

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

Dynamic content updated: 2020-12-09 03:39:43.

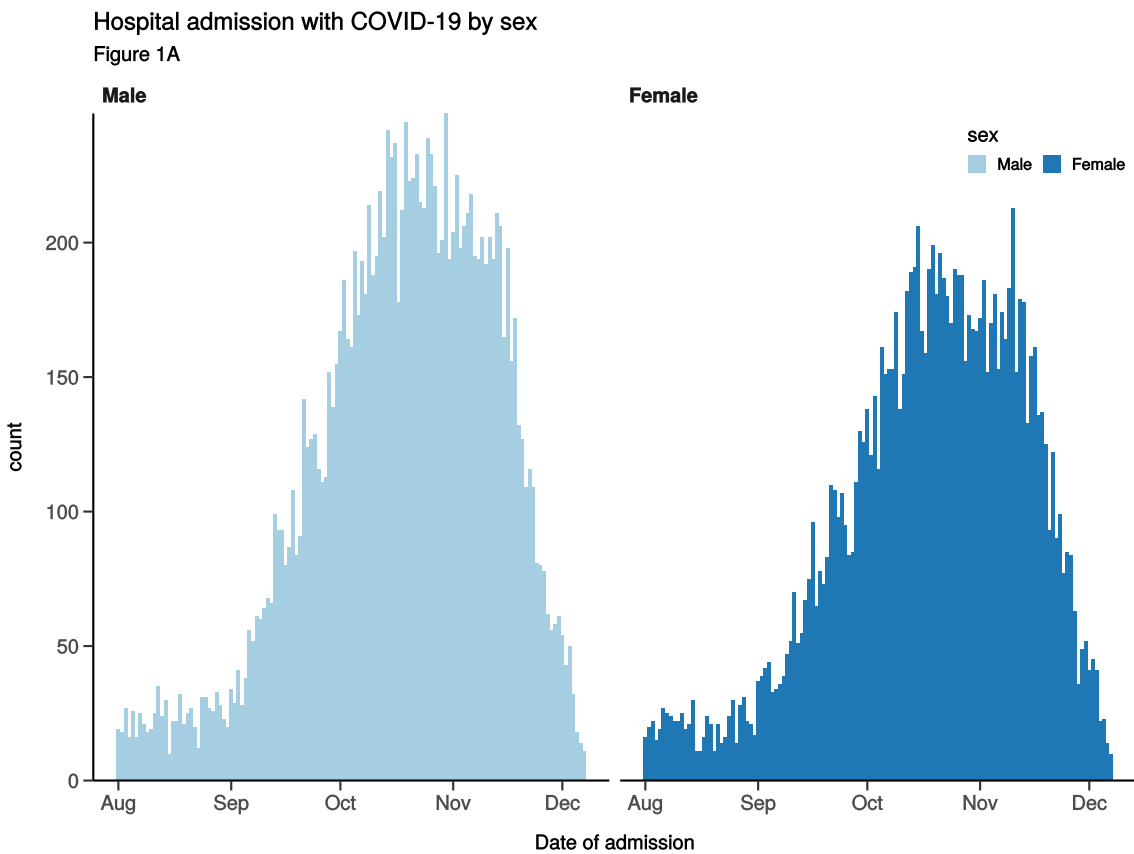
Executive summary

Includes patients admitted after 01 August 2020

There are 26970 patients included in CO-CIN. Of these, 4076 patient(s) have died and 3614 required ICU. 14499 have been discharged home.

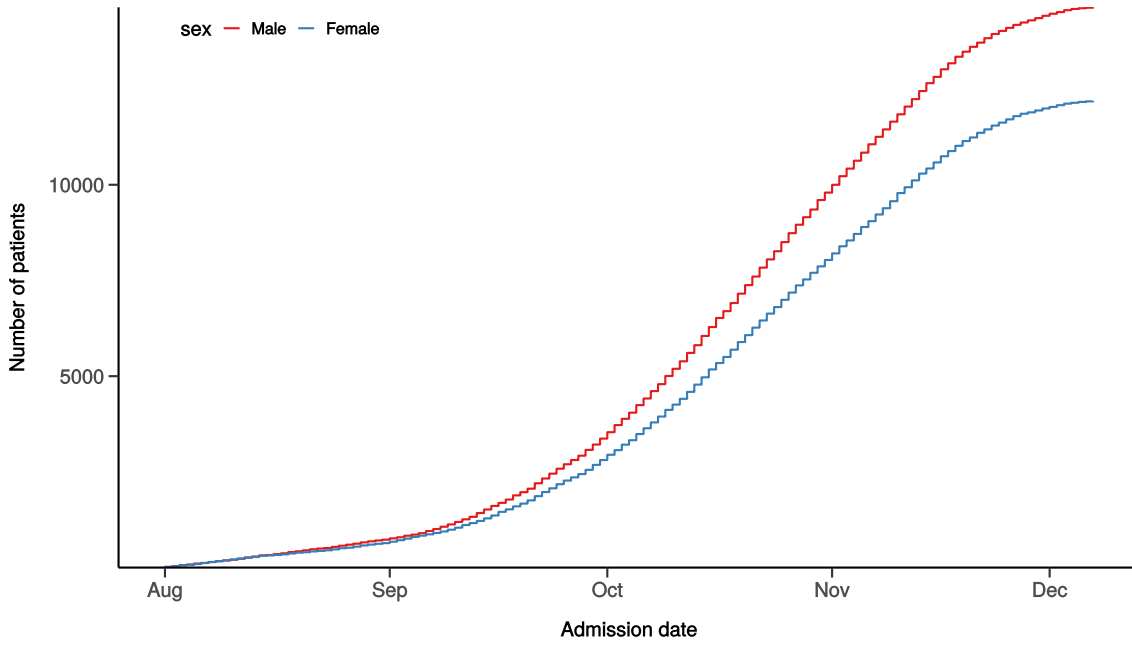
Admission

Figure 1



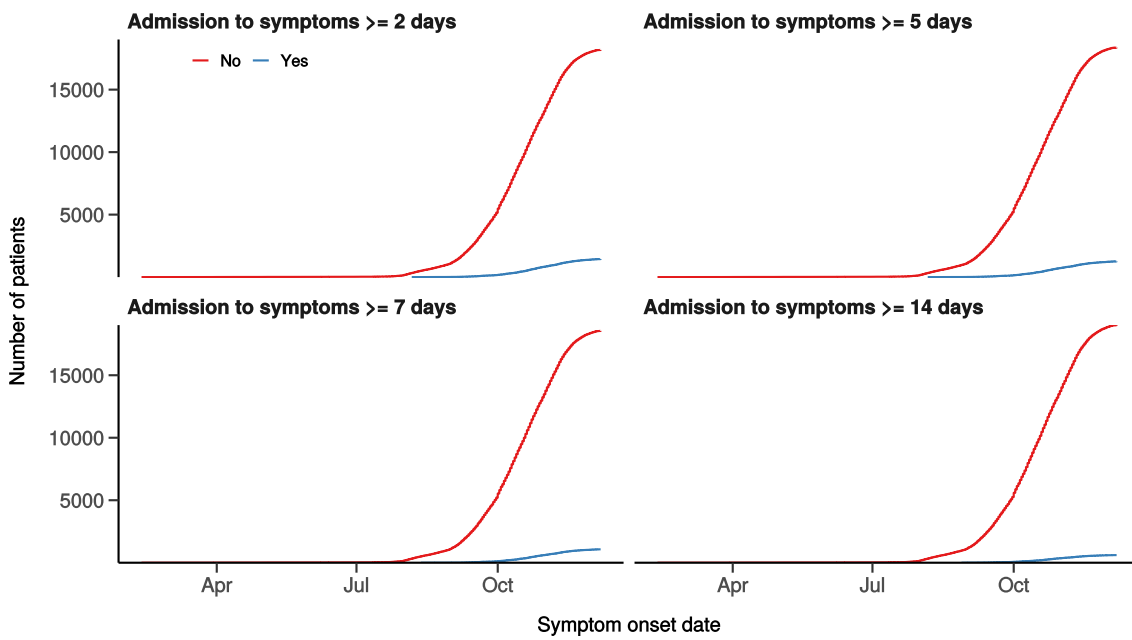
Hospital admission with COVID-19 by sex

Figure 1B



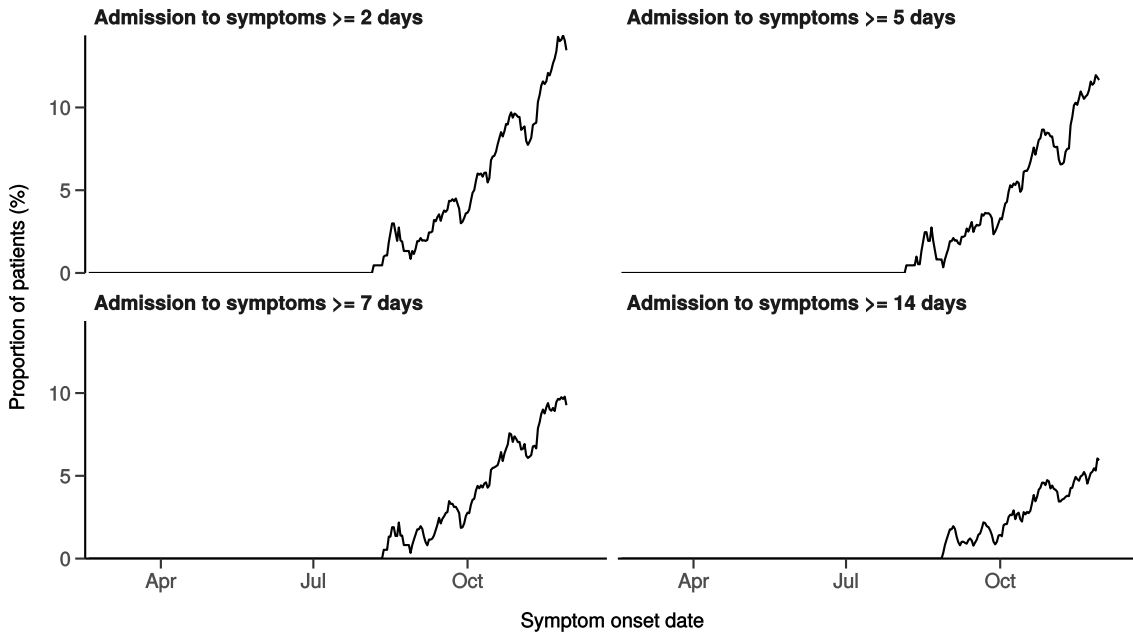
Number with symptom onset occurring after admission to hospital

