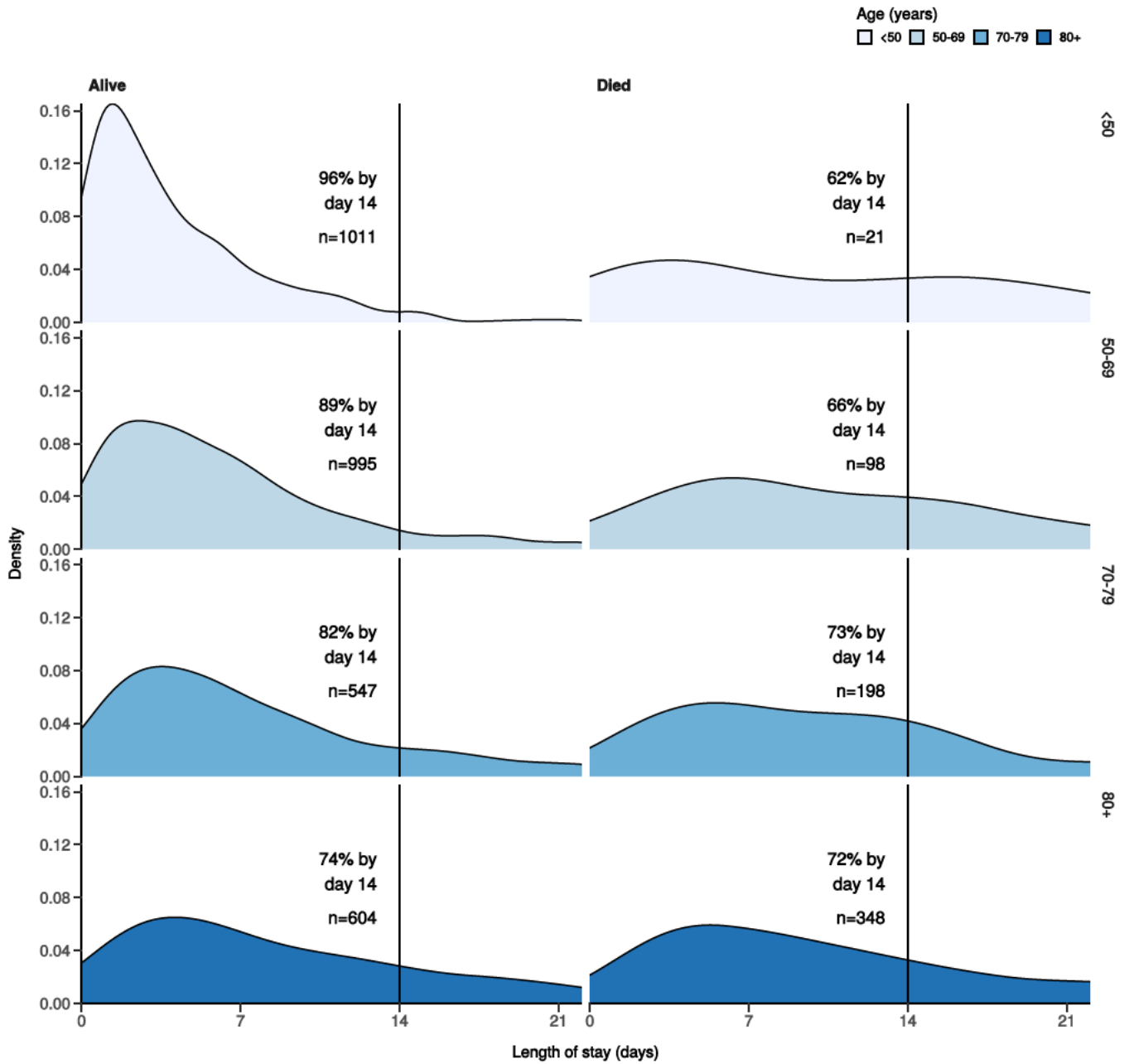
Figure 11c



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	1031 (98.2)	19 (1.8)	•	•
	50-69	969 (90.8)	98 (9.2)	5.49 (3.41-9.31, p<0.001)	4.67 (2.73-8.54, p<0.001)
	70-79	539 (73.9)	190 (26.1)	19.13 (12.12-32.01, p<0.001)	14.07 (8.30-25.58, p<0.001)
	80+	599 (64.1)	335 (35.9)	30.35 (19.45-50.35, p<0.001)	20.00 (11.80-36.35, p<0.001)
Sex at Birth	Male	1643 (81.6)	371 (18.4)	•	•

