



# Weekly Influenza and COVID-19 Surveillance graphs

PHE publishes a weekly national influenza and COVID-19 surveillance report which summarises the information from the surveillance systems which are used to monitor influenza, COVID-19 and other seasonal respiratory viruses in England.

Additional figures based on these surveillance systems are included in this slide set.

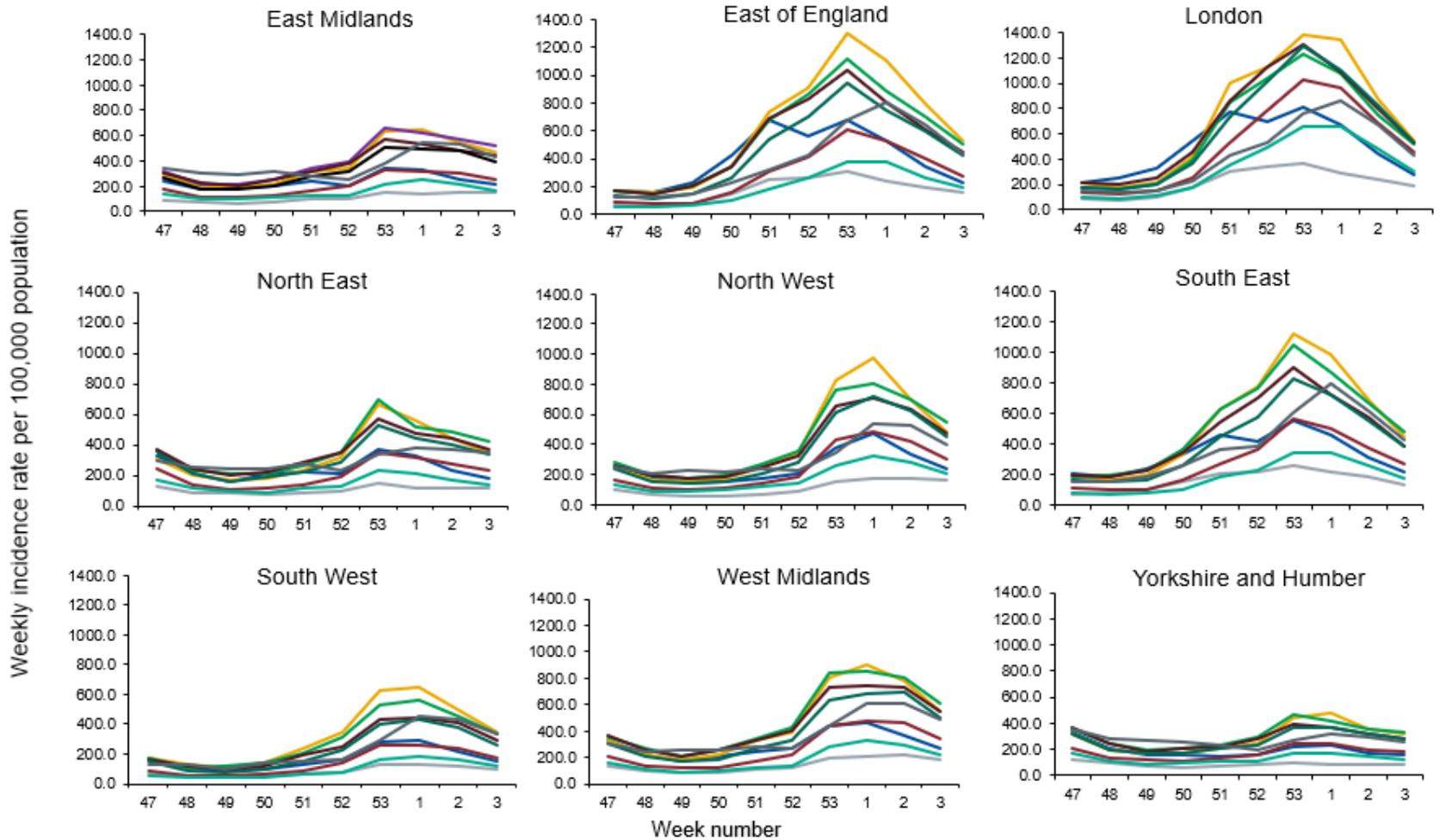
The figures presented in this slide set are based on data from week 3 (between 18 and 24 January 2021).



# Confirmed COVID-19 cases in England

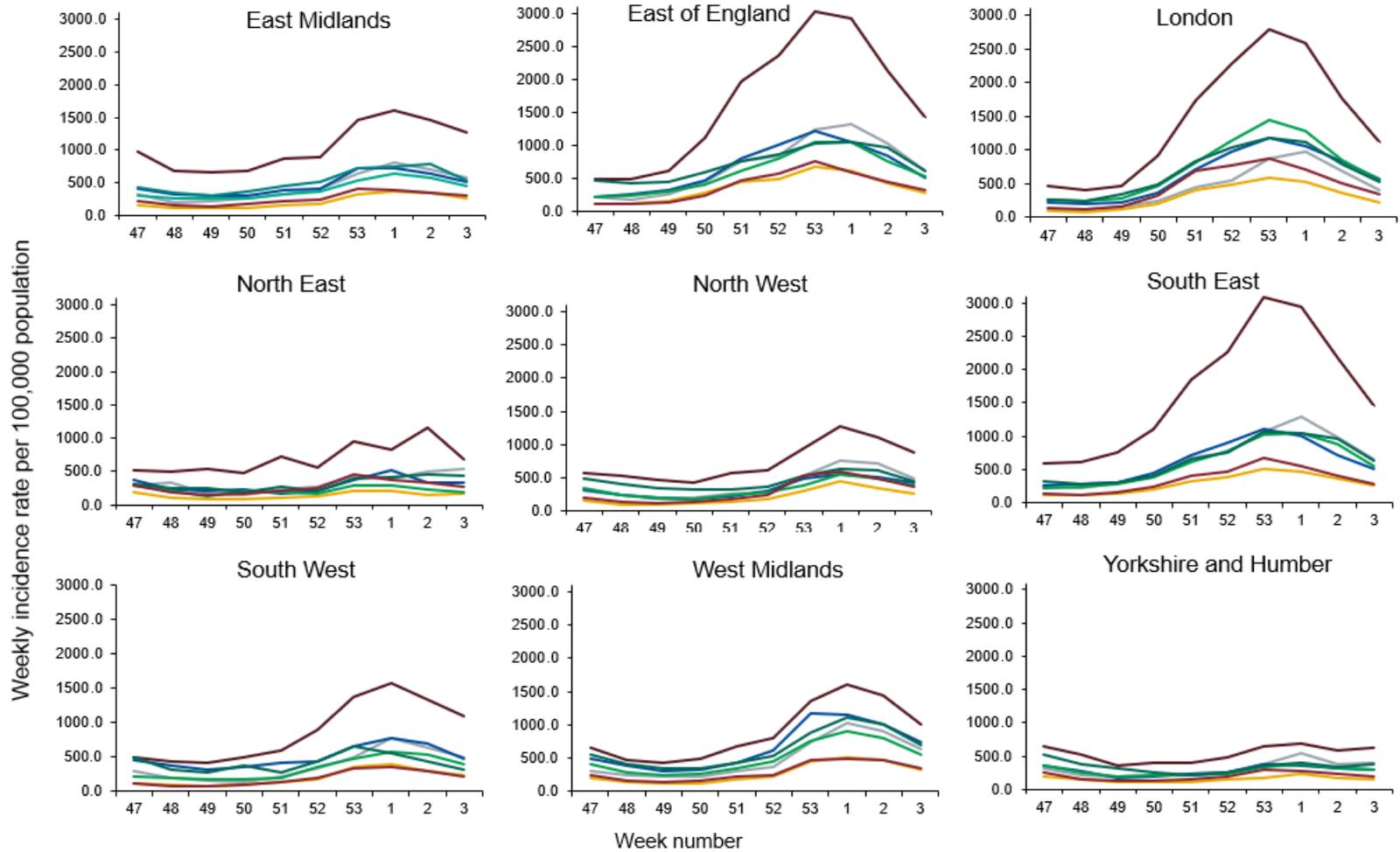


# Weekly COVID-19 incidence per 100,000 population by age group and region, weeks 47 to 3





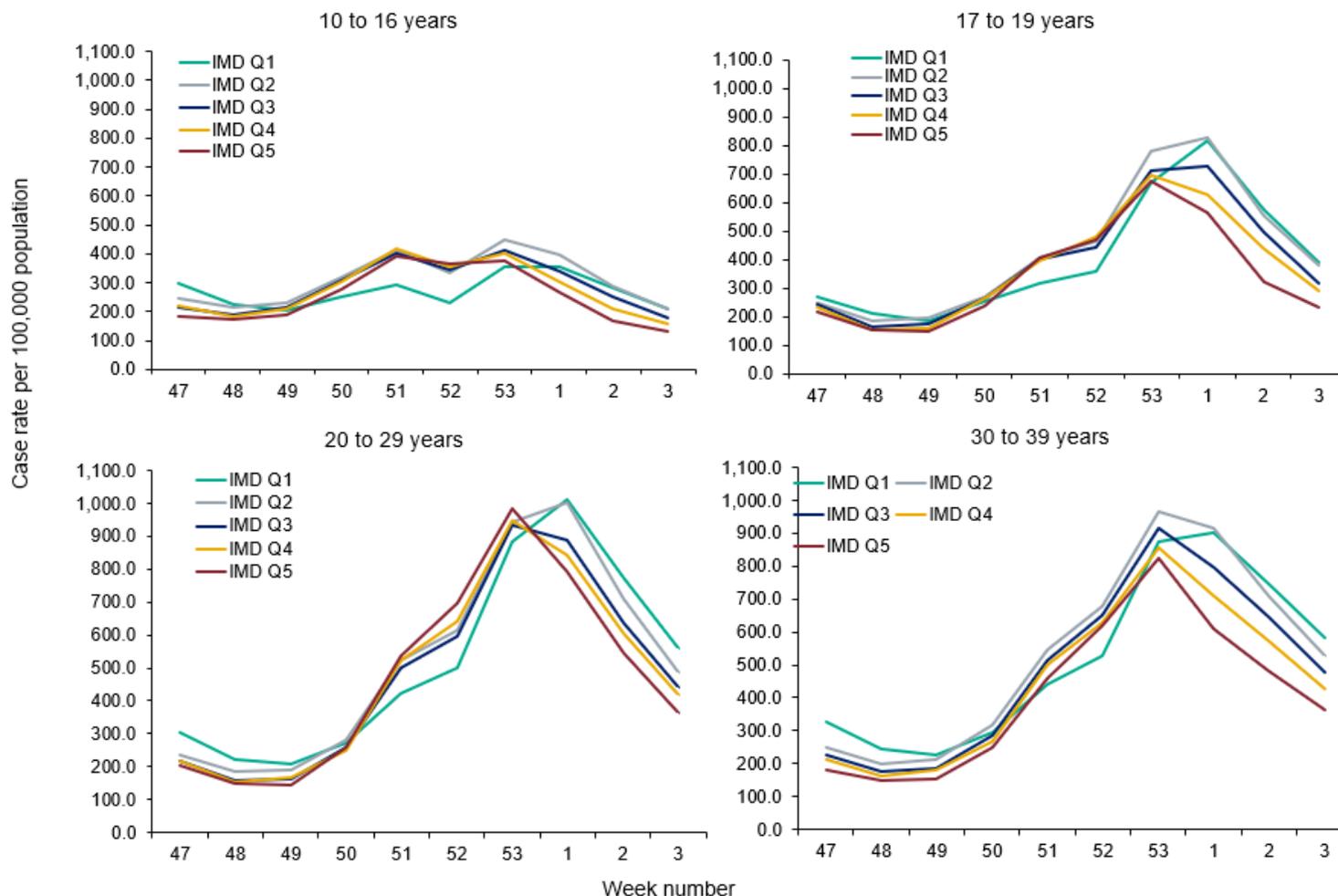
# Weekly COVID-19 incidence per 100,000 population by ethnicity and region, weeks 47 to 3



- Black/African/Caribbean/Black British
- Indian (Asian or British)
- Mixed/Multiple Ethnic Groups
- Other Asian/Asian British
- Other ethnic group
- Pakistani (Asian or British)
- White



# Weekly COVID-19 rate per 100,000 population by IMD quintile (1 being the most deprived and 5 being the least deprived), weeks 47 to 3

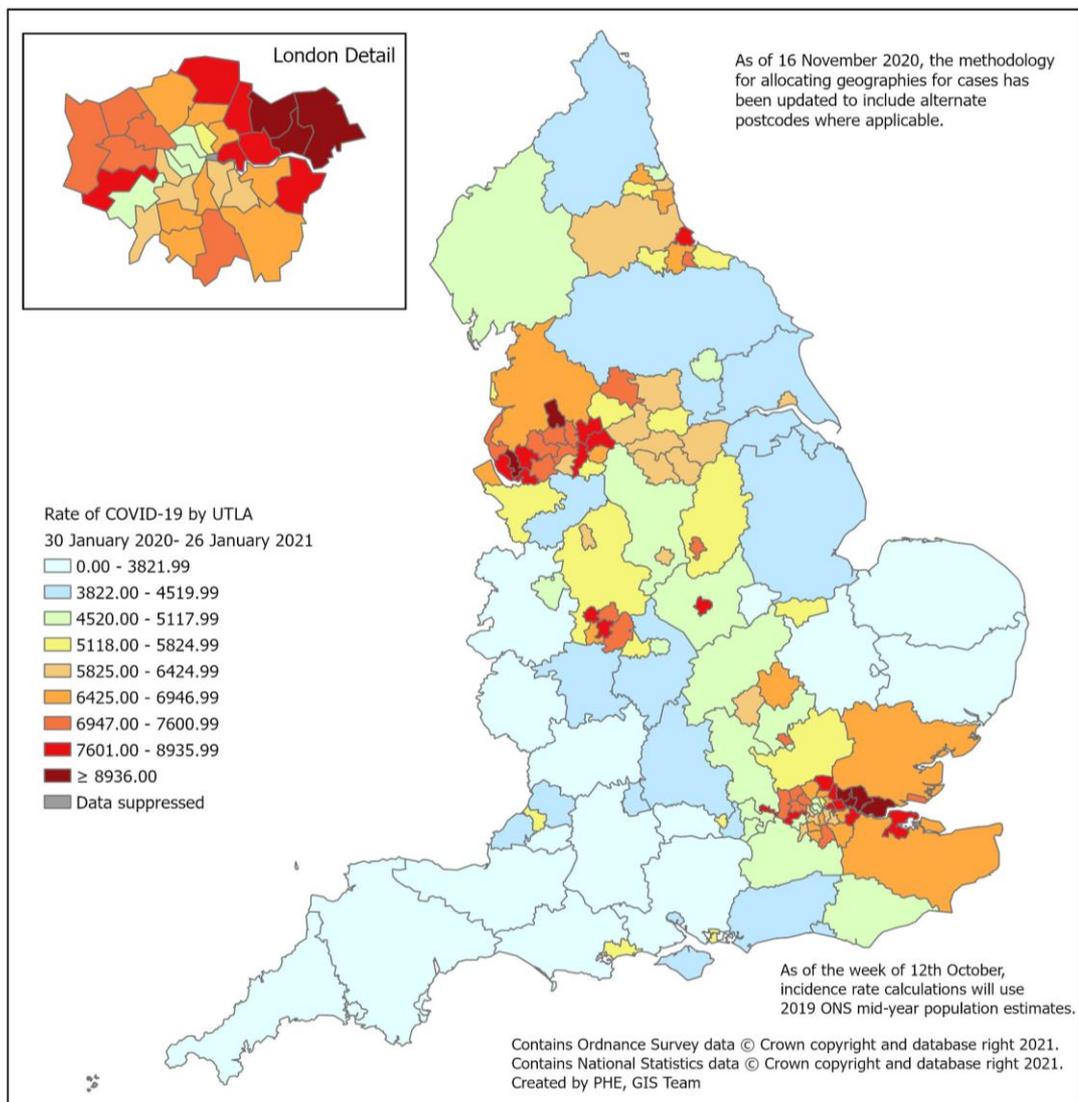


Please note, an error occurred in the IMD graph in previous weeks report. This has now been rectified in this weeks report.

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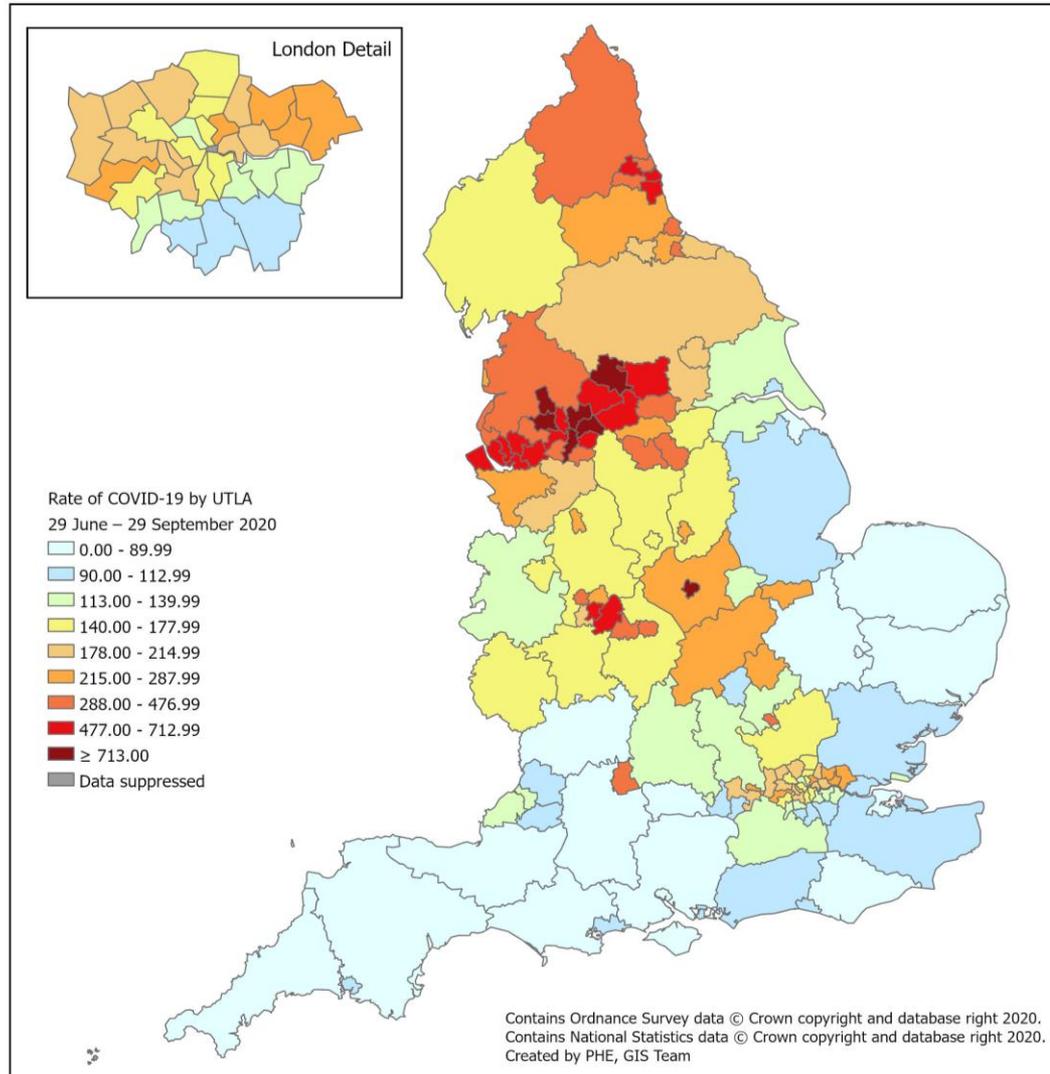


# Cumulative rate of COVID-19 cases per 100,000 population tested under Pillar 1 and 2, by upper-tier local authority, England (box shows enlarged map of London area)



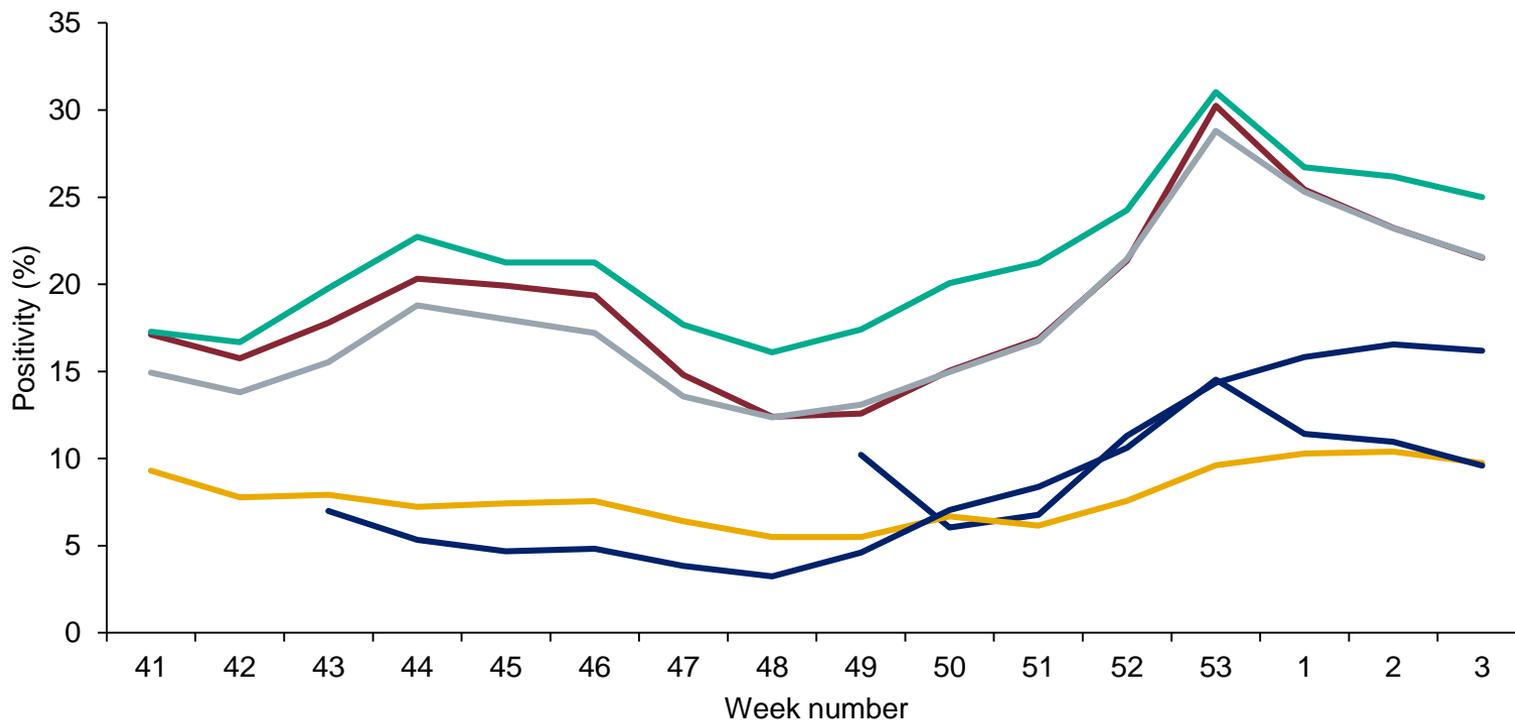


# Cumulative rate (from week 27) of COVID-19 cases per 100,000 population tested under Pillar 1 and 2, by upper-tier local authority, England (box shows enlarged map of London area)





