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I-MOVE-COVID-19 Network

Multidisciplinary European network for research, prevention and control of the COVID-19 pandemic

COVID-19 European Hospital Surveillance: Third Bulletin

15 MARCH 2021

I-MOVE-COVID-19 Network

WP3 coordinated by Public Health Scotland

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Content

Abbreviations

AL	Albania
BE	Belgium
COVID-19	Coronavirus disease 2019
EEA	European Economic Area
ECDC	European Centre for Disease Prevention and Control
EMCO	Extracorporeal membrane oxygenation
EN	England
ES	Spain
EU	European Union
FR	France
GP	General Practitioner
HCW	Healthcare Worker
HDU	High Dependency Unit
ICD	International Classification of Diseases
ICU	Intensive Care Unit
ILI	Influenza-Like Illness
I-MOVE	Influenza – Monitoring Vaccine Effectiveness in Europe
LT	Lithuania
NA	Navarra region
PT	Portugal
RO	Romania
RT- PCR	Real-Time Polymerase Chain Reaction
SARI	Severe Acute Respiratory Infection
SARS-CoV-2	Severe Acute Respiratory Syndrome – Coronavirus 2
SC	Scotland
WP3	Work Package 3

Summary

This surveillance report summarises information from the Influenza – Monitoring Vaccine Effectiveness in Europe - Coronavirus Disease 2019 (I-MOVE-COVID-19) hospital surveillance network. The I-MOVE-COVID-19 hospital surveillance aims to reinforce and complement the COVID-19 epidemiological data in the EU/EEA and the UK that are compiled and reported by the European Centre for Disease Prevention and Control (ECDC). Data are collected following a generic protocol. There may be differences between countries in the range and completeness of data collected, due to differences in health care systems, hospital admission policy, or coding of data.

In this bulletin, surveillance data are provided by 11 participating hospital surveillance sites in nine European countries. Patients who were hospitalised with confirmed, probable or suspected SARS-CoV-2 virus infection are included as COVID-19 cases. A total of 54,904 COVID-19 cases were admitted to hospital between 01 February and 29 November 2020, of whom two-thirds (66%, 36,029) were reported by England.

- More male than female COVID-19 cases were reported in all age groups, except for the 15–44-year-old age group, where the ratio of females to males was approximately the same.

- Over 90% of confirmed COVID-19 cases for whom symptom information was available (10 sites) had febrile illness or respiratory symptoms, 49% had neurological symptoms and 59% experienced gastrointestinal symptoms.

- The three most frequently reported symptoms were cough (68%), followed by shortness of breath and fever (each 64%). The three least frequently reported symptoms were palpitations (5%), followed by rash/other dermatological manifestation and conjunctivitis (each 1%).

- Over three-quarters of patients were admitted within 8 days of onset (78%); excluding England, this was 72%. The median length of hospital stay was 10 days.

- About one-quarter (24%) of COVID-19 cases required ICU/HDU admission; however, for sites excluding England (in England, ICU/HDU reporting is mandatory), this was 12%[1].

- Approximately one-quarter (26%) of COVID-19 patients died in hospital. This was 18% for all sites excluding England[1].

[1]Findings are biased towards England, where ICU/HDU reporting is mandatory and for which data are reported on almost all hospitals nationwide, comprising 66% of all cases in the European hospital surveillance dataset.

Participating sites and data submission

The I-MOVE WP3 hospital surveillance for COVID-19 is coordinated by Public Health Scotland (PHS) with data processing support from Epiconcept. The hospital network comprises 11 surveillance sites in nine countries: six EU Member States (Belgium, two sites in France, Lithuania, Portugal, Romania, and two sites in Spain) and in addition Albania, England and Scotland (Figure 1). Table 1 describes the participating sites and the data they have contributed to this report[2].

The data presented in this report comprise confirmed (n=53,990) probable (n=215) and suspected cases (n=699)[3].

Figure 1: Map of countries participating in I-MOVE-COVID-19 WP3 hospital surveillance (Countries which submitted data for this report are coloured in blue.[4])

[2]The period for which data were submitted does not necessarily reflect the total duration of the epidemic in that country.
[3]See Annex for case definitions.
[4]Note that ES and FR both have two separate sites in different areas/regions of the country.

Table 1: Countries participating in I-MOVE-COVID-19 (WP3) hospital surveillance and their respective contribution to this bulletin

Country	Region	Participating hospitals	Number of cases (%)	Admission of first reported case		Admission of last reported case	
				Date	Week	Date	Week
Albania (AL)	-	Two hospitals, all wards	162 (0.3%)	20 Feb 2020	8	29 Jul 2020	31
Belgium (BE)	-	One hospital, all wards	690 (1.3%)	21 Feb 2020	8	08 Nov 2020	45
England (EN)	Nationwide	All hospitals, including mandatory reporting from ICUs/HDUs	36,029 (65.6%)	15 Mar 2020	11	29 Nov 2020	48
France (FR)	Two sites:						
	FR-R (REIVAC)	Five hospitals, all wards	1,050 (1.9%)	01 Feb 2020	5	30 Jun 2020	27
	FR-V (ViVI)	Two hospitals, all wards	20 (0.0%)	07 May 2020	19	22 Oct 2020	43
Lithuania (LT)	-	Two hospitals	299 (0.5%)	13 Mar 2020	11	24 Nov 2020	48
Portugal (PT)	-	Three hospitals, all wards	575 (1.0%)	02 Mar 2020	10	29 Nov 2020	48
Romania (RO)	-	Two hospitals, all wards	260 (0.5%)	10 Mar 2020	11	29 Nov 2020	48
Scotland (SC)	Nationwide	All hospitals, all wards	12,017 (21.9%)	01 Feb 2020	5	29 Nov 2020	48
Spain (ES)	Two sites:						
	ES	Two hospitals, all wards	1,291 (2.4%)	16 Mar 2020	12	29 Nov 2020	48
	NA	Navarra region: six hospitals, all wards	2,511 (4.6%)	06 Feb 2020	6	17 Nov 2020	47
Total			**54,904**	**01 Feb 2020**	**5**	**29 Nov 2020**	**48**

Cases over time

The number of confirmed, probable and suspected cases reported overall by date of onset of symptoms and date of hospital admission are presented in Figures 2a and 2b, respectively, categorised by ICU/HDU admission.

Figure 2a Number of confirmed, probable and suspected cases reported overall by week of symptom onset *(Includes data for all sites (N=36,016; 18,888 missing onset date))*

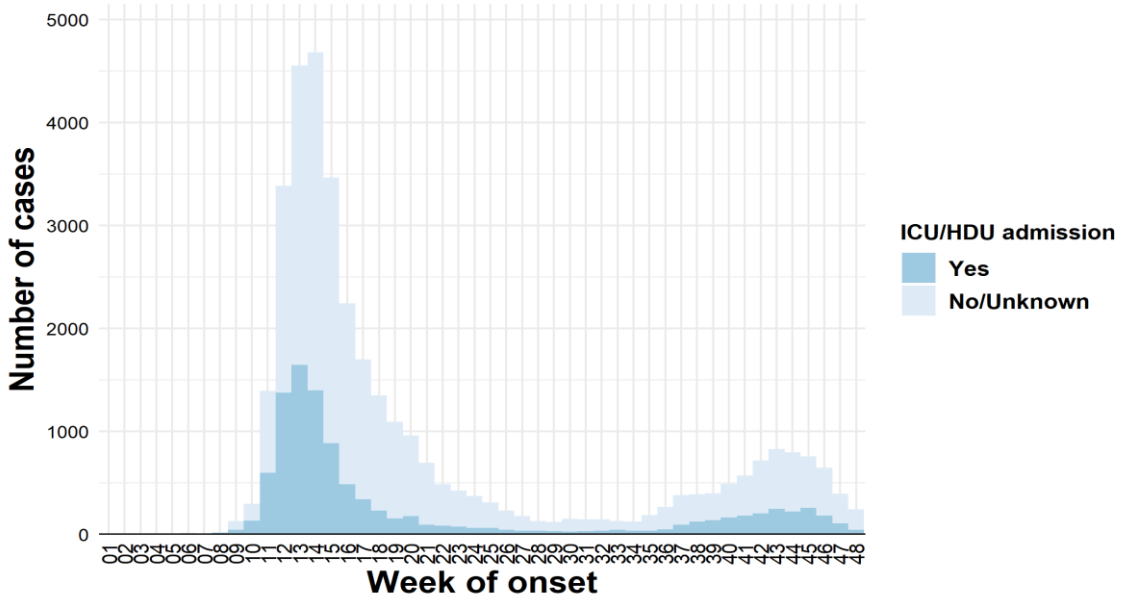
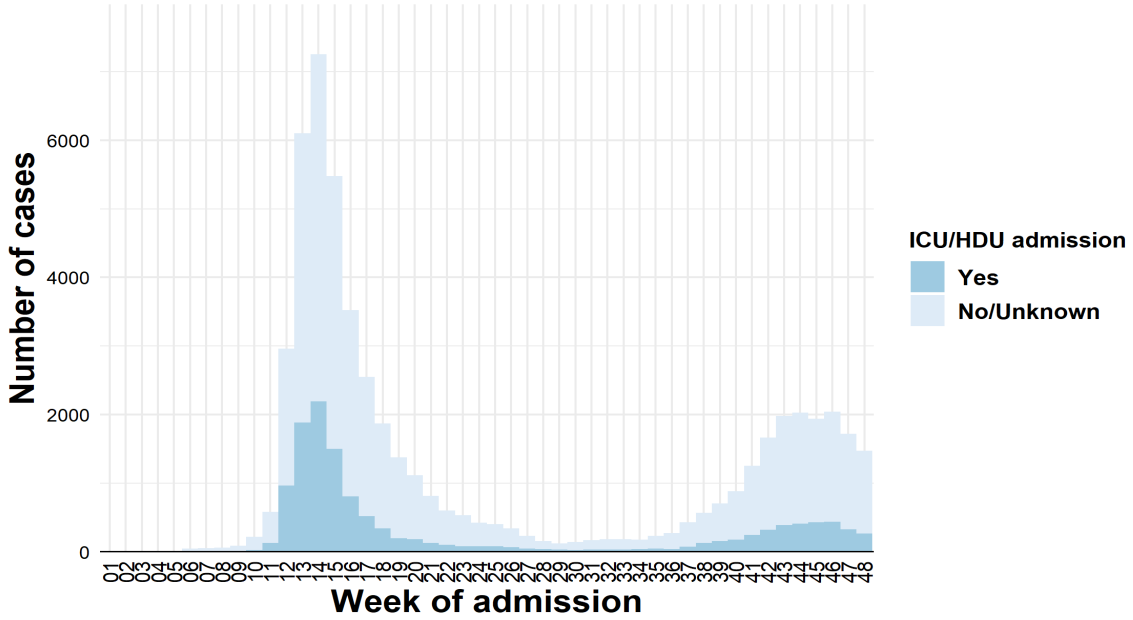


Figure 2b Number of confirmed, probable and suspected cases reported overall by date of hospital admission ***All sites (N=54,904)***



Figures 3a-j present the numbers of confirmed, probable and suspected cases reported overall by week of hospital admission, for each participating site.[5,6]

Figure 3a: EN (N= 36,029)

