Public Health England

Protecting and improving the nation's health

SARS-CoV-2 variant data update, England

Version 13

17 September 2021

This briefing provides an update on previous data located in technical and variant data update briefings and updates up to 13 September 2021.

Contents

Surveillance data overview

This document includes routine data on variants of concern and under investigation. Delta (VOC-21APR-02, B.1.617.2) is detailed in technical briefing 23.

Table 1 shows the current VOC, VUI, and variants in monitoring as of 13 September 2021.

Table 1. Variant lineage and designation as of 13 September 2021

WHO nomenclature	Lineage	Designation	Status	UK or International (not currently detected in UK)
Alpha	B.1.1.7	VOC-20DEC-01	VOC	UK
Beta	B.1.351	VOC-20DEC-02	VOC	UK
Gamma	P.1	VOC-21JAN-02	VOC	UK
Delta	B.1.617.2, AY.1, AY.2, AY.3 and AY.4	VOC-21APR-02	VOC	UK
Eta	B.1.525	VUI-21FEB-03	VUI	UK
	B.1.1.318	VUI-21FEB-04	VUI	UK
Theta^	P.3	VUI-21MAR-02	VUI	UK
	B.1.617.3	VUI-21APR-03	VUI	International
	AV.1	VUI-21MAY-01	VUI	UK
	C.36.3	VUI-21MAY-02	VUI	UK
Lambda	C.37	VUI-21JUN-01	VUI	UK
Mu	B.1.621	VUI-21JUL-01	VUI	UK
Epsilon^	B.1.427/B.1.429		Monitoring	
	B.1.1.7 with S494P		Monitoring	
	A.27		Monitoring	
Iota	B.1.526		Monitoring	
	B.1.1.7 with Q677H		Monitoring	
	B.1.620		Monitoring	
	B.1.214.2		Monitoring	
	R.1		Monitoring	

WHO nomenclature	Lineage	Designation	Status	UK or International (not currently detected in UK)
	B.1 with 214insQAS		Monitoring	
	AT.1		Monitoring	
	A.30		Monitoring	
	P.1 + N501T and E484Q		Monitoring	
	B.1.629		Monitoring	
	B.1.619		Monitoring	
	C.1.2		Monitoring	
	B.1.630		Monitoring	
	B.1.631/B.1.628		Monitoring	
	P.1.8		Monitoring	

Provisionally extinct variants are excluded from this table.

VOCs and VUIs are monitored weekly for observations within the last 12 weeks. If variants have not been detected in the UK within this period, they are moved to international status with continued monitoring. If a VOC or VUI has not been observed in the UK or international datasets within the preceding 12 weeks, it is designated as provisionally extinct, but monitoring remains in place.

The last documented case of VUI-21APR-03 (B.1.617.3) was on the 17 May 2021 in the UK, this variant was moved to international monitoring on the 16 August 2021.

VUI-21FEB-01 (A.23.1 with E484K), VOC-21FEB-02 (B.1.1.7 with E484K), VUI-21MAR-01 (B.1.324.1 with E484K), Kappa - VUI-21APR-01 (B.1.617.1) - and Zeta - VUI-21JAN-01 (P.2) - have not been observed in the UK or within the international GISAID dataset within the last 12 weeks. These variants are no longer included in the data update.

^ Epsilon, Zeta and Theta were de-escalated by ECDC and by WHO. Mu was designated on the 30 August 2021.

Data on individual variants

Alpha

This variant was designated VUI 202012/01 (B.1.1.7) on detection and on review re-designated as VOC-20DEC-01 (202012/01, B.1.1.7) on 18 December 2020. This was named Alpha by the World Health Organization (WHO) on 31 May 2021.

International epidemiology

GISAID includes data on sequences available internationally. As of 14 September 2021, 816,522 sequences of Alpha are listed from 177 countries or territories on GISAID, excluding the UK.

Epidemiology

Table 2. Number of confirmed and provisional Alpha cases, by region of residence as of 13 September 2021

Region	Confirmed case number	Provisional case number[1]	Total case number	Proportion of total cases
East Midlands	16,234	488	16,722	7.4%
East of England	19,911	179	20,090	8.8%
London	40,572	771	41,343	18.2%
North East	14,823	114	14,937	6.6%
North West	42,038	1,762	43,800	19.3%
South East	24,057	119	24,176	10.6%
South West	8,157	53	8,210	3.6%
West Midlands	18,355	1,303	19,658	8.7%
Yorkshire and Humber	35,976	890	36,866	16.2%
Unknown region	1,384	28	1,412	0.6%
Total	221,507	5,707	227,214	-

[1] Genotyping is used to identify variants Alpha, Beta, Delta and Gamma. Genotyping targets were updated in mid-May 2021 to prioritise the accurate identification of Delta over Alpha.

Figure 1. Confirmed and provisional Alpha cases by specimen date and region of residence as of 13 September 2021
(Find accessible data used in this graph in underlying data.)

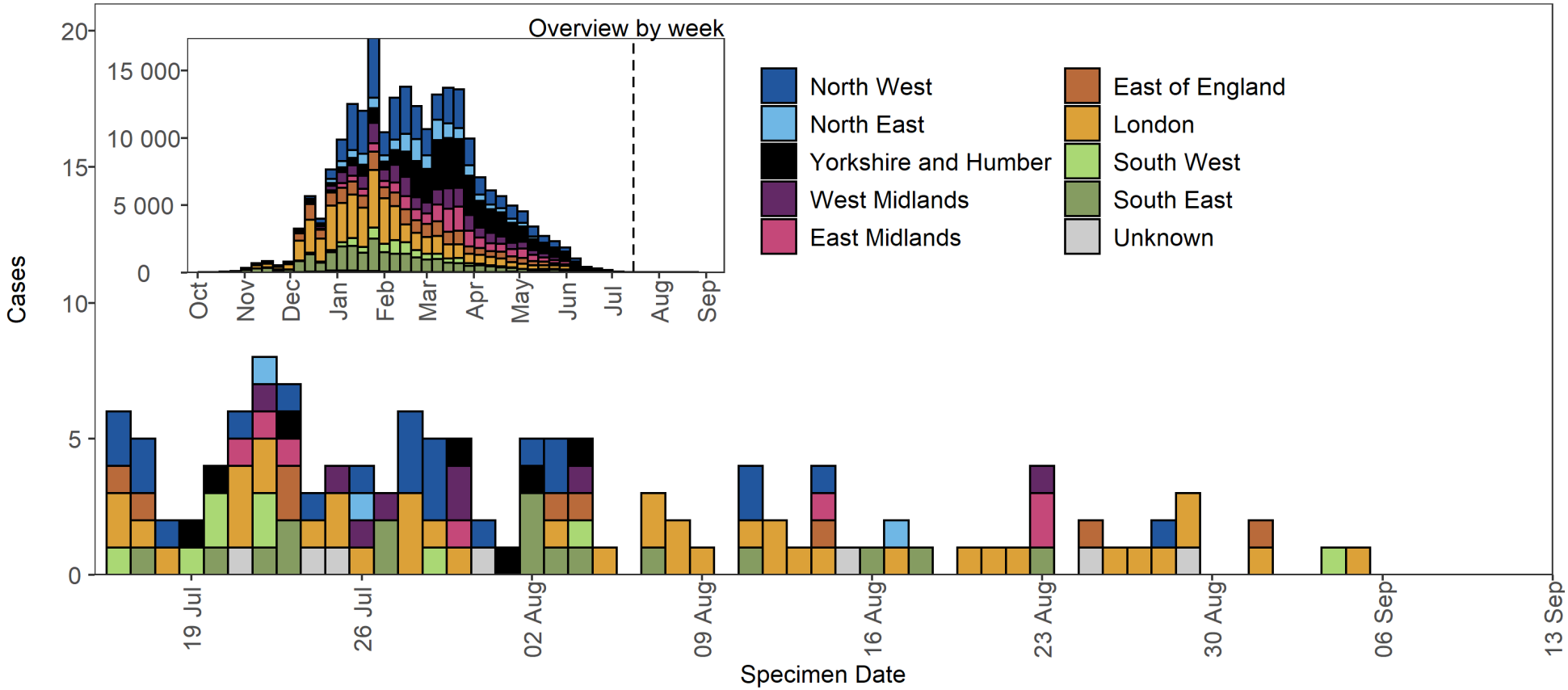


Figure 2. Confirmed and provisional Alpha cases by specimen date and detection method as of 13 September 2021
(Find accessible data used in this graph in underlying data.)

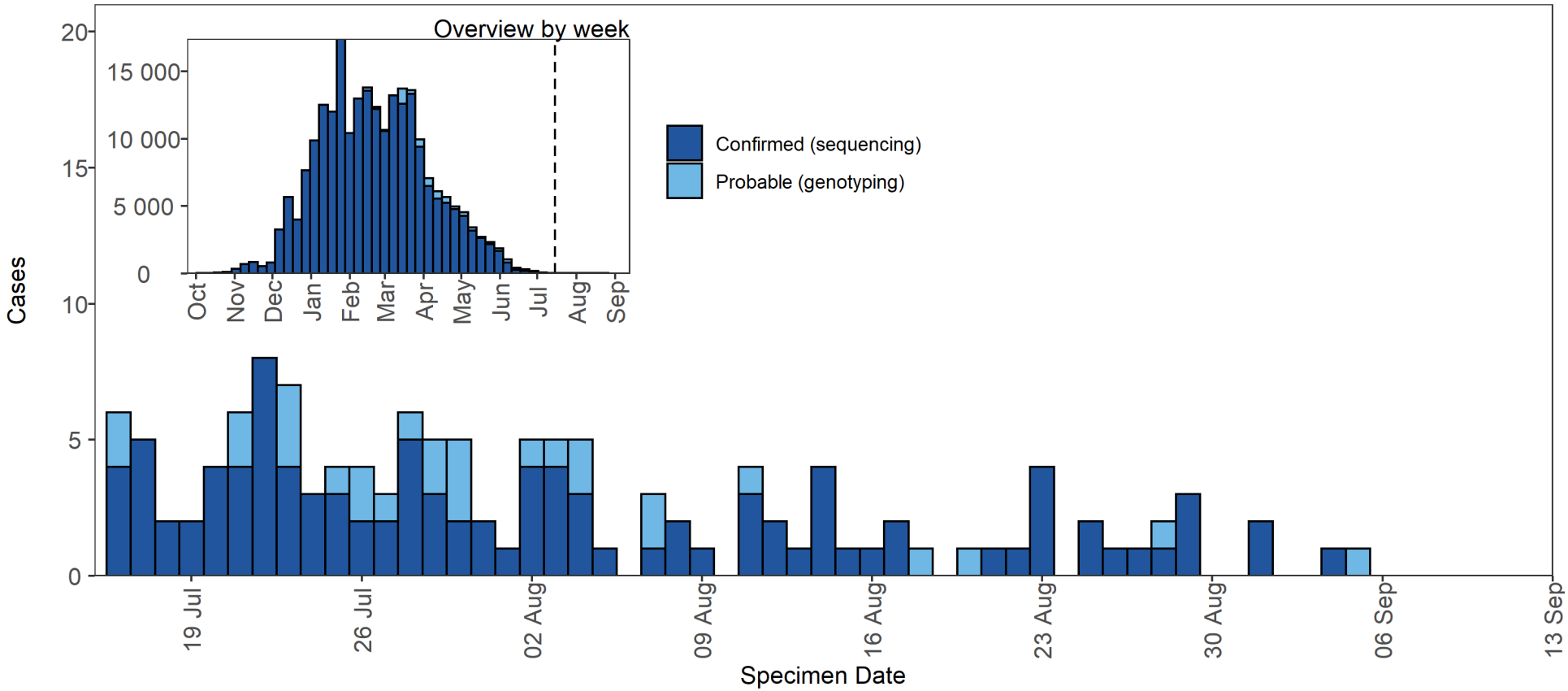
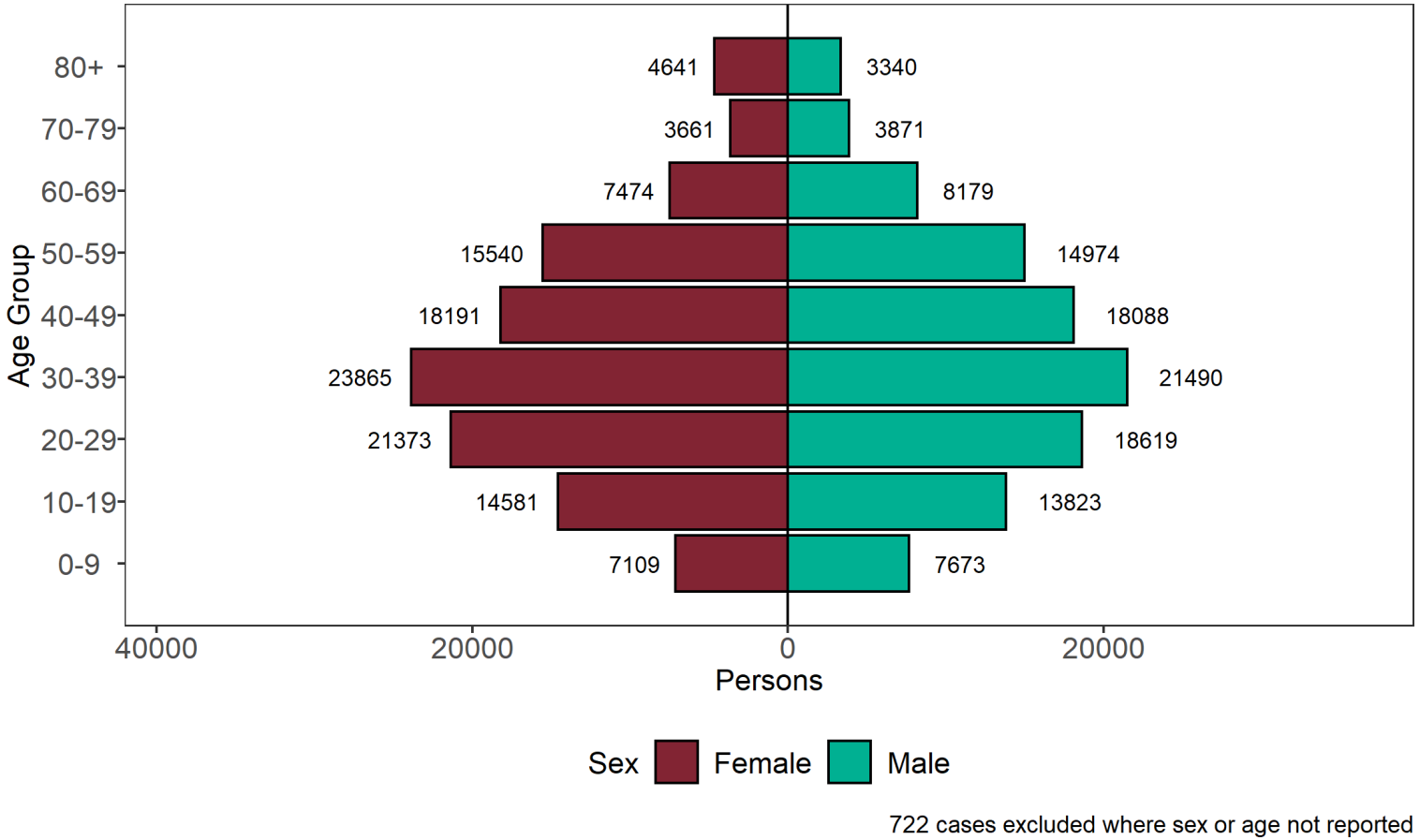


