

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

Dynamic content updated: 2021-01-06 04:07:49.

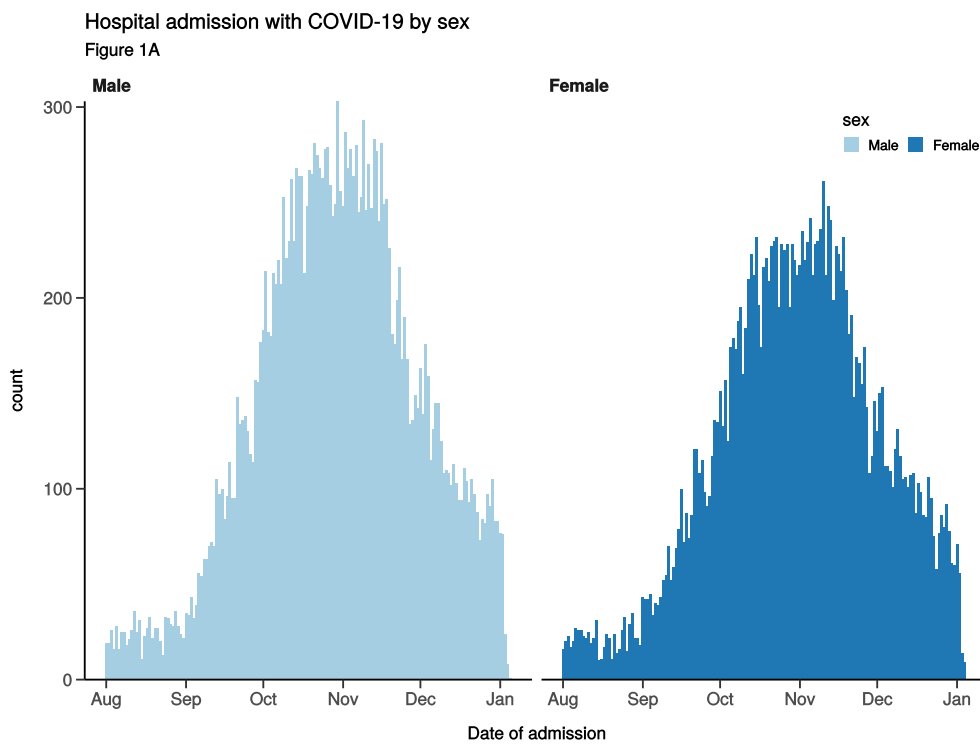
Executive summary

Includes patients admitted after 01 August 2020

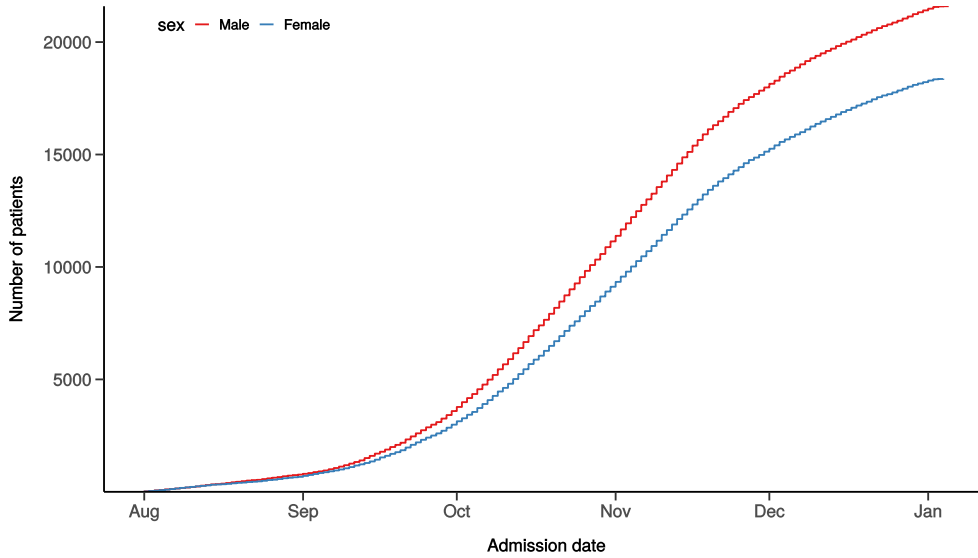
There are 40137 patients included in CO-CIN. Of these, 6406 patient(s) have died and 6618 required ICU. 21722 have been discharged home.

Admission

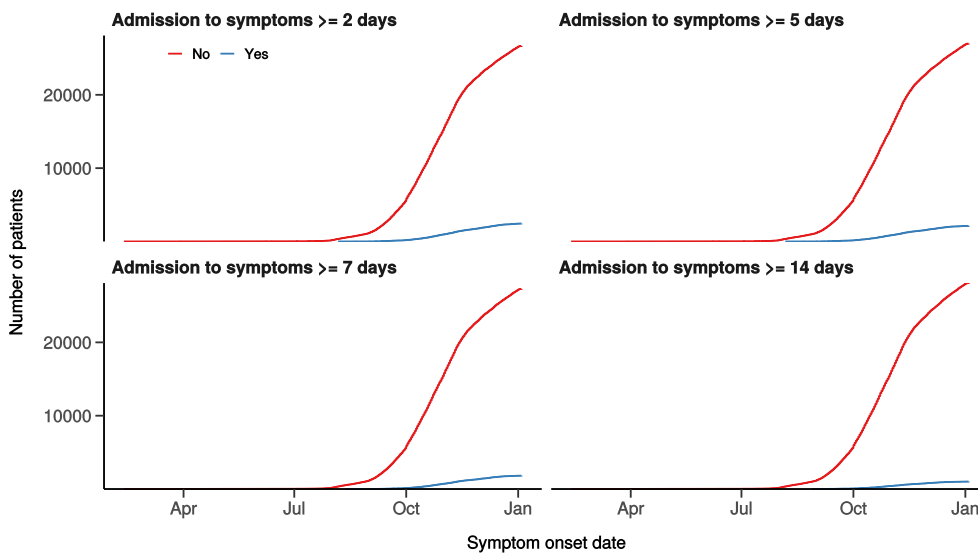
Figure 1



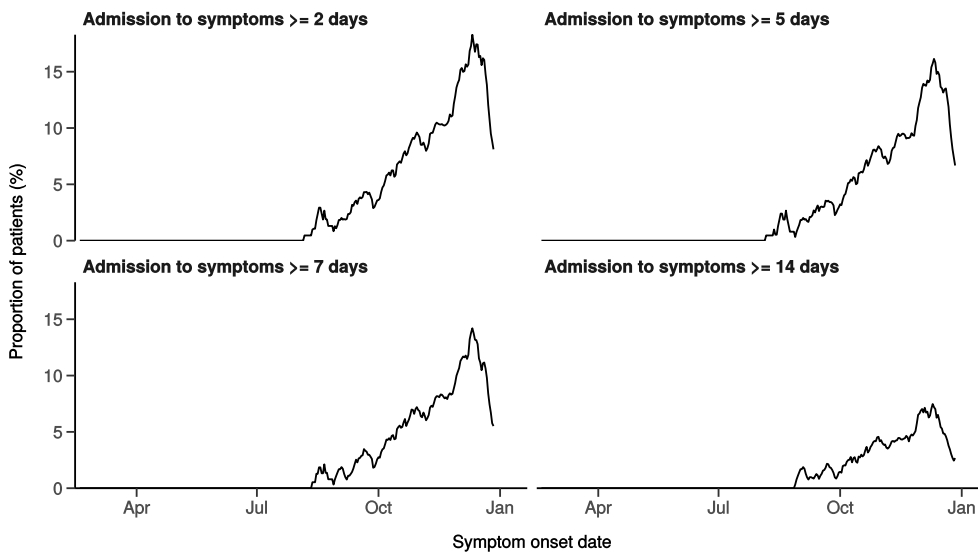
Hospital admission with COVID-19 by sex
Figure 1B



