



# 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.

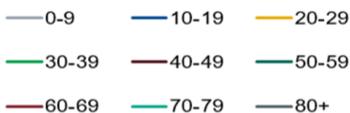
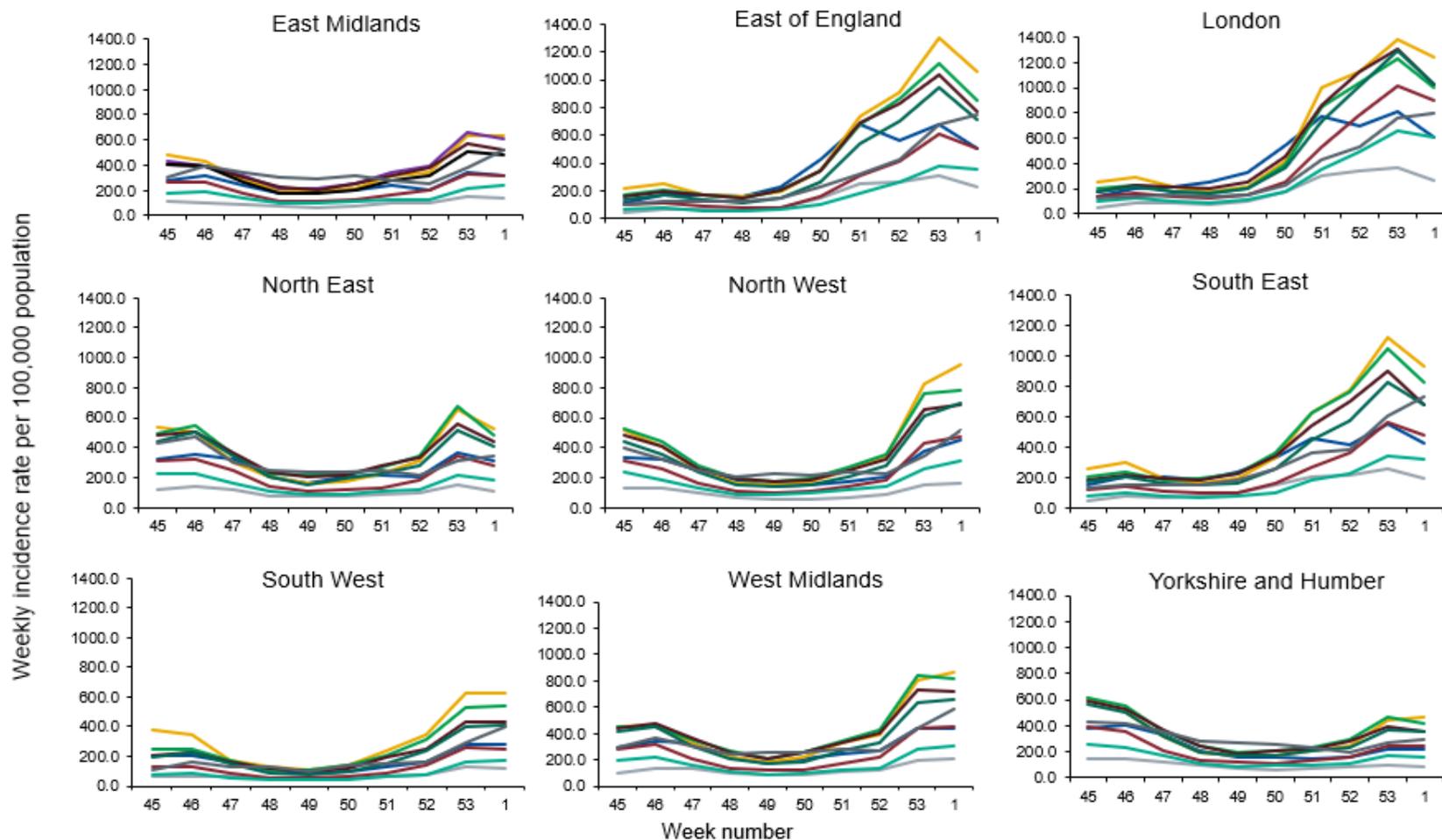
The figures presented in this slide set are based on data from week 1 (between 4 and 10 January 2021).