Figure 3. Age and sex pyramid of Alpha cases as of 13 September 2021
(Find accessible data used in this graph in **underlying data.**)



722 cases excluded where sex or age not reported

Beta

B.1.351 was initially detected in South Africa. This variant was designated variant under investigation on detection and on review re-designated as VOC-20DEC-02 (B.1.351) on 24 December 2020. It was named Beta by WHO on 31 May 2021.

International epidemiology

GISAID includes data on sequences available internationally. As of 14 September 2021, 30,100 sequences of Beta, are listed from 107 countries or territories, excluding the UK.

Epidemiology

Table 3. Number of confirmed and provisional Beta (B.1.351) cases, by region of residence as of 13 September 2021

Region	Confirmed case number	Provisional case number[1]	Total case number	Proportion of total cases
East Midlands	49	3	52	5.2%
East of England	82	4	86	8.6%
London	428	31	459	46.1%
North East	19	6	25	2.5%
North West	81	9	90	9.0%
South East	116	5	121	12.1%
South West	32	1	33	3.3%
West Midlands	64	1	65	6.5%
Yorkshire and Humber	32	7	39	3.9%
Unknown region	22	4	26	2.6%
Total	925	71	996	-

[1] Genotyping is used to identify variants Alpha, Beta, Delta and Gamma. Genotyping targets were updated in mid-May 2021 to prioritise the accurate identification of Delta over Alpha.

Figure 4. Confirmed and provisional Beta cases by specimen date and region of residence as of 13 September 2021
Larger plot includes last 60 days only. (Find accessible data used in this graph in underlying data.)

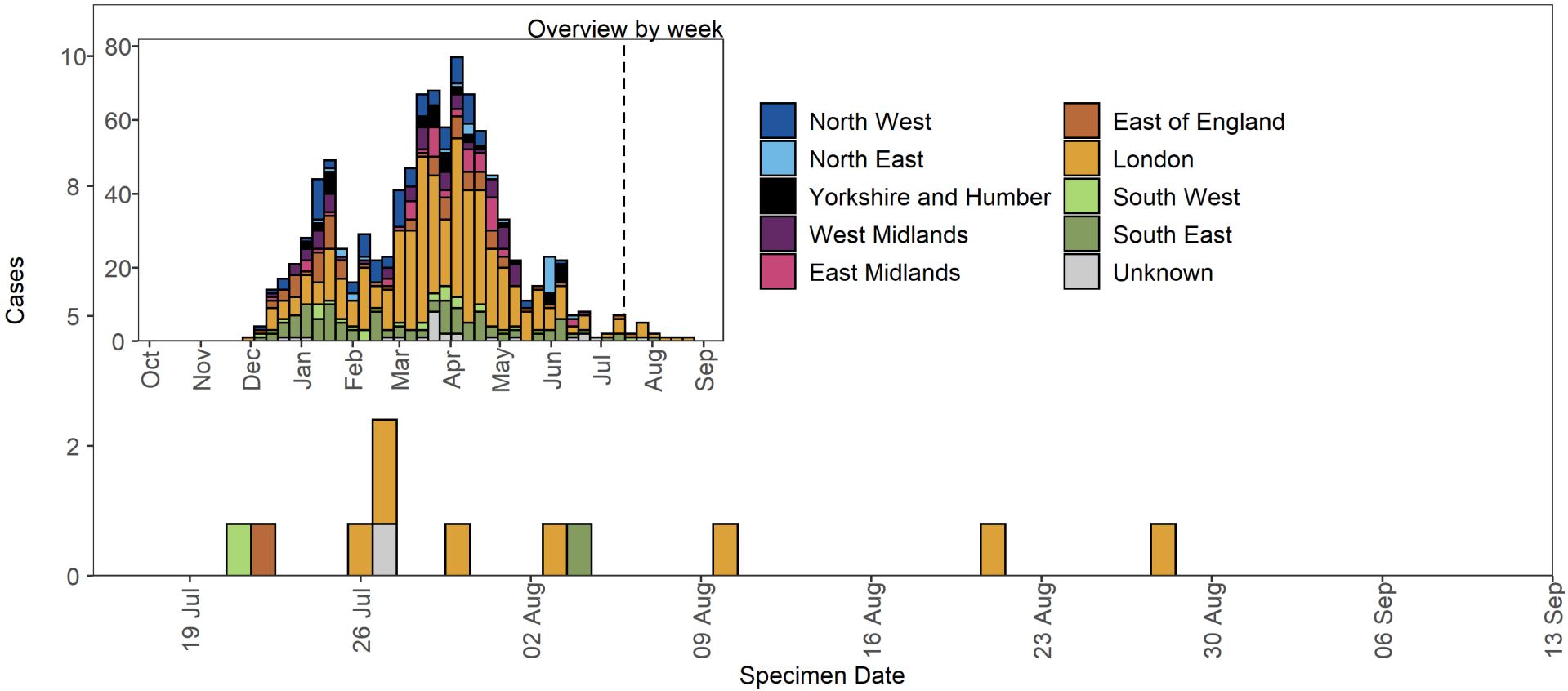


Figure 5. Confirmed and provisional Beta cases by specimen date and detection method as of 13 September 2021
Larger plot includes last 60 days only. (Find accessible data used in this graph in underlying data.)

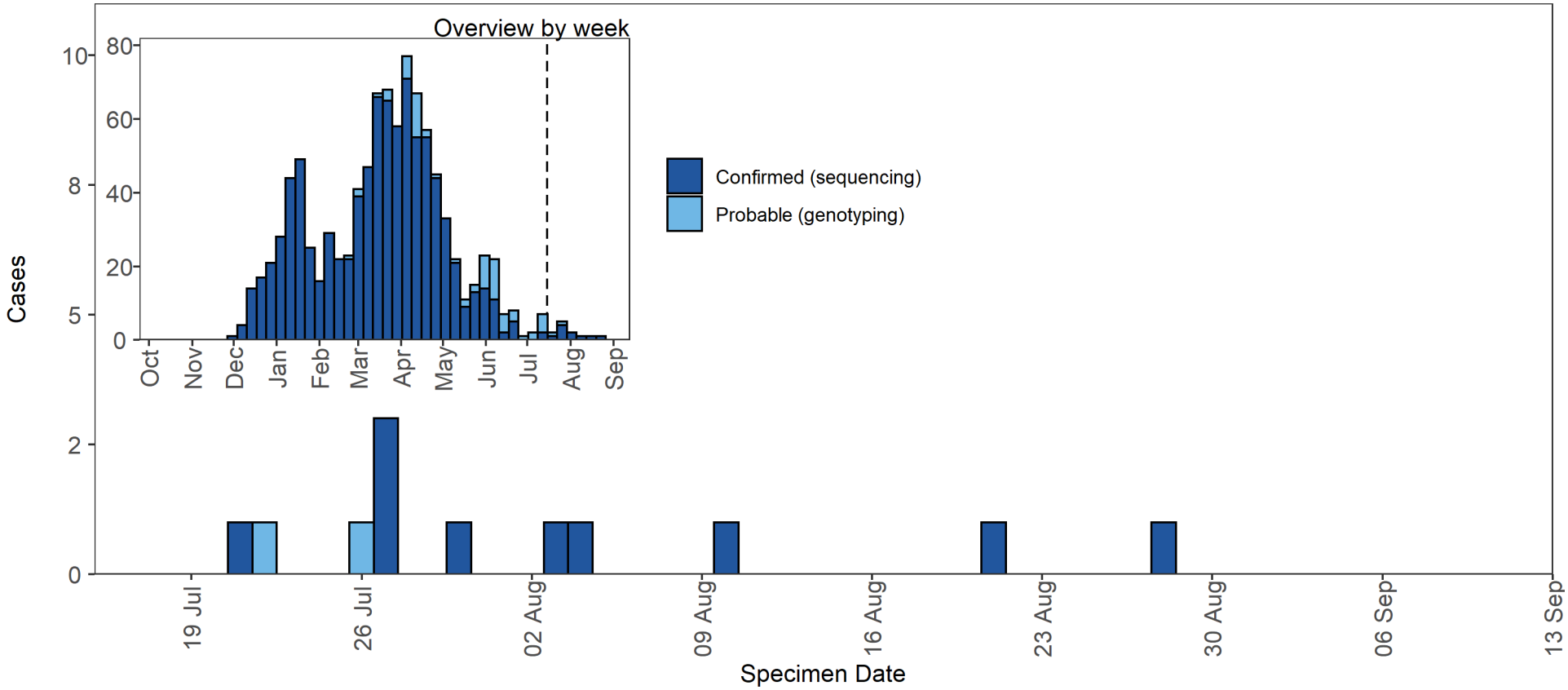
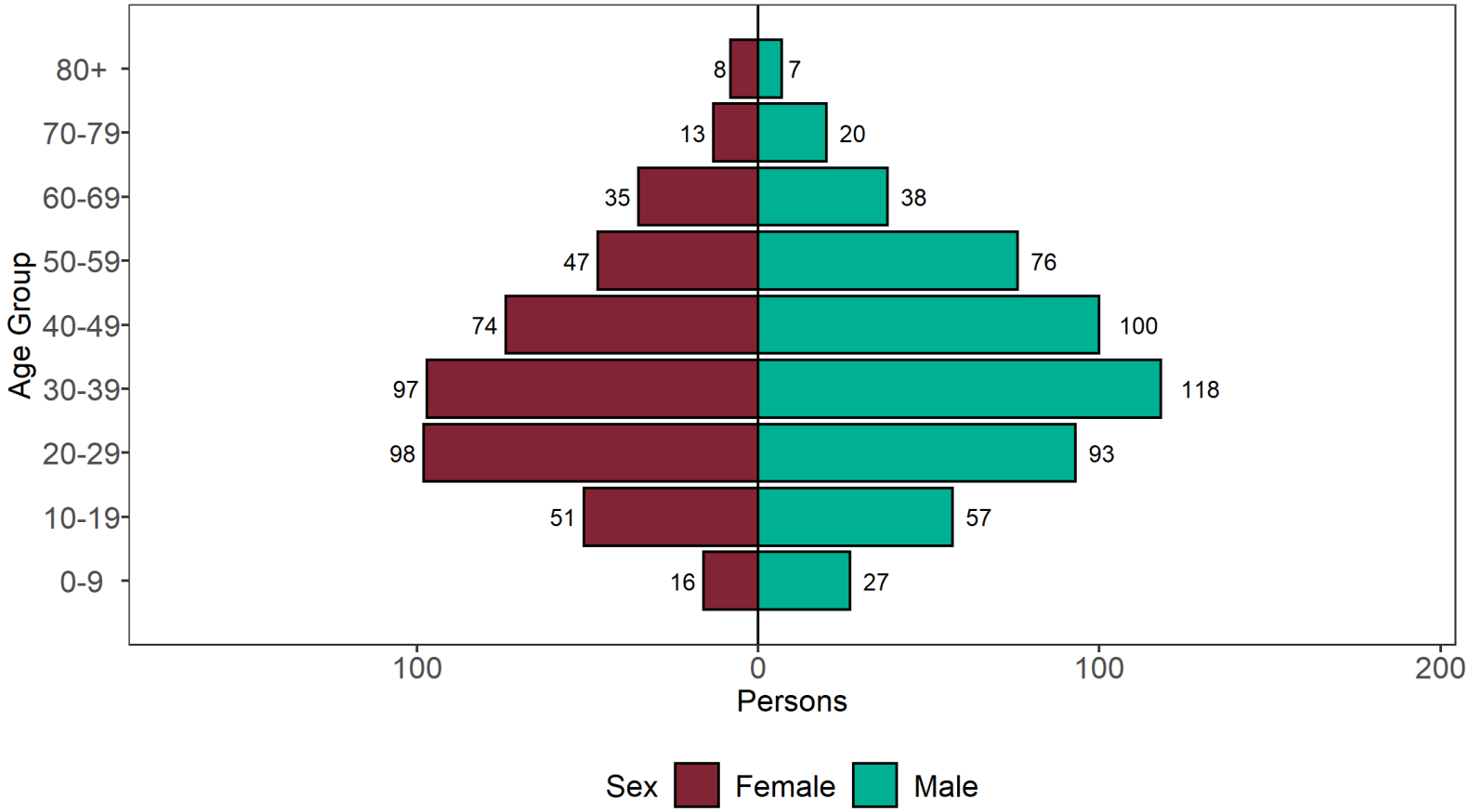


Figure 6. Age and sex pyramid of Beta cases as of 13 September 2021
(Find accessible data used in this graph in underlying data.)



