

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

Dynamic content updated: 2021-02-17 04:29:07.

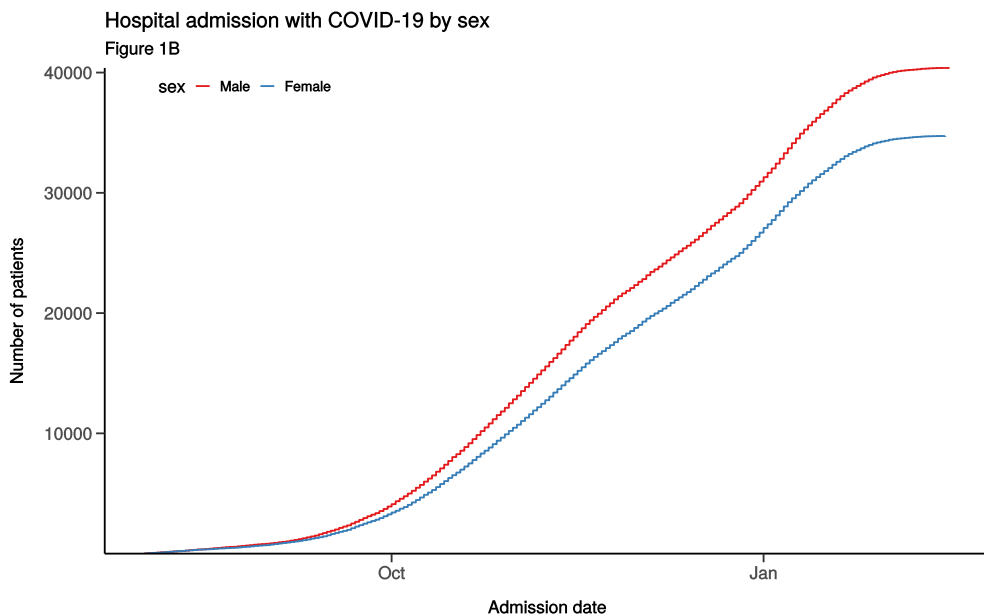
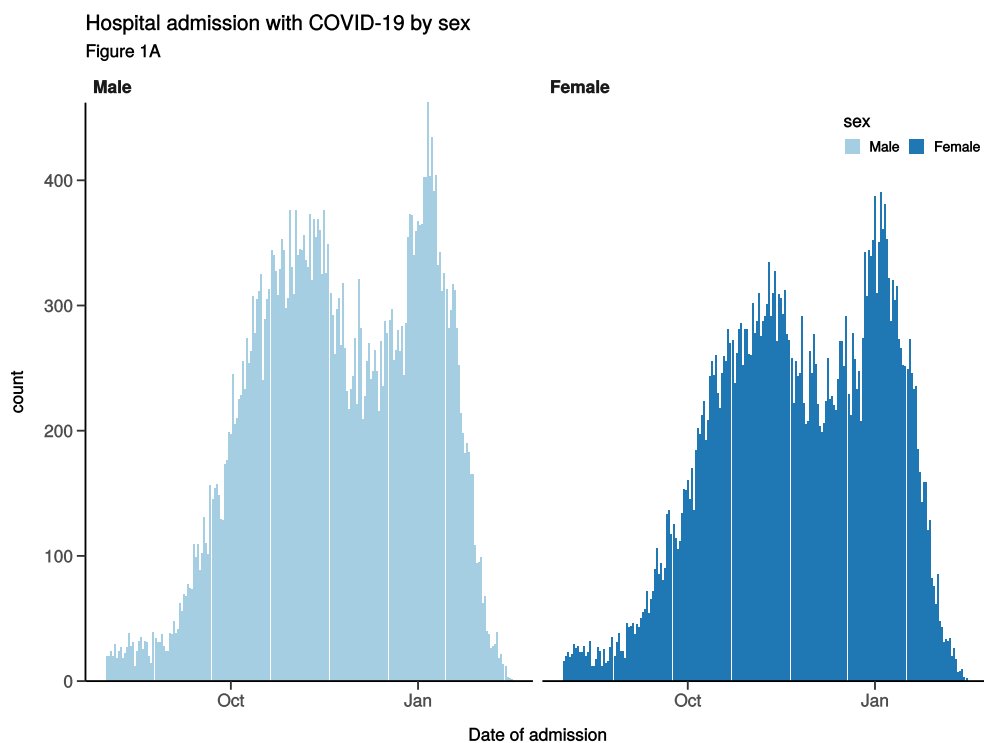
Executive summary

Includes patients admitted after 01 August 2020

There are 75374 patients included in CO-CIN. Of these, 13618 patient(s) have died and 12912 required ICU. 41330 have been discharged home.

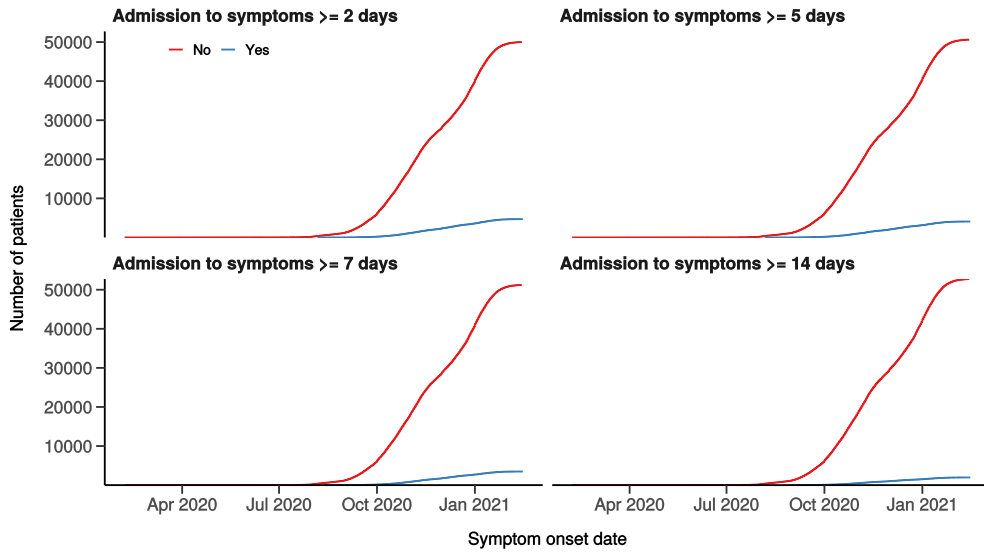
Admission

Figure 1



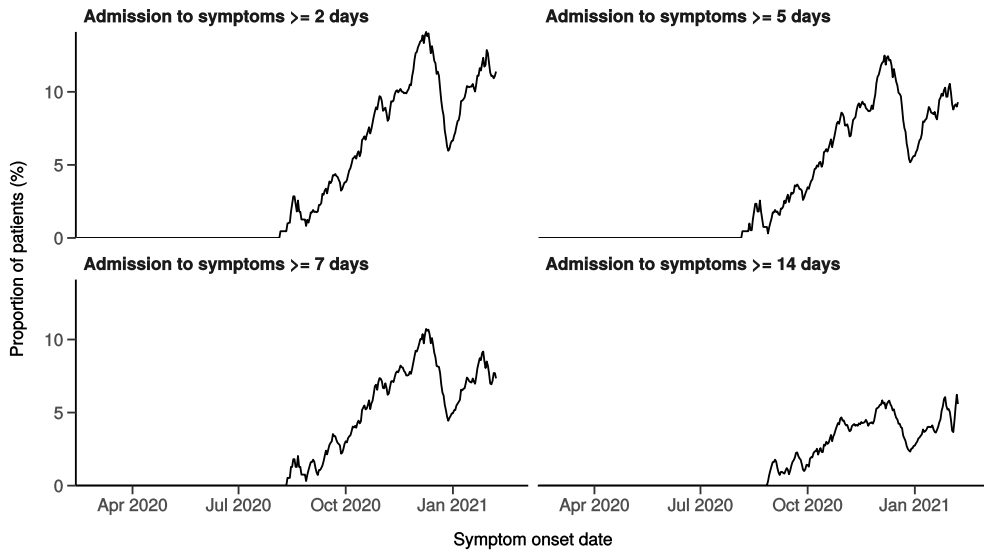
Number with symptom onset occurring after admission to hospital