# Confirmed COVID-19 cases in England

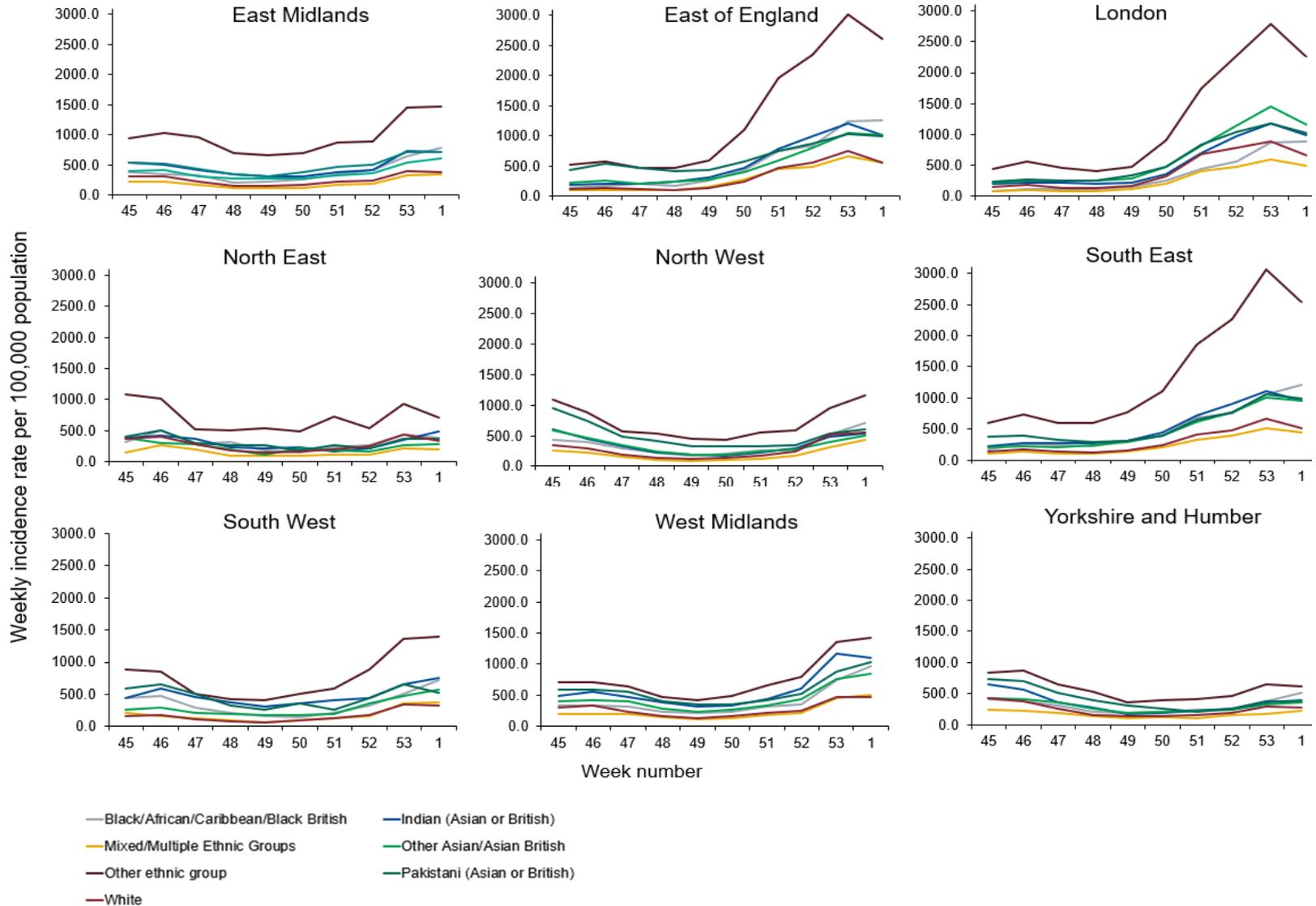


# Weekly COVID-19 incidence per 100,000 population by age group and region, weeks 45 to 1



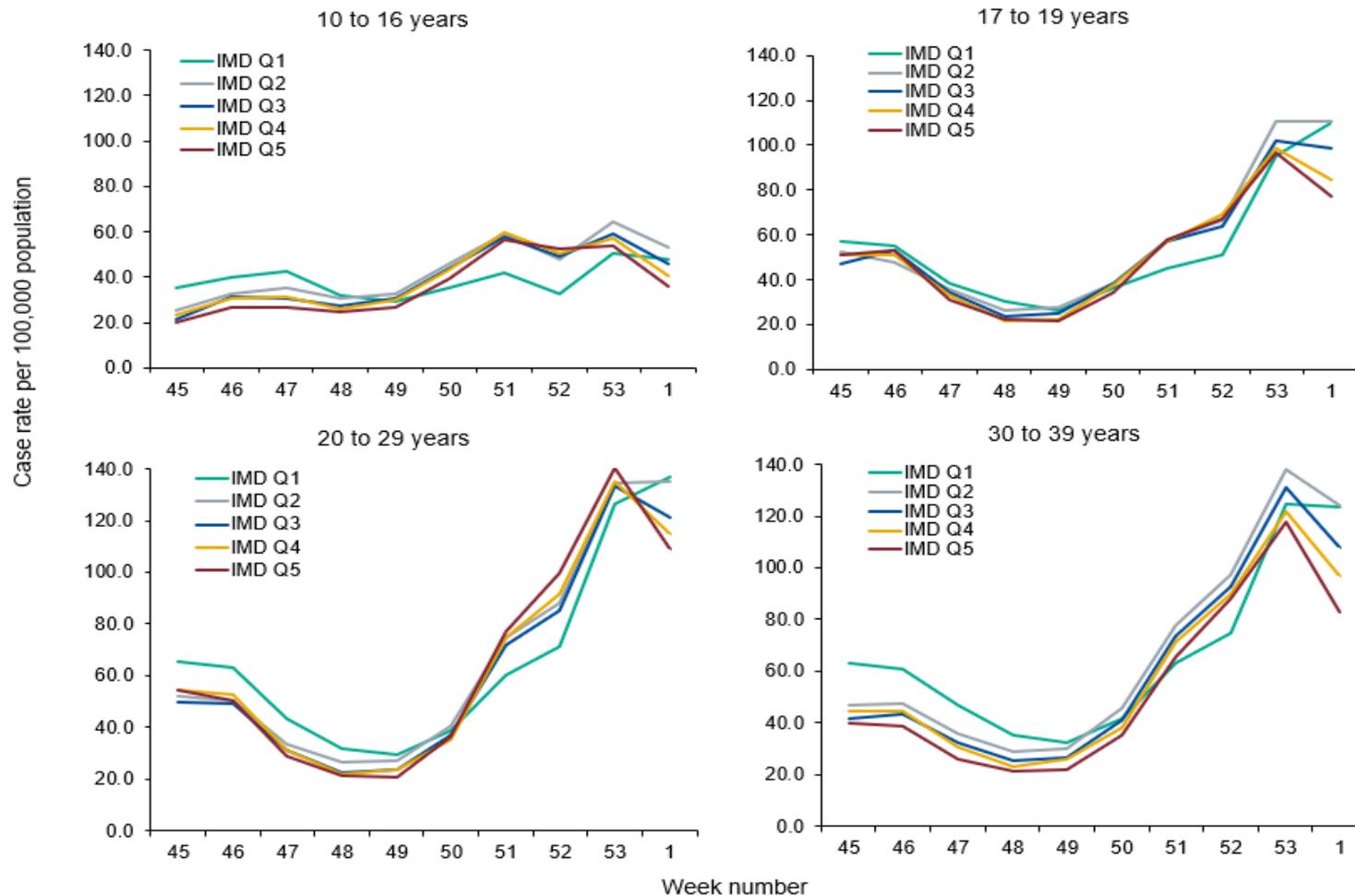


# Weekly COVID-19 incidence per 100,000 population by ethnicity and region, weeks 45 to 1



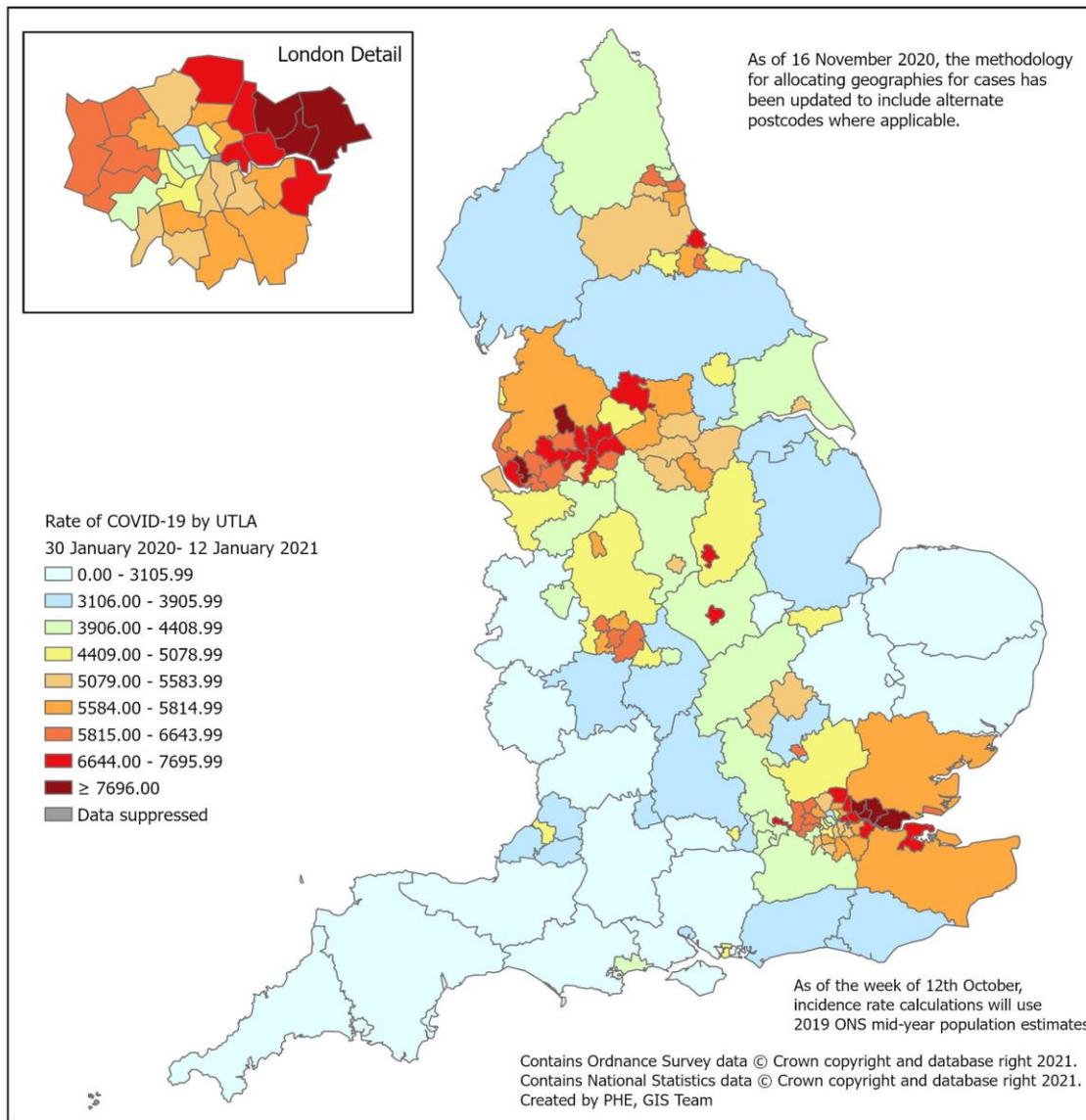