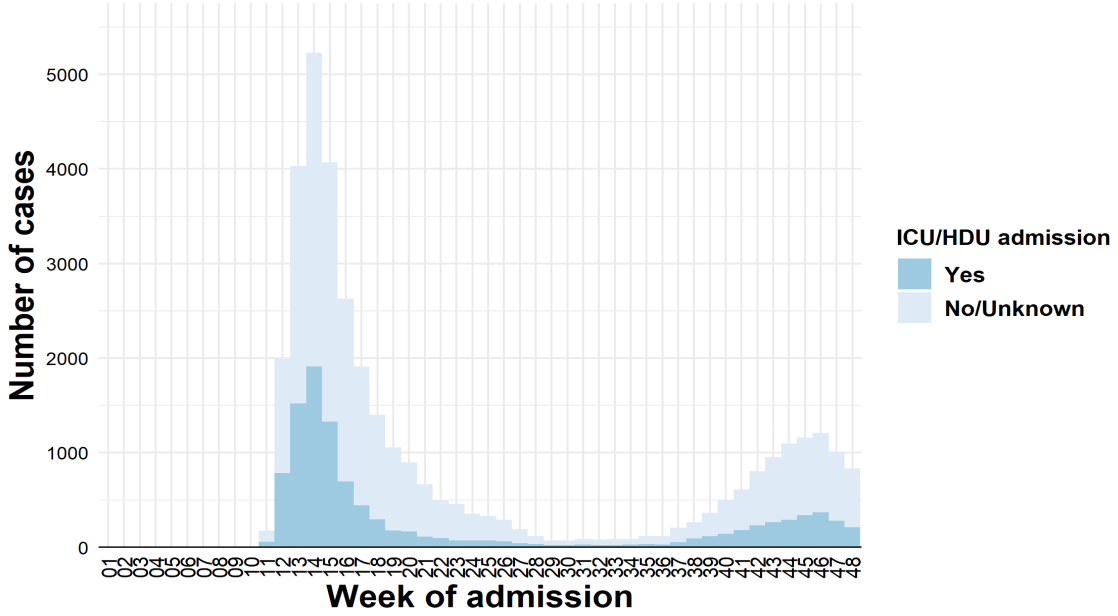
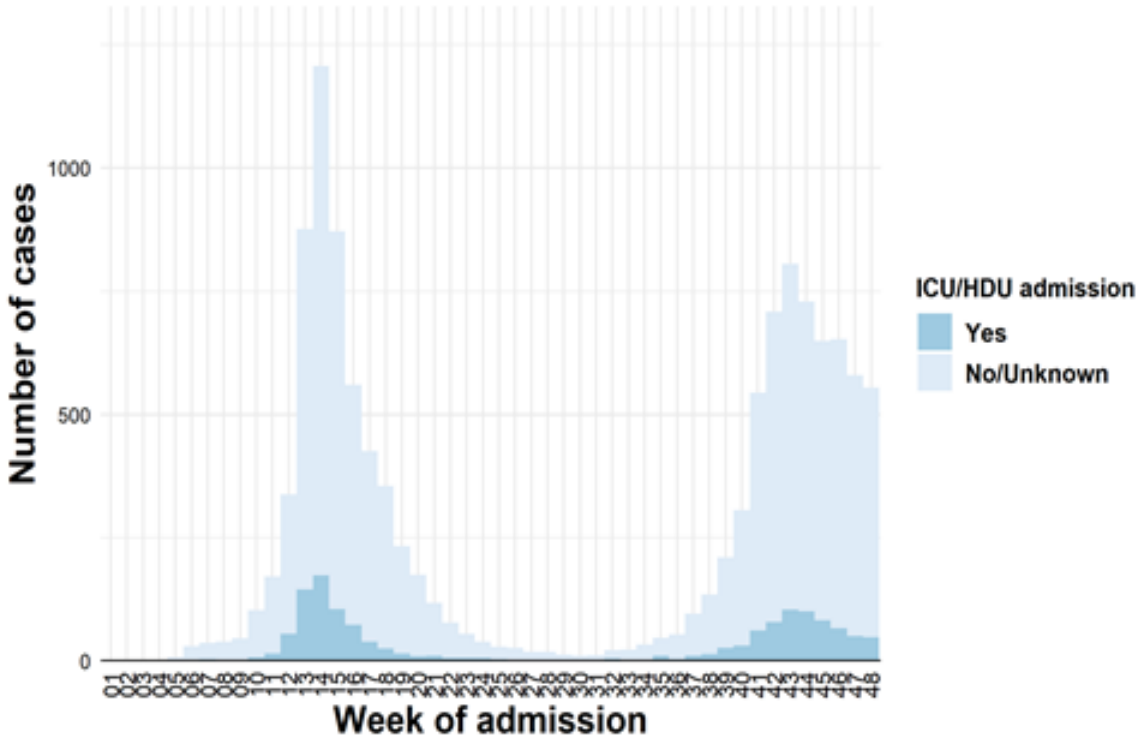


Figure 3b: SC (N= 12,017)



[5]The y-axes differ between countries owing to the large difference in number of cases reported.

[6]Owing to the small number of cases, results are not presented for FR-V.

Figure 3c: BE (N= 690)

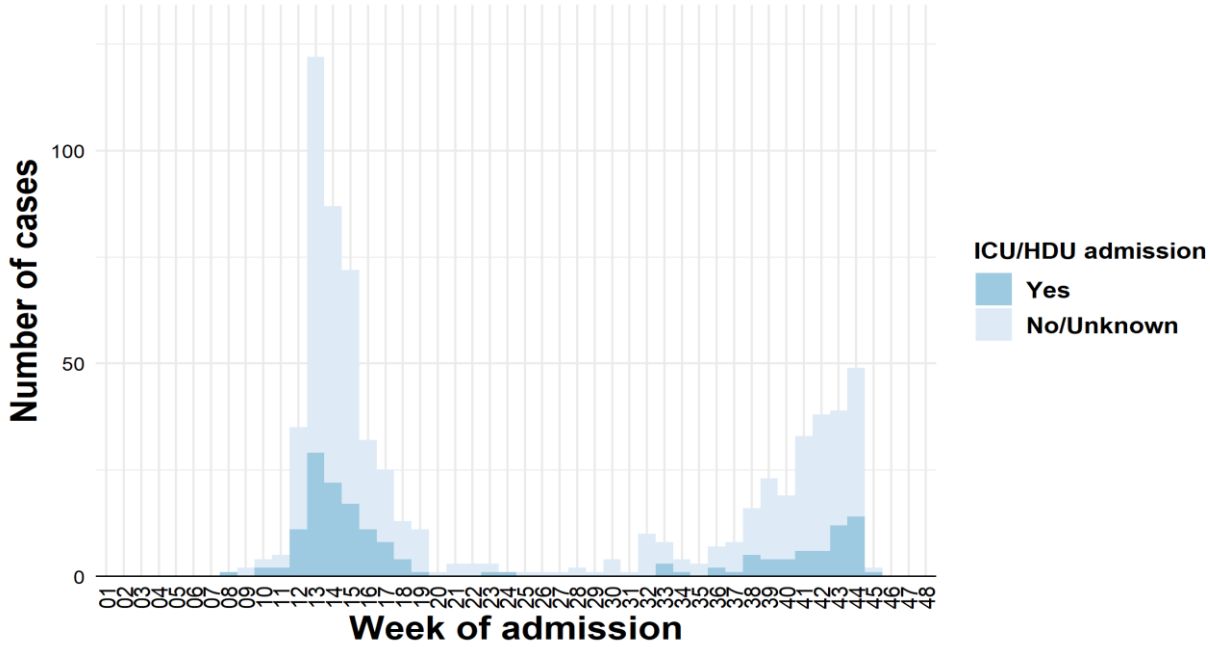


Figure 3d: PT (N= 575)

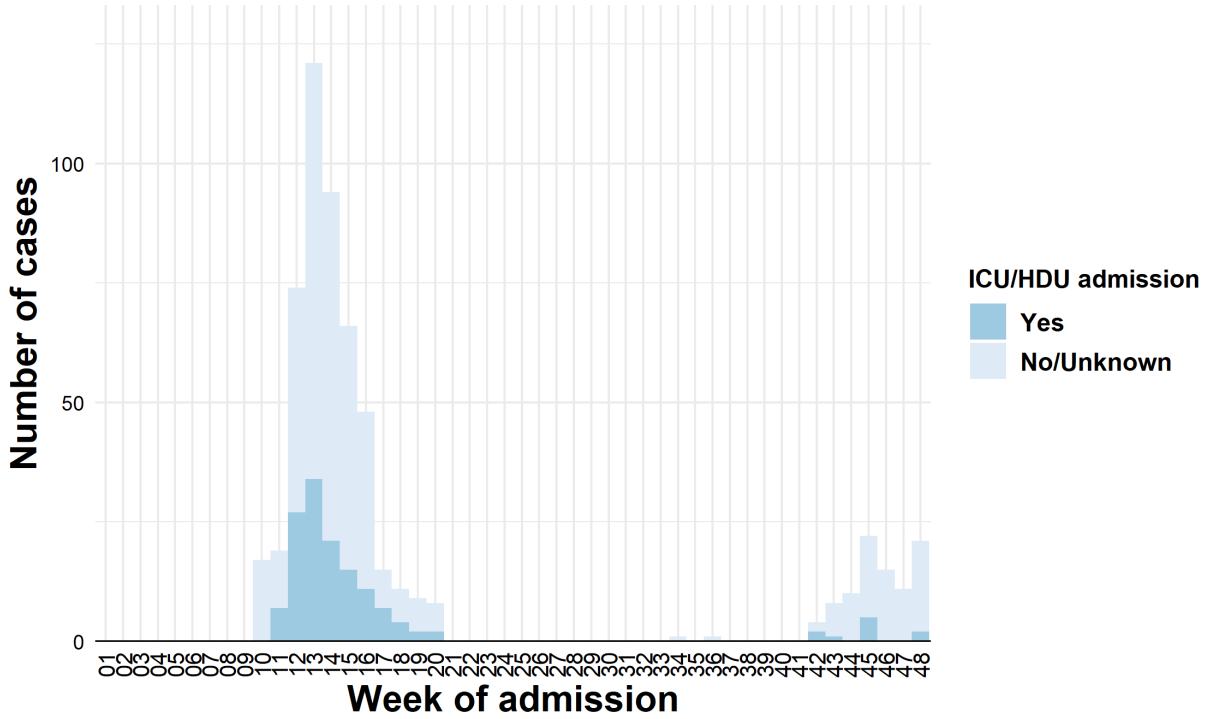


Figure 3e: ES (N= 1,291)

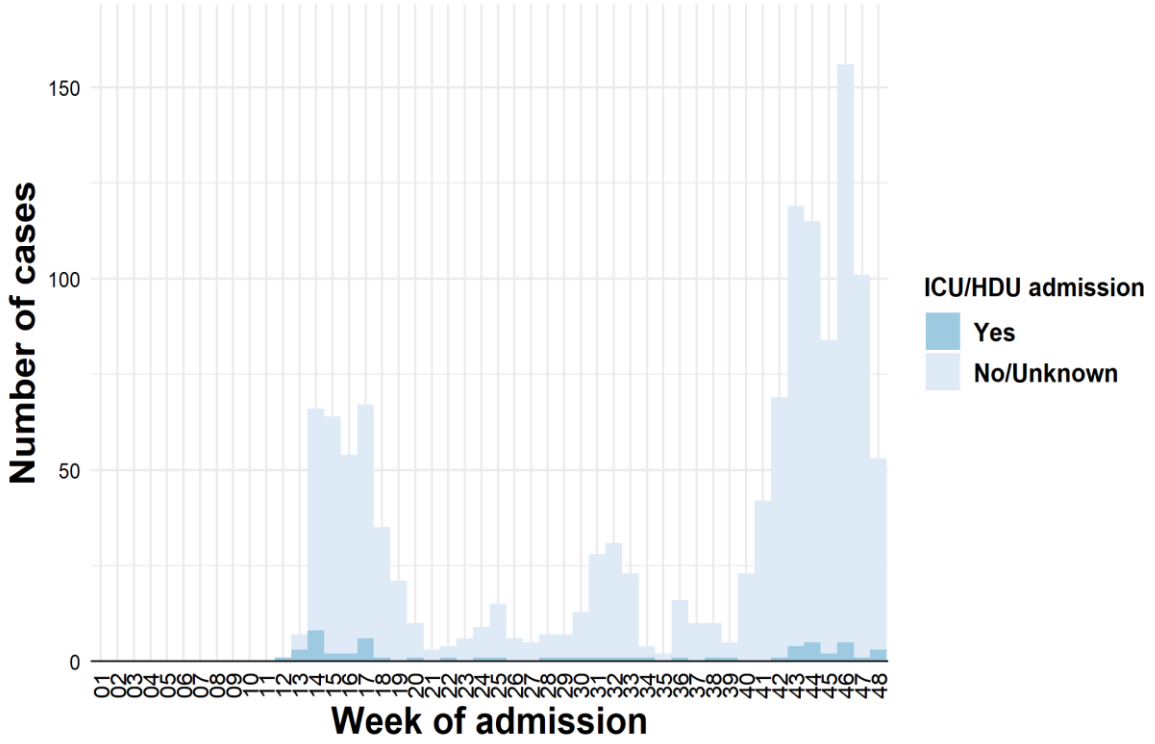


Figure 3f: NA (N= 2,511)

