

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

Dynamic content updated: 2020-11-16 03:34:40.

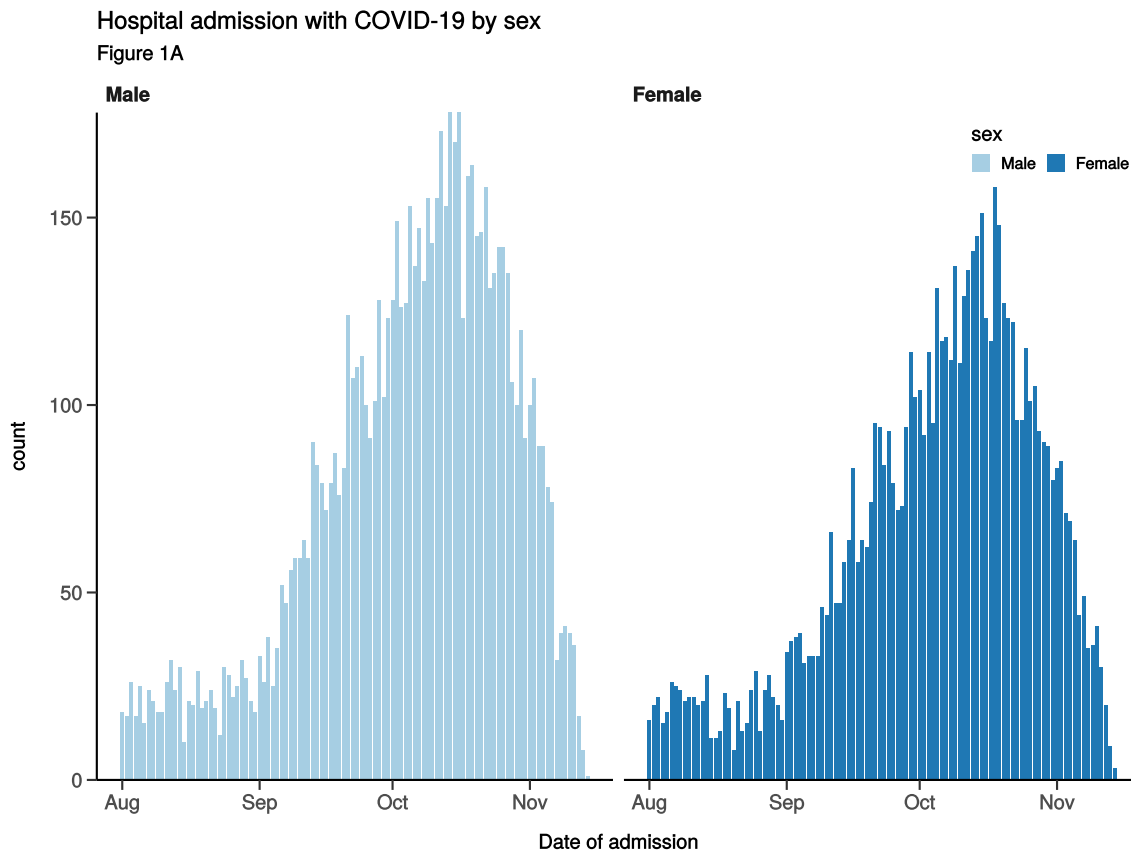
Executive summary

Includes patients admitted after 01 August 2020

There are 14945 patients included in CO-CIN. Of these, 1929 patient(s) have died and 1811 required ICU. 7720 have been discharged home.

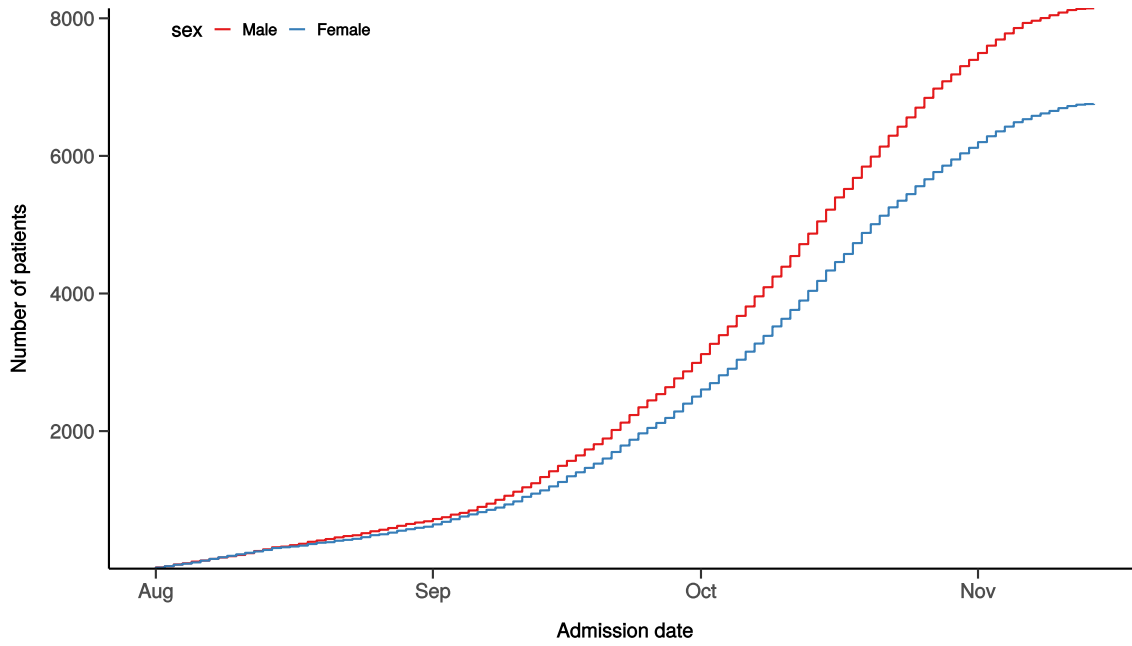
Admission

Figure 1



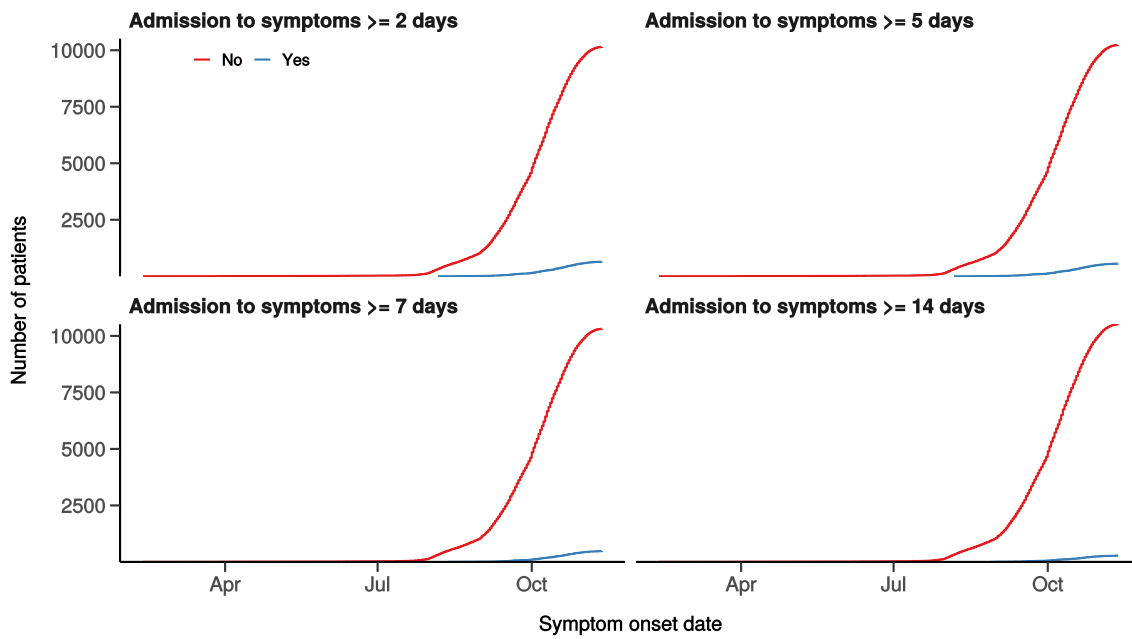
Hospital admission with COVID-19 by sex

Figure 1B



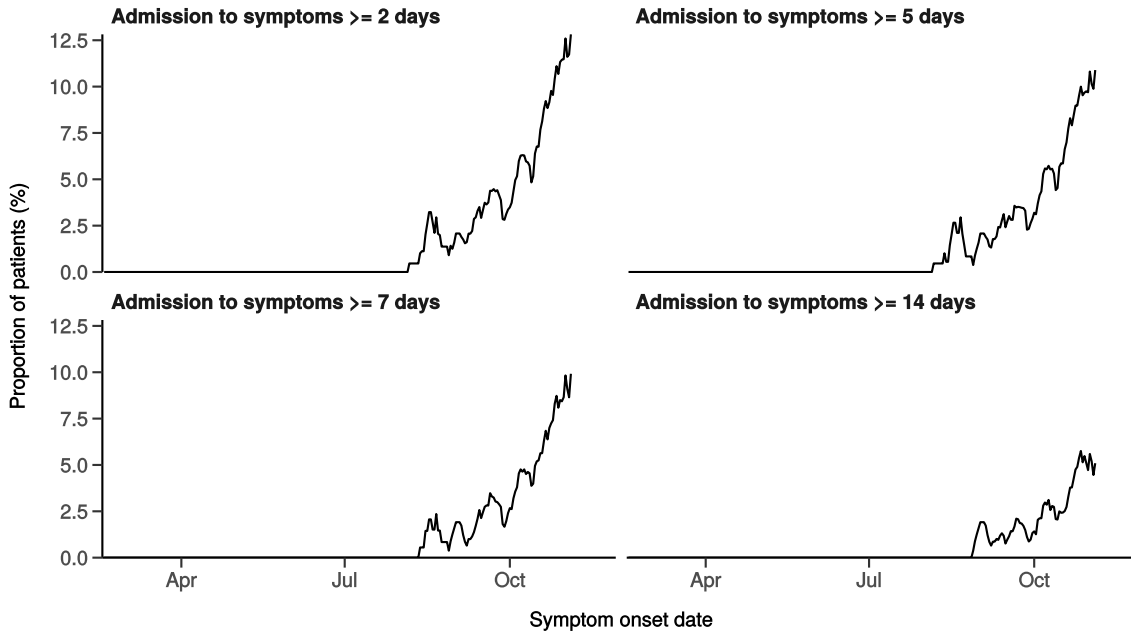
Number with symptom onset occurring after admission to hospital