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

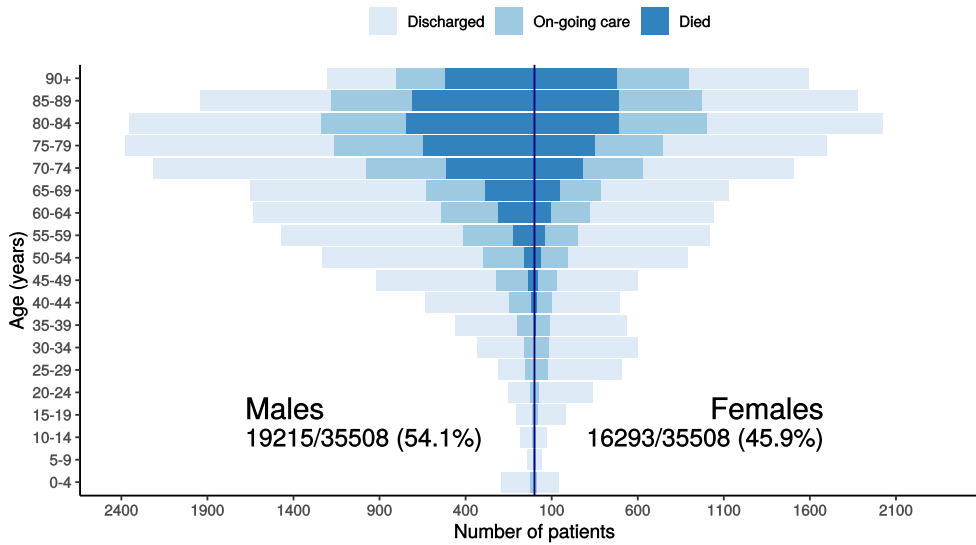


Proportion with symptom onset occurring after hospital admission
Figure 1D - 7-day rolling percentage. n = 29100



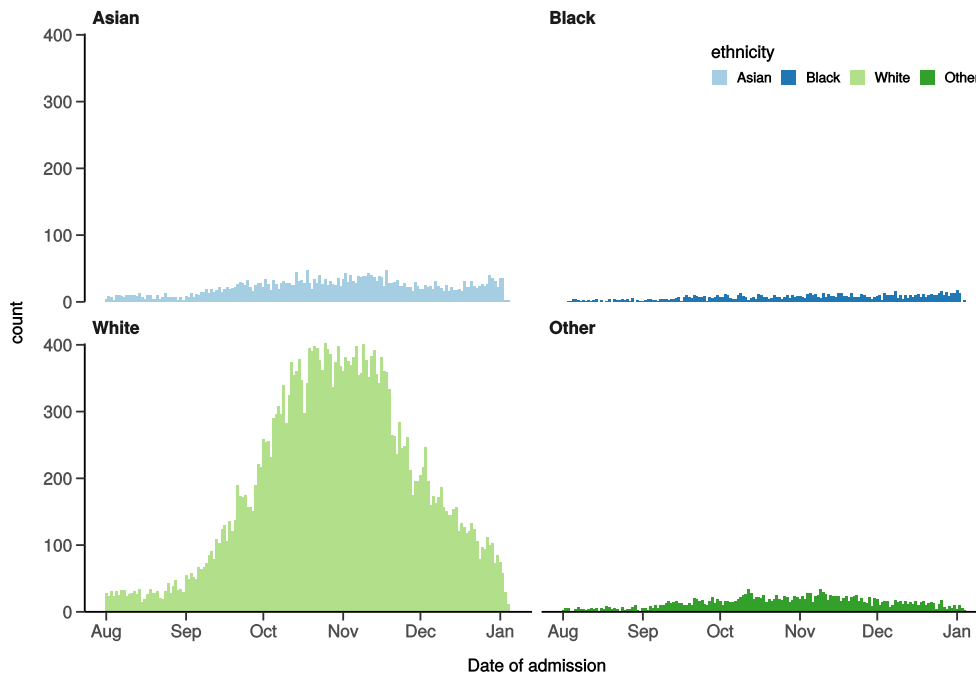
Patients with outcome stratified by age, and sex