Figure 1C



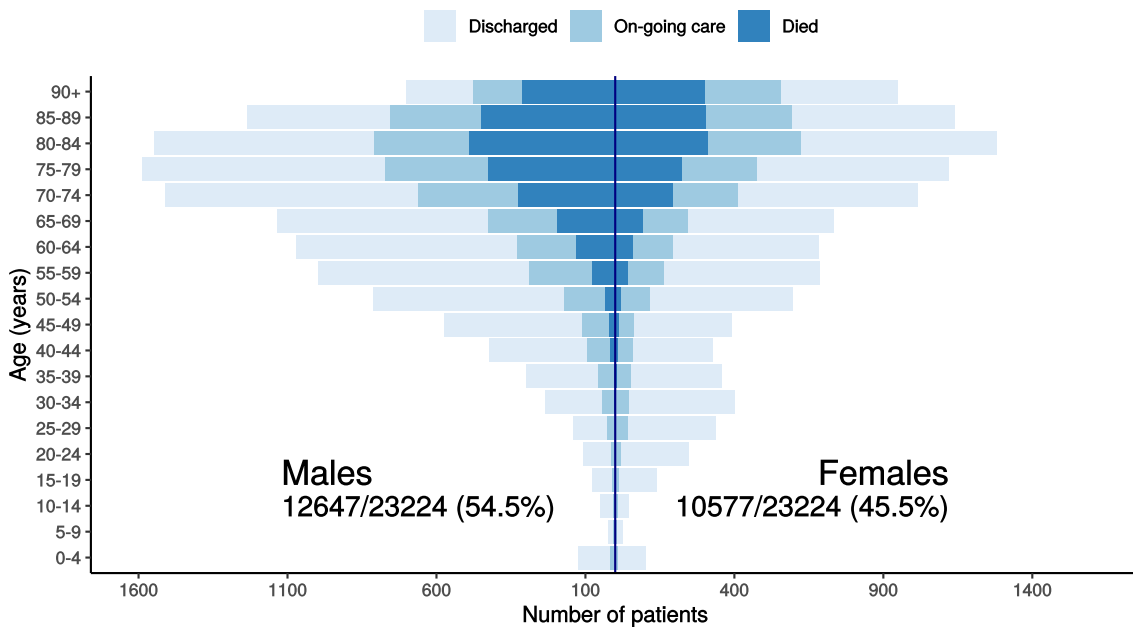
Proportion with symptom onset occurring after hospital admission

Figure 1D - 7-day rolling percentage. n = 19621



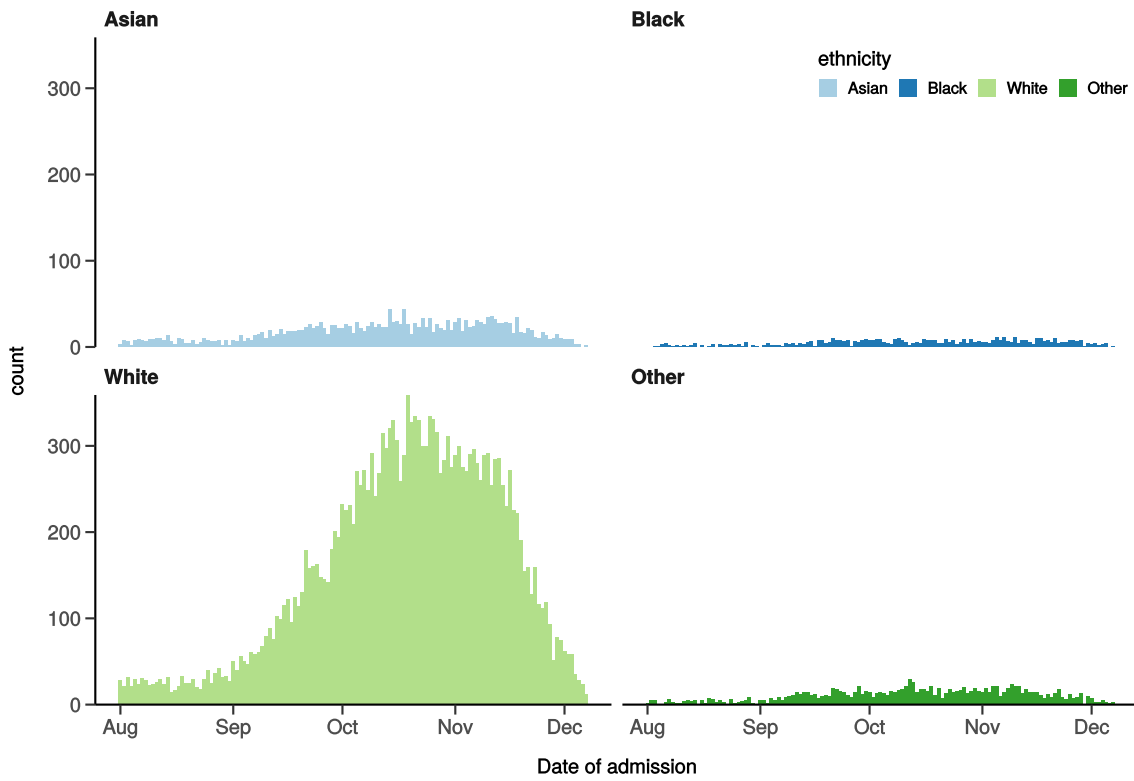
Patients with outcome stratified by age, and sex