Figure 1C



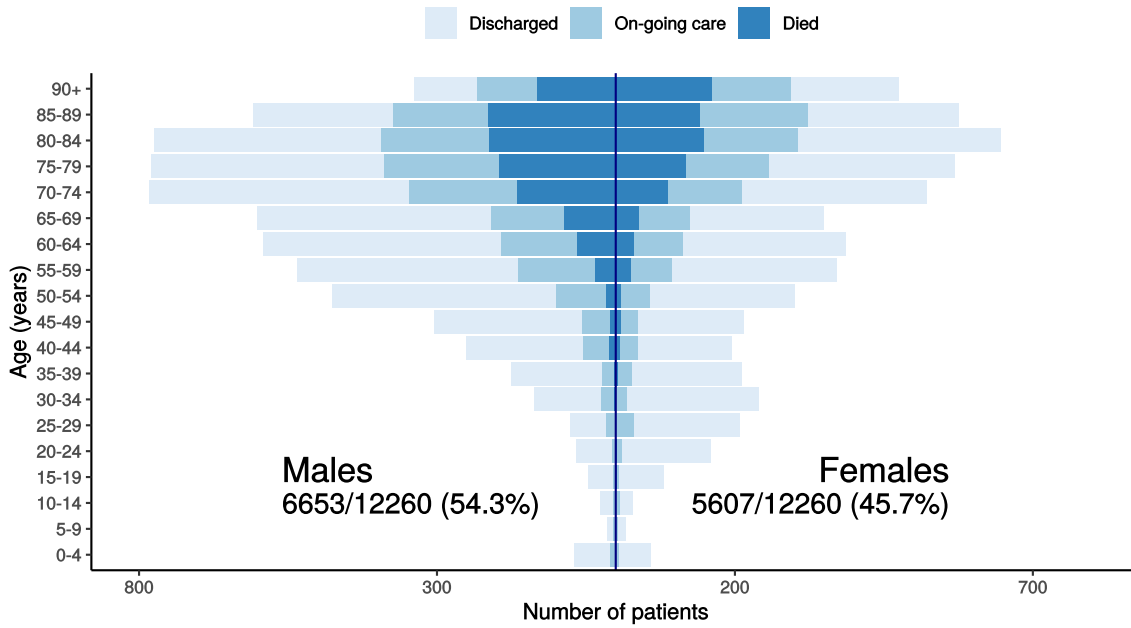
Proportion with symptom onset occurring after hospital admission

Figure 1D - 7-day rolling percentage. n = 10793



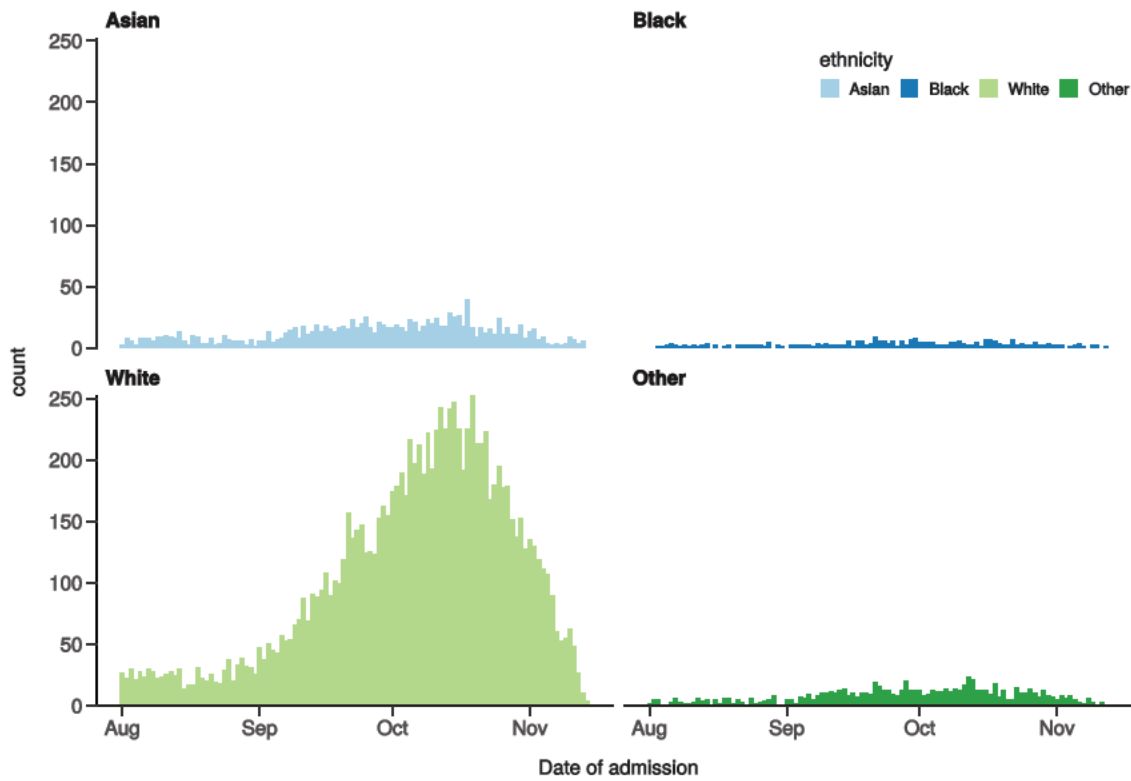
Patients with outcome stratified by age, and sex