21 cases excluded where sex or age not reported

Gamma

First identified in Japan amongst travellers from Brazil. The P.1 lineage is a descendant of B.1.1.28. This variant was designated variant under investigation on detection and on review re-designated as VOC-21JAN-02 (P.1) on 13 January 2021. This was named Gamma by WHO on 31 May 2021.

International epidemiology

GISAID includes data on sequences available internationally. As of 13 September 2021, 79,833 sequences (excluding the UK) of Gamma from 80 countries.

Epidemiology

Table 4. Number of confirmed and provisional Gamma (P.1) cases, by region of residence as of 13 September 2021

Region	Confirmed case number	Provisional case number[1]	Total case number	Proportion of total cases
East Midlands	6	1	7	2.8%
East of England	13	0	13	5.1%
London	122	22	144	56.7%
North East	1	4	5	2.0%
North West	9	1	10	3.9%
South East	29	4	33	13.0%
South West	10	2	12	4.7%
West Midlands	8	5	13	5.1%
Yorkshire and Humber	2	8	10	3.9%
Unknown region	7	0	7	2.8%
Total	207	47	254	-

[1] Genotyping is used to identify variants Alpha, Beta, Delta and Gamma. Genotyping targets were updated in mid-May 2021 to prioritise the accurate identification of Delta over Alpha.

Figure 7. Confirmed and provisional Gamma cases by specimen date and region of residence as of 13 September 2021
Larger plot includes last 60 days only. (Find accessible data used in this graph in underlying data.)

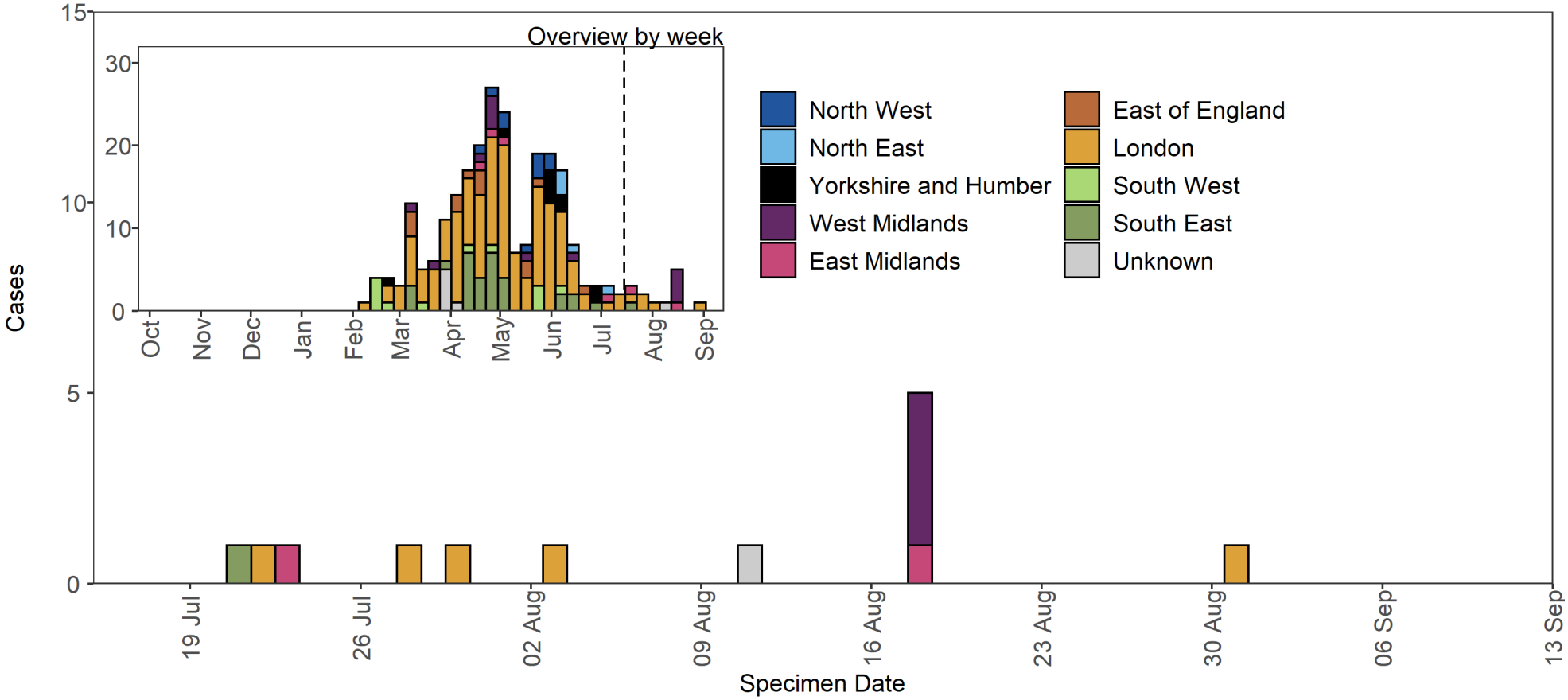


Figure 8. Confirmed and provisional Gamma cases by specimen date and detection method as of 13 September 2021 (Find accessible data used in this graph in underlying data.)

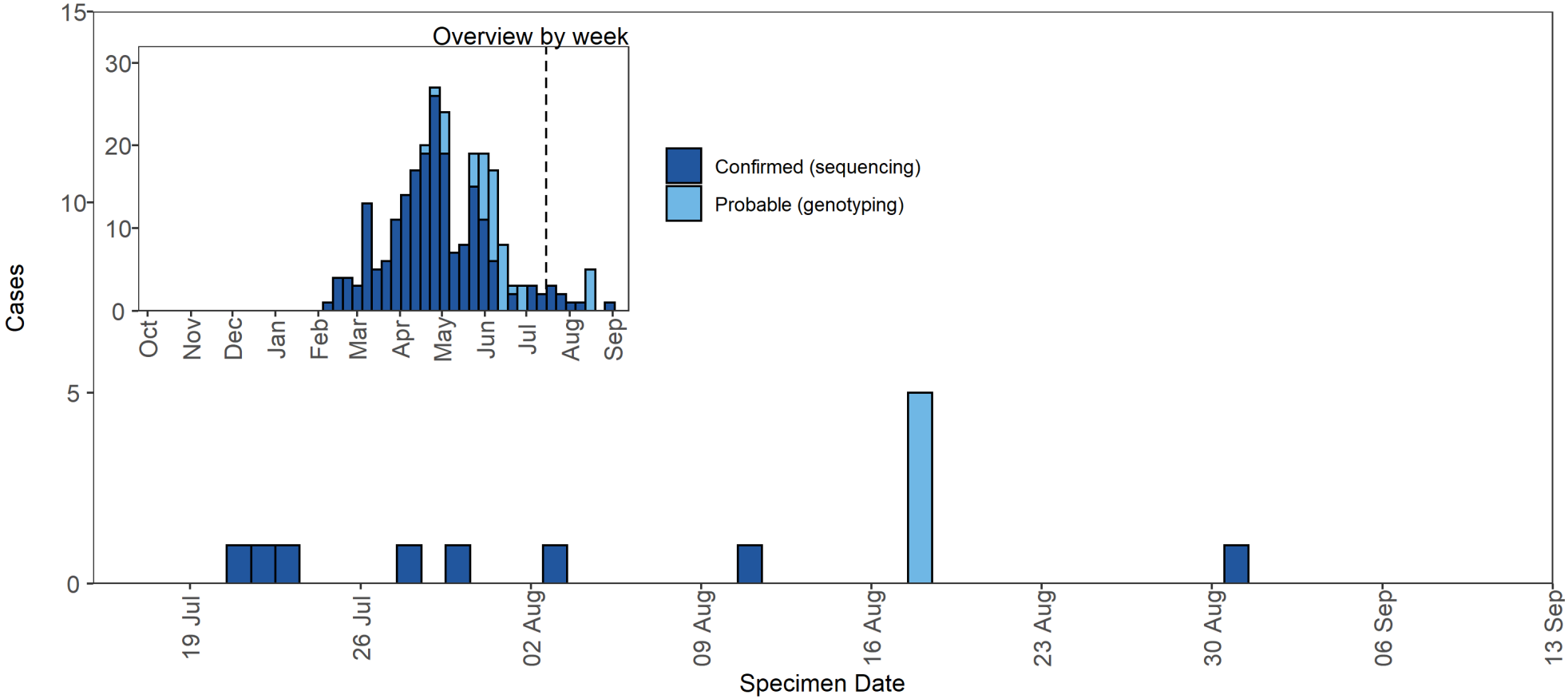
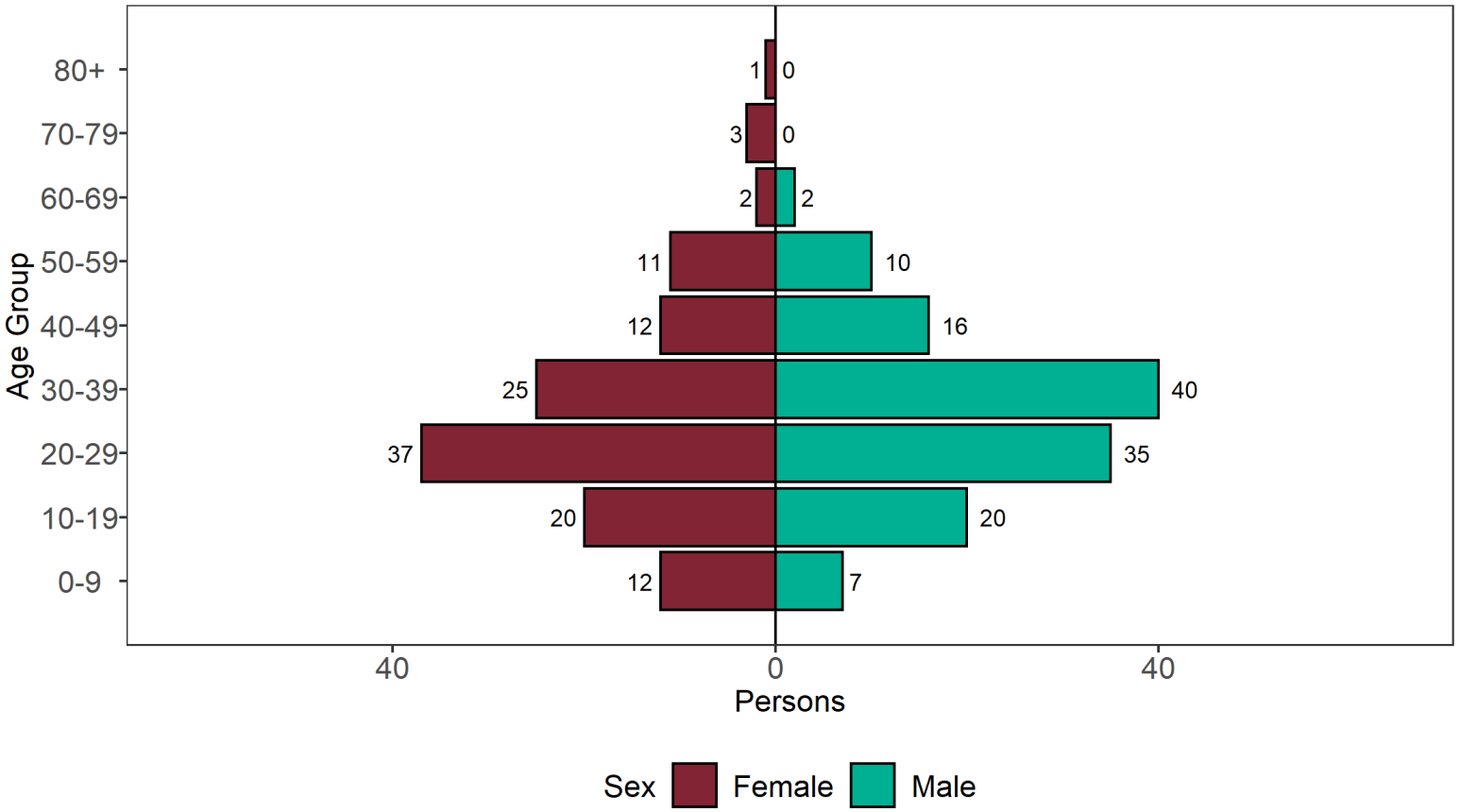


Figure 9. Age and sex pyramid of Gamma cases as of 13 September 2021 (Find accessible data used in this graph in underlying data.)



1 cases excluded where sex or age not reported

Eta

B.1.525 was identified as a geographically dispersed cluster in UK on 2 February 2021. This variant was designated VUI-21FEB-03 (B.1.525) on 12 February 2021. The earliest sample date for VUI-21FEB-03 (B.1.525) in England was 15 December 2020. This was named Eta by WHO on 31 May 2021. Genotyping data is not collected for this variant.

International epidemiology

GISAID includes data on sequences available internationally. As of 14 September 2021, 7,005 sequences of Eta are listed, from 77 countries or territories, excluding the UK.

Epidemiology

Table 5. Number of confirmed and provisional Eta (B.1.525) cases, by region of residence as of 13 September 2021

Region	Total case number	Proportion of total cases
East Midlands	12	2.6%
East of England	30	6.5%
London	166	36.1%
North East	5	1.1%
North West	79	17.2%
South East	82	17.8%
South West	18	3.9%
West Midlands	36	7.8%
Yorkshire and Humber	20	4.3%
Unknown region	12	2.6%
Total	460	-

Figure 10. Confirmed and provisional Eta cases by specimen date and region of residence as of 13 September 2021
Larger plot includes last 60 days only. (Find accessible data used in this graph in underlying data.)