Dependent: death		No	Yes	OR (univariable)	OR (multivariable)
	Female	1496 (84.7)	271 (15.3)	0.80 (0.68-0.95, p=0.012)	0.83 (0.67-1.03, p=0.100)
	Not specified	0 (NaN)	0 (NaN)	•	•
Chronic cardiac disease	NO	2285 (87.8)	318 (12.2)	•	•
	YES	614 (68.5)	282 (31.5)	3.30 (2.75-3.96, p<0.001)	1.50 (1.20-1.89, p<0.001)
Chronic pulmonary disease (not asthma)	NO	2525 (85.7)	421 (14.3)	•	•
	YES	367 (67.8)	174 (32.2)	2.84 (2.31-3.50, p<0.001)	1.49 (1.16-1.92, p=0.002)
Chronic neurological disorder	NO	2665 (83.8)	515 (16.2)	•	•
	YES	217 (73.8)	77 (26.2)	1.84 (1.39-2.41, p<0.001)	1.38 (0.98-1.92, p=0.060)
Chronic hematologic disease	NO	2787 (83.4)	556 (16.6)	•	•
	YES	96 (73.8)	34 (26.2)	1.78 (1.17-2.63, p=0.005)	1.28 (0.76-2.10, p=0.342)
Chronic kidney disease	NO	2601 (85.3)	448 (14.7)	•	•
	YES	296 (66.7)	148 (33.3)	2.90 (2.32-3.62, p<0.001)	1.36 (1.03-1.79, p=0.030)
Dementia	NO	2709 (84.9)	483 (15.1)	•	•
	YES	192 (64.6)	105 (35.4)	3.07 (2.37-3.96, p<0.001)	1.47 (1.06-2.03, p=0.022)
Obesity (as defined by clinical staff)	NO	2193 (82.4)	469 (17.6)	•	•
	YES	364 (86.9)	55 (13.1)	0.71 (0.52-0.95, p=0.023)	1.05 (0.74-1.49, p=0.765)
Malignant neoplasm	NO	2699 (84.4)	497 (15.6)	•	•
	YES	180 (65.5)	95 (34.5)	2.87 (2.19-3.73, p<0.001)	1.91 (1.37-2.63, p<0.001)

Number in dataframe = 5323, Number in model = 2967, Missing = 2356, AIC = 2187.7, C-statistic = 0.806, H&L = Chi-sq(8) 6.10 (p=0.636)

Figure 13 - Adjusted odds ratio plot

Death

Age on admission (years)	<50	-
	50-69	4.67 (2.73-8.54, p<0.001)
	70-79	14.07 (8.30-25.58, p<0.001)
	80+	20.00 (11.80-36.35, p<0.001)
Sex at Birth	Male	-
	Female	0.83 (0.67-1.03, p=0.100)
	Not specified	-
Chronic cardiac disease	YES	1.50 (1.20-1.89, p<0.001)
Chronic pulmonary disease (not asthma)	YES	1.49 (1.16-1.92, p=0.002)
Chronic neurological disorder	YES	1.38 (0.98-1.92, p=0.060)
Chronic hematologic disease	YES	1.28 (0.76-2.10, p=0.342)
Chronic kidney disease	YES	1.36 (1.03-1.79, p=0.030)
Dementia	YES	1.47 (1.06-2.03, p=0.022)
Obesity (as defined by clinical staff)	YES	1.05 (0.74-1.49, p=0.765)
Malignant neoplasm	YES	1.91 (1.37-2.63, p<0.001)