Figure 1E



Hospital admission with COVID-19 by ethnicity

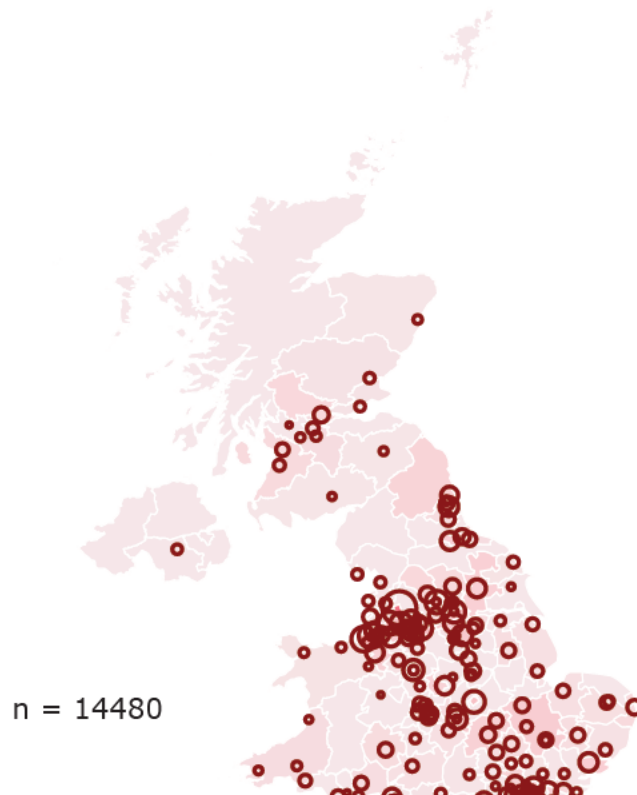
Figure 1F



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

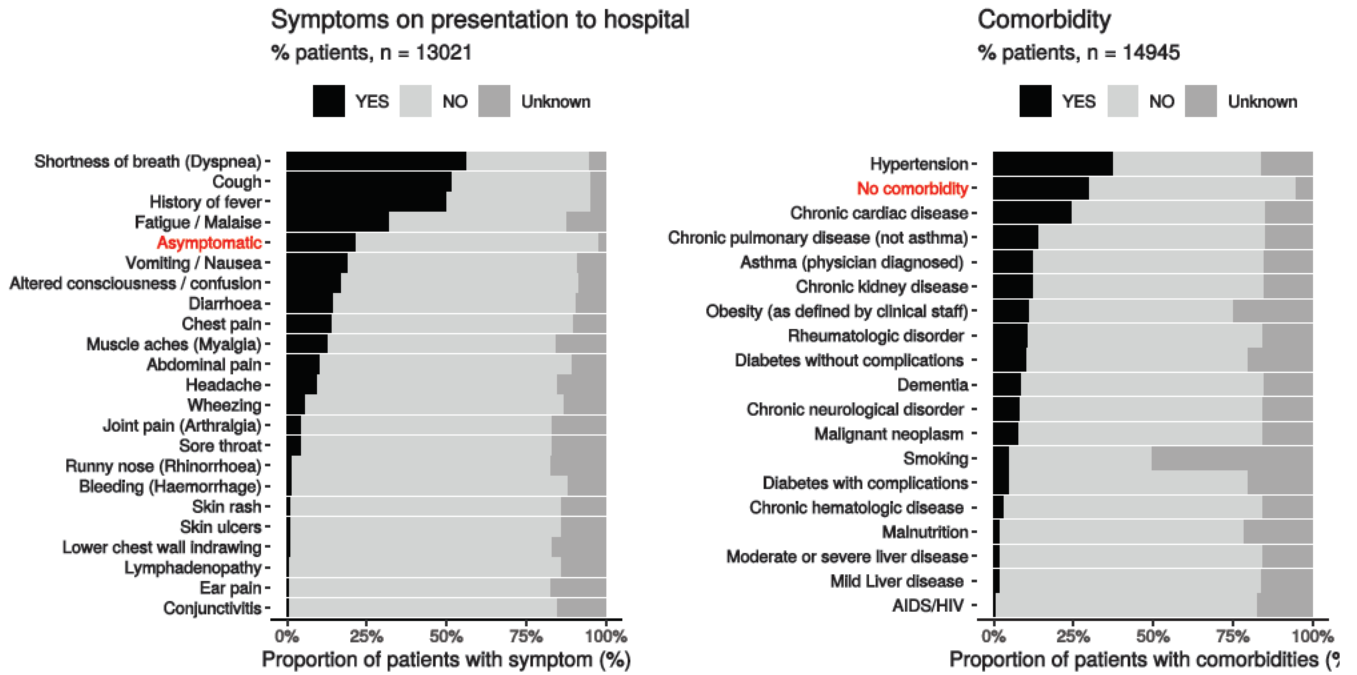


Figure 3B - Symptoms by Age

Symptoms on presentation to hospital
Stratified by age

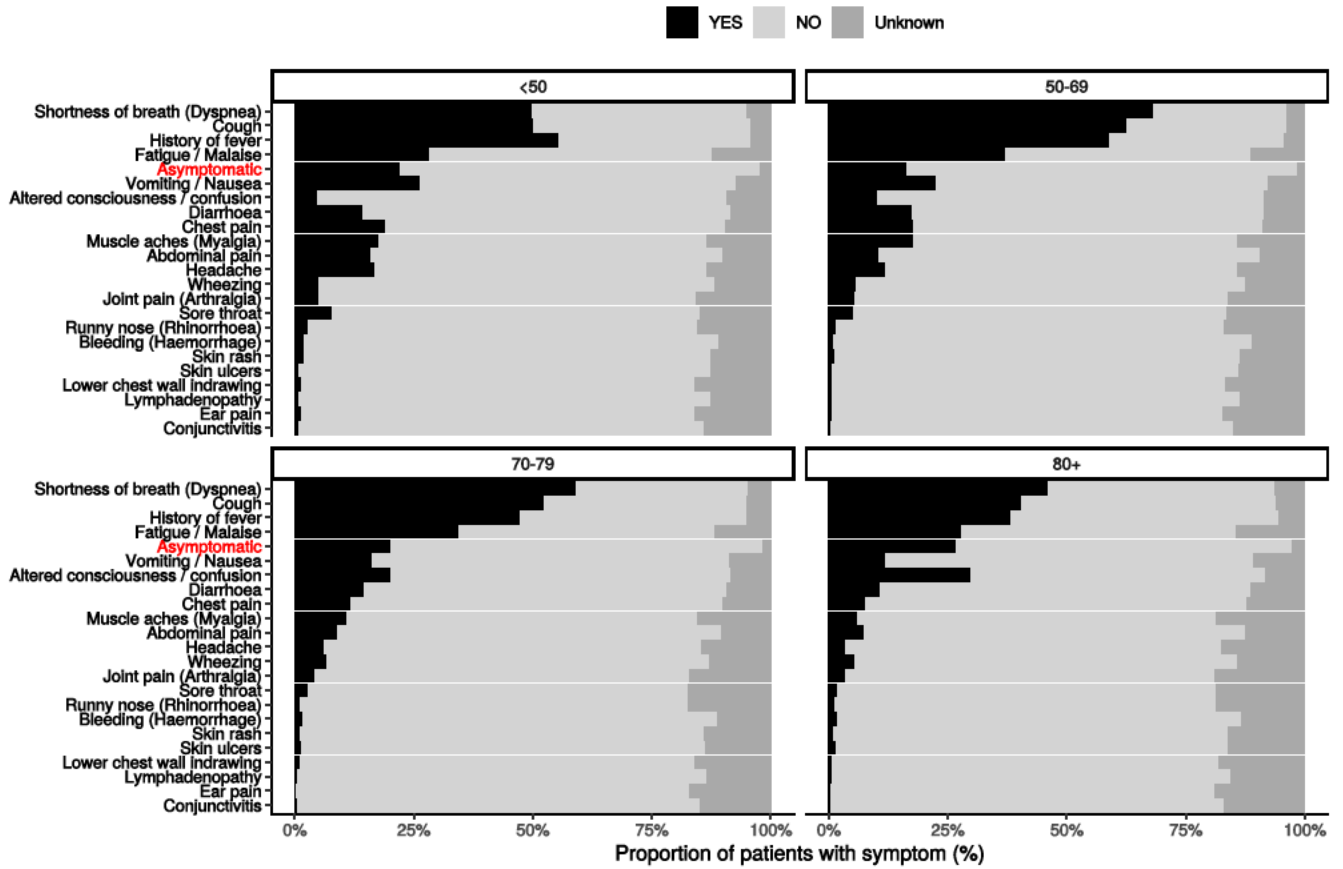
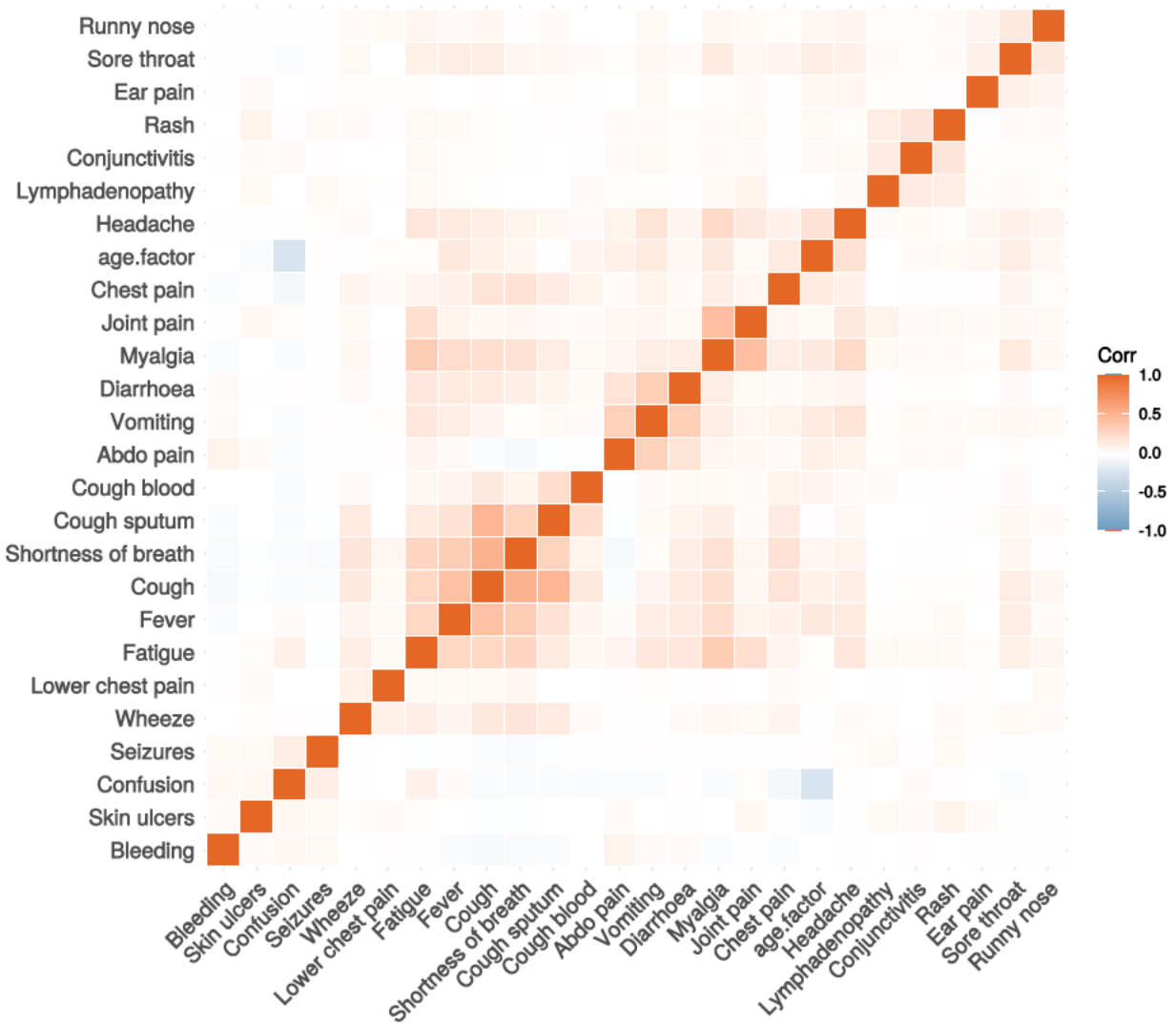


Figure 3C

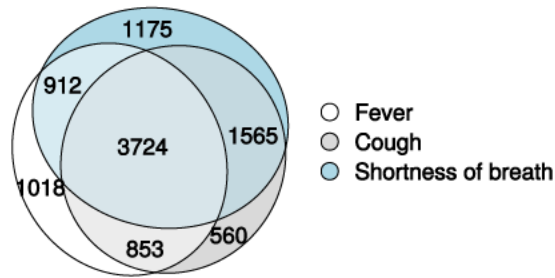
Correlation of symptoms in all pages. Note clusters, top right to bottom left, flu-like, coryzal, abdominal, respiratory, neurocutaneous.



Symptoms (diagnostic criteria)

Figure 4A

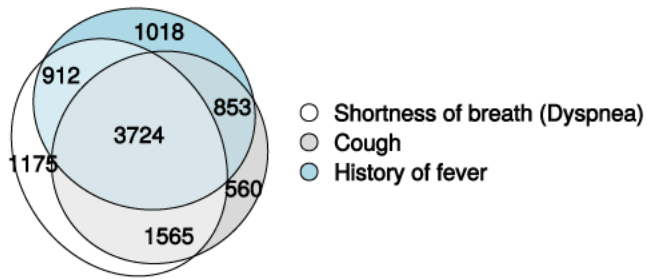
n = 13021



Symptoms (most common)

Figure 4B

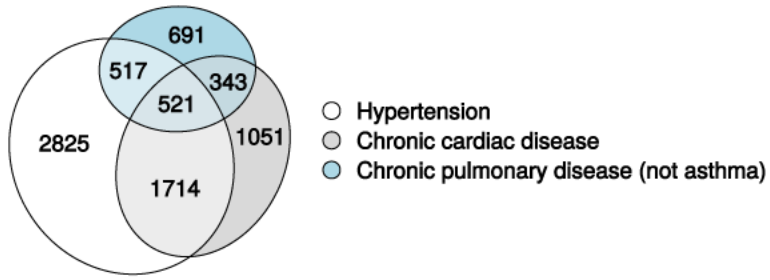
n = 13021



Comorbidity (most common)