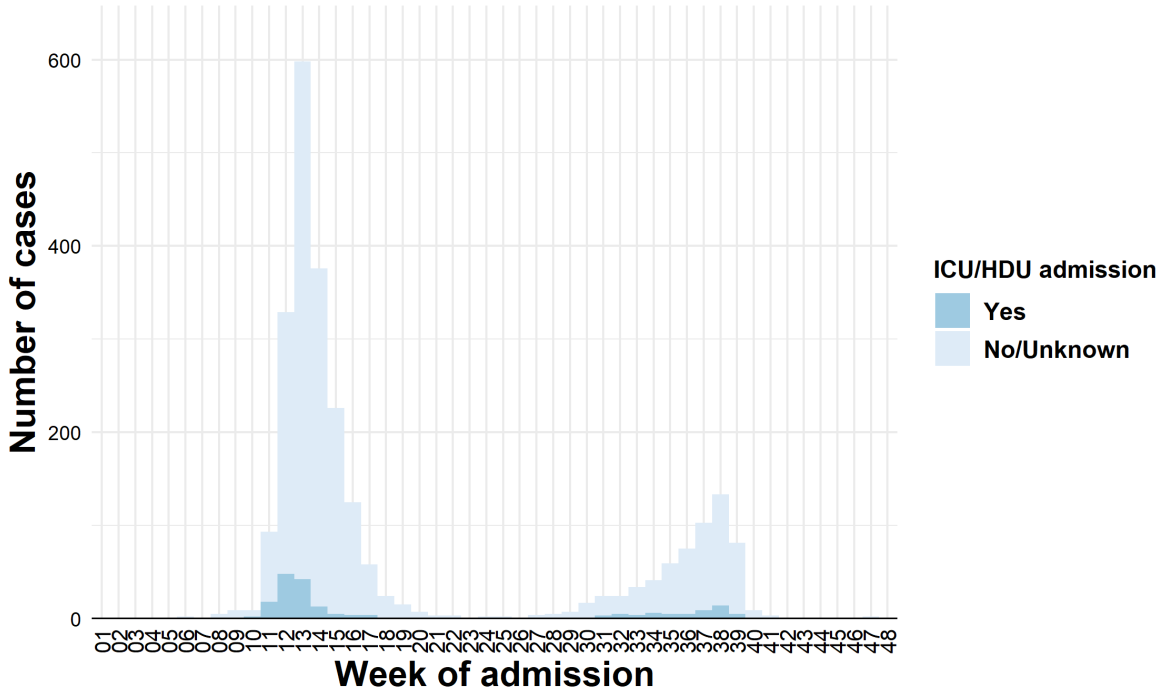


Figure 3g: FR-R (N= 1,050)

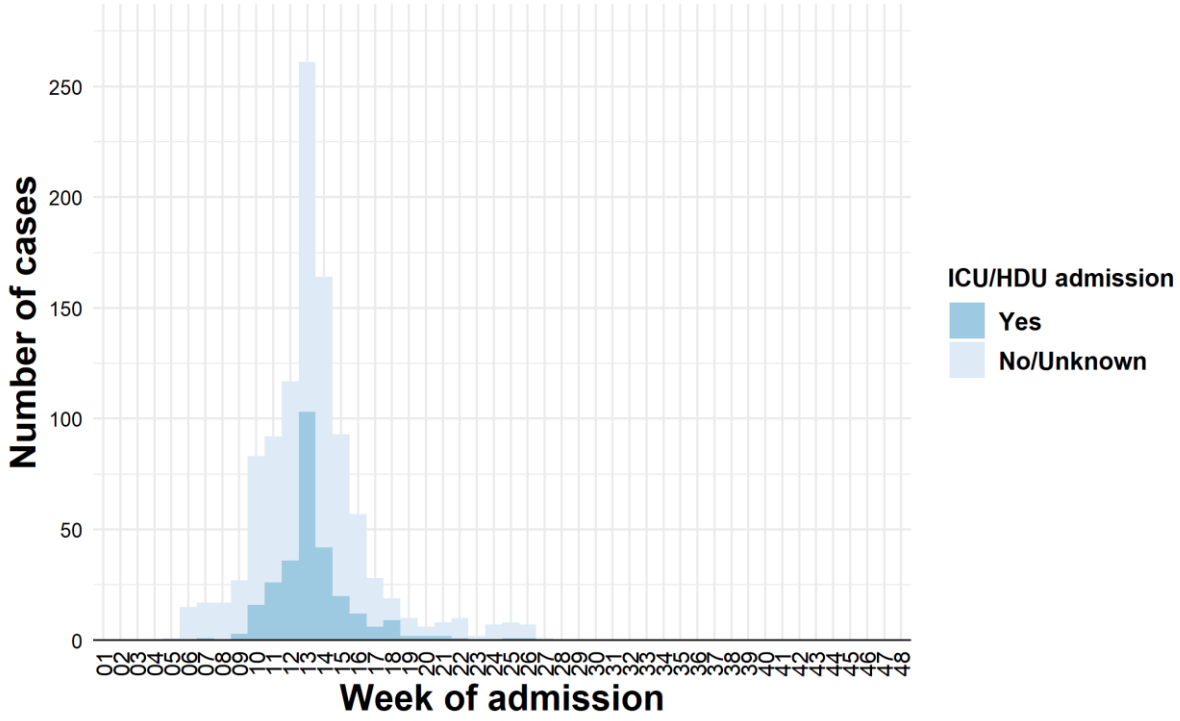


Figure 3h: AL (N= 162)

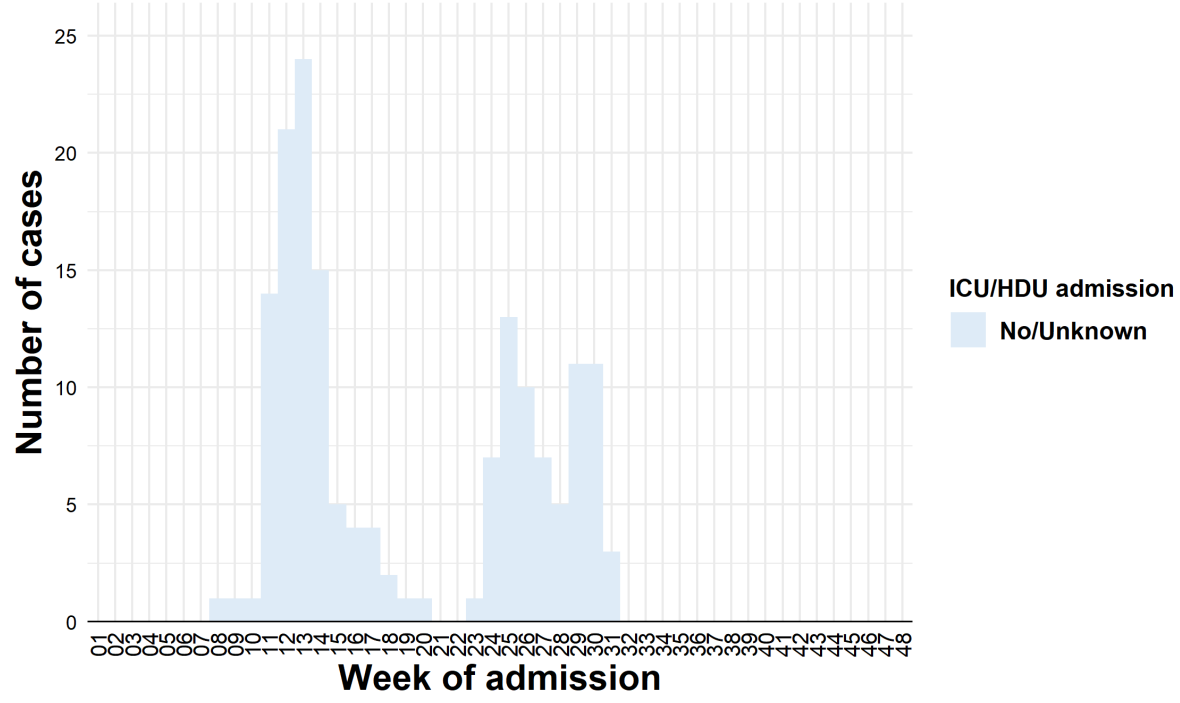


Figure 3i: LT (N= 299)

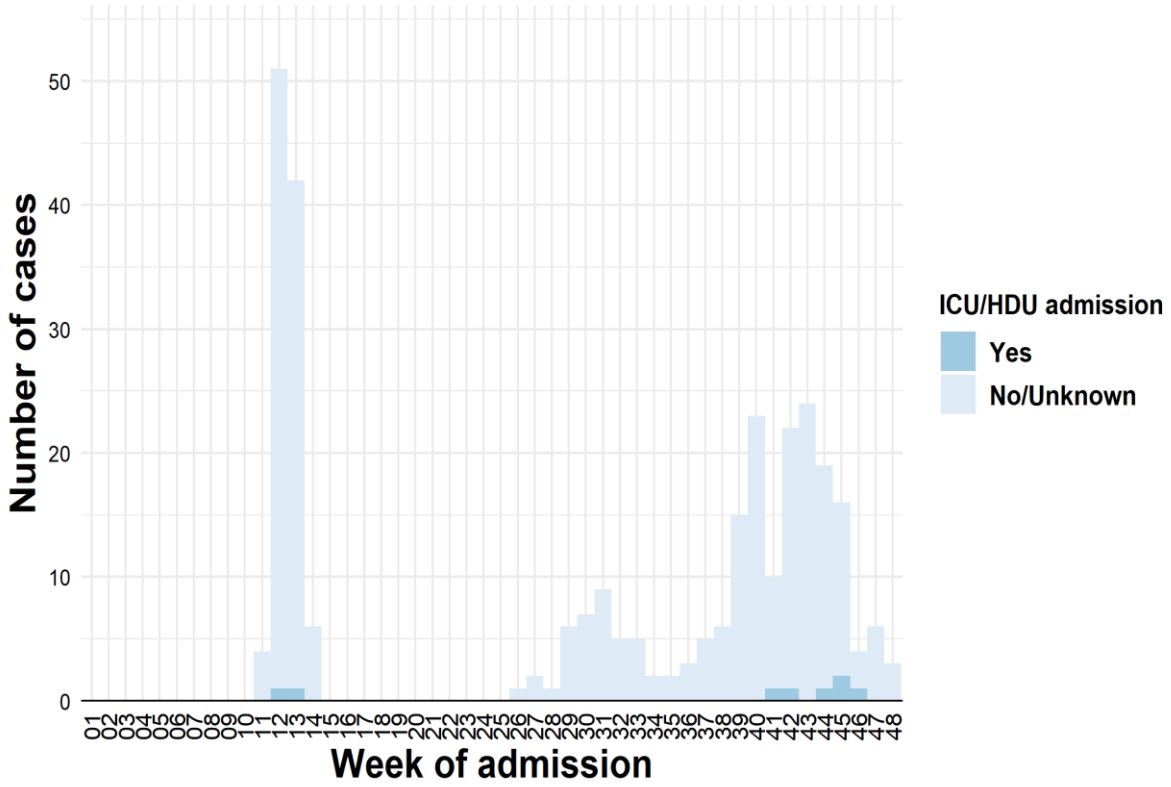
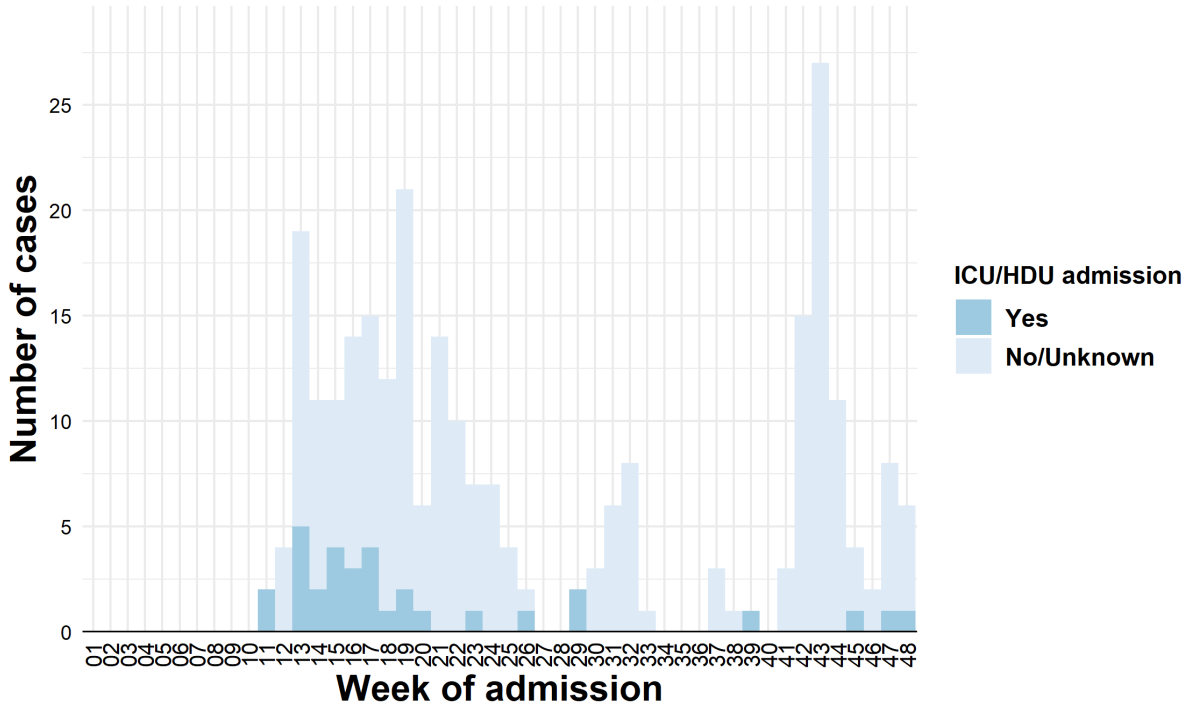