Figure 1C



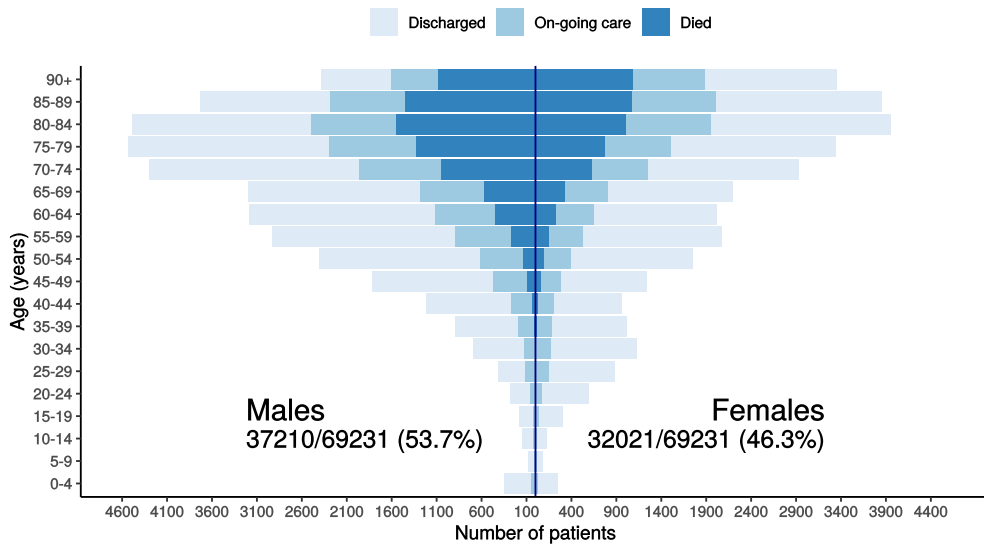
Proportion with symptom onset occurring after hospital admission

Figure 1D - 7-day rolling percentage. n = 54690

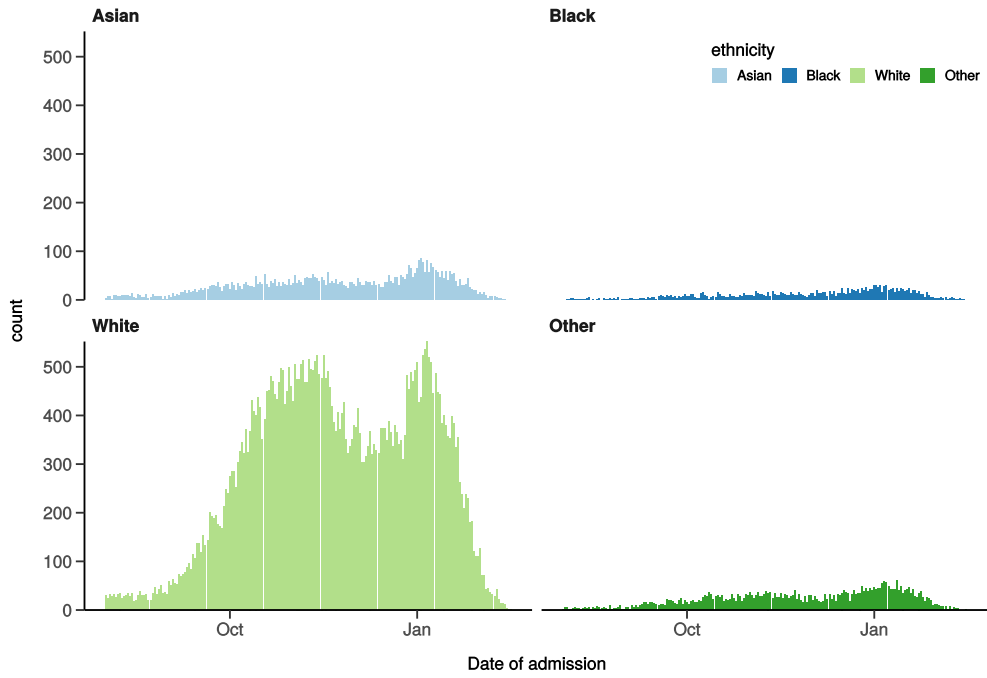


Patients with outcome stratified by age, and sex

Figure 1E



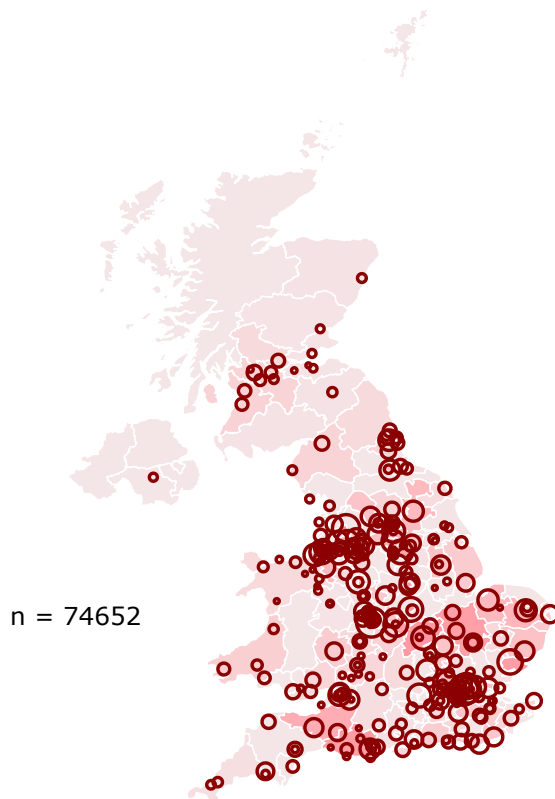
Hospital admission with COVID-19 by ethnicity
Figure 1F