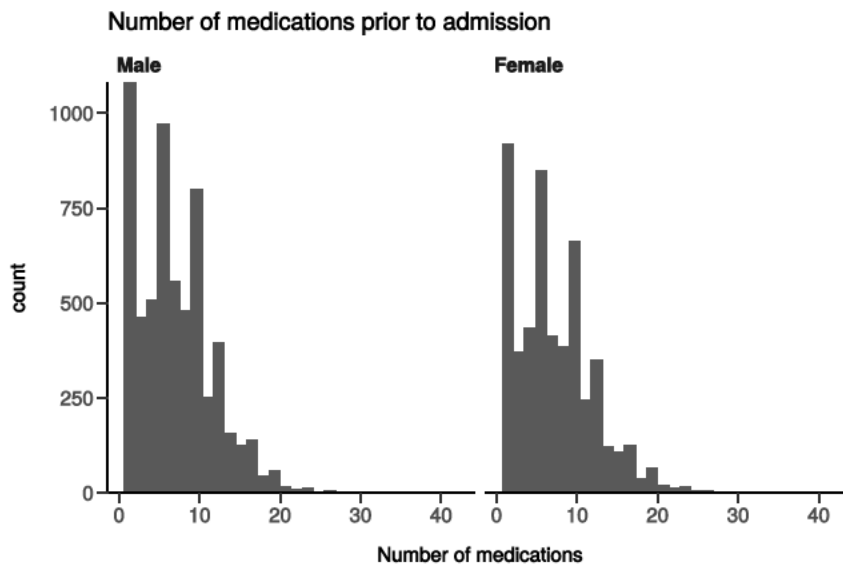
Figure 4C

n = 14945



Medication prior to illness

Figure 5

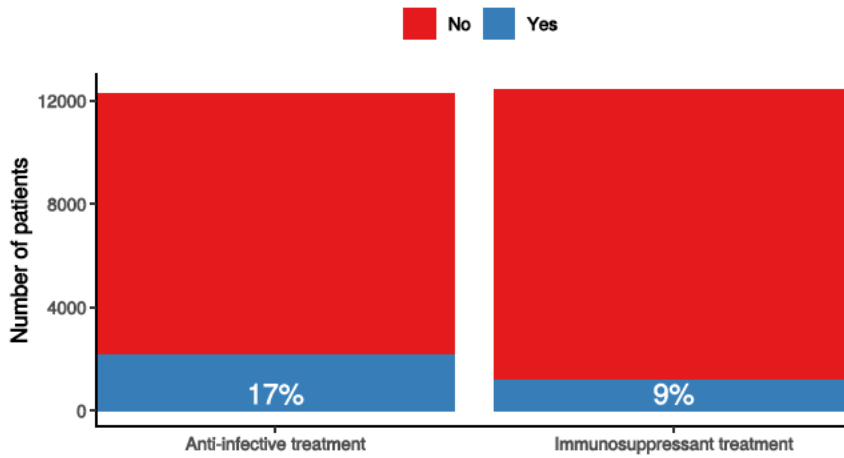


Preadmission treatment

Figure 6

Pre-admission treatment

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



Patient flow

Figure 7A - All patients

N = 13344

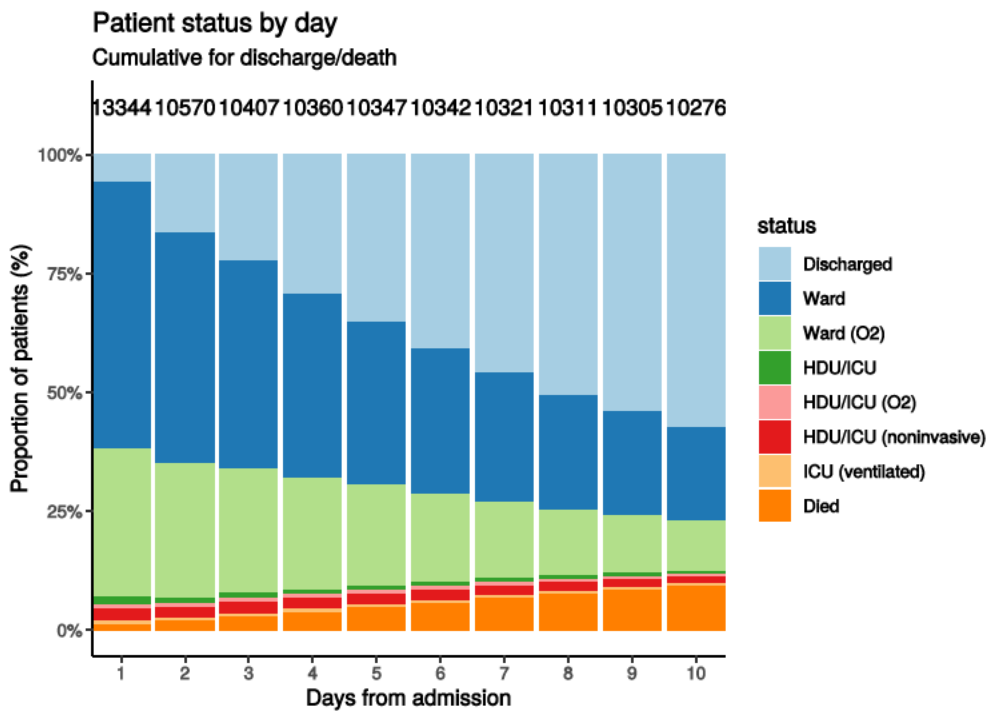
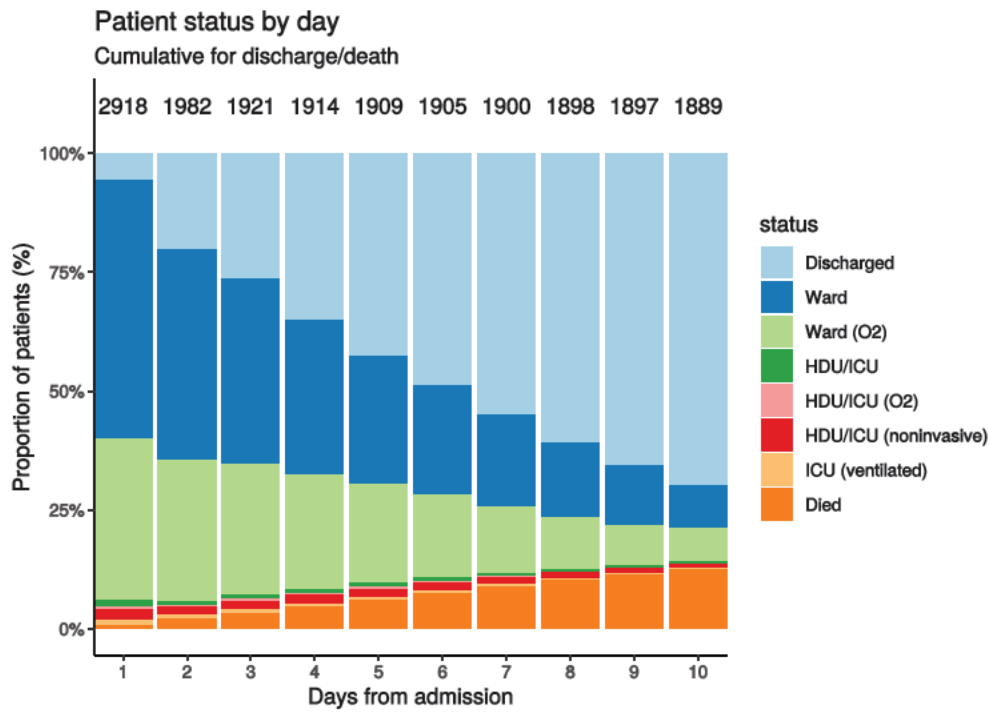


Figure 7B - Patients admitted ≥ 14 days and ≤ 28 days ago

N = 2918



Oxygen requirement

Figure 8A - All patients

N = 12718

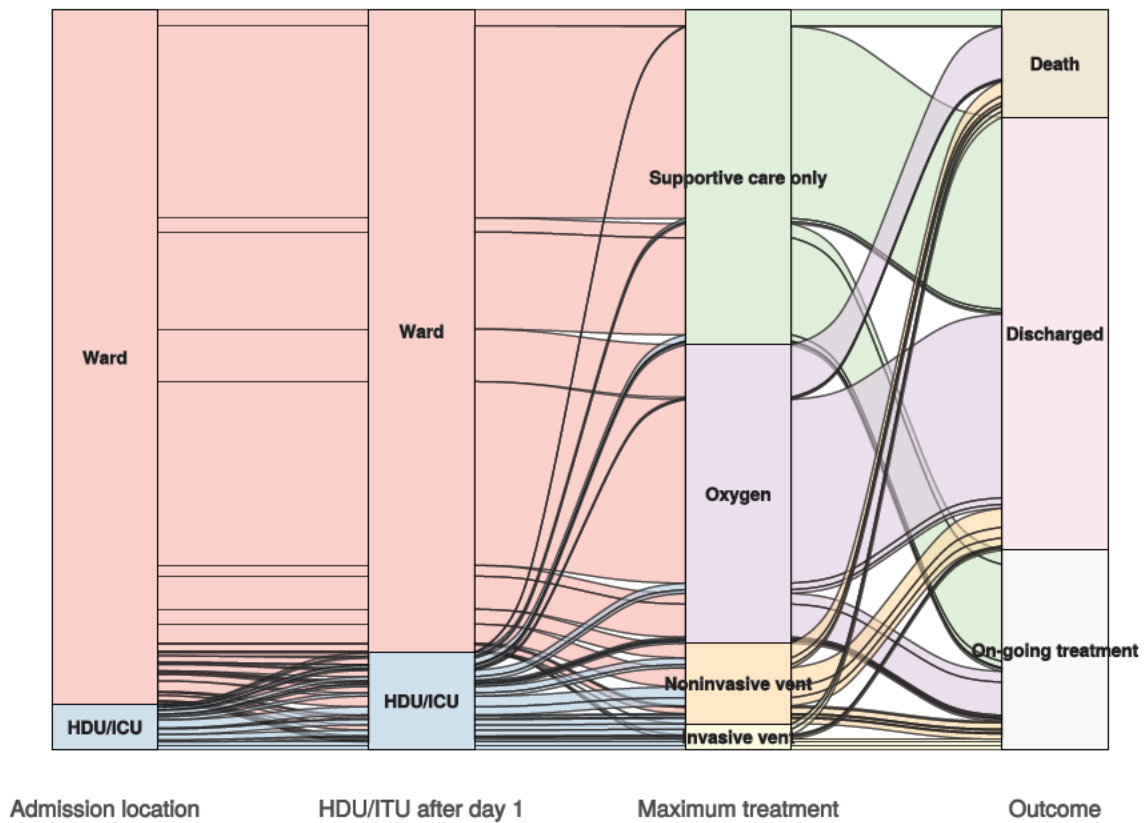


Figure 8B - Patients admitted ≥ 14 days and ≤ 28 days ago

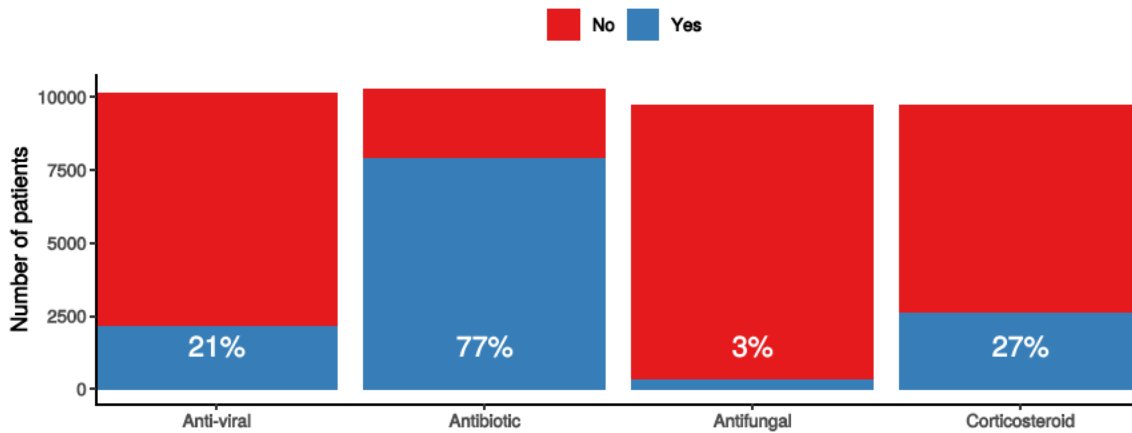
N = 2794

In-hospital medical treatment

Figure 9

In-hospital treatment

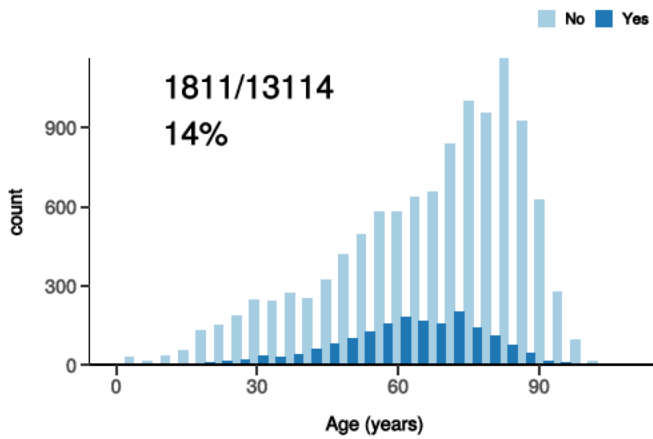
Anti-virals, antibiotics, corticosteroids, and anti-fungals for patients who have completed journey.