# Weekly COVID-19 rate per 100,000 population by IMD quintile (1 being the most deprived and 5 being the least deprived), weeks 45 to 1



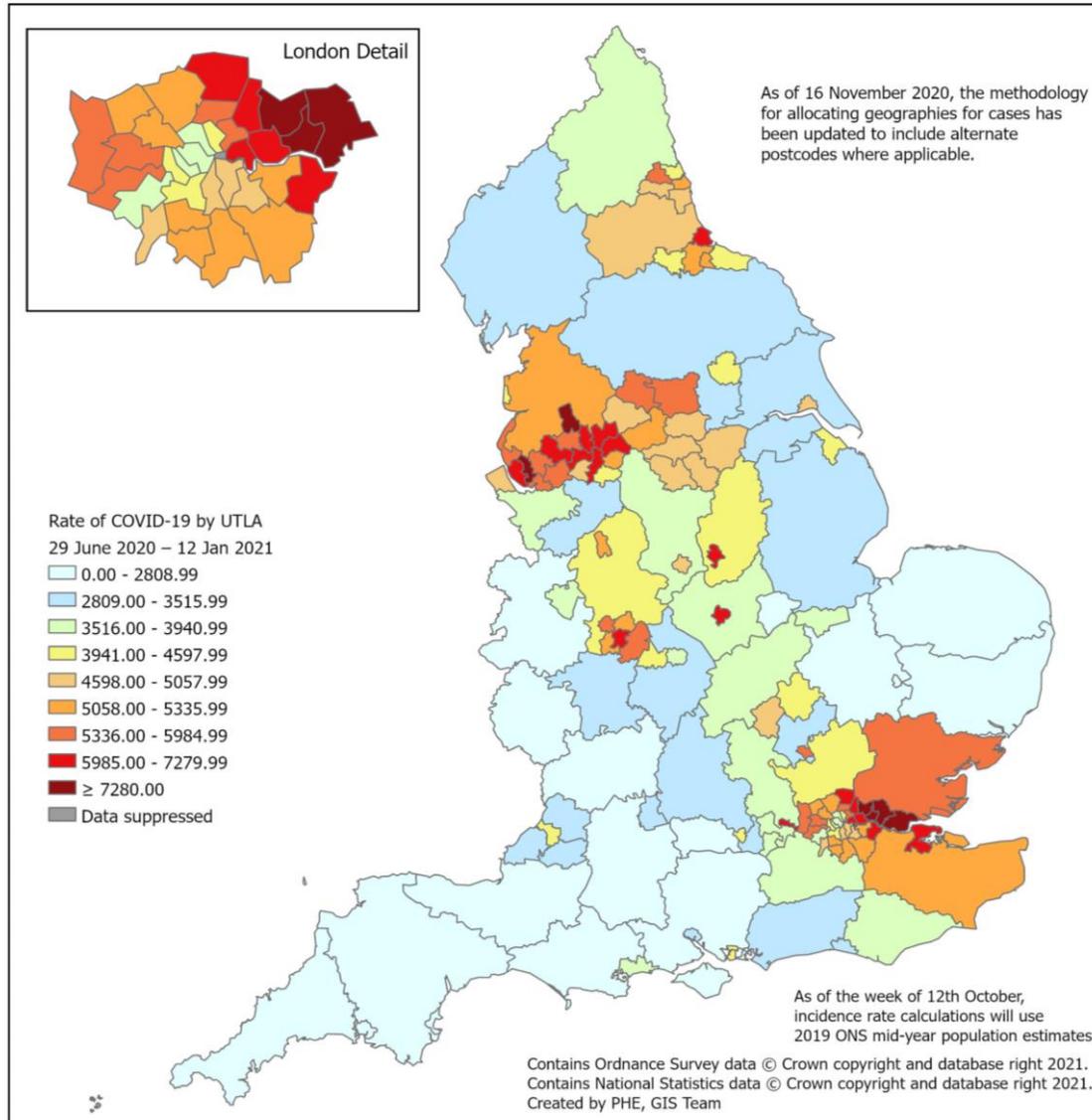


# Cumulative rate of COVID-19 cases per 100,000 population tested under Pillar 1 and 2, by upper-tier local authority, England (box shows enlarged map of London area)