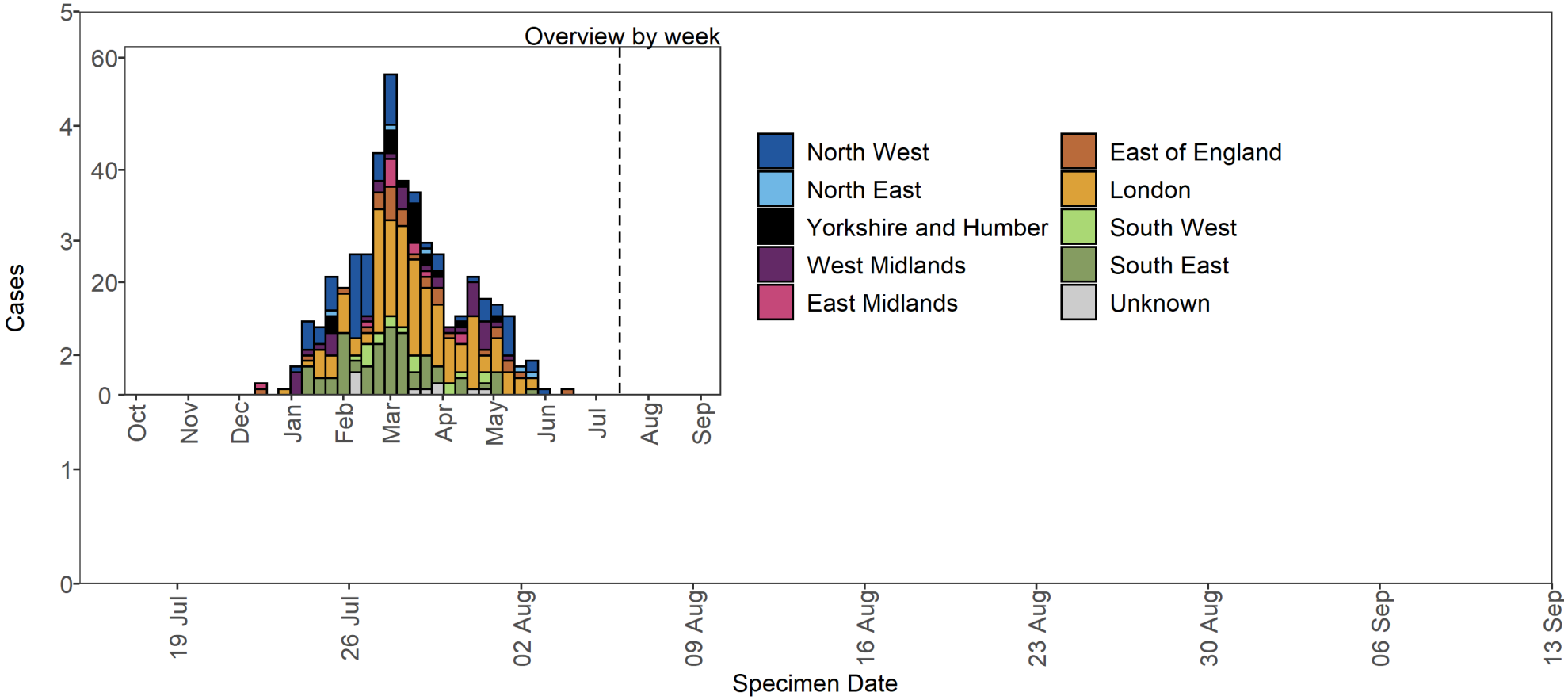
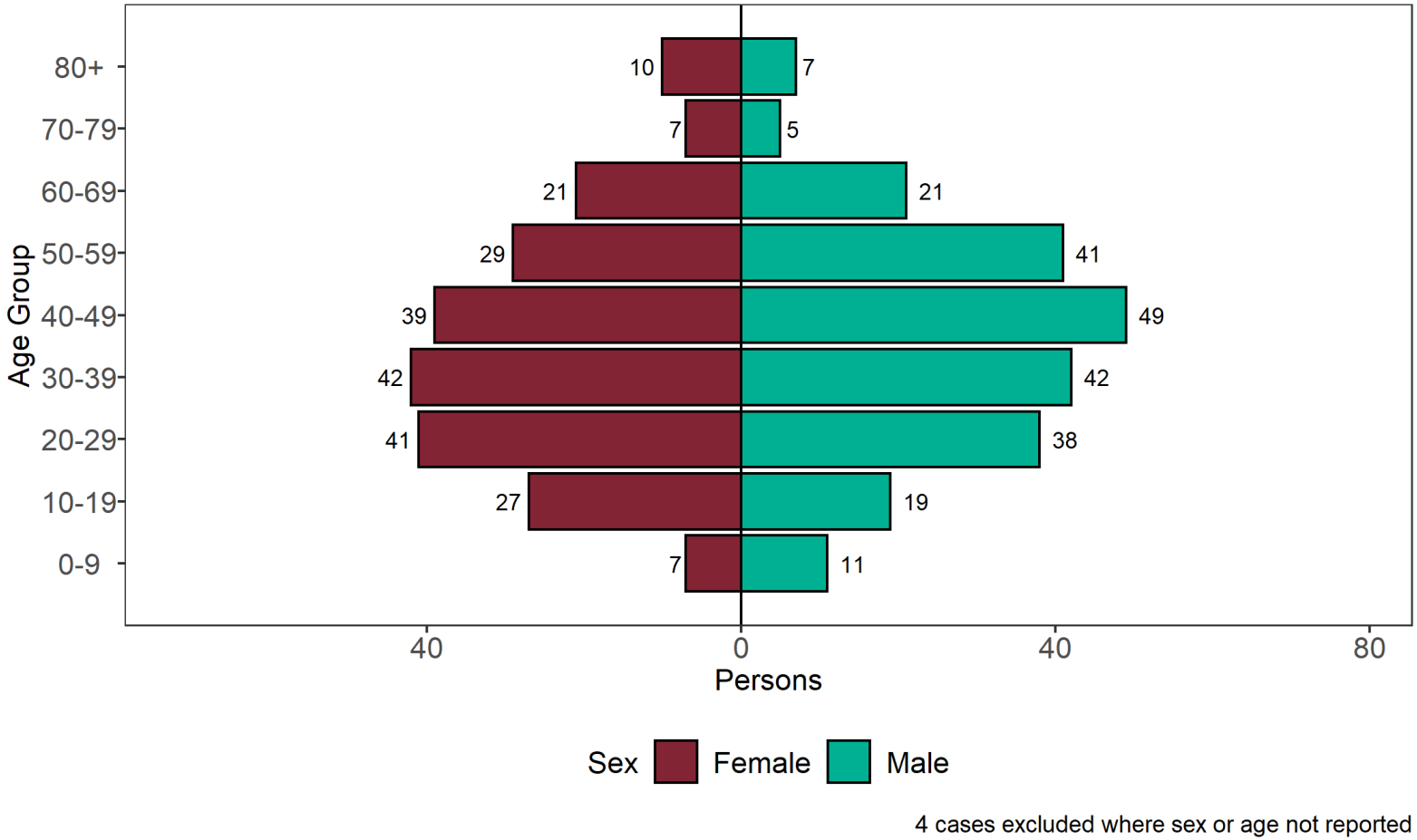


Figure 11. Age and sex pyramid of Eta cases as of 13 September 2021
(Find accessible data used in this graph in underlying data.)



4 cases excluded where sex or age not reported

VUI-21FEB-04 (B.1.1.318)

B.1.1.318 was identified in England in mid-February 2021 through routine horizon scanning for the development of new clusters of genomes containing E484K. This analysis identified an initial cluster of 6 cases containing E484K and other spike mutations, designated VUI-21FEB-04 (B.1.1.318) on 23 February 2021.

International epidemiology

GISAID includes data on sequences available internationally. As of 14 September 2021, 333 international VUI-21FEB-04 sequences from 27 countries, excluding the UK have been identified on GISAID.

Epidemiology

Table 6. Number of confirmed and provisional VUI-21FEB-04 (B.1.1.318) cases, by region of residence as of 13 September 2021

Region	Total case number	Proportion of total cases
East Midlands	12	3.8%
East of England	38	12.1%
London	117	37.3%
North East	2	0.6%
North West	52	16.6%
South East	54	17.2%
South West	3	1.0%
West Midlands	15	4.8%
Yorkshire and Humber	12	3.8%
Unknown region	9	2.9%
Total	314	-

Figure 12. Confirmed and provisional VUI-21FEB-04 cases by specimen date and region of residence as of 13 September 2021
Larger plot includes last 60 days only. (Find accessible data used in this graph in underlying data.)

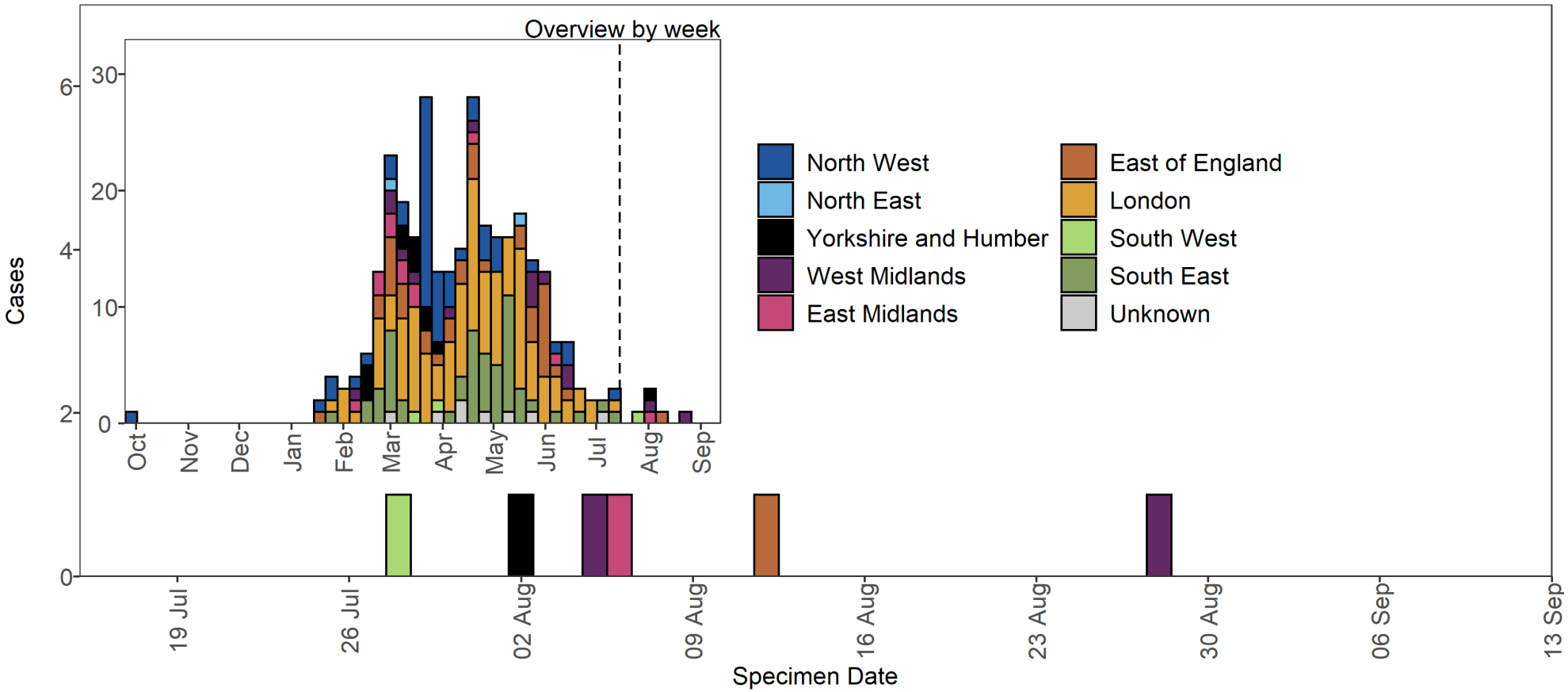
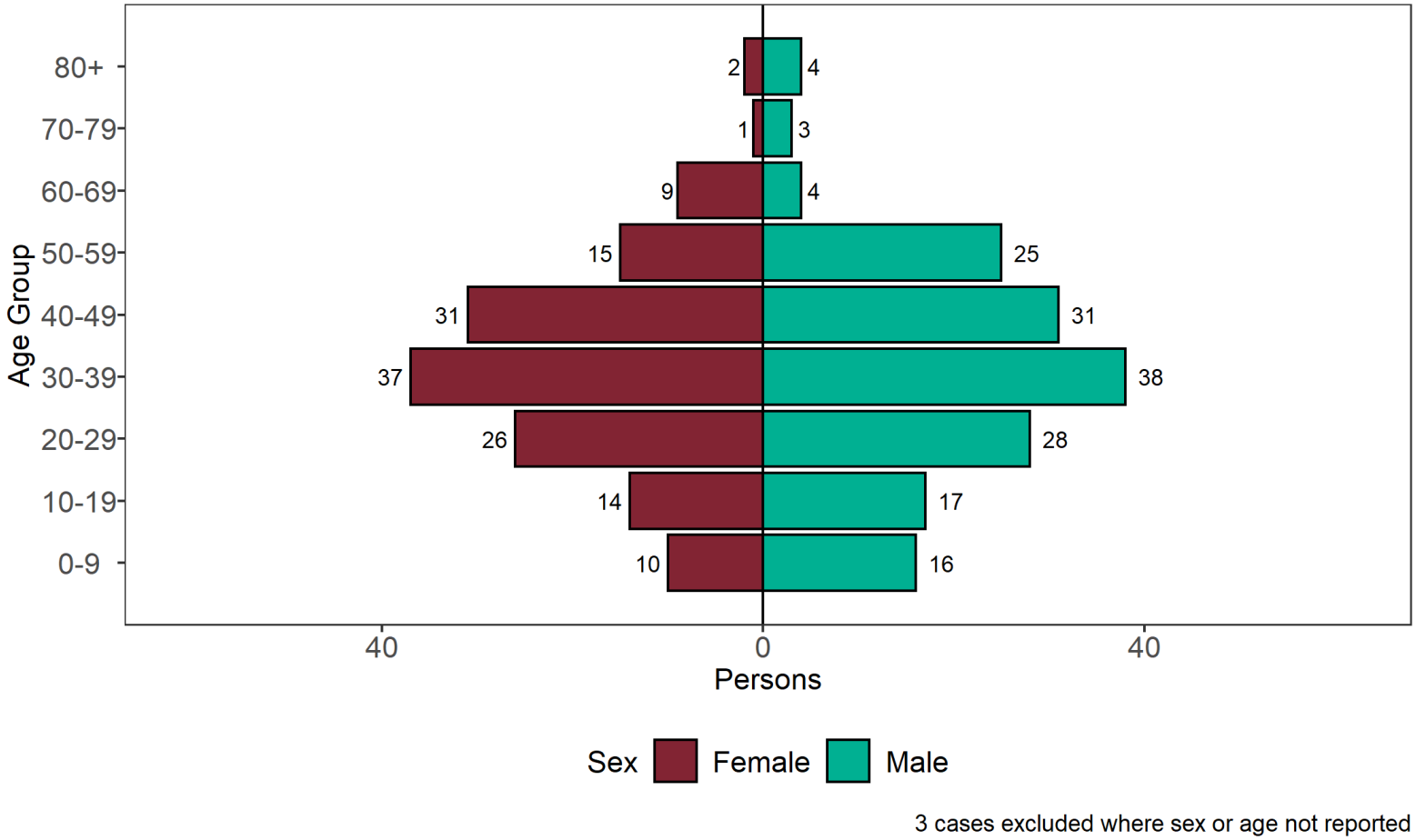