# Weekly positivity of laboratory confirmed COVID-19 cases by reason for test, weeks 41 to 3



Community Testing

ZOE study

Symptomatic essential worker

Local council testing

Symptomatic Citizen

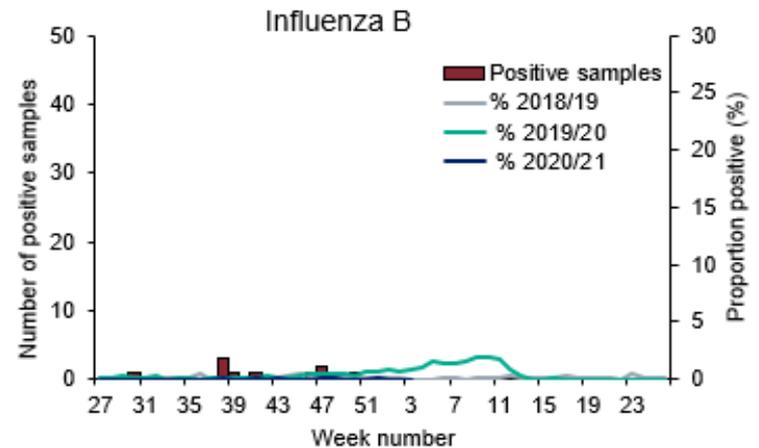
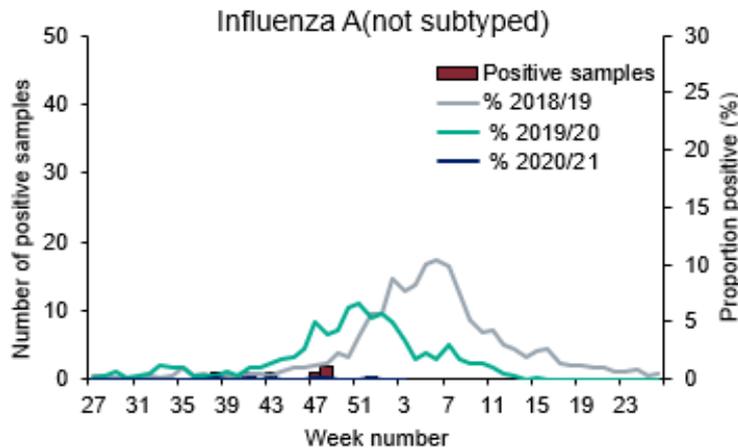
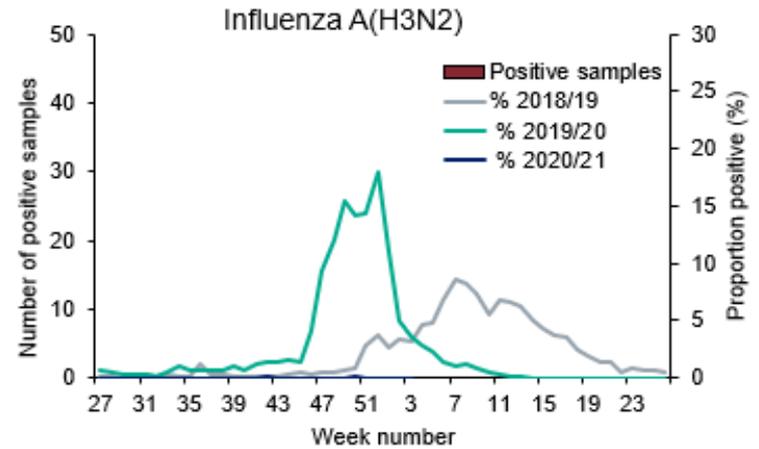
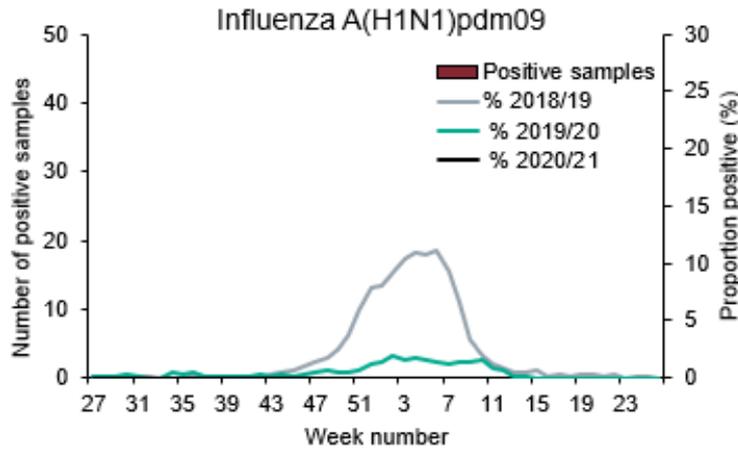
Symptomatic household member



# Respiratory Datamart system (England)

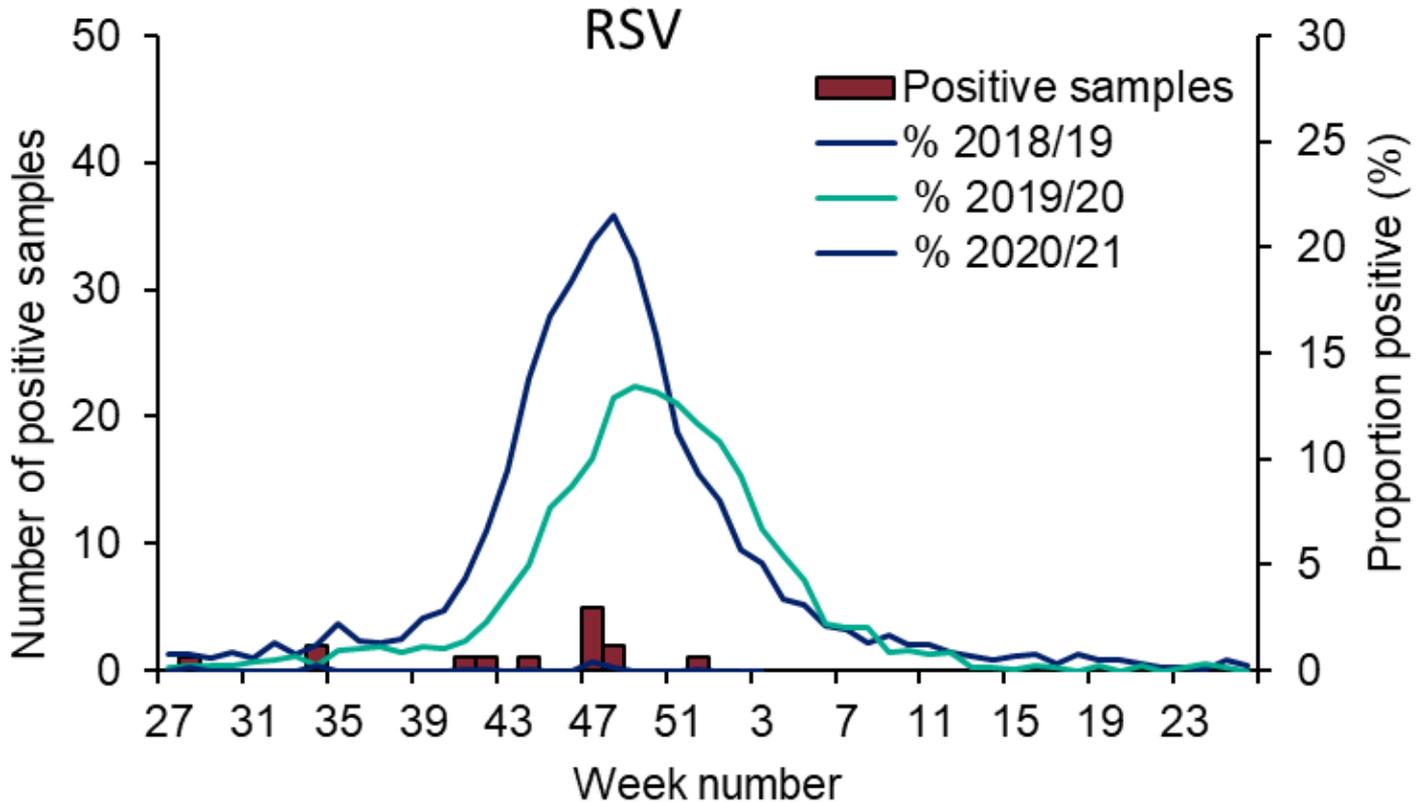


# Respiratory DataMart – Influenza subtypes



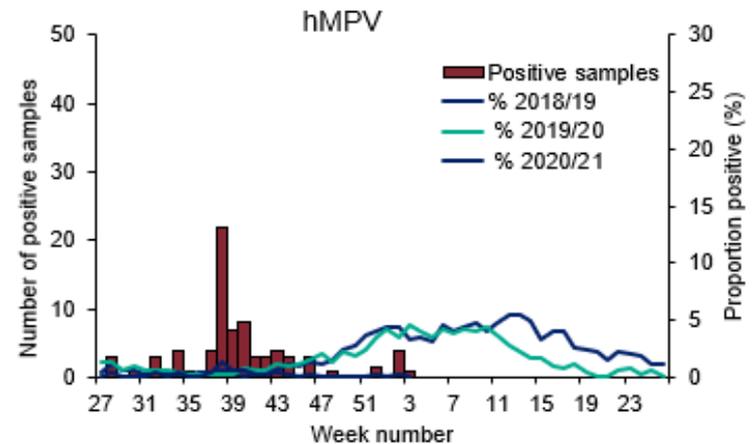
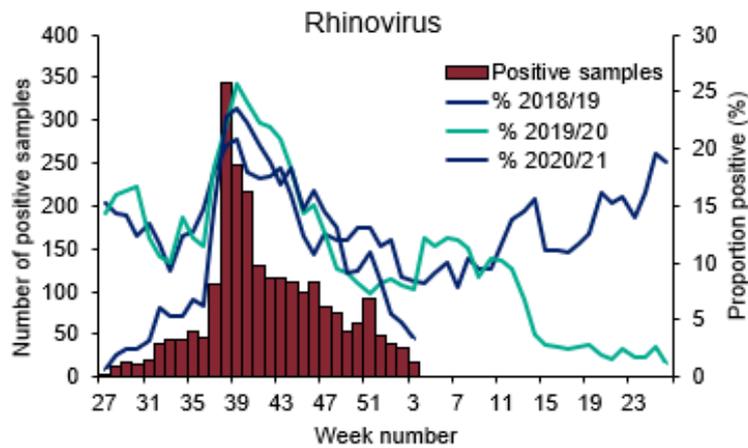
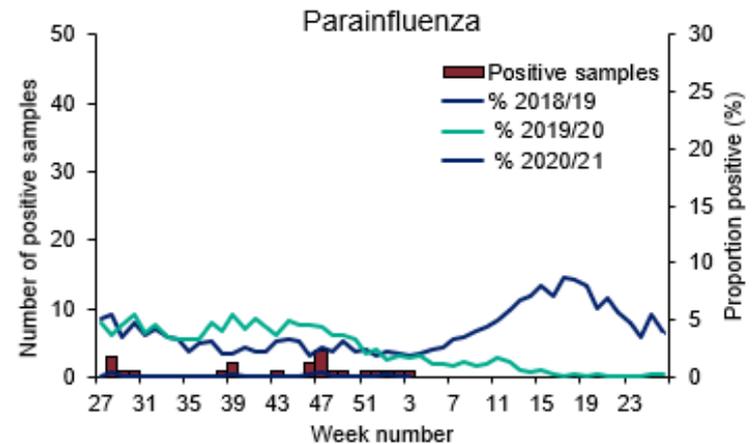
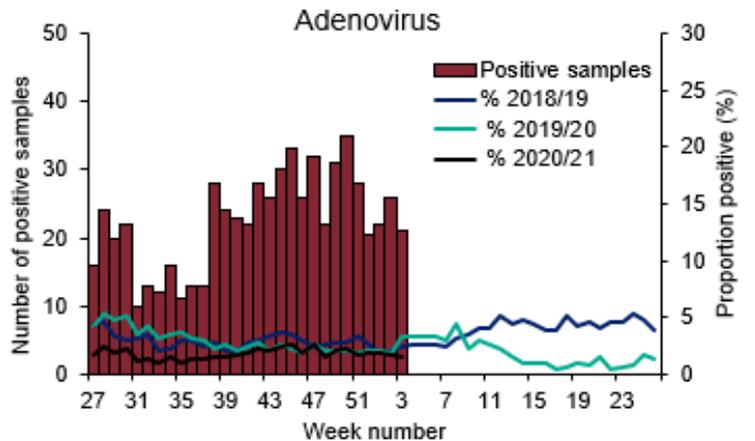


# Respiratory DataMart – Respiratory syncytial virus (RSV)





# Respiratory DataMart – other respiratory viruses



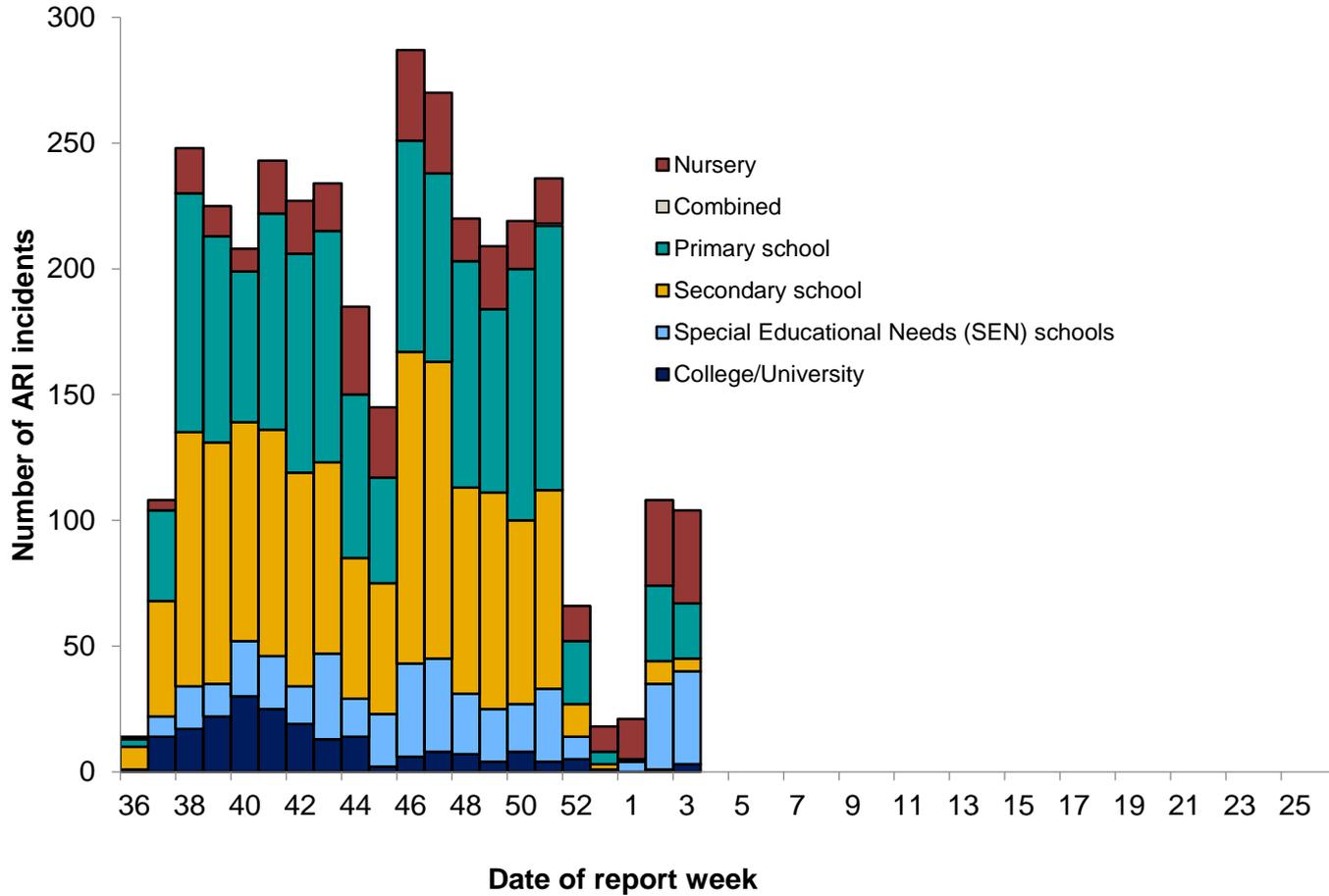
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# Community surveillance



# Number of COVID-19 confirmed clusters or outbreaks by type of educational setting, England





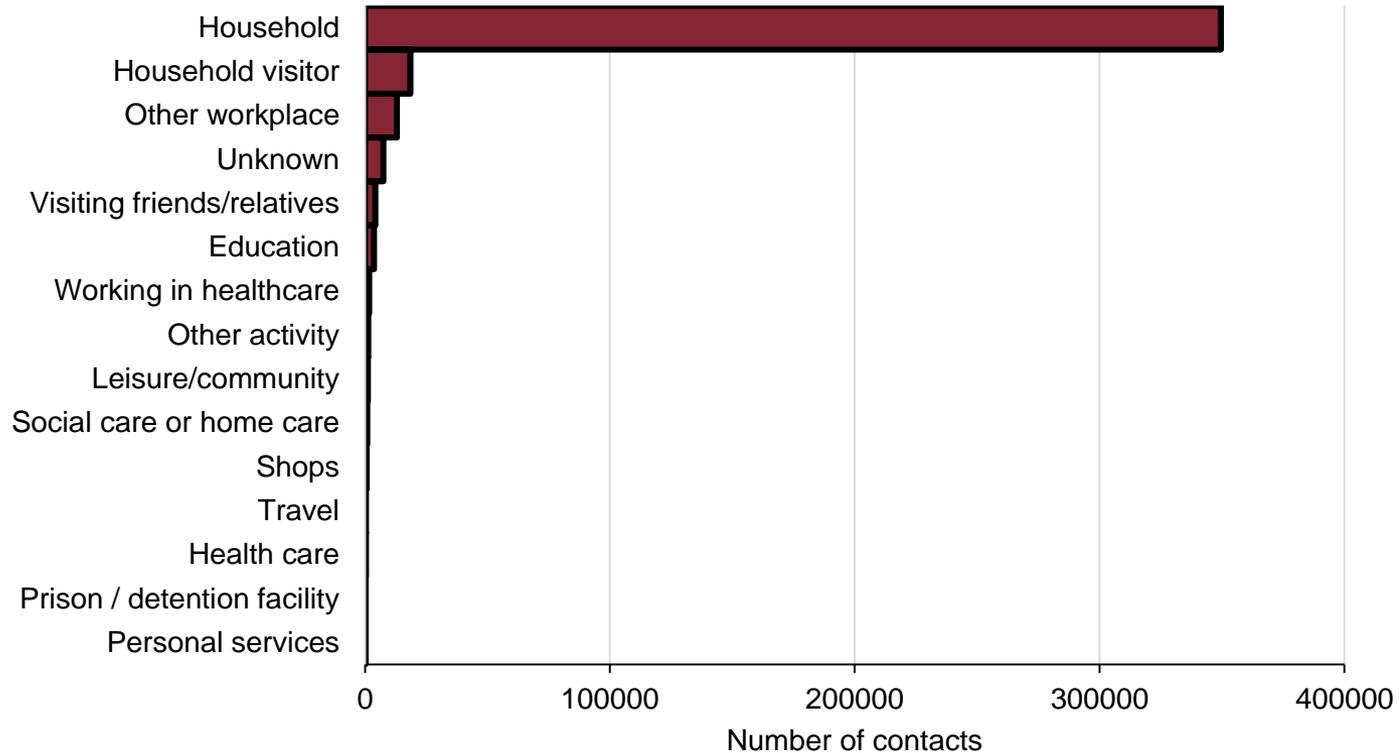
# Cumulative number of confirmed COVID-19 clusters or outbreaks by type of educational setting and PHE Centre since week 36, England

PHE Centres	Nursery	Primary School	Secondary School	Combined	Special Educational Needs (SEN) schools	College University	Total
East of England	7 (0)	16 (0)	40 (0)	0 (0)	9 (0)	13 (0)	85 (0)
East Midlands	74 (8)	147 (0)	103 (1)	0 (0)	43 (8)	22 (2)	389 (19)
London	69 (2)	311 (2)	354 (1)	1(0)	54 (3)	41 (0)	830 (8)
North East	1 (0)	18 (0)	24 (0)	0 (0)	9 (0)	6 (1)	58 (1)
North West	19 (0)	70 (1)	88 (0)	0 (0)	47 (2)	11 (0)	235 (3)
South East	114 (11)	248 (8)	304 (0)	0 (0)	100 (12)	35 (0)	801 (31)
South West	25 (1)	79 (1)	89 (1)	0 (0)	45 (6)	26 (0)	264 (9)
West Midlands	57 (10)	210 (5)	169 (1)	0 (0)	58 (2)	23 (0)	517 (18)
Yorkshire and Humber	60 (5)	159 (5)	118 (1)	0 (0)	54 (4)	25 (0)	416 (15)
<b>Total</b>	426 (37)	1258 (22)	1289 (5)	1(0)	419 (37)	202 (3)	3595 (104)