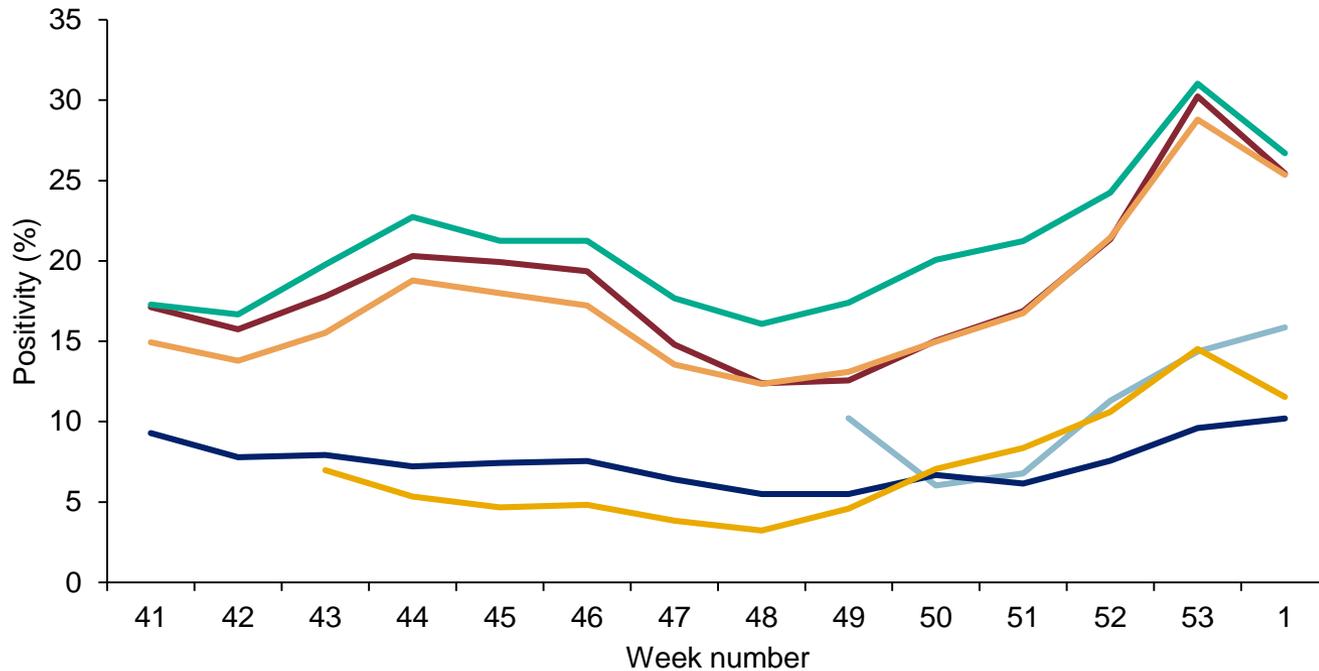


# Cumulative rate (from week 27) of COVID-19 cases per 100,000 population tested under Pillar 1 and 2, by upper-tier local authority, England (box shows enlarged map of London area)





# Weekly positivity of laboratory confirmed COVID-19 cases by reason for test, weeks 41 to 1



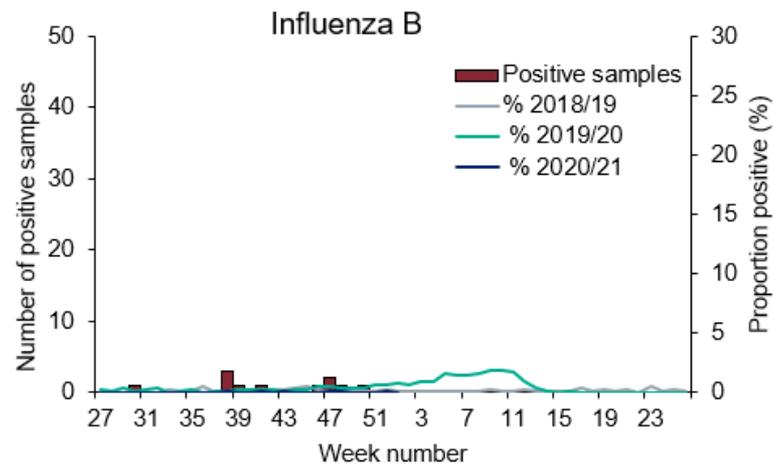
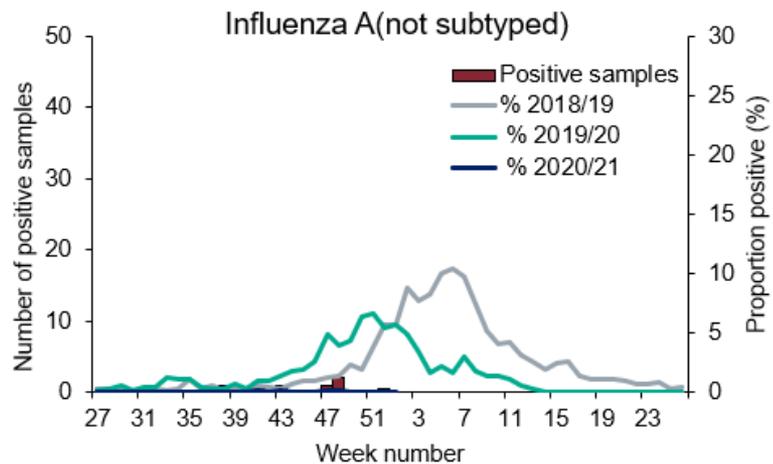
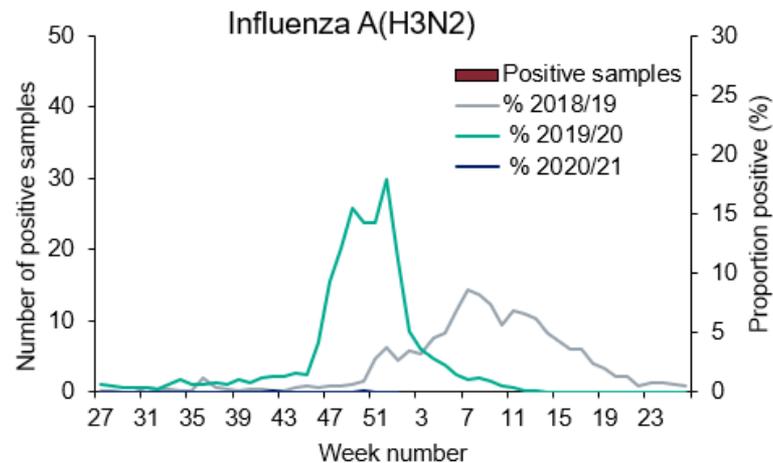
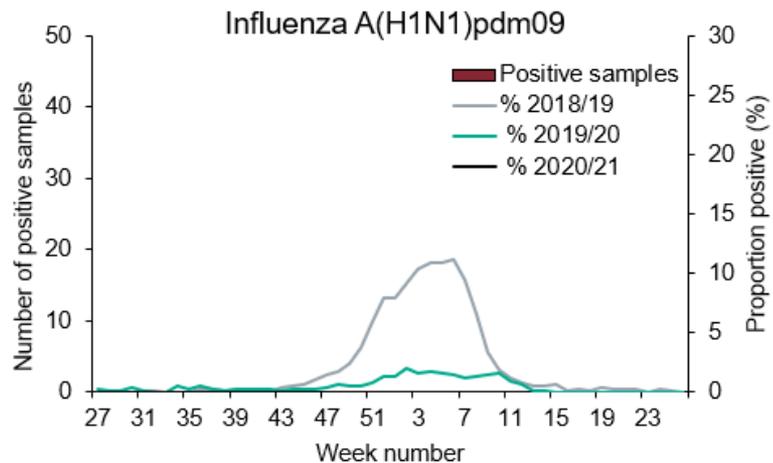
- Community Testing
- ZOE study
- Symptomatic essential worker
- Local council testing
- Symptomatic Citizen
- Symptomatic household member