Figure 1E



Hospital admission with COVID-19 by ethnicity

Figure 1F

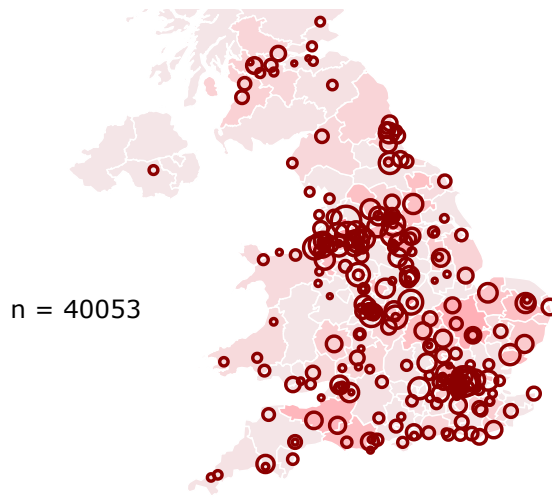


Location by CCG / Healthboard

Figure 2

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





Symptoms and comorbidity

Figure 3A

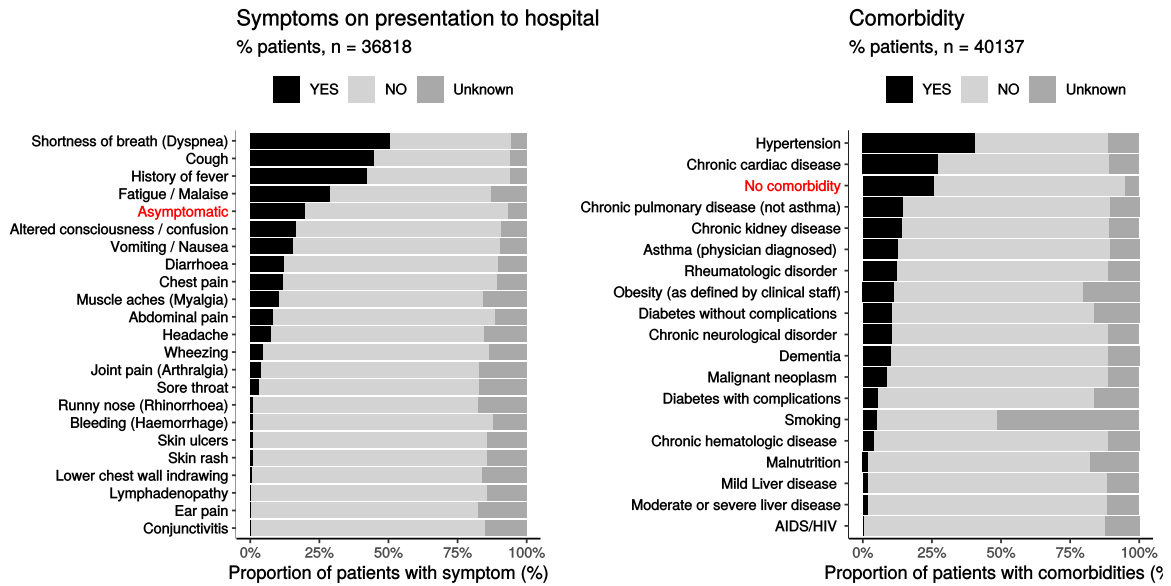


Figure 3B - Symptoms by Age

Symptoms on presentation to hospital
Stratified by age

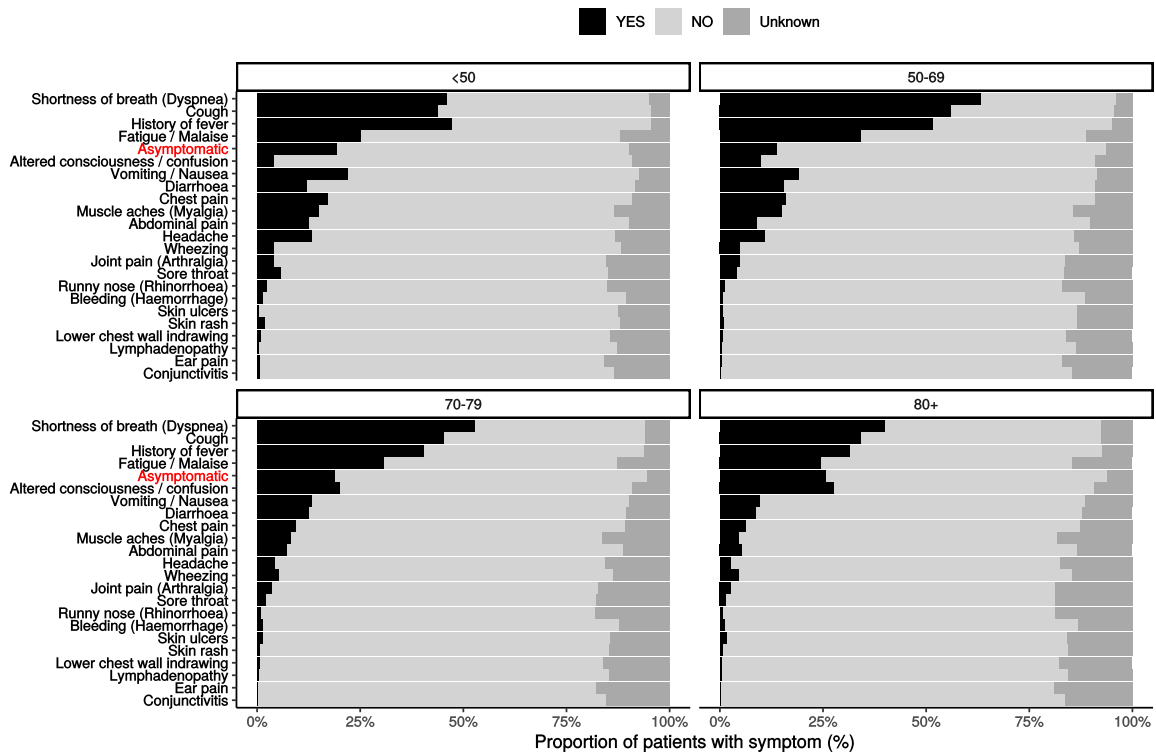
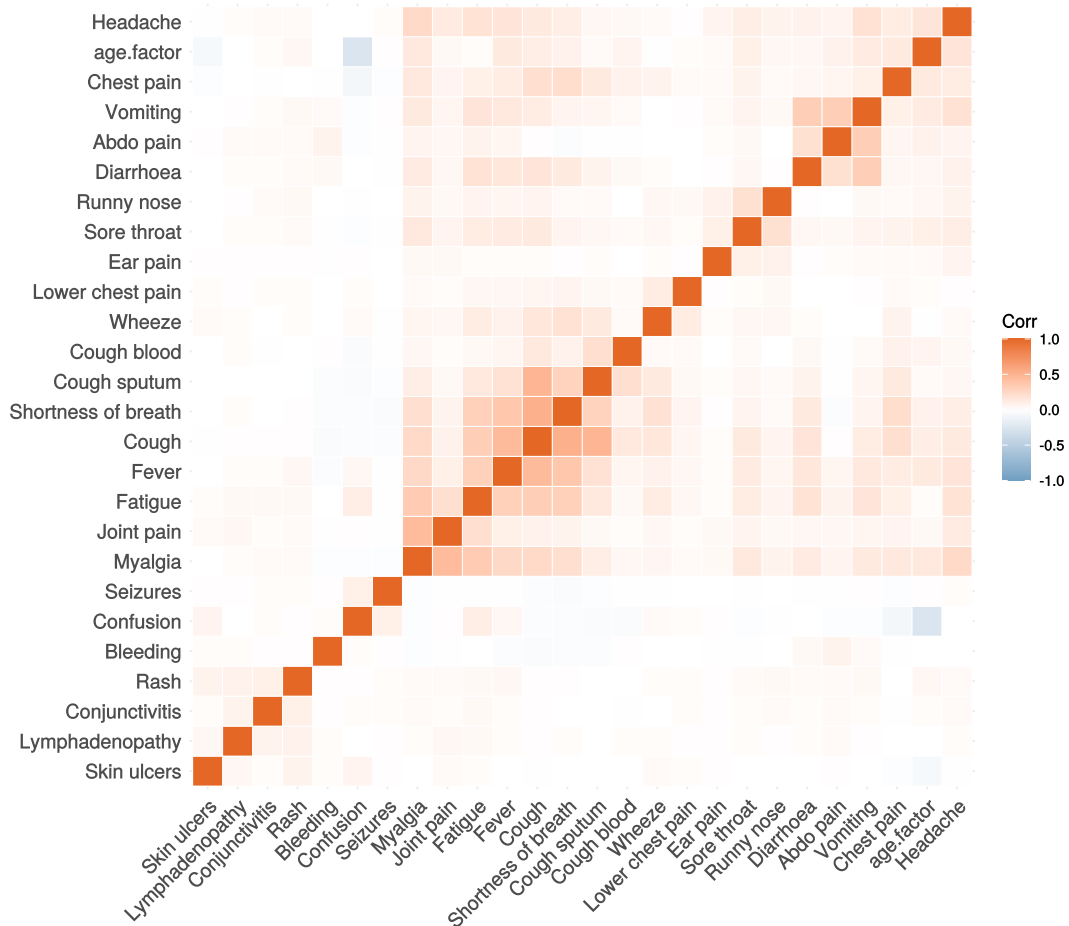


Figure 3C

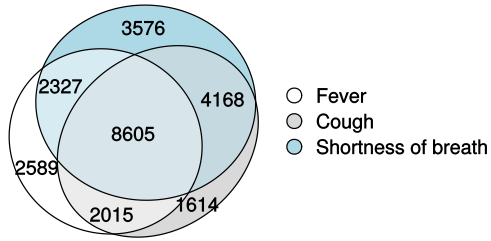
Correlation of symptoms in all pages. Note clusters, top right to bottom left, flu-like, coryzal, abdominal, respiratory, neurocutaneous.



Symptoms (diagnostic criteria)

Figure 4A

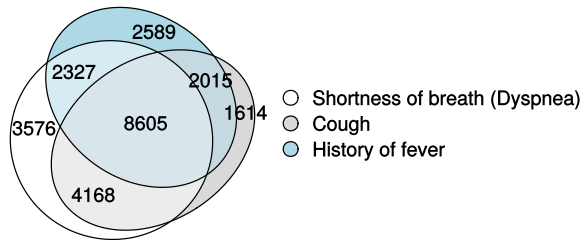
n = 36818



Symptoms (most common)

Figure 4B

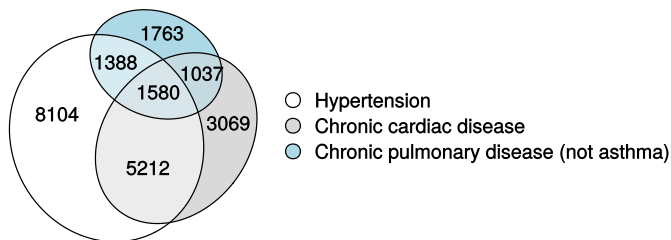
n = 36818



Comorbidity (most common)