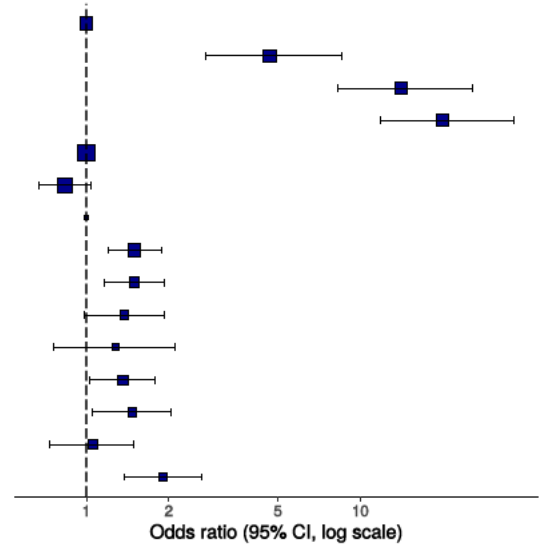
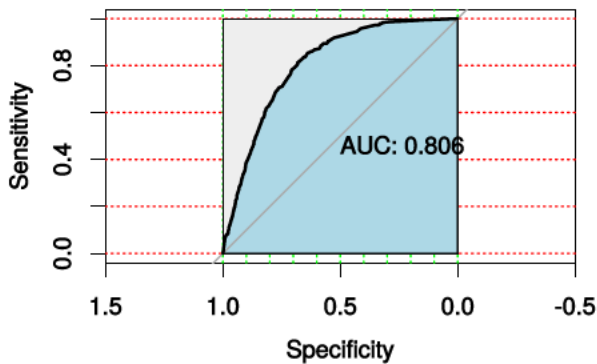


