

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

Dynamic content updated: 2020-11-18 03:36:22.

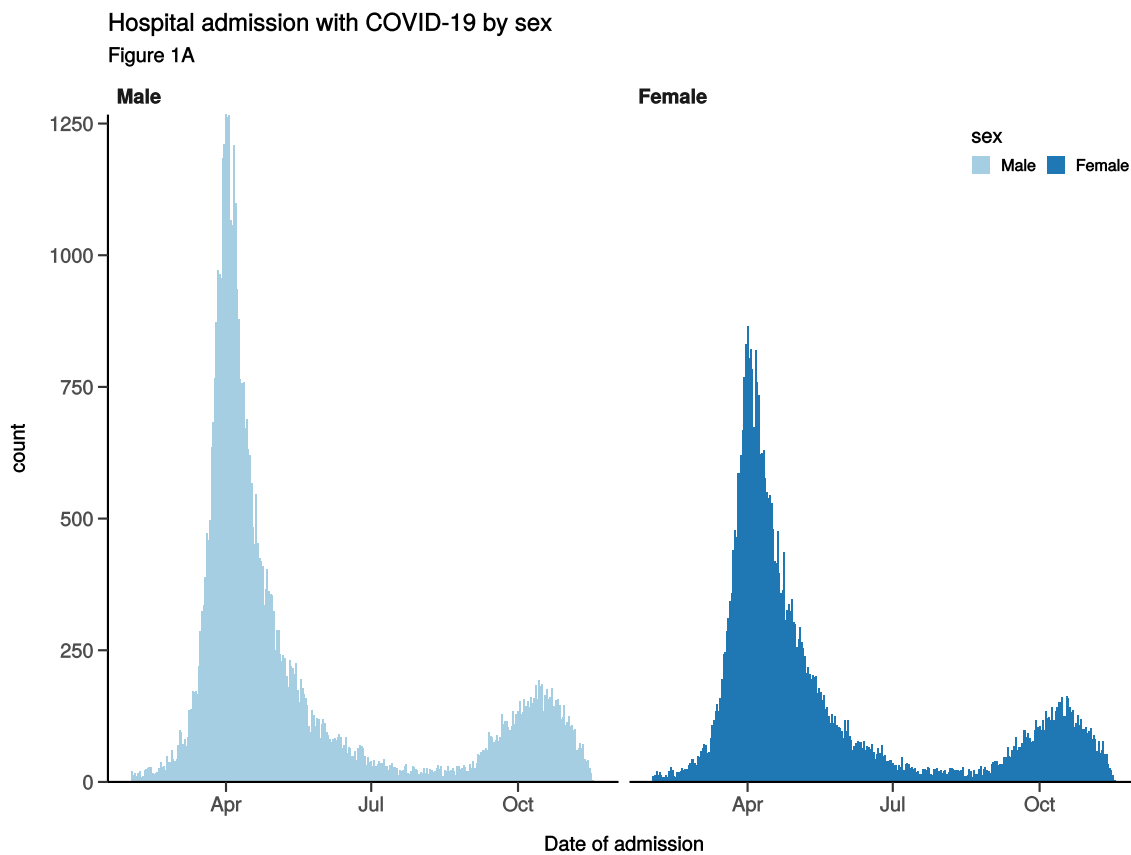
Executive summary

Includes all patients

There are 103647 patients included in CO-CIN. Of these, 26192 patient(s) have died and 12845 required ICU. 54838 have been discharged home.

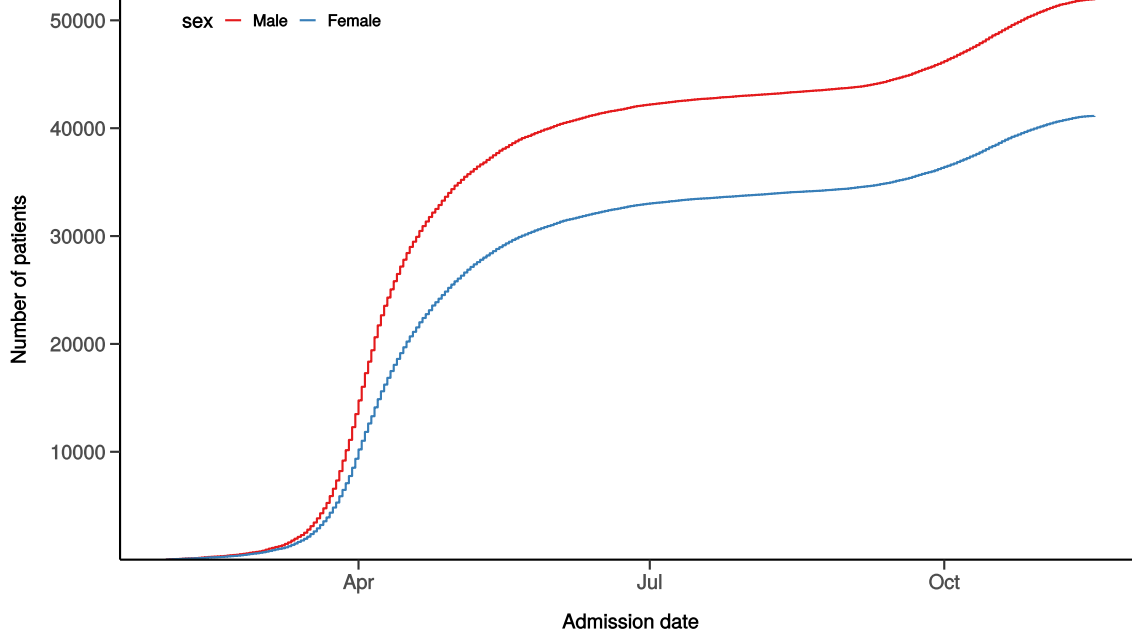
Admission

Figure 1



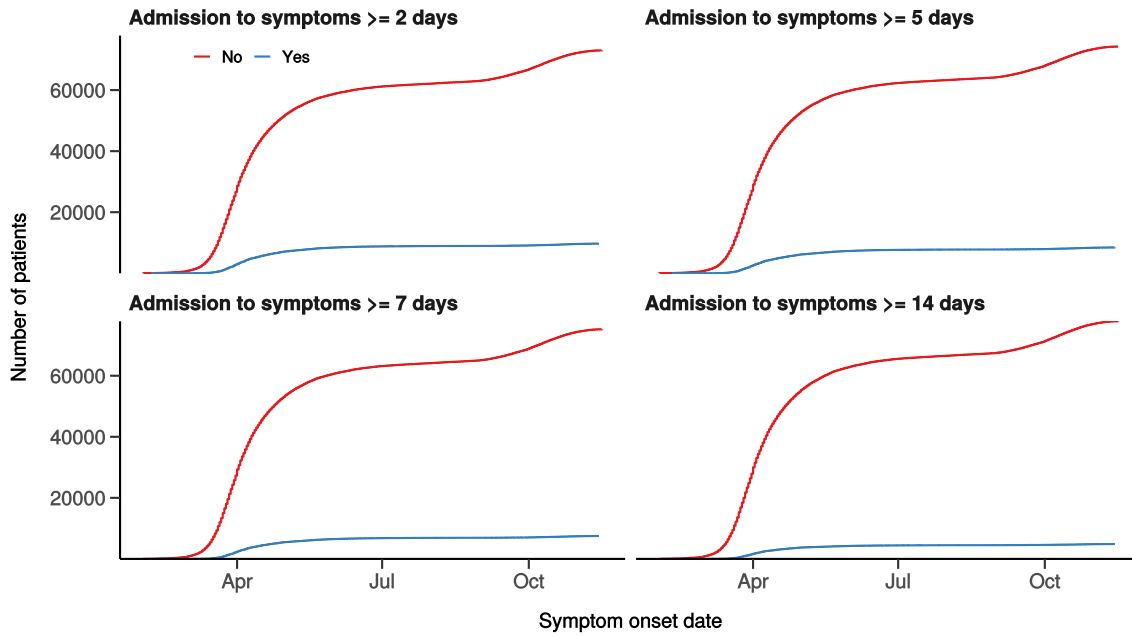
Hospital admission with COVID-19 by sex

Figure 1B



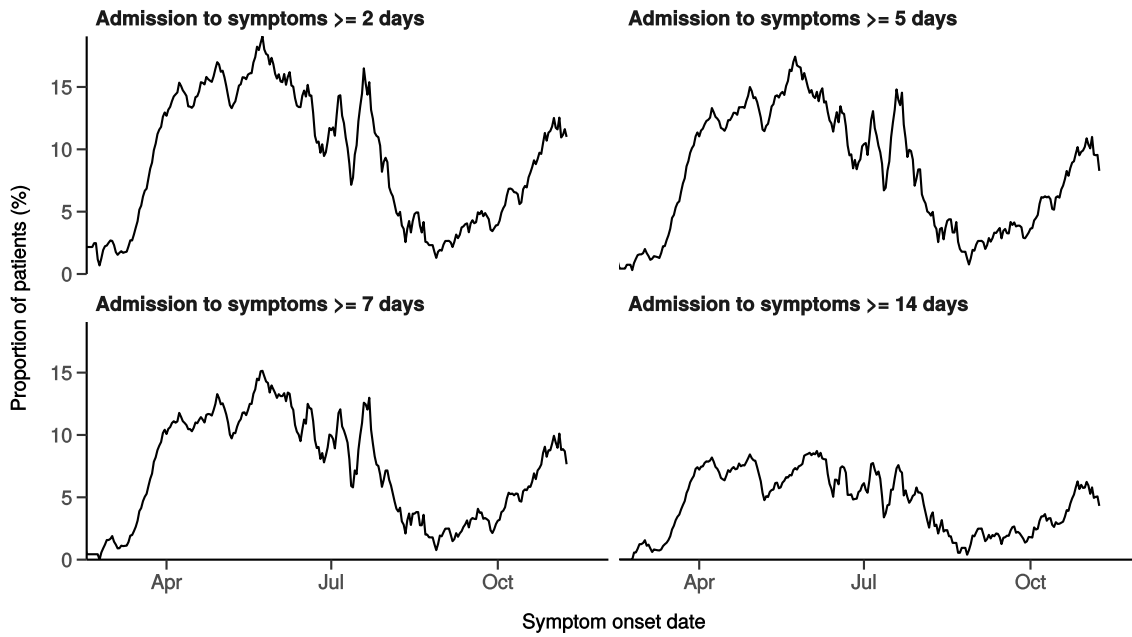
Number with symptom onset occurring after admission to hospital