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

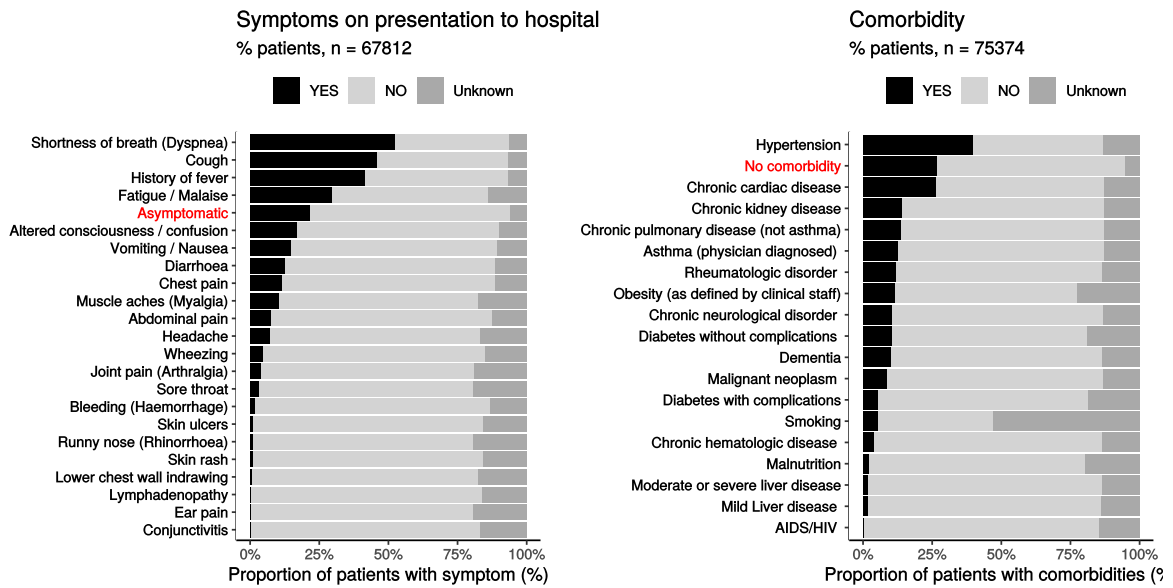


Figure 3B - Symptoms by Age

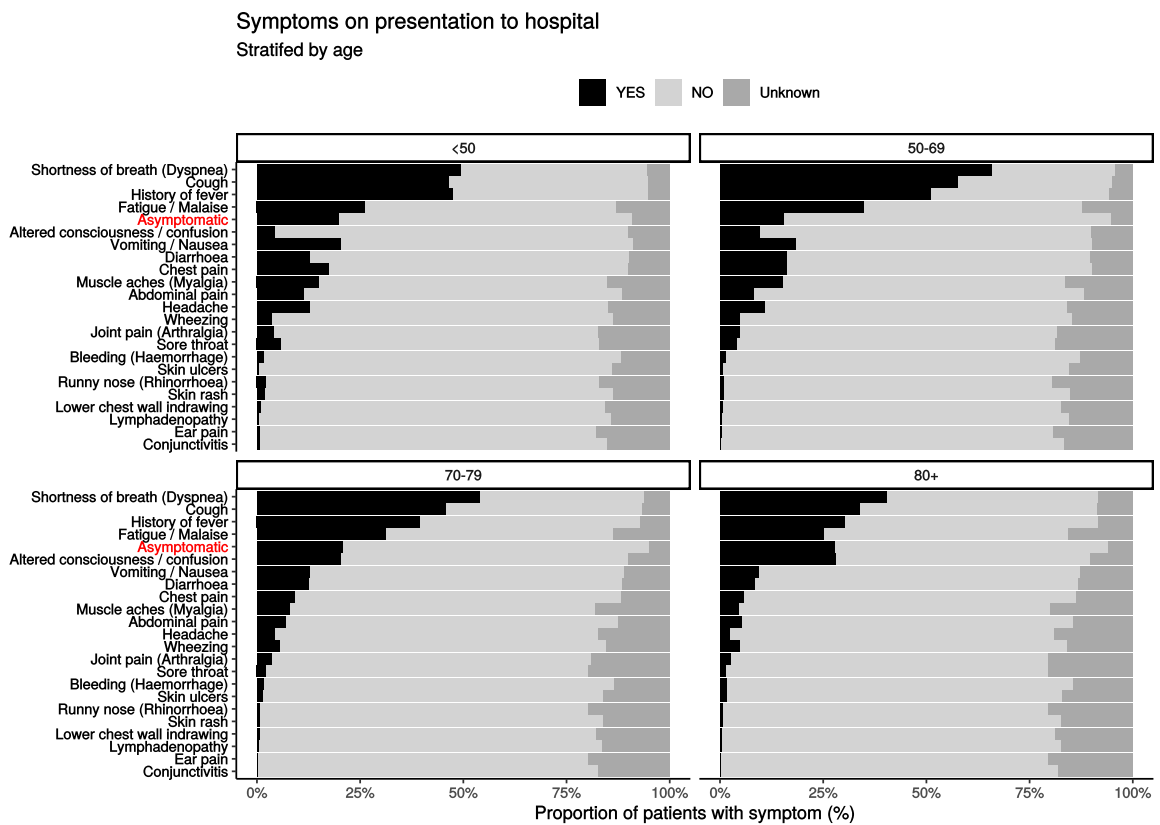
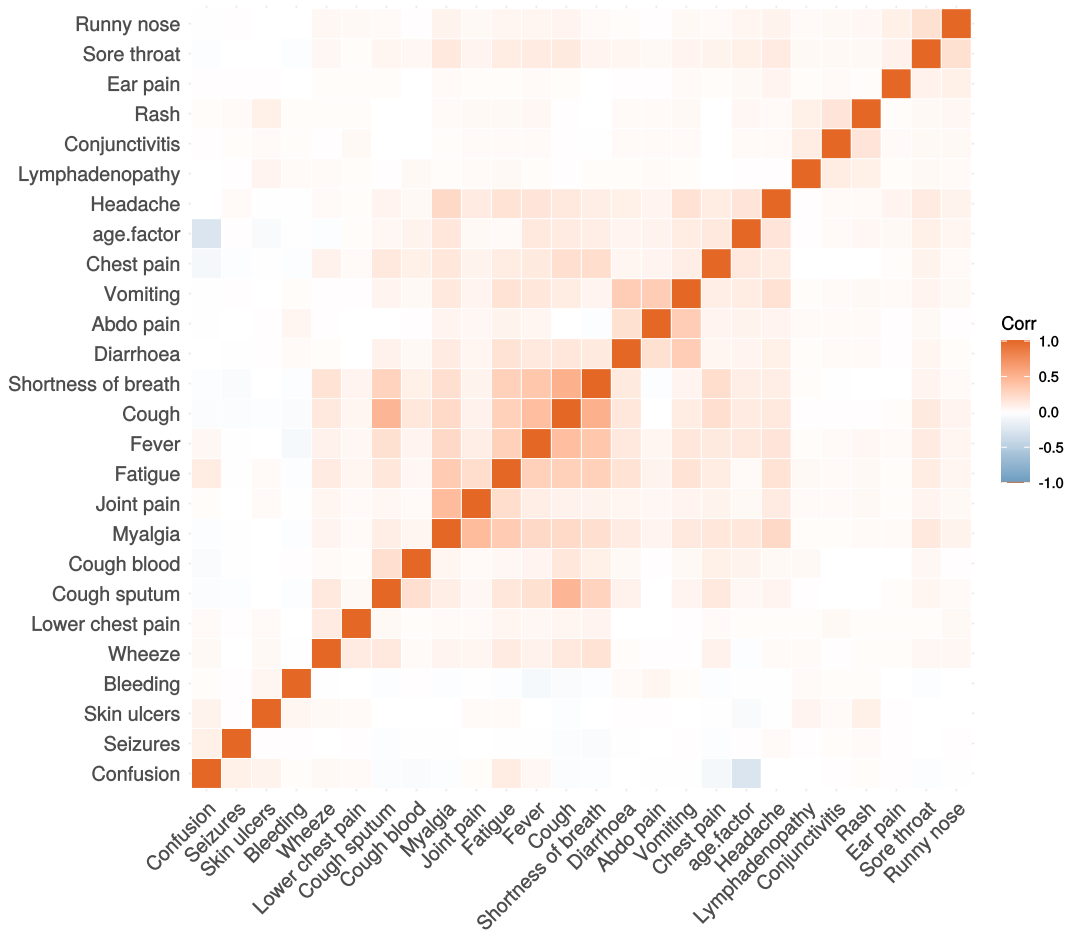


Figure 3C

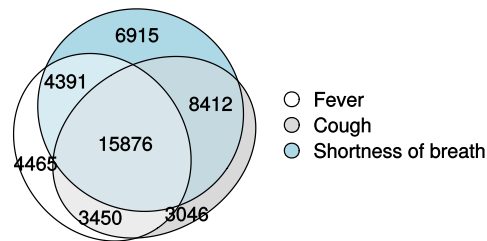
Correlation of symptoms in all pages. Note clusters, top right to bottom left, flu-like, coryzal, abdominal, respiratory, neurocutaneous.



Symptoms (diagnostic criteria)

Figure 4A

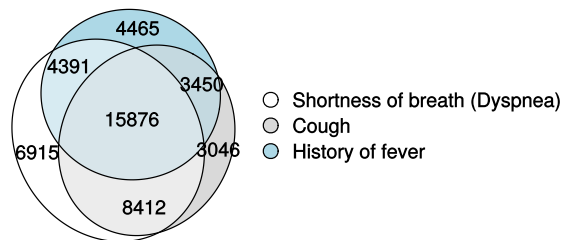
n = 67812



Symptoms (most common)

Figure 4B

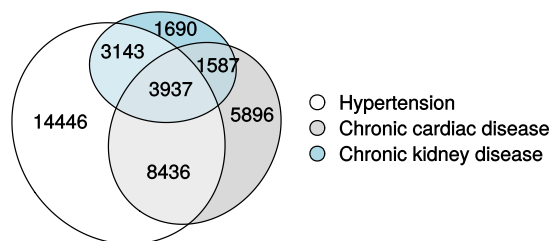
n = 67812



Comorbidity (most common)