# Respiratory Datamart system (England)

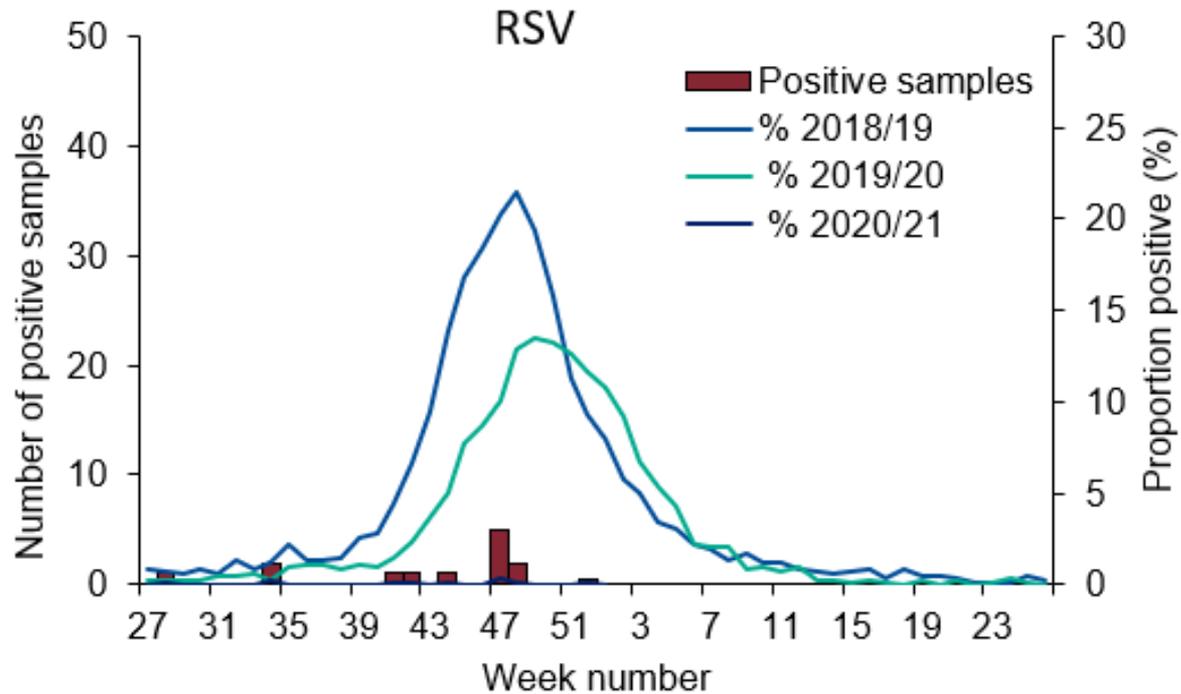


# Respiratory DataMart – Influenza subtypes



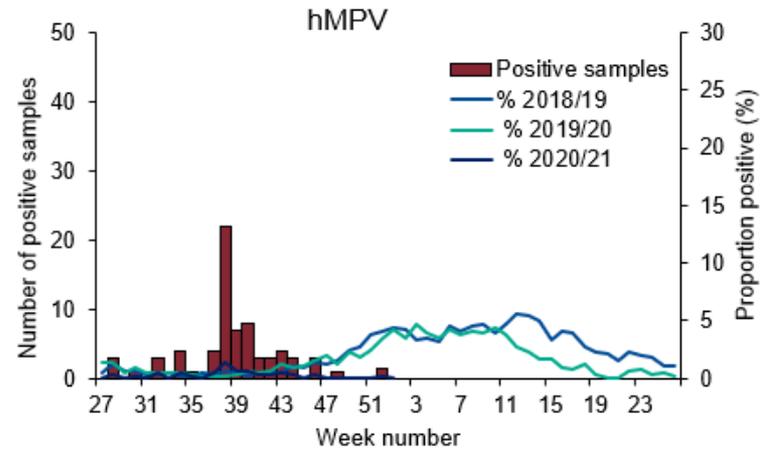
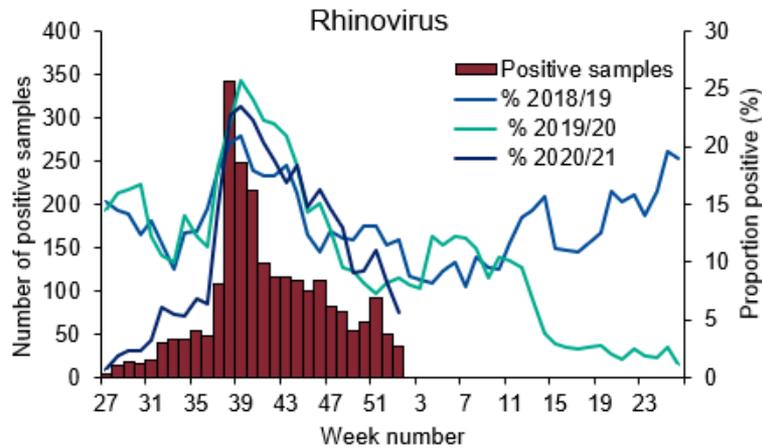
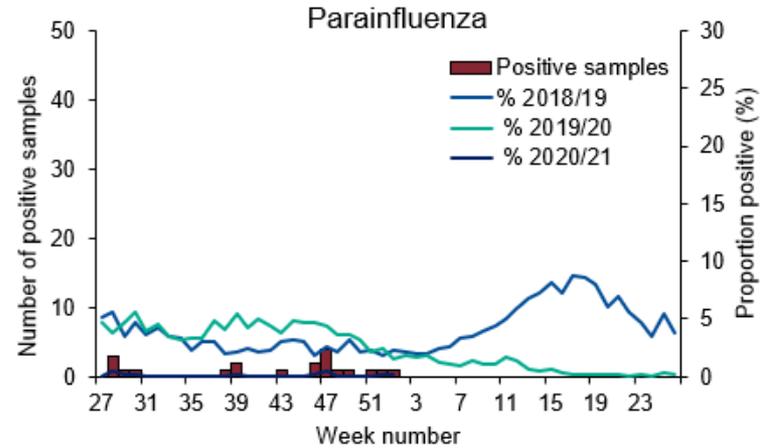
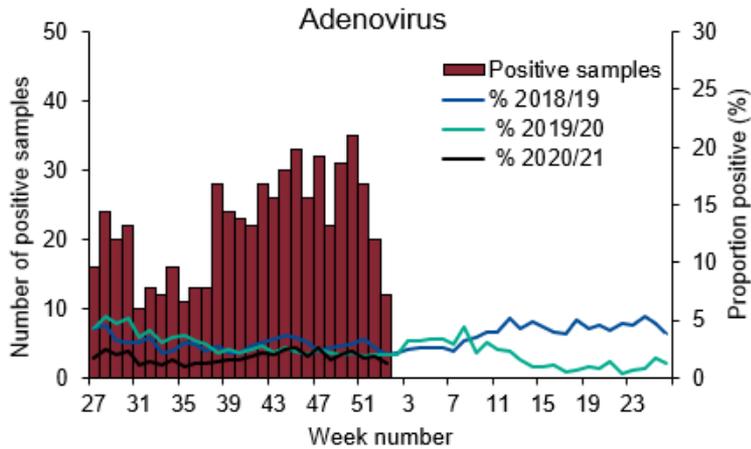