Figure 1C



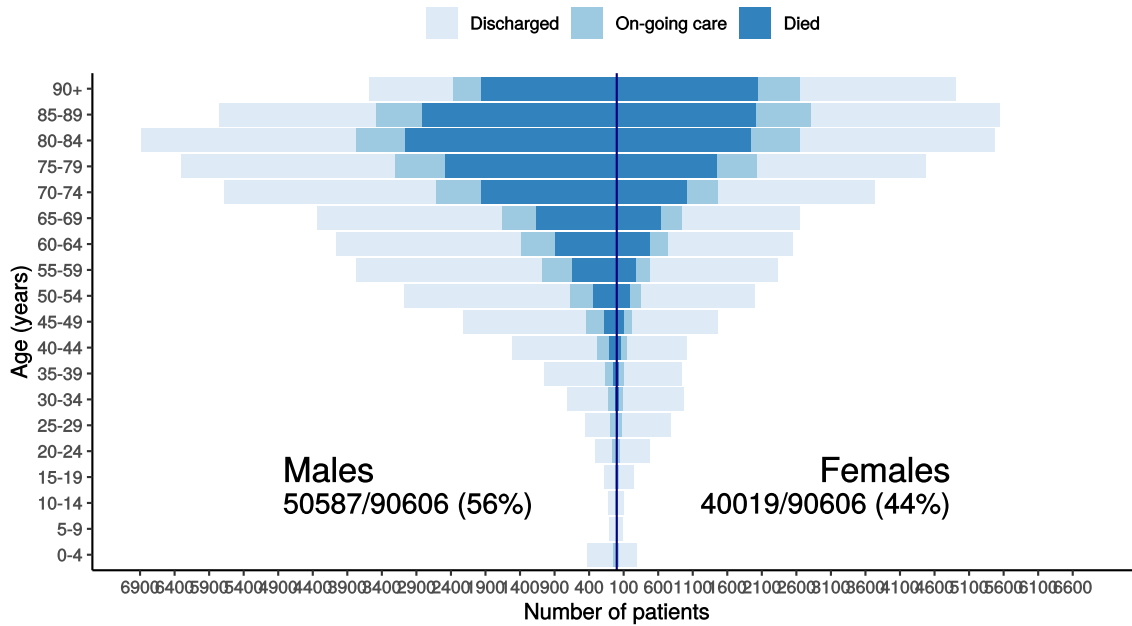
Proportion with symptom onset occurring after hospital admission

Figure 1D - 7-day rolling percentage. n = 82718



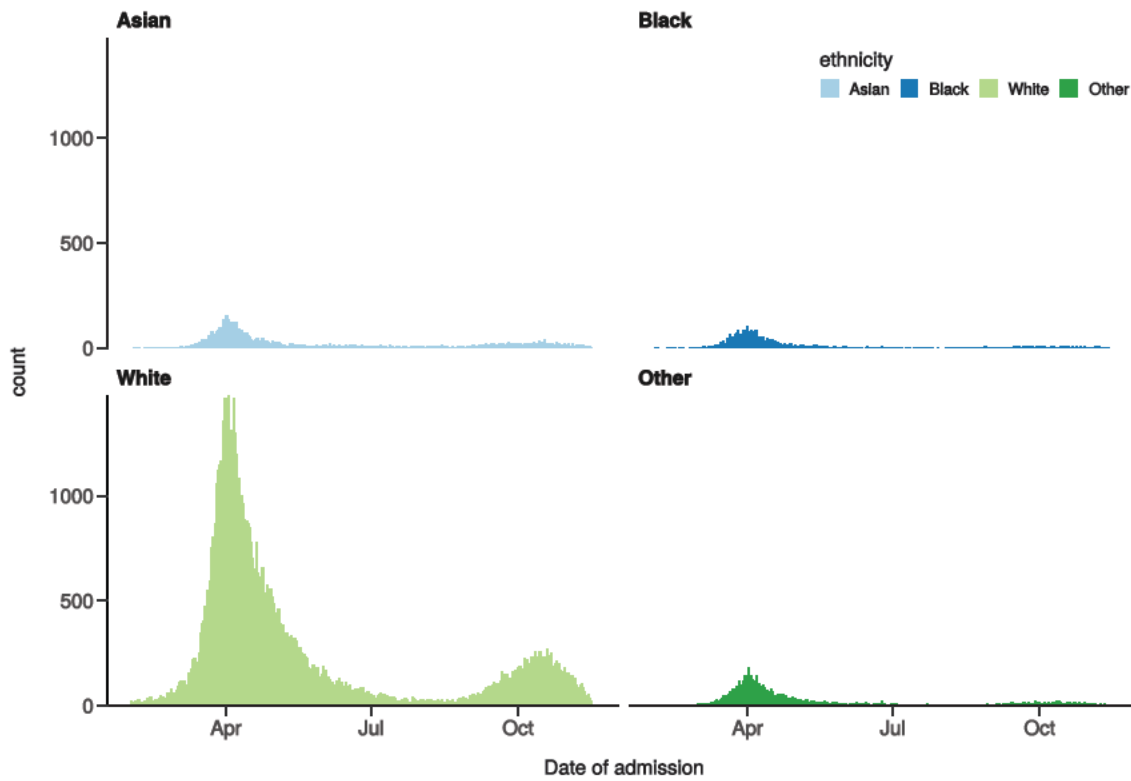
Patients with outcome stratified by age, and sex