Figure 3j: RO (N= 260)



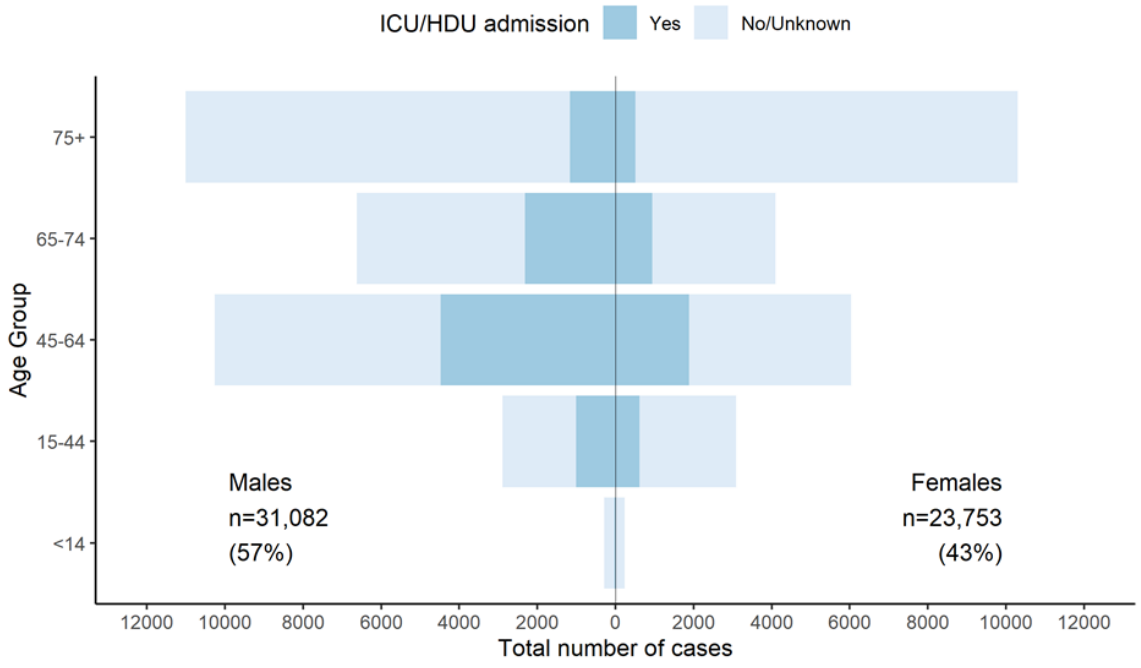
Demographics

The demographic characteristics of the patients included in this report are presented below.

- By **sex**, approximately 57% of cases were male (31,082) and 43% were female (23,753); 69 records missing sex.
- The median **age** of cases was 69 years (range 0–105 years, n=54,885); 19 records missing age.
- Approximately 12% of cases had **supported living arrangements**[7] prior to admission (3,675/31,440); 23,464 records missing/unknown

Figure 4 shows the sex and age distribution of confirmed, probable and suspected cases over all sites, categorised by Intensive care unit (ICU) and High Dependency Unit (HDU) admissions. Figures 5a–5j.[8] show the same for each participating site. Note that absolute numbers are provided, the figures are not age-adjusted according to a country's population structure, and not all sites receive paediatric patients or collect data on paediatric cases (<18 years of age).

Figure 4: The age and sex distribution of confirmed, probable and suspected cases over all sites, categorised by Intensive care unit (ICU) and High Dependency Unit (HDU) admissions.

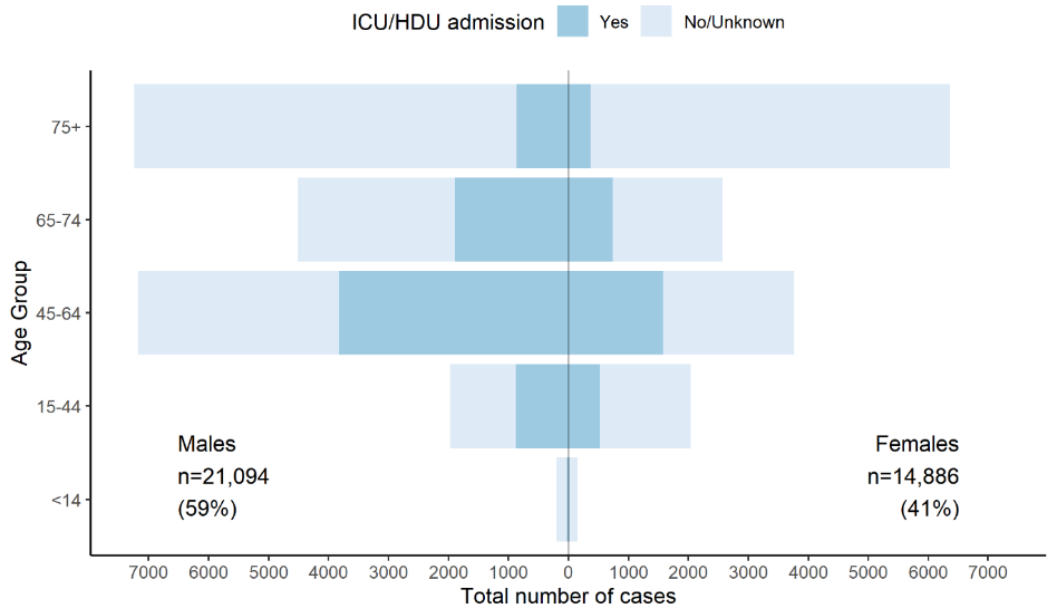


[7] Prior to admission, patient was either living at home with assistance from a carer, or resident at a care home.

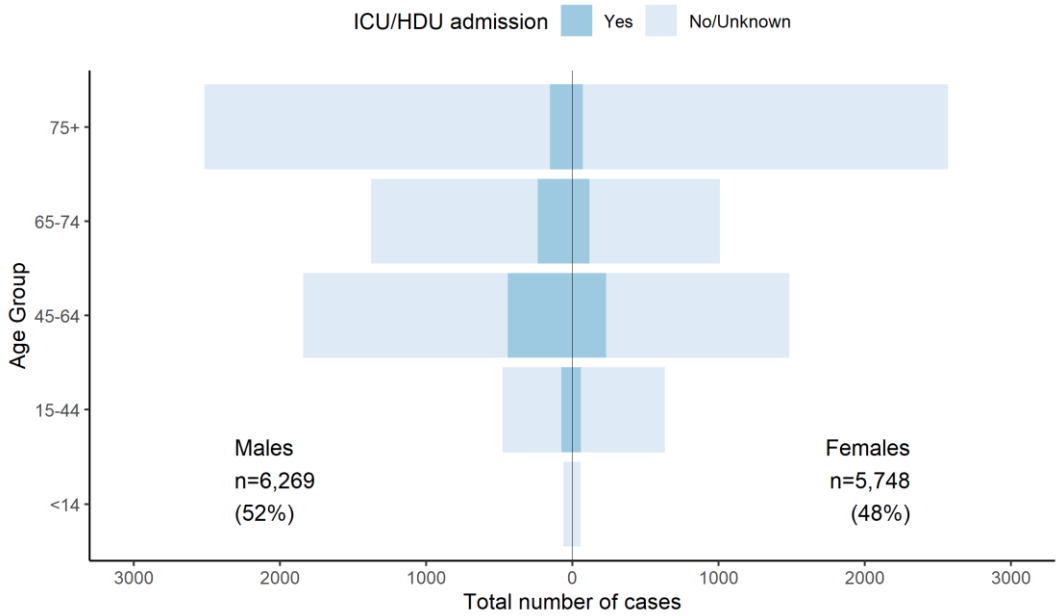
[8] Owing to the small number of cases, results are not presented for FR-V.