\*Number of outbreaks for Week 3 in brackets



# Contacts by exposure/activity setting in week 3, England (Data source: NHS Test and Trace)

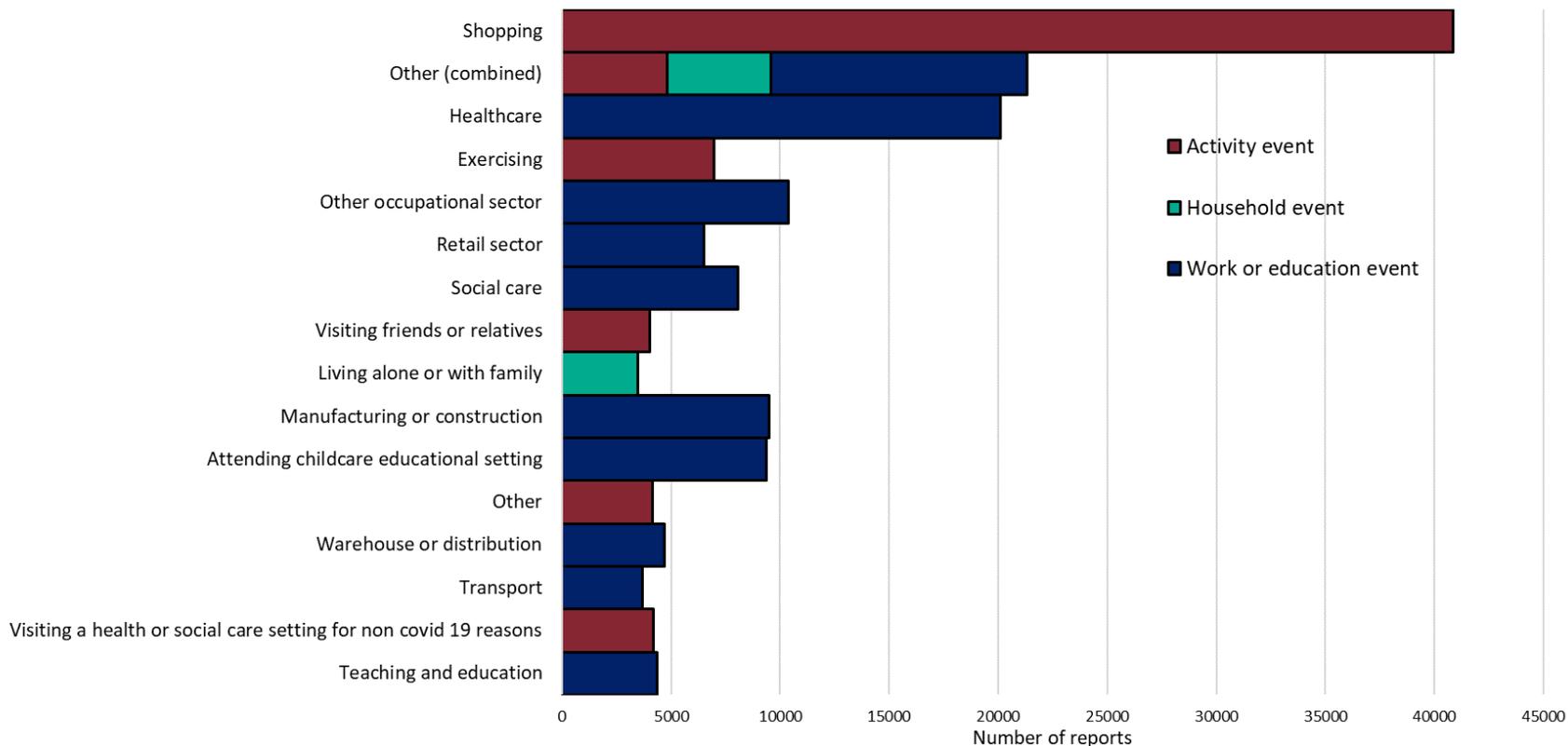


Note: categories have been grouped as follows: leisure / community includes eating out, attending events and celebrations, exercising, worship, arts, entertainment or recreation, community activities and attending play groups or organised trips; other workplace includes: retail, manufacturing or construction, hospitality, transport, emergency services or border force, food production and agriculture, prison, financial services, civil service or local government, information and communication, military, critical national infrastructure.

Personal services include hairdressers, barbers, tattooists and nail bars.



# Events and activities reported by people testing positive, prior to symptom onset in week 3, England (Data source: NHS Test and Trace)



Note: 'Other' includes a wide range of different activities and settings, each of which has small numbers of individuals, as well as activities which did not fit any specific category and were added as Other by the case. This includes: all within 'activities': Arts, entertainment or recreation; Civil service or government; Close contact services; Community and charity activities; Critical national infrastructure; Emergency services; Financial services; Food production; Hospitality; Immigration border services; Information and communication; Military; Personal care; Prison; Private events and celebrations; Public events and mass gathering; event within a shared household; Sport events; Supported living; Teaching and education; Transport; 'Other (combined)' includes all exposure group types that have small counts such as "went to church", "went to the zoo" within that event type.



# Common locations reported by people testing positive in week 3, England (Data source: NHS Test and Trace)

Setting	All ages**	%
Supermarket (visiting and working)	30	29.10%
Warehouse (working)	5	4.90%
Hospital (visiting and working)	4	3.90%
Nursery preschool (attending and working)	4	3.90%
Care home (working)	3	2.90%
Primary school (attending and working)	3	2.90%
Food (working)	2	1.90%
Home (visiting)	2	1.90%
Hotel (home/shared)	2	1.90%
Local convenience store (visiting)	2	1.90%
Office based (working)	2	1.90%

Excludes 32 common exposures classed as 'other' at the third level of classification (these could be from several 2nd level categories such as Eating out, Entertainment and day trips, Sport events etc). Also excludes 14 where no third level categorization was available (includes second level categories such as Prison / detention facility, other occupational sector, information and communication). See appendix for more information.

The data is based on a revised definition for common exposures. Previously, >2 cases in the same location were counted as common exposures. The revised definition further splits this into separate common exposures if the event's settings are different. Additionally, the revised definition excludes exposure events without a known event date.

Furthermore, this data now only includes common exposures identified during the reporting week. This differs from the previous version where a common exposure could be included in multiple reporting weeks depending on its exposure duration.

As a result of these differences, the data will not be comparable with previous versions.

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# Surveillance in 'educational-age' cohorts



## Methodology and limitations

- Data source: SGSS Pillar 1 (NHS and PHE testing) and Pillar 2 (community testing) – England
- Educational-age cohorts have been calculated using dates of birth that correspond to a particular year group. School year groups run from 1 September to 31 of August of the following calendar year.
- We include all cases regardless of whether or not they attended an educational setting or whether or not the educational setting was open during the reporting period
- Data for the most recent week are provisional and likely to be an underestimate
- From early December a mass testing programme has been rolled out in Higher Education Institutions using Lateral Flow Devices ahead of students returning home for the Christmas break. This will impact testing trends and positivity data during this period.

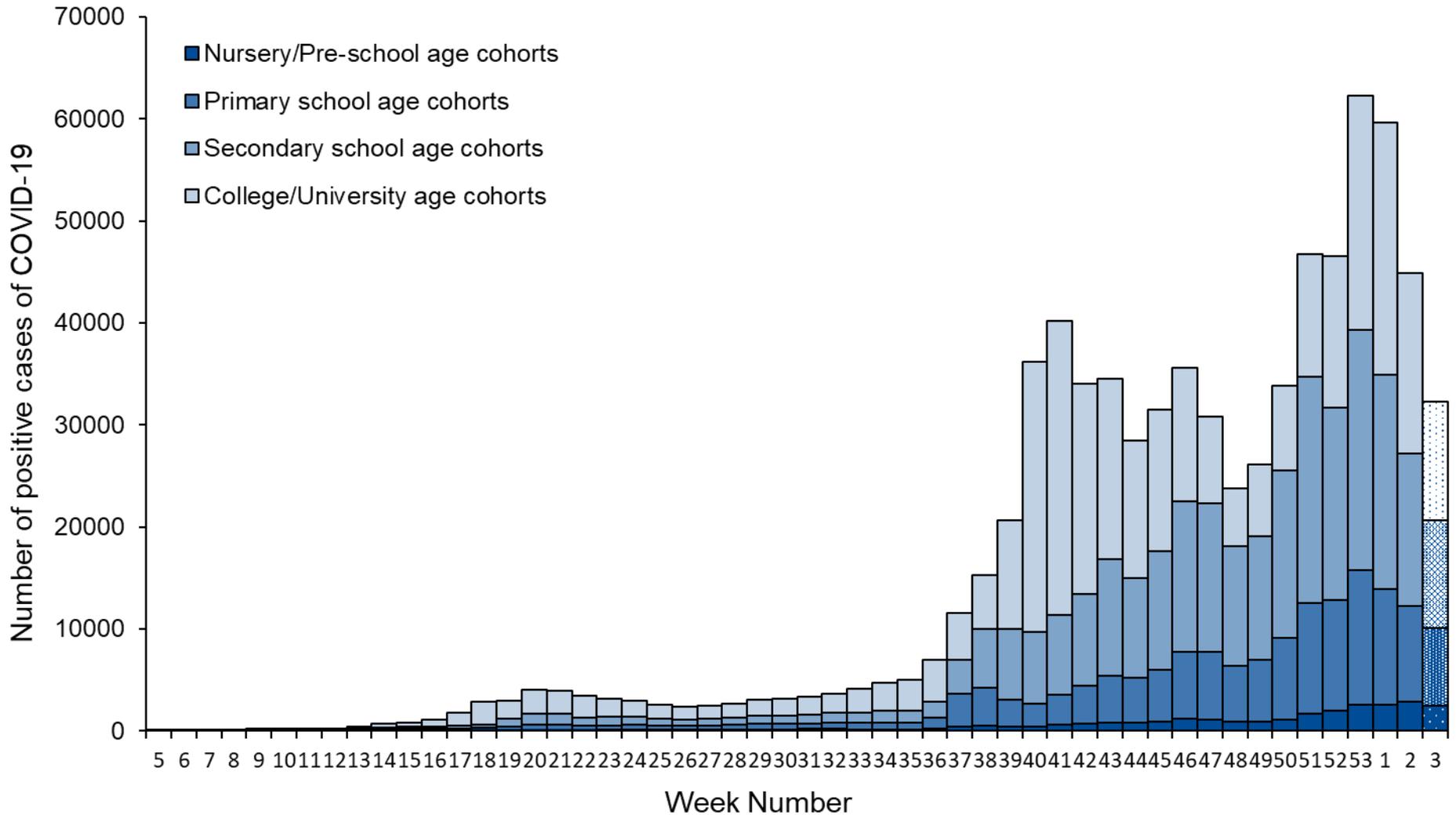


- The table aside represents the birth cohorts for each year group

Birth cohort			Year group
01/09/1998	to	31/08/1999	Uni Year 4
01/09/1999	to	31/08/2000	Uni Year 3
01/09/2000	to	31/08/2001	Uni Year 2
01/09/2001	to	31/08/2002	Uni Year 1
01/09/2002	to	31/08/2003	Year 13
01/09/2003	to	31/08/2004	Year 12
01/09/2004	to	31/08/2005	Year 11
01/09/2005	to	31/08/2006	Year 10
01/09/2006	to	31/08/2007	Year 9
01/09/2007	to	31/08/2008	Year 8
01/09/2008	to	31/08/2009	Year 7
01/09/2009	to	31/08/2010	Year 6
01/09/2010	to	31/08/2011	Year 5
01/09/2011	to	31/08/2012	Year 4
01/09/2012	to	31/08/2013	Year 3
01/09/2013	to	31/08/2014	Year 2
01/09/2014	to	31/08/2015	Year 1
01/09/2015	to	31/08/2016	Reception
01/09/2016	to	31/08/2017	Pre-school
01/09/2017	to	31/08/2018	Nursery

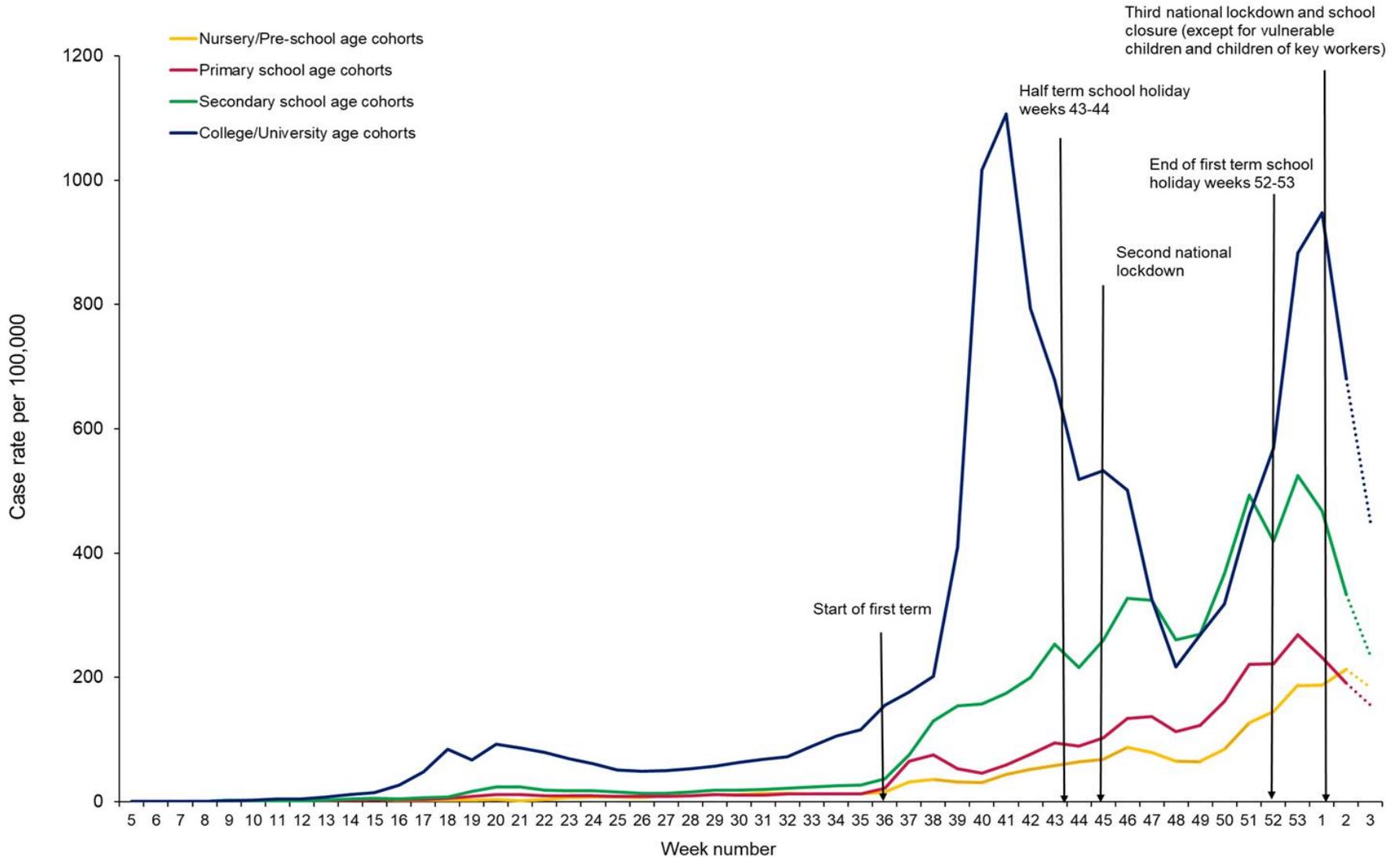


# Weekly number of laboratory confirmed COVID-19 cases in nursery/preschool, primary, secondary and college/university age cohorts



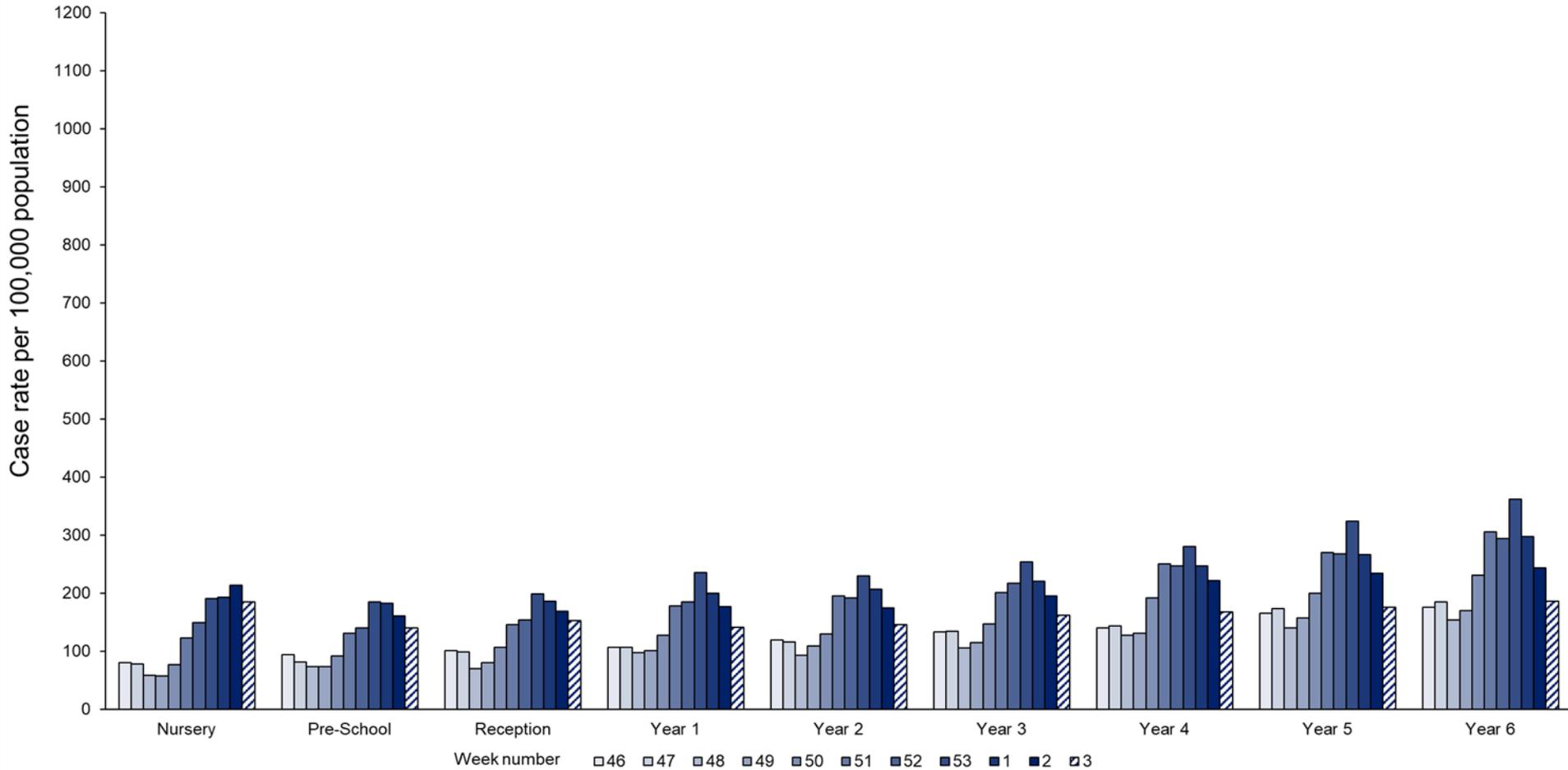


# Weekly incidence of laboratory confirmed COVID-19 cases per 100,000 population in nursery/preschool, primary school, secondary school and college/university age cohorts



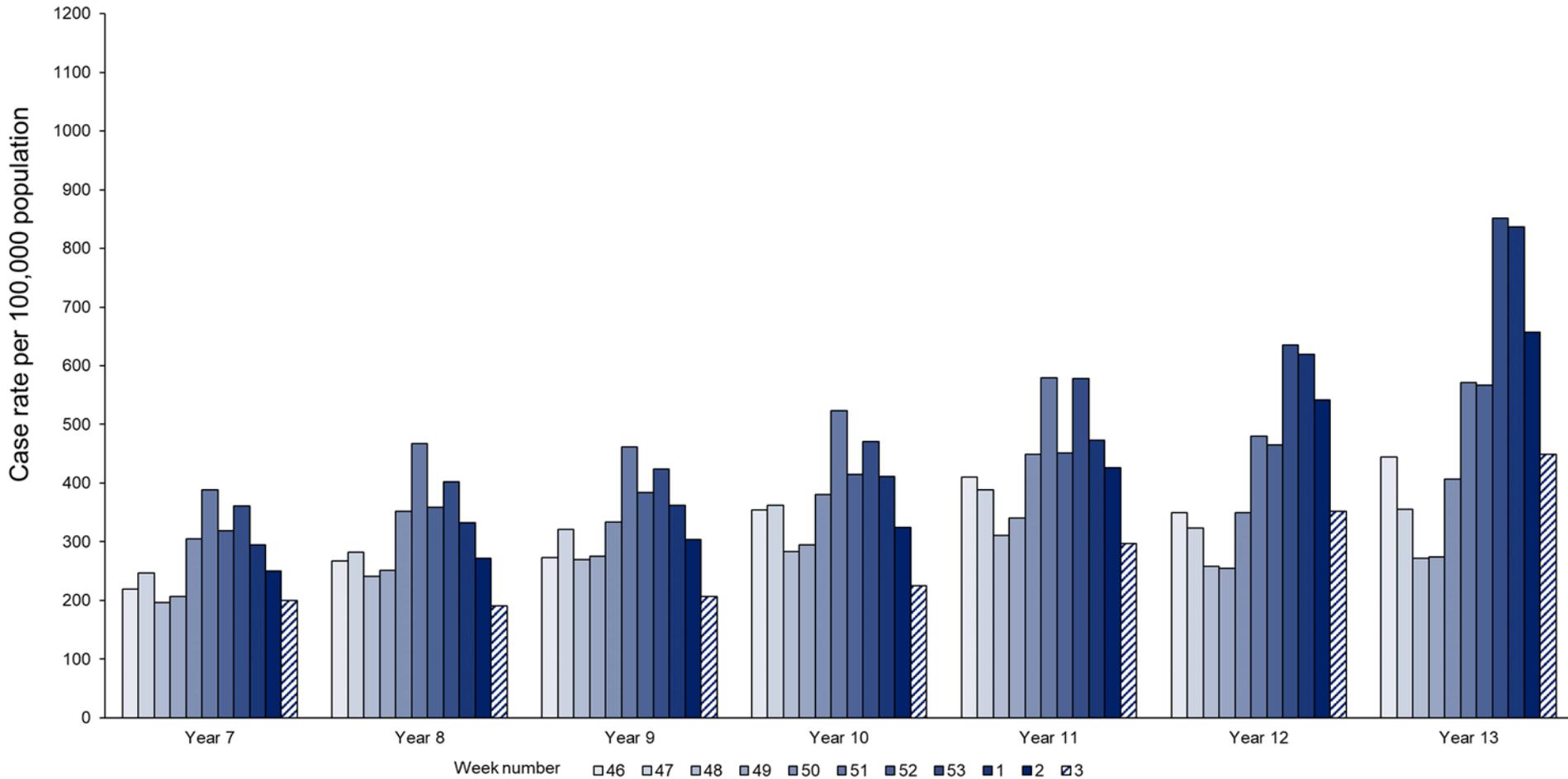


# Weekly incidence of laboratory confirmed COVID-19 cases per 100,000 population in educational age cohorts presented by Year group, from nursery to Year 6, week 46 to 3