Figure 1E



Hospital admission with COVID-19 by ethnicity

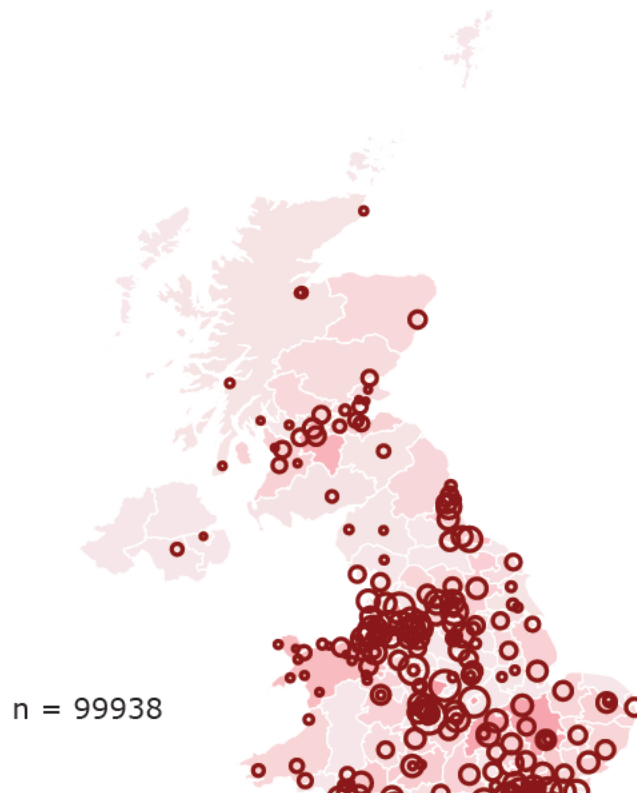
Figure 1F



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

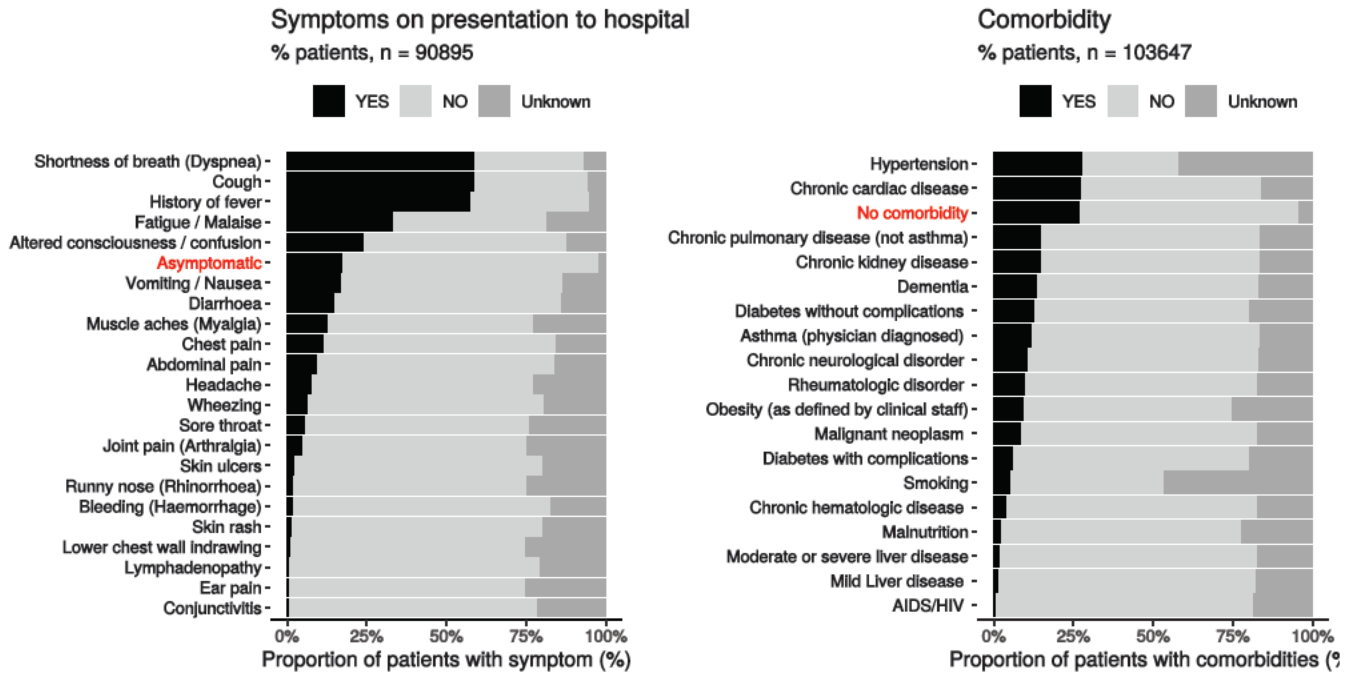


Figure 3B - Symptoms by Age

Symptoms on presentation to hospital
Stratified by age

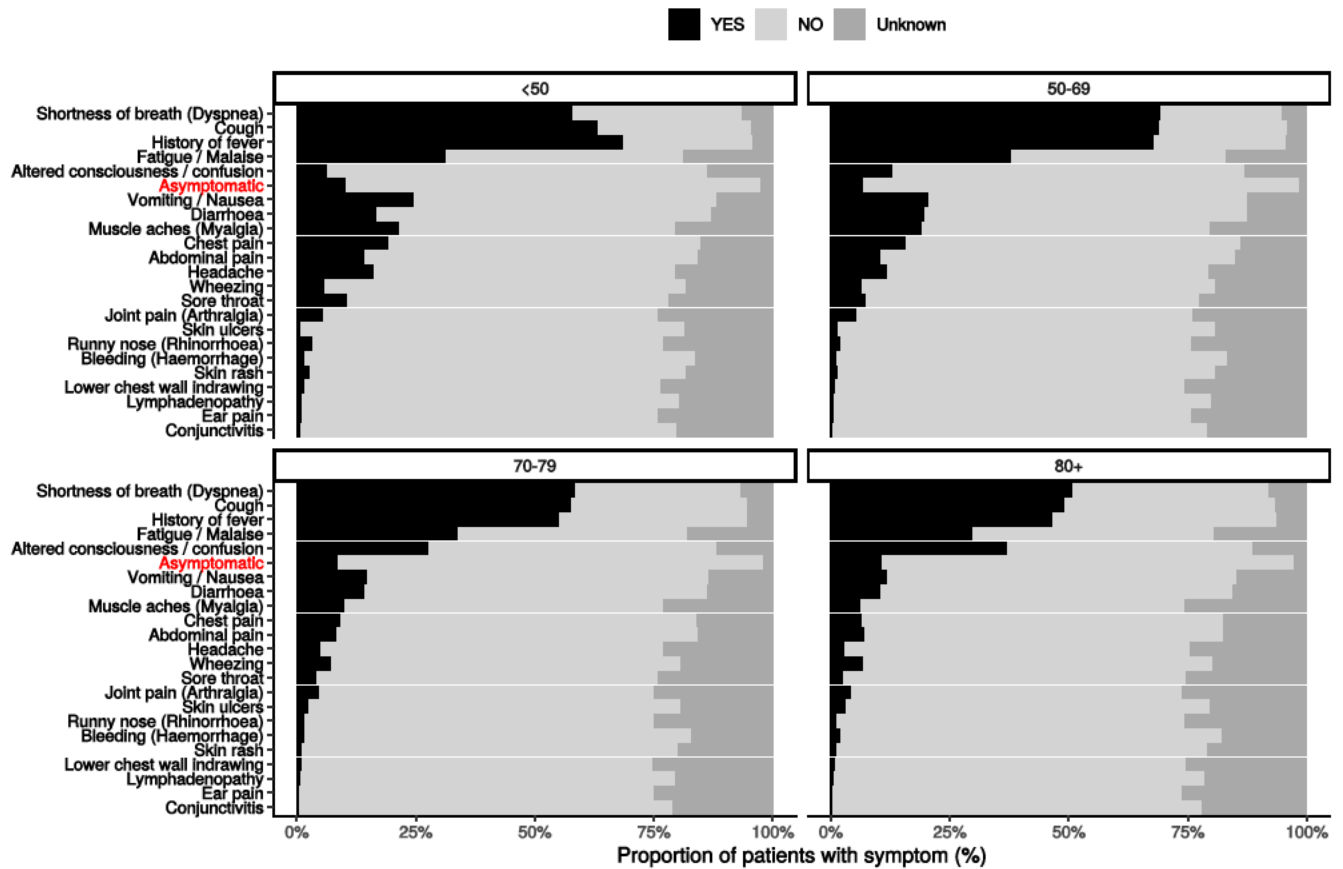
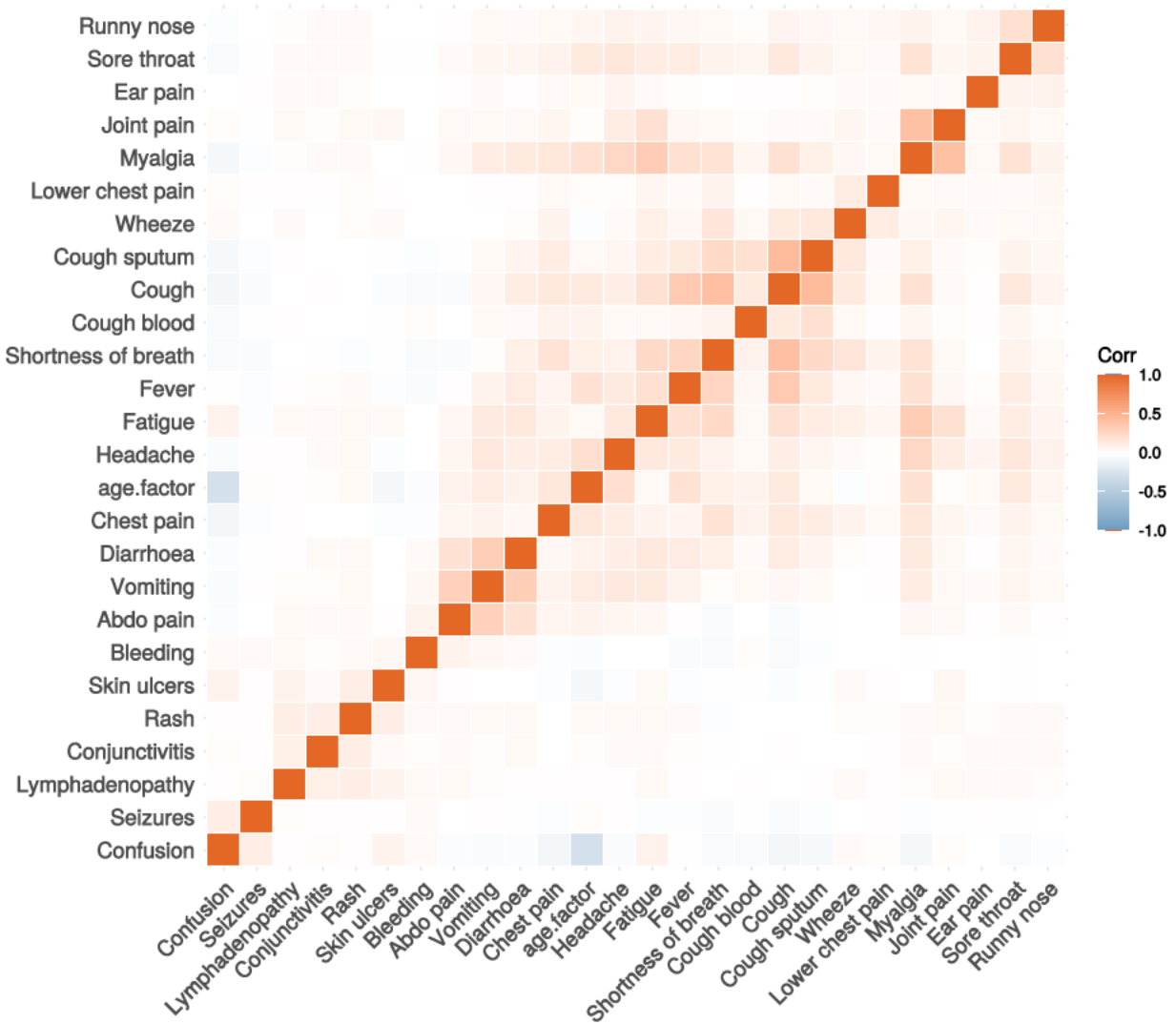


Figure 3C

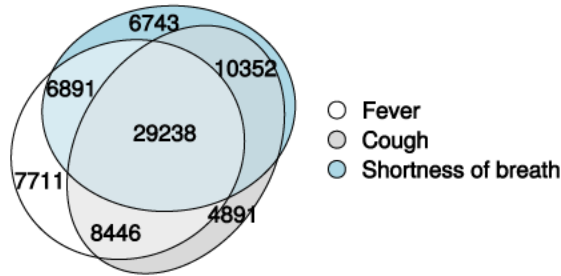
Correlation of symptoms in all pages. Note clusters, top right to bottom left, flu-like, coryzal, abdominal, respiratory, neurocutaneous.



Symptoms (diagnostic criteria)

Figure 4A

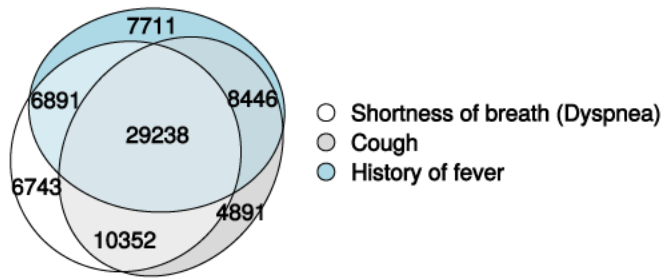
n = 90895



Symptoms (most common)

Figure 4B

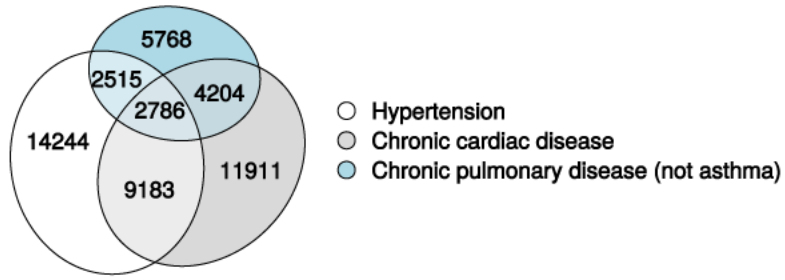
n = 90895



Comorbidity (most common)