Figure 13. Age and sex pyramid of VUI-21FEB-04 cases as of 13 September 2021
(Find accessible data used in this graph in underlying data.)



3 cases excluded where sex or age not reported

Theta

P.3 was identified on 9 March 2021 in a report of 33 genomes from the Philippines with 13 lineage defining mutations. This variant shares important mutations with other variants of concern, including E484K, N501Y, and P681H. Based on its genomic profile, Public Health England designated P.3 as VUI-21MAR-02 on 11 March 2021. This variant arises from B.1.1.28, which is the same parent lineage of P.1 and P.2 in Brazil. Phylogenetic analysis of P.3 shows diversity indicating circulation prior to detection. This variant was named Theta by WHO on 31 May 2021.

International epidemiology

GISAID includes data on sequences available internationally. As of 14 September 2021, 560 sequences of Theta have been identified in GISAID, excluding the UK: Angola (1), Australia (4), Canada (2), China (2), Germany (10), Hong Kong (11), Japan (7), Malaysia (9), Netherlands (7), New Zealand (3), Norway (3), Philippines (195), Singapore (3), South Korea (2), Sweden (2), USA (19).

Epidemiology

Table 7. Number of confirmed and provisional Theta cases, by region of residence as of 13 September 2021

Region	Total case number	Proportion of total cases
East Midlands	0	0.0%
East of England	1	14.3%
London	2	28.6%
North East	0	0.0%
North West	1	14.3%
South East	0	0.0%
South West	2	28.6%
West Midlands	0	0.0%
Yorkshire and Humber	1	14.3%
Total	7	-

Figure 14. Confirmed and provisional Theta cases by specimen date and region of residence as of 13 September 2021
Larger plot includes last 60 days only. (Find accessible data used in this graph in underlying data.)

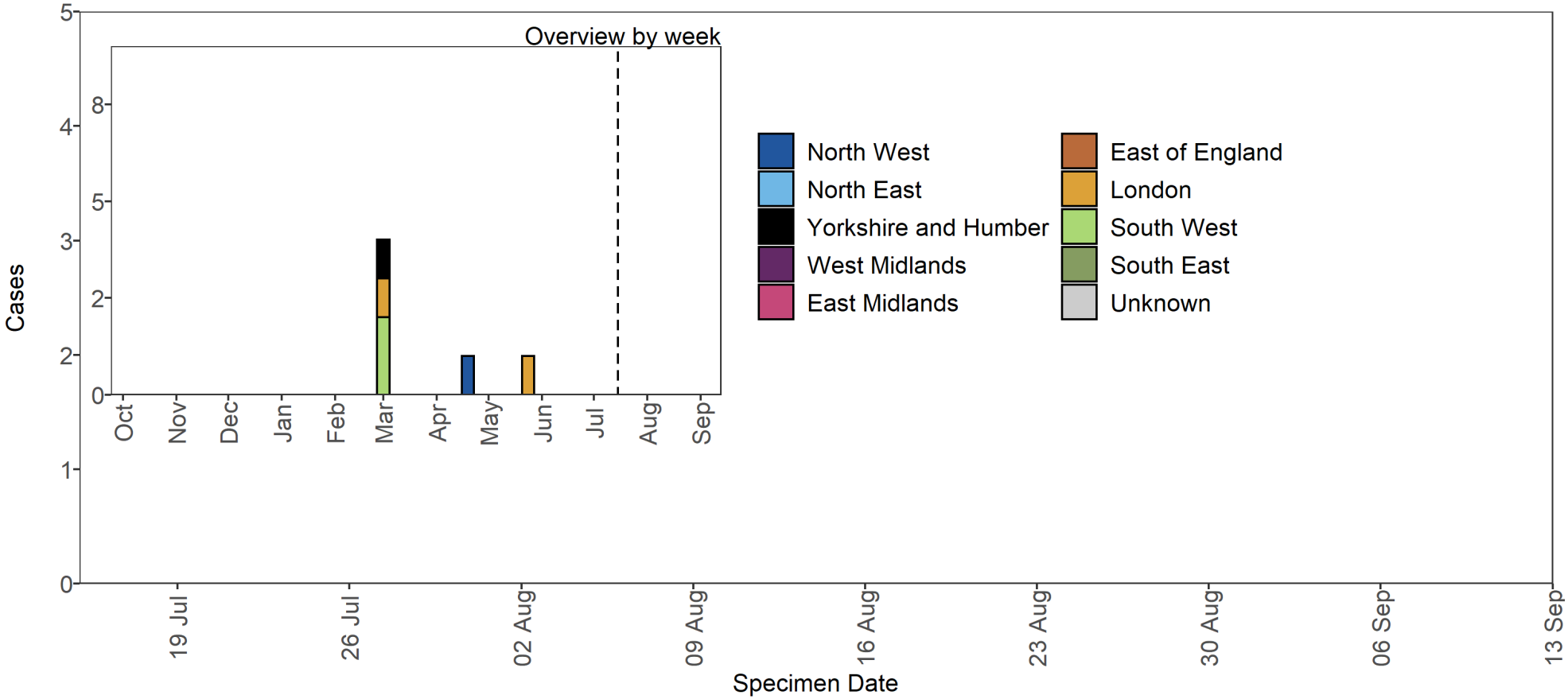
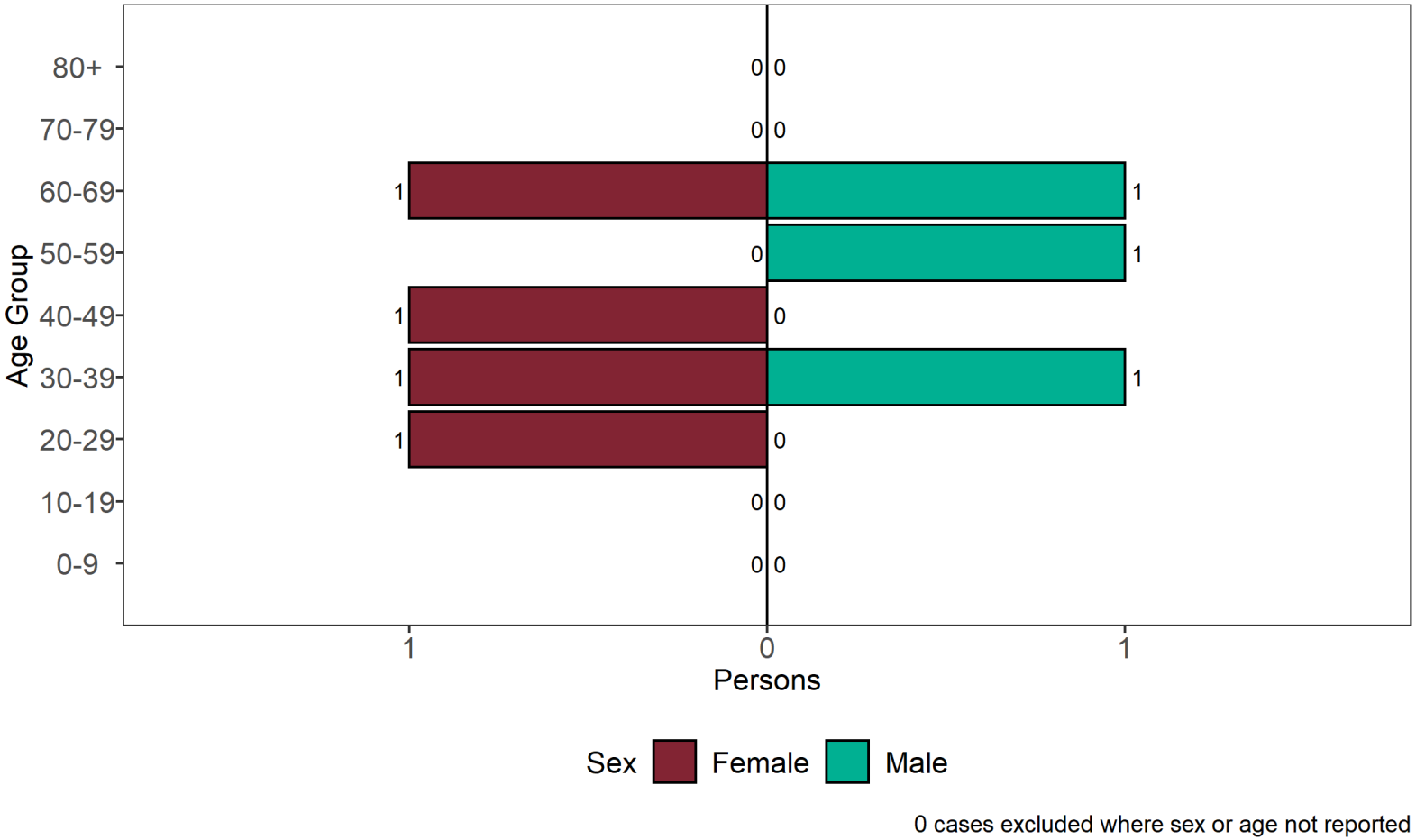


Figure 15. Age and sex pyramid of Theta cases as of 13 September 2021
(Find accessible data used in this graph in underlying data.)



0 cases excluded where sex or age not reported

VUI-21APR-03 (B.1.617.3)

B.1.617 lineage was escalated to a variant under investigation on 1 April 2021. VUI-21APR-03 (B.1.617.3) was escalated to a variant under investigation on 28 April 2021. The last documented case was on the 17 May 2021 in the UK, this variant was de-escalated to monitoring on the 16 August 2021.

International epidemiology

GISAID includes data on sequences available internationally. As of 14 September 2021, 416 sequences of VUI-21APR-03 from the following countries (excluding the UK) have been identified in GISAID: India (192), Japan (1), Malawi (7), Russia (2), Singapore (1), USA (5).

Epidemiology

Table 8. Number of confirmed and provisional VUI-21APR-03 (B.1.617.3) cases, by region of residence as of 13 September 2021

Region	Total case number	Proportion of total cases
East Midlands	0	0.0%
East of England	0	0.0%
London	6	40.0%
North East	0	0.0%
North West	6	40.0%
South East	3	20.0%
South West	0	0.0%
West Midlands	0	0.0%
Yorkshire and Humber	0	0.0%
Total	15	-

Figure 16. Confirmed and provisional VUI-21APR-03 cases by specimen date and region of residence as of 13 September 2021
Larger plot includes last 60 days only. (Find accessible data used in this graph in underlying data.)