Figure 1E



Hospital admission with COVID-19 by ethnicity

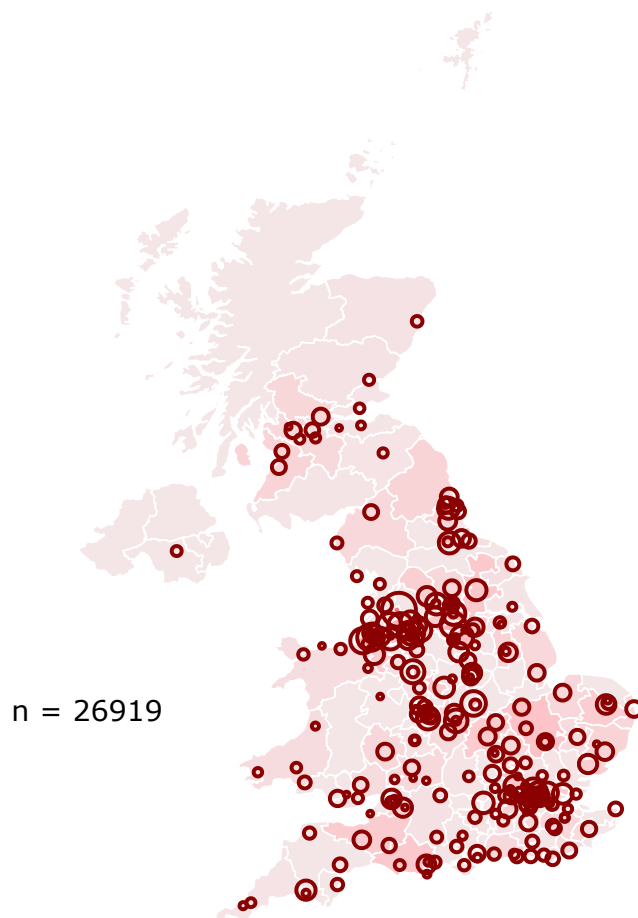
Figure 1F



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

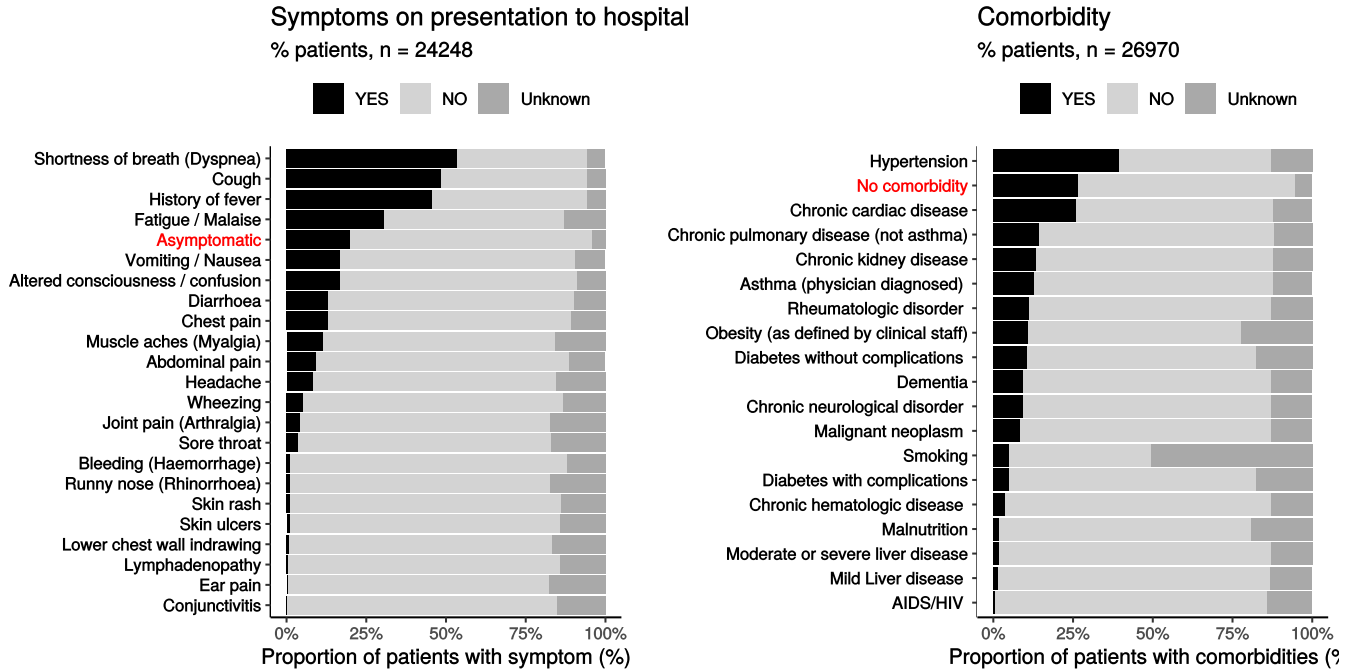


Figure 3B - Symptoms by Age

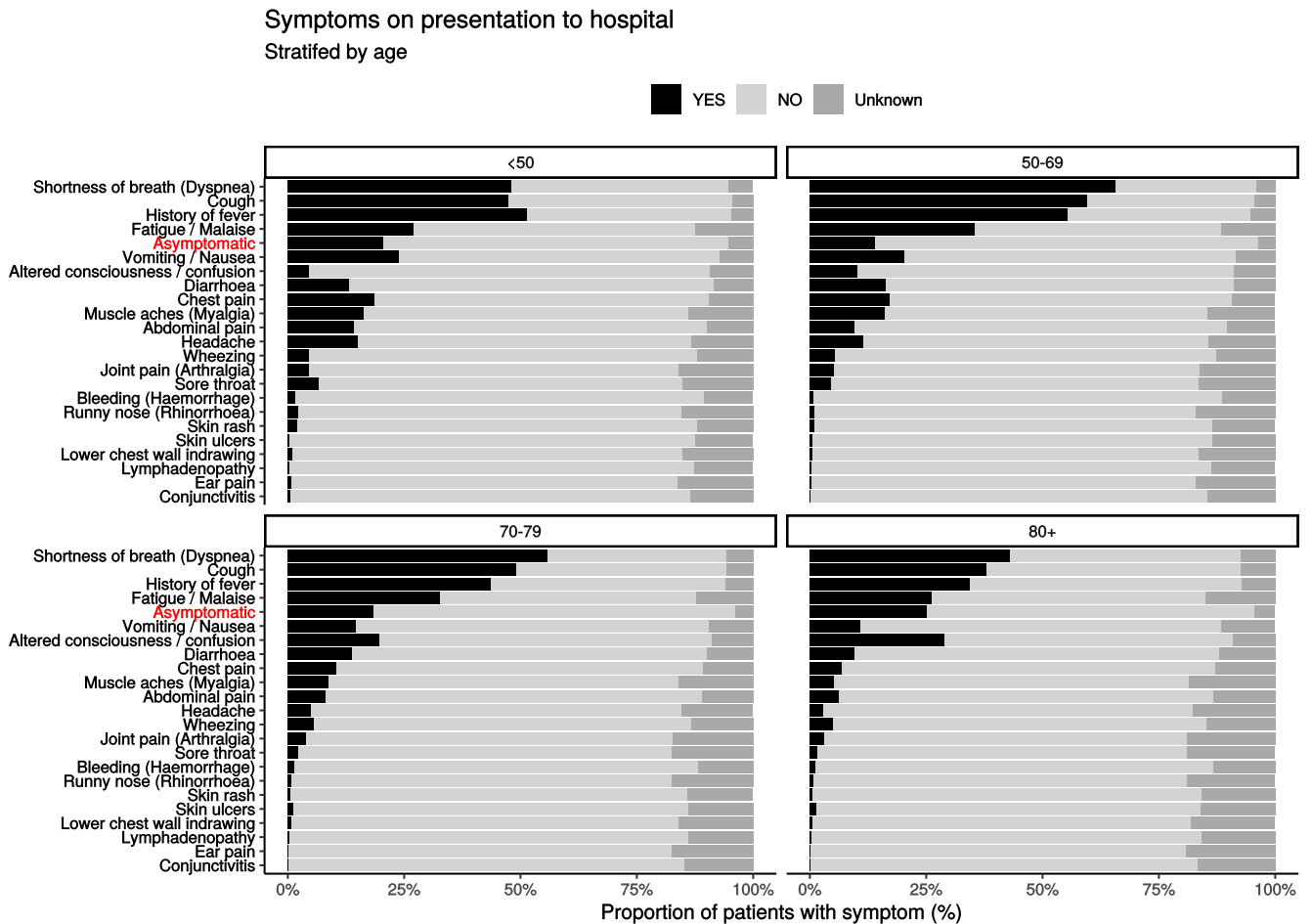
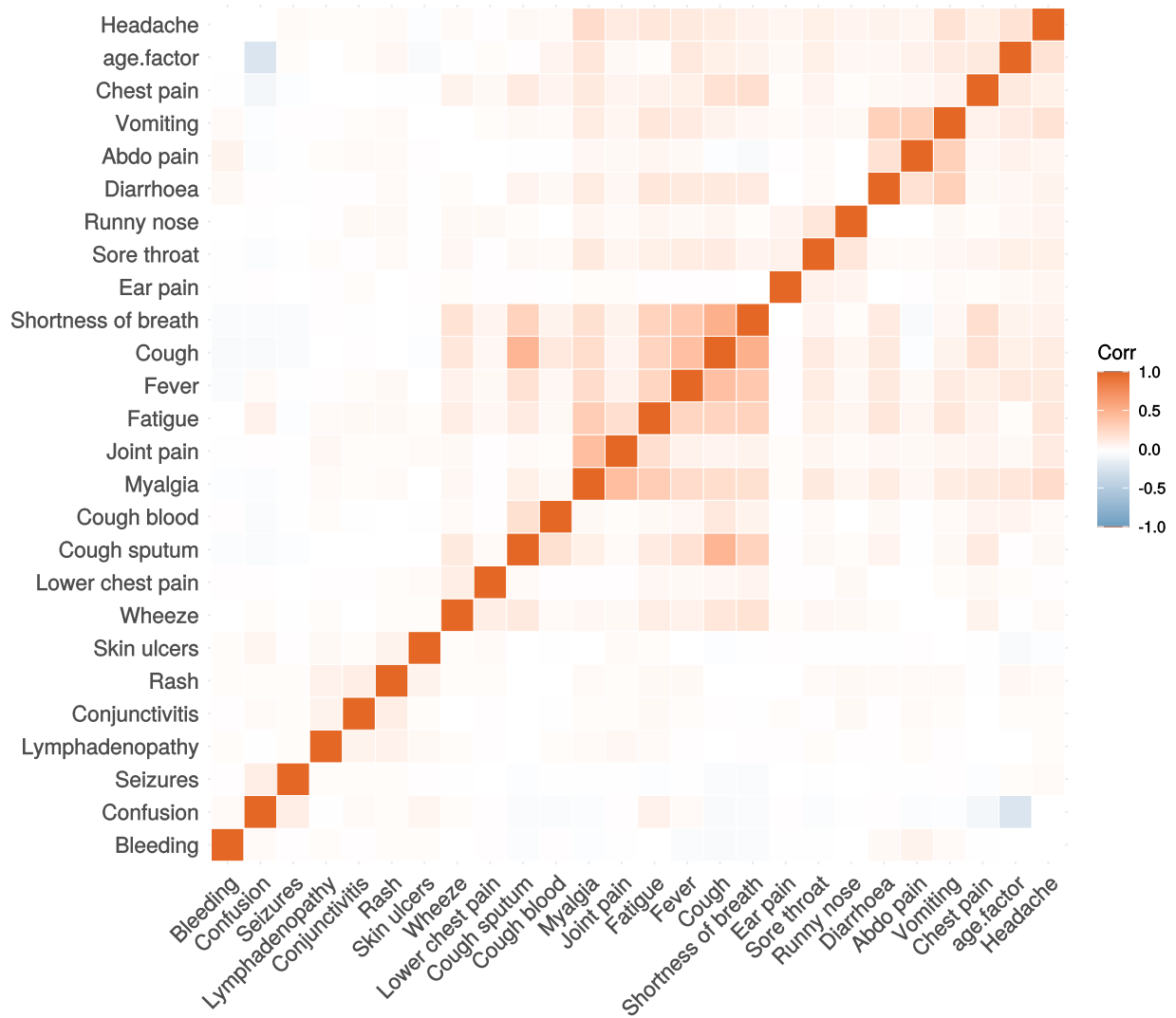


Figure 3C

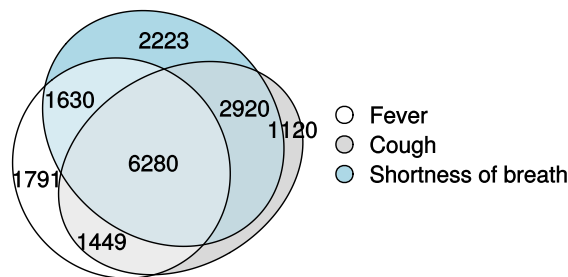
Correlation of symptoms in all pages. Note clusters, top right to bottom left, flu-like, coryzal, abdominal, respiratory, neurocutaneous.



Symptoms (diagnostic criteria)

Figure 4A

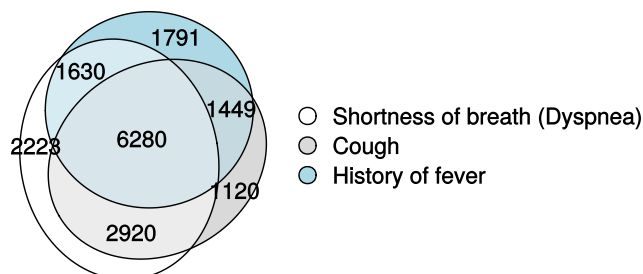
n = 24248



Symptoms (most common)

Figure 4B

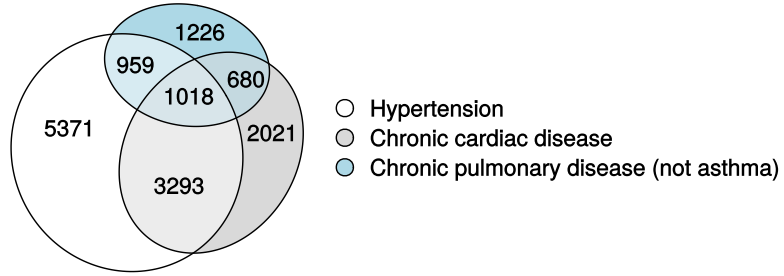
n = 24248



Comorbidity (most common)