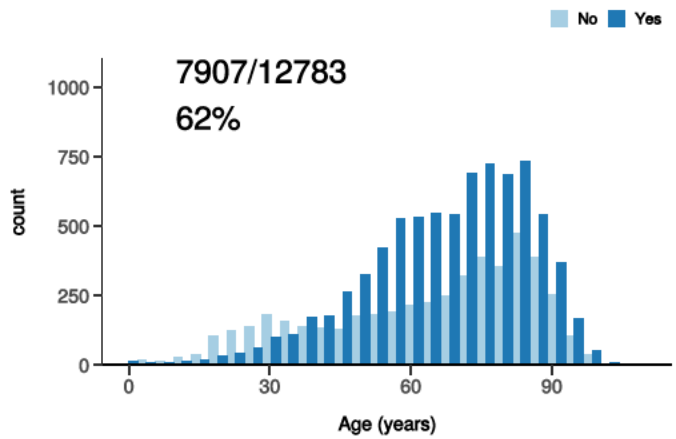
Treatment

Figure 10

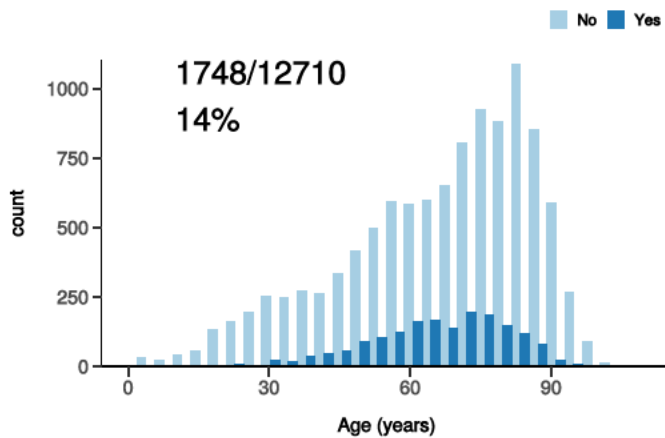
ICU/HDU admission
Figure 10A



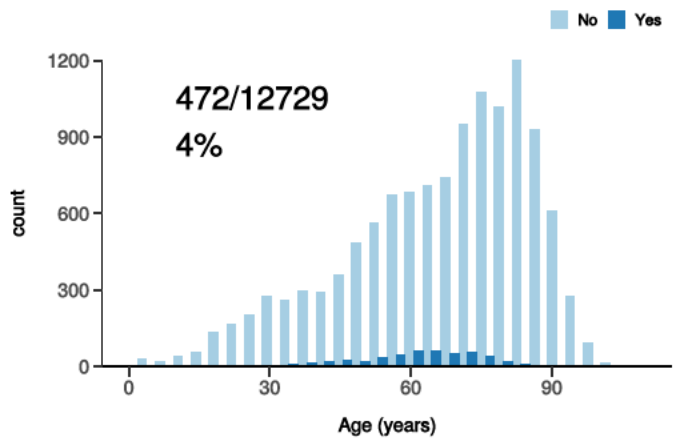
High flow oxygen
Figure 10B



Noninvasive ventilation
Figure 10C



Invasive ventilation
Figure 10D

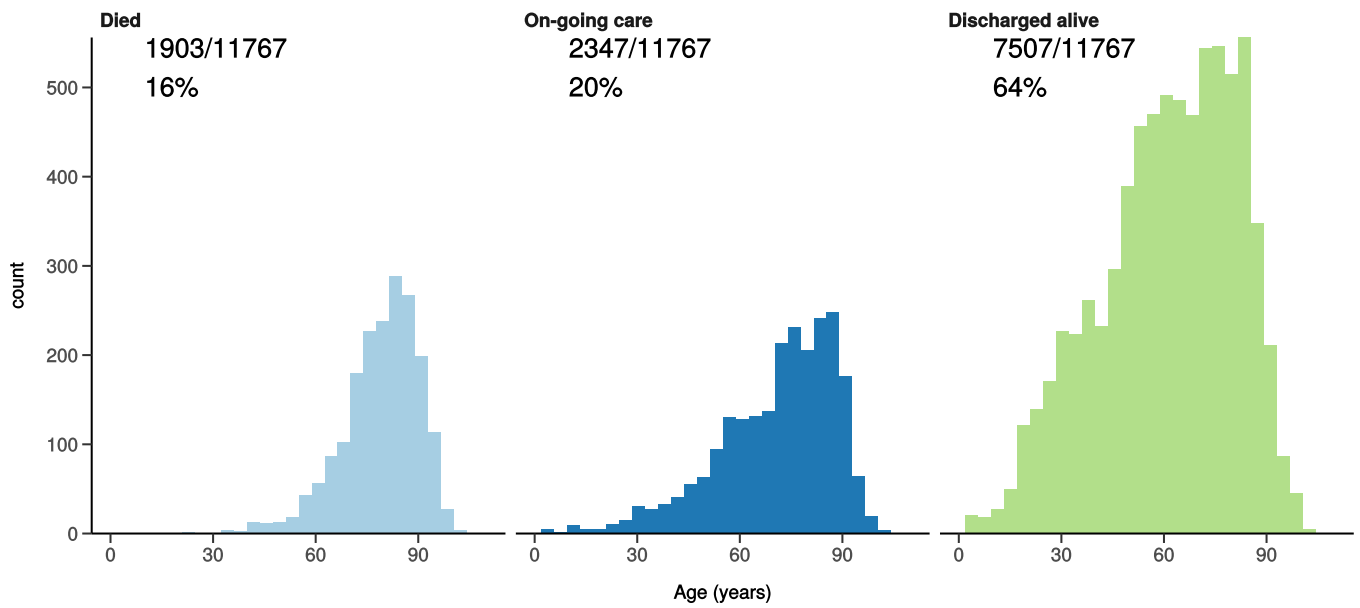


Status in patients admitted ≥ 14 days from today

Figure 11

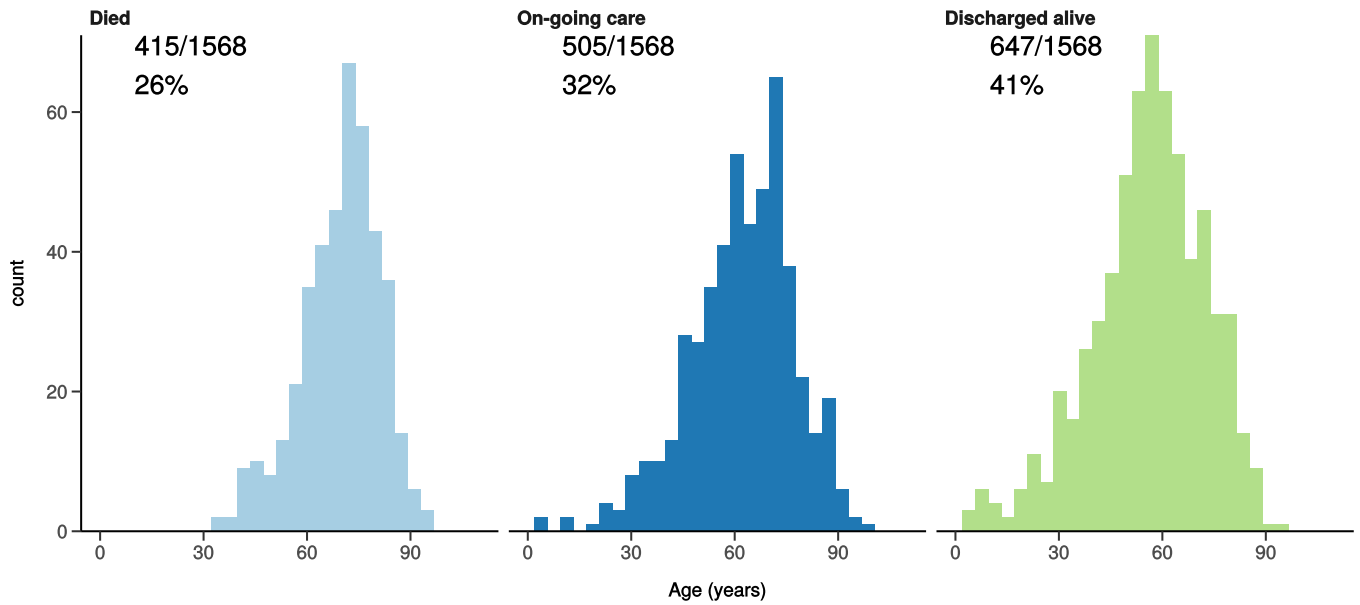
All: status in patients admitted ≥ 14 days ago

Figure 11A



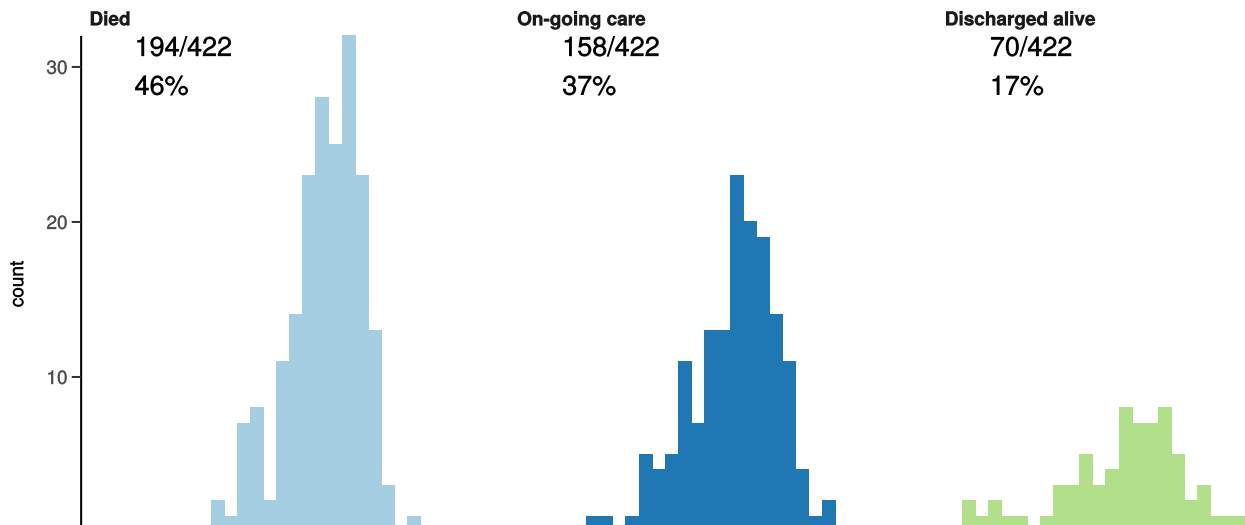
ICU/HDU admissions: status in patients admitted ≥ 14 days ago