Figure 14 - ROC

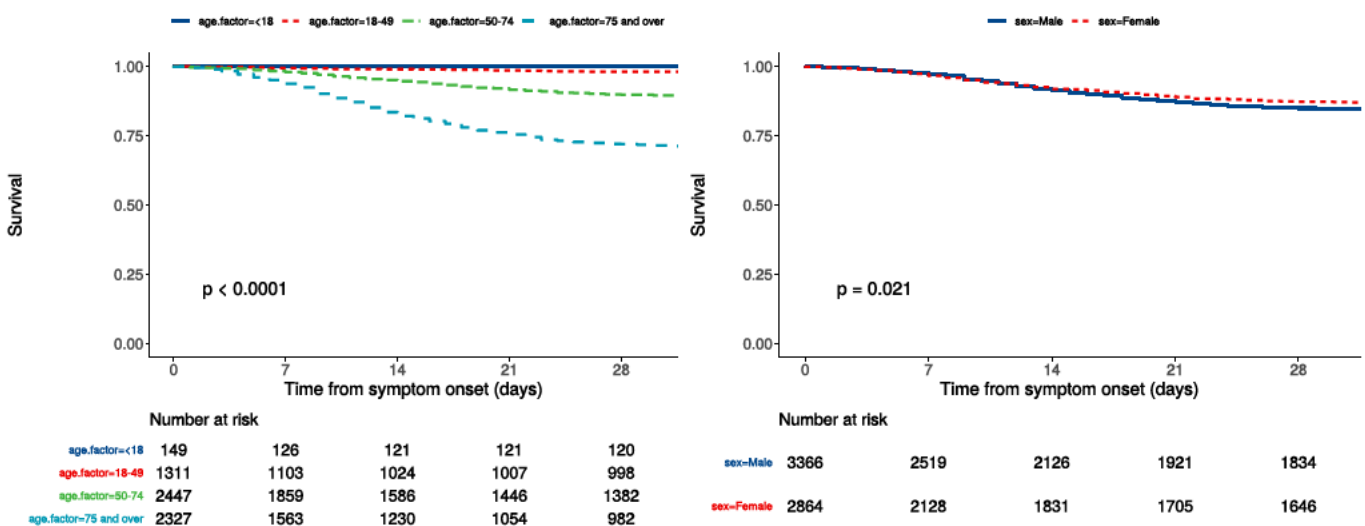


Survival models

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	1460 (23.4)	•	•
	50-69	1818 (29.1)	4.83 (2.99-7.79, p<0.001)	4.21 (2.32-7.64, p<0.001)
	70-79	1288 (20.7)	15.58 (9.84-24.67, p<0.001)	12.57 (7.07-22.35, p<0.001)
	80+	1671 (26.8)	23.75 (15.13-37.26, p<0.001)	18.00 (10.12-32.02, p<0.001)
Sex at Birth	Male	3366 (54.0)	•	•
	Female	2864 (46.0)	0.84 (0.72-0.97, p=0.022)	0.95 (0.79-1.15, p=0.610)
qSOFA score on admission	0	2426 (49.6)	•	•
	1	2099 (42.9)	2.29 (1.89-2.77, p<0.001)	2.40 (1.94-2.96, p<0.001)
	2	341 (7.0)	5.94 (4.64-7.61, p<0.001)	4.26 (3.21-5.66, p<0.001)
	3	25 (0.5)	12.64 (6.86-23.29, p<0.001)	11.07 (5.51-22.25, p<0.001)
Symptomatic at presentation	No symptoms	579 (10.4)	•	•
	Symptoms	5014 (89.6)	1.43 (1.07-1.90, p=0.016)	•
Chronic cardiac disease	NO	3917 (73.5)	•	•
	YES	1409 (26.5)	2.98 (2.55-3.48, p<0.001)	1.51 (1.25-1.83, p<0.001)
Chronic kidney disease	NO	4614 (86.7)	•	•
	YES	710 (13.3)	2.63 (2.20-3.15, p<0.001)	1.35 (1.08-1.68, p=0.008)
Moderate or severe liver disease	NO	5193 (98.3)	•	•
	YES	92 (1.7)	2.26 (1.46-3.49, p<0.001)	2.08 (1.16-3.73, p=0.014)
Chronic neurological disorder	NO	4831 (91.4)	•	•
	YES	457 (8.6)	1.75 (1.39-2.21, p<0.001)	•
Malignant neoplasm	NO	4854 (91.7)	•	•
	YES	438 (8.3)	2.52 (2.03-3.12, p<0.001)	1.67 (1.30-2.15, p<0.001)
Chronic hematologic disease	NO	5101 (96.5)	•	•
	YES	184 (3.5)	1.65 (1.18-2.33, p=0.004)	•
Obesity (as defined by clinical staff)	NO	4104 (86.5)	•	•
	YES	640 (13.5)	0.74 (0.57-0.97, p=0.029)	1.03 (0.76-1.40, p=0.843)
Diabetes without complications	NO	4375 (86.9)	•	•
	YES	661 (13.1)	1.32 (1.06-1.65, p=0.013)	•
Rheumatologic disorder	NO	4682 (88.6)	•	•
	YES	603 (11.4)	1.49 (1.20-1.85, p<0.001)	•

Dependent: Surv(time, status)		all	HR (univariable)	HR (multivariable)
Dementia	NO	4828 (91.0)	•	•
	YES	478 (9.0)	2.79 (2.27-3.42, p<0.001)	1.16 (0.90-1.51, p=0.251)
Malnutrition	NO	4852 (97.9)	•	•
	YES	103 (2.1)	1.78 (1.15-2.75, p=0.010)	•
smoking_mhyn_2levels	NO	2997 (54.6)	•	•
	YES	287 (5.2)	0.87 (0.59-1.28, p=0.483)	•
	N/K	2200 (40.1)	1.37 (1.17-1.61, p<0.001)	•

Number in dataframe = 6271, Number in model = 4025, Missing = 2246, Number of events = 474, Concordance = 0.813 (SE = 0.009), R-squared = 0.145 (Max possible = 0.847), Likelihood ratio test = 630.119 (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	4.21 (2.32-7.64, p<0.001)
	70-79	12.57 (7.07-22.35, p<0.001)
	80+	18.00 (10.12-32.02, p<0.001)
Sex at Birth	Female	0.95 (0.79-1.15, p=0.610)
qSOFA score on admission	0	-
	1	2.40 (1.94-2.96, p<0.001)
	2	4.26 (3.21-5.66, p<0.001)
	3	11.07 (5.51-22.25, p<0.001)
Chronic cardiac disease	YES	1.51 (1.25-1.83, p<0.001)
Chronic kidney disease	YES	1.35 (1.08-1.68, p=0.008)
Moderate or severe liver disease	YES	2.08 (1.16-3.73, p=0.014)
Malignant neoplasm	YES	1.67 (1.30-2.15, p<0.001)
Obesity (as defined by clinical staff)	YES	1.03 (0.76-1.40, p=0.843)
Dementia	YES	1.16 (0.90-1.51, p=0.251)