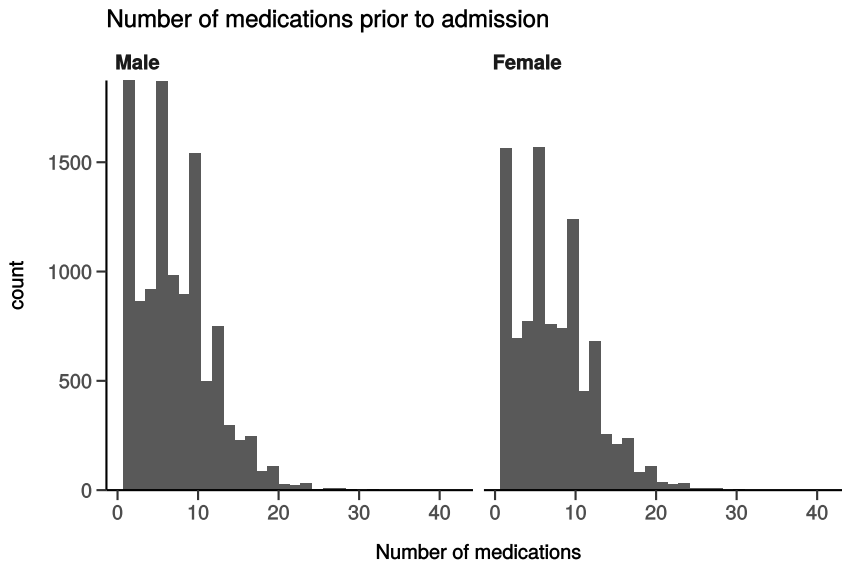
Figure 4C

n = 26970



Medication prior to illness

Figure 5



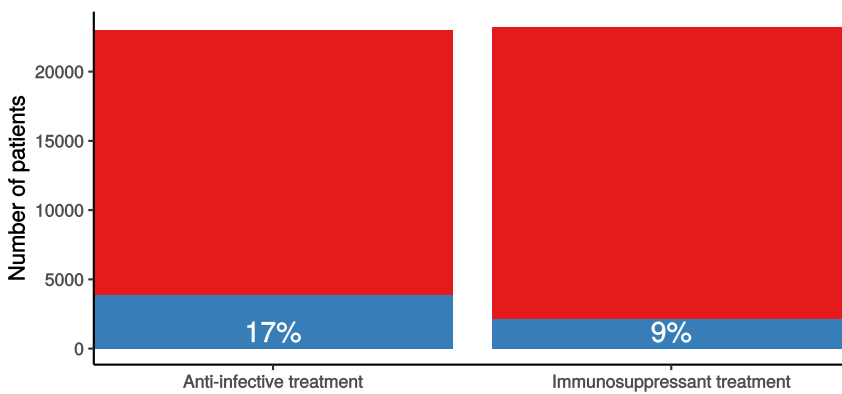
Preadmission treatment

Figure 6

Pre-admission treatment

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

■ No ■ Yes



Patient flow

Figure 7A - All patients

N = 24834

Patient status by day

Cumulative for discharge/death

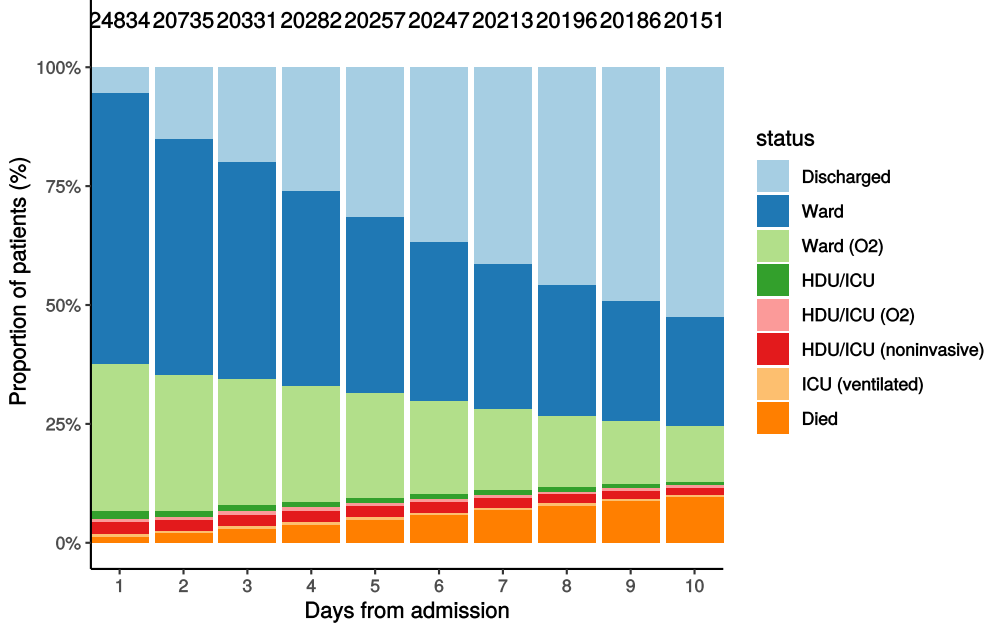
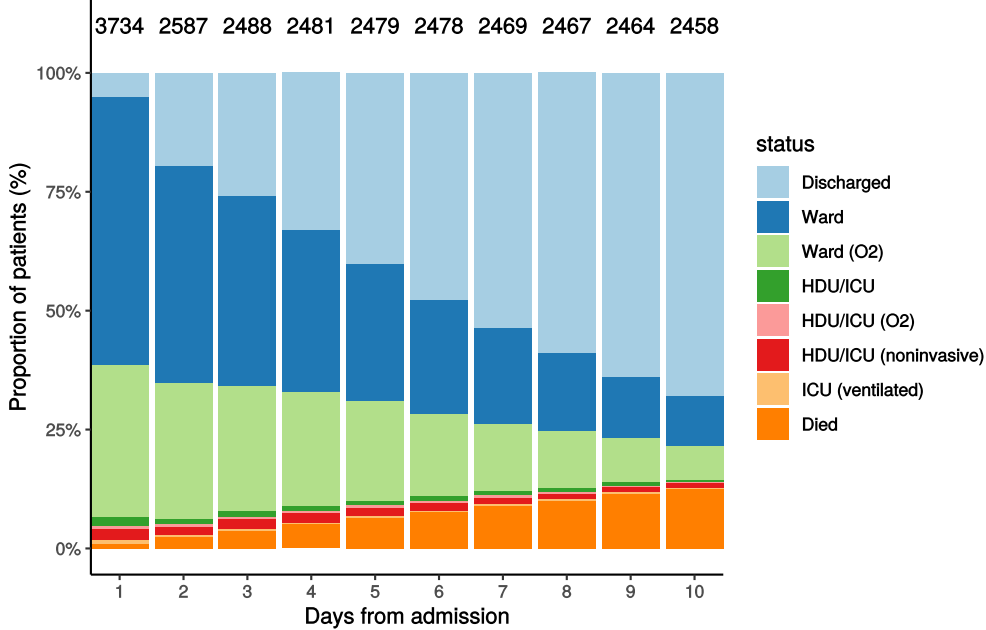


Figure 7B - Patients admitted ≥ 14 days and ≤ 28 days ago

N = 3734

Patient status by day

Cumulative for discharge/death



Oxygen requirement

Figure 8A - All patients

N = 23632

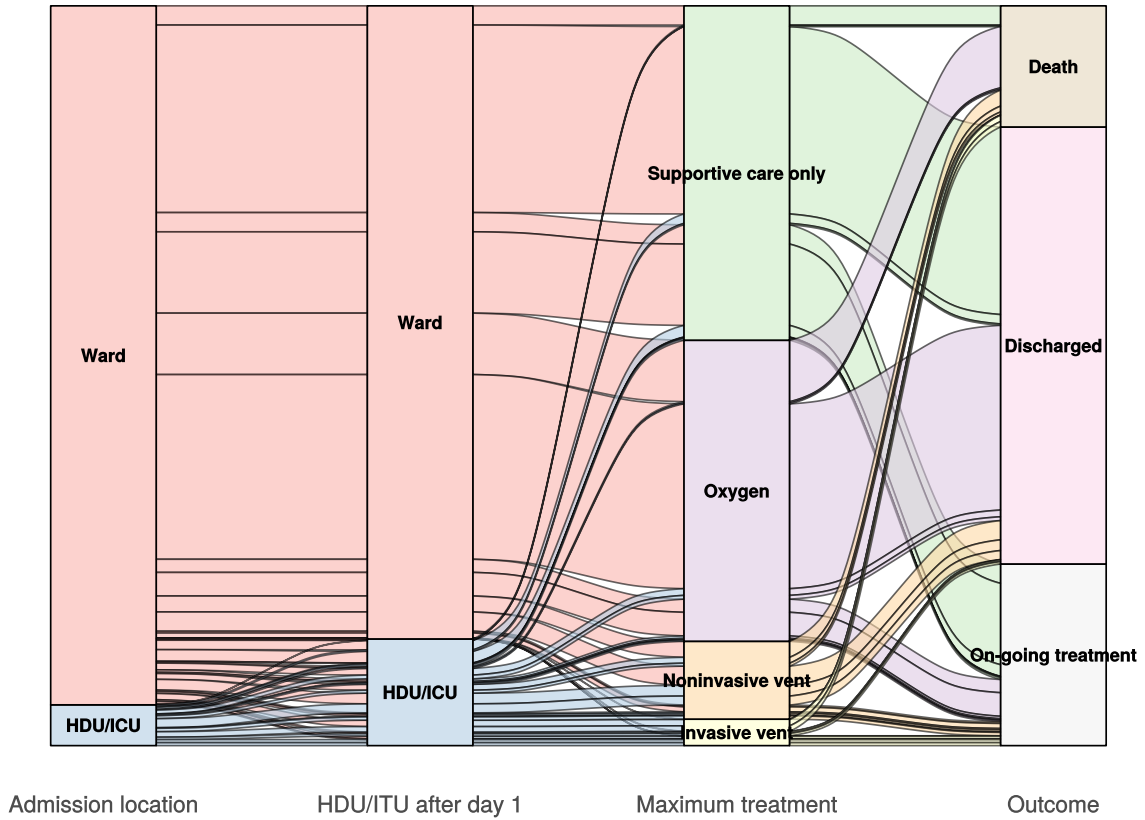


Figure 8B - Patients admitted ≥ 14 days and ≤ 28 days ago

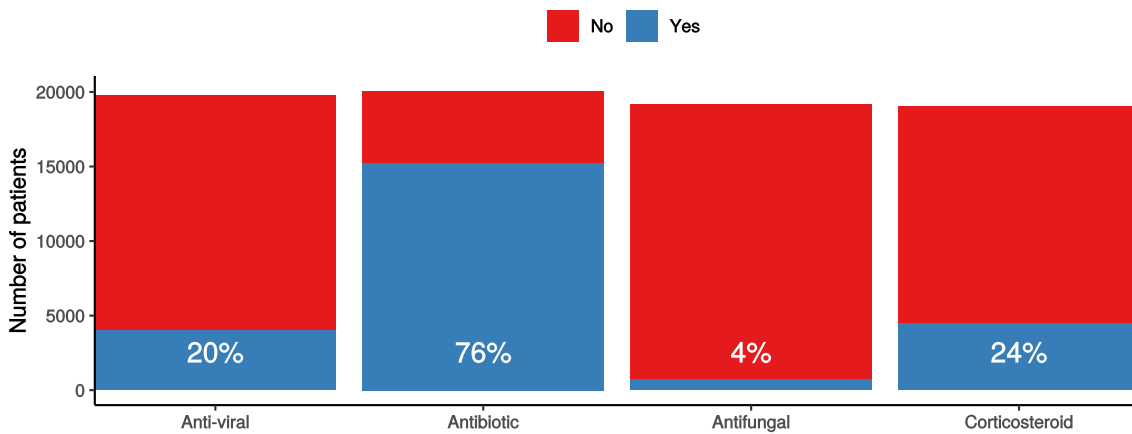
N = 3569

In-hospital medical treatment

Figure 9

In-hospital treatment

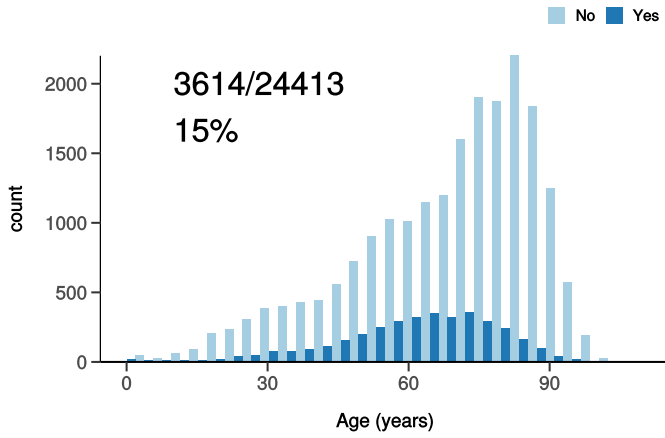
Anti-virals, antibiotics, corticosteroids, and anti-fungals for patients who have completed journey.