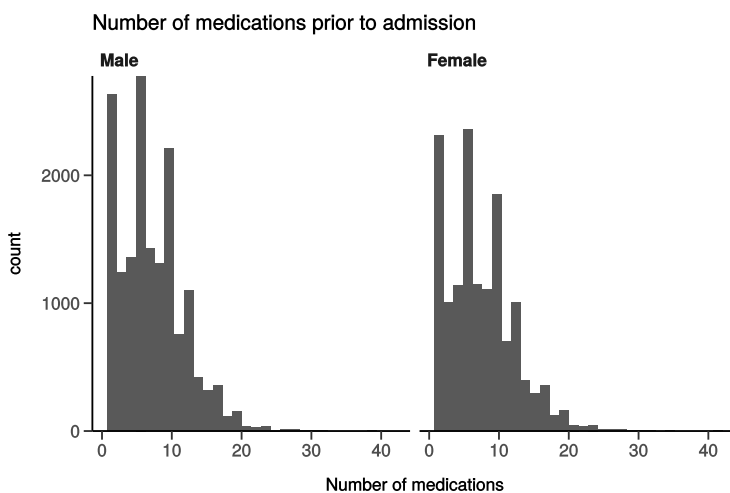
Figure 4C

n = 40137



Medication prior to illness

Figure 5

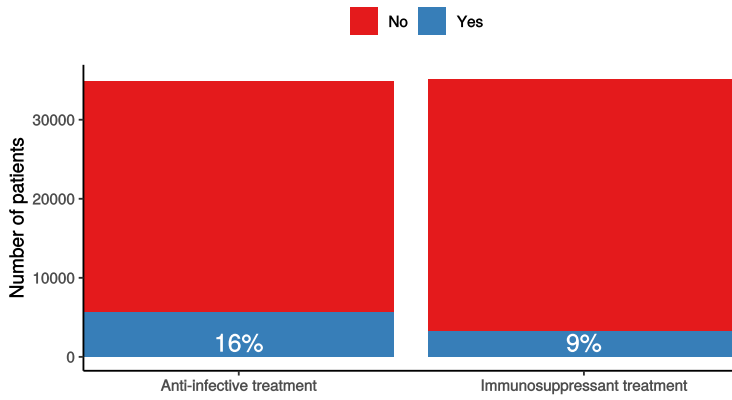


Preadmission treatment

Figure 6

Pre-admission treatment

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



Patient flow

Figure 7A - All patients

N = 37673

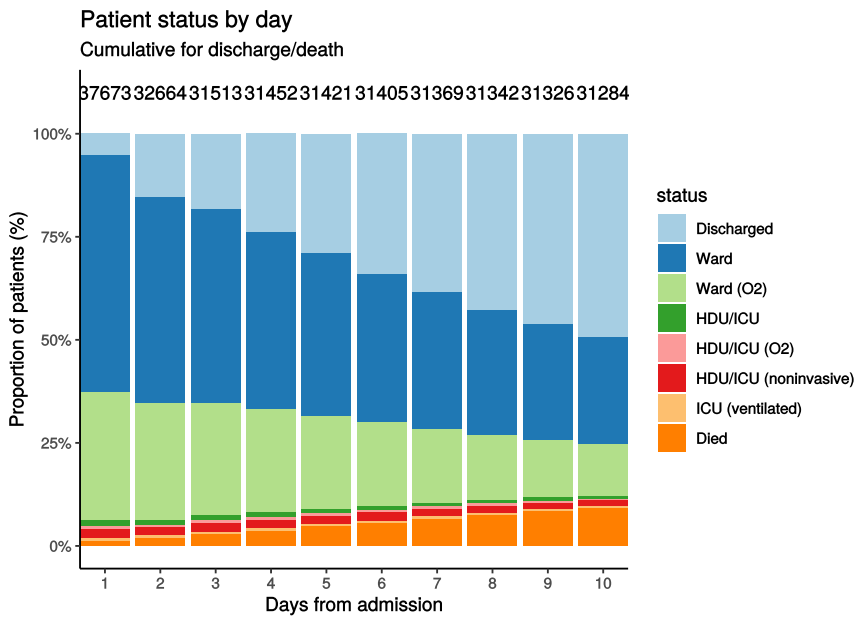
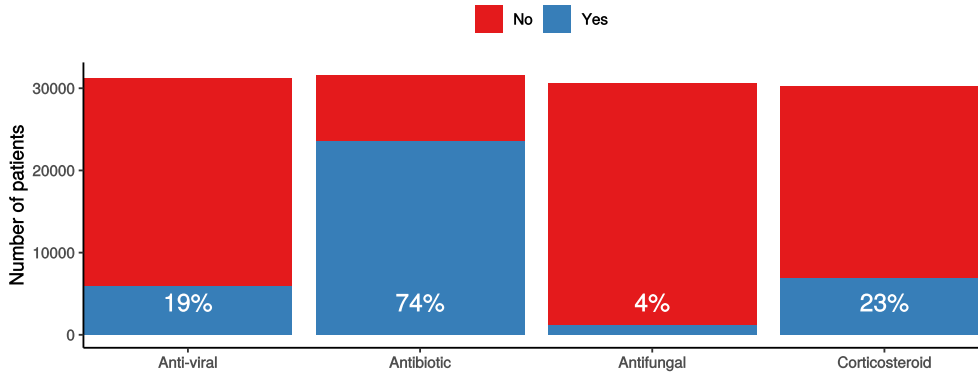


Figure 7B - Patients admitted ≥ 14 days and ≤ 28 days ago

N = 2784

In-hospital treatment

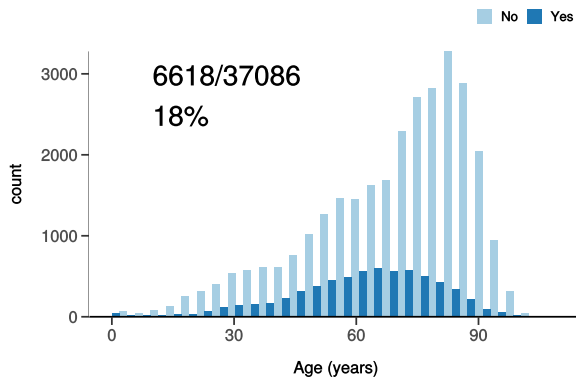
Anti-virals, antibiotics, corticosteroids, and anti-fungals for patients who have completed journey.