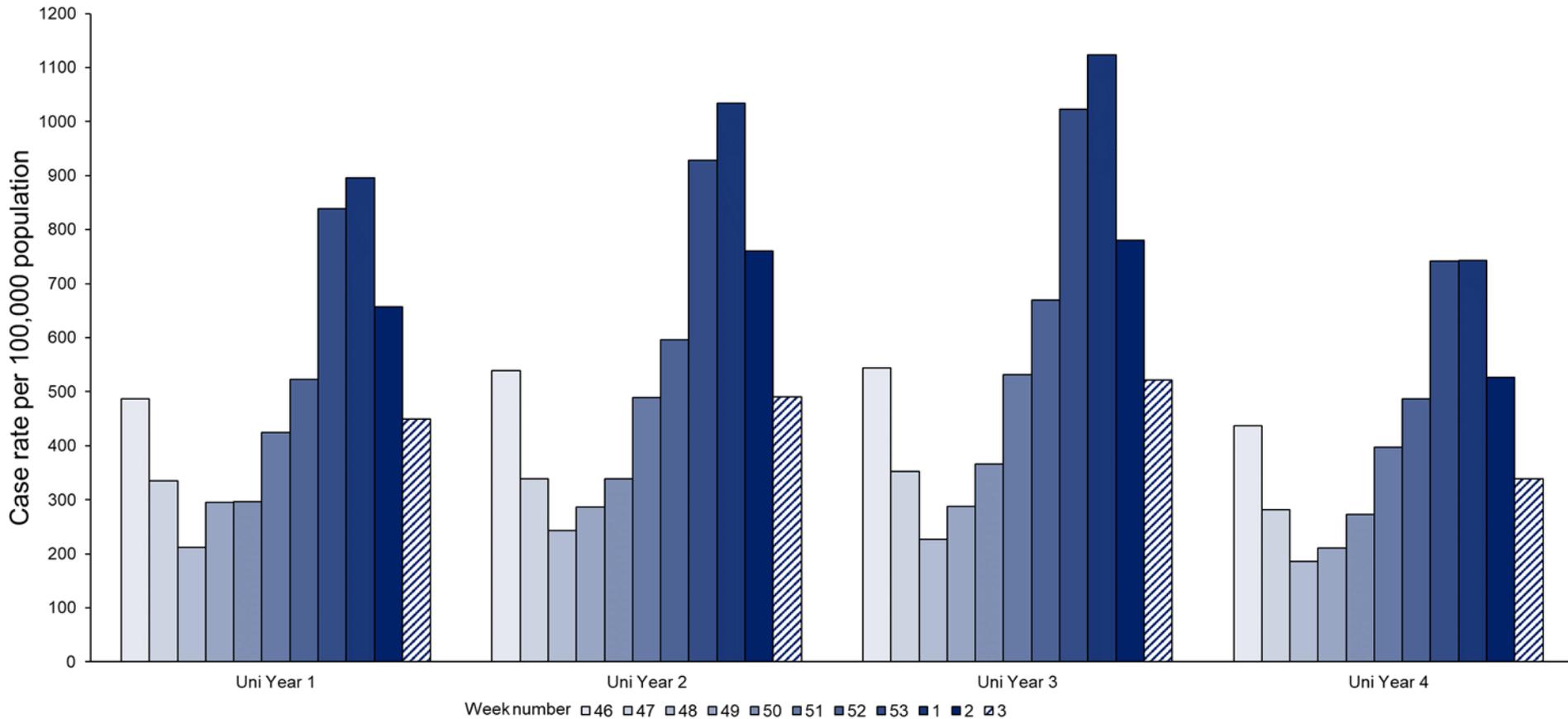


# Weekly incidence of laboratory confirmed COVID-19 cases per 100,000 population in educational age groups presented by secondary school year groups (Year 7 to Year 13), week 46 to 3





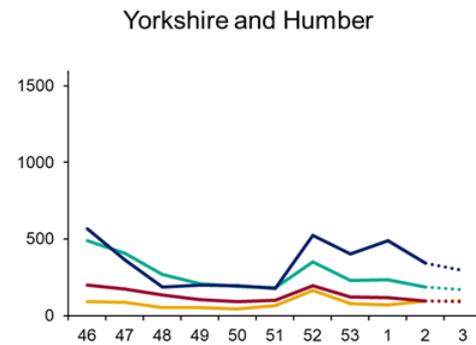
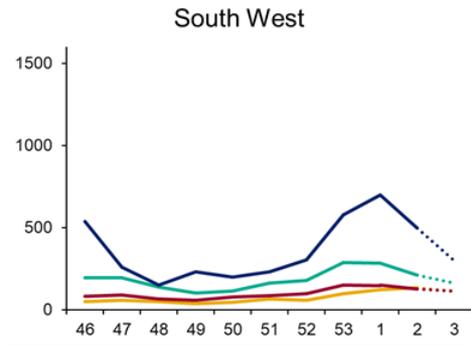
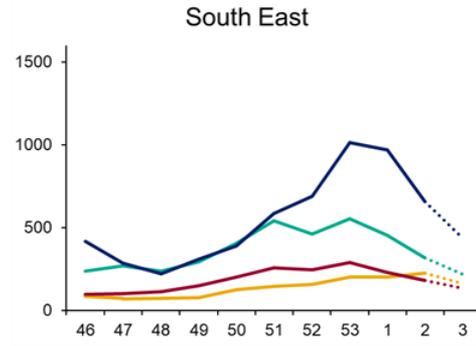
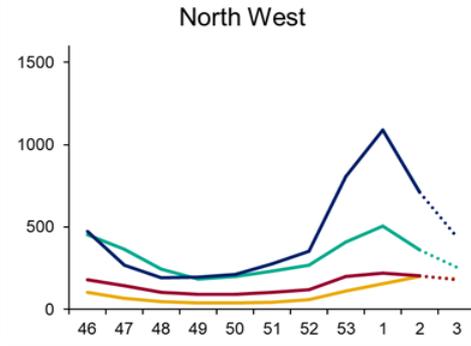
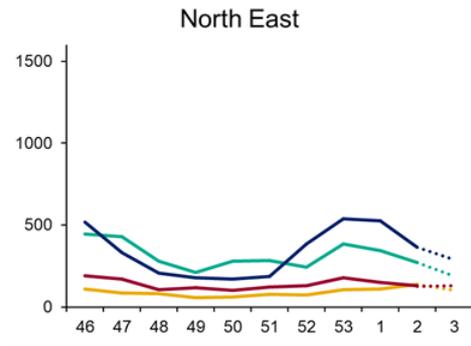
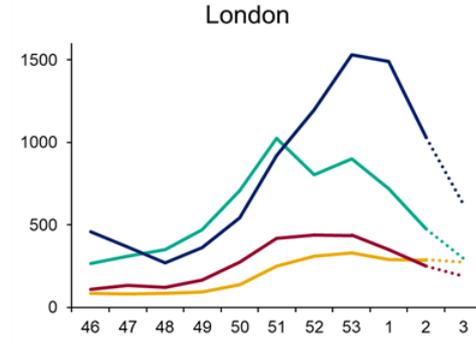
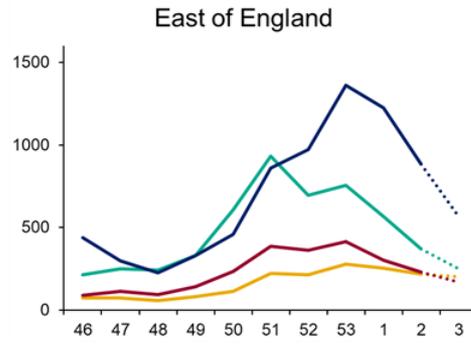
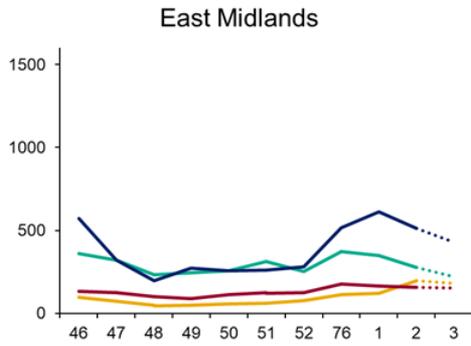
# Weekly incidence of laboratory confirmed COVID-19 cases per 100,000 population in educational age cohorts corresponding to university/college year groups, week 46 to 3





# Weekly incidence of laboratory confirmed COVID-19 cases per 100,000 population by educational age cohorts and PHE region, week 46 to 3

Case rate per 100,000 population

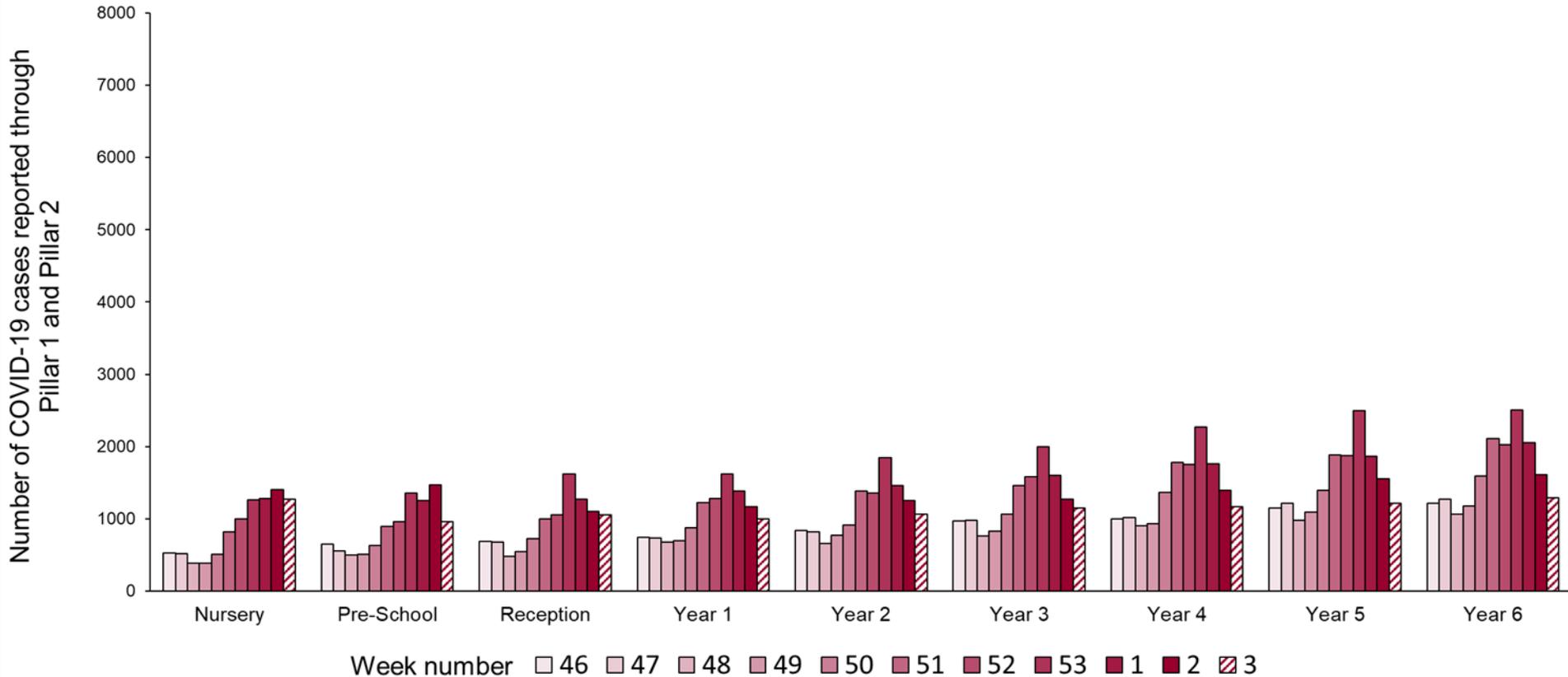


— Nursery/Pre-school age cohorts 
 — Primary school age cohorts 
 — Secondary school age cohorts 
 — College/University age cohorts

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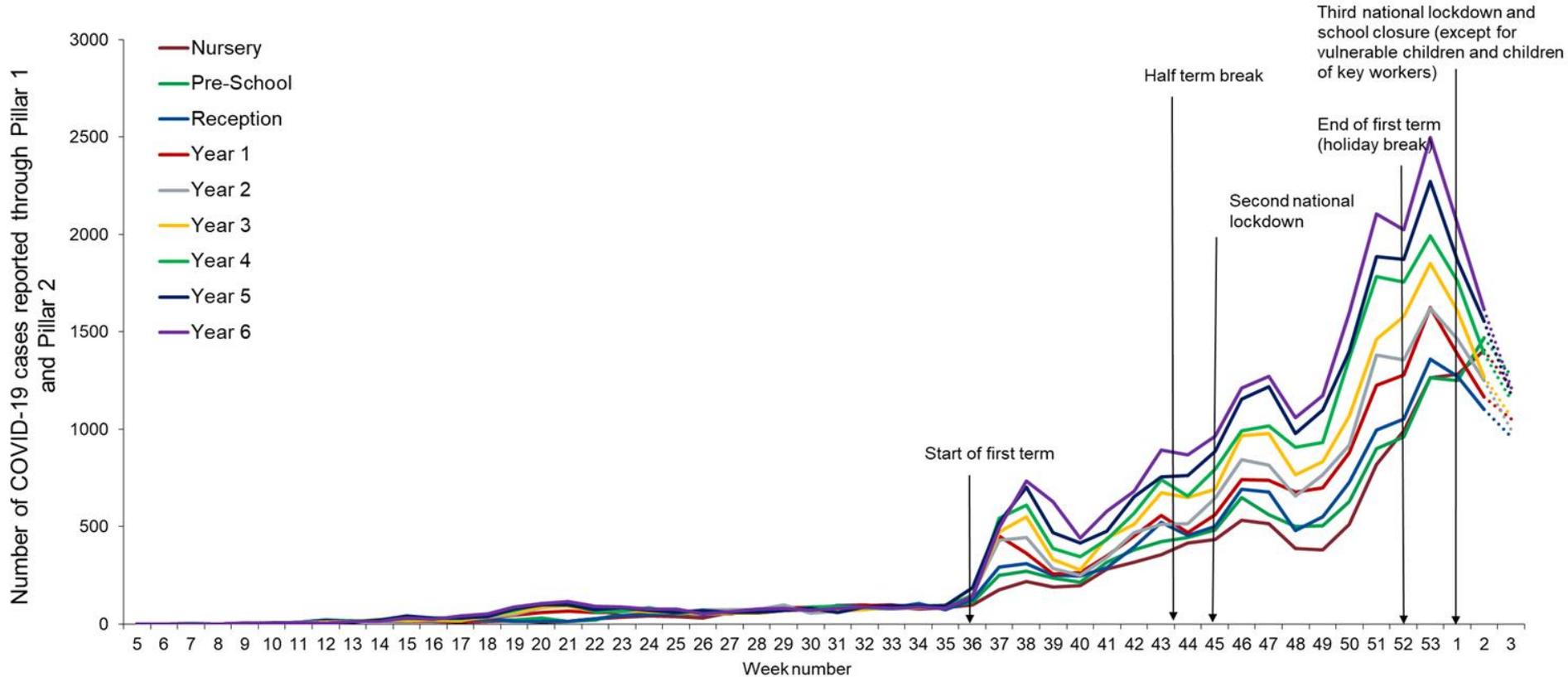


# Weekly number of new laboratory confirmed COVID-19 cases in educational age cohorts presented by Year group, from nursery to Year 6, week 46 to 3



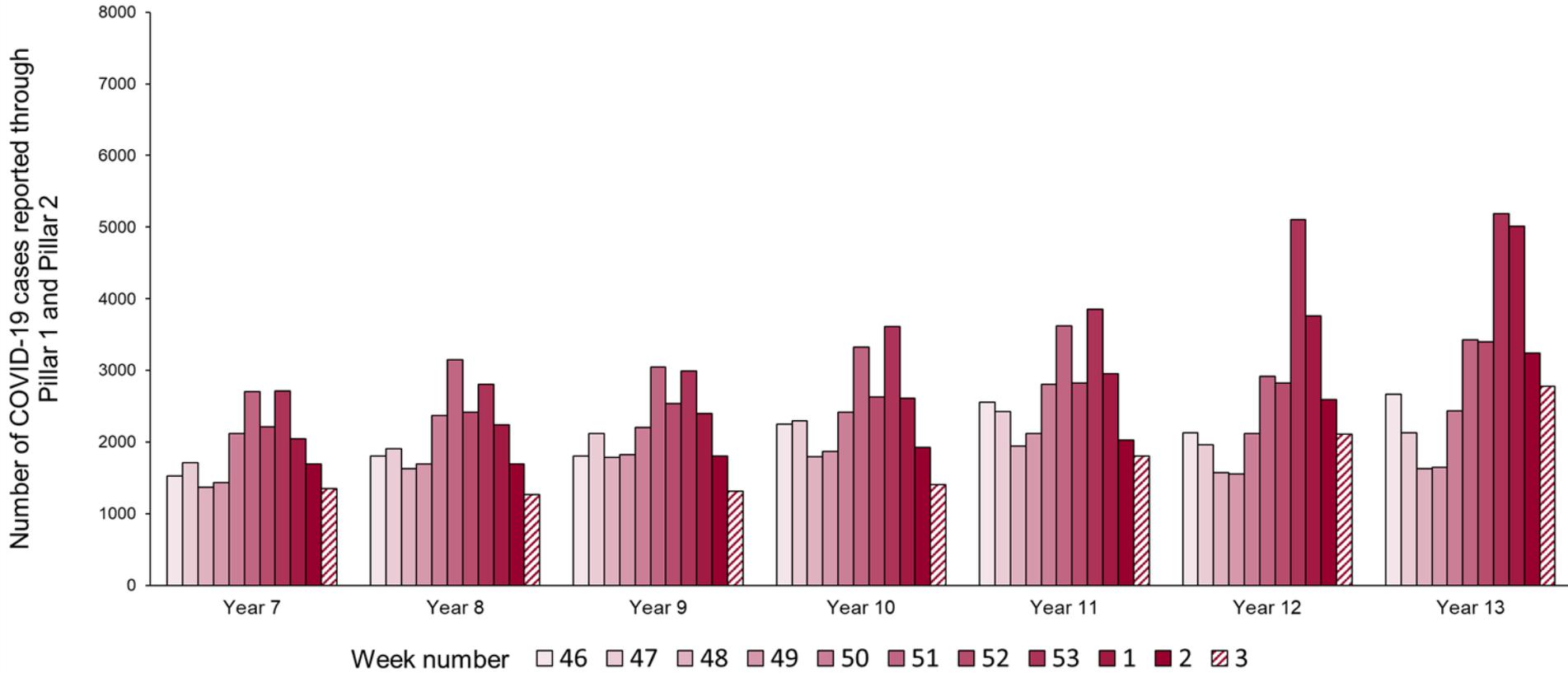


# Weekly number of new laboratory confirmed COVID-19 cases in educational age cohorts presented by Year group, from nursery to Year 6



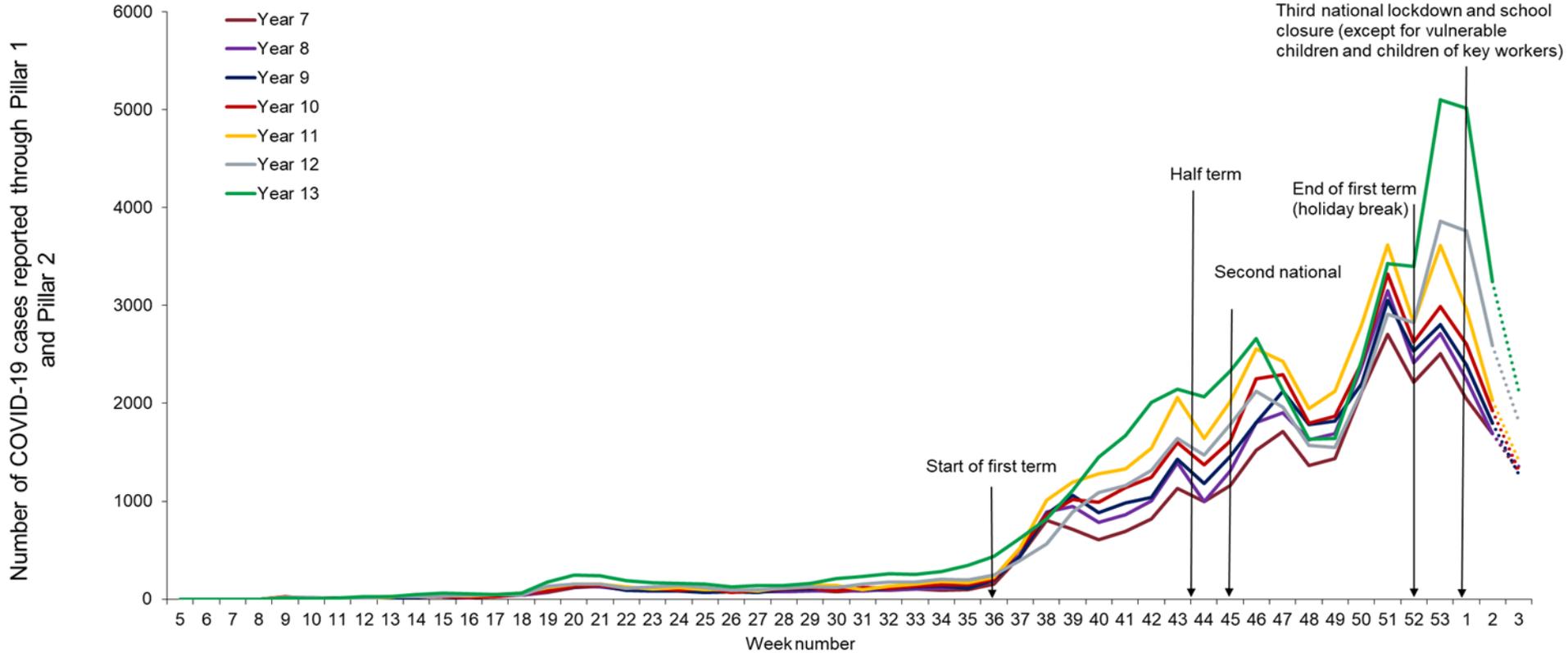


# Weekly number of new laboratory confirmed COVID-19 cases in educational age groups presented by secondary school year groups (Year 7 to Year 13), week 46 to 3