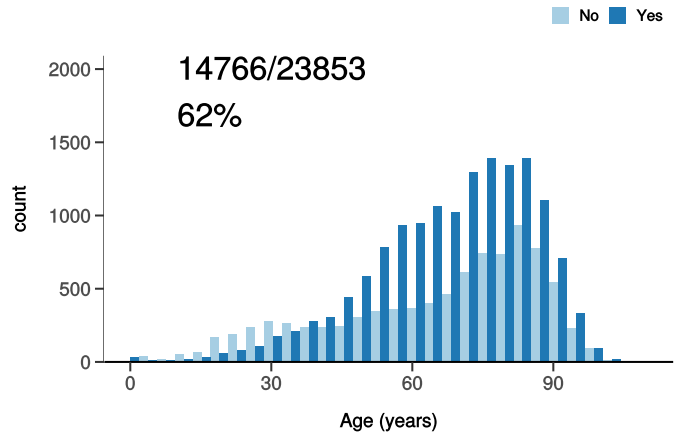
Treatment

Figure 10

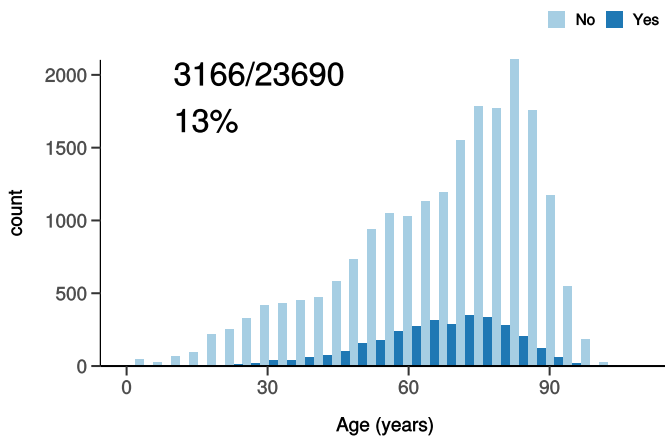
ICU/HDU admission
Figure 10A



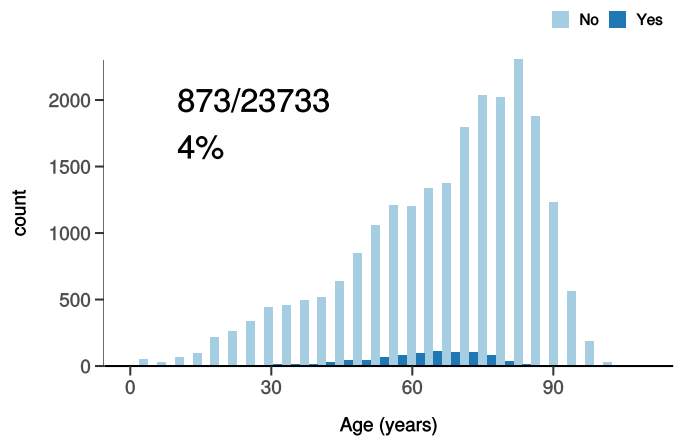
High flow oxygen
Figure 10B



Noninvasive ventilation
Figure 10C



Invasive ventilation
Figure 10D

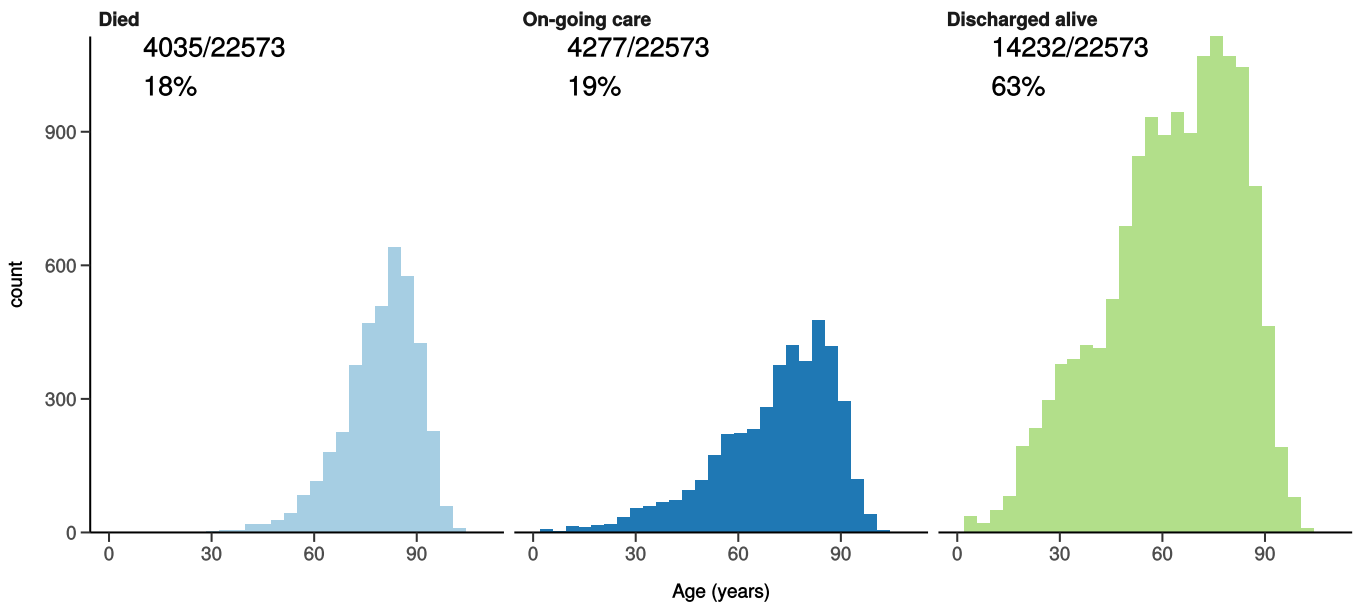


Status in patients admitted ≥ 14 days from today

Figure 11

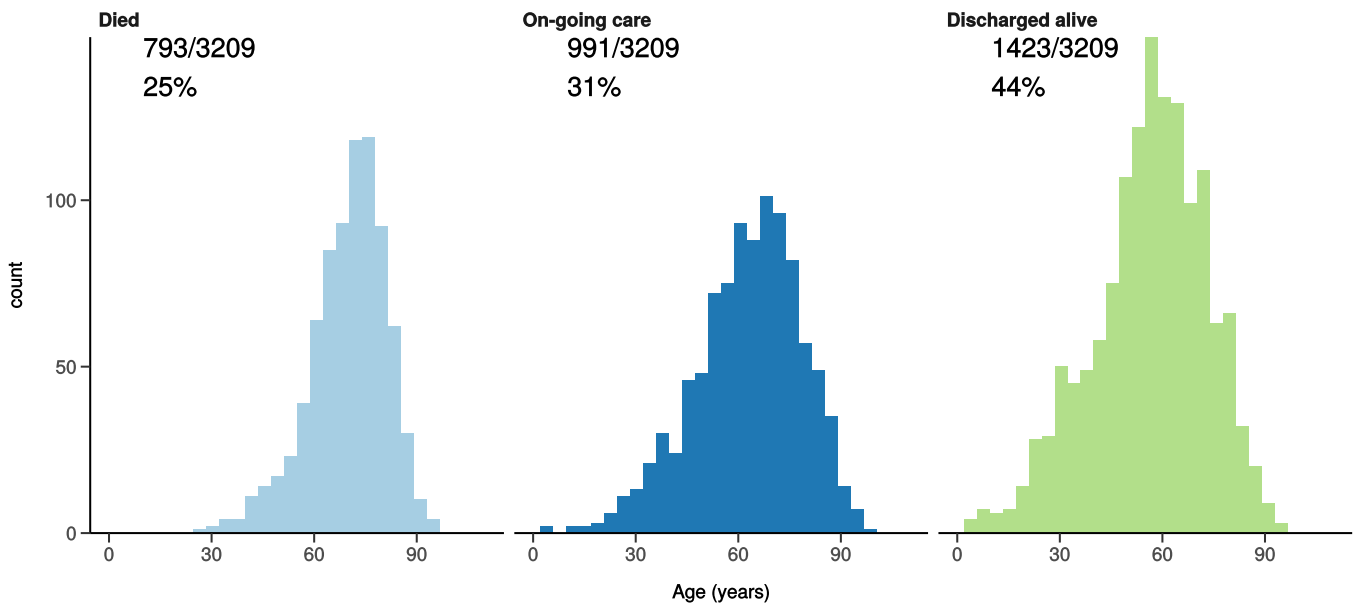
All: status in patients admitted ≥ 14 days ago

Figure 11A



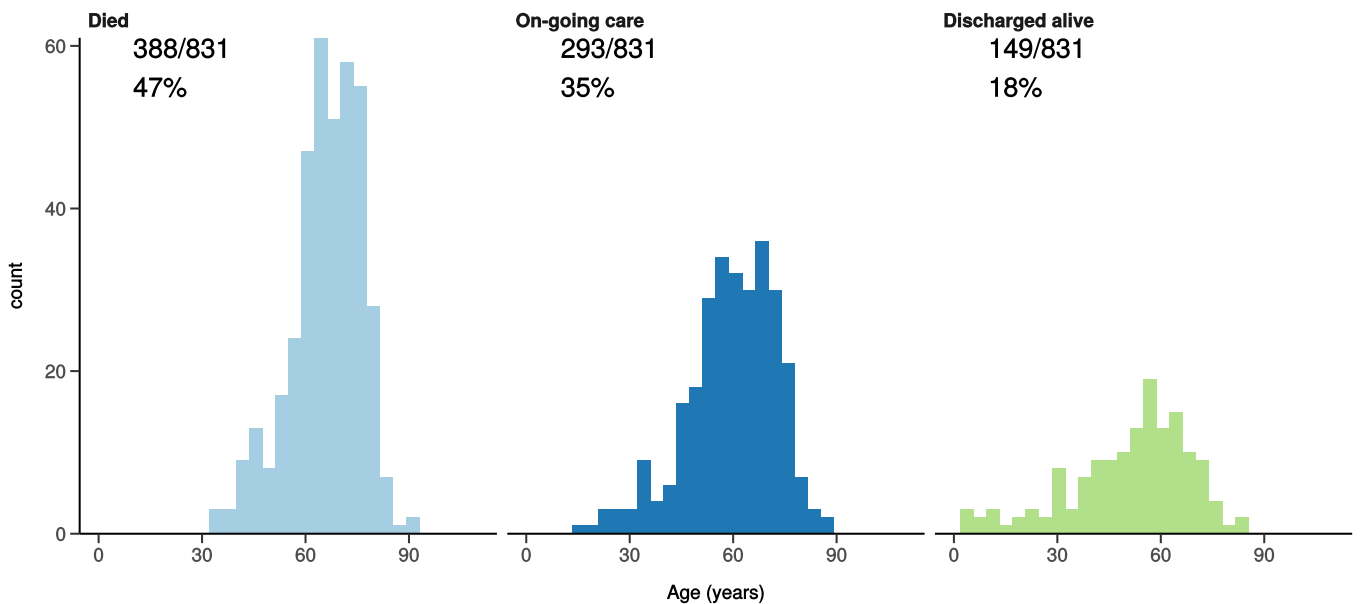
ICU/HDU admissions: status in patients admitted ≥ 14 days ago