Figure 11B



Invasive ventilation: status in patients admitted ≥ 14 days ago

Figure 11c

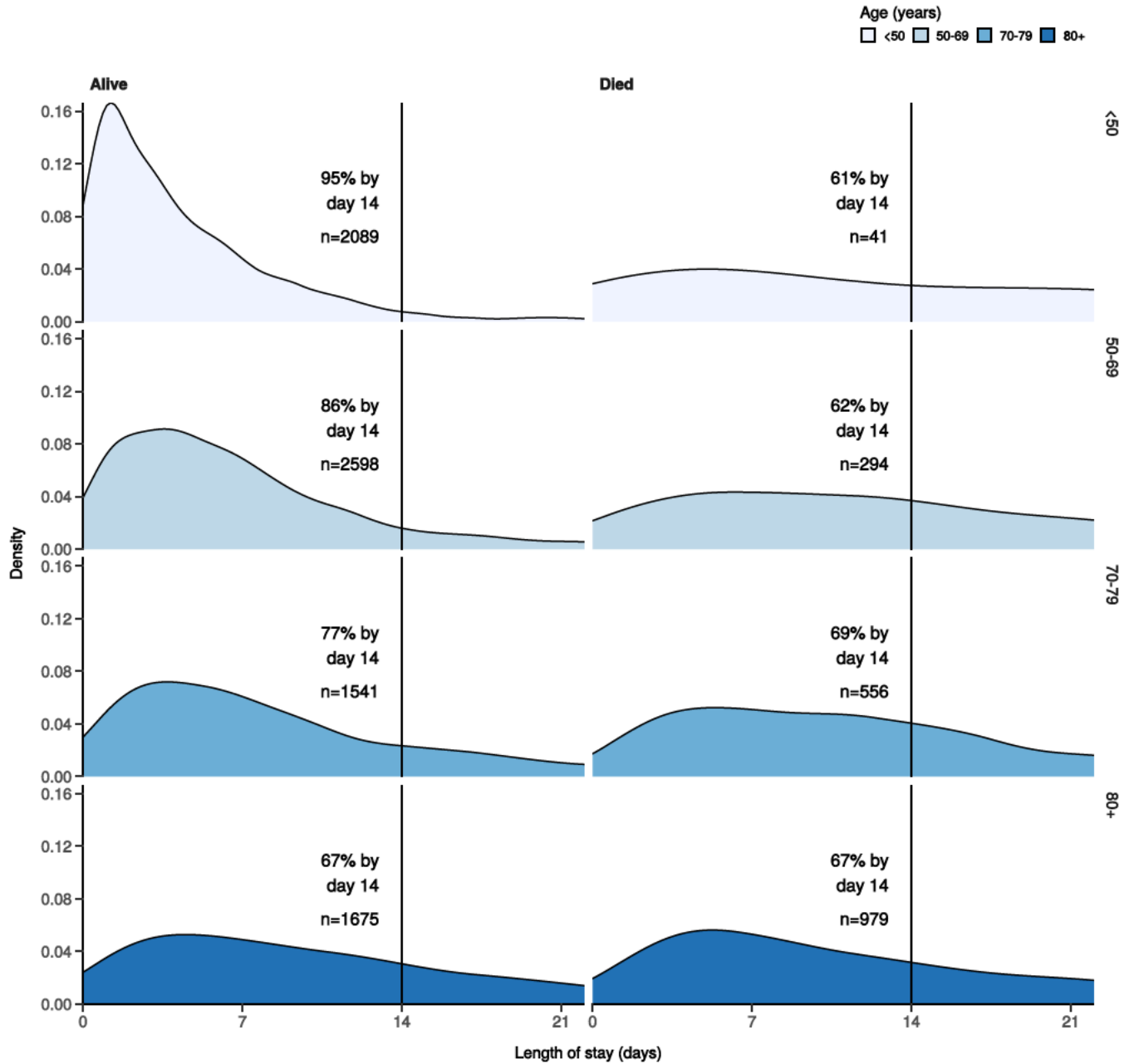




Length of stay stratified by age

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	2218 (98.0)	45 (2.0)	•	•

Dependent: death		No	Yes	OR (univariable)	OR (multivariable)
	50-69	2666 (89.8)	303 (10.2)	5.60 (4.12-7.80, p<0.001)	4.69 (3.32-6.82, p<0.001)
	70-79	1592 (73.9)	561 (26.1)	17.37 (12.89-24.01, p<0.001)	12.24 (8.70-17.74, p<0.001)
	80+	1742 (63.8)	988 (36.2)	27.95 (20.86-38.46, p<0.001)	19.09 (13.58-27.66, p<0.001)
Sex at Birth	Male	4338 (79.3)	1135 (20.7)	•	•
	Female	3883 (83.6)	762 (16.4)	0.75 (0.68-0.83, p<0.001)	0.71 (0.62-0.80, p<0.001)
	Not specified	0 (NaN)	0 (NaN)	•	•
Chronic cardiac disease	NO	5940 (86.5)	931 (13.5)	•	•
	YES	1810 (68.2)	845 (31.8)	2.98 (2.68-3.31, p<0.001)	1.35 (1.18-1.54, p<0.001)
Chronic pulmonary disease (not asthma)	NO	6731 (83.8)	1300 (16.2)	•	•
	YES	1014 (67.8)	481 (32.2)	2.46 (2.17-2.78, p<0.001)	1.55 (1.33-1.80, p<0.001)
Chronic neurological disorder	NO	7094 (82.4)	1520 (17.6)	•	•
	YES	624 (72.3)	239 (27.7)	1.79 (1.52-2.09, p<0.001)	1.20 (0.99-1.46, p=0.066)
Chronic hematologic disease	NO	7464 (81.9)	1647 (18.1)	•	•
	YES	247 (69.0)	111 (31.0)	2.04 (1.61-2.56, p<0.001)	1.45 (1.08-1.92, p=0.012)
Chronic kidney disease	NO	6891 (84.1)	1306 (15.9)	•	•
	YES	853 (64.9)	461 (35.1)	2.85 (2.51-3.24, p<0.001)	1.50 (1.28-1.76, p<0.001)
Dementia	NO	7181 (83.4)	1427 (16.6)	•	•
	YES	549 (63.2)	319 (36.8)	2.92 (2.52-3.39, p<0.001)	1.38 (1.14-1.66, p=0.001)
Obesity (as defined by clinical staff)	NO	5842 (81.2)	1352 (18.8)	•	•
	YES	1022 (84.4)	189 (15.6)	0.80 (0.68-0.94, p=0.008)	1.12 (0.92-1.36, p=0.258)
Malignant neoplasm	NO	7171 (82.9)	1483 (17.1)	•	•
	YES	547 (66.2)	279 (33.8)	2.47 (2.11-2.88, p<0.001)	1.55 (1.28-1.88, p<0.001)

Number in dataframe = 13887, Number in model = 8068, Missing = 5819, AIC = 6331.3, C-statistic = 0.783, H&L = Chi-sq(8) 18.17 (p=0.020)

Figure 13 - Adjusted odds ratio plot

Death

Age on admission (years)	<50	-
	50-69	4.69 (3.32-6.82, p<0.001)
	70-79	12.24 (8.70-17.74, p<0.001)
	80+	19.09 (13.58-27.66, p<0.001)
Sex at Birth	Male	-
	Female	0.71 (0.62-0.80, p<0.001)
	Not specified	-
Chronic cardiac disease	YES	1.35 (1.18-1.54, p<0.001)
Chronic pulmonary disease (not asthma)	YES	1.55 (1.33-1.80, p<0.001)
Chronic neurological disorder	YES	1.20 (0.99-1.46, p=0.066)
Chronic hematologic disease	YES	1.45 (1.08-1.92, p=0.012)
Chronic kidney disease	YES	1.50 (1.28-1.76, p<0.001)
Dementia	YES	1.38 (1.14-1.66, p=0.001)
Obesity (as defined by clinical staff)	YES	1.12 (0.92-1.36, p=0.258)
Malignant neoplasm	YES	1.55 (1.28-1.88, p<0.001)

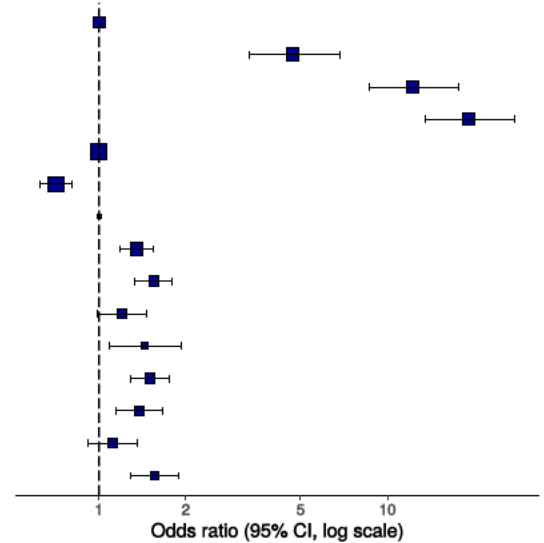
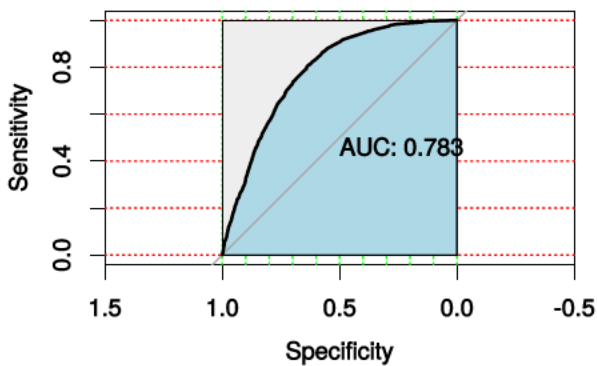