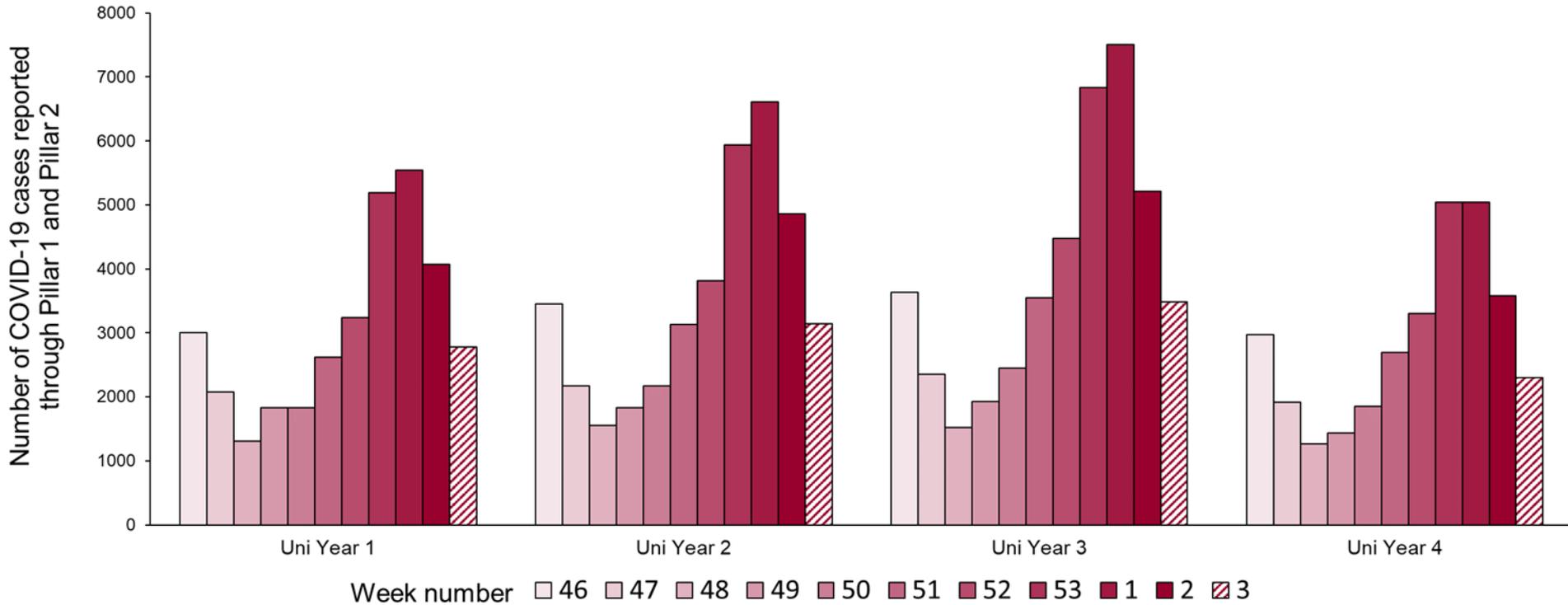


# Weekly number of new laboratory confirmed COVID-19 cases in educational age groups presented by secondary school year groups (Year 7 to Year 13)



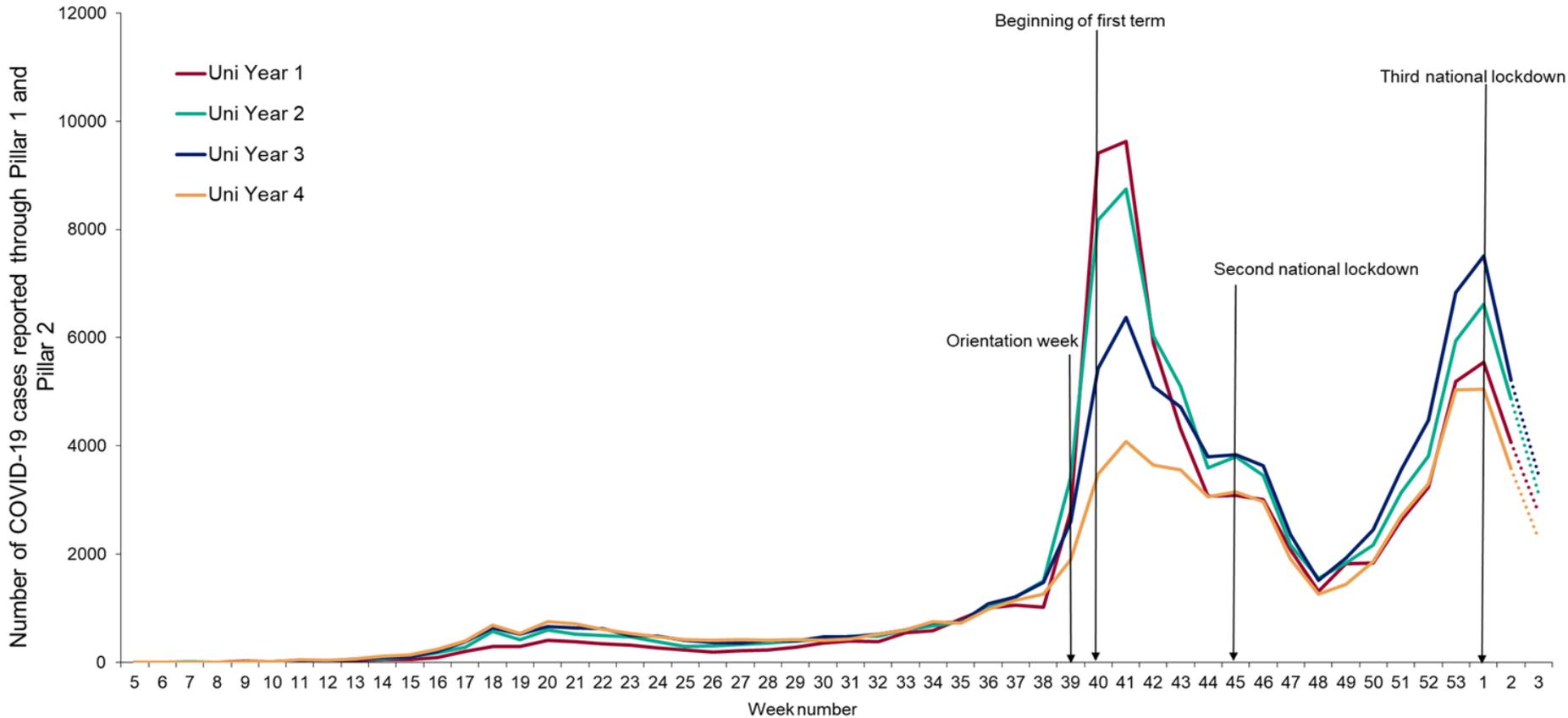


# Weekly number of new laboratory confirmed COVID-19 cases in educational age cohorts corresponding to university/college year groups, week 46 to 3





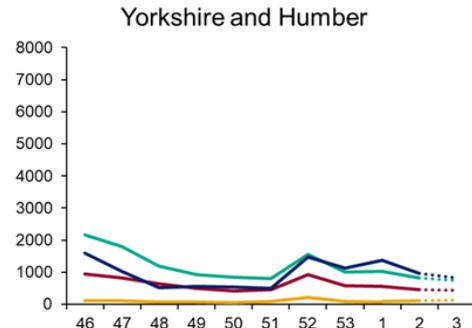
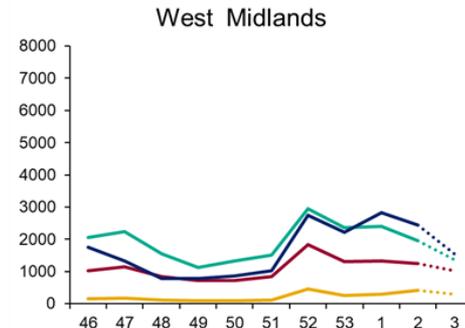
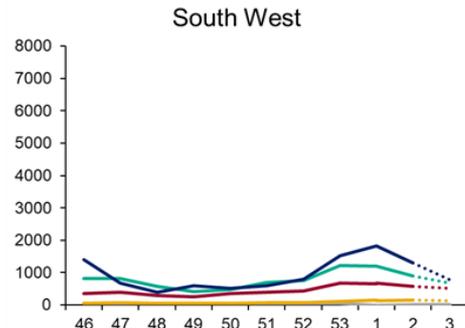
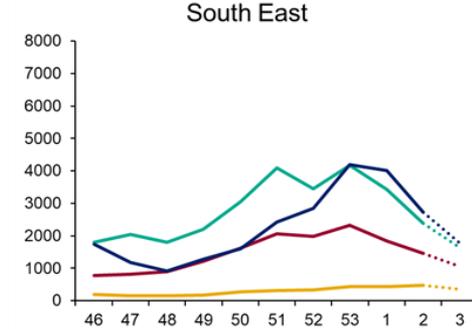
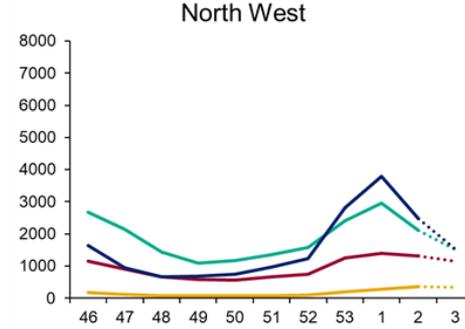
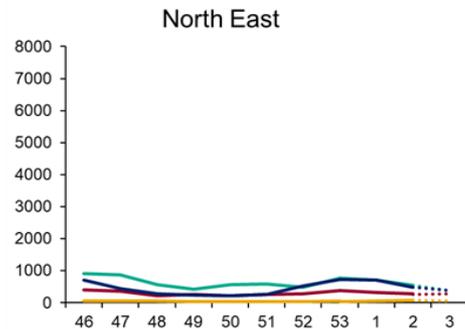
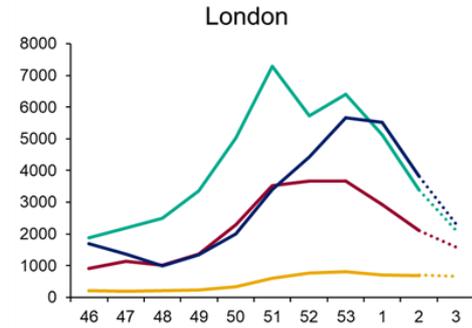
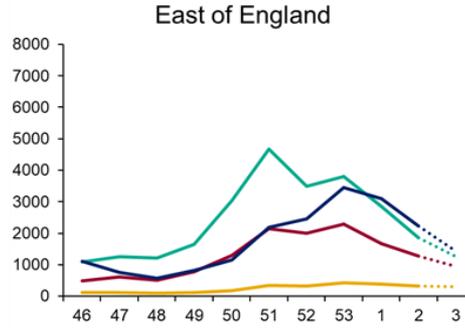
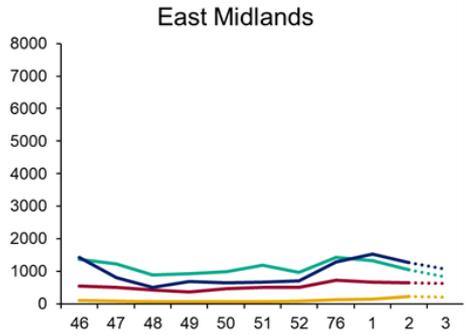
# Weekly number of new laboratory confirmed COVID-19 cases in educational age cohorts corresponding to university/college year groups





# Weekly number of new laboratory confirmed COVID-19 cases by educational age cohorts and PHE region, week 46 to 3

Number of new laboratory confirmed COVID-19 cases

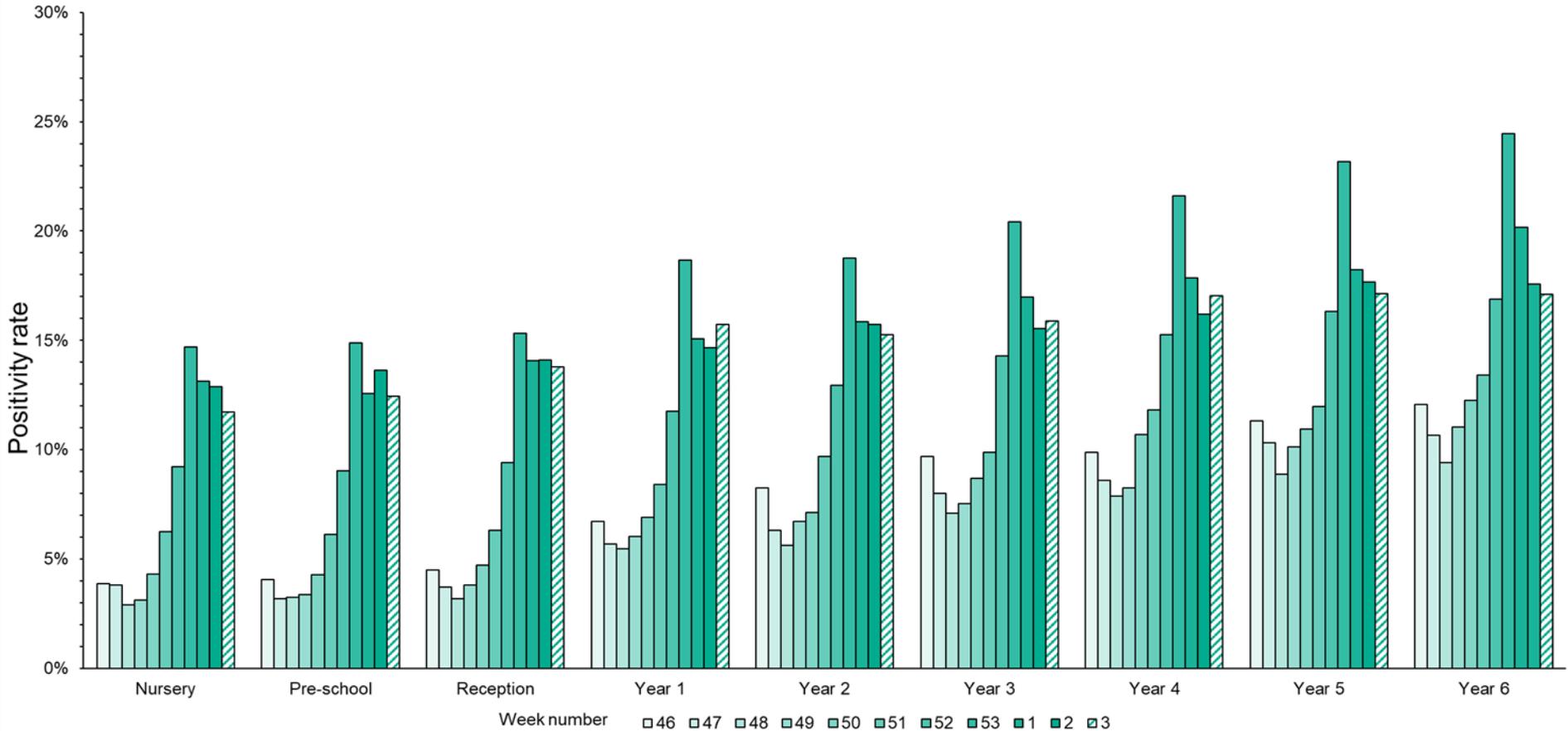


— Nursery/Pre-school age cohorts — Primary school age cohorts — Secondary school age cohorts — College/University age cohorts

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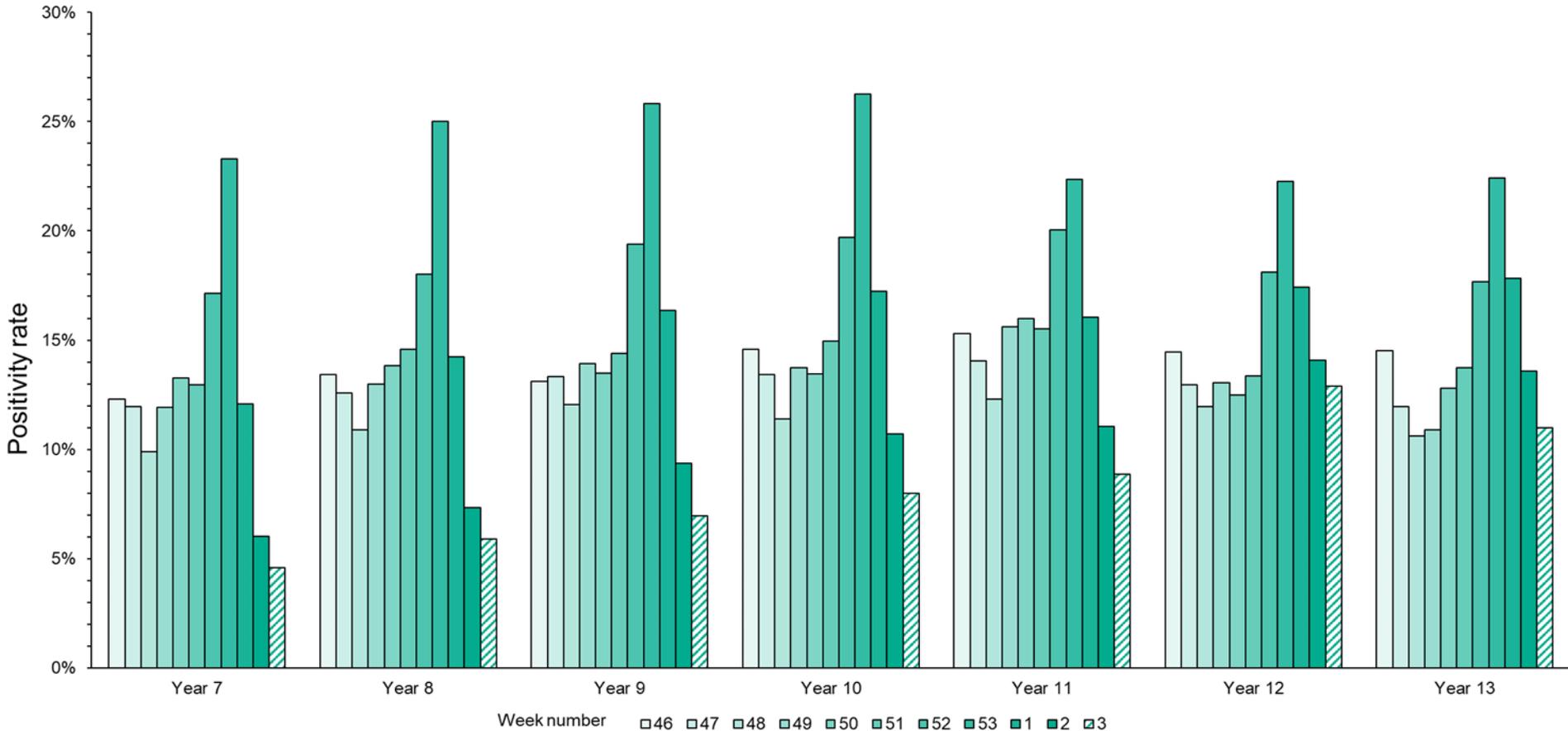


# Weekly positivity rates of confirmed COVID-19 cases in educational age cohorts presented by Year group, from nursery to Year 6, week 46 to 3



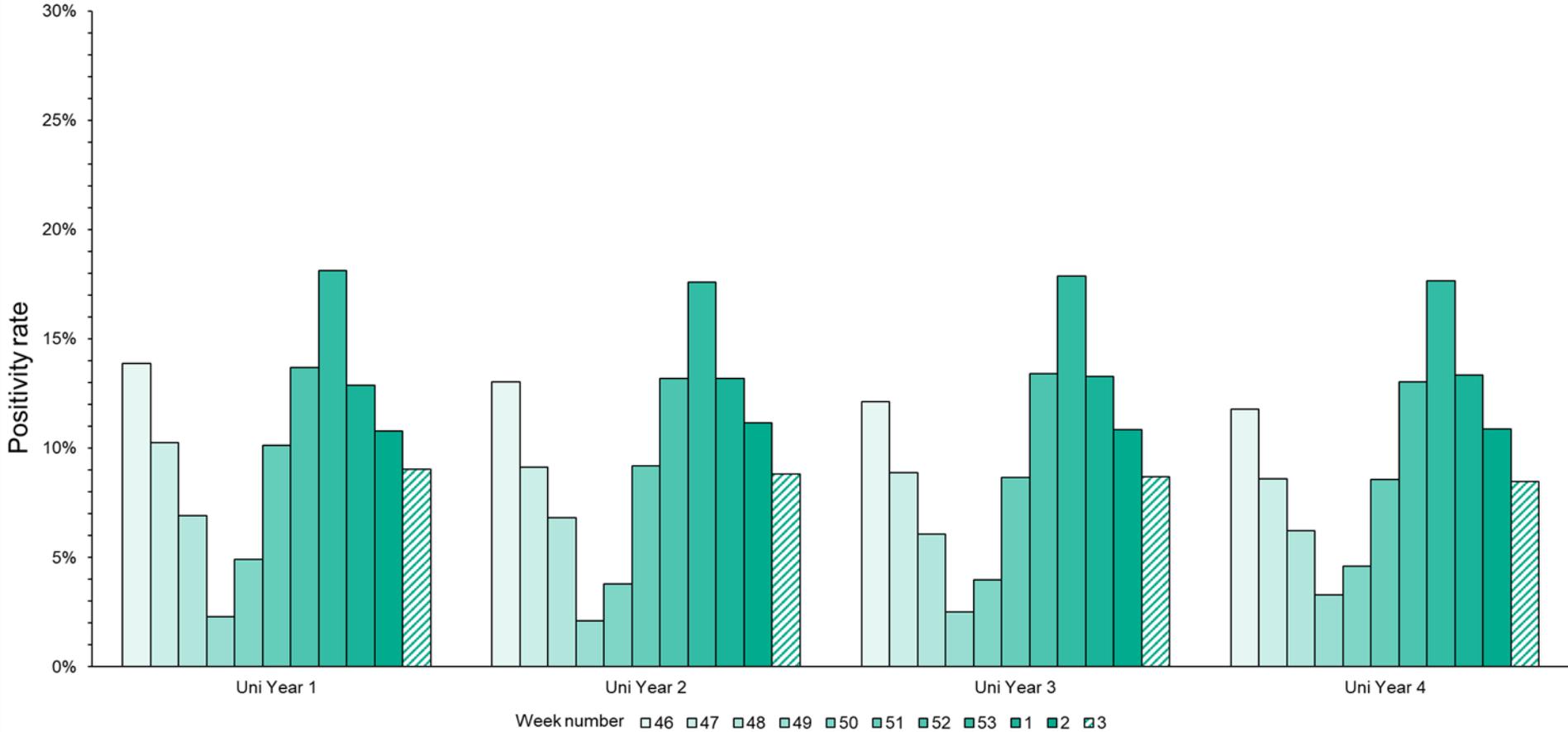


# Weekly positivity rates of confirmed COVID-19 cases in educational age cohorts presented by secondary school year group (Year 7 to Year 13), week 46 to 3