Figure 11B



Invasive ventilation: status in patients admitted ≥ 14 days ago

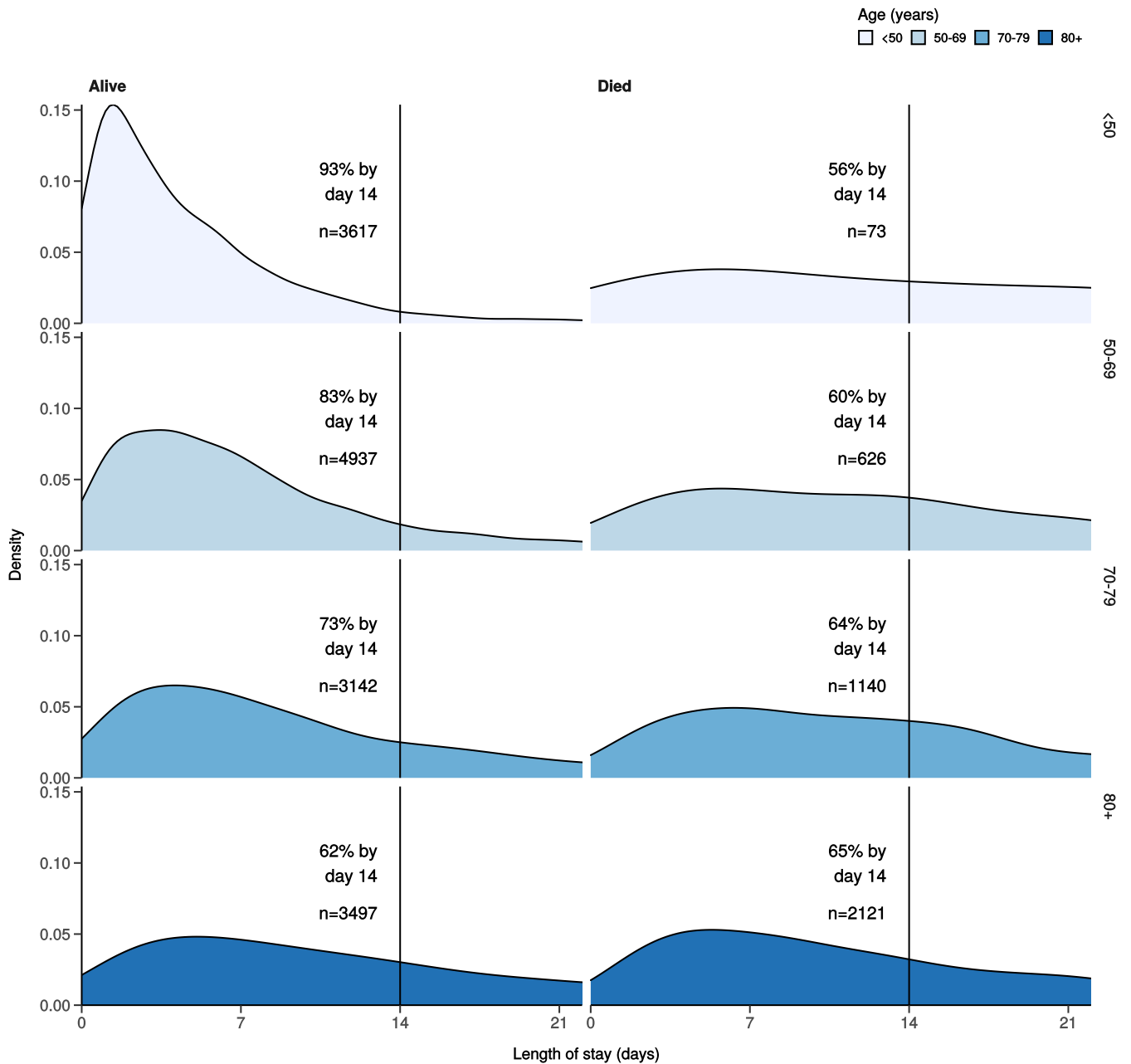
Figure 11c



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	3858 (98.0)	78 (2.0)	•	•
	50-69	5141 (88.9)	641 (11.1)	6.17 (4.89-7.89, p<0.001)	5.05 (3.91-6.63, p<0.001)
	70-79	3298 (74.0)	1157 (26.0)	17.35 (13.83-22.09, p<0.001)	12.32 (9.55-16.14, p<0.001)
	80+	3689 (63.2)	2148 (36.8)	28.80 (23.04-36.55, p<0.001)	19.48 (15.12-25.51, p<0.001)
Sex at Birth	Male	8419 (77.4)	2458 (22.6)	•	•

Dependent: death		No	Yes	OR (univariable)	OR (multivariable)
	Female	7571 (82.9)	1567 (17.1)	0.71 (0.66-0.76, p<0.001)	0.66 (0.60-0.72, p<0.001)
	Not specified	0 (NaN)	0 (NaN)	•	•
Chronic cardiac disease	NO	11357 (85.1)	1984 (14.9)	•	•
	YES	3769 (67.8)	1792 (32.2)	2.72 (2.53-2.93, p<0.001)	1.34 (1.22-1.47, p<0.001)
Chronic pulmonary disease (not asthma)	NO	13060 (82.4)	2783 (17.6)	•	•
	YES	2075 (67.5)	999 (32.5)	2.26 (2.07-2.46, p<0.001)	1.48 (1.33-1.64, p<0.001)
Chronic neurological disorder	NO	13655 (81.0)	3206 (19.0)	•	•
	YES	1408 (72.4)	537 (27.6)	1.62 (1.46-1.81, p<0.001)	1.11 (0.97-1.26, p=0.115)
Chronic hematologic disease	NO	14522 (80.6)	3504 (19.4)	•	•
	YES	532 (69.9)	229 (30.1)	1.78 (1.52-2.09, p<0.001)	1.25 (1.03-1.52, p=0.024)
Chronic kidney disease	NO	13248 (82.6)	2791 (17.4)	•	•
	YES	1862 (65.7)	970 (34.3)	2.47 (2.26-2.70, p<0.001)	1.33 (1.20-1.49, p<0.001)
Dementia	NO	13843 (82.1)	3014 (17.9)	•	•
	YES	1244 (64.0)	700 (36.0)	2.58 (2.34-2.86, p<0.001)	1.30 (1.15-1.48, p<0.001)
Obesity (as defined by clinical staff)	NO	11426 (79.8)	2885 (20.2)	•	•
	YES	2025 (84.2)	381 (15.8)	0.75 (0.66-0.84, p<0.001)	1.05 (0.91-1.20, p=0.510)
Malignant neoplasm	NO	13929 (81.7)	3113 (18.3)	•	•
	YES	1137 (64.3)	632 (35.7)	2.49 (2.24-2.76, p<0.001)	1.70 (1.50-1.93, p<0.001)

Number in dataframe = 25806, Number in model = 16039, Missing = 9767, AIC = 13287.6, C-statistic = 0.769, H&L = Chi-sq(8) 28.67 (p<0.001)

Figure 13 - Adjusted odds ratio plot

Death

Age on admission (years)	<50	-
	50-69	5.05 (3.91-6.63, p<0.001)
	70-79	12.32 (9.55-16.14, p<0.001)
	80+	19.48 (15.12-25.51, p<0.001)
Sex at Birth	Male	-
	Female	0.66 (0.60-0.72, p<0.001)
	Not specified	-
Chronic cardiac disease	YES	1.34 (1.22-1.47, p<0.001)
Chronic pulmonary disease (not asthma)	YES	1.48 (1.33-1.64, p<0.001)
Chronic neurological disorder	YES	1.11 (0.97-1.26, p=0.115)
Chronic hematologic disease	YES	1.25 (1.03-1.52, p=0.024)
Chronic kidney disease	YES	1.33 (1.20-1.49, p<0.001)
Dementia	YES	1.30 (1.15-1.48, p<0.001)
Obesity (as defined by clinical staff)	YES	1.05 (0.91-1.20, p=0.510)
Malignant neoplasm	YES	1.70 (1.50-1.93, p<0.001)

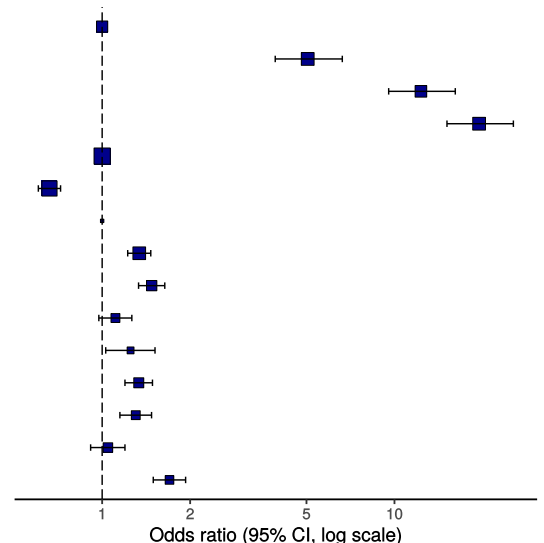
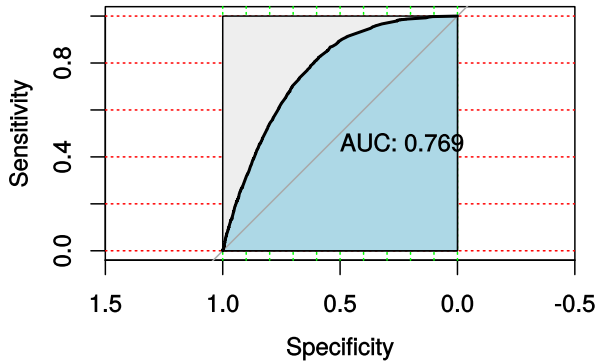