Figure 14 - ROC

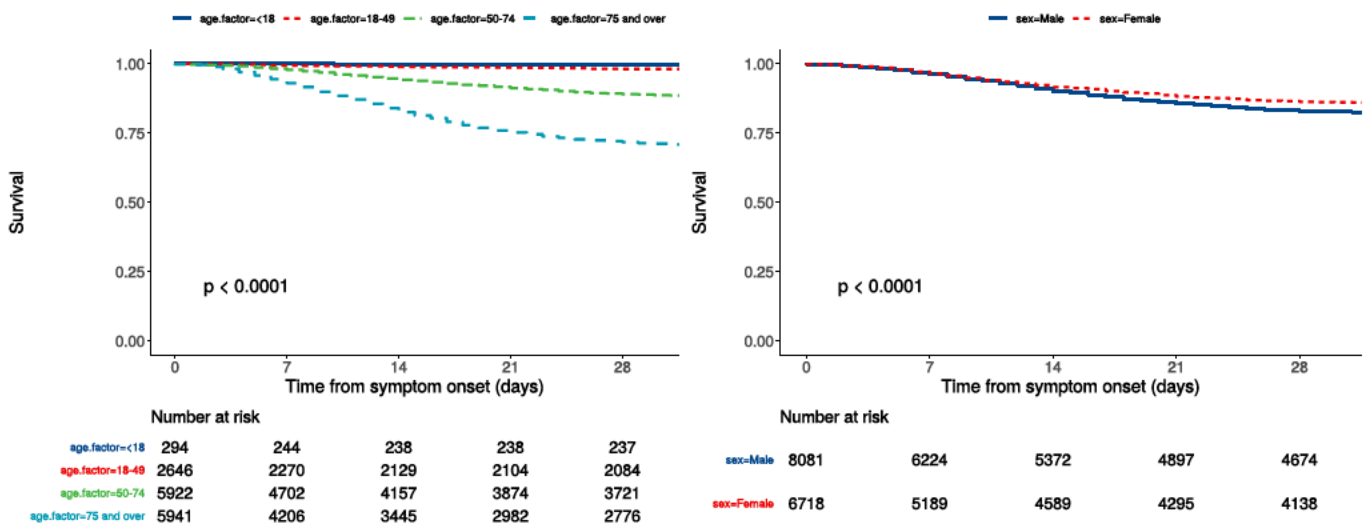


Survival models

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	2940 (19.9)	•	•
	50-69	4335 (29.3)	5.40 (3.93-7.43, p<0.001)	4.57 (3.11-6.71, p<0.001)
	70-79	3285 (22.2)	15.24 (11.17-20.77, p<0.001)	11.83 (8.13-17.22, p<0.001)
	80+	4247 (28.7)	23.28 (17.16-31.60, p<0.001)	17.85 (12.27-25.99, p<0.001)
Sex at Birth	Male	8081 (54.6)	•	•
	Female	6718 (45.4)	0.79 (0.72-0.87, p<0.001)	0.80 (0.71-0.89, p<0.001)
qSOFA score on admission	0	5791 (51.0)	•	•
	1	4787 (42.2)	1.90 (1.71-2.12, p<0.001)	2.04 (1.80-2.30, p<0.001)
	2	733 (6.5)	4.72 (4.07-5.47, p<0.001)	3.89 (3.28-4.62, p<0.001)
	3	39 (0.3)	7.82 (4.83-12.68, p<0.001)	7.29 (4.26-12.47, p<0.001)
Symptomatic at presentation	No symptoms	1557 (11.8)	•	•
	Symptoms	11618 (88.2)	1.45 (1.23-1.71, p<0.001)	•
Chronic cardiac disease	NO	9039 (71.5)	•	•
	YES	3605 (28.5)	2.65 (2.42-2.91, p<0.001)	1.36 (1.22-1.53, p<0.001)
Chronic kidney disease	NO	10827 (85.9)	•	•
	YES	1776 (14.1)	2.51 (2.26-2.79, p<0.001)	1.43 (1.26-1.63, p<0.001)
Moderate or severe liver disease	NO	12287 (98.1)	•	•
	YES	235 (1.9)	1.86 (1.42-2.44, p<0.001)	1.57 (1.10-2.24, p=0.014)
Chronic neurological disorder	NO	11371 (90.5)	•	•
	YES	1189 (9.5)	1.64 (1.43-1.88, p<0.001)	•
Malignant neoplasm	NO	11446 (91.1)	•	•
	YES	1124 (8.9)	2.21 (1.95-2.51, p<0.001)	1.70 (1.46-1.97, p<0.001)
Chronic hematologic disease	NO	12087 (96.4)	•	•
	YES	456 (3.6)	1.85 (1.53-2.24, p<0.001)	•
Obesity (as defined by clinical staff)	NO	9594 (85.9)	•	•
	YES	1578 (14.1)	0.81 (0.70-0.95, p=0.007)	1.12 (0.94-1.33, p=0.219)

Dependent: Surv(time, status)		all	HR (univariable)	HR (multivariable)
Diabetes without complications	NO	10419 (87.6)	•	•
	YES	1469 (12.4)	1.28 (1.12-1.46, p<0.001)	•
Rheumatologic disorder	NO	10995 (87.7)	•	•
	YES	1546 (12.3)	1.40 (1.24-1.59, p<0.001)	•
Dementia	NO	11340 (90.1)	•	•
	YES	1248 (9.9)	2.51 (2.22-2.83, p<0.001)	1.15 (0.99-1.34, p=0.073)
Malnutrition	NO	11438 (98.0)	•	•
	YES	235 (2.0)	1.96 (1.51-2.55, p<0.001)	•
smoking_mhyn_2levels	NO	6682 (51.3)	•	•
	YES	679 (5.2)	0.94 (0.75-1.18, p=0.601)	•
	N/K	5664 (43.5)	1.30 (1.19-1.43, p<0.001)	•

Number in dataframe = 14837, Number in model = 9260, Missing = 5577, Number of events = 1314, Concordance = 0.787 (SE = 0.006), R-squared = 0.142(Max possible = 0.919), Likelihood ratio test = 1423.459 (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	4.57 (3.11-6.71, p<0.001)
	70-79	11.83 (8.13-17.22, p<0.001)
	80+	17.85 (12.27-25.99, p<0.001)
Sex at Birth	Female	0.80 (0.71-0.89, p<0.001)
qSOFA score on admission	0	-
	1	2.04 (1.80-2.30, p<0.001)
	2	3.89 (3.28-4.62, p<0.001)
	3	7.29 (4.26-12.47, p<0.001)
Chronic cardiac disease	YES	1.36 (1.22-1.53, p<0.001)
Chronic kidney disease	YES	1.43 (1.26-1.63, p<0.001)
Moderate or severe liver disease	YES	1.57 (1.10-2.24, p=0.014)
Malignant neoplasm	YES	1.70 (1.46-1.97, p<0.001)
Obesity (as defined by clinical staff)	YES	1.12 (0.94-1.33, p=0.219)
Dementia	YES	1.15 (0.99-1.34, p=0.073)

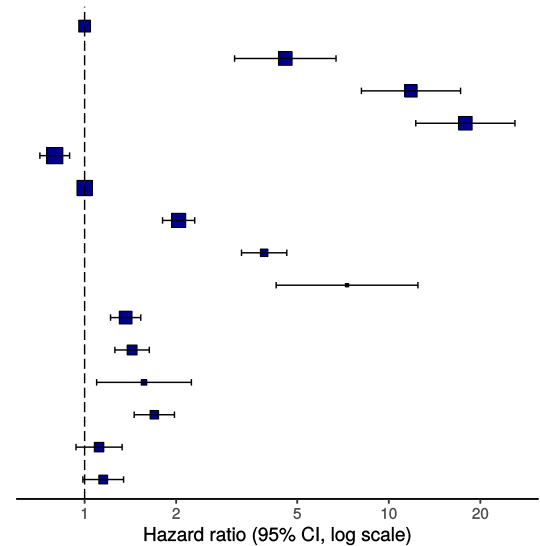
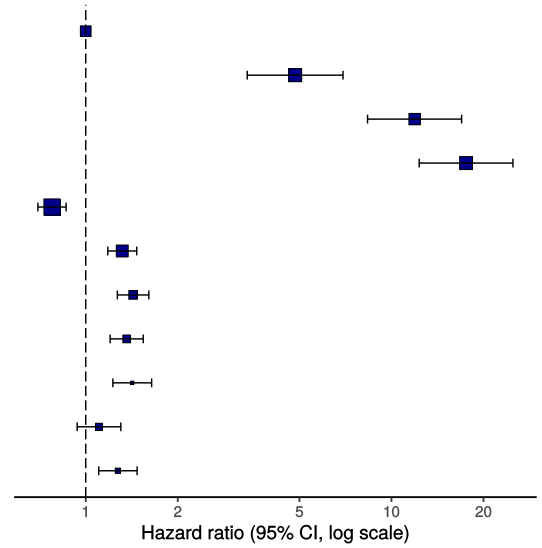


Figure 16b - Multivariable Cox proportional hazards model (age, sex, comorbidities only)

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

Age on admission (years)	<50	-
	50-69	4.84 (3.37-6.94, p<0.001)
	70-79	11.90 (8.35-16.96, p<0.001)
	80+	17.54 (12.32-24.97, p<0.001)
Sex at Birth	Female	0.78 (0.70-0.86, p<0.001)
Chronic cardiac disease	YES	1.32 (1.18-1.47, p<0.001)
Chronic pulmonary disease (not asthma)	YES	1.43 (1.27-1.61, p<0.001)
Chronic kidney disease	YES	1.36 (1.20-1.54, p<0.001)
Malignant neoplasm	YES	1.42 (1.23-1.64, p<0.001)
Obesity (as defined by clinical staff)	YES	1.11 (0.94-1.30, p=0.233)
Dementia	YES	1.27 (1.10-1.47, p=0.001)



ROC = 0.7889012

Figure 17 - Predictions calibration plot

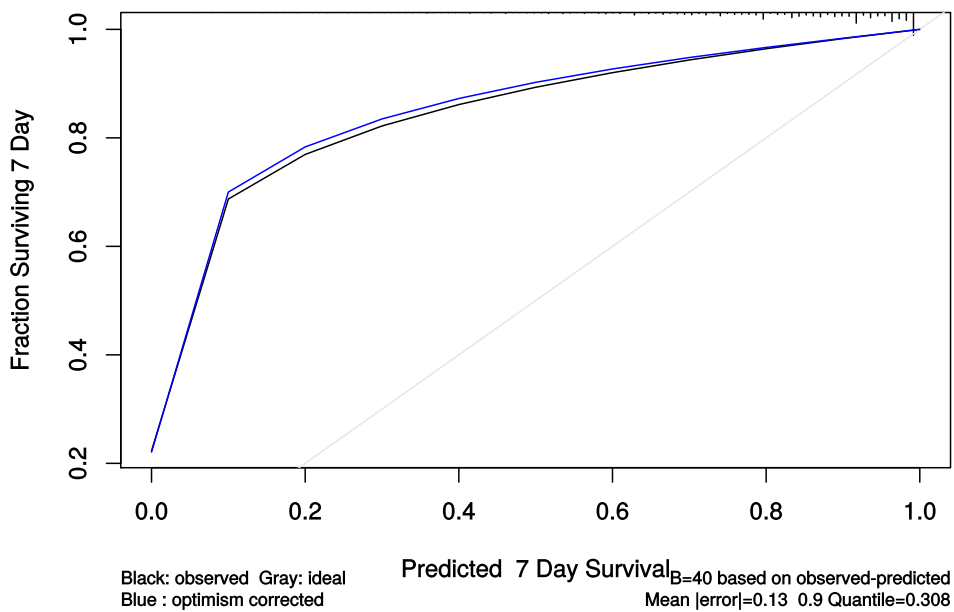


Figure 18 - Prognostic model predictions

Again, for demonstration of methods.