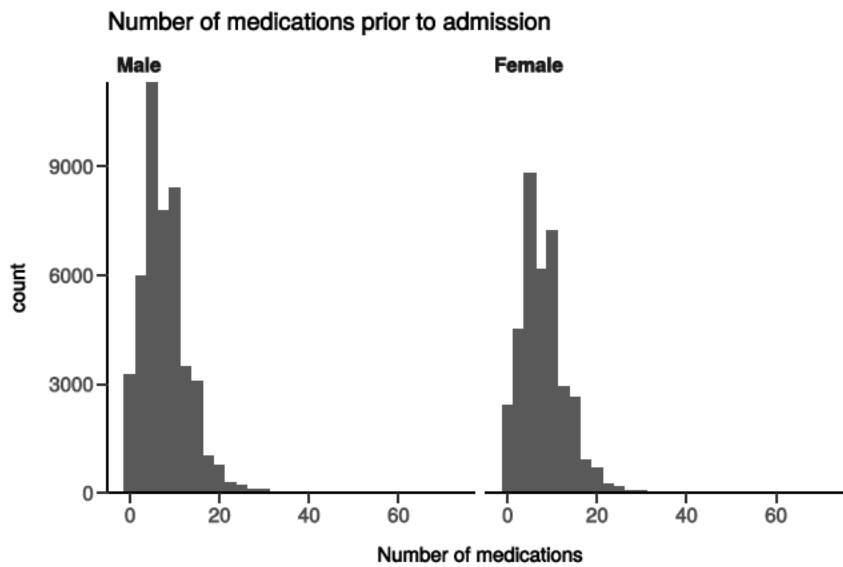
Figure 4C

n = 103647



Medication prior to illness

Figure 5

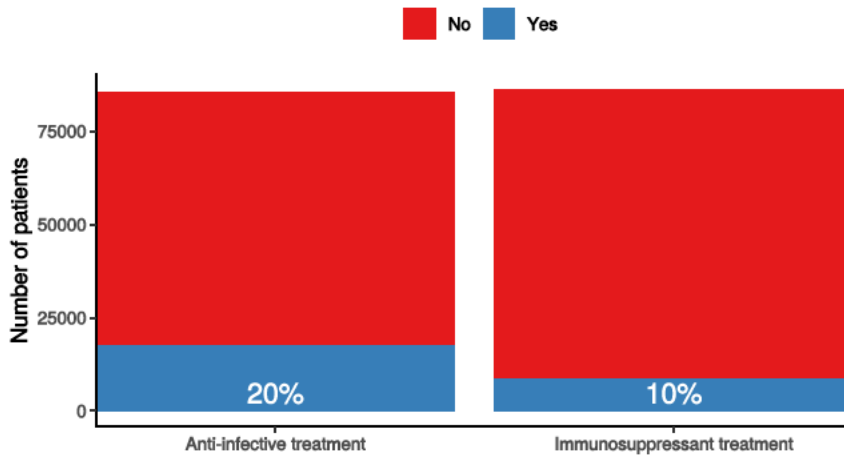


Preadmission treatment

Figure 6

Pre-admission treatment

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



Patient flow

Figure 7A - All patients

N = 93033

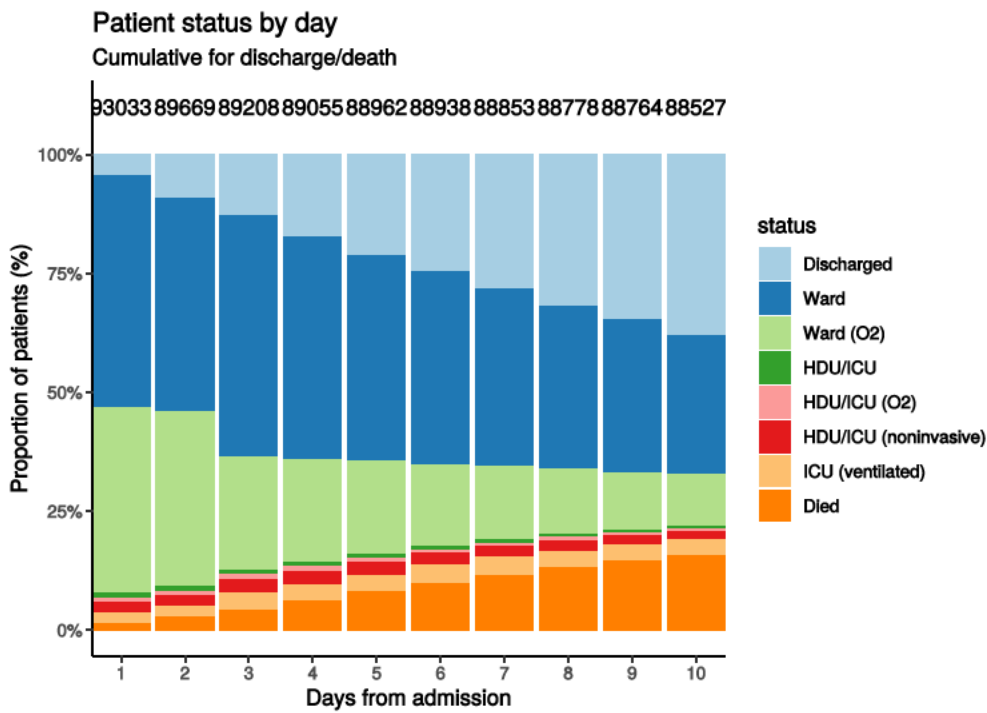
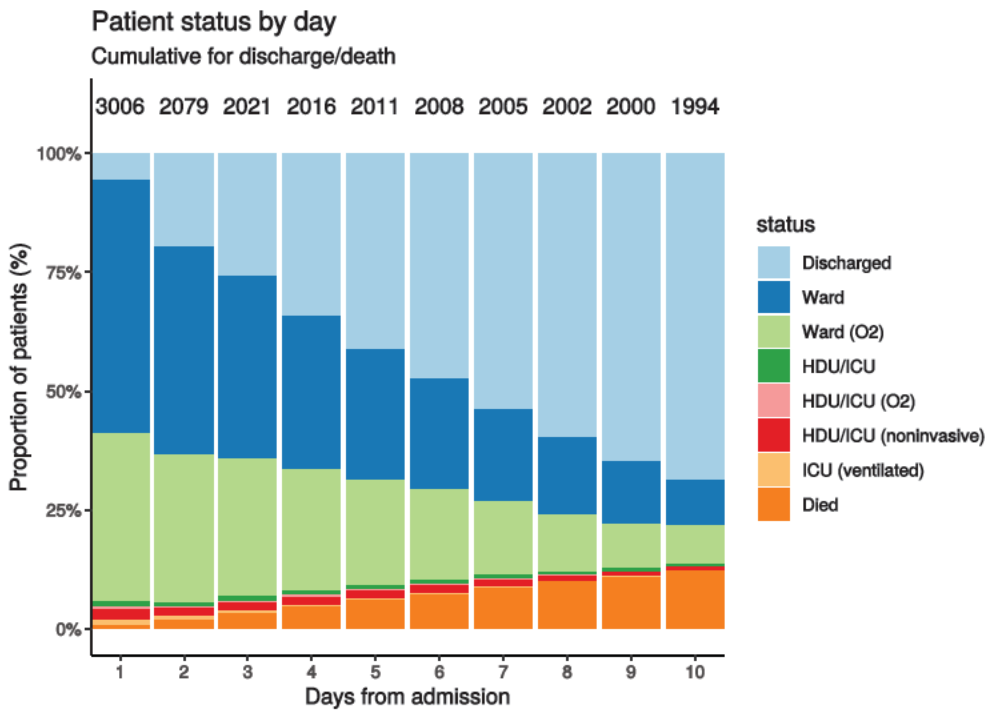


Figure 7B - Patients admitted ≥ 14 days and ≤ 28 days ago

N = 3006



Oxygen requirement

Figure 8A - All patients

N = 88110

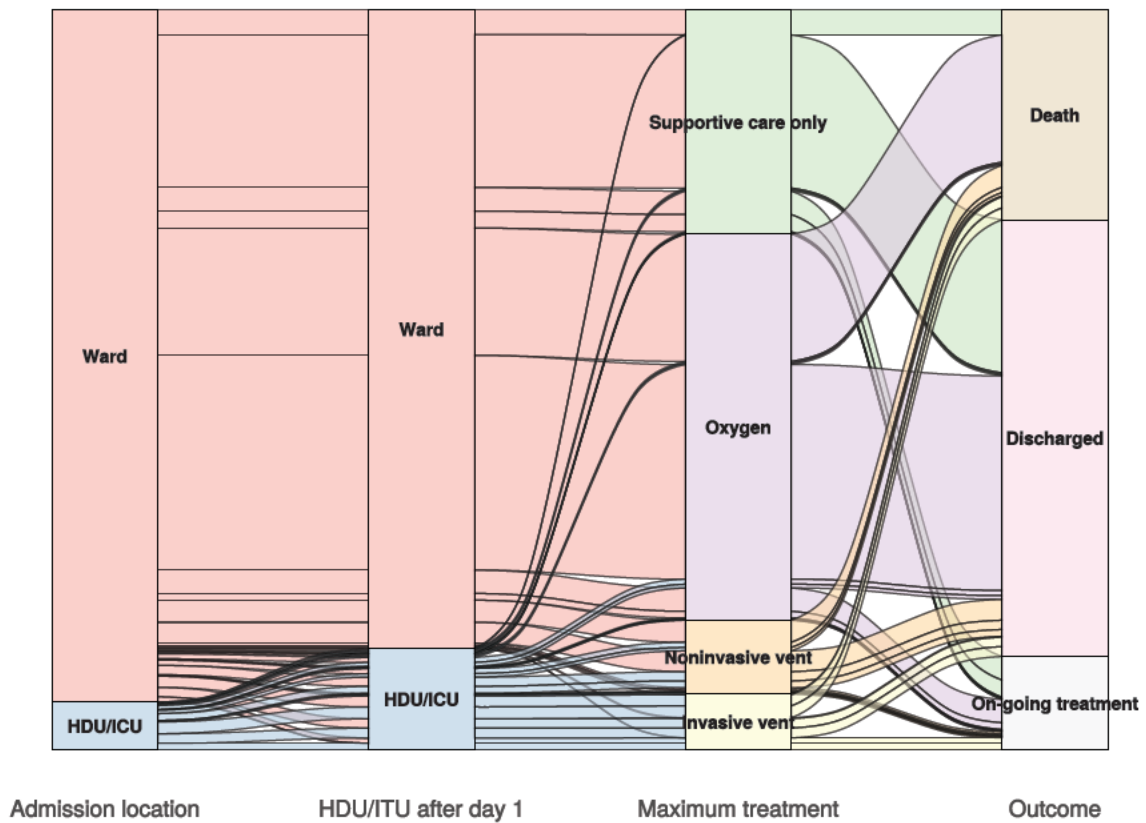


Figure 8B - Patients admitted ≥ 14 days and ≤ 28 days ago

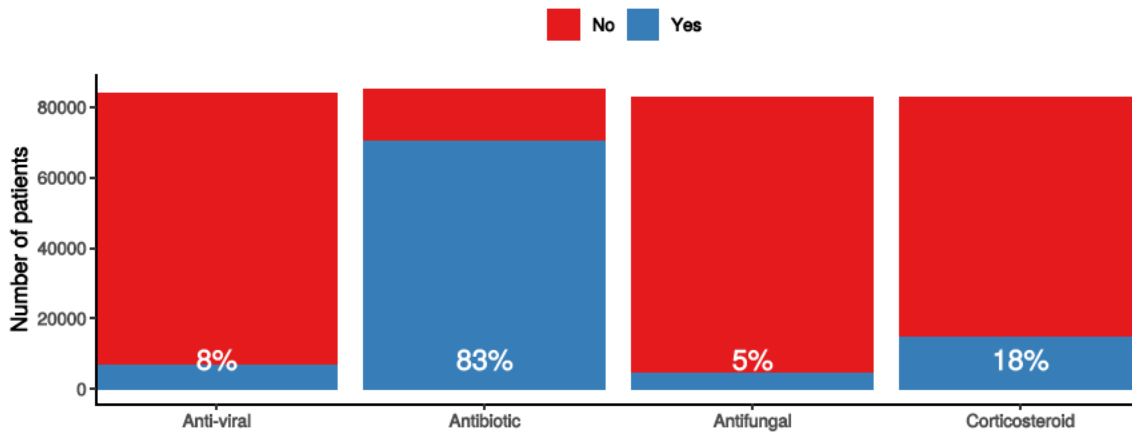
N = 2873

In-hospital medical treatment

Figure 9

In-hospital treatment

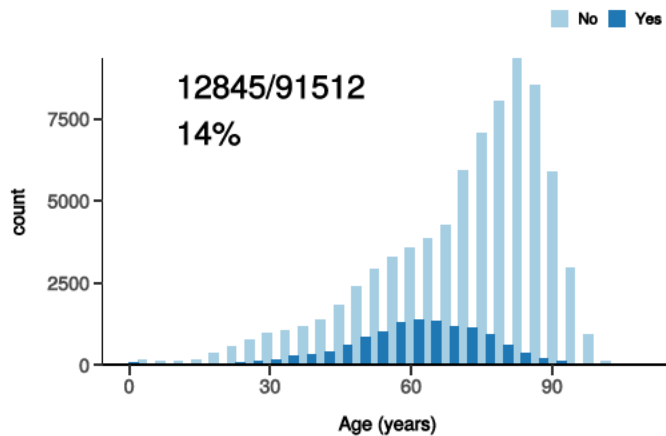
Anti-virals, antibiotics, corticosteroids, and anti-fungals for patients who have completed journey.