Figure 14 - ROC

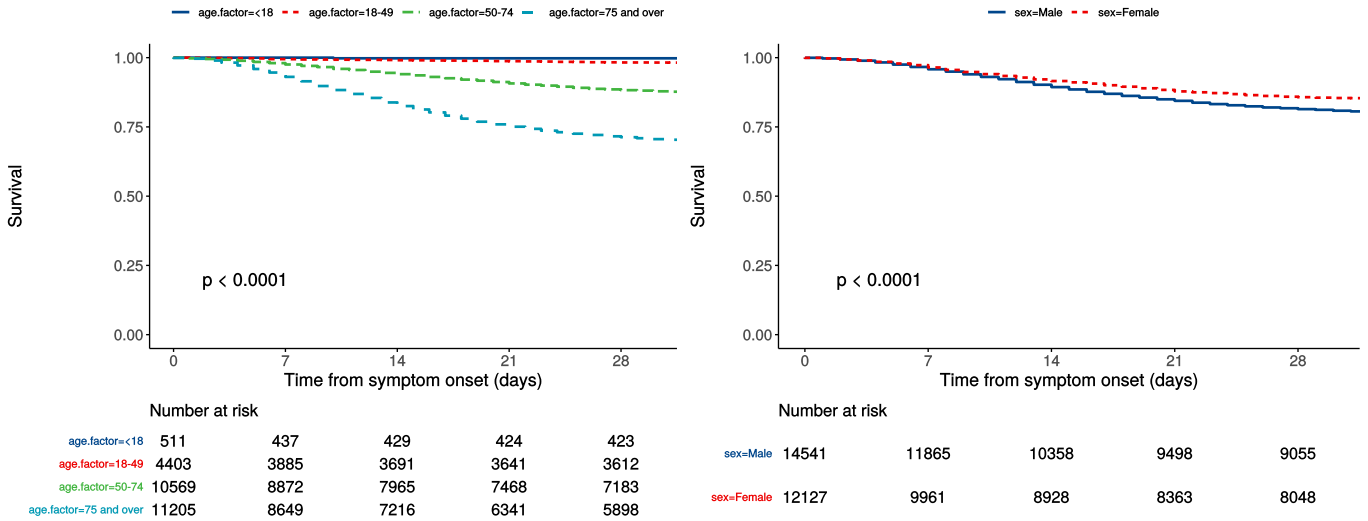


Survival models

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	4926 (18.4)	•	•
	50-69	7655 (28.7)	5.97 (4.71-7.57, p<0.001)	4.64 (3.52-6.11, p<0.001)
	70-79	6087 (22.8)	15.32 (12.15-19.33, p<0.001)	11.43 (8.72-14.99, p<0.001)
	80+	8037 (30.1)	23.67 (18.83-29.76, p<0.001)	17.15 (13.09-22.49, p<0.001)
Sex at Birth	Male	14553 (54.5)	•	•
	Female	12127 (45.5)	0.74 (0.69-0.79, p<0.001)	0.73 (0.68-0.79, p<0.001)
qSOFA score on admission	0	10959 (51.3)	•	•
	1	8959 (41.9)	1.77 (1.65-1.91, p<0.001)	1.96 (1.80-2.12, p<0.001)

Dependent: Surv(time, status)		all	HR (univariable)	HR (multivariable)
	2	1375 (6.4)	3.95 (3.56-4.38, p<0.001)	3.54 (3.14-3.98, p<0.001)
	3	74 (0.3)	8.43 (6.15-11.55, p<0.001)	8.18 (5.74-11.65, p<0.001)
Symptomatic at presentation	No symptoms	3520 (14.4)	•	•
	Symptoms	20987 (85.6)	1.53 (1.38-1.70, p<0.001)	•
Chronic cardiac disease	NO	16623 (70.4)	•	•
	YES	6976 (29.6)	2.43 (2.28-2.59, p<0.001)	1.32 (1.22-1.43, p<0.001)
Chronic kidney disease	NO	19991 (84.8)	•	•
	YES	3576 (15.2)	2.22 (2.06-2.39, p<0.001)	1.31 (1.20-1.44, p<0.001)
Moderate or severe liver disease	NO	22948 (98.2)	•	•
	YES	429 (1.8)	1.59 (1.30-1.93, p<0.001)	1.33 (1.03-1.72, p=0.028)
Chronic neurological disorder	NO	20979 (89.5)	•	•
	YES	2474 (10.5)	1.51 (1.38-1.66, p<0.001)	•
Malignant neoplasm	NO	21215 (90.5)	•	•
	YES	2233 (9.5)	2.20 (2.02-2.40, p<0.001)	1.64 (1.48-1.81, p<0.001)
Chronic hematologic disease	NO	22471 (96.0)	•	•
	YES	929 (4.0)	1.64 (1.43-1.87, p<0.001)	•
Obesity (as defined by clinical staff)	NO	17981 (86.1)	•	•
	YES	2897 (13.9)	0.78 (0.70-0.86, p<0.001)	1.06 (0.94-1.19, p=0.380)
Diabetes without complications	NO	19347 (87.4)	•	•
	YES	2784 (12.6)	1.20 (1.10-1.32, p<0.001)	•
Rheumatologic disorder	NO	20412 (87.2)	•	•
	YES	2992 (12.8)	1.28 (1.17-1.39, p<0.001)	•
Dementia	NO	20937 (89.3)	•	•
	YES	2512 (10.7)	2.27 (2.09-2.47, p<0.001)	1.12 (1.01-1.24, p=0.038)
Malnutrition	NO	21249 (97.9)	•	•
	YES	463 (2.1)	1.65 (1.37-1.99, p<0.001)	•
smoking_mhyn_2levels	NO	11925 (48.9)	•	•
	YES	1326 (5.4)	0.97 (0.84-1.13, p=0.723)	•
	N/K	11133 (45.7)	1.28 (1.20-1.36, p<0.001)	•

Number in dataframe = 26823, Number in model = 17508, Missing = 9315, Number of events = 2798, Concordance = 0.771 (SE = 0.004), R-squared = 0.142(Max possible = 0.953), Likelihood ratio test = 2686.476 (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	4.64 (3.52-6.11, p<0.001)
	70-79	11.43 (8.72-14.99, p<0.001)
	80+	17.15 (13.09-22.49, p<0.001)
Sex at Birth	Female	0.73 (0.68-0.79, p<0.001)
qSOFA score on admission	0	-
	1	1.96 (1.80-2.12, p<0.001)
	2	3.54 (3.14-3.98, p<0.001)
	3	8.18 (5.74-11.65, p<0.001)
Chronic cardiac disease	YES	1.32 (1.22-1.43, p<0.001)
Chronic kidney disease	YES	1.31 (1.20-1.44, p<0.001)
Moderate or severe liver disease	YES	1.33 (1.03-1.72, p=0.028)
Malignant neoplasm	YES	1.64 (1.48-1.81, p<0.001)
Obesity (as defined by clinical staff)	YES	1.06 (0.94-1.19, p=0.380)
Dementia	YES	1.12 (1.01-1.24, p=0.038)

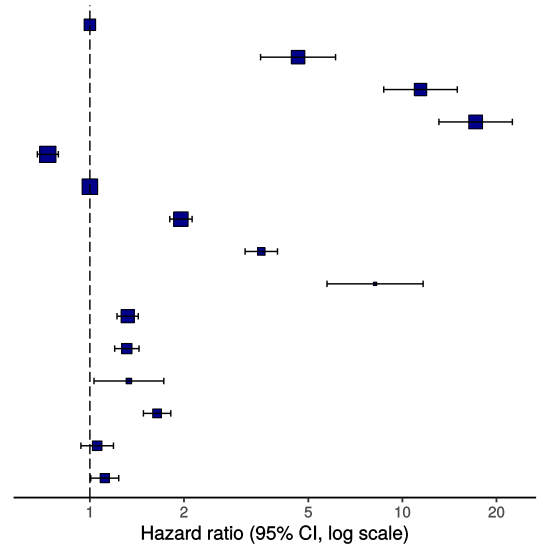
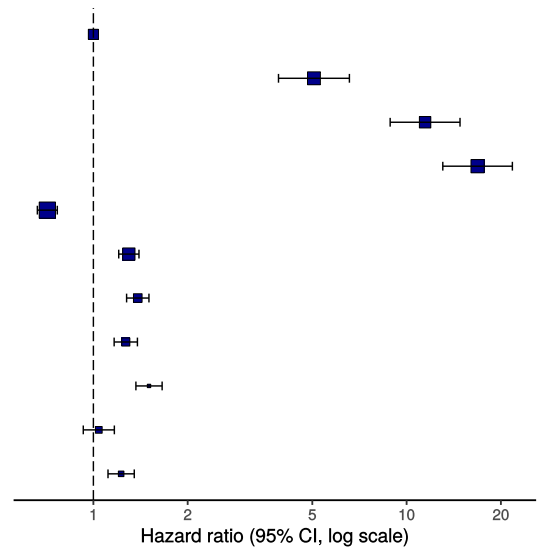


Figure 16b - Multivariable Cox proportional hazards model (age, sex, comorbidities only)

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

Age on admission (years)	<50	-
	50-69	5.06 (3.90-6.57, p<0.001)
	70-79	11.46 (8.86-14.81, p<0.001)
	80+	16.85 (13.05-21.76, p<0.001)
Sex at Birth	Female	0.71 (0.66-0.77, p<0.001)
Chronic cardiac disease	YES	1.30 (1.20-1.40, p<0.001)
Chronic pulmonary disease (not asthma)	YES	1.39 (1.28-1.50, p<0.001)
Chronic kidney disease	YES	1.27 (1.16-1.38, p<0.001)
Malignant neoplasm	YES	1.51 (1.37-1.66, p<0.001)
Obesity (as defined by clinical staff)	YES	1.04 (0.93-1.17, p=0.494)
Dementia	YES	1.23 (1.11-1.35, p<0.001)



ROC = 0.7718355

Figure 17 - Predictions calibration plot

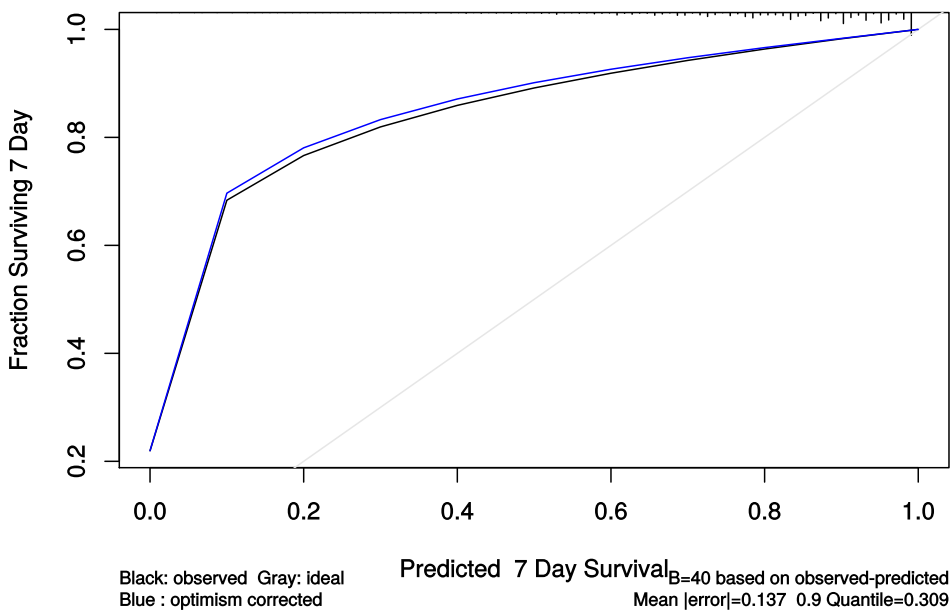


Figure 18 - Prognostic model predictions

Again, for demonstration of methods.