Figure 5a-j: Age and sex distribution of confirmed, probable and suspected COVID-19 cases by ICU/HDU admission by countries

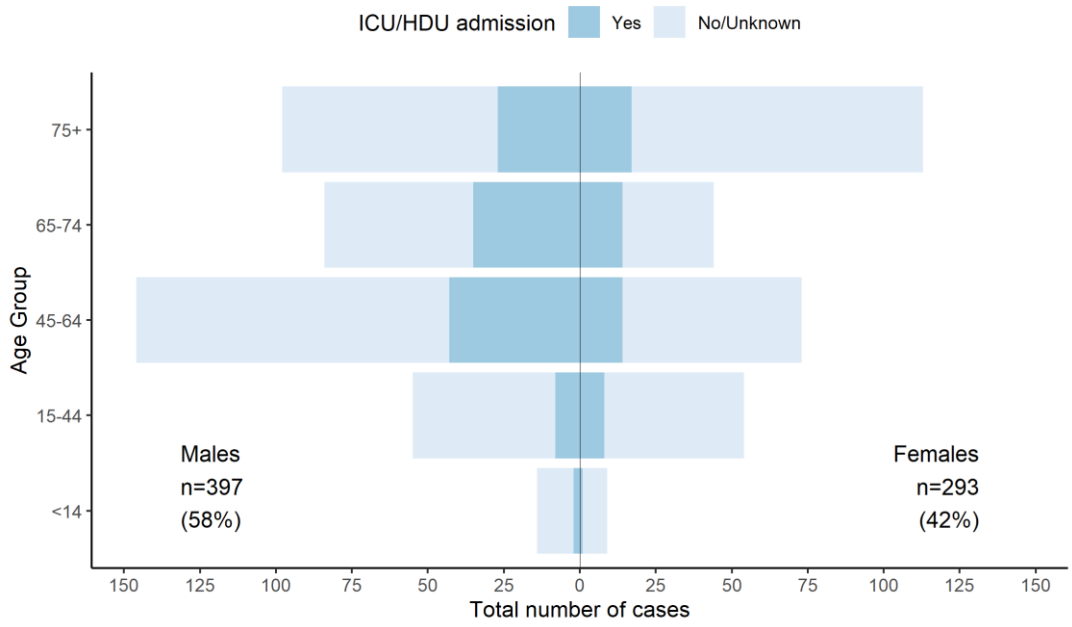
5a: EN



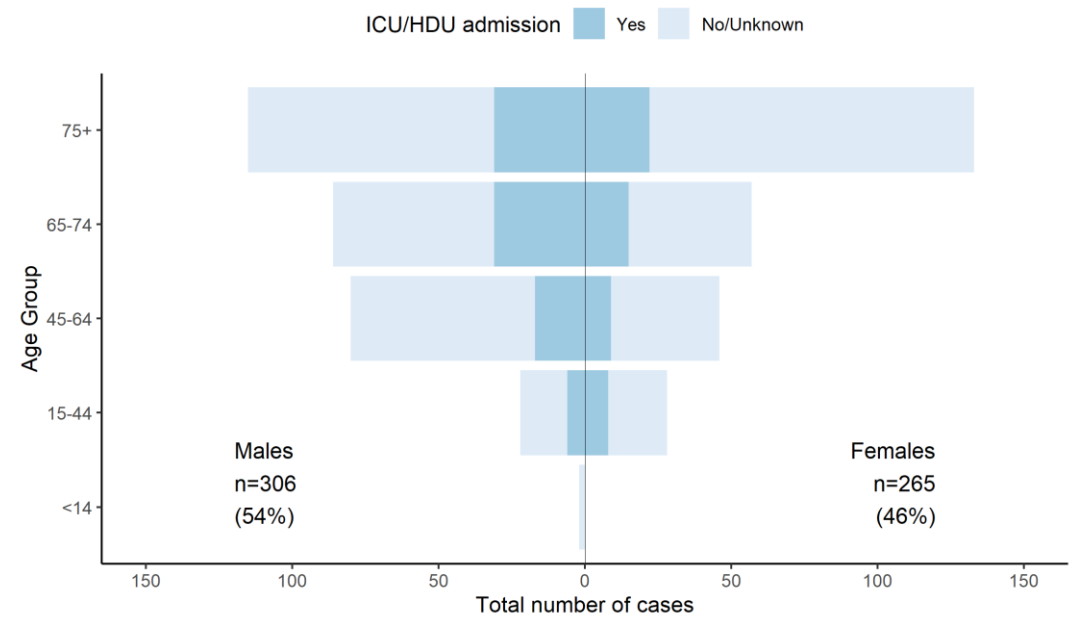
5b: SC



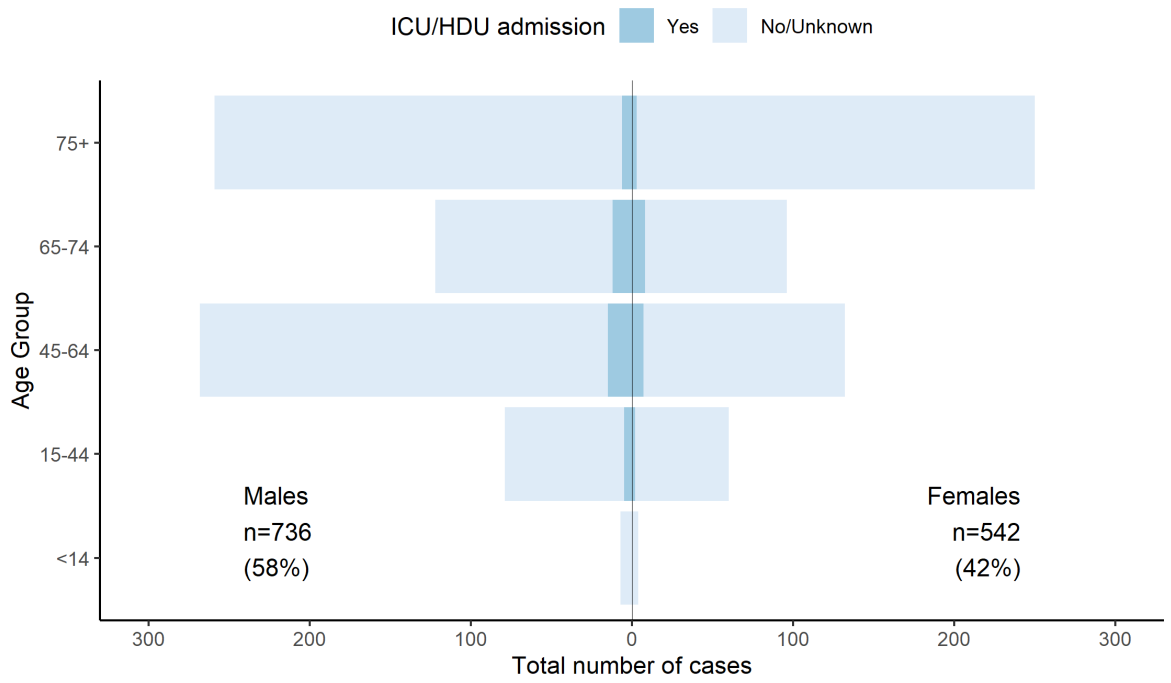
5c: BE


ICU/HDU admission
Yes
No/Unknown
75+
65-74
45-64
15-44
<14
Age Group
Males
n=397
(58%)
Females
n=293
(42%)
150
125
100
75
50
25
0
25
50
75
100
125
150
Total number of cases

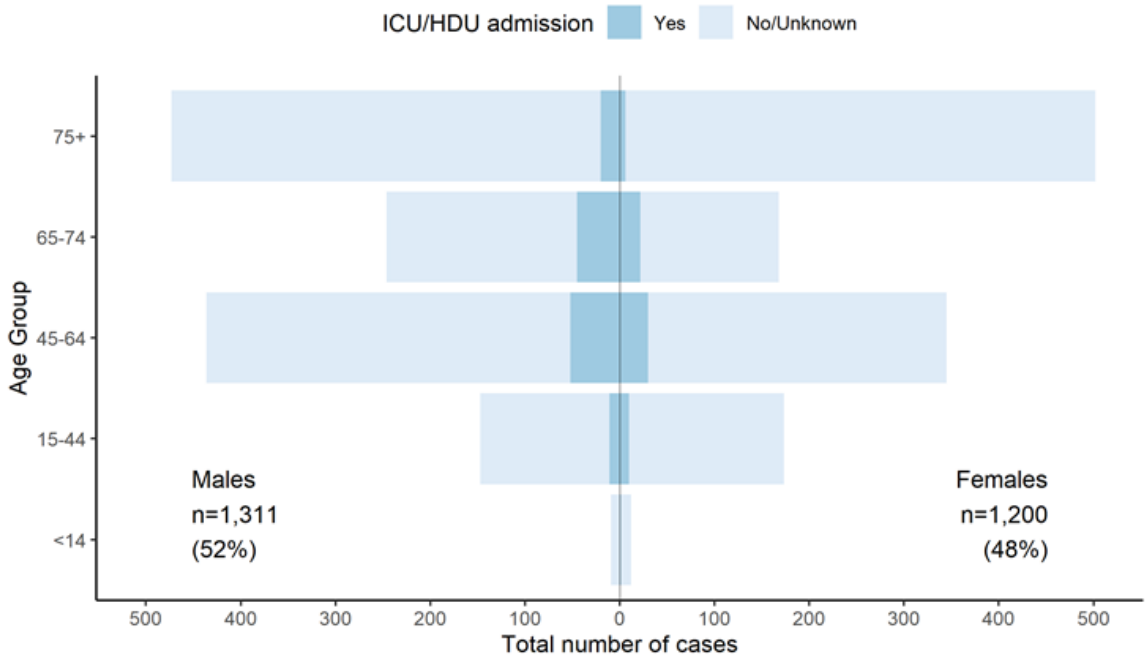
5d: PT


ICU/HDU admission
Yes
No/Unknown
75+
65-74
45-64
15-44
<14
Age Group
Males
n=306
(54%)
Females
n=265
(46%)
150
100
50
0
50
100
150
Total number of cases

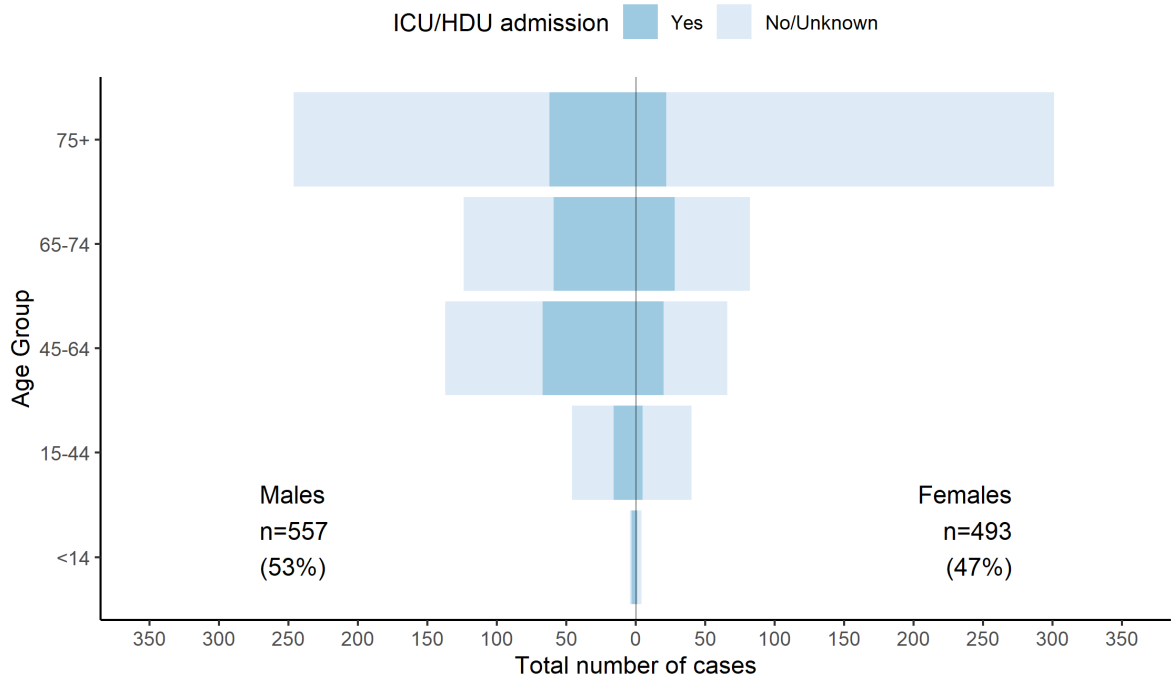
5e: ES


ICU/HDU admission
Yes
No/Unknown
75+
65-74
45-64
15-44
<14
Age Group
Males
n=736
(58%)
Females
n=542
(42%)
300
200
100
0
100
200
300
Total number of cases