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

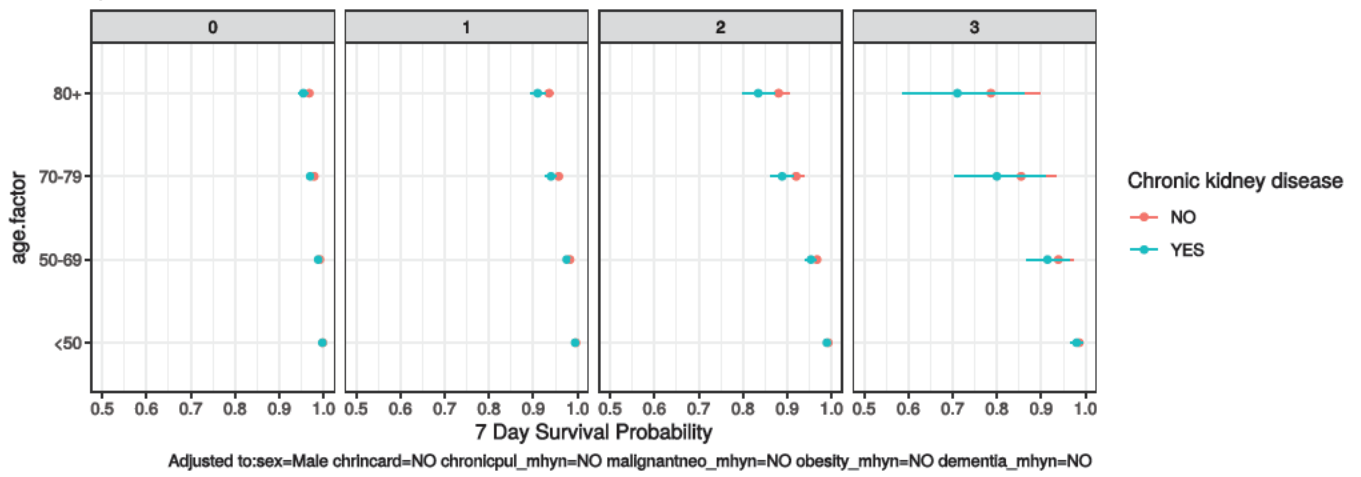


Figure 19 - Death by severity (NEWS) on admission

Number of deaths by NEWS score at admission

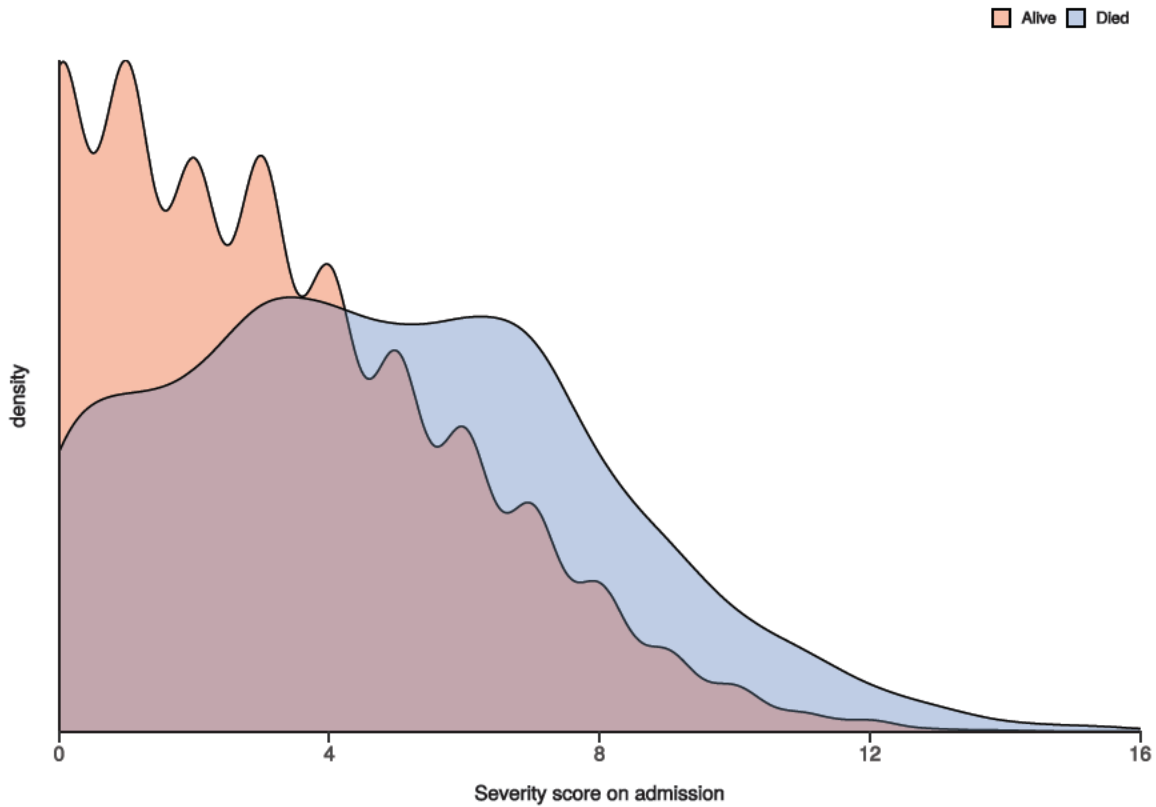


Figure 20 - Death by severity (NEWS) on admission stratified by age

Number of deaths by NEWS score at admission
Stratified by age

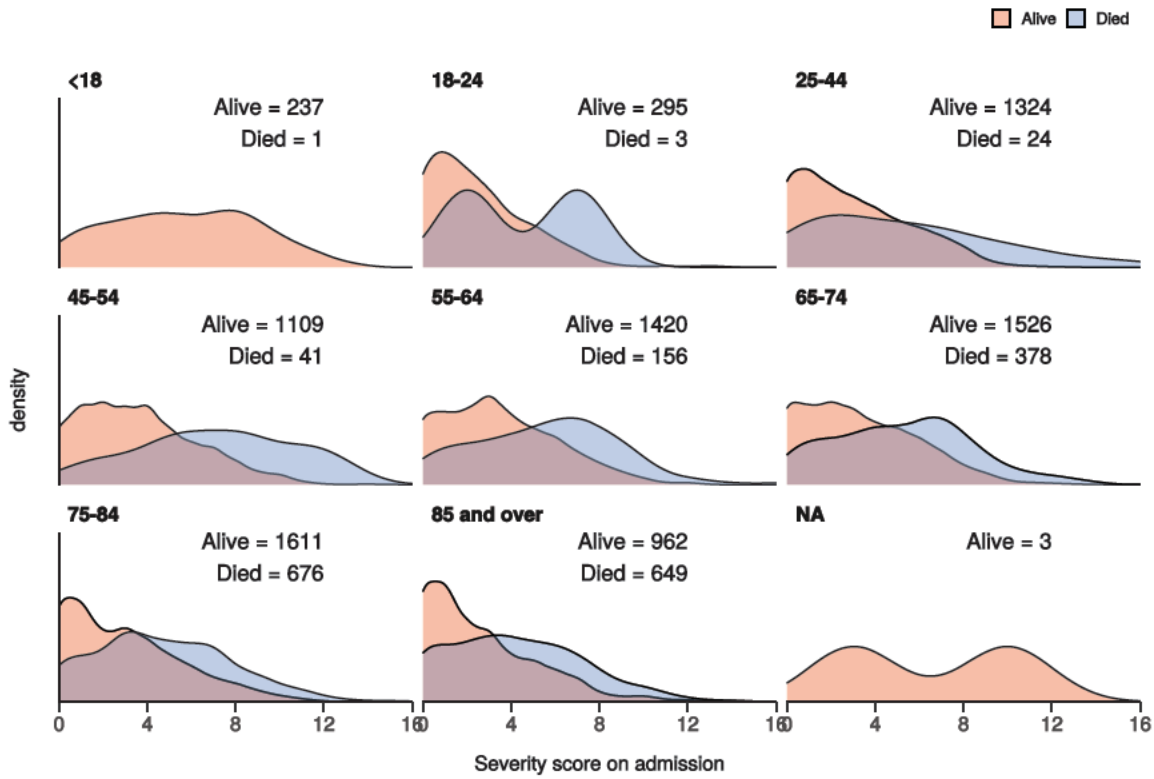
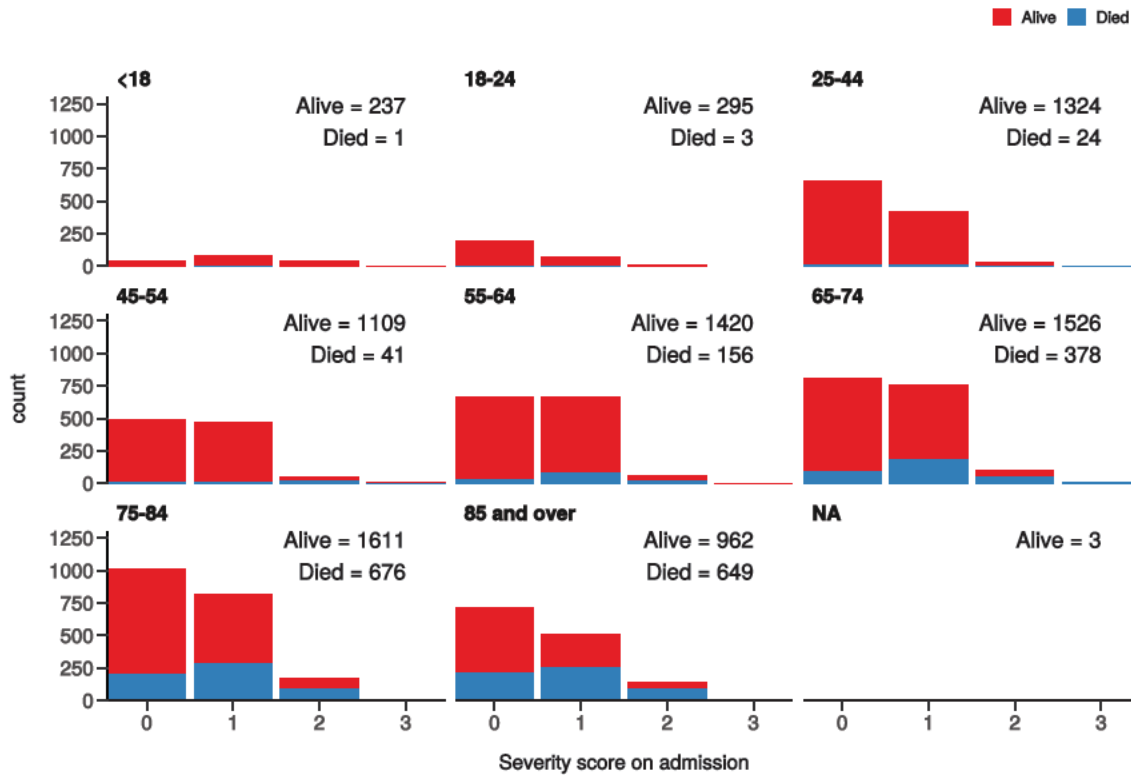


Figure 21 - Death by severity (qSOFA) on admission stratified by age

Number of deaths by qSOFA score at admission
Stratified by age



Healthcare workers

Employed as a healthcare worker?

NO

YES

p

Employed as a healthcare worker?		NO	YES	p
Total N (%)		12355 (97.6)	309 (2.4)	
NEWS score on admission	Median (IQR)	3.0 (4.0)	3.0 (4.0)	0.870
Death	No	7008 (79.7)	227 (97.4)	<0.001
	Yes	1787 (20.3)	6 (2.6)	