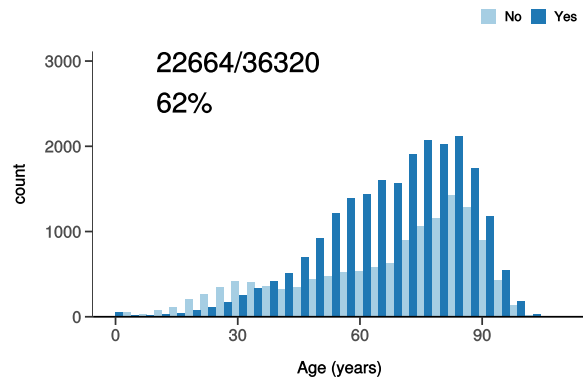
Treatment

Figure 10

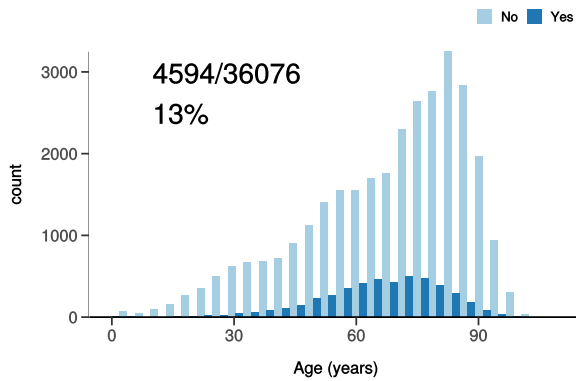
ICU/HDU admission
Figure 10A



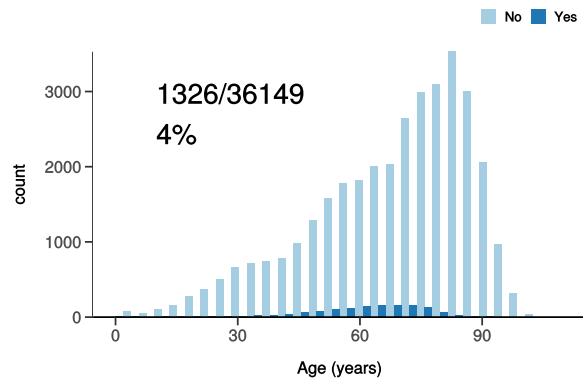
High flow oxygen
Figure 10B



Noninvasive ventilation
Figure 10C



Invasive ventilation
Figure 10D

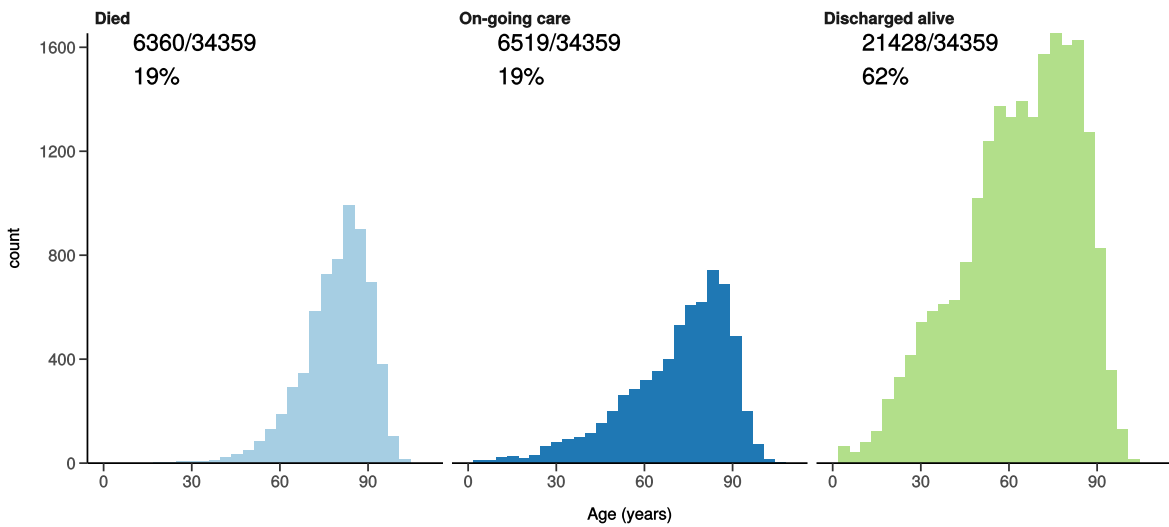


Status in patients admitted ≥ 14 days from today

Figure 11

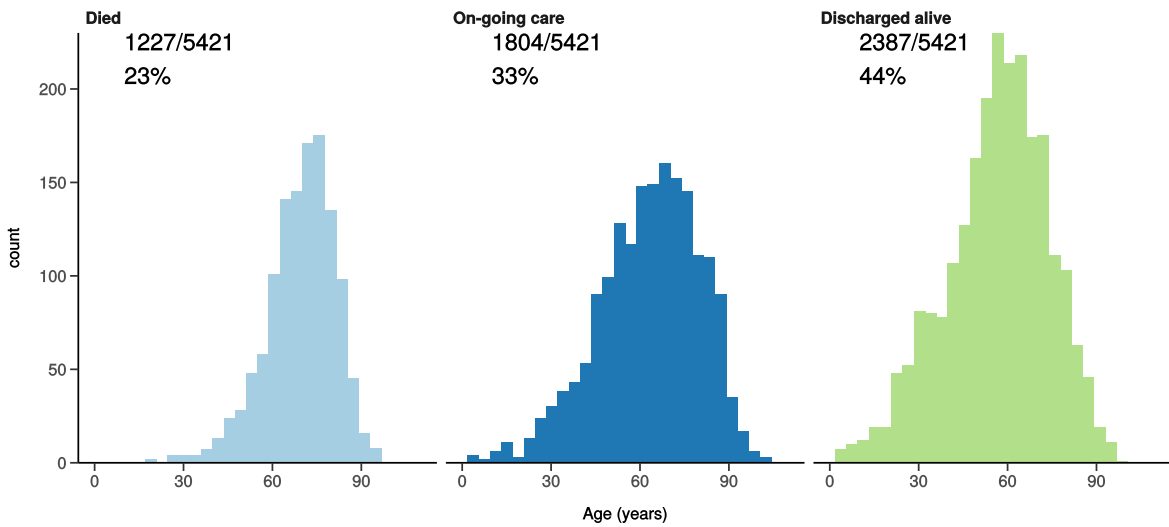
All: status in patients admitted ≥ 14 days ago

Figure 11A



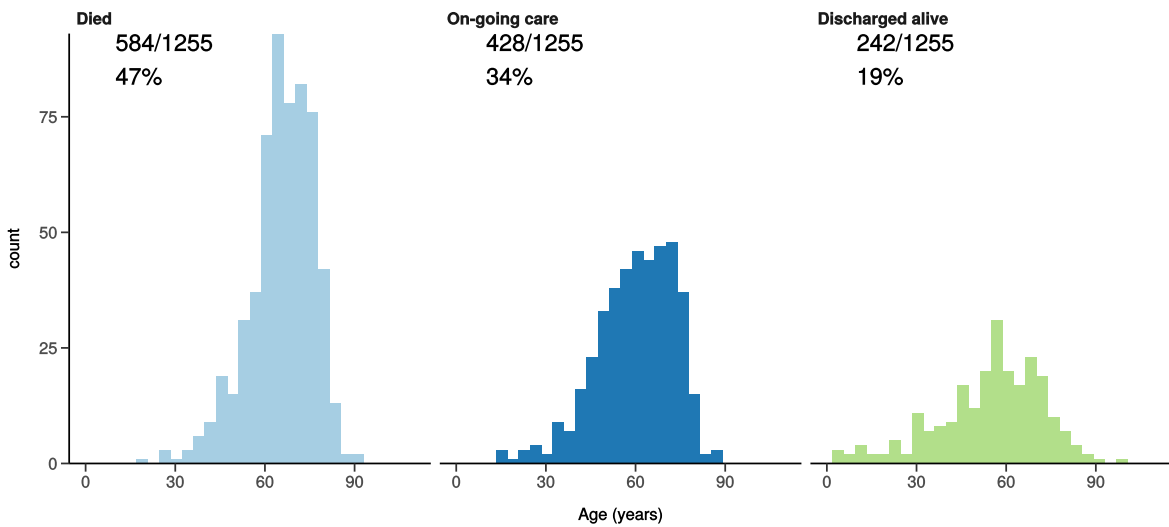
ICU/HDU admissions: status in patients admitted ≥ 14 days ago

Figure 11B



Invasive ventilation: status in patients admitted ≥ 14 days ago

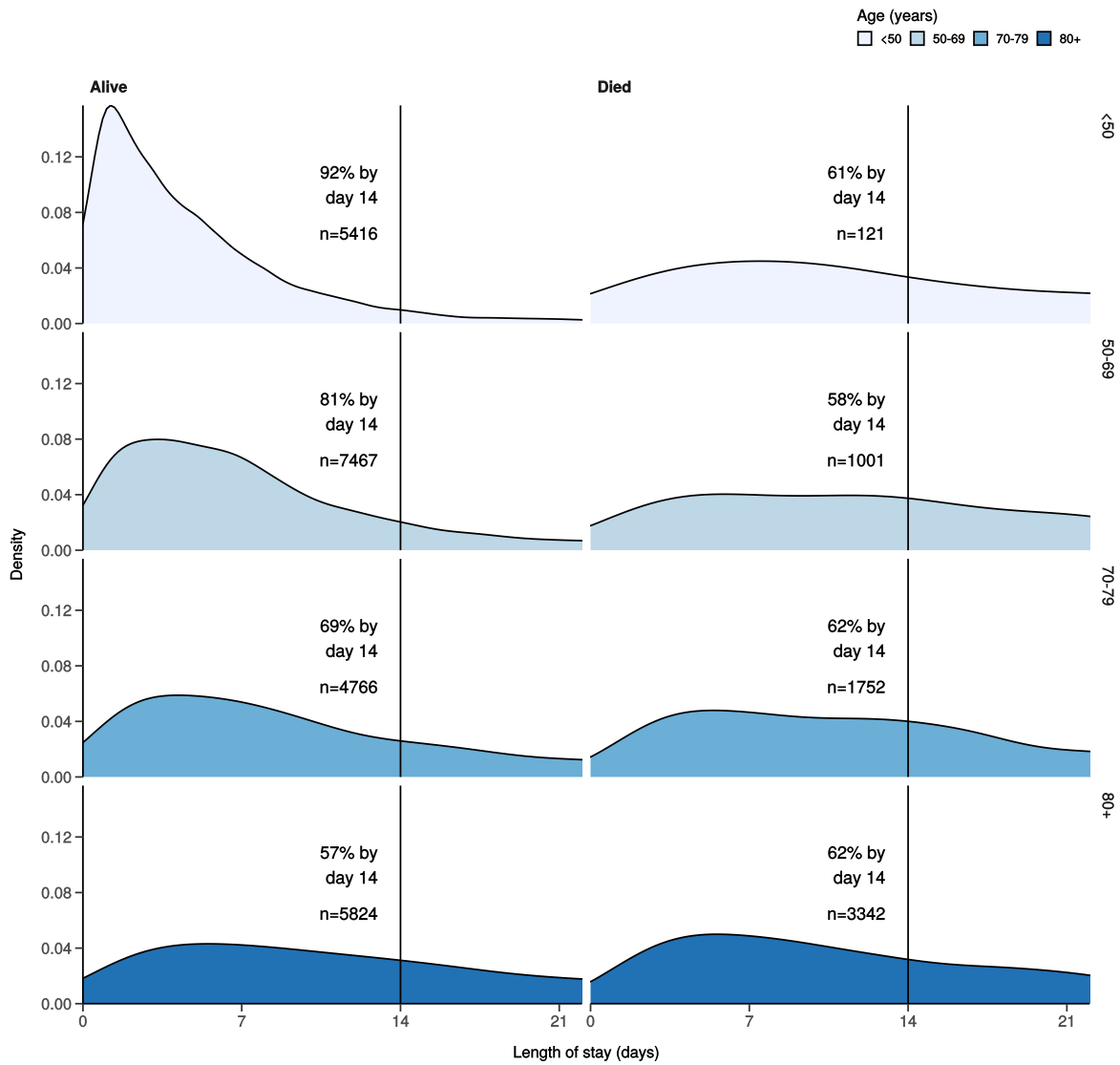
Figure 11c



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	5753 (97.8)	127 (2.2)	•	•
	50-69	7835 (88.4)	1026 (11.6)	5.93 (4.94-7.19, p<0.001)	4.96 (4.05-6.13, p<0.001)
	70-79	5095 (74.1)	1783 (25.9)	15.85 (13.25-19.14, p<0.001)	11.41 (9.33-14.09, p<0.001)
	80+	6230 (64.7)	3406 (35.3)	24.77 (20.76-29.81, p<0.001)	17.27 (14.15-21.30, p<0.001)
Sex at Birth	Male	13025 (77.1)	3877 (22.9)	•	•
	Female	11897 (82.8)	2467 (17.2)	0.70 (0.66-0.74, p<0.001)	0.65 (0.61-0.70, p<0.001)
	Not specified	0 (NaN)	0 (NaN)	•	•
Chronic cardiac disease	NO	17451 (84.6)	3172 (15.4)	•	•