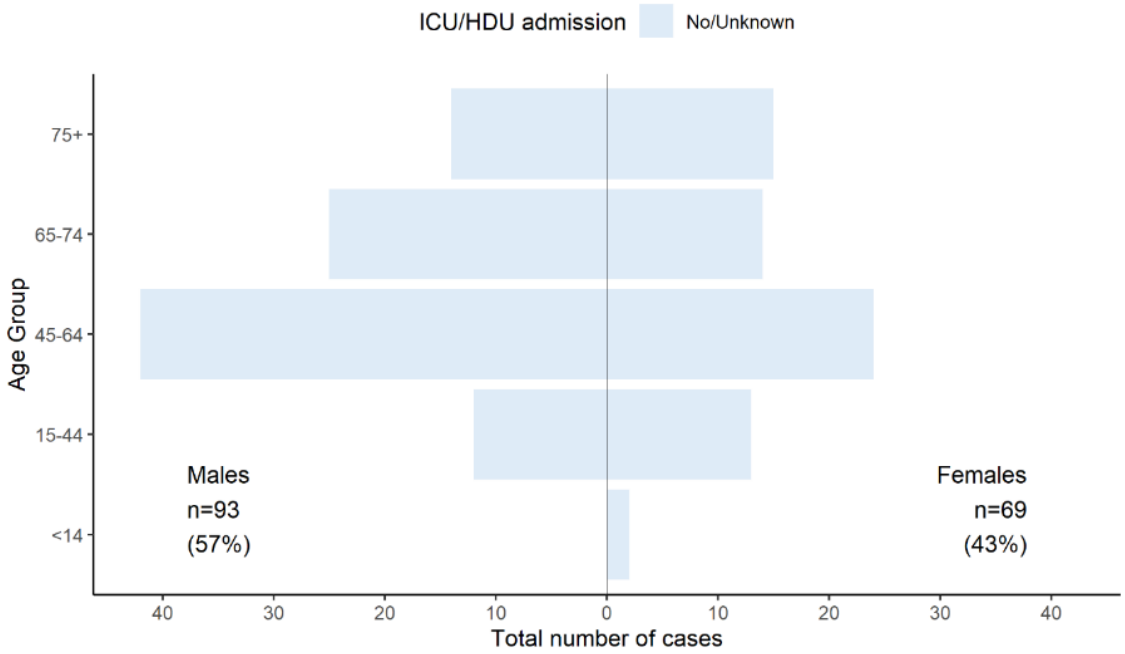
5f: NA


ICU/HDU admission
Yes
No/Unknown
75+
65-74
45-64
15-44
<14
Age Group
Males
n=1,311
(52%)
Females
n=1,200
(48%)
500
400
300
200
100
0
100
200
300
400
500
Total number of cases

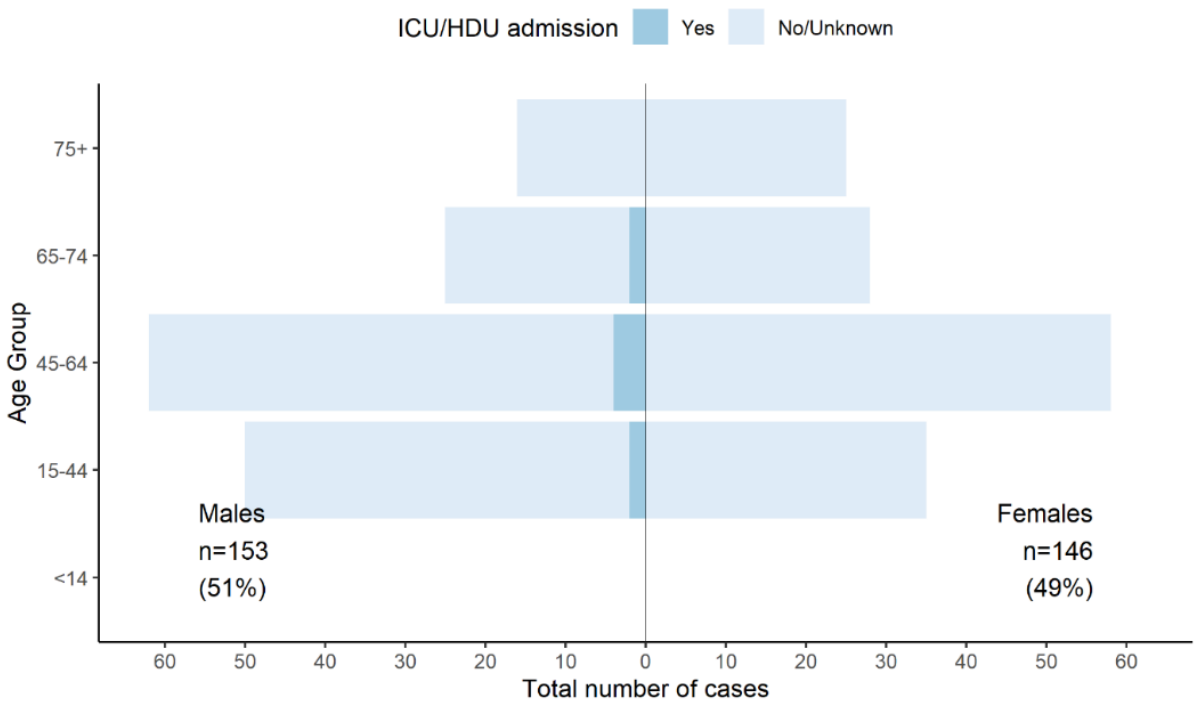
5g: FR-R


ICU/HDU admission
Yes
No/Unknown
75+
65-74
45-64
15-44
<14
Age Group
Males
n=557
(53%)
Females
n=493
(47%)
350
300
250
200
150
100
50
0
50
100
150
200
250
300
350
Total number of cases

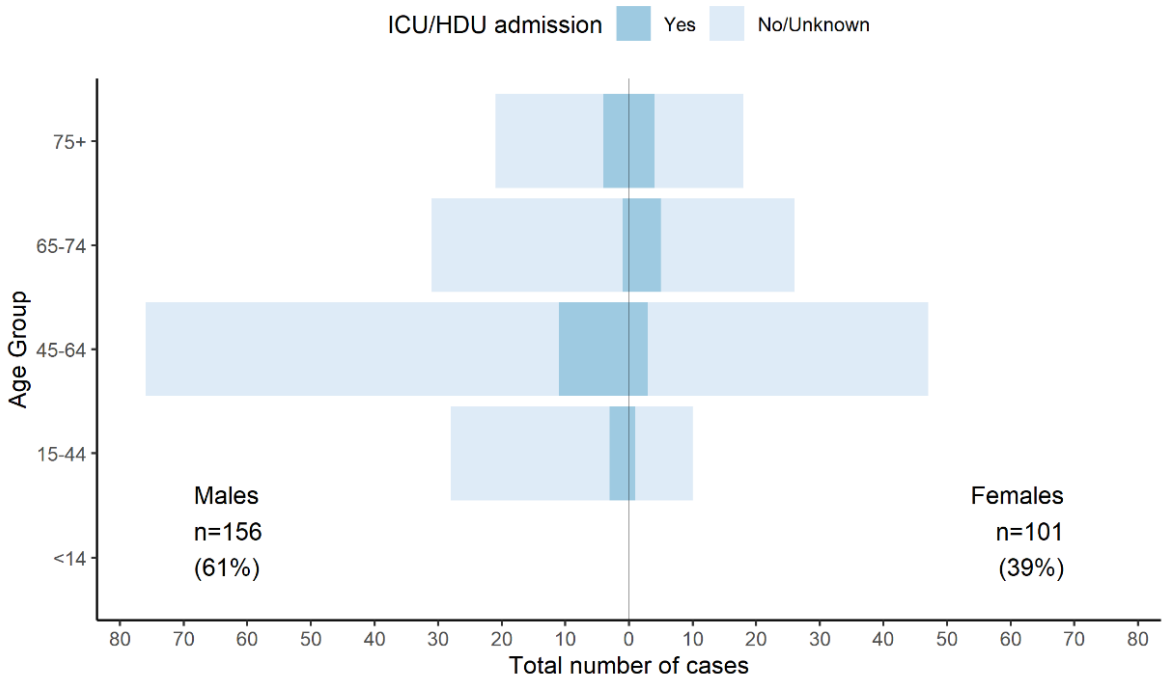
5h: AL


ICU/HDU admission
No/Unknown
75+
65-74
45-64
15-44
<14
Age Group
Males
n=93
(57%)
Females
n=69
(43%)
40
30
20
10
0
10
20
30
40
Total number of cases

5i: LT



5j: RO



The remainder of this report pertains only to confirmed cases where key variables (age, sex and date of admission) were not missing (n=53,224).

Clinical characteristics (Confirmed cases)

Table 2 describes cases by their clinical characteristics. All sites routinely collect information on symptoms with the exception of England (EN), with varying degrees of data completeness. The symptoms of anosmia and ageusia were not recognised symptoms of COVID-19 at the outset of the pandemic and thus may not have been collected in the first few weeks of surveillance.

Table 2: Clinical characteristics of patients hospitalised with confirmed COVID-19

	Total number (%) with information available (N=17,504)	Number (%) of cases with symptom
Symptom groups[9]		
Respiratory	6,088 (34.8)	5,736 (94.2)
Febrile illness	5,214 (29.8)	4,762 (91.3)
Gastrointestinal	3,710 (21.2)	2,179 (58.7)
Neurological	4,492 (25.7)	2,182 (48.6)
Other	4,617 (26.4)	4,071 (88.2)
Symptoms		
Cough	6,615 (37.8)	4,502 (68.1)
Shortness of breath	6,564 (37.5)	4,184 (63.7)
Fever	6,642 (37.9)	4,226 (63.6)
General deterioration	3,361 (19.2)	2,024 (60.2)
Feverishness	2,380 (13.6)	1,236 (51.9)
Malaise	5,953 (34.0)	2,284 (38.4)
Myalgia	5,994 (34.2)	1,404 (23.4)
Diarrhoea	6,284 (35.9)	1,394 (22.2)
Tachypnoea	3,398 (19.4)	640 (18.8)
Chills	2,138 (12.2)	384 (18.0)
Headache	5,949 (34.0)	1,009 (17.0)
Vomit	4,847 (27.7)	818 (16.9)
Confusion	6,101 (34.9)	846 (13.9)
Chest pain	3,661 (20.9)	488 (13.3)
Nausea	3,272 (18.7)	422 (12.9)
Ageusia	4,692 (26.8)	422 (9.0)
Sore throat	5,839 (33.4)	504 (8.6)
Anosmia	4,748 (27.1)	408 (8.6)
Abdominal pain	6,239 (35.6)	520 (8.3)
Coryza	3,415 (19.5)	245 (7.2)
Dizziness	3,440 (19.7)	208 (6.0)
Palpitations	2,164 (12.4)	97 (4.5)
Rash/other dermatological manifestation	5,368 (30.7)	59 (1.1)
Conjunctivitis	5,539 (30.5)	32 (0.6)

[9] **Respiratory** (coryza, cough, sore throat, shortness of breath, tachypnoea, chest pain); **Neurological** (ageusia, anosmia, confusion, dizziness, headache); **Gastrointestinal** (abdominal pain, diarrhoea, nausea, vomiting); **Febrile illness** (Fever, feverishness, chills); **Other** (any other symptom listed)

Outcomes (Confirmed cases)

Figure 6 shows patient outcome by sex. All patients were included in the figure even if outcome was yet to be determined, as may be the situation, for example, for more recent admissions. A greater proportion of men (28%) than women (21%) died in hospital.

Figure 6: Patient outcome by sex.