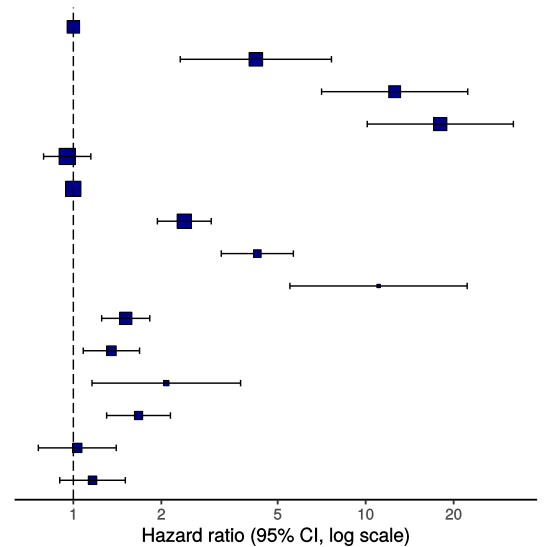
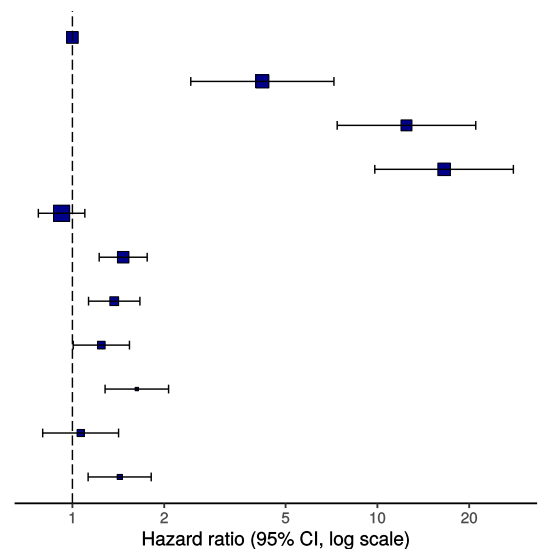


Figure 16b - Multivariable Cox proportional hazards model (age, sex, comorbidities only)

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

Age on admission (years)	<50	-
	50-69	4.20 (2.44-7.20, p<0.001)
	70-79	12.45 (7.38-21.02, p<0.001)
	80+	16.55 (9.81-27.92, p<0.001)
Sex at Birth	Female	0.92 (0.77-1.10, p=0.362)
Chronic cardiac disease	YES	1.47 (1.22-1.76, p<0.001)
Chronic pulmonary disease (not asthma)	YES	1.37 (1.13-1.66, p=0.001)
Chronic kidney disease	YES	1.24 (1.01-1.54, p=0.044)
Malignant neoplasm	YES	1.63 (1.28-2.07, p<0.001)
Obesity (as defined by clinical staff)	YES	1.06 (0.80-1.42, p=0.672)
Dementia	YES	1.43 (1.13-1.81, p=0.003)



ROC = 0.814497

Figure 17 - Predictions calibration plot

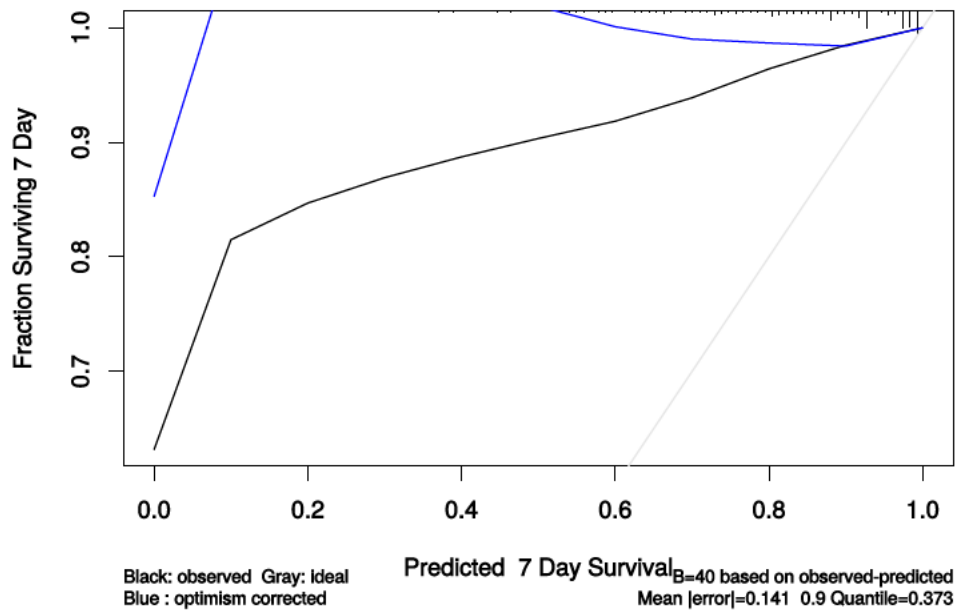


Figure 18 - Prognostic model predictions

Again, for demonstration of methods.