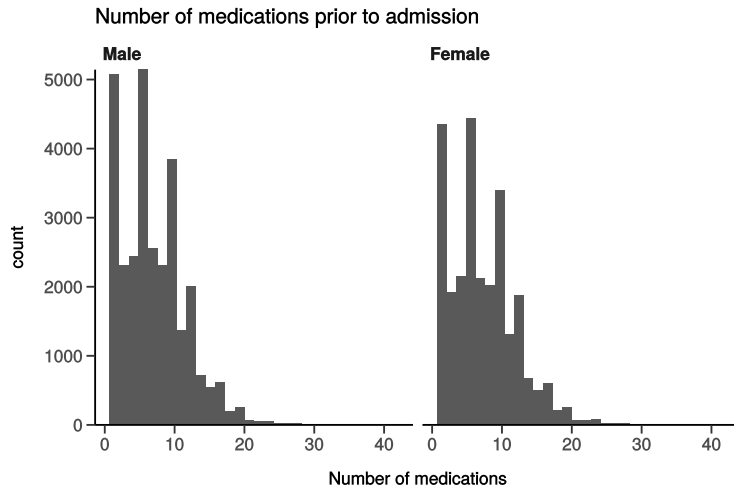
Figure 4C

n = 75374



Medication prior to illness

Figure 5

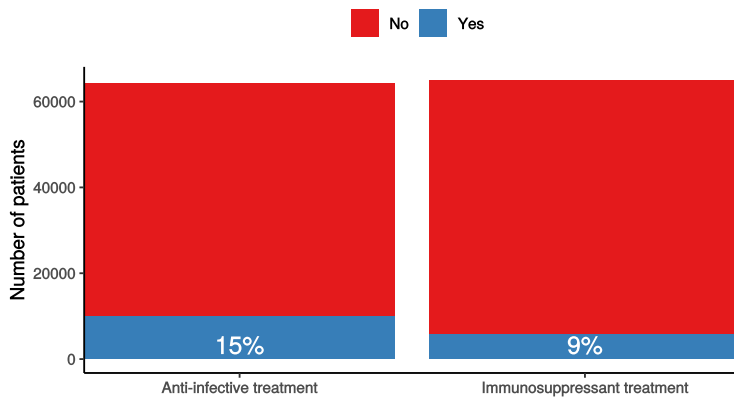


Preadmission treatment

Figure 6

Pre-admission treatment

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



Patient flow

Figure 7A - All patients

N = 70834

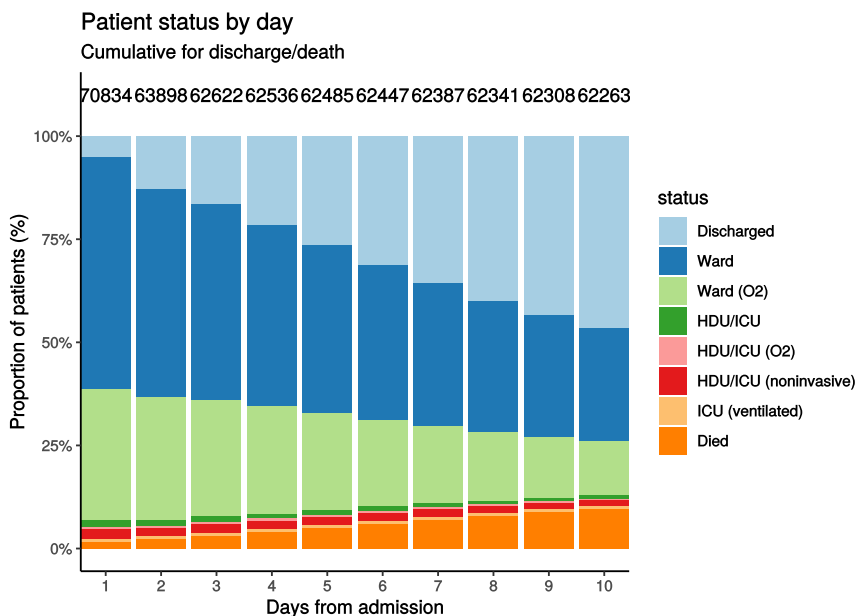
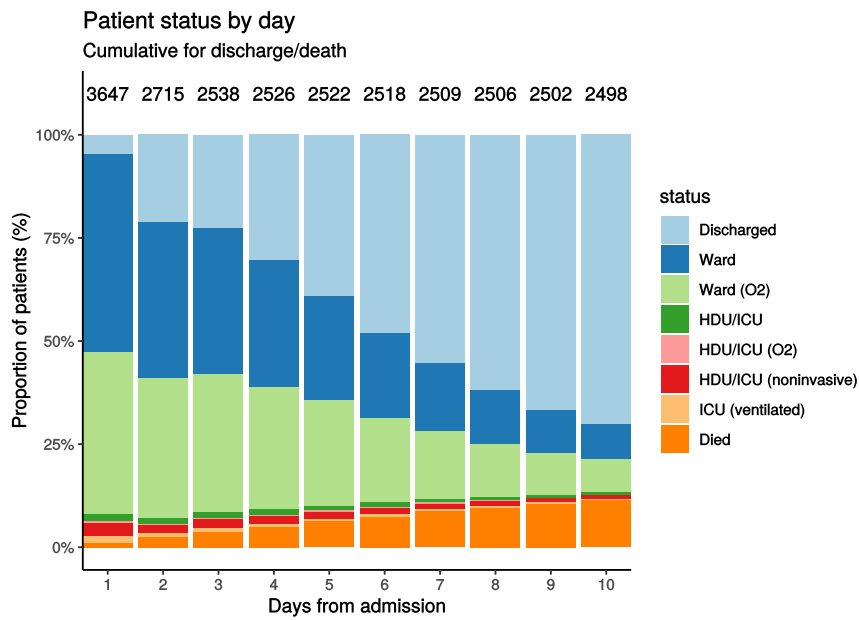


Figure 7B - Patients admitted >=14 days and <=28 days ago

N = 3647



Oxygen requirement

Figure 8A - All patients

N = 67172

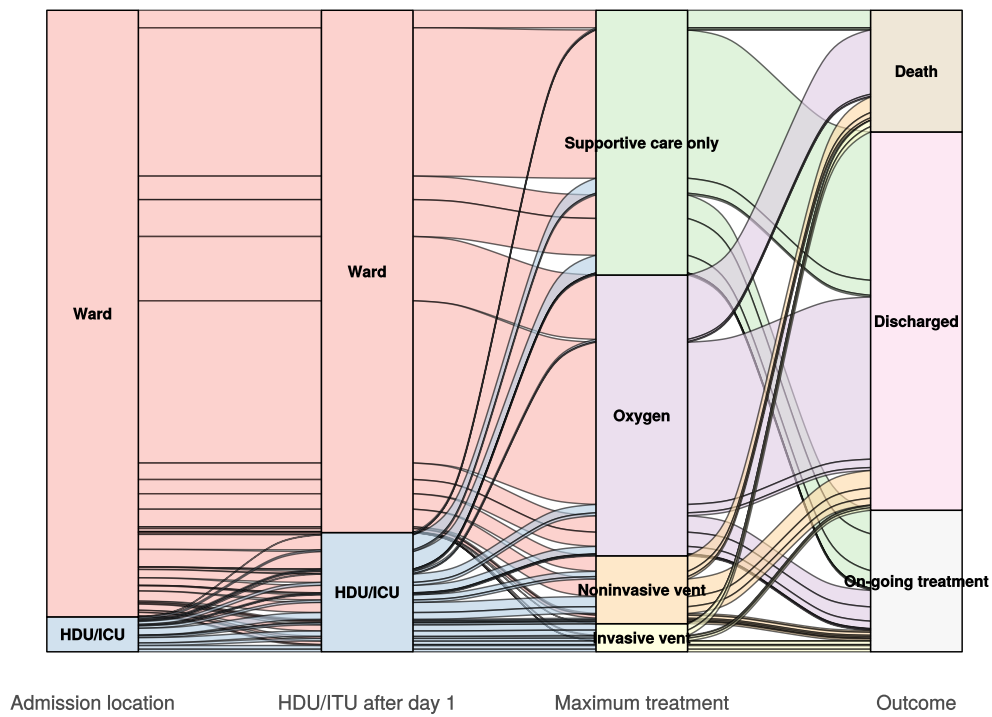


Figure 8B - Patients admitted ≥ 14 days and ≤ 28 days ago

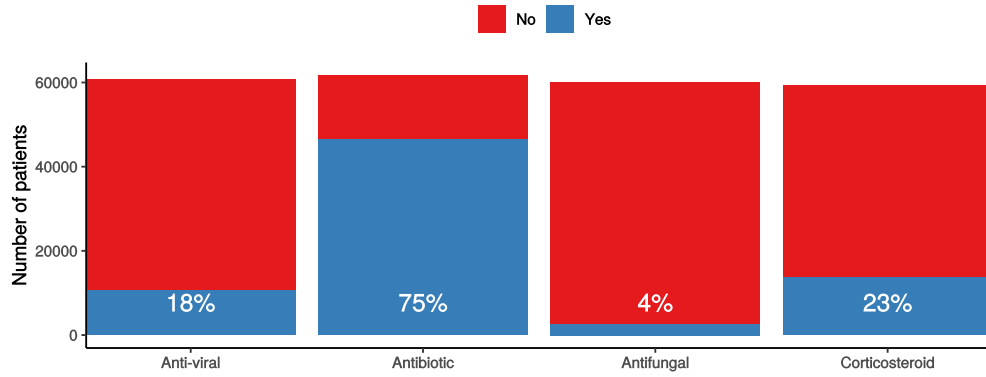
N = 3477

In-hospital medical treatment

Figure 9

In-hospital treatment

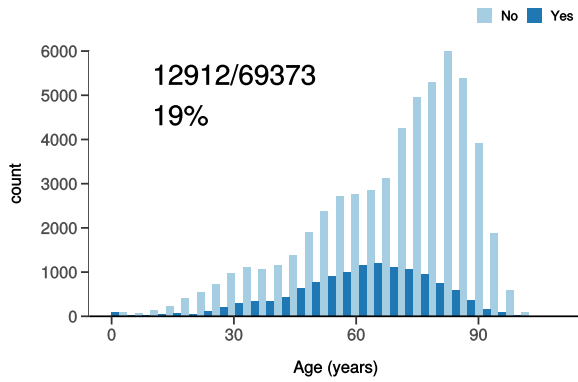
Anti-virals, antibiotics, corticosteroids, and anti-fungals for patients who have completed journey.