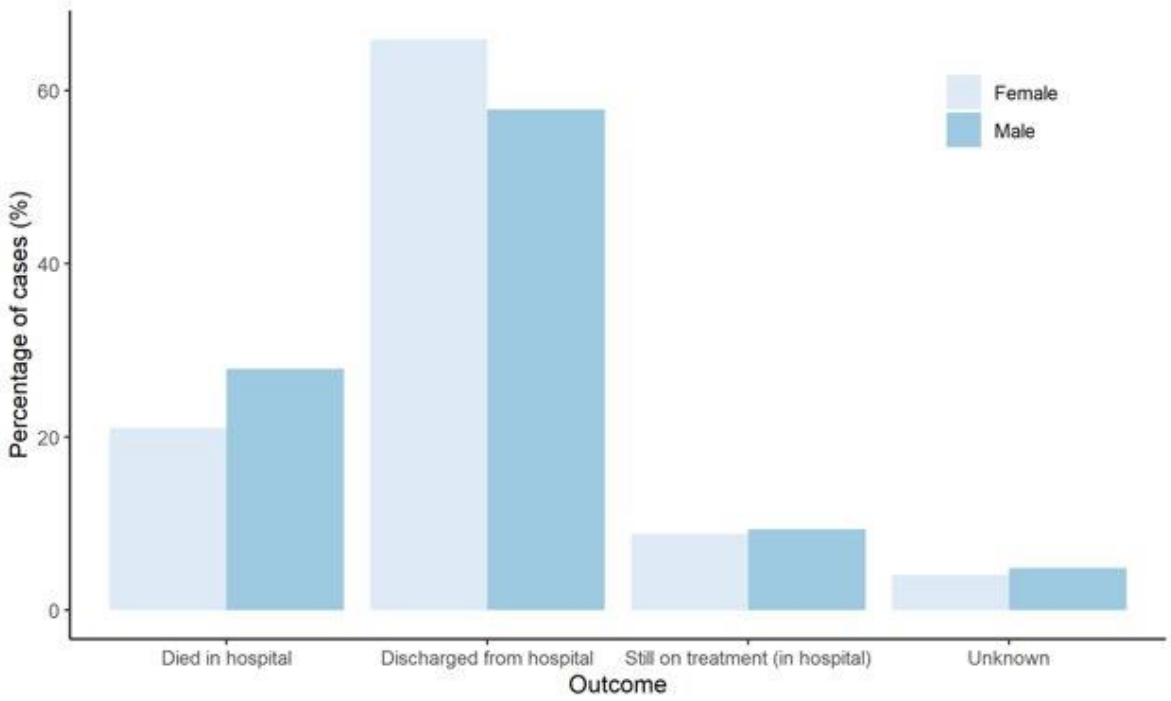


Table 3 describes patient outcomes by a range of patient characteristics. As England is over-represented in the dataset (66%) and is biased towards patients with ICU/HDU admission,[10] this may bias the outcomes seen in the pooled data. Because of this Table 4 describes the same information but excludes England.[11] Table 5 describes patient requirement for ventilation for a range of patient characteristics, for all sites. Table 6 shows the same information but with data from England excluded again because of the potential bias with over representation.

- Over all sites, the median **length of stay** in hospital was **10 days** (range 1–377, n=53,224); this was the same without England data included (n=17,504)
- Over all sites, **24%** cases required **ICU/HDU admission**; however, without England data included, this was **12%** cases.
- Over all sites, **26%** cases **died in hospital**; however, without England data included, this was **18%** cases.

[10] Reporting from these wards is mandatory in England.
[11] Note that the data in the tables and Figure 6 were not censored and all cases were included even if date of admission was recent and outcome was yet to be determined.

Table 3: Patient characteristics for all admissions, ICU/HDU admissions and deaths (all sites)

Characteristic	Total cases		ICU/HDU admission[12]		Deaths	
	N	%	N	%	N	%
All cases	53,224	-	12,661	24.4	13,281	26.1
Missing data	-	-	1,363	2.6	2,414	4.5
Age groups						
0–14	511	1.0	45	0.4	9	0.1
15–44	5,833	11.0	1,596	12.6	278	2.1
45–64	15,828	29.7	6,243	49.3	2,461	18.5
65–74	10,388	19.5	3,161	25.0	2,994	22.5
≥ 75	20,664	38.8	1,616	12.8	7,539	56.8
Sex						
Female	23,130	43.5	3,886	30.7	4,877	36.7
Male	30,094	56.5	8,775	69.3	8,404	63.3
Healthcare worker						
Yes	1,271	4.7	624	7.7	126	1.8
No	25,719	95.3	7,432	92.3	6,811	98.2
Missing data	26,234	-	4,605	-	6,344	-
Smoker						
Yes	2,162	38.3	381	40.1	461	46.1
No	3,478	61.7	570	59.9	540	53.9
Missing data	47,584	-	11,710	-	12,280	-
Pregnant (female only)						
Yes	345	3.5	50	2.0	4	0.2
No	9,375	96.5	2,460	98.0	2,102	99.8
Missing data	13,410	-	1,376	-	2,771	-
Close contact setting (contact of a COVID-19 case)						
Yes	2,288	75.3	353	65.6	350	72.9
No	749	24.7	185	34.4	130	27.1
Missing data	50,187	-	50,195	-	12,801	-
Days between onset and hospitalisation[13]						
0–4	21,366	60.5	4,437	44.6	5,773	64.0
5–9	6,194	17.5	2,940	29.6	1,410	15.6
10+	4,183	11.8	1,960	19.7	846	9.4
Onset in hospital	3,581	10.1	606	6.1	990	11.0
Missing data	17,900	-	2,718	-	4,262	-

[12] The proportion of ICU/HDU admissions in each category was calculated for those for whom this is known; cases whose ICU/HDU admission status was unknown were not included in the denominator. The proportion of deaths in each category was calculated only for those for whose outcome was known; cases still on treatment or whose outcome was unknown were not included in the dominator.

[13] Some hospitals in England use proxy dates for onset; substituting missing values of onset date with either admission date or swab date (note that in some hospitals, patients are swabbed on admission), resulting in a 0 value for delay from onset to admission. As patients from England comprise almost three-quarters of the dataset, the delay from onset to admission is skewed to the lowest category (0–4 days).

Table 4: Patient characteristics for all admissions, ICU/HDU admissions and deaths (excluding English data)

Characteristic	Total cases		ICU/HDU admission[14]		Deaths	
	N	%	N	%	N	%
All cases	17,504	-	2,150	12.4	3,122	18.0
Missing data	-	-	176	1.0	136	0.8
Age groups						
0–14	174	1.0	8	0.4	3	0.1
15–44	1,838	10.5	205	9.5	30	1.0
45–64	4,997	28.5	933	43.4	346	11.1
65–74	3,380	19.3	589	27.4	624	20.0
≥ 75	7,115	40.6	415	19.3	2,119	67.9
Sex						
Female	8,323	47.5	716	33.3	1,272	40.7
Male	9,181	52.5	1,434	66.7	1,850	59.3
Healthcare worker						
Yes	453	5.6	48	4.1	10	0.7
No	7,629	94.4	1,122	95.9	1,485	99.3
Missing data	9,422	-	980	-	1,627	-
Smoker						
Yes	2,162	38.3	381	40.1	461	46.1
No	3,478	61.7	570	59.9	540	53.9
Missing data	11,864	-	1,199	-	2,121	-
Pregnant (female only)						
Yes	56	3.3	5	2.2	1	0.5
No	1,636	96.7	219	97.8	199	99.5
Missing data	6,631	-	492	-	1,072	-
Close contact setting (contact of a COVID-19 case)						
Yes	2,288	75.3	353	65.6	350	72.9
No	749	24.7	185	34.4	130	27.1
Missing data	14,467	-	1,612	-	2,642	-
Days between onset and hospitalisation						
0–4	3,092	38.1	364	30.2	649	49.4
5–9	2,712	33.4	477	39.6	324	24.7
10+	1,767	21.8	301	25.0	196	14.9
Onset in hospital	549	6.8	63	5.2	145	11.0
Missing data	9,384	-	945	-	1,808	-

[14] The proportion of ICU/HDU admissions in each category was calculated only for those for whom this is known; cases whose ICU/HDU admission status was unknown were not included in the denominator. The proportion of deaths in each category was calculated only for those for whose outcome was known; cases still on treatment or whose outcome was unknown were not included in the dominator.

Table5: Patient characteristic by level of mechanical ventilation (all sites)[15]

Characteristic	Total N(%)	Any ventilation n (%)	Ventilator (non-invasive) n (%)	Ventilator (invasive) n (%)	High flow oxygen n (%)	ECMO n (%)	Other n (%)
All cases	53,224	31,651	3,969	5,925	2,061	267	9,164
		(59.5)	(9.2)	(13.7)	(4.8)	(0.6)	(21.3)
Not known	-	-	10,003	10,003	10,003	10,003	10,114
			(18.8)	(18.9)	(18.8)	(18.8)	(19.0)
Age group							
0-44	6,334	3,429	475	695	179	109	874
	(11.9)	(10.8)	(12.0)	(11.7)	(8.7)	(40.3)	(9.5)
45-64	15,828	10,641	1,512	3,146	732	147	2,242
	(29.7)	(33.6)	(38.1)	(53.1)	(35.5)	(55.7)	(24.5)
65-74	10,388	6,591	923	1,563	416	8	1,636
	(19.5)	(20.8)	(23.3)	(26.4)	(20.2)	(3.0)	(17.9)
75+	20,664	10,990	1,059	521	734	3	4,412
	(38.8)	(34.7)	(26.7)	(8.8)	(35.6)	(1.1)	(48.1)
Sex							
Female	23,130	12,877	1,387	1,627	803	70	4,075
	(43.5)	(40.7)	(34.9)	(27.5)	(39.0)	(26.2)	(44.5)
Male	30,094	18,774	2,582	4,298	1,258	197	5,089
	(56.5)	(59.3)	(65.1)	(72.5)	(61.0)	(73.8)	(55.5)
Healthcare worker							
Yes	1,271	852	162	343	67	45	142
	(4.7)	(5.6)	(6.4)	(8.0)	(4.1)	(20.1)	(2.6)
No	25,719	14,448	2,377	3,922	1,565	179	5,260
	(95.3)	(94.4)	(93.6)	(92.0)	(95.9)	(79.9)	(97.4)
Smoker							
Yes	2,162	1,033	142	147	217	2	5
	(38.3)	(40.2)	(33.4)	(39.2)	(38.4)	(28.6)	(41.7)
No	3,478	1,535	283	228	348	5	7
	(61.7)	(59.8)	(66.6)	(60.8)	(61.6)	(71.4)	(58.3)
Pregnant (female only)							
Yes	345	68	10	18	6	5	29
	(3.5)	(1.2)	(0.9)	(1.5)	(1.4)	(7.8)	(1.1)
No	9,375	5,656	1,126	1,223	438	59	2,636
	(96.5)	(98.8)	(99.1)	(98.5)	(98.6)	(92.2)	(98.9)
Close contact setting (contact of a COVID-19 case)							
Yes	2,288	879	227	104	234	5	8
	(75.3)	(64.4)	(90.1)	(61.5)	(78.3)	(100)	(100)
No	749	485	25	65	65	-	-
	(24.7)	(35.6)	(9.9)	(38.5)	(21.7)	-	-
Days between onset and hospitalisation							
0-4	21,366	12,712	2,048	2,482	1,048	123	6,441
	(60.5)	(61.0)	(56.1)	(45.4)	(56.0)	(48.8)	(79.2)
5-9	6,194	4,174	954	1,634	425	51	657
	(17.5)	(20.0)	(26.1)	(29.9)	(22.7)	(20.2)	(8.1)
10+	4,183	2,685	540	1,058	278	77	403
	(11.8)	(12.9)	(14.8)	(19.4)	(14.8)	(30.6)	(5.0)
Onset in hospital	3,581	1,254	109	289	122	1	629
	(10.1)	(6.0)	(3.0)	(5.3)	(6.5)	(0.4)	(7.7)

[15] The proportion of ventilation types in each category was calculated only for those for whom this is known; cases for whom the ventilation type was not known were not included in the denominators.