## Respiratory DataMart – Respiratory syncytial virus (RSV)





# Respiratory DataMart – other respiratory viruses



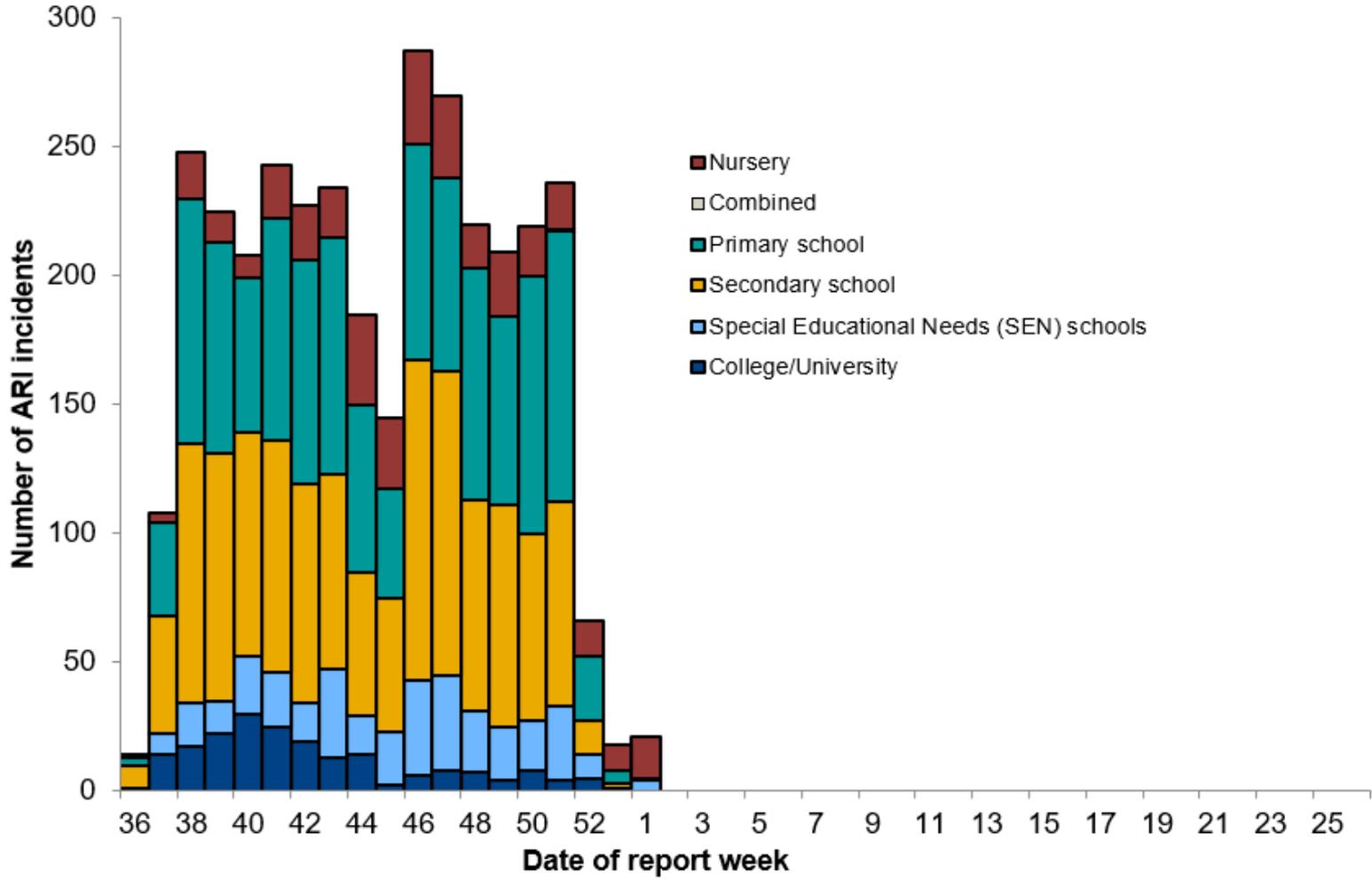
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# Community surveillance



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





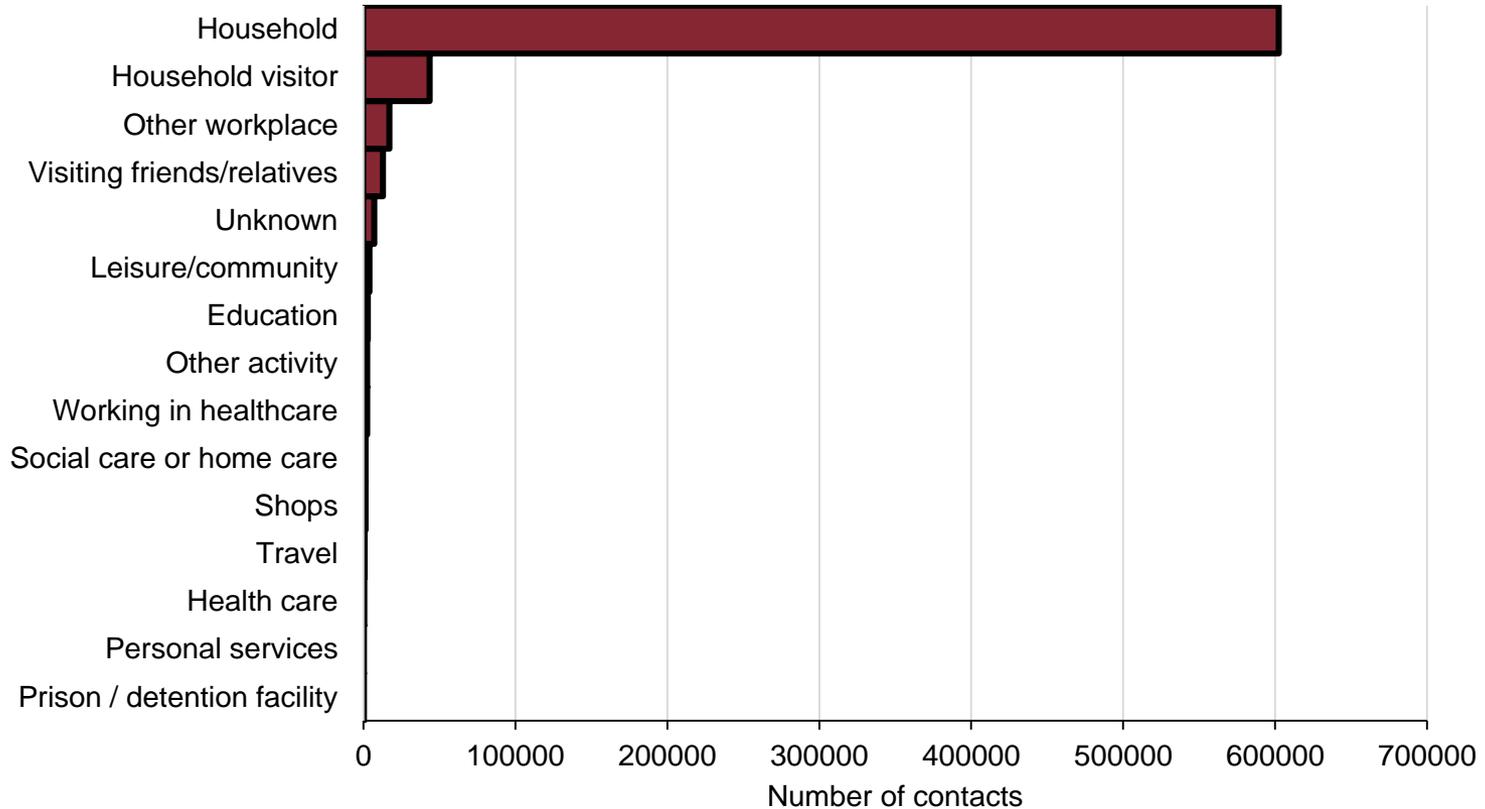
# Cumulative number of confirmed COVID-19 clusters or outbreaks by type of educational setting and PHE Centre since week 36, England