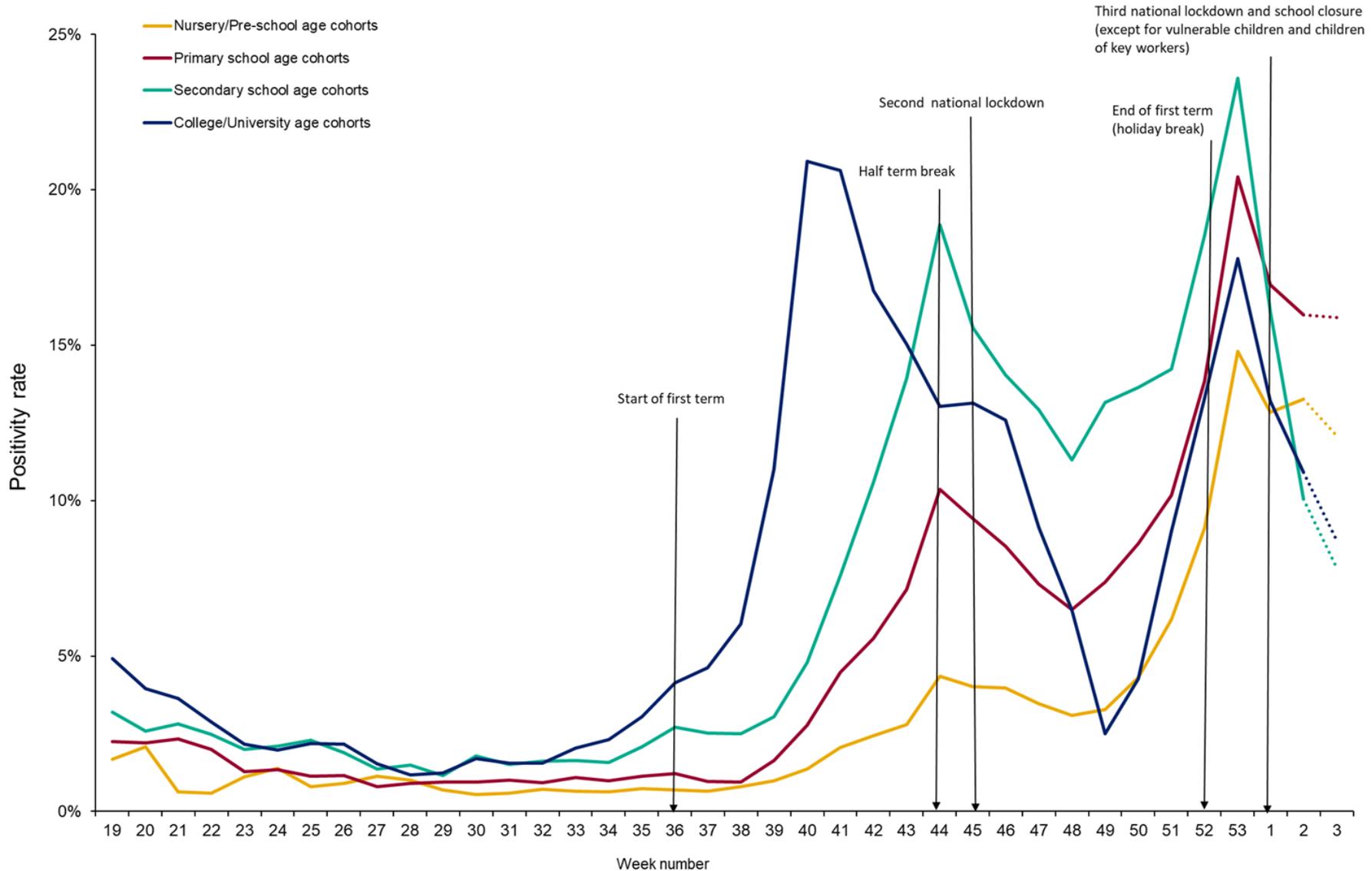


# Weekly positivity rates of confirmed COVID-19 cases in educational age cohorts corresponding to university/college year groups, week 46 to 3





# Weekly positivity rates of confirmed COVID-19 cases, in nursery/preschool, primary school, secondary school and college/University age cohorts, week 46 to 3



Third national lockdown and school closure (except for vulnerable children and children of key workers)

Second national lockdown

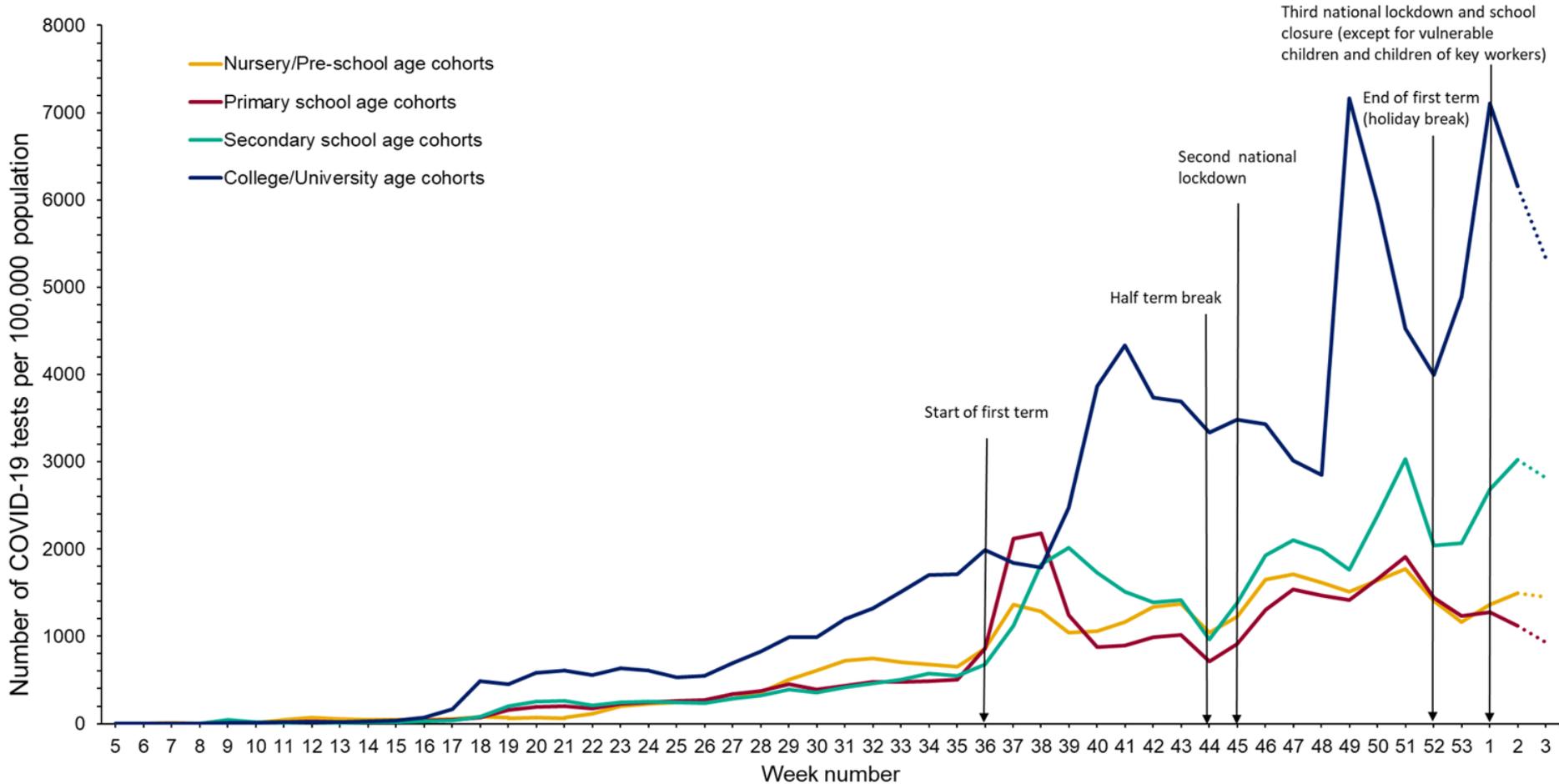
End of first term (holiday break)

Half term break

Start of first term



# Weekly rate of new COVID-19 tests performed per 100,000 population in nursery/preschool, primary school, secondary school and college/University age cohorts, week 46 to 3



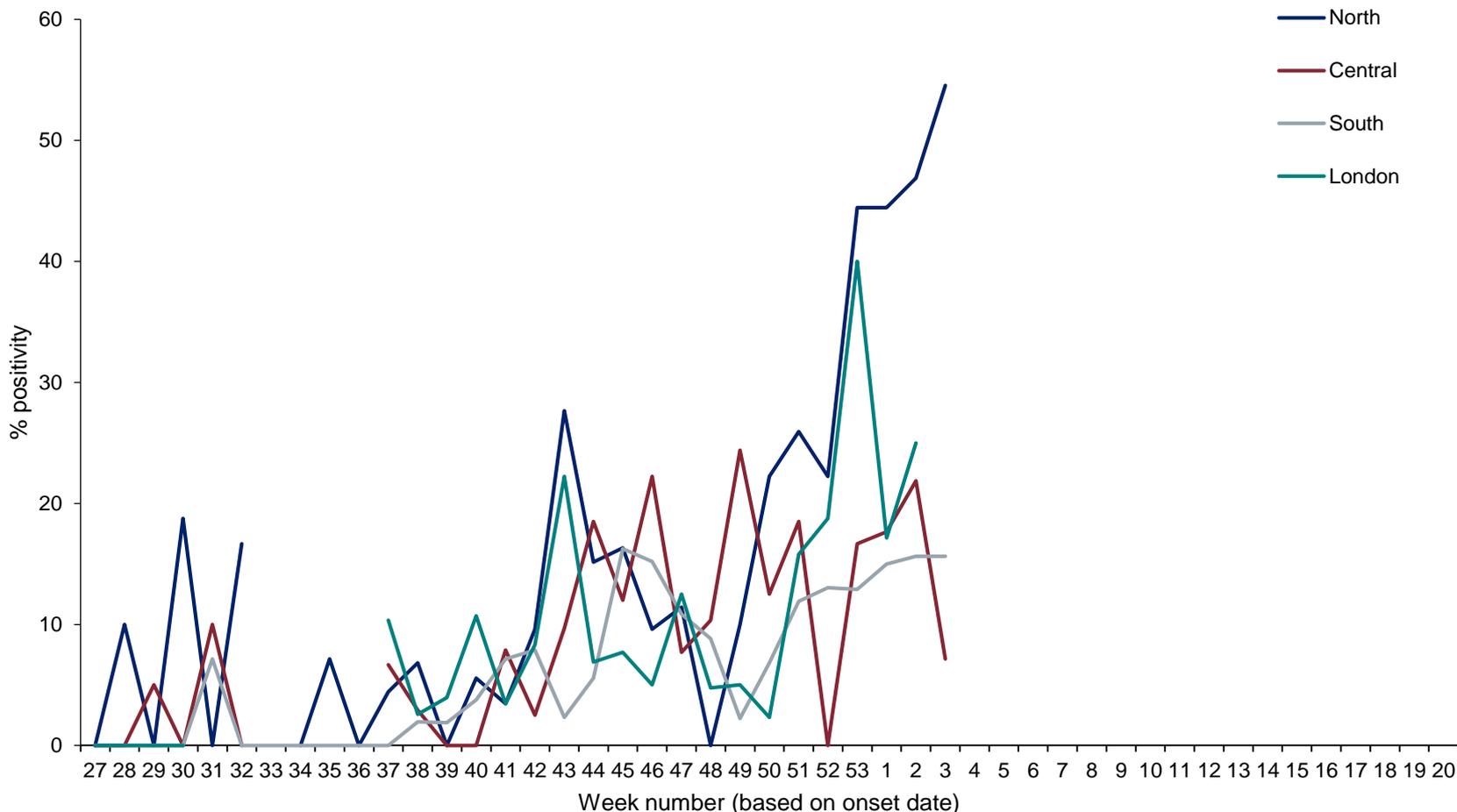
\* From early December a mass testing programme has been rolled out in Higher Education Institutions using Lateral Flow Devices ahead of students returning home for the Christmas break. This will impact testing trends and positivity data during this period.



# Primary care surveillance



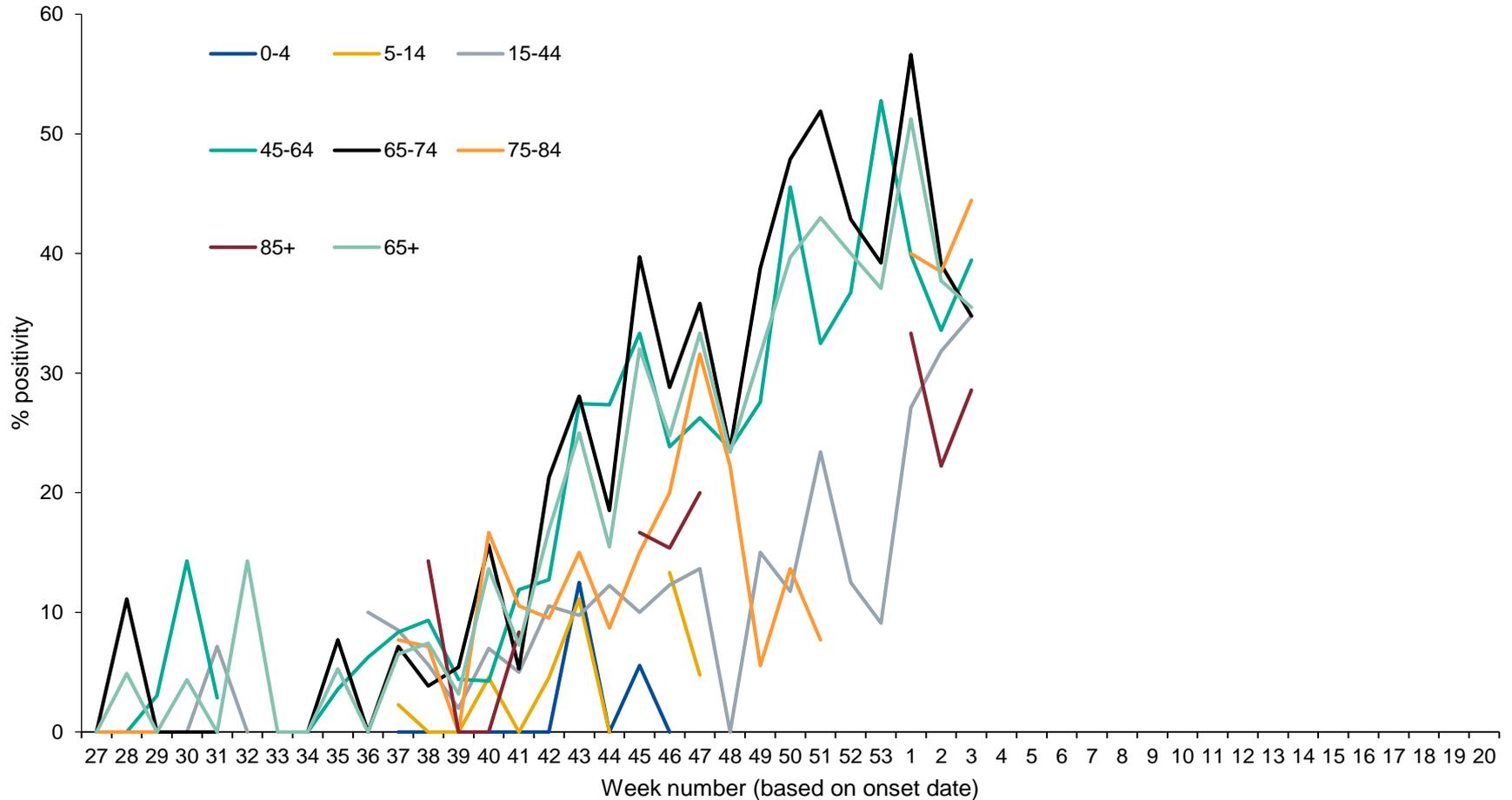
# Overall SARS-CoV-2 positivity (%) (weekly) by PHE Region, England (RCGP)



For the most recent week, more samples are expected to be tested therefore the graph should be interpreted with caution. Positivity (%) is not calculated when the total number tested is less than 10



# Overall SARS-CoV-2 positivity (%) (weekly) by age group, England (RCGP)



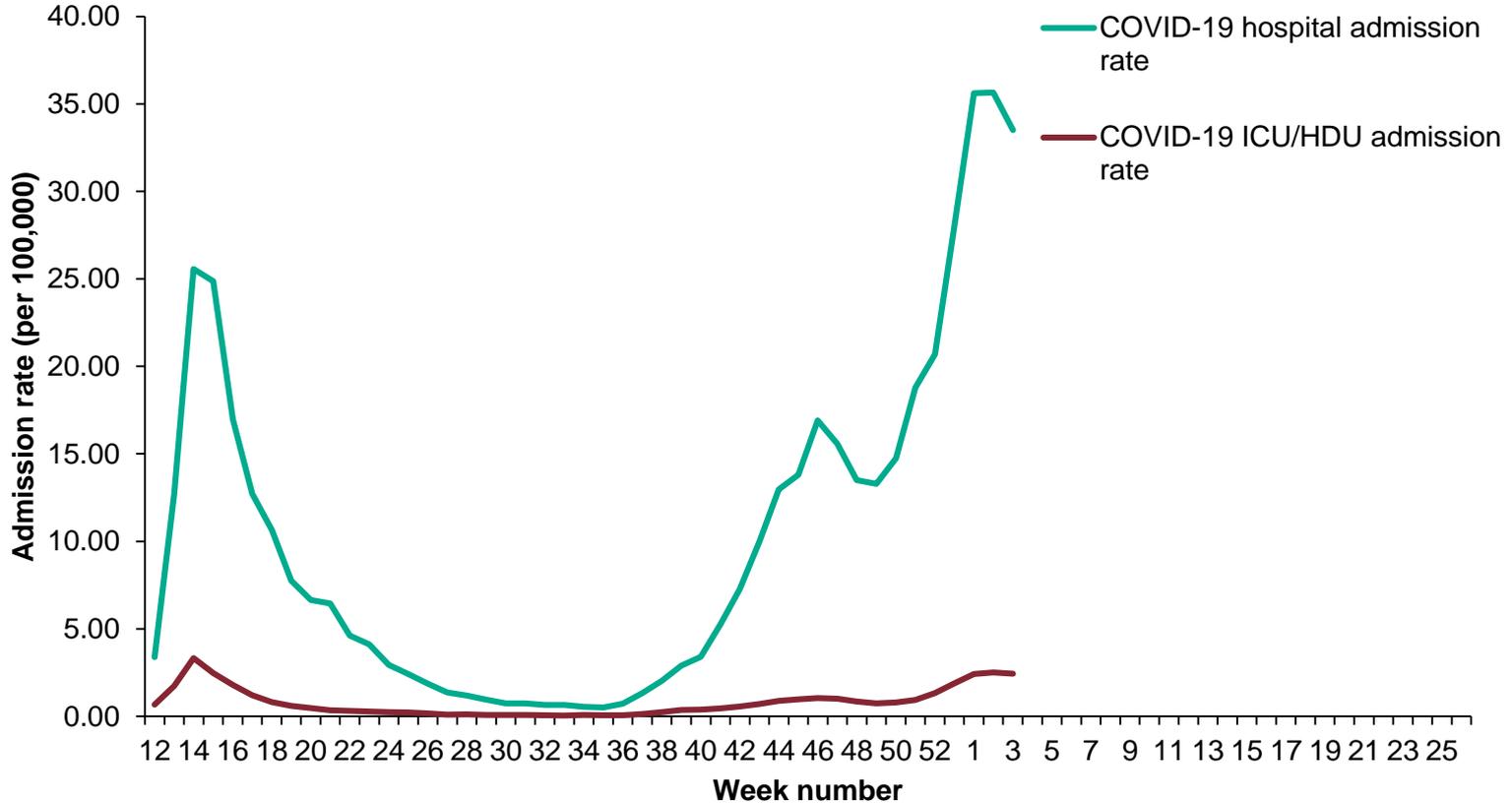
For the most recent week, more samples are expected to be tested therefore the graph should be interpreted with caution. Positivity (%) is not calculated when the total number tested is less than 10