Table 6: Patient characteristic by level of mechanical ventilation (excluding English data)[16]

Characteristic	Total N(%)	Any ventilation n (%)	Ventilator (non-invasive) n (%)	Ventilator (invasive) n (%)	High flow oxygen n (%)	ECMO n (%)	Other n (%)
All cases	17,504	12,212 (69.8)	573 (7.6)	525 (7.0)	822 (11.0)	14 (0.2)	13 (0.2)
Missing data	-	-	10,003 (57.1)	10,003 (57.1)	10,003 (57.1)	10,003 (57.1)	10,114 (57.8)
Age group							
0-44	2,012 (11.5)	1,278 (10.5)	68 (11.9)	47 (9.0)	64 (7.8)	2 (14.3)	- -
45-64	4,997 (28.5)	3,564 (29.2)	209 (36.5)	229 (43.6)	255 (31.0)	5 (35.7)	4 (30.8)
65-74	3,380 (19.3)	2,472 (20.2)	84 (14.7)	173 (33.0)	161 (19.6)	5 (35.7)	4 (30.8)
75+	7,115 (40.6)	4,898 (40.1)	212 (37.0)	76 (14.5)	342 (41.6)	2 (14.3)	5 (38.5)
Sex							
Female	8,323 (47.5)	5,676 (46.5)	256 (44.7)	152 (29.0)	346 (42.1)	1 (7.1)	6 (46.2)
Male	9,181 (52.5)	6,536 (53.5)	317 (55.3)	373 (71.0)	476 (57.9)	13 (92.9)	7 (53.8)
Healthcare worker							
Yes	453 (5.6)	170 (5.6)	19 (3.5)	25 (5.1)	33 (4.4)	- -	- -
No	7,629 (94.4)	2,878 (94.4)	527 (96.5)	465 (94.9)	723 (95.6)	11 (100)	7 (100)
Smoker							
Yes	2,162 (38.3)	1,033 (40.2)	142 (33.4)	147 (39.2)	217 (38.4)	2 (28.6)	5 (41.7)
No	3,478 (61.7)	1,535 (59.8)	283 (66.6)	228 (60.8)	348 (61.6)	5 (71.4)	7 (58.3)
Pregnant (female only)							
Yes	56 (3.3)	1 (0.2)	- -	1 (1.7)	- -	- -	- -
No	1,636 (96.7)	568 (99.8)	214 (100)	58 (98.3)	121 (100)	1 (100)	- -
Close contact setting (contact of a COVID-19 case)							
Yes	2,288 (75.3)	879 (64.4)	227 (90.1)	104 (61.5)	234 (78.3)	5 (100)	8 (100)
No	749 (24.7)	485 (35.6)	25 (9.9)	65 (38.5)	65 (21.7)	- -	- -
Days between onset and hospitalisation							
0-4	3,092 (38.1)	1,275 (38.1)	188 (33.2)	136 (27.5)	369 (45.8)	5 (38.5)	7 (63.6)
5-9	2,712 (33.4)	1,189 (35.5)	249 (43.9)	220 (44.4)	258 (32.0)	5 (38.5)	4 (36.4)
10+	1,767 (21.8)	713 (21.3)	124 (21.9)	120 (24.2)	137 (17.0)	3 (23.1)	-
Onset in hospital	549 (6.8)	171 (5.1)	6 (1.1)	19 (3.8)	42 (5.2)	-	-

[16] The proportion of ventilation types in each category was calculated only for those for whom this is known; cases for whom the ventilation type was not known were not included in the denominators.

Limitations of the surveillance data

The surveillance data has a number of limitations.

The definition of a confirmed case potentially includes patients who were hospitalised during the surveillance period for reasons other than COVID-19, but who were incidentally swab positive for SARS-CoV2 shortly prior to, during or after admission. This may bias the results e.g. in favour of less severe outcomes.

Two-thirds of the cases (36,029/54,904; 66%) were reported from one site (England), which submitted data on cases from almost all hospitals nationwide. In England, as ICU/HDU reporting of COVID-19 cases is mandatory, these patients may therefore have been over-represented in the pooled dataset. This may bias the results in favour of more severe outcomes. For this reason, some of the figures and tables presented in this bulletin exclude data from England.

Intra- and inter-country/site differences in the timeframe over which data have been submitted, as well as potential variation in reporting practice and completeness over time, mean that both the pooled descriptions of patient characteristics and site specific analysis of epidemic progression, should be interpreted with caution. In the second wave of the epidemic, some sites have opted to systematically recruit cases on 1 or 2 days per week, rather than daily.

Data for patient outcomes have not been censored. This may introduce bias into the report findings by including recently hospitalised patients for whom outcome is not yet determined.

Containment and mitigation strategies, and healthcare-seeking guidance during the COVID-19 pandemic have differed between countries, and within countries over time. For example, members of the public may have been advised to contact primary care services by telephone on first observation of initial (milder) symptoms, or advice might be instead to stay at home and only contact emergency services when/if symptoms worsen. In some countries the recommended management strategy for those who are ill, together with the individual's healthcare-seeking behaviour, might have had an impact on the time between onset of symptoms and hospitalisation or the collection of a respiratory sample specimen for a diagnostic test. This in turn may influence outcomes between surveillance sites, or at particular sites at different points in the epidemic. For this reason, alongside the collection of dates of symptom onset, admission and testing, place-time variation in case-containment and mitigation strategies, and healthcare-seeking behaviour needs to be considered when interpreting results.

Annexes

Annex A. The I-MOVE-COVID-19 project

A.1 Background

The I-MOVE (Influenza – Monitoring Vaccine Effectiveness in Europe) project was initiated in 2007 and was the first network to monitor influenza vaccine effectiveness (VE) within Europe. The network has two components, one for primary care practices, recruiting patients with influenza-like illness (ILI) and the other for hospitals, recruiting patients with severe acute respiratory illness (SARI).

The emergence of a novel severe acute respiratory syndrome – coronavirus 2 (SARS-CoV-2) occurred at the end of 2019, which caused the coronavirus disease 2019 (COVID-19). As of 22nd February 2021 (the time of writing), there had been 110,974,862 confirmed cases of COVID-19 globally, including 2,460,792 deaths, reported to the World Health Organization.[17]

In February 2020, partners already involved in studies within the I-MOVE network, came together as the I-MOVE-COVID-19 consortium and successfully bid for the European Commission H2020 call on "Advancing knowledge for the clinical and public health response to the novel coronavirus epidemic".

The I-MOVE-COVID-19 consortium aims to obtain epidemiological and clinical information on patients with COVID-19 as well as virological information on SARS-CoV-2, through different work packages (WPs): (a) provision of a flexible surveillance platform, adaptable to the epidemiological situation, through WP2 (primary care surveillance) and WP3 (hospital surveillance), (b) research studies, through WP4 and (c) evaluation of public health interventions (e.g. vaccination, antivirals) in WP2–4, in order to contribute to the knowledge base, guide patient management, and inform the public health response. This is being achieved through adaptation and expansion of the existing I-MOVE network to include COVID-19. The network includes primary care networks, hospitals, and national laboratory reference centres in 13 countries across the WHO European Region.[18]

The WP3 hospital surveillance for COVID-19 is coordinated by Public Health Scotland (PHS) with Epiconcept support. The hospital network comprises 11 surveillance sites involving hospitals in six EU Member States,[19] England, Scotland, and Albania (with two of the EU member state countries having two sites each). The laboratory component of the network includes regional and national reference centres from the participating countries. While each of the surveillance sites can analyse their data separately, pooling the data for overall analysis will provide a sample size big enough to describe trends and generate hypotheses (surveillance), and answer research questions.

[17] Source: World Health Organisation (WHO) Situation Report dashboard. Available at: https://covid19.who.int/. Accessed 22 February 2021.

[18] Albania Belgium, Croatia, France, Germany, Ireland, Lithuania, the Netherlands, Portugal, Romania, Spain, Sweden and the UK (England and Scotland).

[19] Belgium, France, Lithuania, Portugal, Romania, and Spain

This document presents the first surveillance bulletin for the hospital-based surveillance component of I-MOVE-COVID-19 for 2020. The specificities of each site's COVID-19 data collection are detailed in the individual site protocol annexes.

A.2 Objectives of the I-Move Surveillance

Primary objectives

The main objective of the I-Move is to describe, for nine European countries, clinical and epidemiological characteristics of patients hospitalised with COVID-19 and virological characteristics of SARS-CoV-2 in hospitalised patients, in order to contribute to the knowledge base, guide patient management, and inform the public health response.

Secondary objectives

Potential secondary objectives include:

- To strengthen preparedness to respond to COVID-19 through hospital surveillance.
- To describe COVID-19 suspected, probable and confirmed cases with severe disease by sex, age-group, and other potential risk or protective factors.
- To describe deaths from COVID-19 in hospital by country and pooled across the network.
- To measure the incidence of hospitalised COVID-19 patients, by participating region/country (where appropriate) in order to measure the impact of/inform decisions on mitigation measures, and to identify at-risk groups for severe disease.

Additional future objectives

Additional future objectives include to:

- Investigate risk factors for severe COVID-19 in hospitalised patients.
- Investigate risk factors for COVID-19 in HCW's at hospital level.

Annex B. Methods

B.1 Active hospital-based surveillance of COVID-19 at European level

Type of surveillance

- Multi-centre population-based surveillance over several countries/regions

Population under surveillance

- The surveillance population consists of the entire population living in the catchment areas of the participating hospitals.

B.2 Surveillance and study period

The surveillance period started in March 2020, although some sites submitted data retrospectively from January 2020. Participating hospitals carry out surveillance throughout the year. This third surveillance report is for the period from 01 February 2020 to 29 November 2020.

B.3 Outcomes

The two primary outcomes of interest are laboratory-confirmed COVID-19 in patients hospitalised with suspected COVID-19, and severe COVID-19 in patients hospitalised with suspected COVID-19.

The secondary outcomes of interest are:

- Suspected COVID-19 cases
- Probable COVID-19 cases
- Laboratory-confirmed SARS-CoV-2 by viral genetic clade (where possible).

Annex C. Case definitions

C.1 Hospitalised patient

A hospitalised patient is defined as a patient who has been admitted to one of the participating hospitals during the surveillance period, and has not been discharged home or home-equivalent before 24h.

C.2 COVID patient

Confirmed case of COVID-19 (confirmed case)

A confirmed COVID-19 is defined as a patient hospitalised during the surveillance period with a respiratory sample positive for SARS-CoV-2.

Probable case of COVID-19 (probable case)

A probable COVID-19 case will be defined as a patient hospitalised with suspected COVID-19 during the surveillance period for whom

- testing for virus causing COVID-19 is inconclusive (according to the test results reported by the laboratory)

OR

- testing was positive on a pan-coronavirus assay

OR

- no laboratory tests are available but there is clinical confirmation with suggestive radiology

Suspected COVID-19 patient

A suspected COVID-19 patient is defined as a hospitalised person with:

- at least one systemic symptom or sign: fever or feverishness, malaise, headache or myalgia or deterioration of general condition (asthenia or loss of weight or anorexia or confusion or dizziness)

AND

- at least one respiratory symptom or sign (cough, sore throat or shortness of breath; **or** tachypnoea **or** signs of low oxygen saturation)

at admission or within 48 hours after admission.

All patients fulfilling the above criteria, until they are re-classified as COVID-19 negative, probable or confirmed (see below), are considered as suspected COVID-19 patients.

C. 3 Severe COVID-19 case

For the purposes of surveillance, all patients hospitalised due to confirmed COVID-19 disease are severe COVID-19 cases. However, these hospitalised patients will be further classified as "severe hospitalised COVID-19 patients" if they have any of the following clinically, analytically or radiologically significant alterations/outcomes mentioned in the admission or discharge diagnosis:

- Bilateral pneumonia with ground-glass opacities
- Admitted to ICU/HDU
- On ventilation
    - Invasive (i.e. with intubation)
    - non-invasive (e.g. high-flow oxygen; or those needing >6L)
- Extracorporeal membrane oxygenation (ECMO)
- Death

C. 3 COVID-19 death

A COVID-19 death is defined as a probable or confirmed COVID-19 case who died during hospitalisation.

C4 Exclusion criteria for surveillance

All COVID-19 patients will be included in the surveillance unless the surveillance site/country requires consent and patient is unwilling to participate or unable to communicate and give consent (the consent may also be given by her/his legal representative, or by specific consent procedures, acceptable according to the local ethical review process)

Note: in some countries, individual patient consent is not required for routine surveillance.