| 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        | 58 (5)          | 144 (0)         | 102 (0)          | 0 (0)       | 32 (2)                                  | 20 (0)             | 356 (7)          |
| London               | 65 (0)          | 305 (1)         | 353 (0)          | 1(0)        | 49 (0)                                  | 41 (0)             | 814 (1)          |
| North East           | 1 (0)           | 18 (0)          | 23 (0)           | 0 (0)       | 8 (0)                                   | 5 (0)              | 55 (0)           |
| North West           | 18 (1)          | 65 (0)          | 87 (0)           | 0 (0)       | 41 (0)                                  | 11 (0)             | 222 (1)          |
| South East           | 96 (7)          | 234 (0)         | 300 (0)          | 0 (0)       | 82 (0)                                  | 34 (0)             | 746 (7)          |
| South West           | 24 (0)          | 74 (0)          | 87 (0)           | 0 (0)       | 32 (0)                                  | 26 (0)             | 243 (0)          |
| West Midlands        | 41 (3)          | 202 (0)         | 166 (0)          | 0 (0)       | 48 (0)                                  | 23 (0)             | 480 (3)          |
| Yorkshire and Humber | 45 (0)          | 148 (0)         | 117 (0)          | 0 (0)       | 47 (2)                                  | 25 (0)             | 382 (2)          |
| <b>Total</b>         | <b>355 (16)</b> | <b>1206 (1)</b> | <b>1275 (0)</b>  | <b>1(0)</b> | <b>348 (4)</b>                          | <b>198 (0)</b>     | <b>3383 (21)</b> |

\*Number of outbreaks for Week 1 in brackets



# Contacts by exposure/activity setting in week 1, England (Data source: NHS Test and Trace)

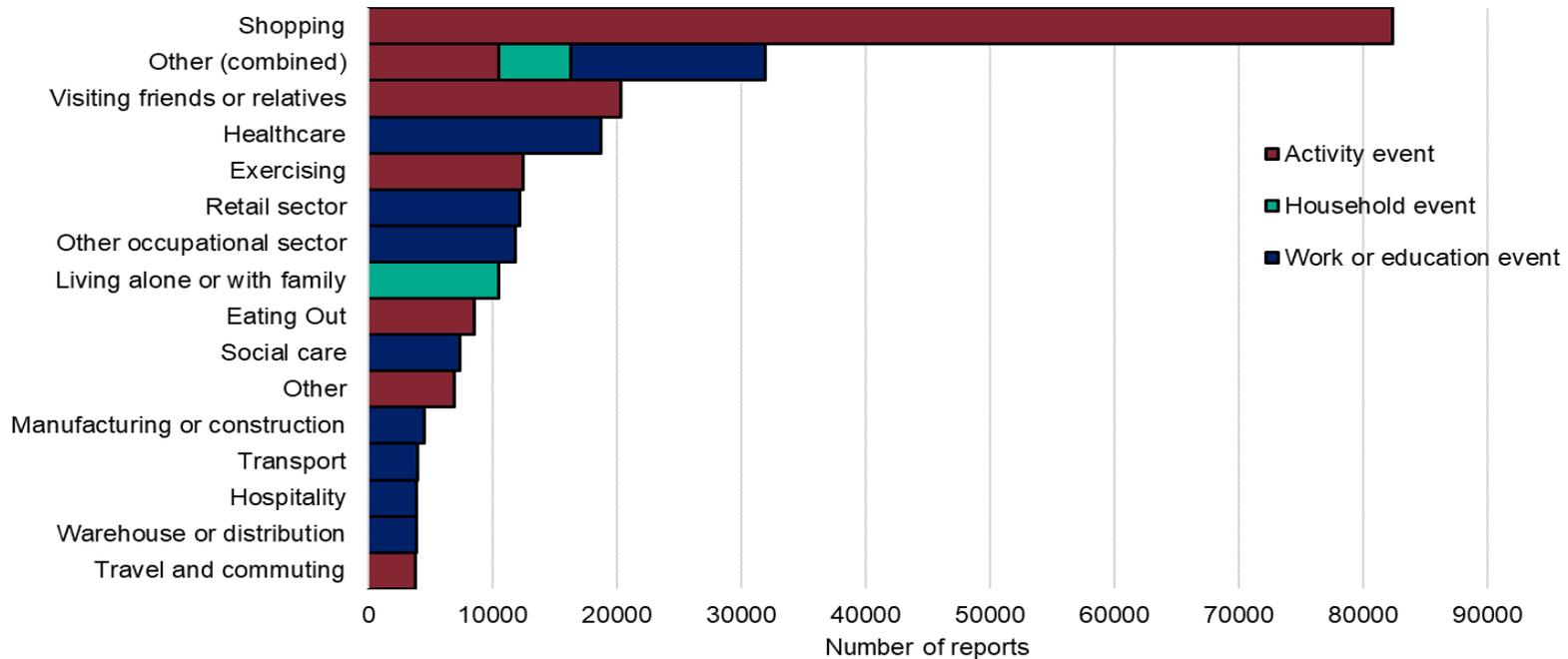


Note: categories have been grouped as follows: leisure / community includes eating out, attending events and celebrations, exercising, worship, arts, entertainment or recreation, community activities and attending play groups or organised trips; other workplace includes: retail, manufacturing or construction, 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 includes hairdressers, barbers, tattooists and nail bars.



# Events and activities reported by people testing positive, prior to symptom onset in week 1, 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 1, England (Data source: NHS Test and Trace)

| Setting                                   | All ages** | %      |
|---|------------|--------|
| Supermarket (visiting and working)        | 54         | 28.60% |
| Primary school (attending and working)    | 19         | 10.10% |
| Care home (working)                       | 11         | 5.80%  |
| Nursery preschool (attending and working) | 9          | 4.80%  |
| Hospital (visiting and working)           | 8          | 4.20%  |
| General practice (visiting and working)   | 5          | 2.60%  |
| Bus (working)                             | 4          | 2.10%  |
| Food (working)                            | 3          | 1.60%  |
| Home (visiting)                           | 3          | 1.60%  |
| Warehouse (working)                       | 3          | 1.60%  |
| Mosque (visiting)                         | 1          | 0.50%  |

Excludes 38 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 13 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.



# Surveillance in 'educational-age' cohorts



- 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.