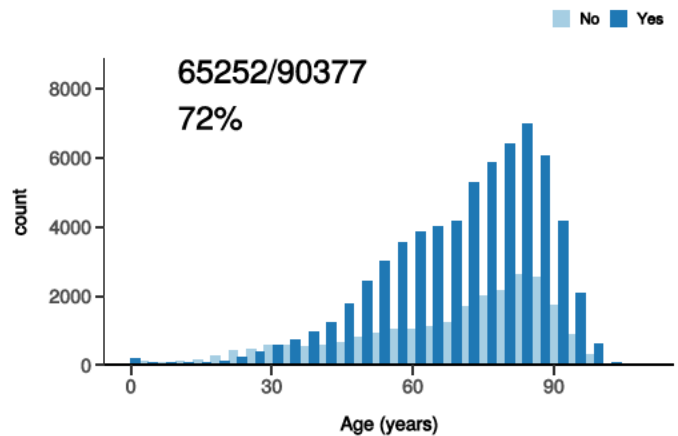
Treatment

Figure 10

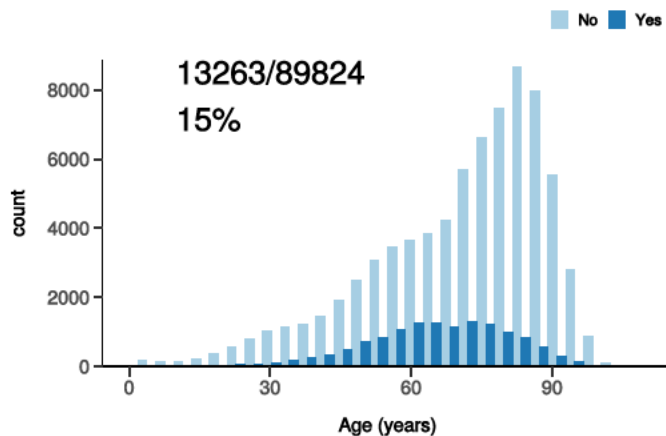
ICU/HDU admission
Figure 10A



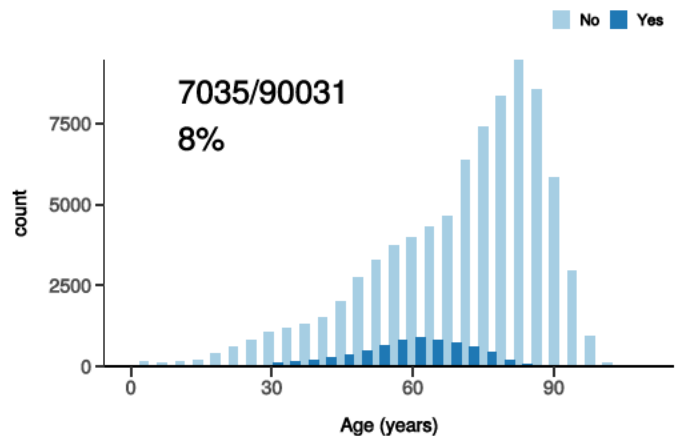
High flow oxygen
Figure 10B



Noninvasive ventilation
Figure 10C



Invasive ventilation
Figure 10D

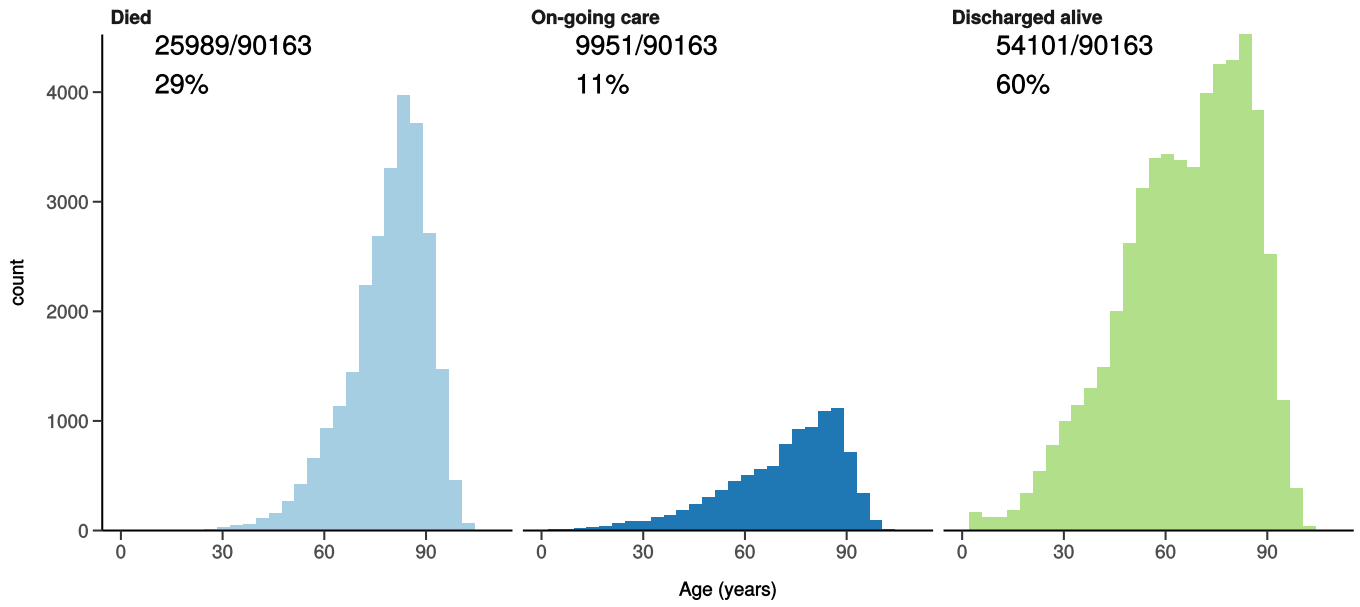


Status in patients admitted ≥ 14 days from today

Figure 11

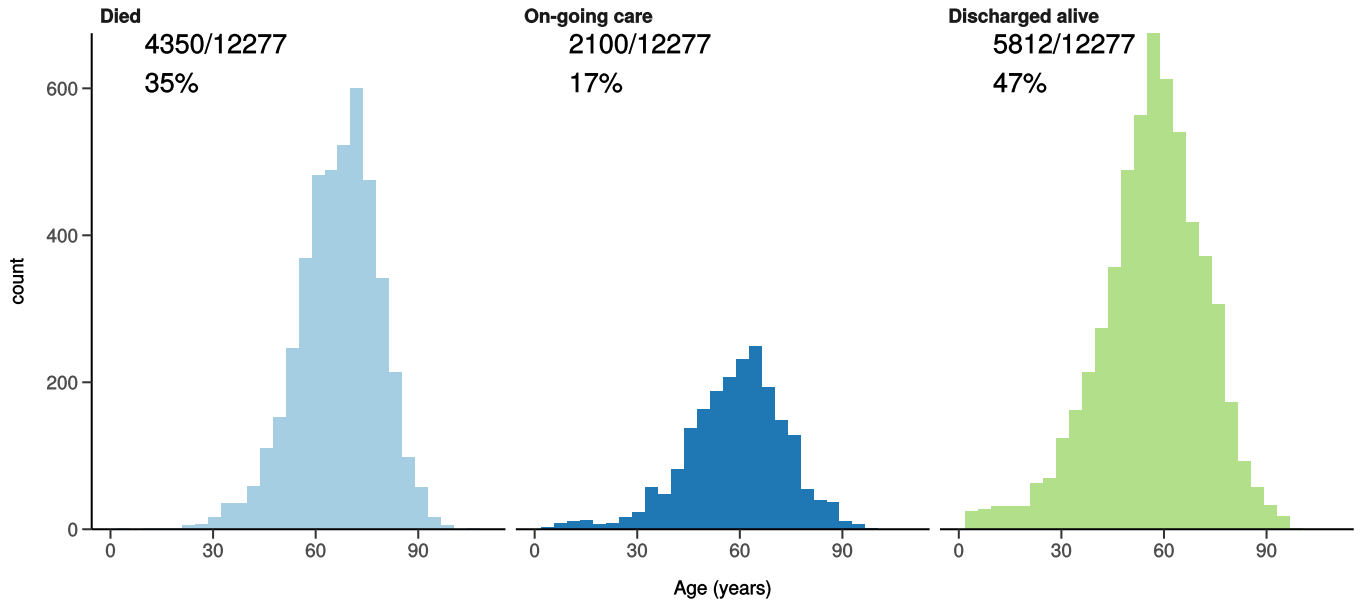
All: status in patients admitted ≥ 14 days ago

Figure 11A



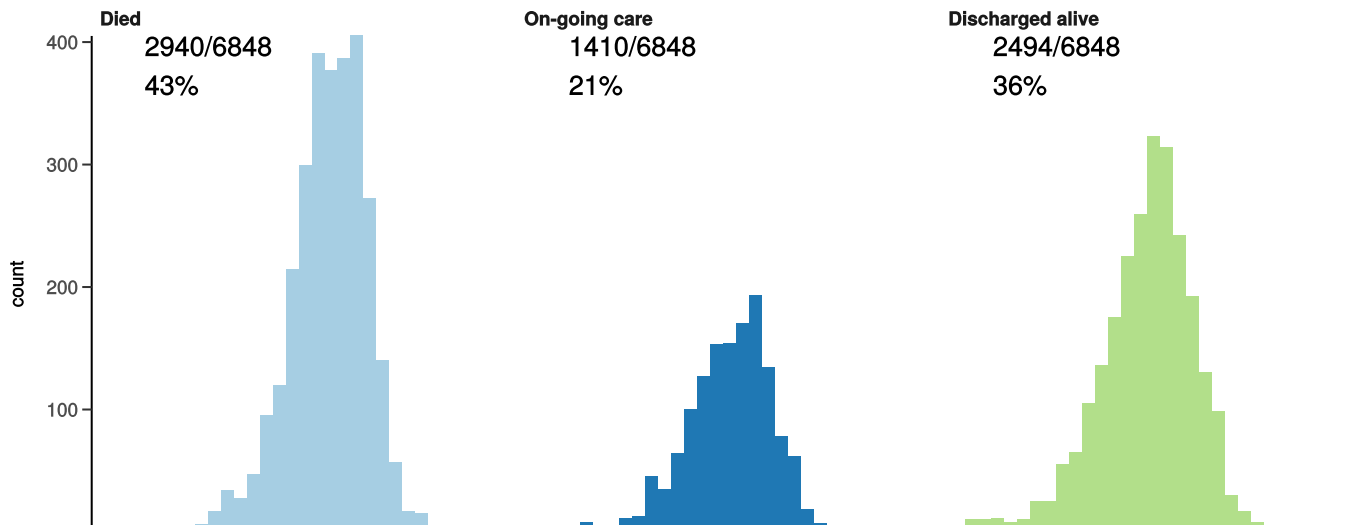
ICU/HDU admissions: status in patients admitted ≥ 14 days ago