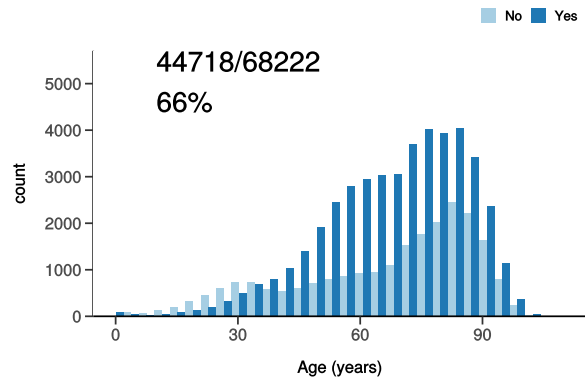
Treatment

Figure 10

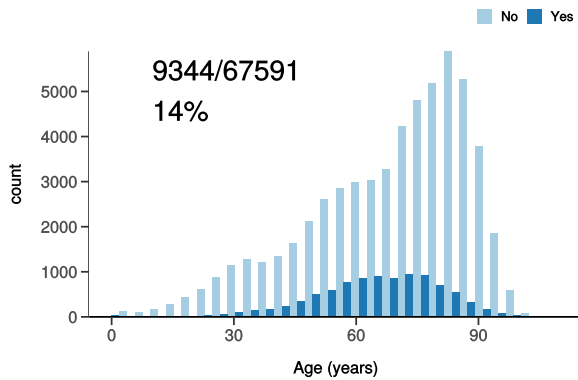
ICU/HDU admission
Figure 10A



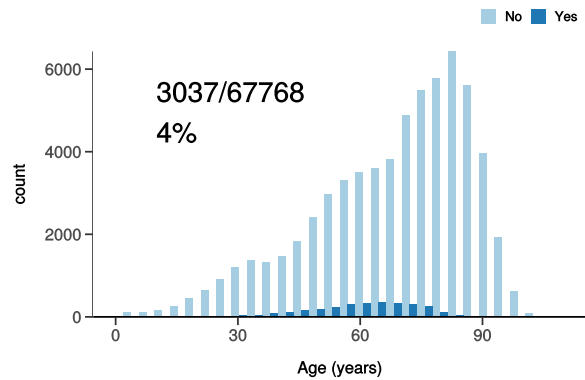
High flow oxygen
Figure 10B



Noninvasive ventilation
Figure 10C



Invasive ventilation
Figure 10D

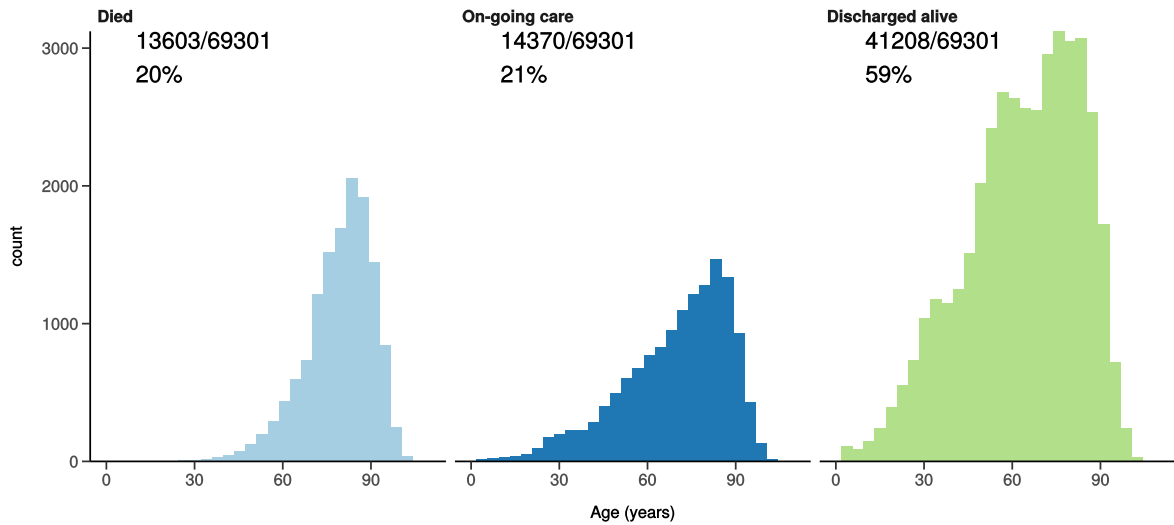


Status in patients admitted ≥ 14 days from today

Figure 11

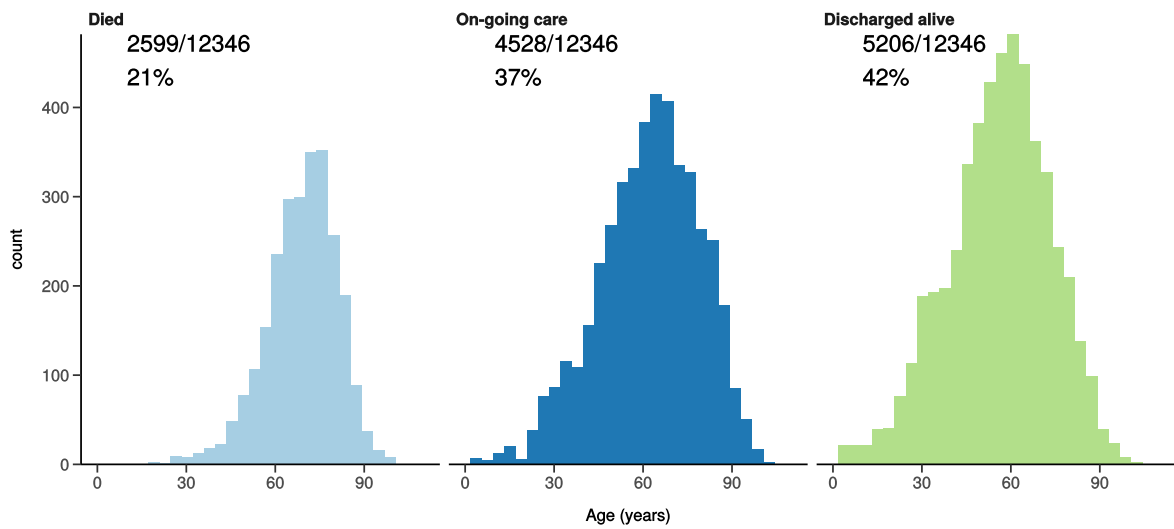
All: status in patients admitted ≥ 14 days ago

Figure 11A



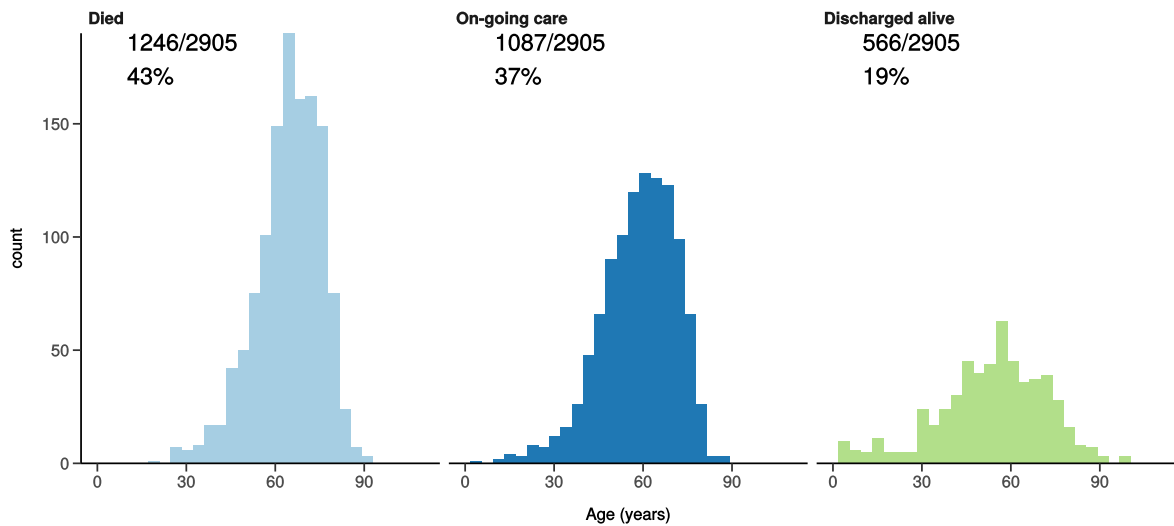
ICU/HDU admissions: status in patients admitted ≥ 14 days ago