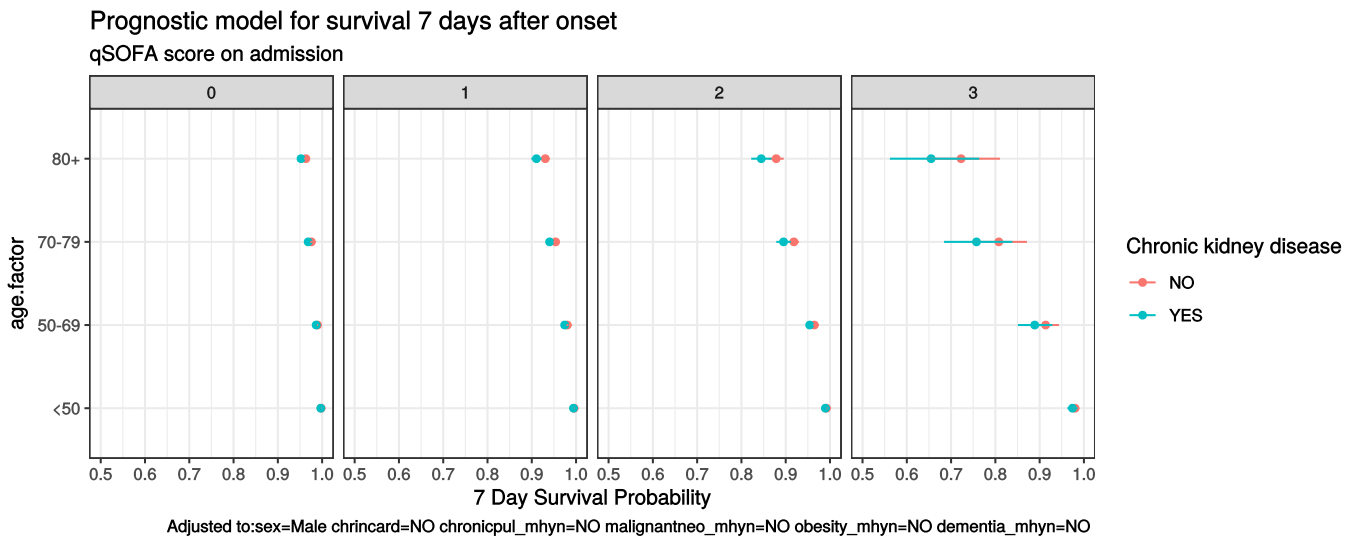


Figure 19 - Death by severity (NEWS) on admission

Number of deaths by NEWS score at admission

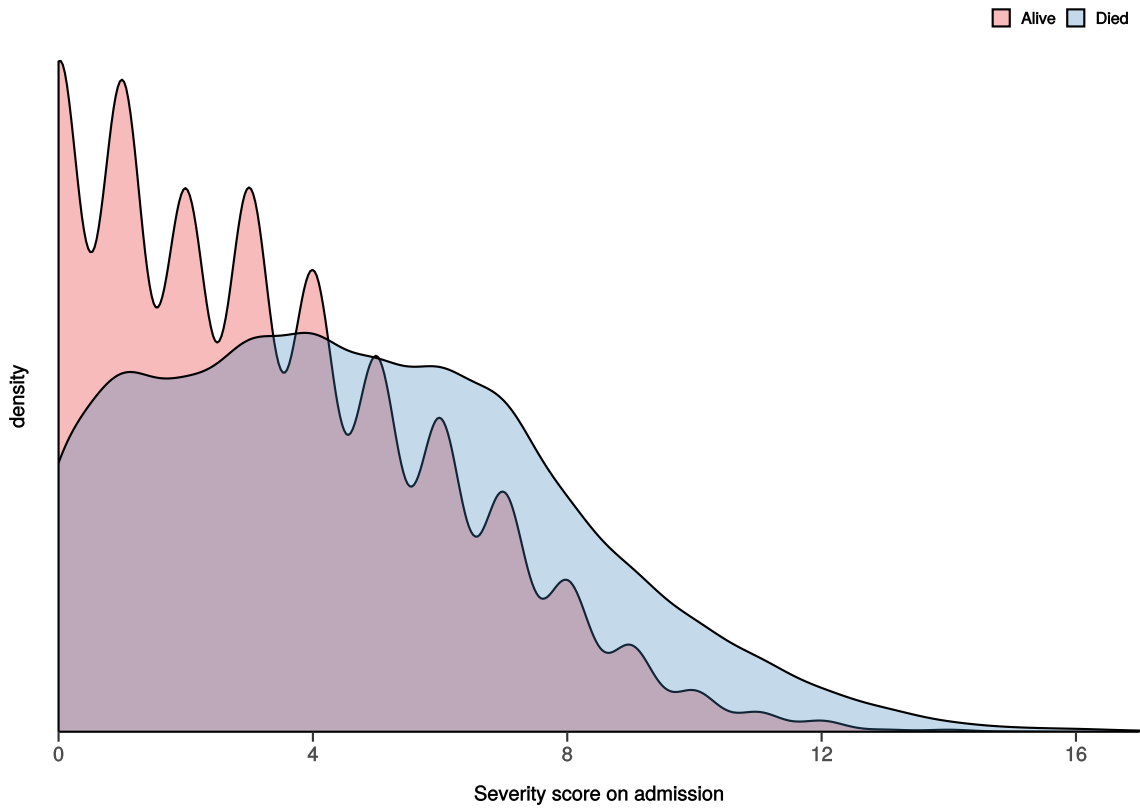


Figure 20 - Death by severity (NEWS) on admission stratified by age

Number of deaths by NEWS score at admission
Stratified by age

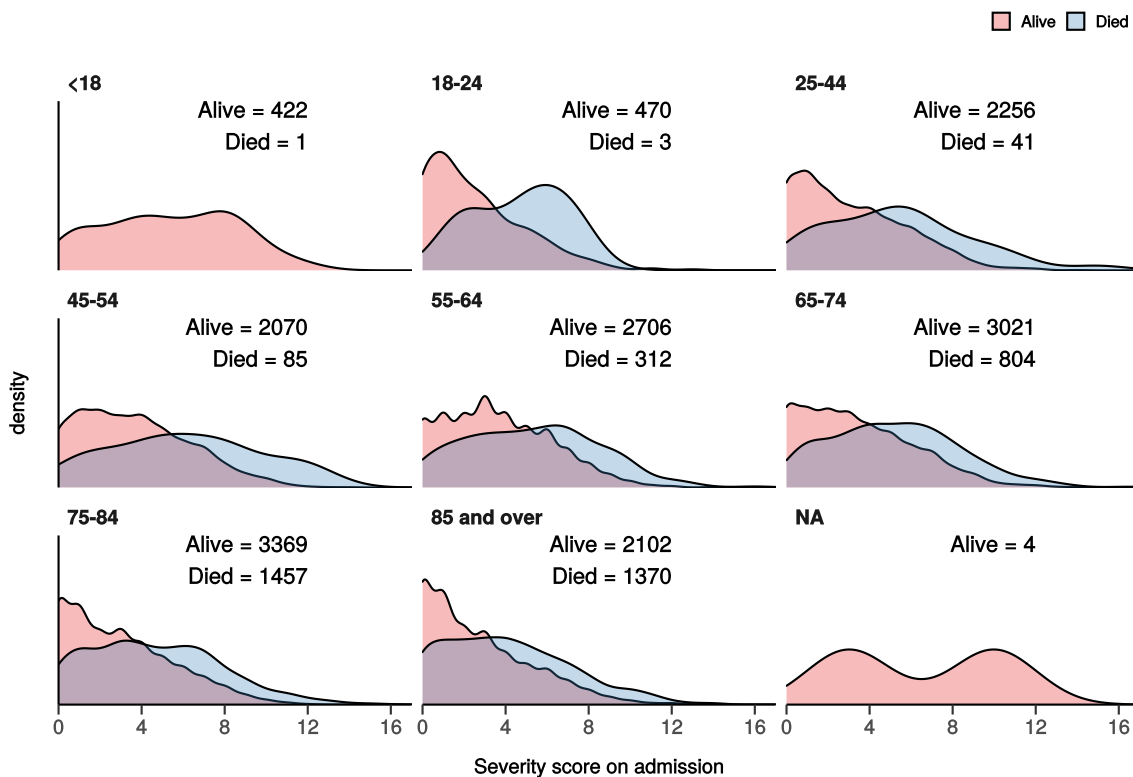
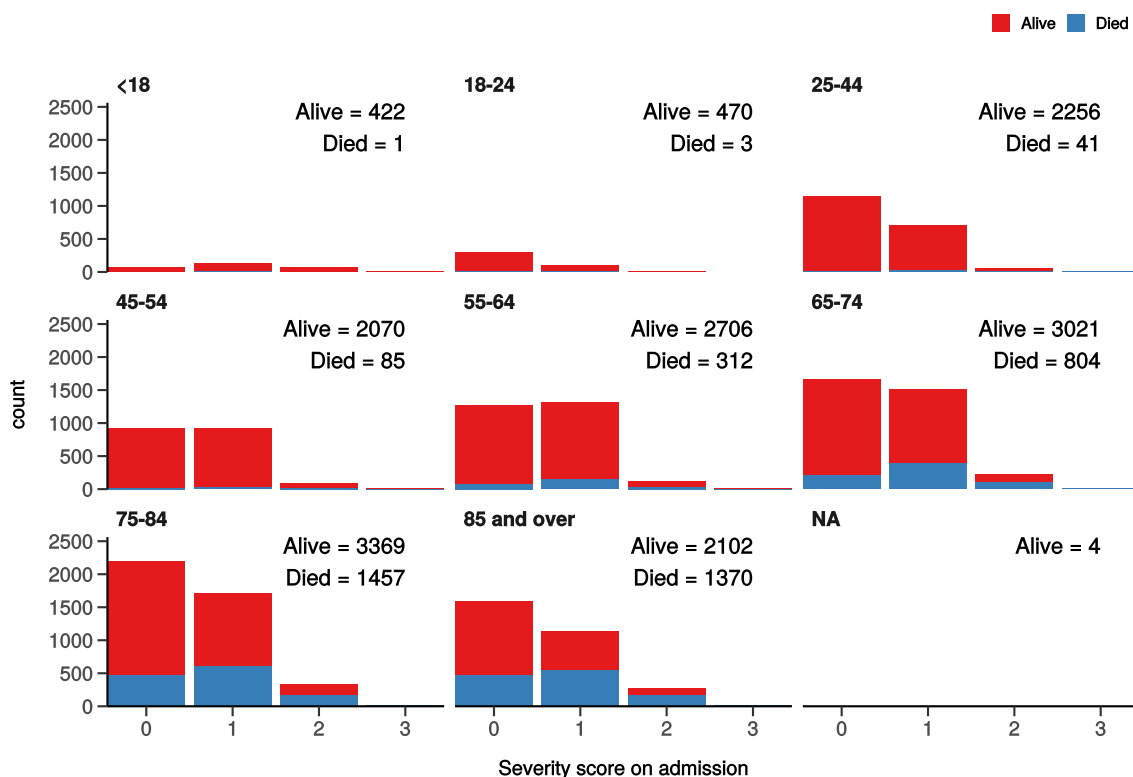


Figure 21 - Death by severity (qSOFA) on admission stratified by age

Number of deaths by qSOFA score at admission
Stratified by age



Healthcare workers

Employed as a healthcare worker?	NO	YES	p	
Total N (%)	21717 (97.7)	521 (2.3)		
NEWS score on admission	Median (IQR)	3.0 (4.0)	3.0 (5.0)	0.125

Employed as a healthcare worker?		NO	YES	p
Death	No	12992 (77.9)	415 (95.6)	<0.001
	Yes	3695 (22.1)	19 (4.4)	