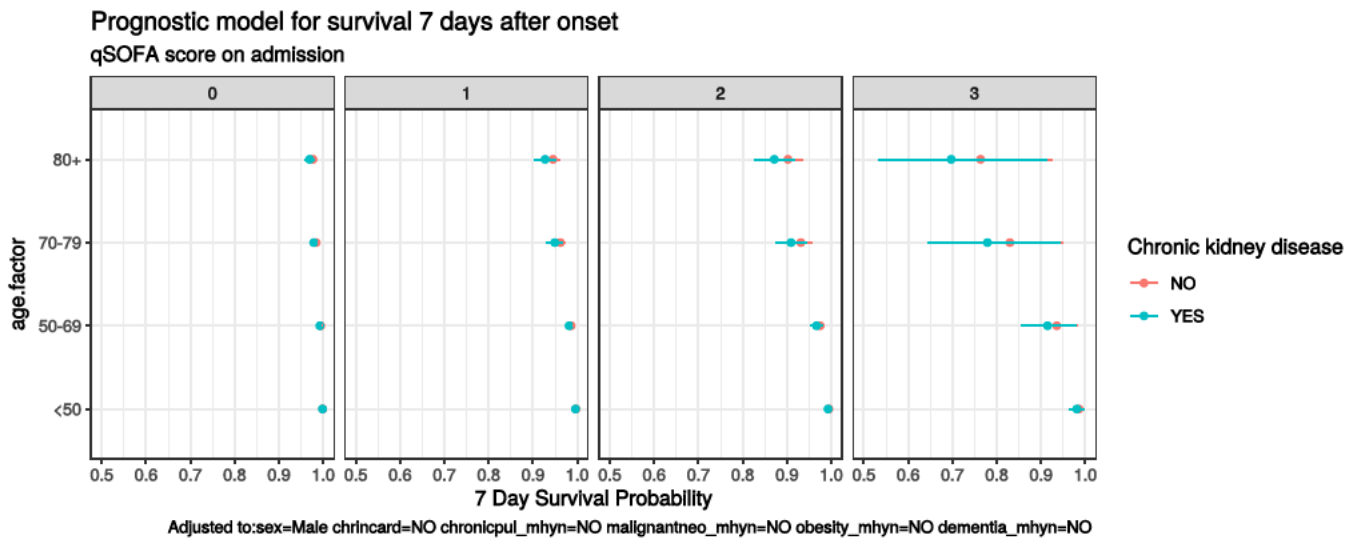


Figure 19 - Death by severity (NEWS) on admission

Number of deaths by NEWS score at admission

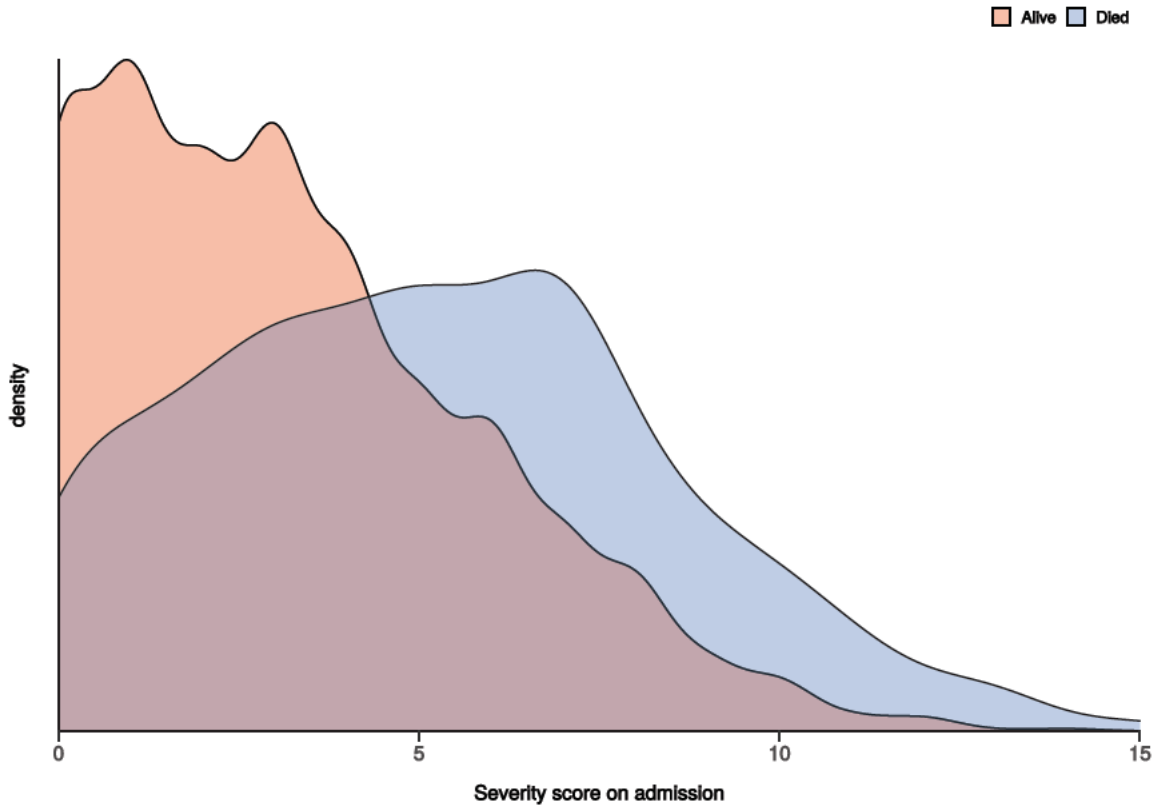