Figure 11B



Invasive ventilation: status in patients admitted ≥ 14 days ago

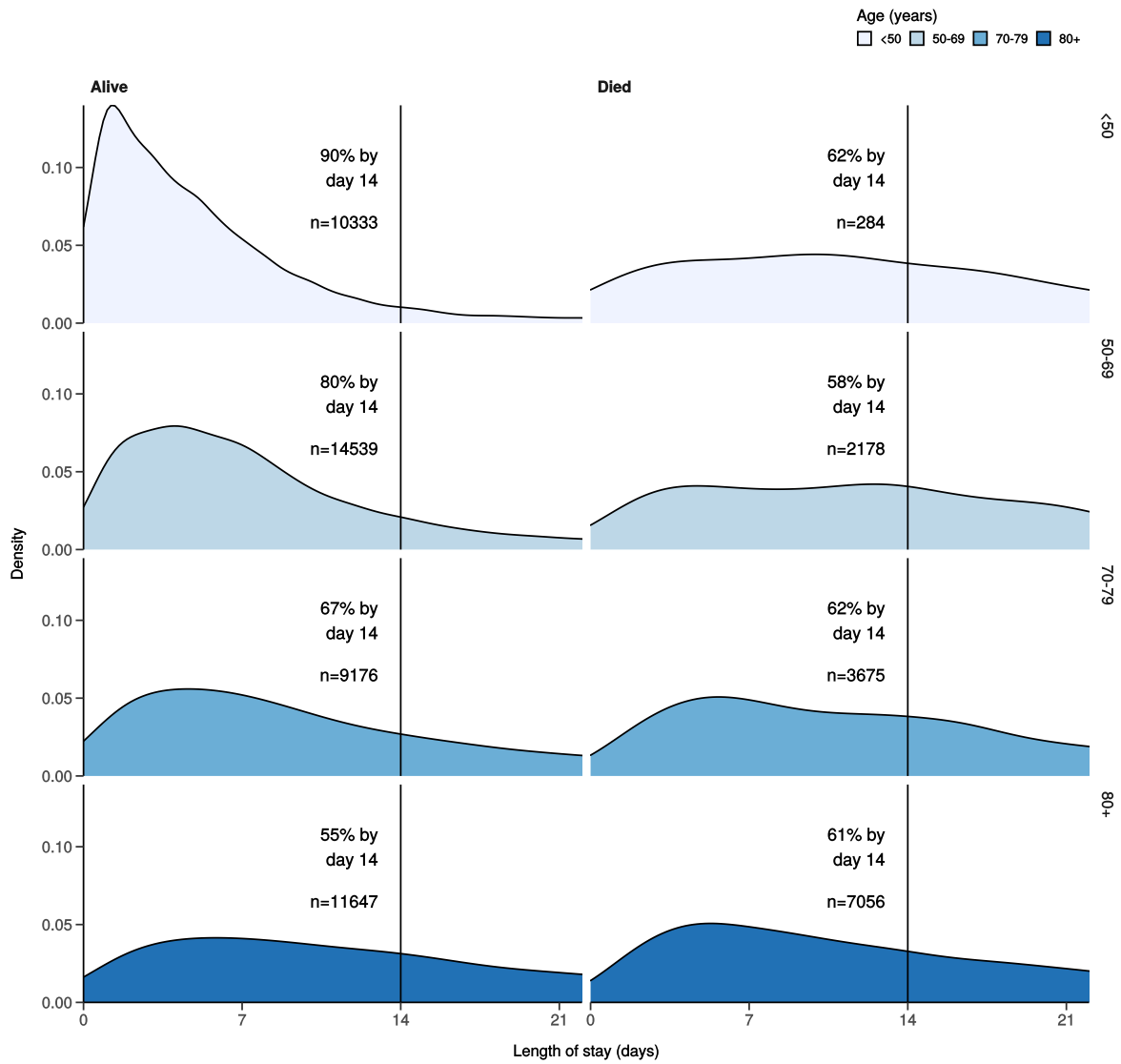
Figure 11c



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	11341 (97.4)	297 (2.6)	•	•
	50-69	15603 (87.5)	2237 (12.5)	5.47 (4.85-6.21, p<0.001)	4.72 (4.12-5.44, p<0.001)
	70-79	9944 (72.5)	3766 (27.5)	14.46 (12.84-16.36, p<0.001)	10.78 (9.40-12.40, p<0.001)
	80+	12584 (63.4)	7258 (36.6)	22.02 (19.60-24.85, p<0.001)	16.13 (14.09-18.56, p<0.001)
Sex at Birth	Male	25735 (76.1)	8073 (23.9)	•	•
	Female	23763 (81.2)	5497 (18.8)	0.74 (0.71-0.77, p<0.001)	0.69 (0.66-0.72, p<0.001)
	Not specified	0 (NaN)	0 (NaN)	•	•
Chronic cardiac disease	NO	33782 (83.6)	6623 (16.4)	•	•
	YES	11981 (67.9)	5658 (32.1)	2.41 (2.31-2.51, p<0.001)	1.19 (1.13-1.26, p<0.001)

Dependent: death		No	Yes	OR (univariable)	OR (multivariable)
Chronic pulmonary disease (not asthma)	NO	39785 (81.3)	9170 (18.7)	•	•
	YES	6008 (66.0)	3099 (34.0)	2.24 (2.13-2.35, p<0.001)	1.56 (1.47-1.65, p<0.001)
Chronic neurological disorder	NO	40569 (79.8)	10264 (20.2)	•	•
	YES	5020 (72.7)	1888 (27.3)	1.49 (1.40-1.57, p<0.001)	1.04 (0.97-1.12, p=0.232)
Chronic hematologic disease	NO	43639 (79.2)	11459 (20.8)	•	•
	YES	1878 (73.3)	684 (26.7)	1.39 (1.27-1.52, p<0.001)	0.90 (0.81-1.00, p=0.047)
Chronic kidney disease	NO	39745 (81.5)	9013 (18.5)	•	•
	YES	5968 (64.9)	3221 (35.1)	2.38 (2.27-2.50, p<0.001)	1.35 (1.27-1.44, p<0.001)
Dementia	NO	41416 (81.2)	9598 (18.8)	•	•
	YES	4078 (62.8)	2416 (37.2)	2.56 (2.42-2.70, p<0.001)	1.38 (1.29-1.48, p<0.001)
Obesity (as defined by clinical staff)	NO	34633 (78.9)	9247 (21.1)	•	•
	YES	6335 (82.3)	1366 (17.7)	0.81 (0.76-0.86, p<0.001)	1.13 (1.06-1.22, p=0.001)
Malignant neoplasm	NO	41966 (80.5)	10146 (19.5)	•	•
	YES	3585 (63.9)	2028 (36.1)	2.34 (2.21-2.48, p<0.001)	1.66 (1.55-1.78, p<0.001)

Number in dataframe = 74619, Number in model = 49413, Missing = 25206, AIC = 42995.7, C-statistic = 0.752, H&L = Chi-sq(8) 121.70 (p<0.001)

Figure 13 - Adjusted odds ratio plot

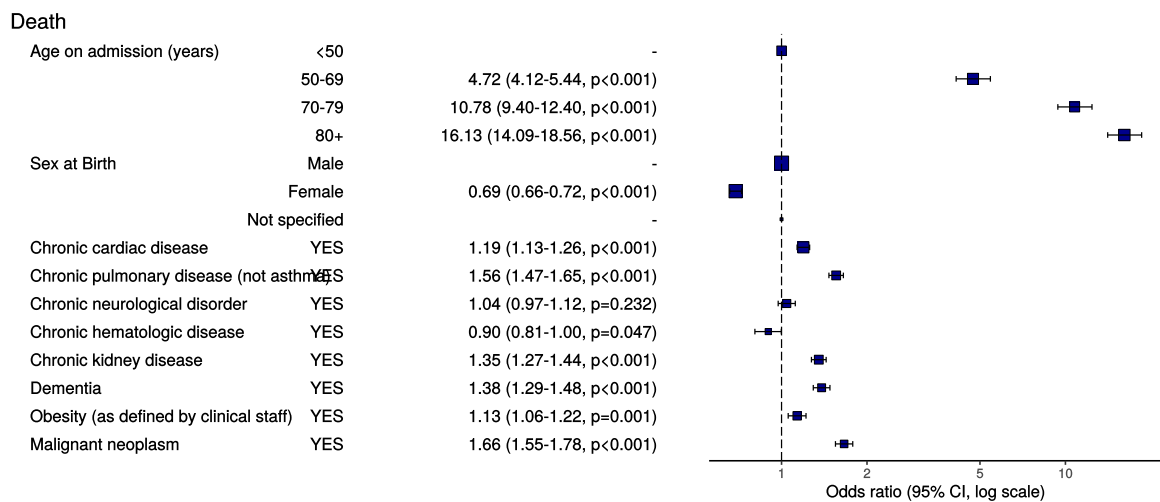
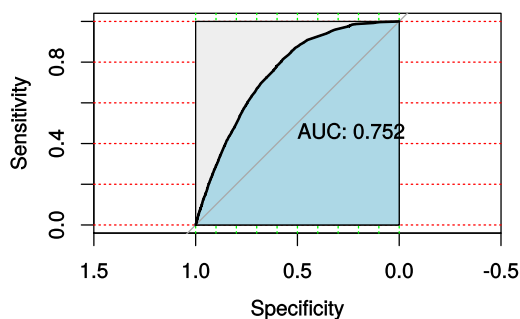