Dependent: death		No	Yes	OR (univariable)	OR (multivariable)
	YES	6136 (68.9)	2773 (31.1)	2.49 (2.34-2.64, p<0.001)	1.24 (1.16-1.33, p<0.001)
Chronic pulmonary disease (not asthma)	NO	20402 (82.2)	4424 (17.8)	•	•
	YES	3204 (67.6)	1539 (32.4)	2.22 (2.07-2.37, p<0.001)	1.54 (1.41-1.67, p<0.001)
Chronic neurological disorder	NO	21078 (80.7)	5027 (19.3)	•	•
	YES	2418 (73.5)	873 (26.5)	1.51 (1.39-1.64, p<0.001)	1.04 (0.94-1.15, p=0.401)
Chronic hematologic disease	NO	22506 (80.2)	5548 (19.8)	•	•
	YES	949 (73.3)	346 (26.7)	1.48 (1.30-1.68, p<0.001)	0.95 (0.82-1.11, p=0.527)
Chronic kidney disease	NO	20528 (82.4)	4399 (17.6)	•	•
	YES	3041 (66.4)	1540 (33.6)	2.36 (2.20-2.53, p<0.001)	1.34 (1.23-1.46, p<0.001)
Dementia	NO	21426 (82.0)	4703 (18.0)	•	•
	YES	2064 (64.6)	1130 (35.4)	2.49 (2.30-2.70, p<0.001)	1.35 (1.22-1.48, p<0.001)
Obesity (as defined by clinical staff)	NO	17965 (79.7)	4577 (20.3)	•	•
	YES	3209 (84.2)	600 (15.8)	0.73 (0.67-0.80, p<0.001)	0.98 (0.88-1.09, p=0.732)
Malignant neoplasm	NO	21609 (81.5)	4904 (18.5)	•	•
	YES	1868 (65.0)	1008 (35.0)	2.38 (2.19-2.58, p<0.001)	1.69 (1.53-1.86, p<0.001)

Number in dataframe = 38335, Number in model = 25269, Missing = 13066, AIC = 21344.2, C-statistic = 0.756, H&L = Chi-sq(8) 38.13 (p<0.001)

Figure 13 - Adjusted odds ratio plot

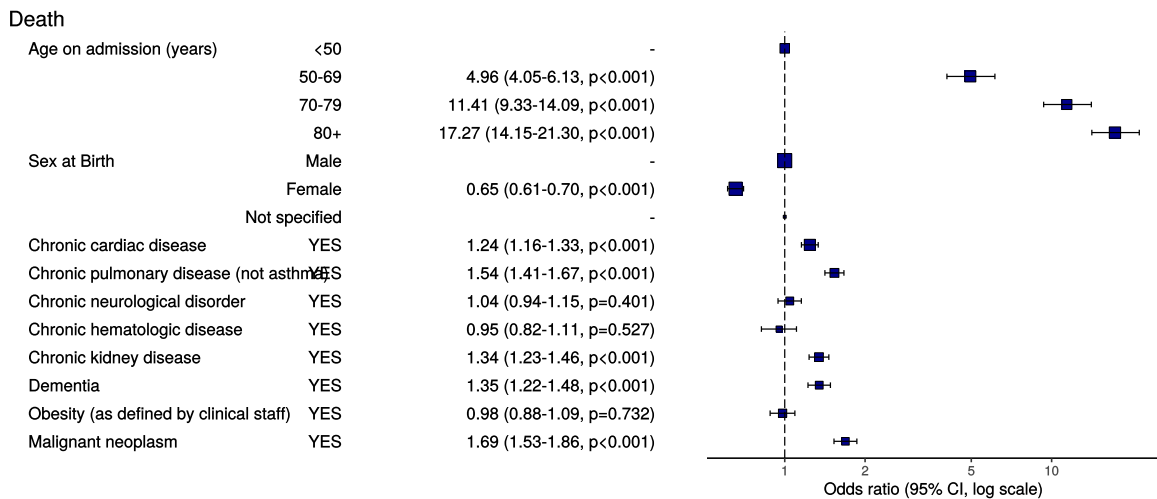
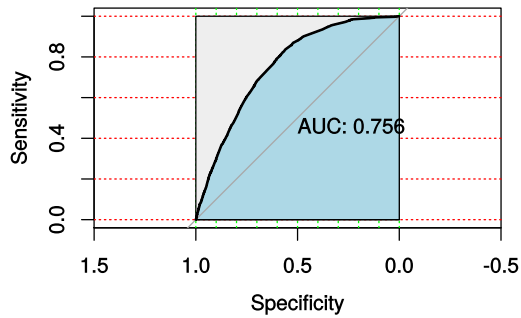


Figure 14 - ROC

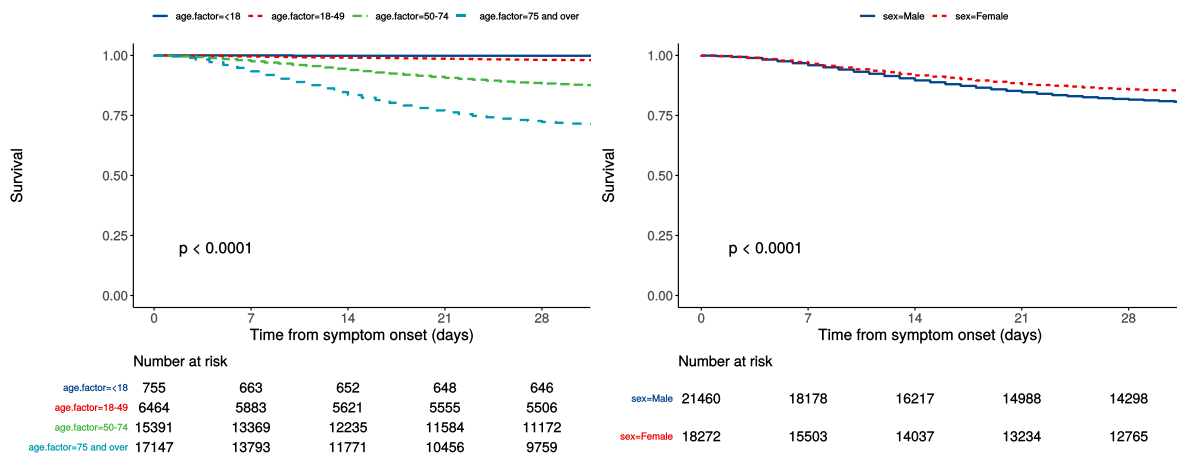


Survival models

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	7231 (18.2)	•	•
	50-69	11208 (28.2)	5.69 (4.73-6.85, p<0.001)	4.72 (3.80-5.86, p<0.001)
	70-79	8844 (22.2)	14.08 (11.75-16.86, p<0.001)	11.07 (8.94-13.70, p<0.001)
	80+	12493 (31.4)	20.67 (17.31-24.70, p<0.001)	16.21 (13.10-20.06, p<0.001)
Sex at Birth	Male	21472 (54.0)	•	•
	Female	18272 (46.0)	0.74 (0.70-0.77, p<0.001)	0.73 (0.69-0.78, p<0.001)
qSOFA score on admission	0	16871 (52.0)	•	•
	1	13379 (41.3)	1.71 (1.62-1.81, p<0.001)	1.90 (1.78-2.03, p<0.001)
	2	2049 (6.3)	3.52 (3.24-3.83, p<0.001)	3.23 (2.93-3.56, p<0.001)
	3	120 (0.4)	6.72 (5.24-8.62, p<0.001)	6.42 (4.87-8.48, p<0.001)
Symptomatic at presentation	No symptoms	6725 (18.2)	•	•