Figure 20 - Death by severity (NEWS) on admission stratified by age

Number of deaths by NEWS score at admission
Stratified by age

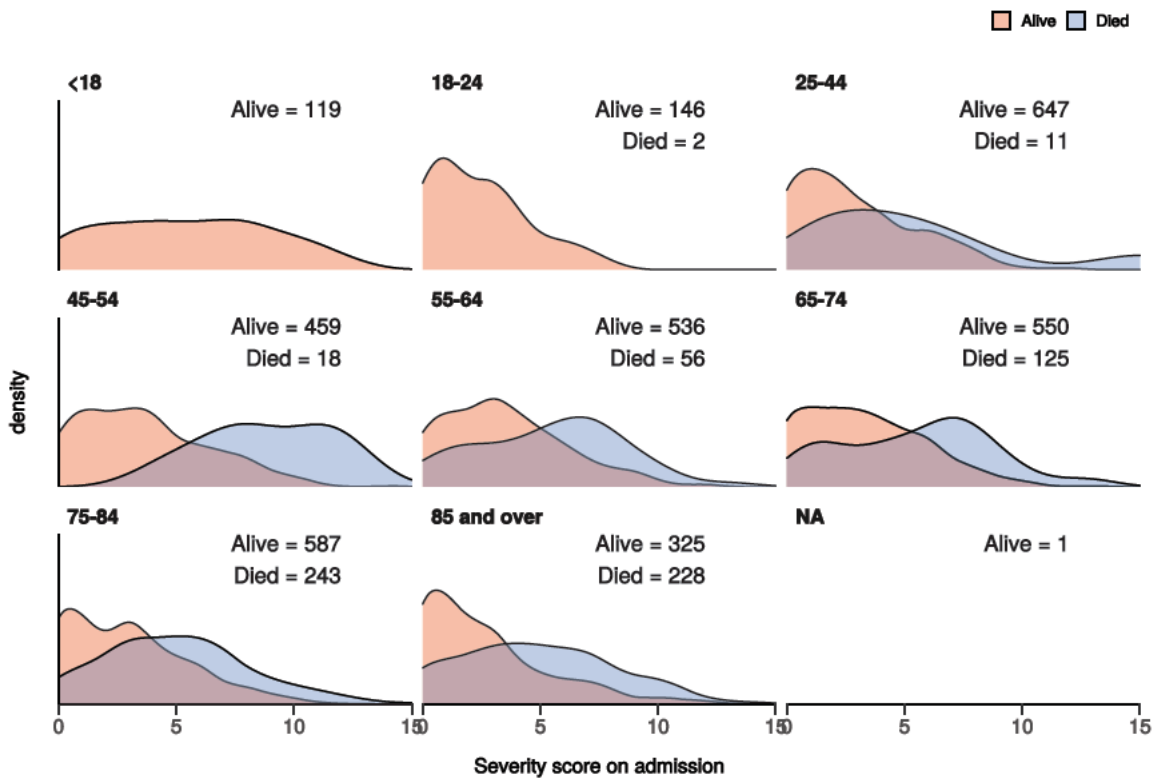


Figure 21 - Death by severity (qSOFA) on admission stratified by age