Figure 14 - ROC

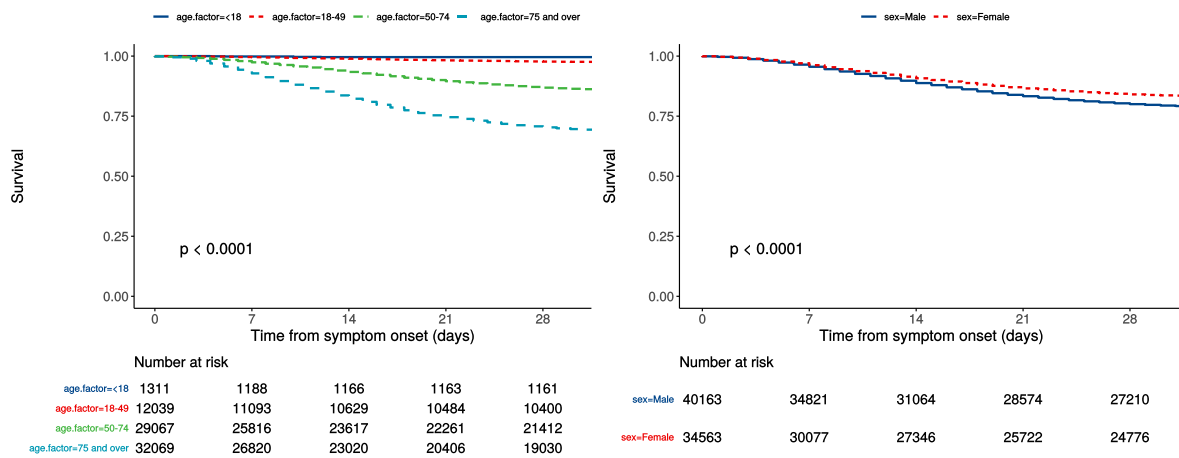


Survival models

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	13378 (17.9)	•	•
	50-69	21283 (28.5)	5.12 (4.53-5.78, p<0.001)	4.41 (3.81-5.10, p<0.001)
	70-79	16386 (22.0)	12.36 (10.98-13.91, p<0.001)	10.21 (8.85-11.77, p<0.001)
	80+	23506 (31.5)	17.76 (15.81-19.95, p<0.001)	14.65 (12.70-16.89, p<0.001)
Sex at Birth	Male	40219 (53.8)	•	•
	Female	34563 (46.2)	0.77 (0.75-0.80, p<0.001)	0.76 (0.72-0.79, p<0.001)
qSOFA score on admission	0	30703 (51.1)	•	•
	1	25156 (41.9)	1.61 (1.54-1.67, p<0.001)	1.79 (1.71-1.87, p<0.001)
	2	3959 (6.6)	3.25 (3.06-3.44, p<0.001)	3.03 (2.83-3.25, p<0.001)
	3	271 (0.5)	5.72 (4.85-6.76, p<0.001)	5.19 (4.31-6.25, p<0.001)
Symptomatic at presentation	No symptoms	11943 (17.5)	•	•
	Symptoms	56270 (82.5)	1.50 (1.43-1.58, p<0.001)	•
Chronic cardiac disease	NO	45769 (69.8)	•	•
	YES	19772 (30.2)	2.19 (2.12-2.27, p<0.001)	1.20 (1.14-1.25, p<0.001)
Chronic kidney disease	NO	55087 (84.2)	•	•
	YES	10307 (15.8)	2.13 (2.05-2.22, p<0.001)	1.27 (1.20-1.33, p<0.001)
Moderate or severe liver disease	NO	63663 (98.1)	•	•
	YES	1228 (1.9)	1.55 (1.39-1.73, p<0.001)	1.62 (1.42-1.85, p<0.001)
Chronic neurological disorder	NO	57437 (88.2)	•	•
	YES	7715 (11.8)	1.43 (1.36-1.50, p<0.001)	•
Malignant neoplasm	NO	58819 (90.3)	•	•
	YES	6322 (9.7)	2.06 (1.97-2.17, p<0.001)	1.49 (1.41-1.58, p<0.001)

Dependent: Surv(time, status)		all	HR (univariable)	HR (multivariable)
Chronic hematologic disease	NO	62255 (95.7)	•	•
	YES	2776 (4.3)	1.36 (1.25-1.46, p<0.001)	•
Obesity (as defined by clinical staff)	NO	49501 (85.2)	•	•
	YES	8566 (14.8)	0.83 (0.78-0.88, p<0.001)	1.09 (1.02-1.16, p=0.011)
Diabetes without complications	NO	53356 (87.5)	•	•
	YES	7643 (12.5)	1.18 (1.12-1.25, p<0.001)	•
Rheumatologic disorder	NO	56043 (86.3)	•	•
	YES	8864 (13.7)	1.24 (1.18-1.30, p<0.001)	•
Dementia	NO	57570 (88.7)	•	•
	YES	7352 (11.3)	2.27 (2.17-2.37, p<0.001)	1.20 (1.14-1.27, p<0.001)
Malnutrition	NO	59005 (97.6)	•	•
	YES	1428 (2.4)	1.70 (1.54-1.88, p<0.001)	•
smoking_mhyn_2levels	NO	31374 (46.1)	•	•
	YES	3894 (5.7)	0.89 (0.82-0.97, p=0.008)	•
	N/K	32744 (48.1)	1.19 (1.15-1.23, p<0.001)	•

Number in dataframe = 75030, Number in model = 48851, Missing = 26179, Number of events = 9008, Concordance = 0.749 (SE = 0.002), R-squared = 0.137 (Max possible = 0.980), Likelihood ratio test = 7180.870 (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	4.41 (3.81-5.10, p<0.001)
	70-79	10.21 (8.85-11.77, p<0.001)
	80+	14.65 (12.70-16.89, p<0.001)
Sex at Birth	Female	0.76 (0.72-0.79, p<0.001)
qSOFA score on admission	0	-
	1	1.79 (1.71-1.87, p<0.001)
	2	3.03 (2.83-3.25, p<0.001)
	3	5.19 (4.31-6.25, p<0.001)
Chronic cardiac disease	YES	1.20 (1.14-1.25, p<0.001)
Chronic kidney disease	YES	1.27 (1.20-1.33, p<0.001)
Moderate or severe liver disease	YES	1.62 (1.42-1.85, p<0.001)
Malignant neoplasm	YES	1.49 (1.41-1.58, p<0.001)
Obesity (as defined by clinical staff)	YES	1.09 (1.02-1.16, p=0.011)
Dementia	YES	1.20 (1.14-1.27, p<0.001)

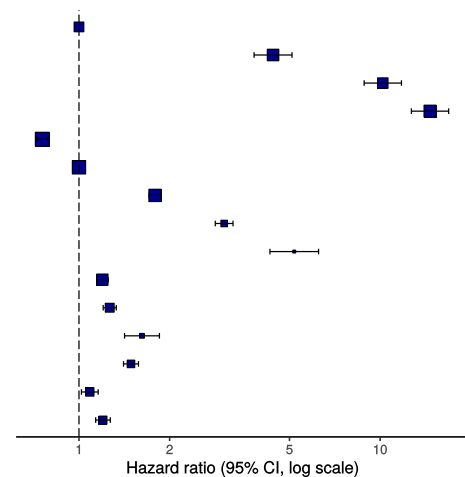
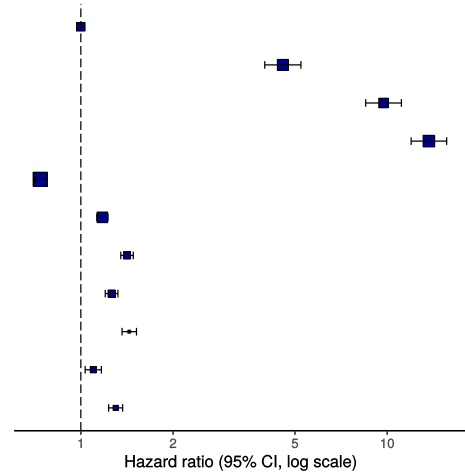


Figure 16b - Multivariable Cox proportional hazards model (age, sex, comorbidities only)

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

Age on admission (years)	<50	-
	50-69	4.56 (3.98-5.23, p<0.001)
	70-79	9.73 (8.51-11.13, p<0.001)
	80+	13.68 (11.97-15.63, p<0.001)
Sex at Birth	Female	0.74 (0.71-0.77, p<0.001)
Chronic cardiac disease	YES	1.18 (1.13-1.23, p<0.001)
Chronic pulmonary disease (not asthma)	YES	1.42 (1.35-1.48, p<0.001)
Chronic kidney disease	YES	1.26 (1.20-1.32, p<0.001)
Malignant neoplasm	YES	1.44 (1.36-1.52, p<0.001)
Obesity (as defined by clinical staff)	YES	1.10 (1.03-1.17, p=0.003)
Dementia	YES	1.30 (1.23-1.37, p<0.001)



ROC = 0.7500801

Figure 17 - Predictions calibration plot

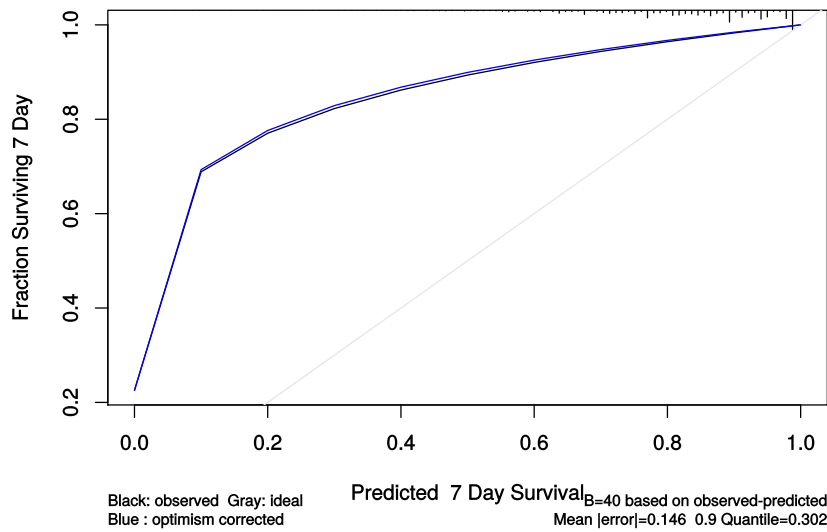


Figure 18 - Prognostic model predictions

Again, for demonstration of methods.