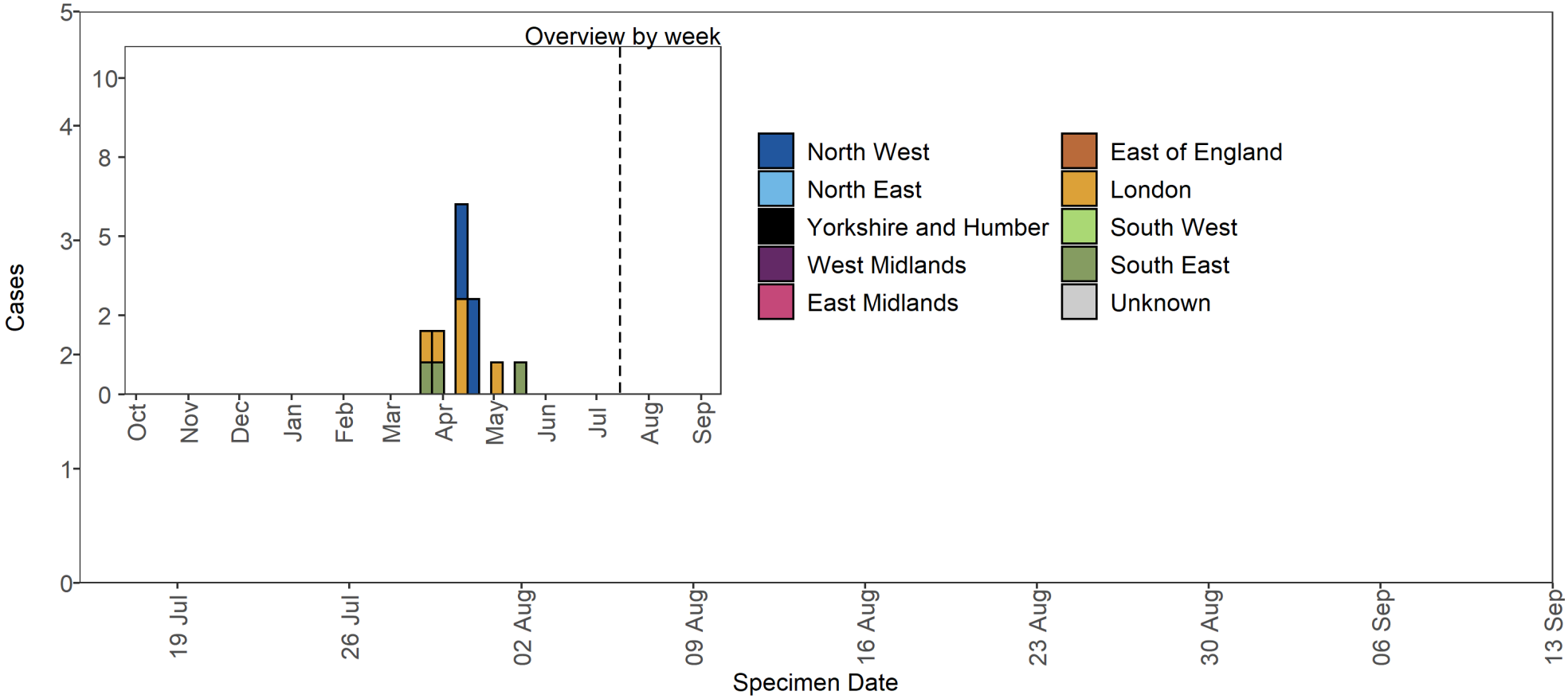
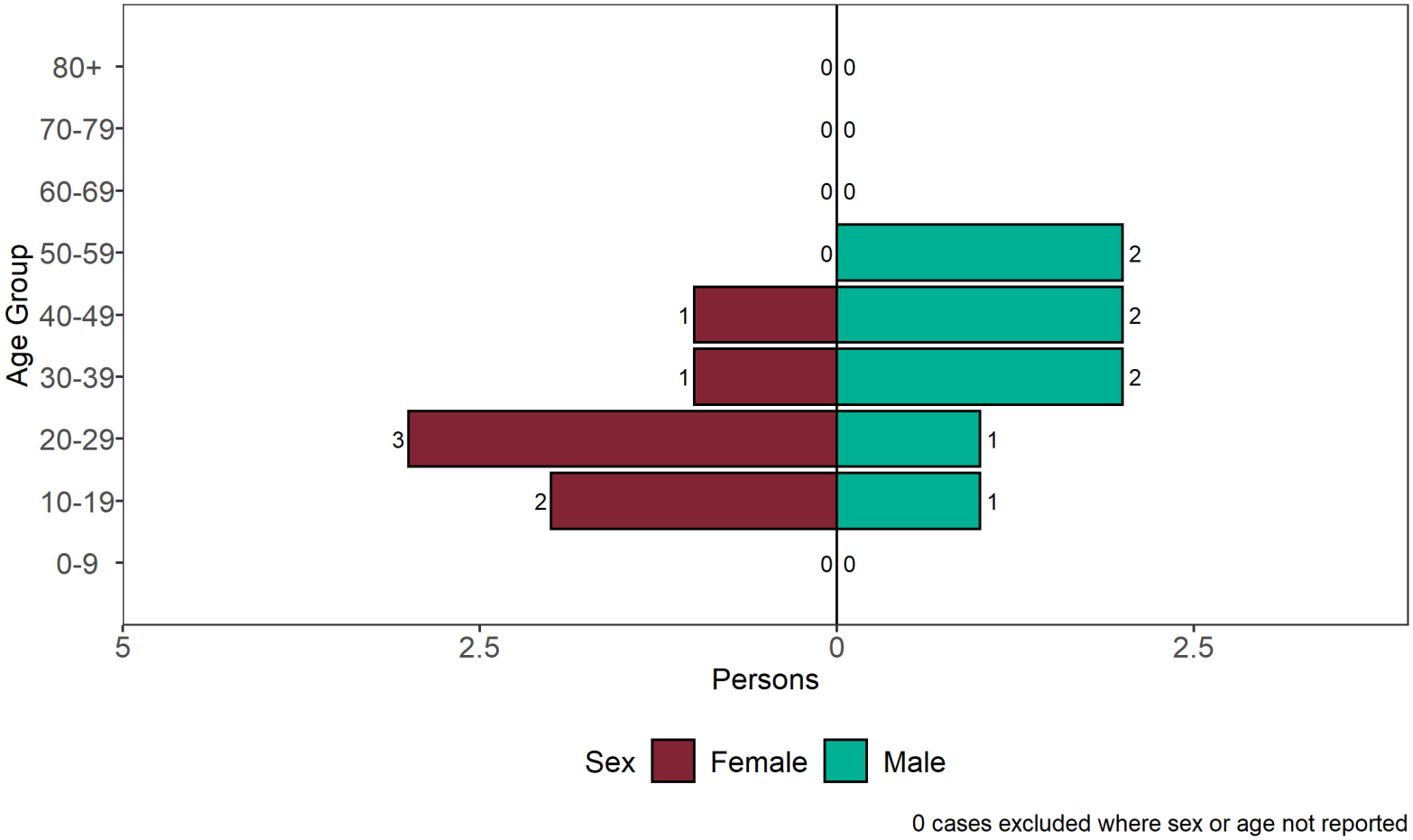


Figure 17. Age and sex pyramid of VUI-21APR-03 cases as of 13 September 2021
(Find accessible data used in this graph in underlying data.)



VUI-21MAY-01 (AV.1)

AV.1 was first detected in UK sequences and designated under investigation on 14 May 2021 as VUI-21MAY-01 based on its mutation profile and apparent localised cluster in Yorkshire and Humber.

International epidemiology

GISAID includes data on sequences available internationally. Excluding the UK, as of 14 September 2021, 5 sequences of VUI-21MAY-01 from France have been identified in GISAID.

Epidemiology

Table 9. Number of confirmed and provisional VUI-21MAY-01 (AV.1) cases, by region of residence as of 13 September 2021

Region	Total case number	Proportion of total cases
East Midlands	7	3.8%
East of England	11	6.0%
London	1	0.5%
North East	1	0.5%
North West	7	3.8%
South East	0	0.0%
South West	0	0.0%
West Midlands	4	2.2%
Yorkshire and Humber	152	82.6%
Unknown region	1	0.5%
Total	184	-

Figure 18. Confirmed and provisional VUI-21MAY-01 cases by specimen date and region of residence as of 13 September 2021
Larger plot includes last 60 days only. (Find accessible data used in this graph in underlying data.)

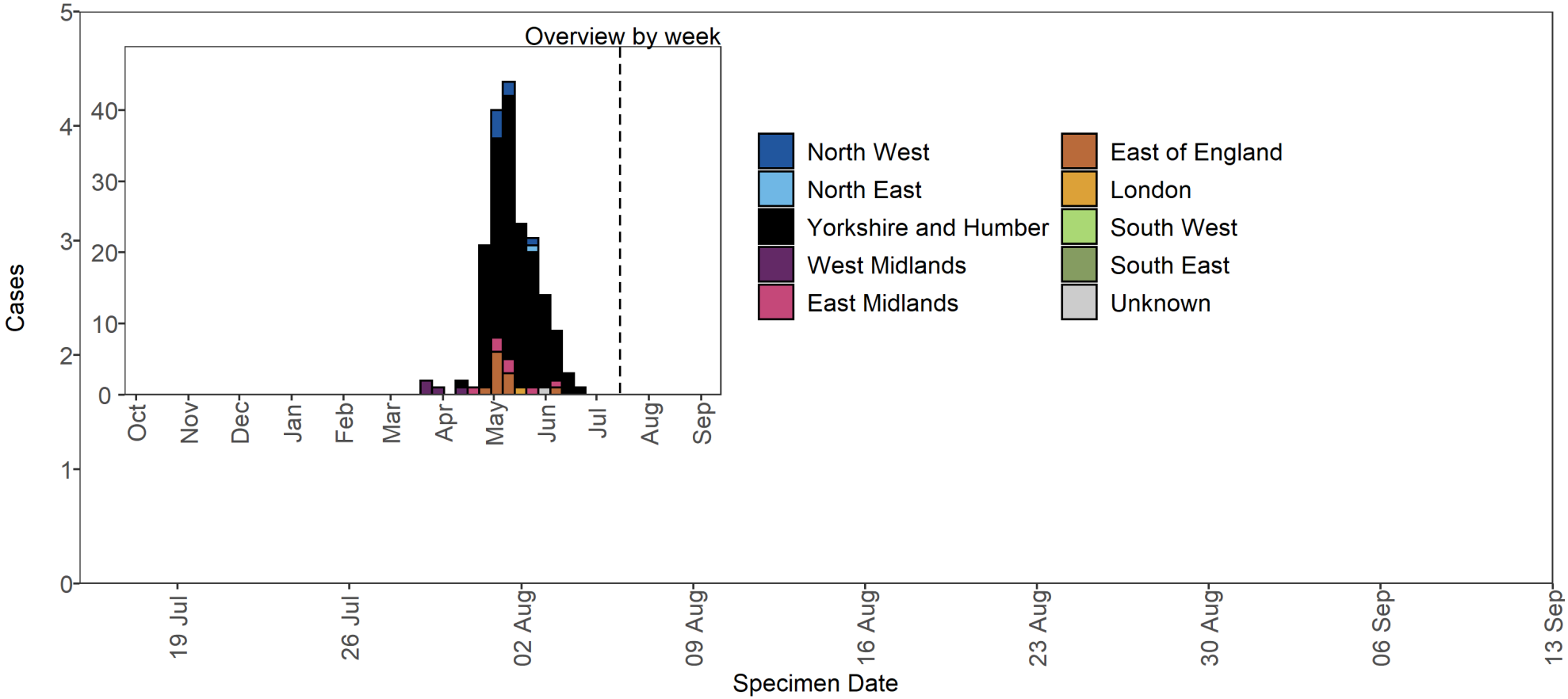
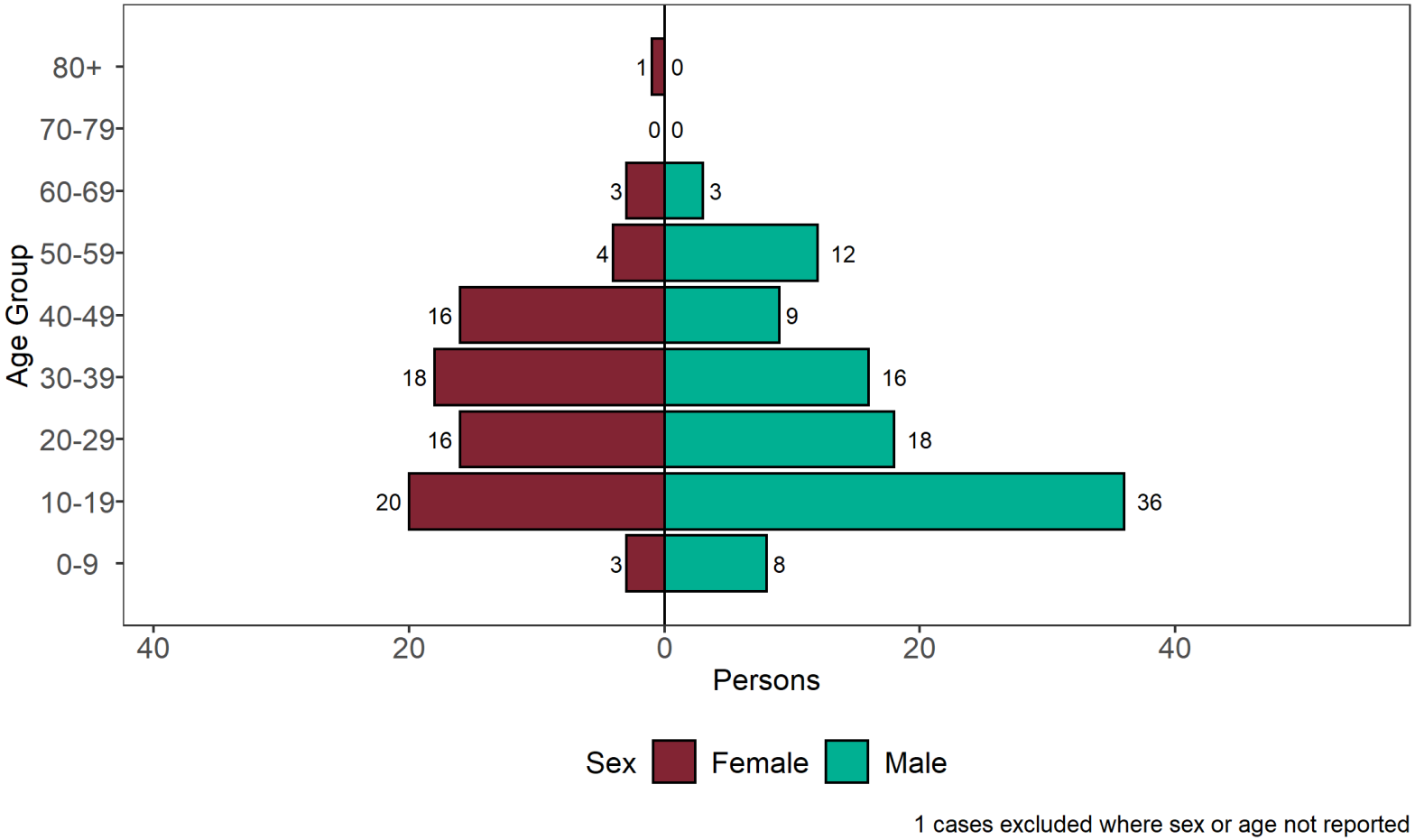


Figure 19. Age and sex pyramid of VUI-21MAY-01 cases as of 13 September 2021 (Find accessible data used in this graph in underlying data.)