# Secondary Care surveillance

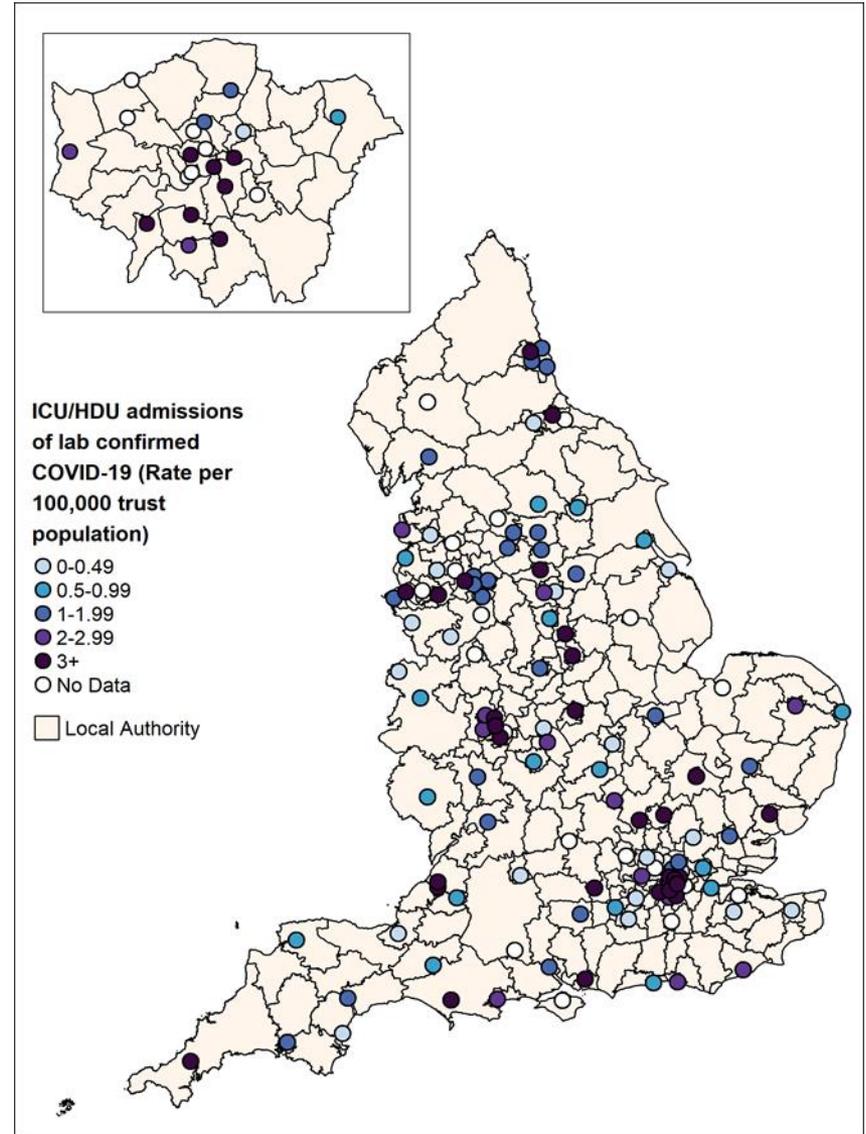
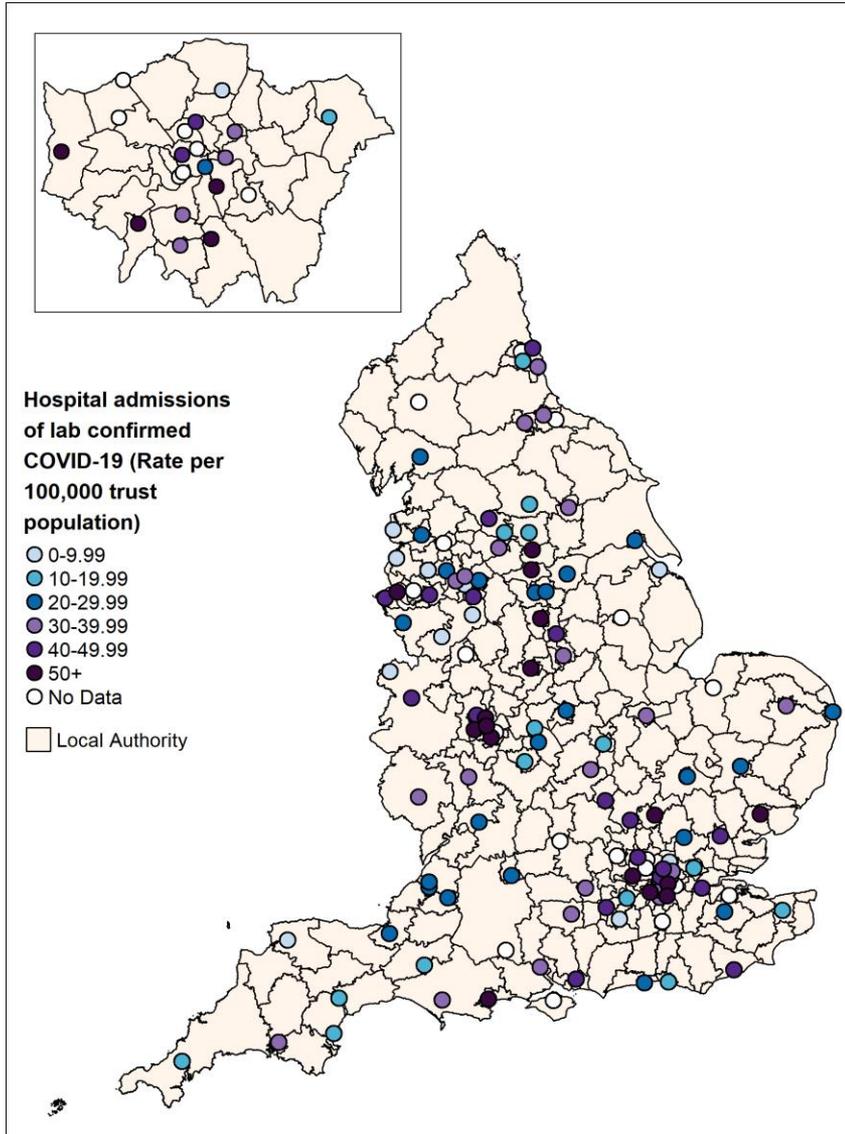


# Weekly overall hospital and ICU/HDU admission rates per 100,000 of new COVID-19 positive cases reported through SARI Watch, England since week 12





# Weekly admission rates for hospital and ICU/HDU laboratory confirmed COVID-19 cases reported through SARI Watch, week 3





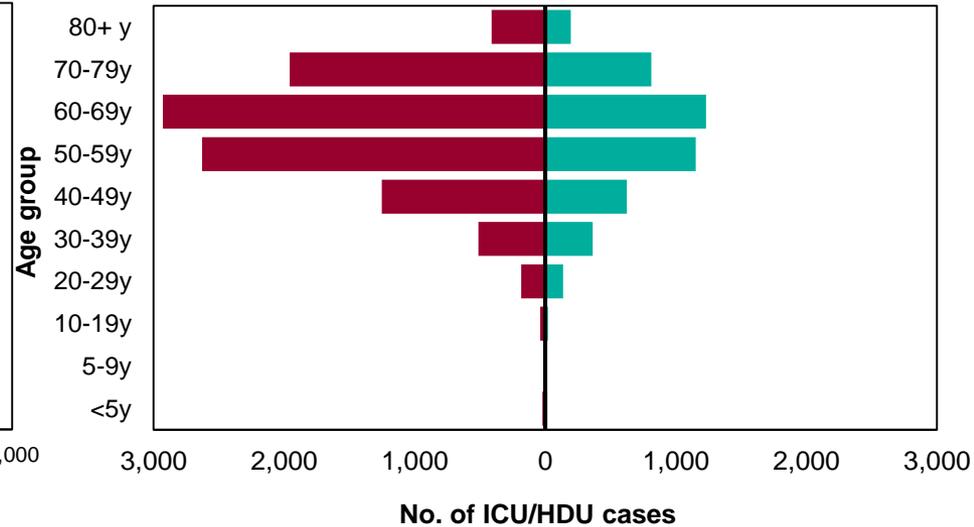
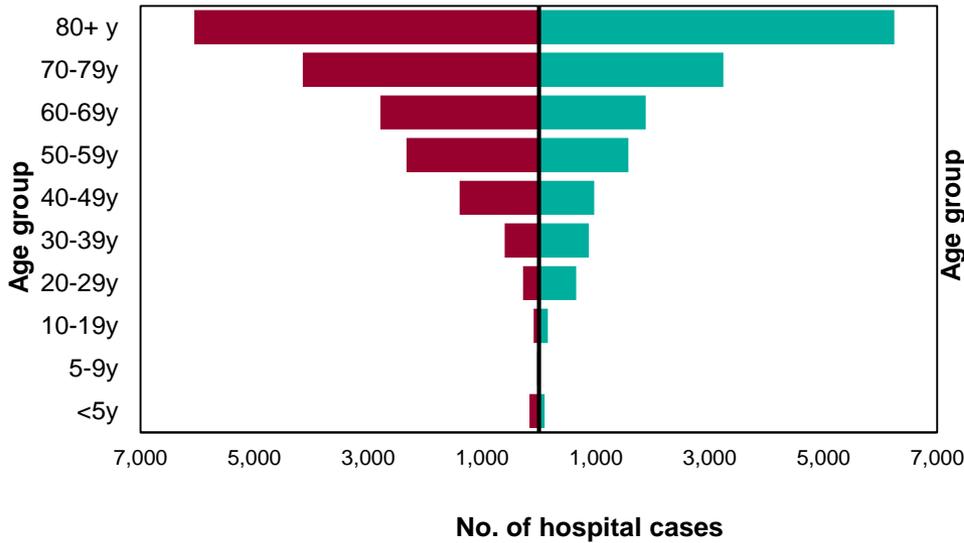
# Age/sex pyramid of new (a) hospital (lower level of care) (n=33,602) and (b) ICU/HDU (n=14,496) COVID-19 cases reported through SARI Watch, England

(a)

(b)

■ Male ■ Female

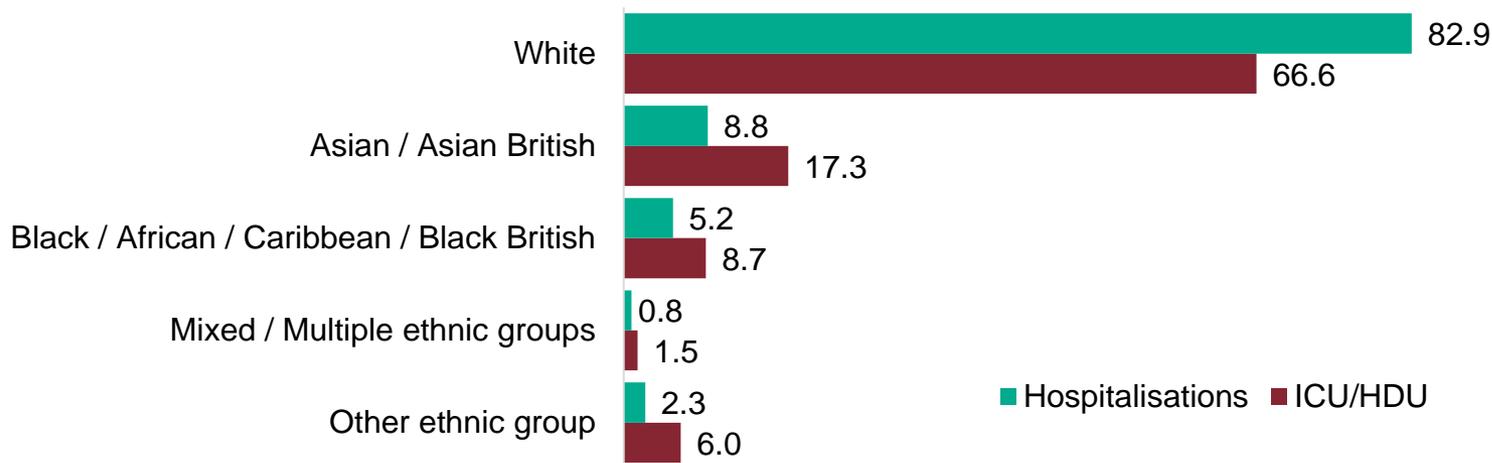
■ Male ■ Female



This figure is based on individual patient level data which are provided to SARI Watch from a subset of NHS Acute Trusts, therefore the data should be interpreted with caution as the distribution of age, sex and ethnic group may not be representative of all hospitalised patients.



# Ethnic group of new hospitalisations (lower level of care) (n=32,382) and ICU/HDU (n=13,393) COVID-19 cases reported through SARI Watch, England

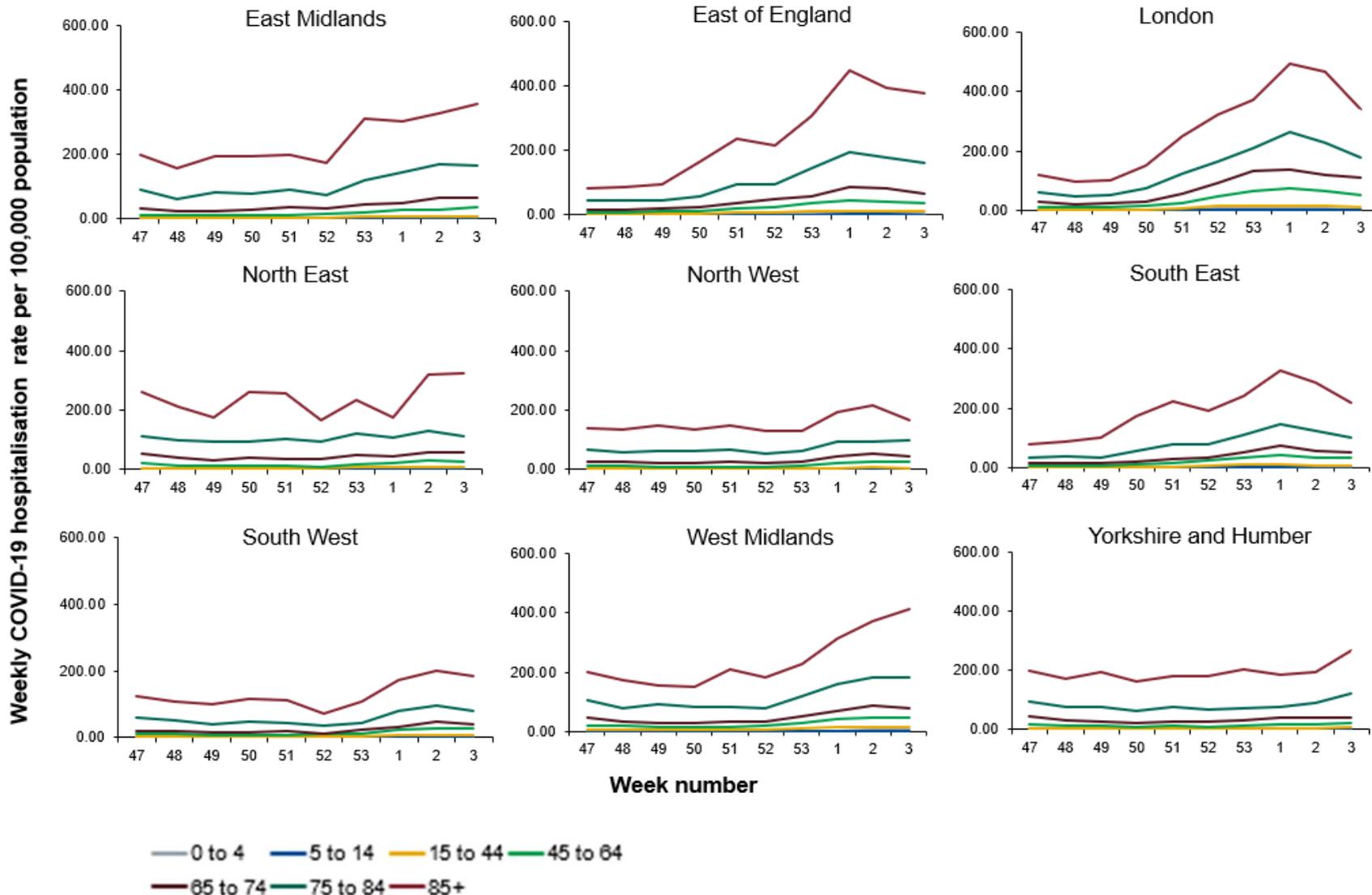


proportion of admitted cases (%)

This figure is based on individual patient level data which are provided to SARI Watch from a subset of NHS Acute Trusts, therefore the data should be interpreted with caution as the distribution of age, sex and ethnic group may not be representative of all hospitalised patients.

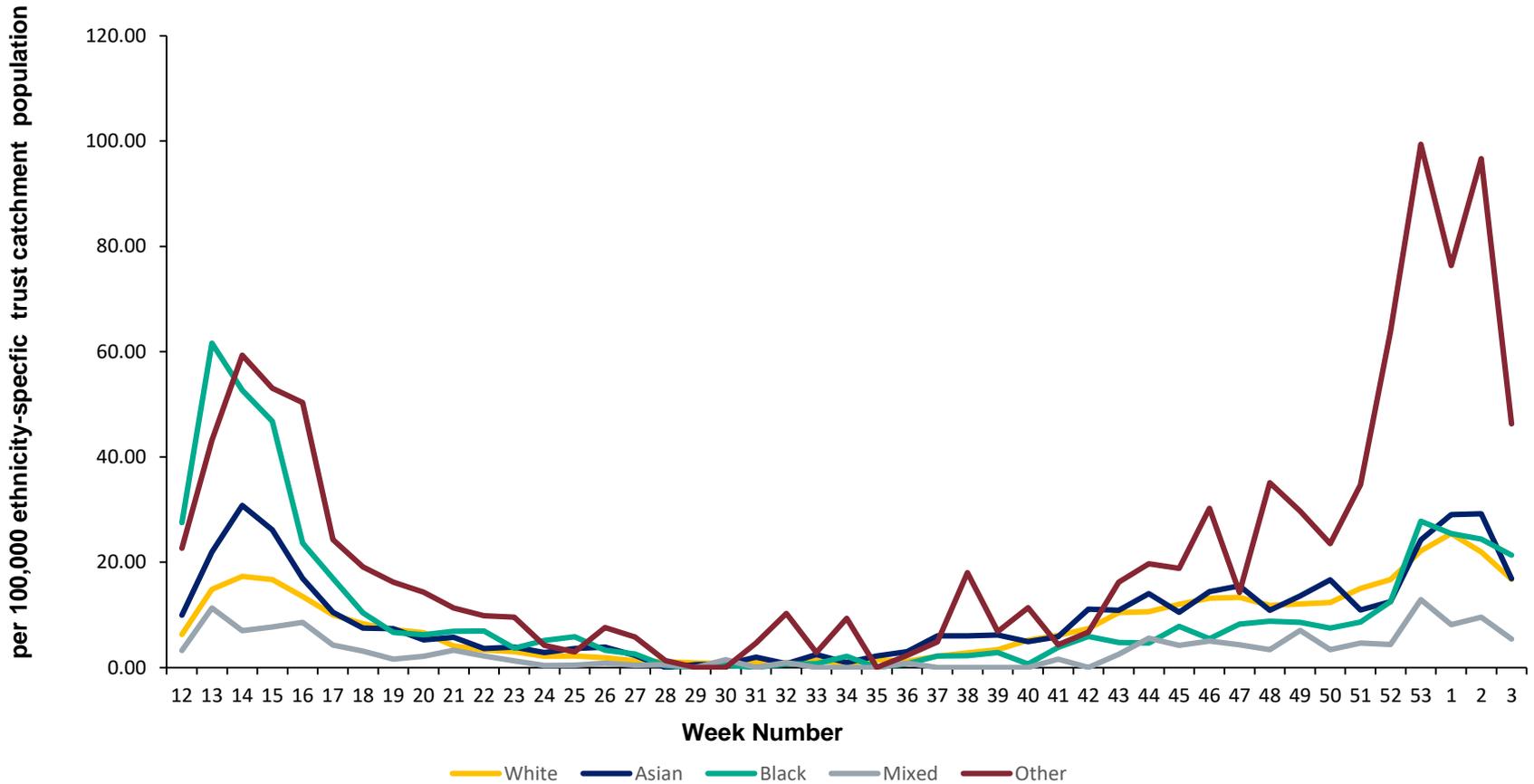


# Weekly COVID-19 hospitalisation rate per 100,000 trust catchment population by age group and region, weeks 47 to 3





# Hospital admission rate (excluding ICU/HDU) by ethnicity per 100,000 trust catchment population

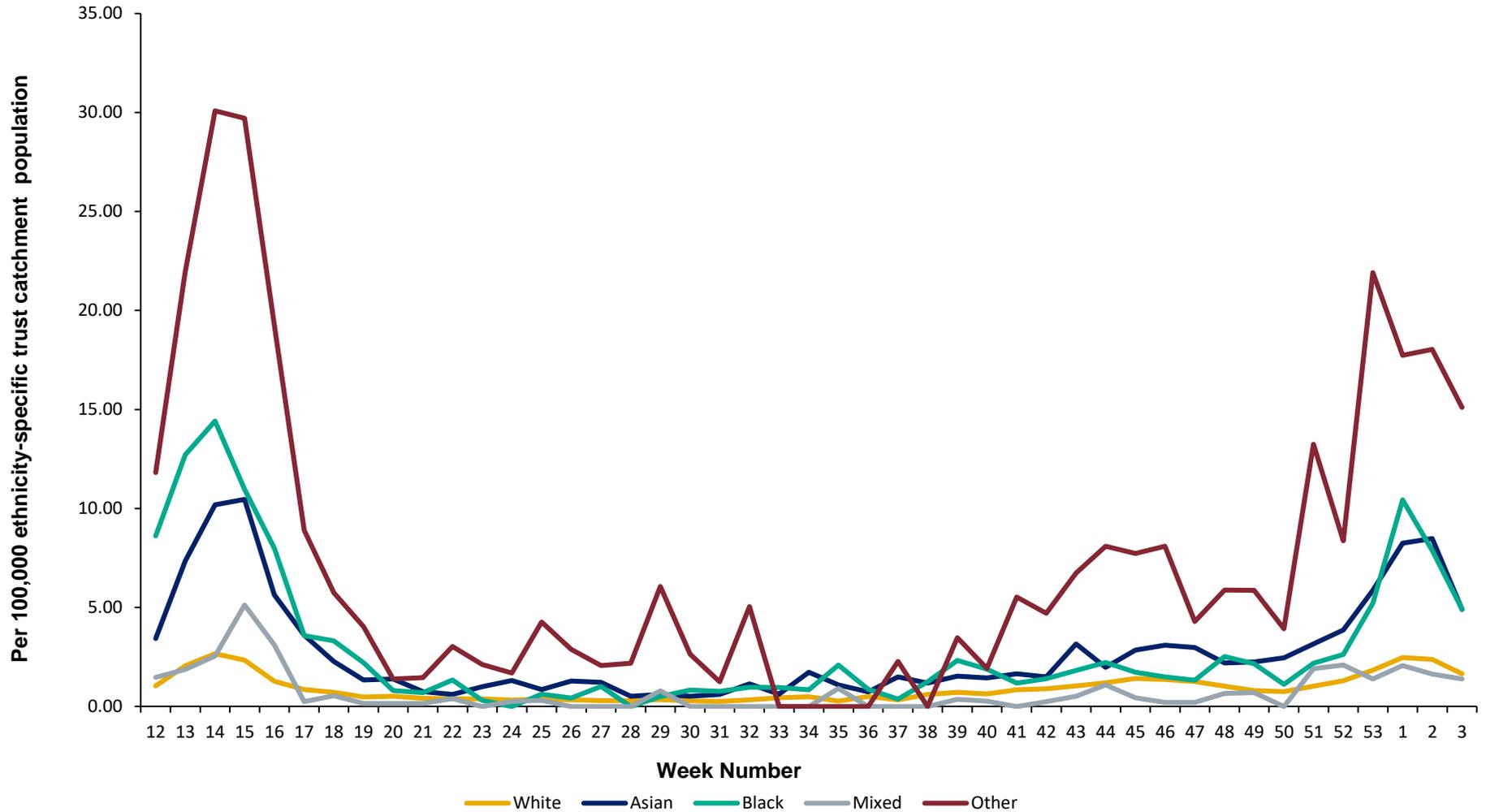


Caveat: Ethnicity was obtained through linkage to hospital activity data and determined by the ethnicity stated in the most recent record. There are several limitations with this approach. Ethnicity is supposed to be self-reported by the patient in hospital records, but this may not always be the case. Patients may also report different ethnicities in different episodes of care. The Other ethnic group may include people who do not self-identify with any of the more explicitly-defined ethnicity categories, or people who have been assigned to the group by data reporters. In addition, people from certain ethnic backgrounds may be less likely to have complete records with which to complete the linkage to hospital data. Previous analysis has shown higher population-based diagnoses and death rates in the Other ethnic group due to a mismatch between ethnicity assigned in the population data and hospital records ([see disparities report](#)). However, further work is ongoing to improve the allocation of ethnicity to COVID-19 data.