Dependent: Surv(time, status)		all	HR (univariable)	HR (multivariable)
	Symptoms	30324 (81.8)	1.66 (1.54-1.79, p<0.001)	•
Chronic cardiac disease	NO	24862 (69.6)	•	•
	YES	10840 (30.4)	2.25 (2.14-2.37, p<0.001)	1.23 (1.15-1.31, p<0.001)
Chronic kidney disease	NO	30134 (84.5)	•	•
	YES	5534 (15.5)	2.15 (2.02-2.27, p<0.001)	1.28 (1.19-1.37, p<0.001)
Moderate or severe liver disease	NO	34722 (98.1)	•	•
	YES	671 (1.9)	1.55 (1.33-1.81, p<0.001)	1.57 (1.30-1.89, p<0.001)
Chronic neurological disorder	NO	31438 (88.5)	•	•
	YES	4082 (11.5)	1.42 (1.32-1.52, p<0.001)	•
Malignant neoplasm	NO	32052 (90.3)	•	•
	YES	3459 (9.7)	2.14 (2.00-2.29, p<0.001)	1.57 (1.45-1.70, p<0.001)
Chronic hematologic disease	NO	33885 (95.6)	•	•
	YES	1557 (4.4)	1.39 (1.24-1.55, p<0.001)	•
Obesity (as defined by clinical staff)	NO	27346 (85.9)	•	•
	YES	4504 (14.1)	0.76 (0.70-0.83, p<0.001)	0.99 (0.90-1.09, p=0.837)
Diabetes without complications	NO	29295 (87.6)	•	•
	YES	4158 (12.4)	1.20 (1.11-1.29, p<0.001)	•
Rheumatologic disorder	NO	30569 (86.2)	•	•
	YES	4885 (13.8)	1.16 (1.09-1.25, p<0.001)	•
Dementia	NO	31517 (88.9)	•	•
	YES	3945 (11.1)	2.25 (2.11-2.40, p<0.001)	1.16 (1.07-1.26, p<0.001)
Malnutrition	NO	32171 (97.7)	•	•
	YES	756 (2.3)	1.90 (1.66-2.17, p<0.001)	•
smoking_mhyn_2levels	NO	17403 (47.1)	•	•
	YES	1966 (5.3)	0.93 (0.82-1.05, p=0.239)	•
	N/K	17575 (47.6)	1.18 (1.12-1.24, p<0.001)	•

Number in dataframe = 39915, Number in model = 26696, Missing = 13219, Number of events = 4422, Concordance = 0.759 (SE = 0.003), R-squared = 0.134 (Max possible = 0.964), Likelihood ratio test = 3849.553 (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	4.72 (3.80-5.86, p<0.001)
	70-79	11.07 (8.94-13.70, p<0.001)
	80+	16.21 (13.10-20.06, p<0.001)
Sex at Birth	Female	0.73 (0.69-0.78, p<0.001)
qSOFA score on admission	0	-
	1	1.90 (1.78-2.03, p<0.001)
	2	3.23 (2.93-3.56, p<0.001)
	3	6.42 (4.87-8.48, p<0.001)
Chronic cardiac disease	YES	1.23 (1.15-1.31, p<0.001)
Chronic kidney disease	YES	1.28 (1.19-1.37, p<0.001)
Moderate or severe liver disease	YES	1.57 (1.30-1.89, p<0.001)
Malignant neoplasm	YES	1.57 (1.45-1.70, p<0.001)
Obesity (as defined by clinical staff)	YES	0.99 (0.90-1.09, p=0.837)
Dementia	YES	1.16 (1.07-1.26, p<0.001)

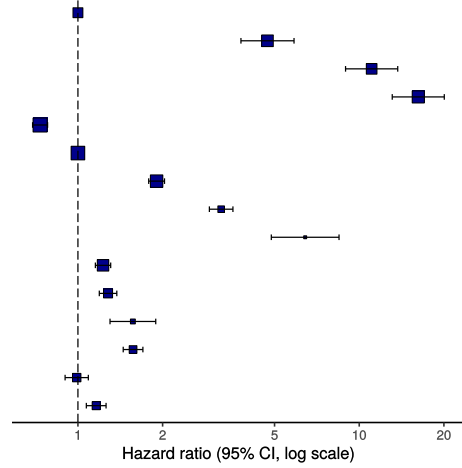
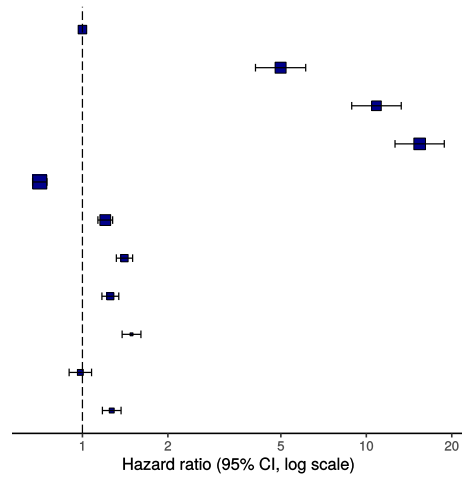


Figure 16b - Multivariable Cox proportional hazards model (age, sex, comorbidities only)

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

Age on admission (years)	<50	-
	50-69	4.99 (4.07-6.12, p<0.001)
	70-79	10.86 (8.88-13.28, p<0.001)
	80+	15.41 (12.62-18.82, p<0.001)
Sex at Birth	Female	0.71 (0.67-0.75, p<0.001)
Chronic cardiac disease	YES	1.20 (1.13-1.28, p<0.001)
Chronic pulmonary disease (not asthma)	YES	1.41 (1.32-1.50, p<0.001)
Chronic kidney disease	YES	1.25 (1.17-1.34, p<0.001)
Malignant neoplasm	YES	1.49 (1.38-1.61, p<0.001)
Obesity (as defined by clinical staff)	YES	0.98 (0.90-1.08, p=0.715)
Dementia	YES	1.27 (1.18-1.37, p<0.001)



ROC = 0.7596635

Figure 17 - Predictions calibration plot

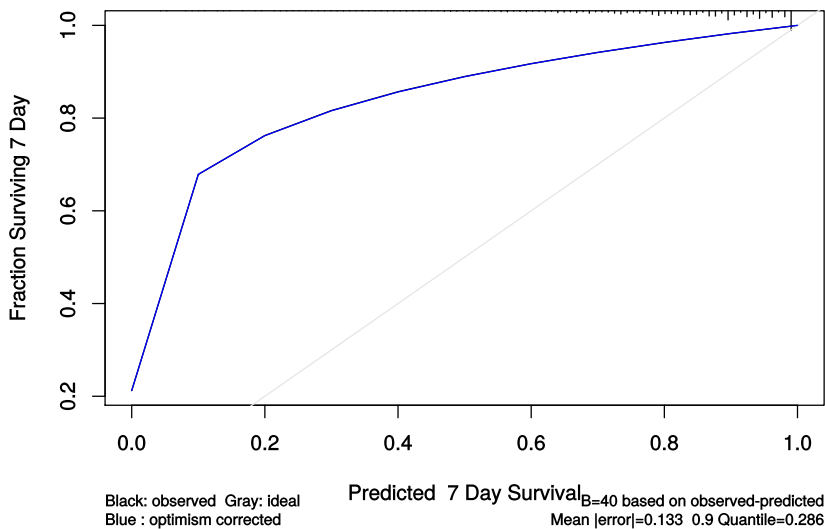


Figure 18 - Prognostic model predictions

Again, for demonstration of methods.