VUI-21MAY-02 (C.36.3)

C.36.3 was designated a variant under investigation on 24 May 2021 (VUI-21MAY-02) based on its mutation profile and increased importation from a widening international area.

International epidemiology

GISAID includes data on sequences available internationally. As of 1 September 2021, 1,763 sequences of VUI-21MAY-02 from 52 countries (excluding the UK) have been identified in GISAID.

Epidemiology

Table 10. Number of confirmed and provisional VUI-21MAY-02 (C.36.3) cases, by region of residence as of 13 September 2021

Region	Total case number	Proportion of total cases
East Midlands	9	6.1%
East of England	23	15.6%
London	43	29.3%
North East	1	0.7%
North West	14	9.5%
South East	13	8.8%
South West	5	3.4%
West Midlands	10	6.8%
Yorkshire and Humber	26	17.7%
Unknown region	3	2.0%
Total	147	-

Figure 20. Confirmed and provisional VUI-21MAY-02 cases by specimen date and region of residence as of 13 September 2021
Larger plot includes last 60 days only. (Find accessible data used in this graph in underlying data.)

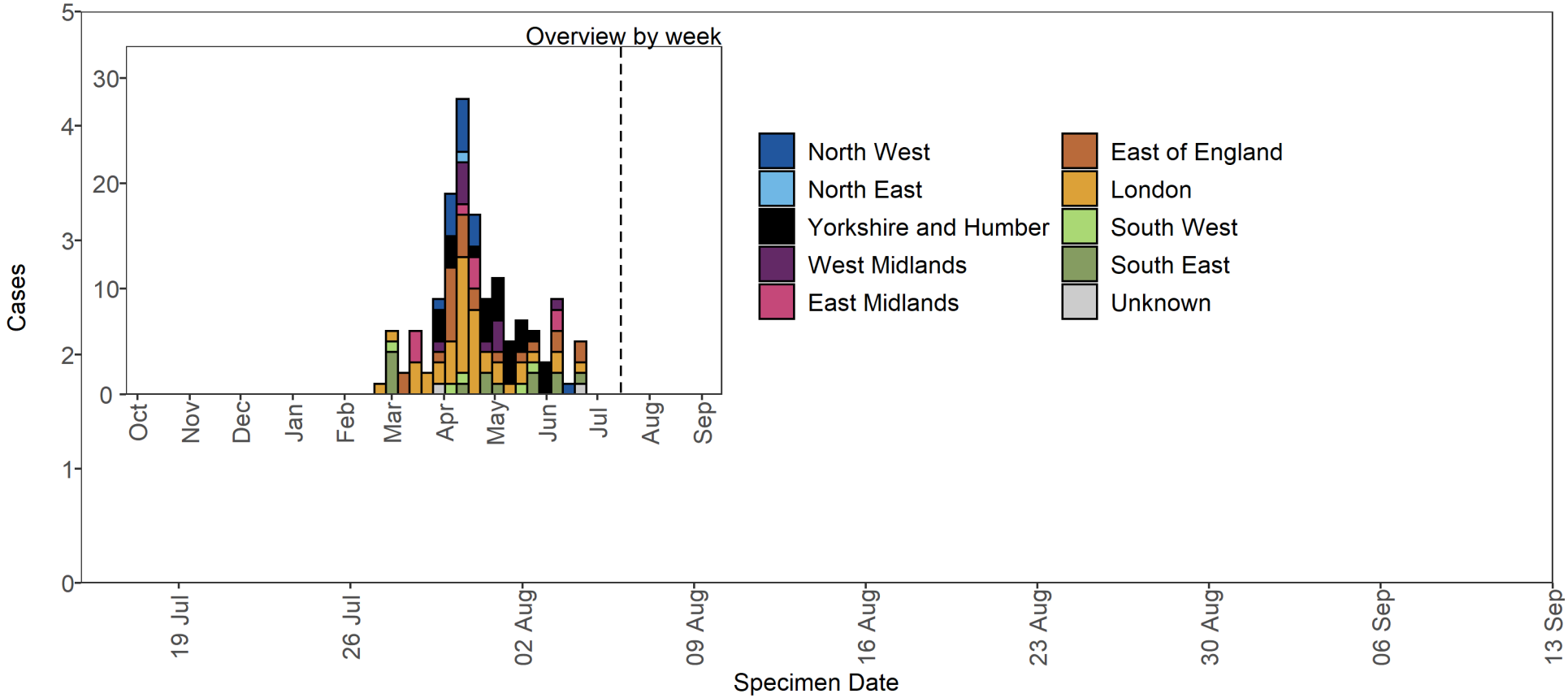
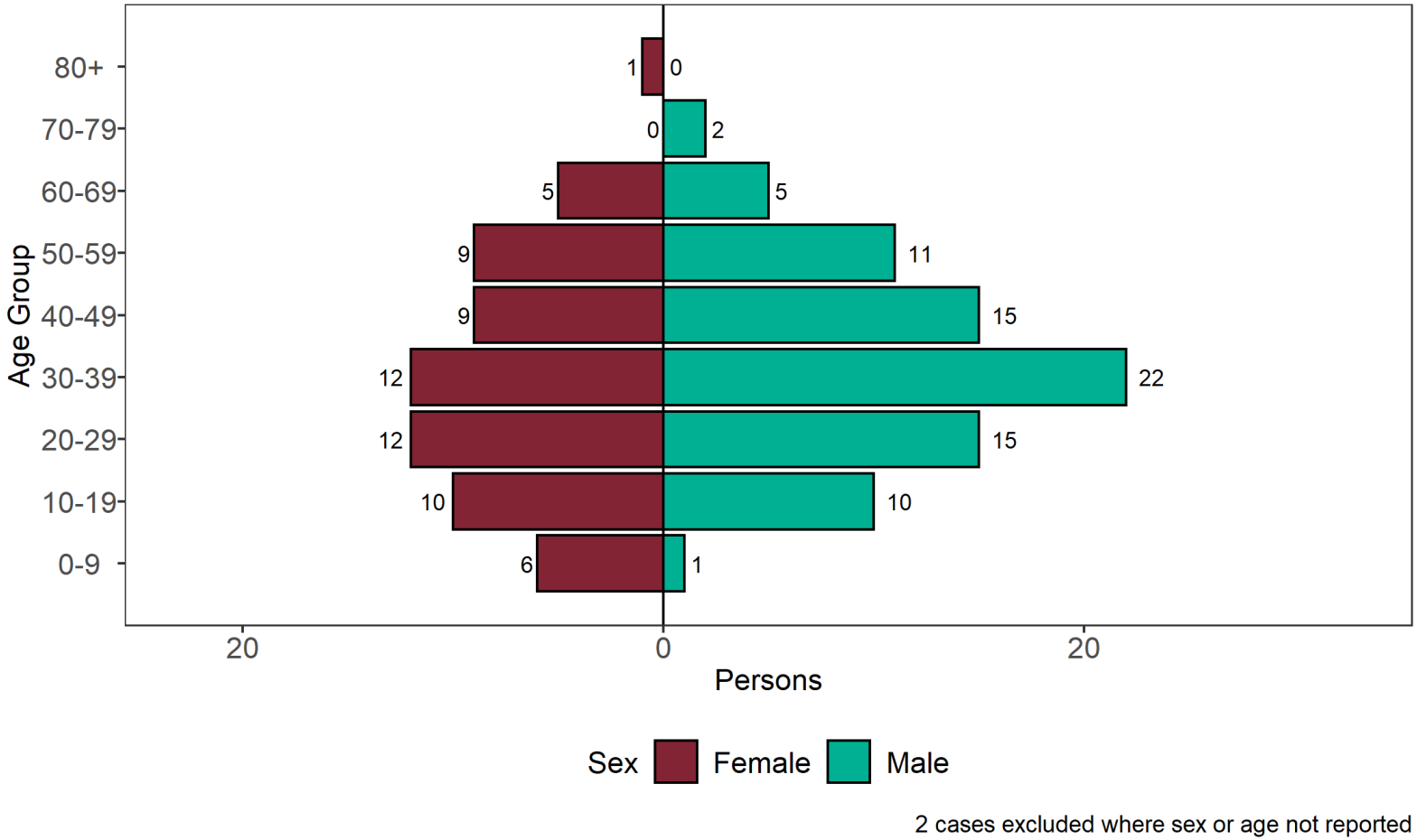


Figure 21. Age and sex pyramid of VUI-21MAY-02 cases as of 13 September 2021
(Find accessible data used in this graph in underlying data.)



2 cases excluded where sex or age not reported

Lambda (C.37)

Lambda was identified through international variant horizon scanning and was made a signal in monitoring by Public Health England on 14 April 2021 (lineage B.1.1.1 at the time). On 14 June 2021, WHO designated lineage C.37 as Lambda, a new variant of interest based on evidence of continued emergence and suspected phenotypic implications. Lambda was designated a variant under investigation (VUI-21JUN-01) by Public Health England on 23 June 2021. The risk assessment for Lamba is here.

International epidemiology

As of 14 September 2021, 6,358 Lambda sequences from 35 countries (excluding the UK) have been identified in GISAID.

Epidemiology

Table 11. Number of confirmed and provisional Lambda (C.37) cases, by region of residence as of 13 September 2021

Region	Total case number	Proportion of total cases
East Midlands	0	0.0%
East of England	0	0.0%
London	6	75.0%
North East	0	0.0%
North West	0	0.0%
South East	0	0.0%
South West	1	12.5%
West Midlands	1	12.5%
Yorkshire and Humber	0	0.0%
Total	8	-

Figure 22. Confirmed and provisional Lambda cases by specimen date and region of residence as of 13 September 2021
(Larger plot includes last 60 days only. (Find accessible data used in this graph in underlying data.)

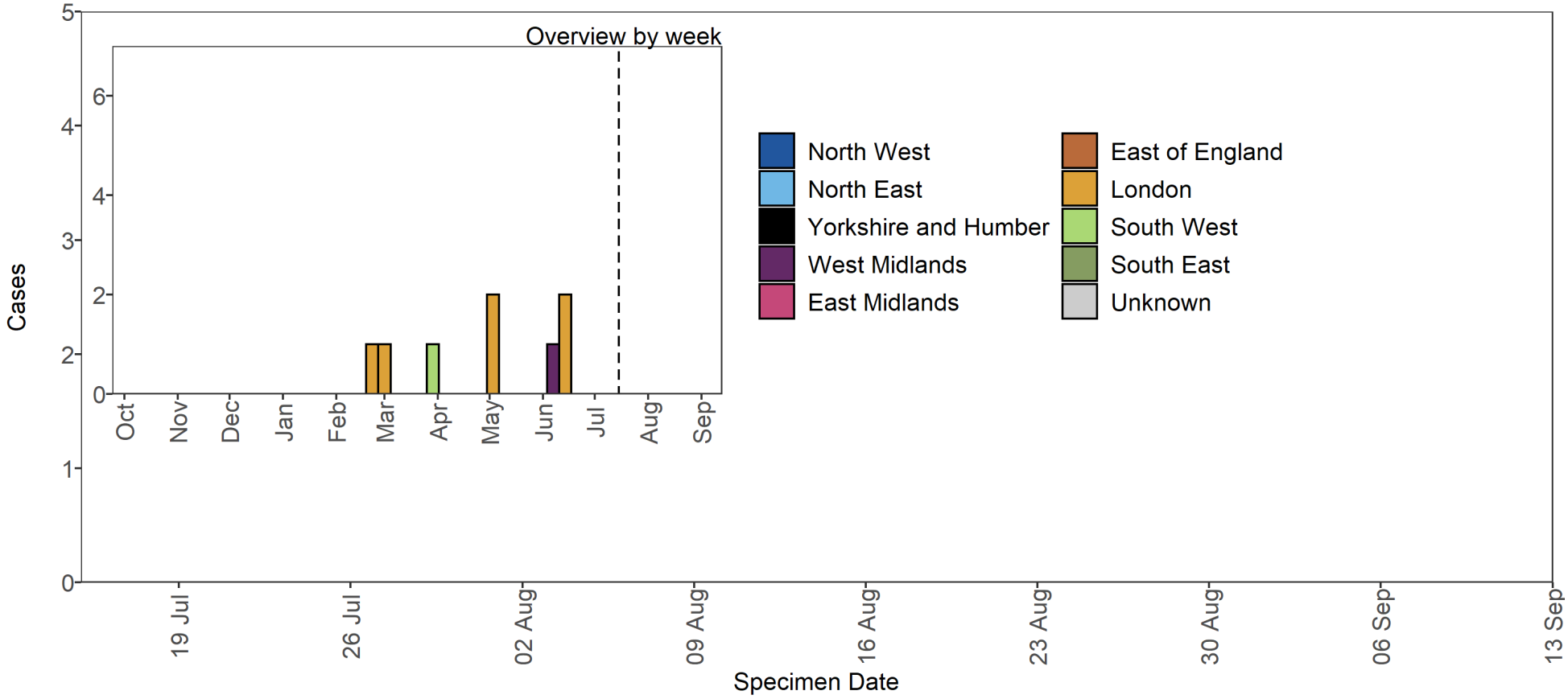
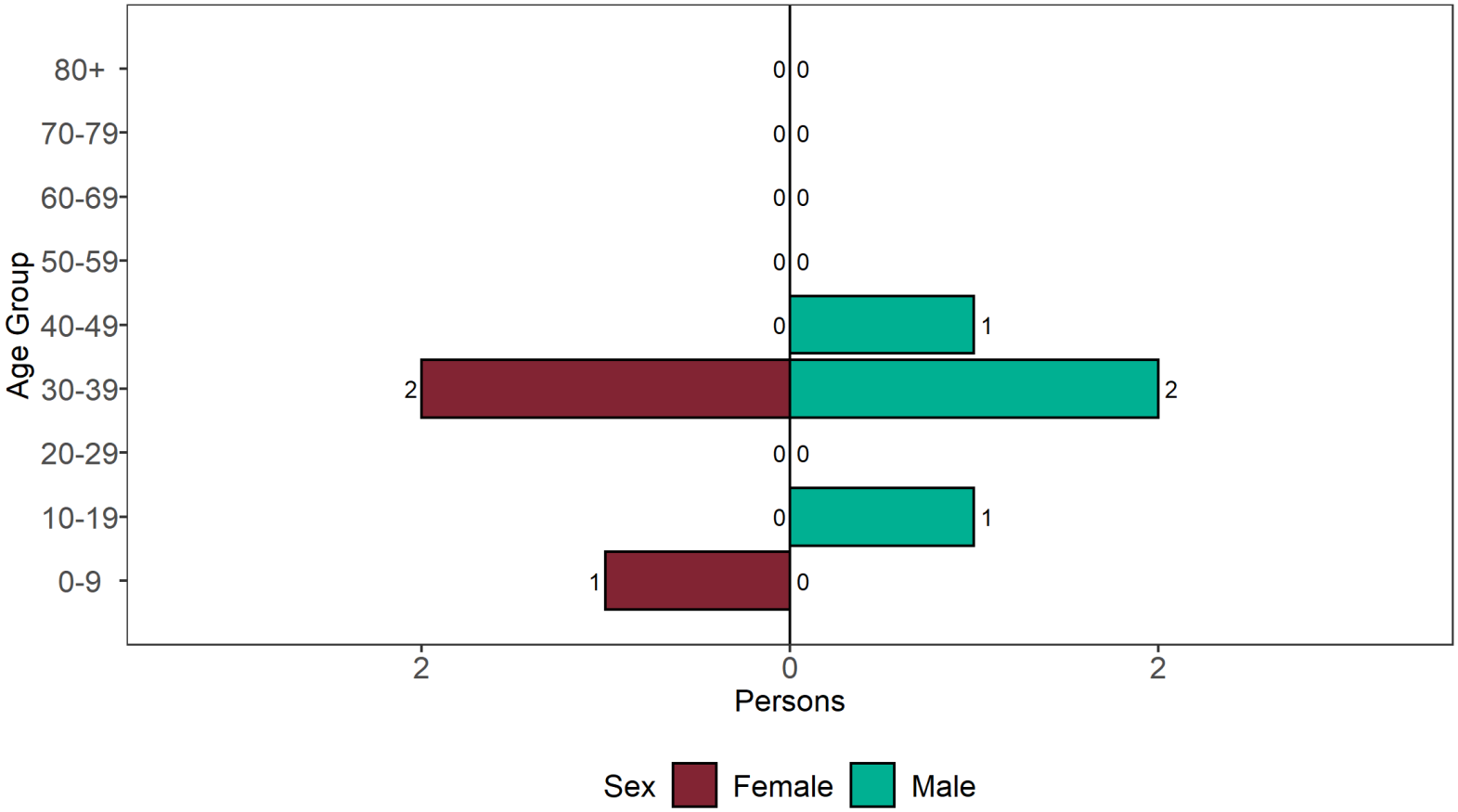