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# Rate of admission to ICU/HDU by ethnicity, per 100,000 trust catchment population



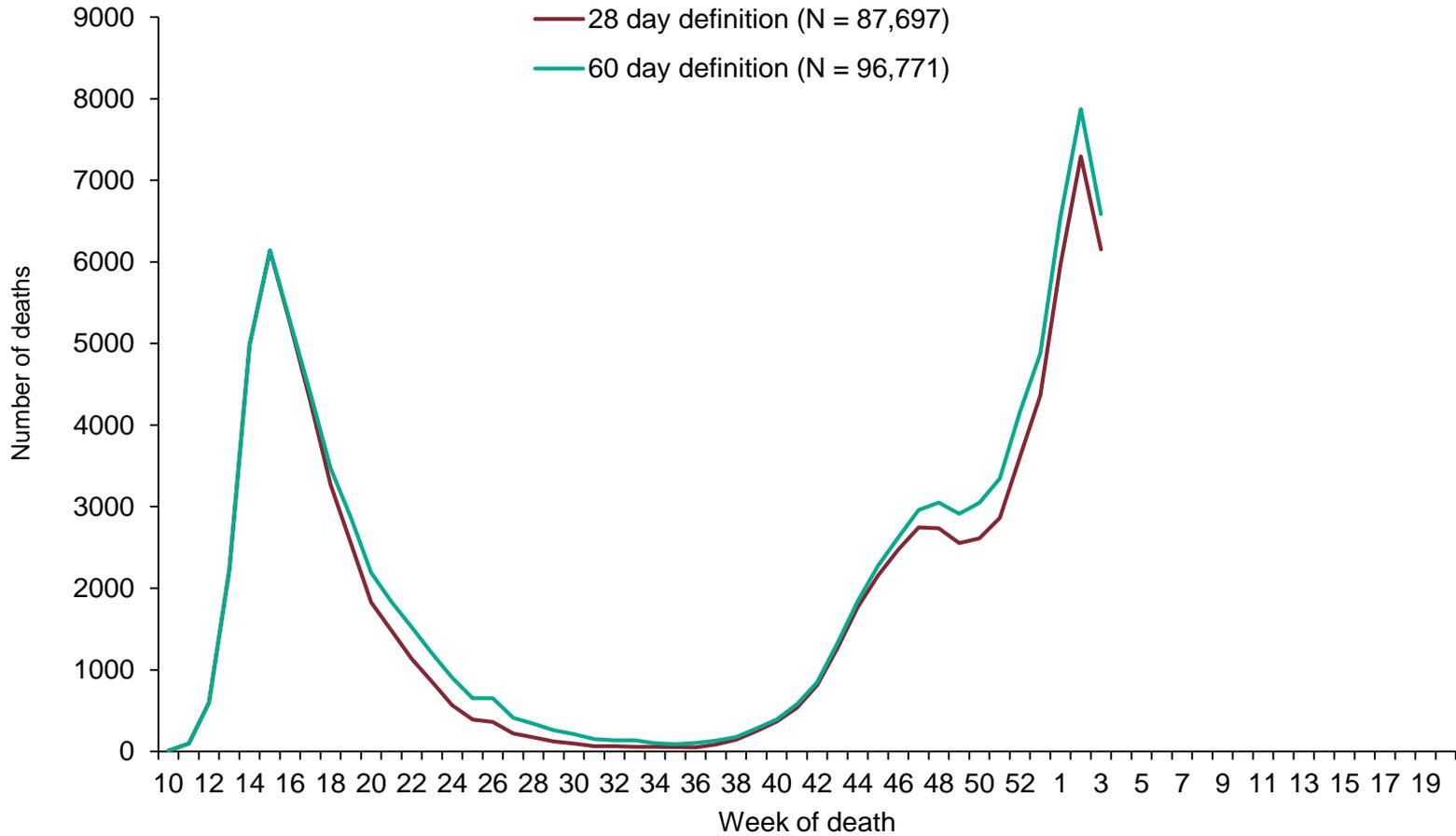
have complete records with which to complete the linkage to hospital data. Previous analysis has shown higher population-based diagnoses and death rates in the Other ethnic group due to a mismatch between ethnicity assigned in the population data and hospital records ([see disparities report](#)). However, further work is ongoing to improve the allocation of ethnicity to COVID-19 data.



# Mortality surveillance



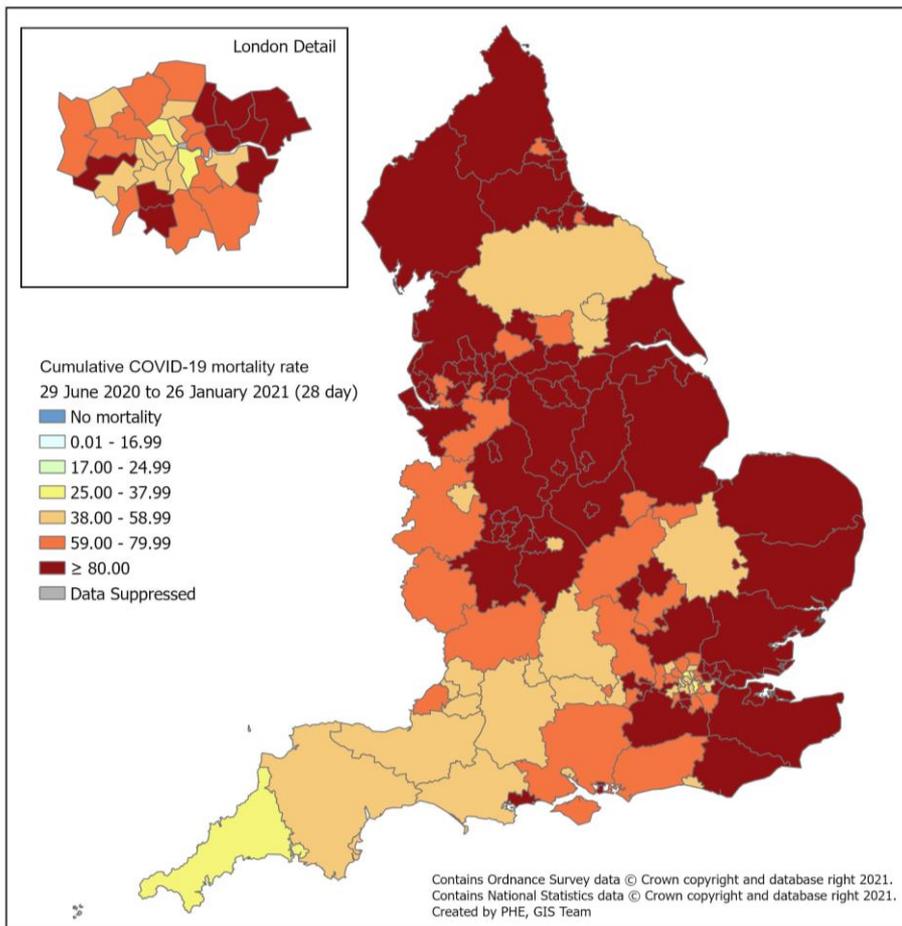
# Number of deaths since week 10 by week of death and time since laboratory confirmation of COVID-19, England



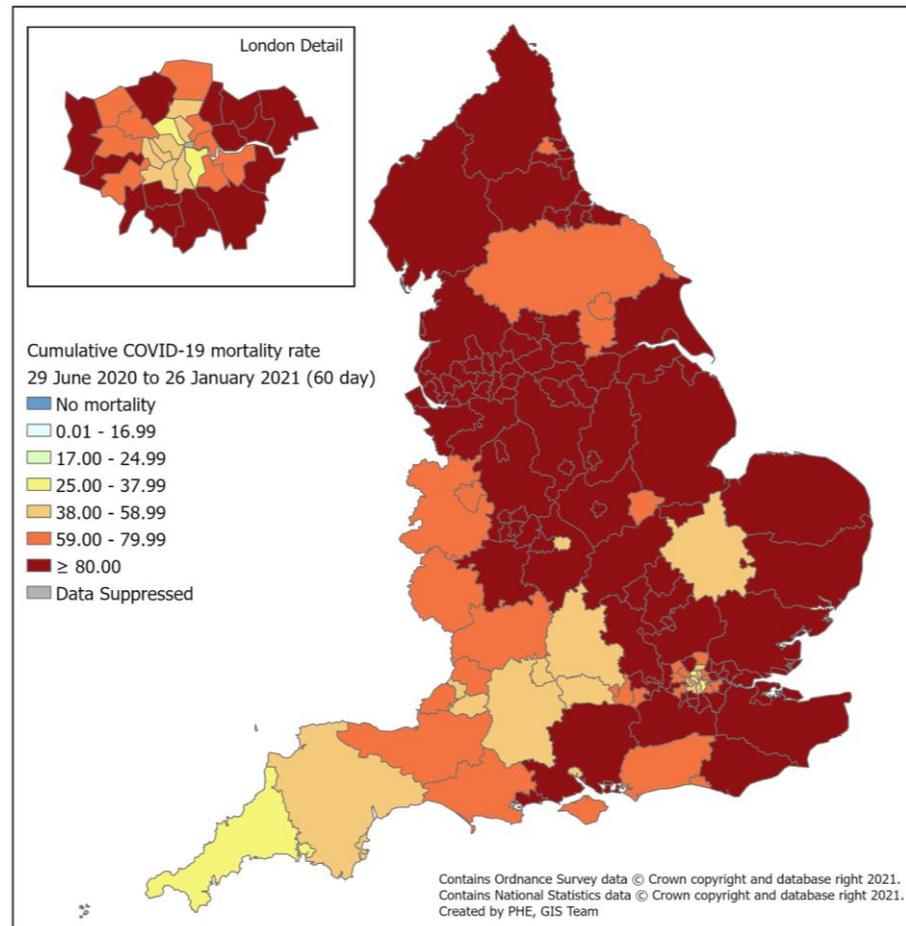


# Cumulative mortality rate of COVID-19 cases per 100,000 population tested under Pillar 1 and 2 since week 27 by (a) 28 day definition and (b) 60 day definition

(a)



(b)



*From this report onwards, rates have been calculated using mid-2019 ONS population estimates*



# COVID-19 sero-prevalence surveillance



## Seroprevalence in adults in the RCGP collection

- Prevalence was estimated from samples from patients aged between 18 and 100 years old, who had a routine blood test via the Royal College of General Practitioners Research and Surveillance Centre (RCGP-RSC) network during the period 1<sup>st</sup> May – 17<sup>th</sup> November.
- Population weighted (by NHS region and age group) seropositivity estimates for adults from the RCGP collection were 4.1% (95% CI 3.1%-5.3%) in May/June increasing to 5.2% (95% CI 4.5%-6.1%) for samples collected from July-August and 5.4% (95% CI 4.6-6.4%) in Sept – 17 Nov as measured by the EuroImmun assay. The most recent estimate from testing of the RCGP samples is just a little lower than the national seropositivity estimates from blood donors during this period, which may reflect that the RCGP estimate includes those aged 85+.

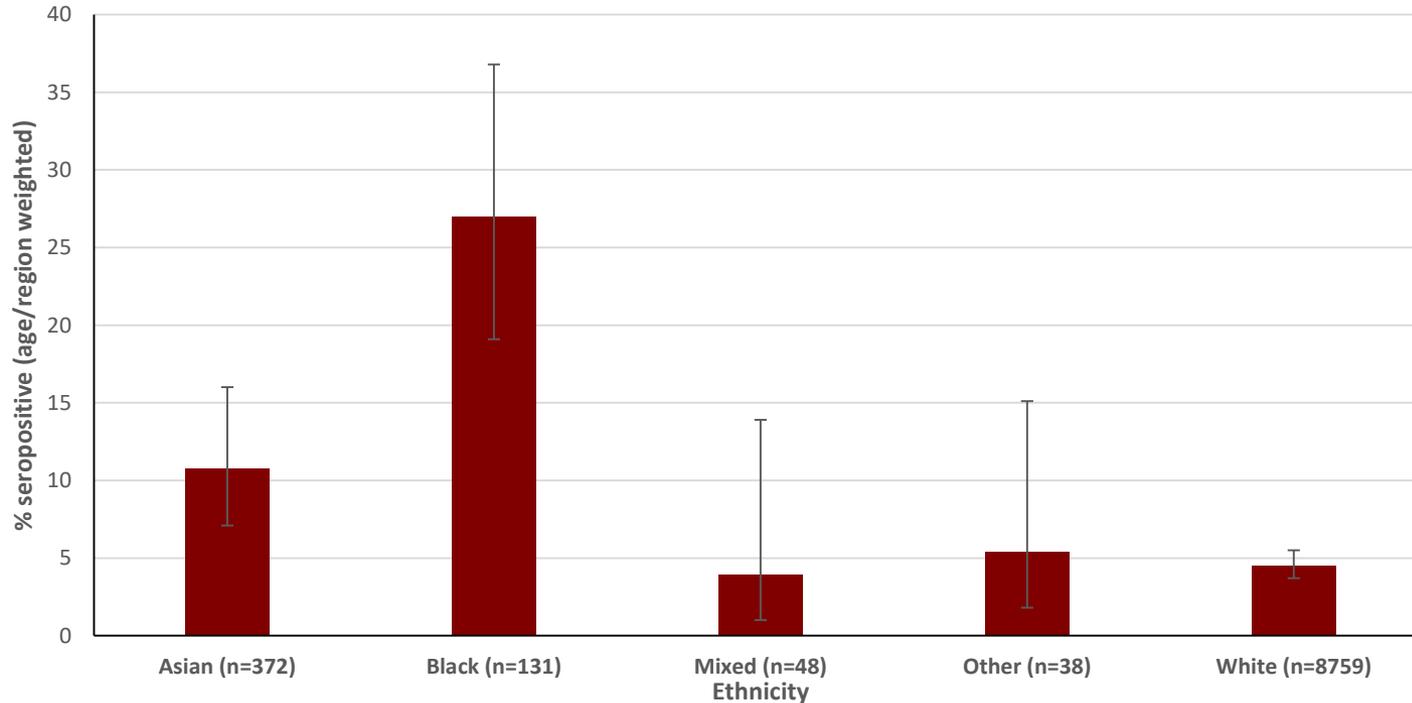
Period	Positive	Ind	Negative	Total	Population weighted % positive (95% CI)
<b>EuroImmun</b>					
<b>1 May - 30 June</b>	165	24	5264	5453	4.1% (3.1 - 5.3%)
<b>1 July - 28 Aug</b>	248	36	5496	5780	5.2% (4.5 - 6.1%)
<b>1 Sept - 17 Nov</b>	244	36	5113	5393	5.4% (4.6 - 6.4%)



# Sero-prevalence in adults in the RCGP collection

Linked additional RCGP information was available for 14,364 individual patients whose sample was collected at their GP during a consultation for a routine blood test via the Royal College of General Practitioners Research and Surveillance Centre (RCGP-RSC) network during the period May to October 2020 for adults over 18 years.

Seropositivity was 27.0% (95% CI 19.1%-36.8%) in black ethnicities compared to 4.5% (95% CI 3.7%-5.5%) in white ethnicities when tested using the Euroimmun assay. Asian ethnicities also showed a slightly higher seropositivity when compared to white ethnicities with a seropositivity of 10.8% (95% CI 7.1%-16.0%).



This graph represents seropositivity (age/region weighted) by ethnicity using the Euroimmun assay, May – November 2020



# Co/secondary infections with COVID-19



# Co/secondary infections with COVID-19 (data updated monthly)

- Caveat - a limited number of COVID-19 cases are tested for other respiratory viruses therefore data could represent an underestimate of co/secondary infection cases. Due to the low number of cases data is representative of January to November 2020 unless stated.
- Co/secondary infections refers to when a patient has an infection with more than one pathogen at the same time (co-infection), or acquires another infection after contracting the first infection (secondary infection).
- Numbers of co/secondary infection remain low across PHE surveillance systems except for patients requiring Extra Corporeal Membrane Oxygenation (ECMO) which are those with the most severe respiratory signs. Analysis of ECMO cases indicates co/secondary infections account for just less than a third of respiratory infection cases.
- Preliminary data analysis from the first pandemic wave (health care associated infections, *Streptococcus pneumoniae*, influenza, ECMO data) to end of September 2020 indicates that patients requiring ECMO and those not requiring ECMO with co/secondary infection have increased risk of mortality in comparison to patients without co/secondary infection.

Definitions agreed with DAs



## Co/secondary infections among Extra Corporeal Membrane Oxygenation (ECMO) patients (patients with most severe clinical respiratory signs)

Based on cumulative data on ECMO activity from week 40 (week beginning 30 Sep 2020) to week 52 (week ending 27 December 2020), which includes data from the first and second waves of the pandemic. COVID-19 cases from week 10 2020 (3 March 2020).

- 32% (133/418) of patients admitted to ECMO with a laboratory confirmed respiratory infection had a co/secondary infection reported.
- 43% (16/37) of patients with influenza had co/secondary infections
- 32% (102/318) of patients with COVID-19 had co/secondary infections. Of these 102 cases, the most frequent co/secondary infections in COVID-19 cases were Gram-negative bacilli and fungi, accounting for 62% (63/102).



## Co/secondary infections among patients with Healthcare Associated Infections: Blood stream and respiratory infections (bacterial and fungal, COVID-19 cases up to November 4<sup>th</sup> 2020)

- 0.4% of COVID-19 patients had a bacterial/fungal infection at or within 28 days following their COVID-19 diagnosis: 0.1% respiratory infection; 0.2% bloodstream infection.
- Most (66%) of co/secondary infections were categorised as secondary infections.
- Most frequent species identified from respiratory co/secondary infection isolates were *Staphylococcus aureus*, followed by *Haemophilus influenzae*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae*.
- Most frequent species identified from blood co/secondary infection isolates were *Escherichia coli*, followed by *Staphylococcus aureus*, *Enterococcus faecium*, and *Klebsiella pneumoniae*.
- Co-infections occur more frequently in the elderly (>70y 68% of co-infections).



## Co/secondary infection with respiratory viruses, vaccine preventable bacteria and fungi

Bacteria/Fungi	Cases per Month												Total Cases
	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	24.12.2020
Influenza A	0	0	28	5	0	0	0	0	0	0	0	TBC	33
Influenza B	0	0	10	3	0	0	0	0	0	0	1	TBC	14
Influenza A & B	0	0	1	0	0	0	0	0	0	0	0	TBC	1
Flu (not typed)	0	0	1	0	0	0	0	0	0	0	0	TBC	1
Parainfluenza (any subtype)	0	3	10	1	0	0	0	0	0	0	0	TBC	14
Seasonal coronavirus	0	6	41	56	8	0	0	0	0	3	6	TBC	120
Enterovirus	0	2	1	2	0	0	0	0	0	1	0	TBC	6
Adenovirus	0	2	11	0	0	1	0	0	0	0	1	TBC	15
Rhinovirus	0	21	68	7	1	0	0	1	1	2	2	TBC	103
RSV	0	5	17	1	0	0	0	0	0	0	0	TBC	23
Human metapneumovirus	0	3	44	8	0	0	0	0	0	0	0	TBC	55
<i>Aspergillus fumigatus</i> ISOLATES (azole resistant)	0	0	5 (1)	30 (3)	10	1	0	1	2	1	16	14	80(4)
Probable/Proven cases of CAPA	0	0	1	8	3	3	0	0	2	0	3	8	28
<i>Bordetella pertussis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Candida</i> spp.: Candidemia	0	0	1	21	6	1	0	0	1	0	5	3	38
Osteomyelitis/discitis:	0	0	0	0	0	0	0	0	1	0	0	0	1
Ventriculitis	0	0	0	0	0	0	0	0	0	0	0	1	1
<i>Haemophilus influenzae</i>	-	-	2	1	0	0	0	0	0	0	1	0	4
<i>Neisseria meningitidis</i>	0	0	1	1	0	0	0	0	0	0	0	0	2
<i>Streptococcus pneumoniae</i>	0	0	16	23	1	0	0	0	2	3	7	2	54

The UK moved out of influenza season in early 2020/21 when COVID-19 increase began in March 2020

Data contains results from two systems (Respiratory DataMart system and SGSS).

Mycology data contains results from Mycology reference laboratory data, Candidaemia is representative of deep infection.

*Legionella*, *Mycoplasma* and gastrointestinal infection data not included