Prognostic model for survival 7 days after onset

qSOFA score on admission

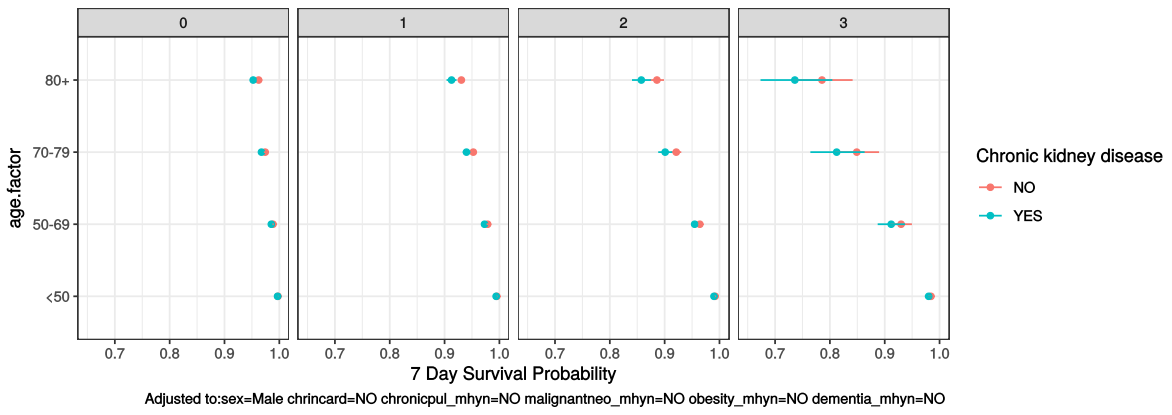


Figure 19 - Death by severity (NEWS) on admission

Number of deaths by NEWS score at admission

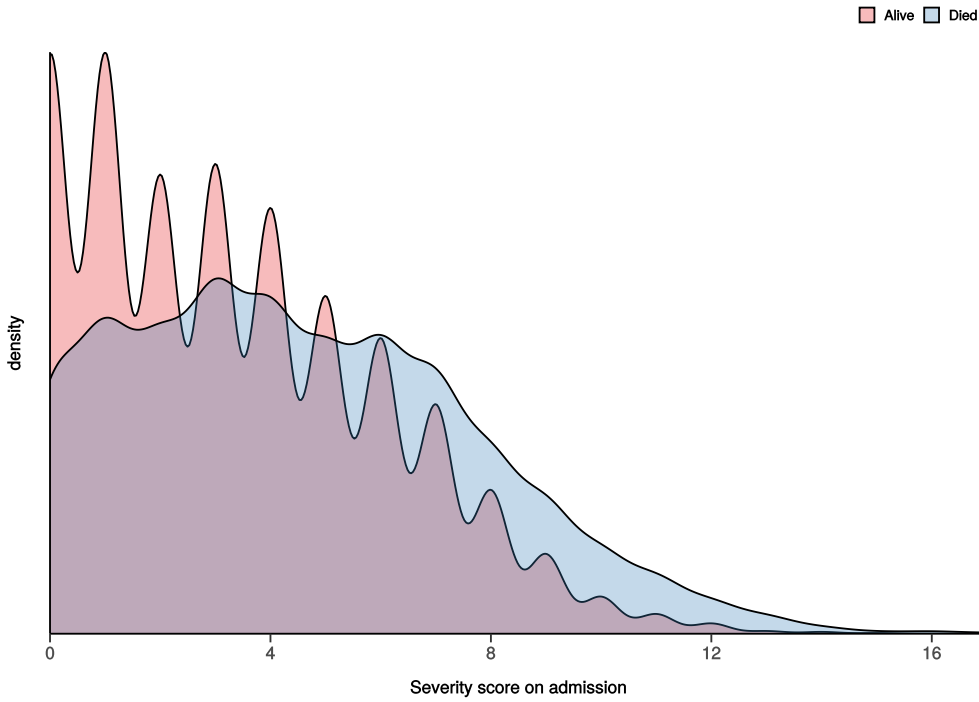


Figure 20 - Death by severity (NEWS) on admission stratified by age

Number of deaths by NEWS score at admission
Stratified by age

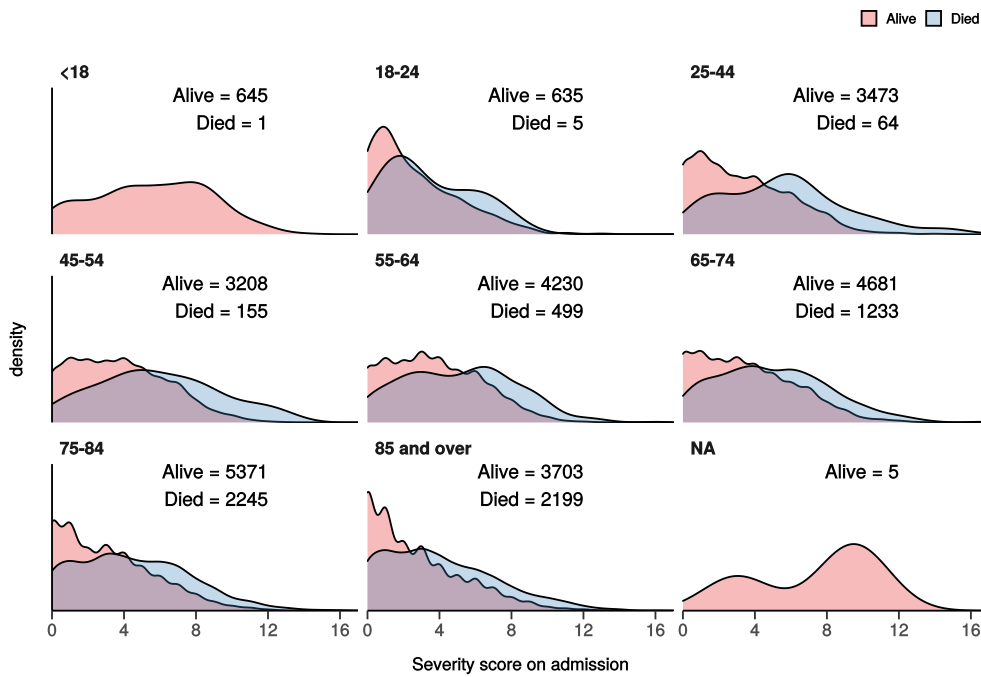
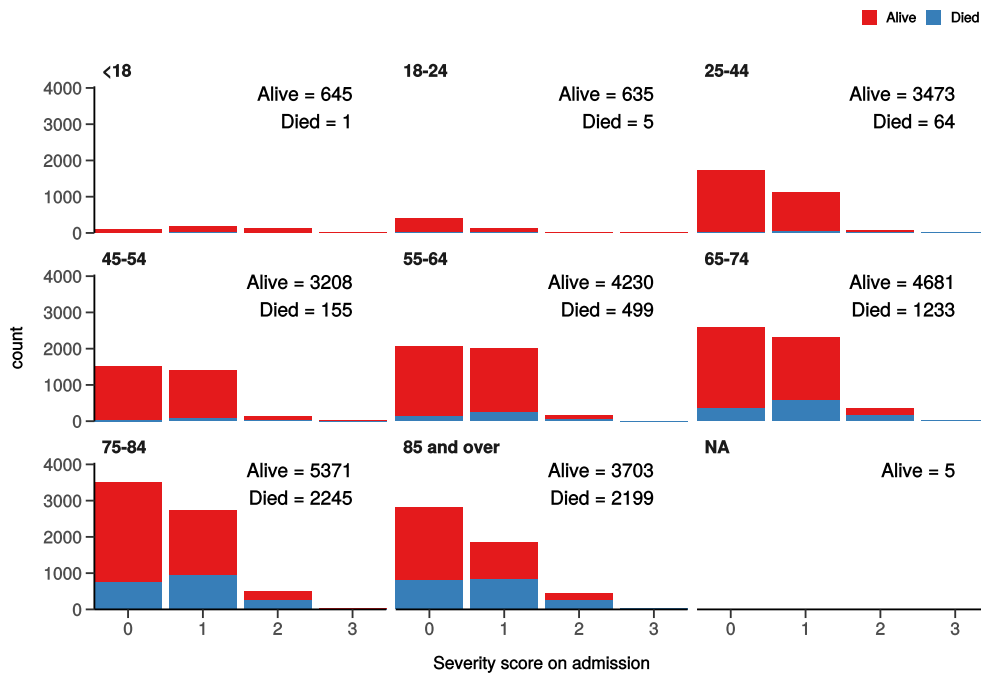


Figure 21 - Death by severity (qSOFA) on admission stratified by age

Number of deaths by qSOFA score at admission
Stratified by age



Healthcare workers

Employed as a healthcare worker?		NO	YES	p
Total N (%)		31255 (97.6)	761 (2.4)	
NEWS score on admission	Median (IQR)	3.0 (4.0)	3.0 (4.0)	0.004
Death	No	19509 (77.2)	617 (95.8)	<0.001
	Yes	5762 (22.8)	27 (4.2)	