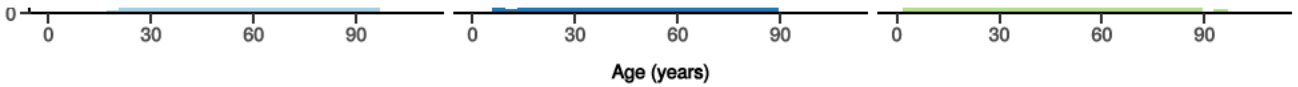
Figure 11B



Invasive ventilation: status in patients admitted ≥ 14 days ago

Figure 11c

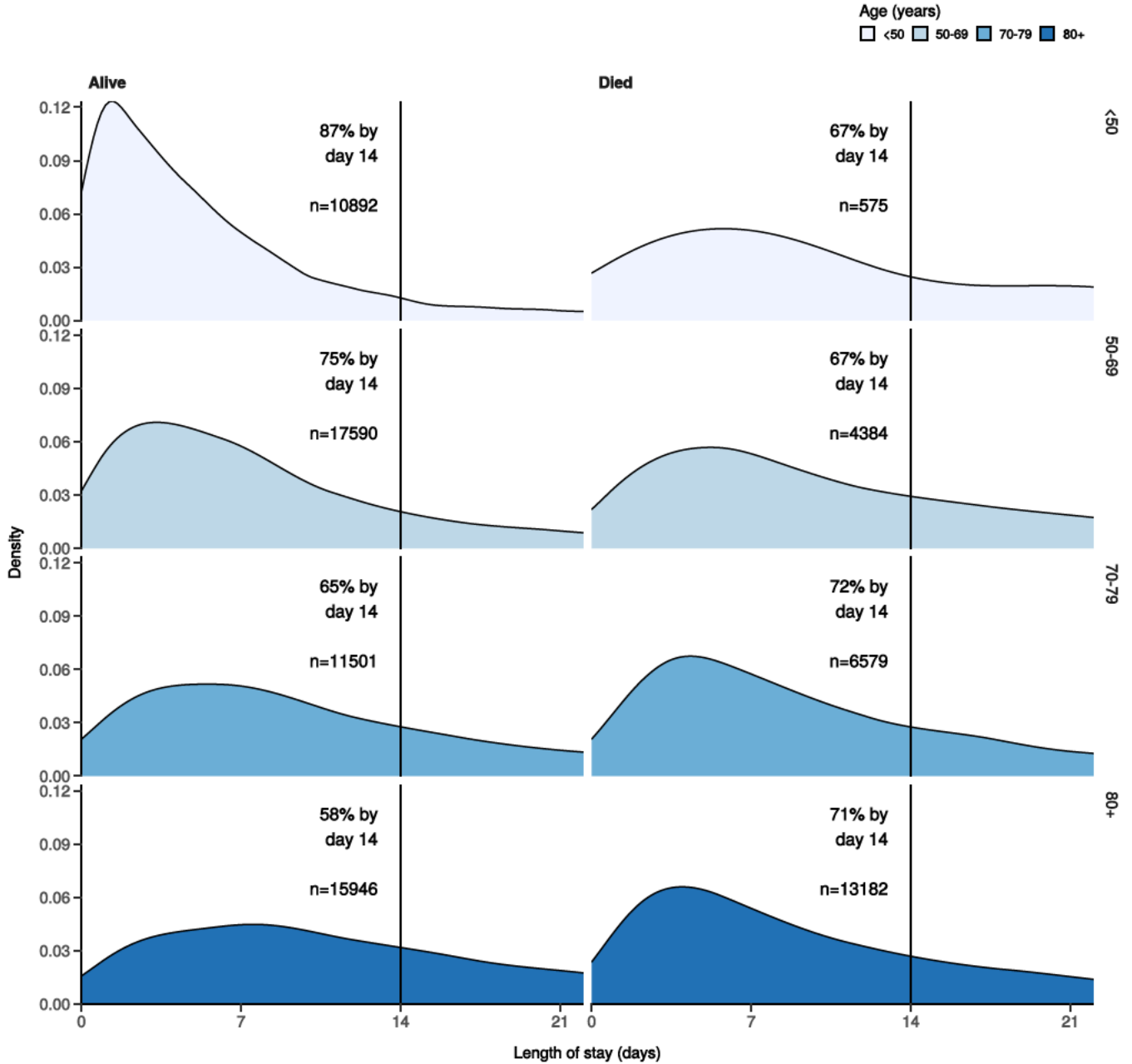




Length of stay stratified by age

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	12422 (95.3)	618 (4.7)	•	•

Dependent: death		No	Yes	OR (univariable)	OR (multivariable)
	50-69	19355 (80.8)	4599 (19.2)	4.78 (4.38-5.21, p<0.001)	4.41 (4.00-4.87, p<0.001)
	70-79	12660 (64.8)	6876 (35.2)	10.92 (10.03-11.91, p<0.001)	9.04 (8.20-9.99, p<0.001)
	80+	17434 (55.8)	13807 (44.2)	15.92 (14.65-17.33, p<0.001)	13.09 (11.88-14.45, p<0.001)
Sex at Birth	Male	33368 (68.0)	15675 (32.0)	•	•
	Female	28543 (73.6)	10240 (26.4)	0.76 (0.74-0.79, p<0.001)	0.70 (0.67-0.72, p<0.001)
	Not specified	0 (NaN)	0 (NaN)	•	•
Chronic cardiac disease	NO	42188 (75.5)	13721 (24.5)	•	•
	YES	16029 (60.1)	10646 (39.9)	2.04 (1.98-2.11, p<0.001)	1.16 (1.11-1.20, p<0.001)
Chronic pulmonary disease (not asthma)	NO	49346 (72.7)	18511 (27.3)	•	•
	YES	8761 (60.6)	5688 (39.4)	1.73 (1.67-1.80, p<0.001)	1.27 (1.21-1.33, p<0.001)
Chronic neurological disorder	NO	51204 (71.7)	20198 (28.3)	•	•
	YES	6524 (63.3)	3782 (36.7)	1.47 (1.41-1.53, p<0.001)	1.16 (1.10-1.22, p<0.001)
Chronic hematologic disease	NO	55372 (71.1)	22550 (28.9)	•	•
	YES	2200 (62.4)	1325 (37.6)	1.48 (1.38-1.59, p<0.001)	1.17 (1.07-1.27, p<0.001)
Chronic kidney disease	NO	49736 (73.3)	18143 (26.7)	•	•
	YES	8204 (57.8)	5980 (42.2)	2.00 (1.92-2.07, p<0.001)	1.31 (1.25-1.37, p<0.001)
Dementia	NO	50581 (73.7)	18073 (26.3)	•	•
	YES	7193 (54.6)	5981 (45.4)	2.33 (2.24-2.42, p<0.001)	1.38 (1.31-1.44, p<0.001)
Obesity (as defined by clinical staff)	NO	45598 (70.6)	18970 (29.4)	•	•
	YES	6661 (74.6)	2272 (25.4)	0.82 (0.78-0.86, p<0.001)	1.25 (1.18-1.32, p<0.001)
Malignant neoplasm	NO	52826 (72.2)	20354 (27.8)	•	•
	YES	4779 (57.3)	3560 (42.7)	1.93 (1.85-2.02, p<0.001)	1.47 (1.39-1.55, p<0.001)

Number in dataframe = 92868, Number in model = 69927, Missing = 22941, AIC = 74321.5, C-statistic = 0.721, H&L = Chi-sq(8) 127.65 (p<0.001)

Figure 13 - Adjusted odds ratio plot

Death

Age on admission (years)	<50	-
	50-69	4.41 (4.00-4.87, p<0.001)
	70-79	9.04 (8.20-9.99, p<0.001)
	80+	13.09 (11.88-14.45, p<0.001)
Sex at Birth	Male	-
	Female	0.70 (0.67-0.72, p<0.001)
	Not specified	-
Chronic cardiac disease	YES	1.16 (1.11-1.20, p<0.001)
Chronic pulmonary disease (not asthma)	YES	1.27 (1.21-1.33, p<0.001)
Chronic neurological disorder	YES	1.16 (1.10-1.22, p<0.001)
Chronic hematologic disease	YES	1.17 (1.07-1.27, p<0.001)
Chronic kidney disease	YES	1.31 (1.25-1.37, p<0.001)
Dementia	YES	1.38 (1.31-1.44, p<0.001)
Obesity (as defined by clinical staff)	YES	1.25 (1.18-1.32, p<0.001)
Malignant neoplasm	YES	1.47 (1.39-1.55, p<0.001)

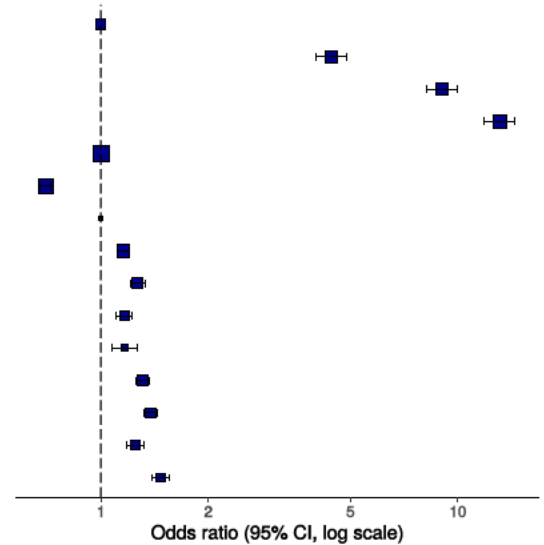
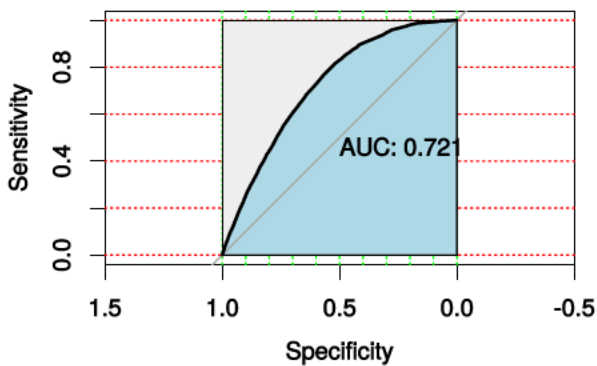