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

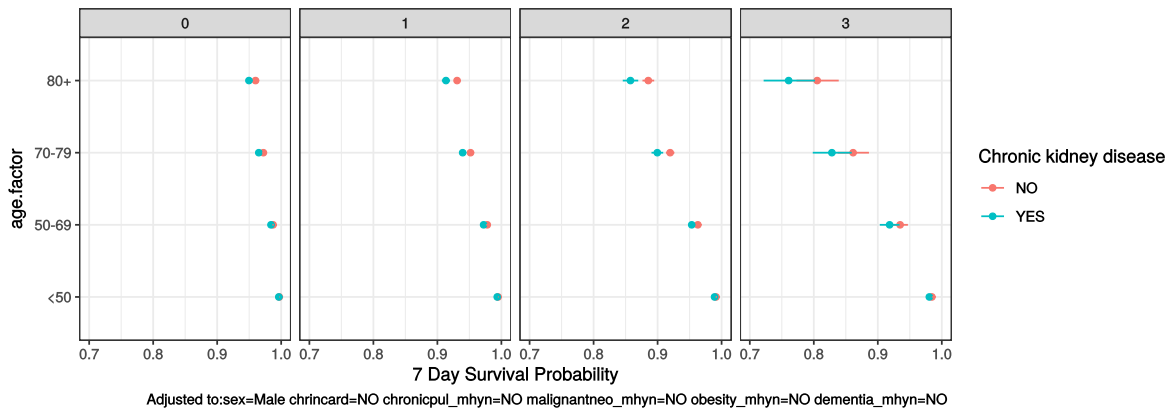


Figure 19 - Death by severity (NEWS) on admission

Number of deaths by NEWS score at admission

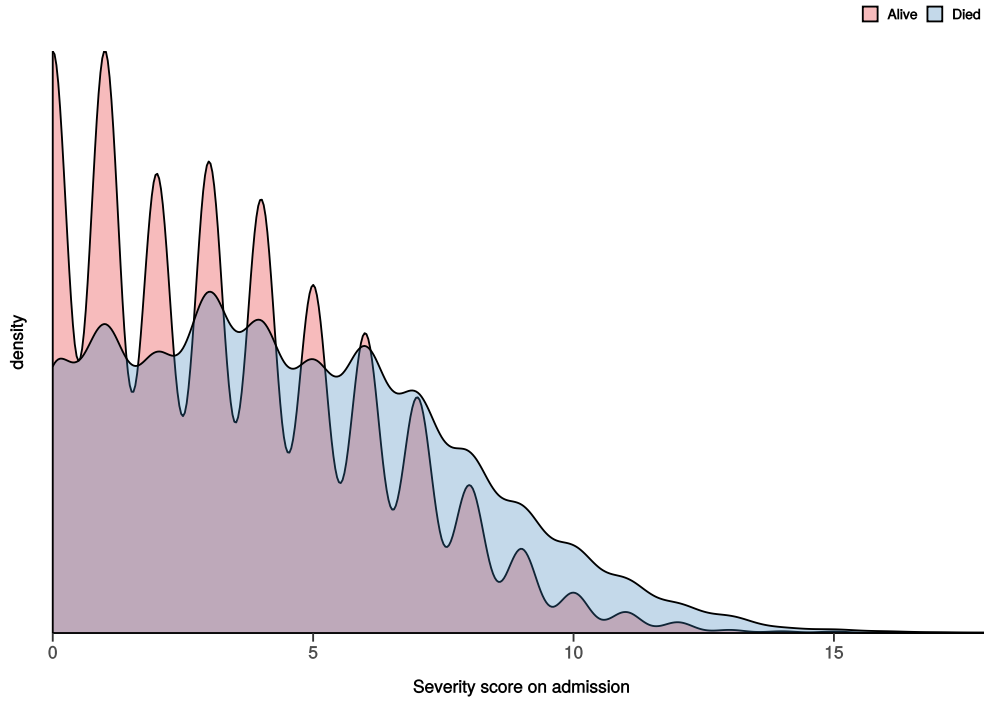


Figure 20 - Death by severity (NEWS) on admission stratified by age

Number of deaths by NEWS score at admission
Stratified by age

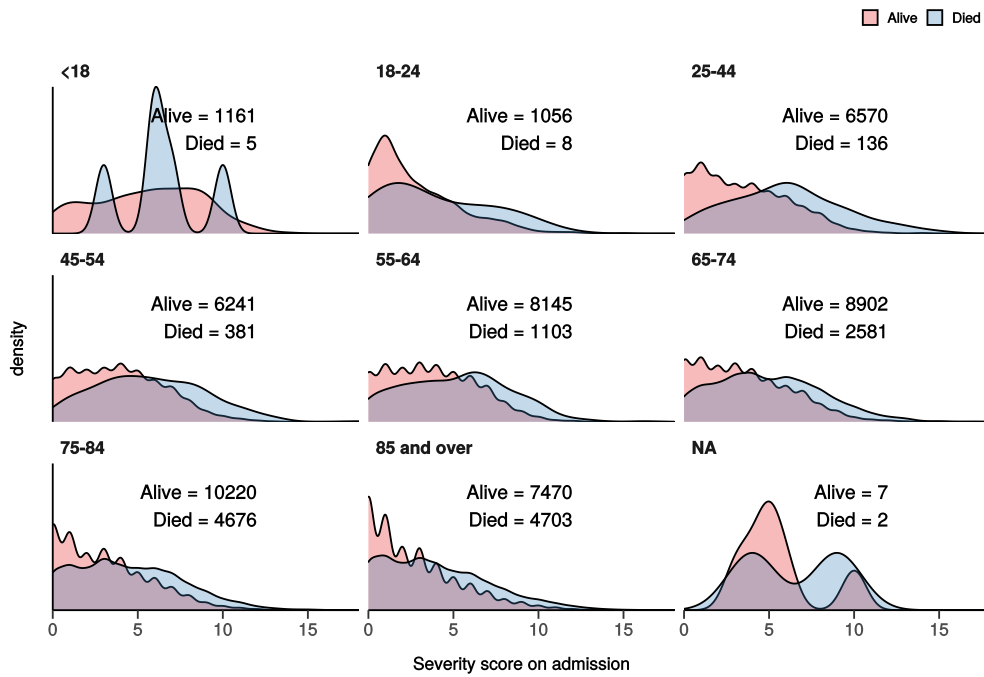
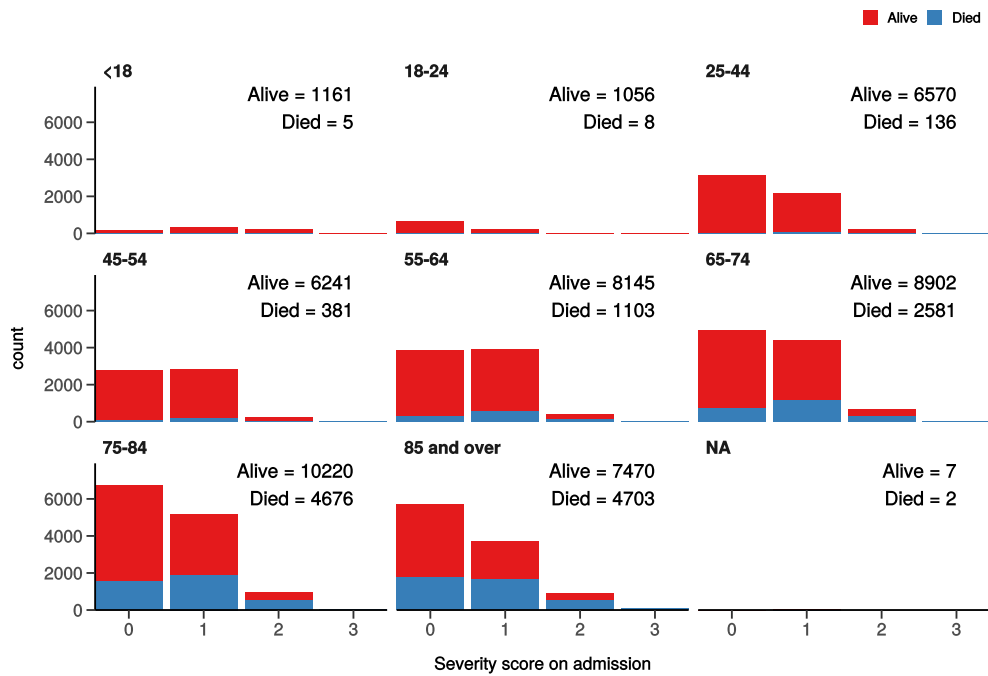


Figure 21 - Death by severity (qSOFA) on admission stratified by age

Number of deaths by qSOFA score at admission
Stratified by age



Healthcare workers

Employed as a healthcare worker?		NO	YES	p
Total N (%)		57450 (97.5)	1463 (2.5)	
NEWS score on admission	Median (IQR)	3.0 (4.0)	4.0 (4.0)	<0.001
Death	No	36839 (75.5)	1198 (94.0)	<0.001
	Yes	11985 (24.5)	77 (6.0)	