Figure 23. Age and sex pyramid of Lambda cases as of 13 September 2021
(Find accessible data used in this graph in underlying data.)



1 cases excluded where sex or age not reported

Mu (B.1.621)

VUI-21JUL-01 was identified through international variant horizon scanning and was made a signal in monitoring by PHE on 7 June 2021 (lineage B.1.621 at the time). On 21 July 2021, PHE designated lineage B.1.621 as a new variant under investigation, VUI-21JUL-01, based on apparent spread into multiple countries, importation to the UK and mutations of concern. B.1.621 was designated as Mu by WHO on the 30 August 2021.

International epidemiology

As of 14 September 2021, 5,535 Mu sequences from 47 countries (excluding the UK) have been identified in GISAID.

Epidemiology

Table 12. Confirmed and provisional Mu cases in England by region as of 13 September 2021

Region	Total case number	Proportion of total cases
East Midlands	3	6.4%
East of England	7	14.9%
London	23	48.9%
North East	0	0.0%
North West	3	6.4%
South East	6	12.8%
South West	1	2.1%
West Midlands	0	0.0%
Yorkshire and Humber	1	2.1%
Unknown region	3	6.4%
Total	47	-

Figure 24. Cases of Mu in England by region as of 13 September 2021
(Find accessible data used in this graph in underlying data)

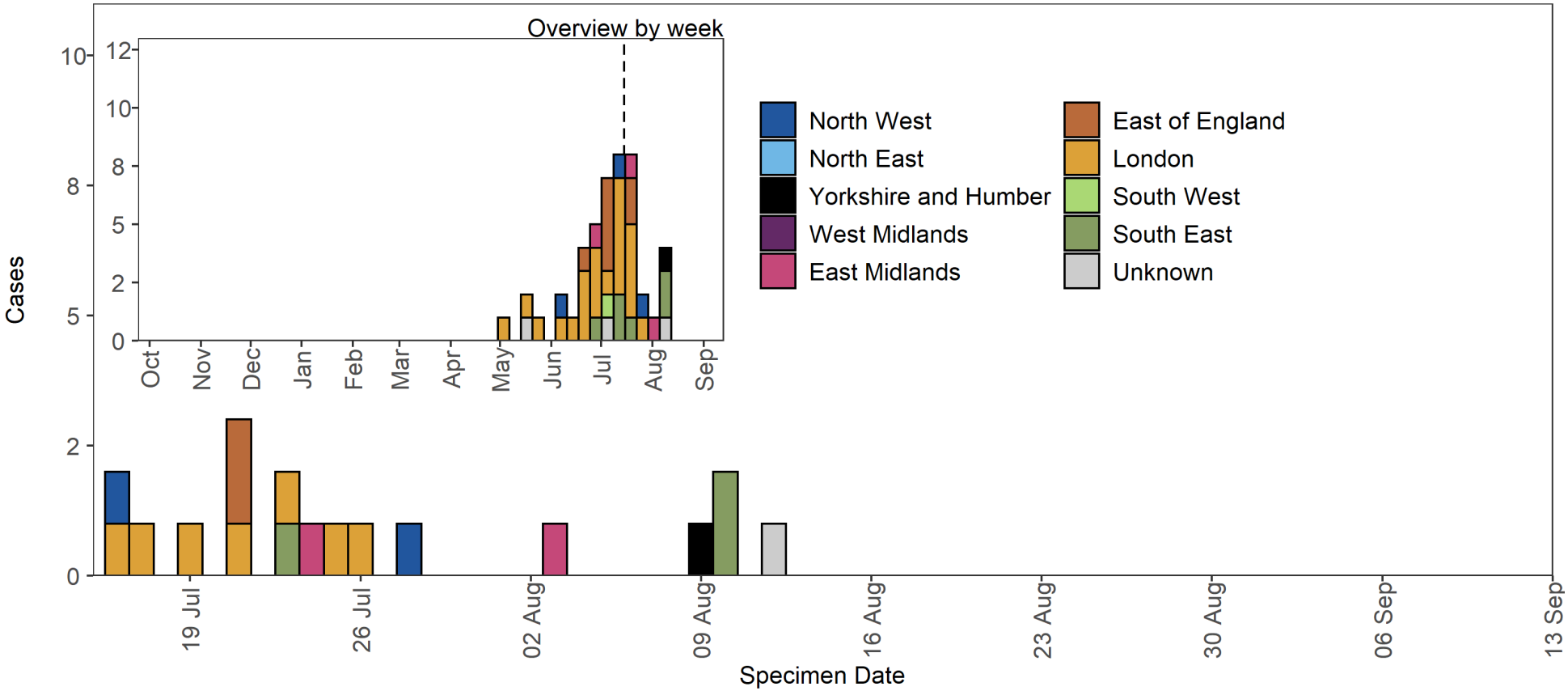
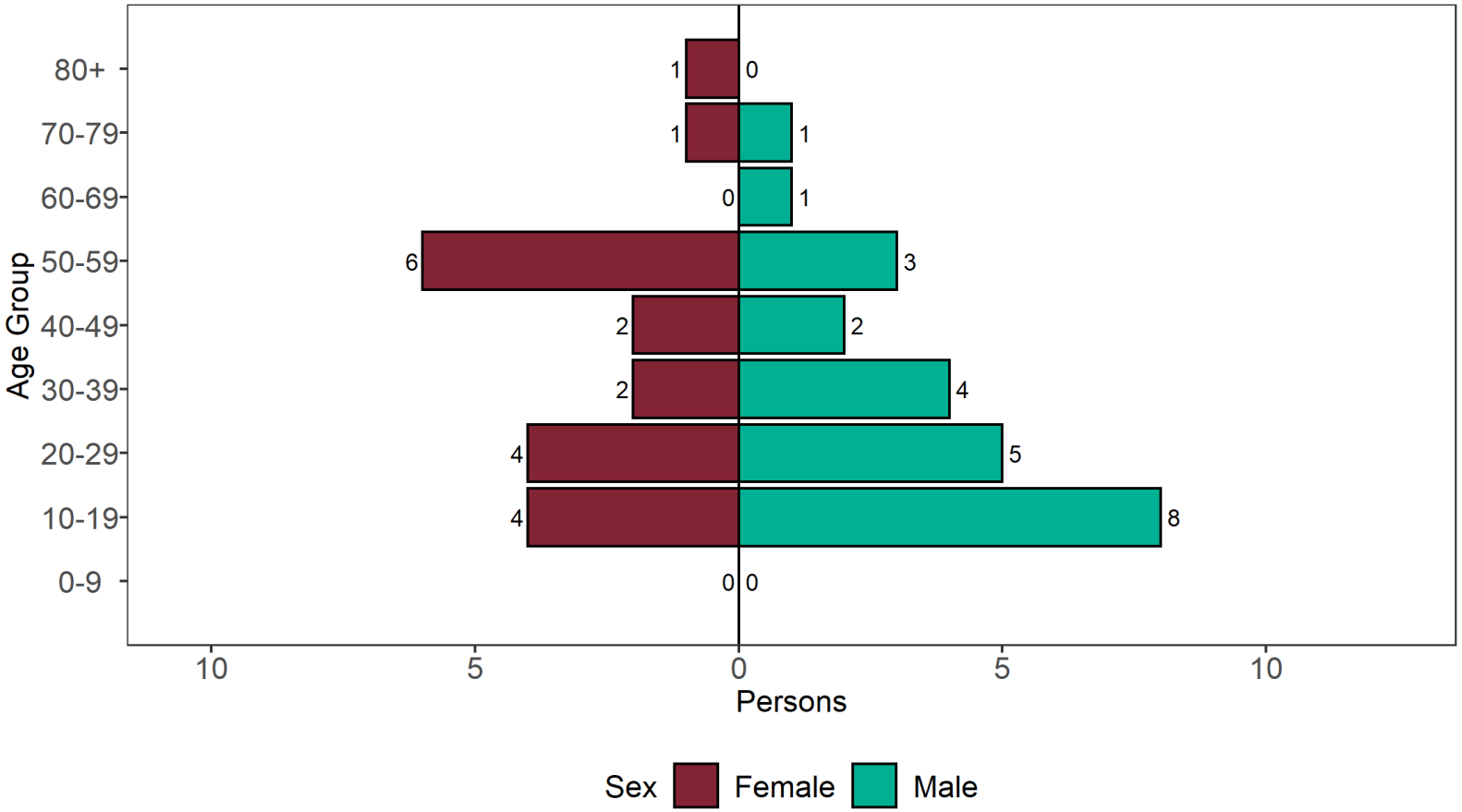


Figure 25. Age and sex pyramid of Mu cases as of 13 September 2021
(Find accessible data used in this graph in underlying data.)



3 cases excluded where sex or age not reported

Sources and acknowledgments

Data sources

Data used in this investigation is derived from the COG-UK data set, the PHE Second Generation Surveillance System (SGSS), NHS Test and Trace, the Secondary Uses Service (SUS) data set and Emergency Care Data Set (ECDS). Data on international cases are derived from reports in GISAID, the media and information received via the International Health Regulations National Focal Point (IHRNFP) and Early Warning and Response System (EWRS).

Repository of human and machine-readable genomic case definitions

A repository containing the up-to-date genomic definitions for all VOC and VUI as curated by Public Health England was created 5 March 2021. The repository can be accessed on GitHub. They are provided to facilitate standardised VOC and VUI calling across sequencing sites and bioinformatics pipelines and are the same definitions used internally at Public Health England. Definition files are provided in YAML format so are compatible with a range of computational platforms. The repository will be regularly updated. The genomic and biological profiles of VOC and VUI are also detailed on first description in prior technical briefings.

Variant Technical Group

Authors of this report

PHE Genomics Cell
PHE Outbreak Surveillance Team
PHE Epidemiology Cell
PHE Contact Tracing Cell Data Team
PHE International Cell

Variant Technical Group Membership

The PHE Variant Technical Group includes representation from the following organisations: PHE, DHSC, BEIS, Public Health Wales, Public Health Scotland, Public Health Agency Northern Ireland, Imperial College London, London School of Hygiene and Tropical Medicine, University of Birmingham, University of Cambridge, University of Edinburgh, University of Liverpool, the Wellcome Sanger Institute.

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About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-leading science, research, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health and Social Care, and a distinct delivery organisation with operational autonomy. We provide government, local government, the NHS, Parliament, industry and the public with evidence-based professional, scientific and delivery expertise and support.

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