Figure 14 - ROC

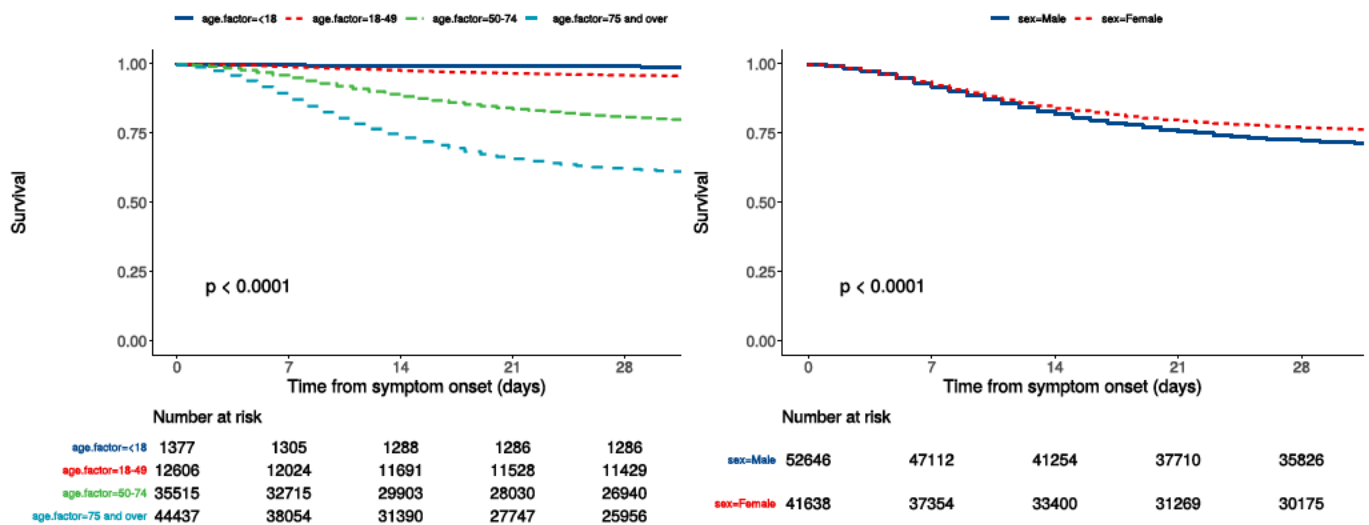


Survival models

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	13983 (14.9)	•		•
	50-69	25736 (27.4)		4.37 (4.02-4.75, p<0.001)	4.14 (3.73-4.59, p<0.001)
	70-79	21003 (22.4)		9.00 (8.29-9.78, p<0.001)	8.27 (7.47-9.15, p<0.001)
	80+	33221 (35.4)		12.33 (11.37-13.37, p<0.001)	11.04 (9.98-12.22, p<0.001)
Sex at Birth	Male	52646 (55.8)	•		•
	Female	41638 (44.2)		0.80 (0.78-0.82, p<0.001)	0.78 (0.76-0.81, p<0.001)
qSOFA score on admission	0	34835 (43.9)	•		•
	1	35319 (44.5)		1.63 (1.58-1.68, p<0.001)	1.74 (1.68-1.80, p<0.001)
	2	8327 (10.5)		3.20 (3.08-3.32, p<0.001)	2.95 (2.82-3.08, p<0.001)
	3	892 (1.1)		5.25 (4.82-5.72, p<0.001)	4.69 (4.26-5.16, p<0.001)
Symptomatic at presentation	No symptoms	5738 (6.3)	•		•
	Symptoms	85226 (93.7)		1.69 (1.59-1.80, p<0.001)	•
Chronic cardiac disease	NO	58736 (67.7)	•		•
	YES	27961 (32.3)		1.82 (1.78-1.87, p<0.001)	1.14 (1.11-1.18, p<0.001)
Chronic kidney disease	NO	71322 (82.8)	•		•
	YES	14822 (17.2)		1.78 (1.73-1.84, p<0.001)	1.24 (1.19-1.28, p<0.001)
Moderate or severe liver disease	NO	83662 (98.0)	•		•
	YES	1684 (2.0)		1.30 (1.19-1.41, p<0.001)	1.41 (1.27-1.56, p<0.001)
Chronic neurological disorder	NO	75019 (87.5)	•		•
	YES	10734 (12.5)		1.39 (1.35-1.44, p<0.001)	•
Malignant neoplasm	NO	76847 (89.8)	•		•
	YES	8717 (10.2)		1.68 (1.63-1.75, p<0.001)	1.35 (1.30-1.41, p<0.001)
Chronic hematologic disease	NO	81818 (95.7)	•		•
	YES	3655 (4.3)		1.37 (1.30-1.45, p<0.001)	•
Obesity (as defined by clinical staff)	NO	67742 (87.8)	•		•
	YES	9399 (12.2)		0.84 (0.80-0.87, p<0.001)	1.15 (1.09-1.21, p<0.001)

Dependent: Surv(time, status)		all	HR (univariable)	HR (multivariable)
Diabetes without complications	NO	69720 (84.2)	•	•
	YES	13043 (15.8)	1.27 (1.23-1.31, p<0.001)	•
Rheumatologic disorder	NO	75340 (88.3)	•	•
	YES	9960 (11.7)	1.19 (1.15-1.24, p<0.001)	•
Dementia	NO	72221 (84.1)	•	•
	YES	13682 (15.9)	2.05 (1.99-2.11, p<0.001)	1.17 (1.13-1.22, p<0.001)
Malnutrition	NO	78153 (97.3)	•	•
	YES	2158 (2.7)	1.49 (1.39-1.59, p<0.001)	•
smoking_mhyn_2levels	NO	49721 (56.4)	•	•
	YES	4899 (5.6)	0.86 (0.81-0.92, p<0.001)	•
	N/K	33560 (38.1)	1.21 (1.18-1.24, p<0.001)	•

Number in dataframe = 94658, Number in model = 64869, Missing = 29789, Number of events = 17817, Concordance = 0.724 (SE = 0.002), R-squared = 0.159(Max possible = 0.997), Likelihood ratio test = 11262.848 (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	4.14 (3.73-4.59, p<0.001)
	70-79	8.27 (7.47-9.15, p<0.001)
	80+	11.04 (9.98-12.22, p<0.001)
Sex at Birth	Female	0.78 (0.76-0.81, p<0.001)
qSOFA score on admission	0	-
	1	1.74 (1.68-1.80, p<0.001)
	2	2.95 (2.82-3.08, p<0.001)
	3	4.69 (4.26-5.16, p<0.001)
Chronic cardiac disease	YES	1.14 (1.11-1.18, p<0.001)
Chronic kidney disease	YES	1.24 (1.19-1.28, p<0.001)
Moderate or severe liver disease	YES	1.41 (1.27-1.56, p<0.001)
Malignant neoplasm	YES	1.35 (1.30-1.41, p<0.001)
Obesity (as defined by clinical staff)	YES	1.15 (1.09-1.21, p<0.001)
Dementia	YES	1.17 (1.13-1.22, p<0.001)

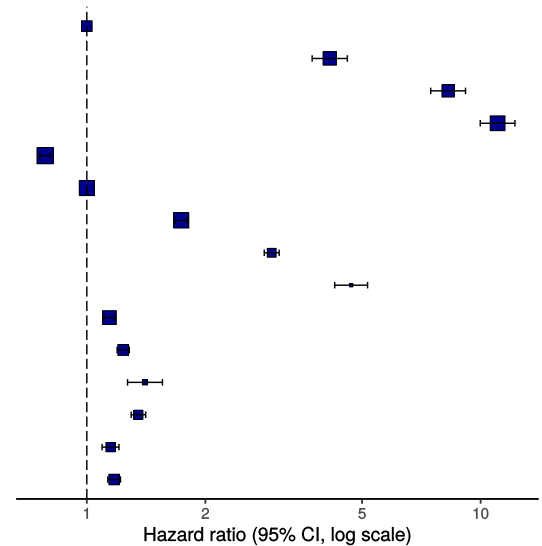
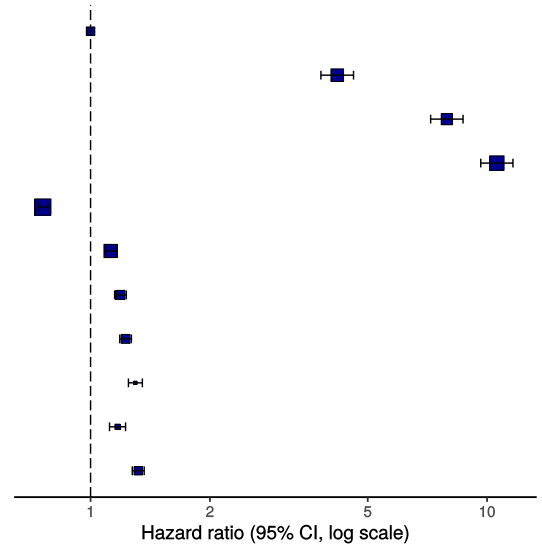


Figure 16b - Multivariable Cox proportional hazards model (age, sex, comorbidities only)

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

Age on admission (years)	<50	-
	50-69	4.19 (3.81-4.60, p<0.001)
	70-79	7.92 (7.21-8.70, p<0.001)
	80+	10.59 (9.64-11.62, p<0.001)
Sex at Birth	Female	0.76 (0.74-0.78, p<0.001)
Chronic cardiac disease	YES	1.12 (1.09-1.16, p<0.001)
Chronic pulmonary disease (not asthma)	YES	1.19 (1.15-1.23, p<0.001)
Chronic kidney disease	YES	1.23 (1.18-1.27, p<0.001)
Malignant neoplasm	YES	1.30 (1.25-1.35, p<0.001)
Obesity (as defined by clinical staff)	YES	1.17 (1.12-1.23, p<0.001)
Dementia	YES	1.32 (1.27-1.37, p<0.001)



ROC = 0.7241221

Figure 17 - Predictions calibration plot

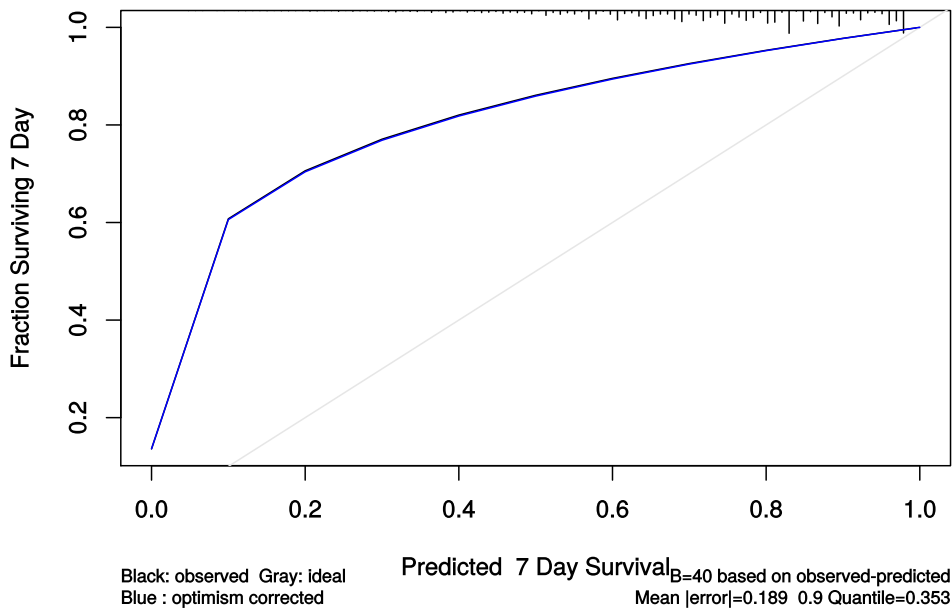


Figure 18 - Prognostic model predictions

Again, for demonstration of methods.

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

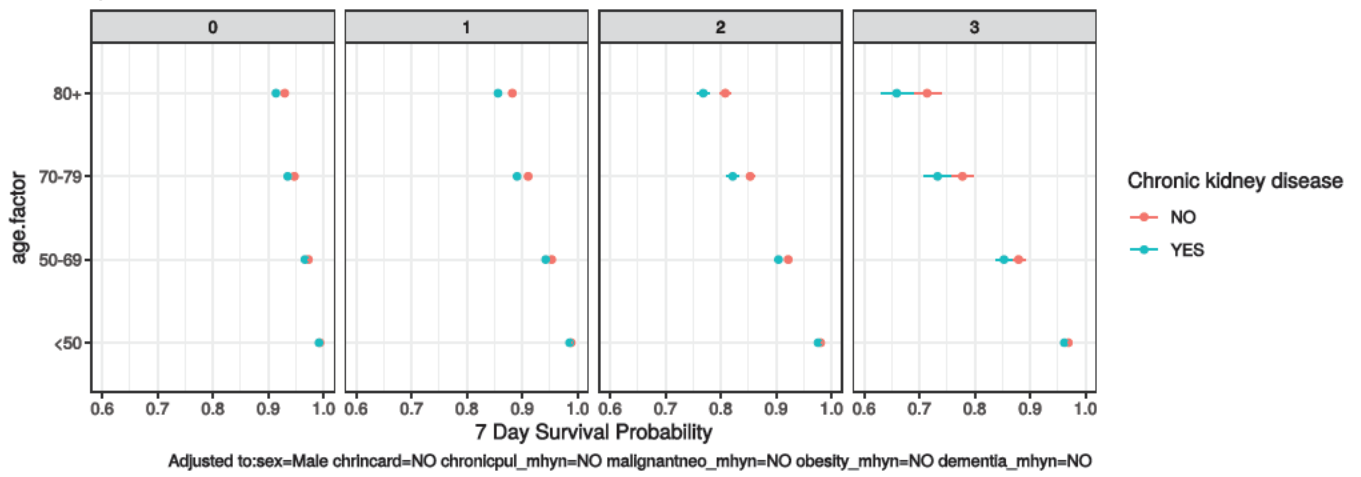


Figure 19 - Death by severity (NEWS) on admission

Number of deaths by NEWS score at admission

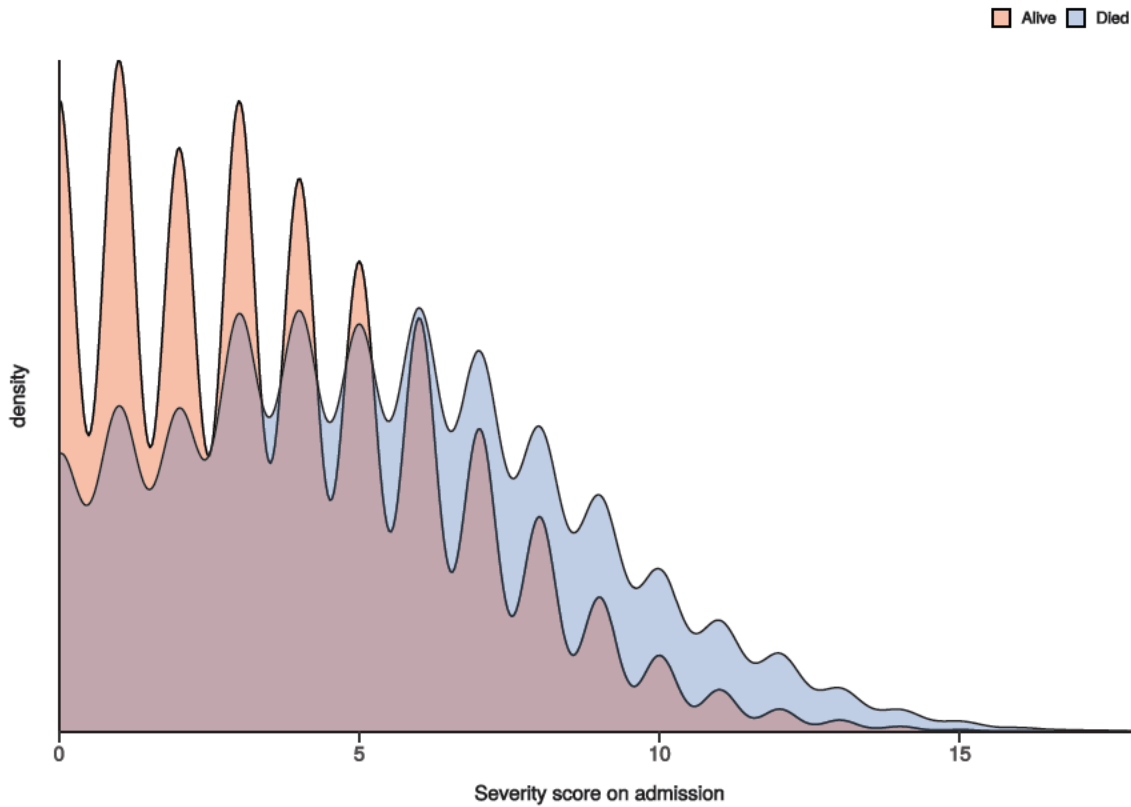


Figure 20 - Death by severity (NEWS) on admission stratified by age

Number of deaths by NEWS score at admission
Stratified by age

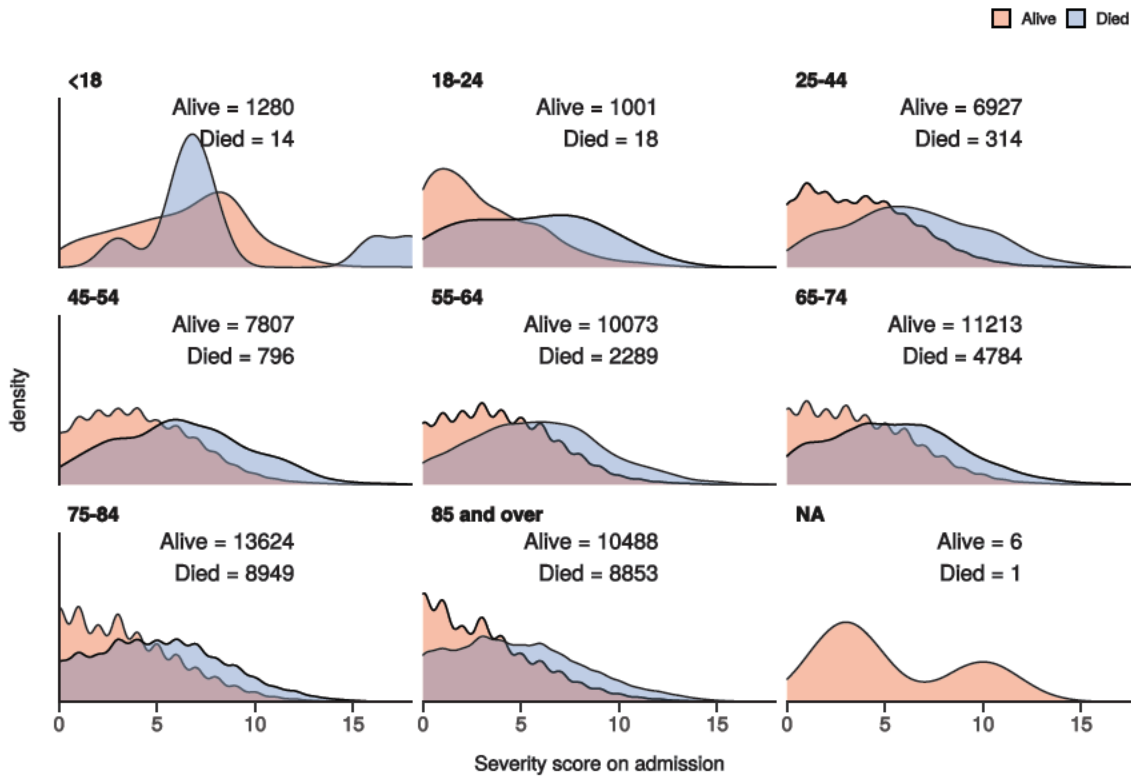
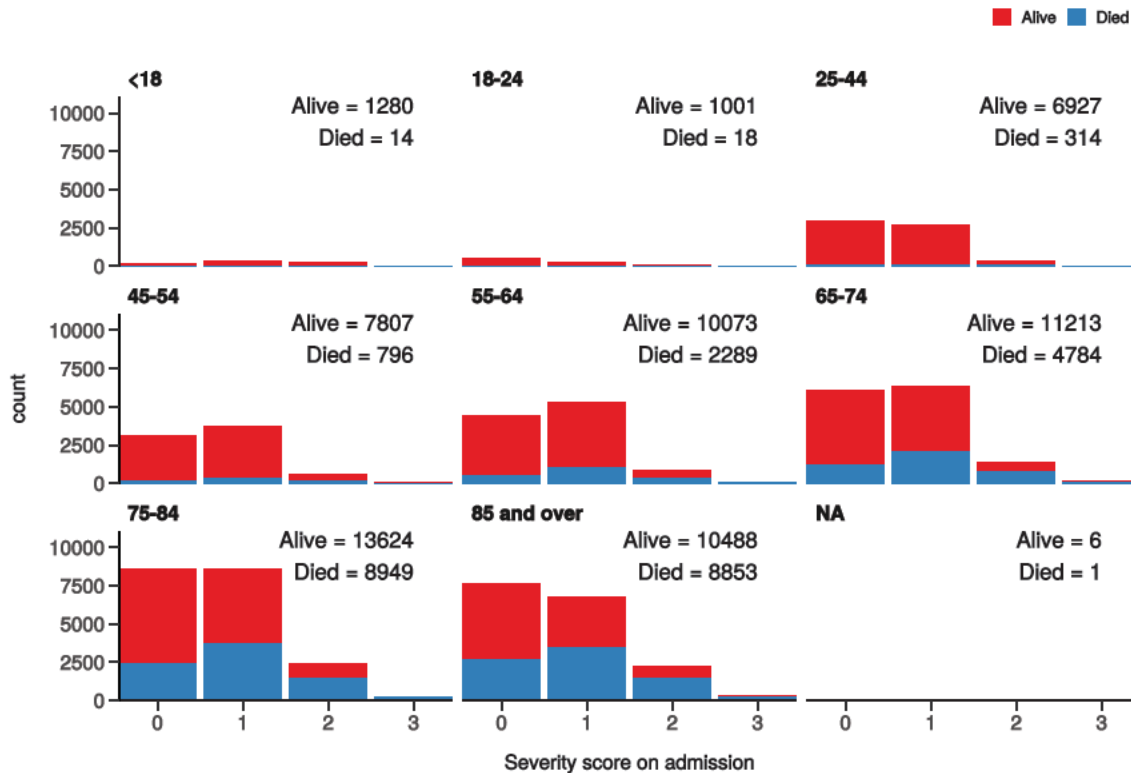


Figure 21 - Death by severity (qSOFA) on admission stratified by age

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 (%)		82140 (95.6)	3815 (4.4)	
NEWS score on admission	Median (IQR)	4.0 (4.0)	4.0 (4.0)	<0.001
Death	No	51995 (68.6)	3405 (92.8)	<0.001
	Yes	23759 (31.4)	264 (7.2)	