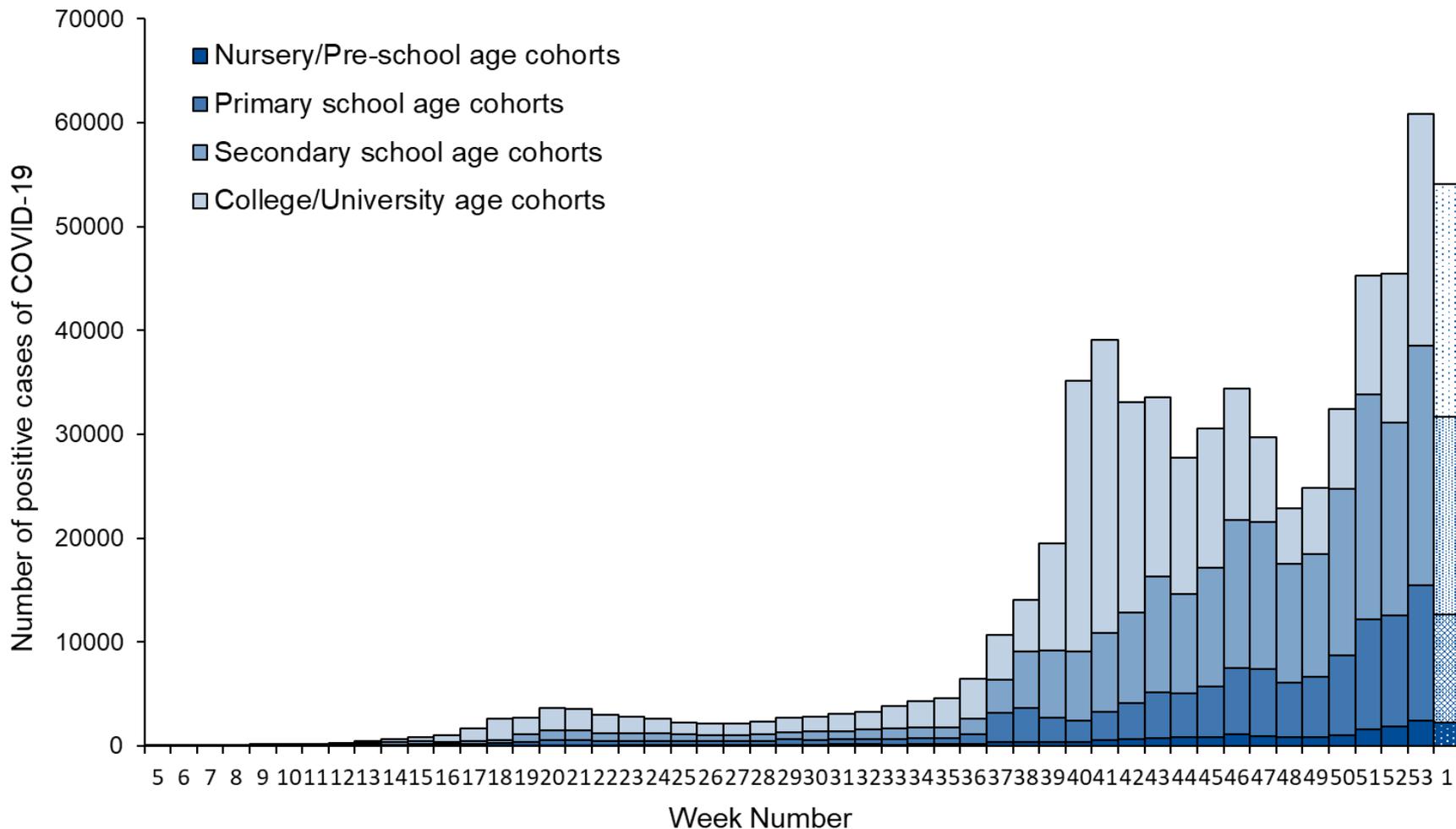


- The table aside represents the birth cohorts for each year group

| 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    |

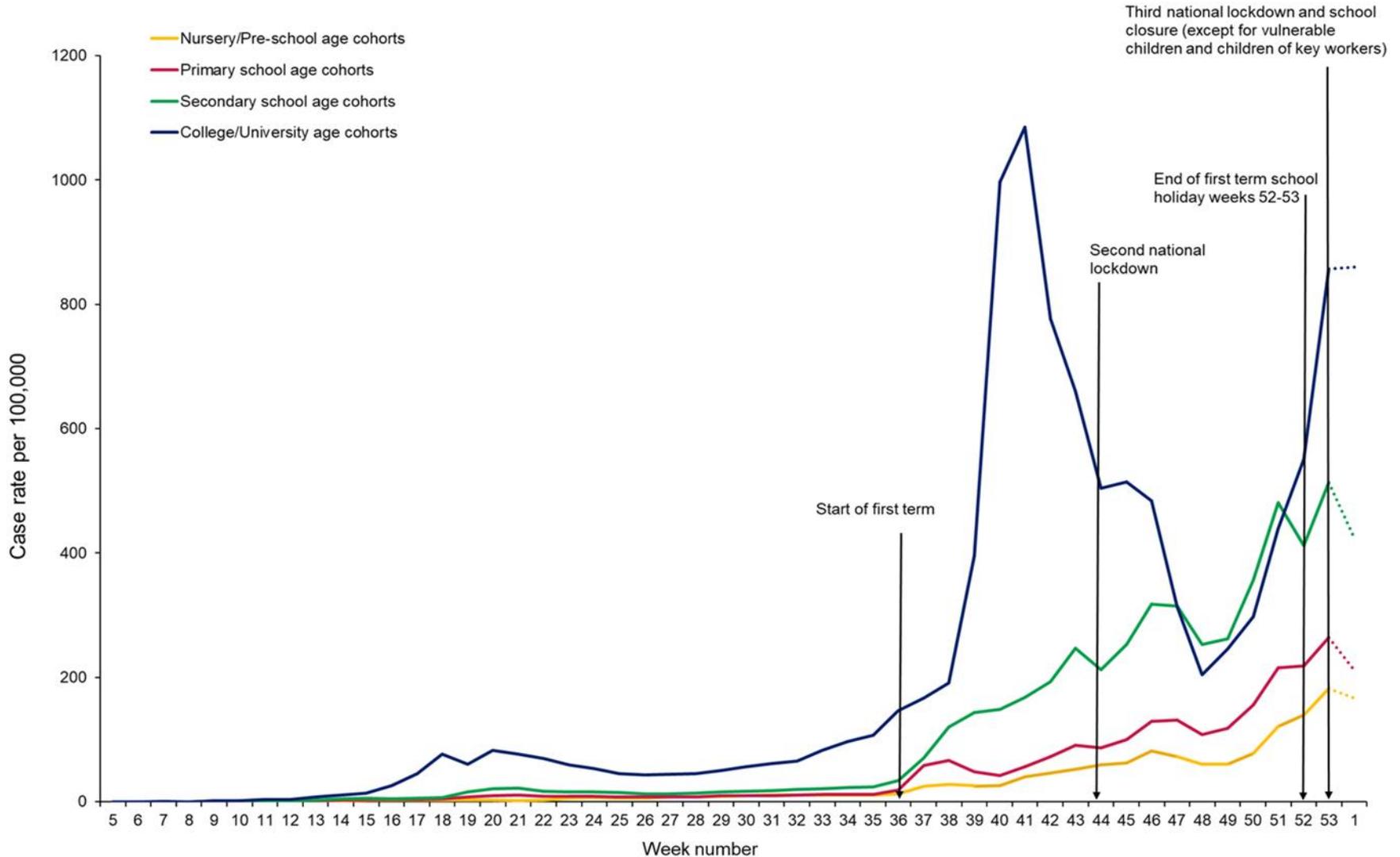


# Weekly number of laboratory confirmed COVID-19 cases in nursery/preschool, primary, secondary and college/university age cohorts



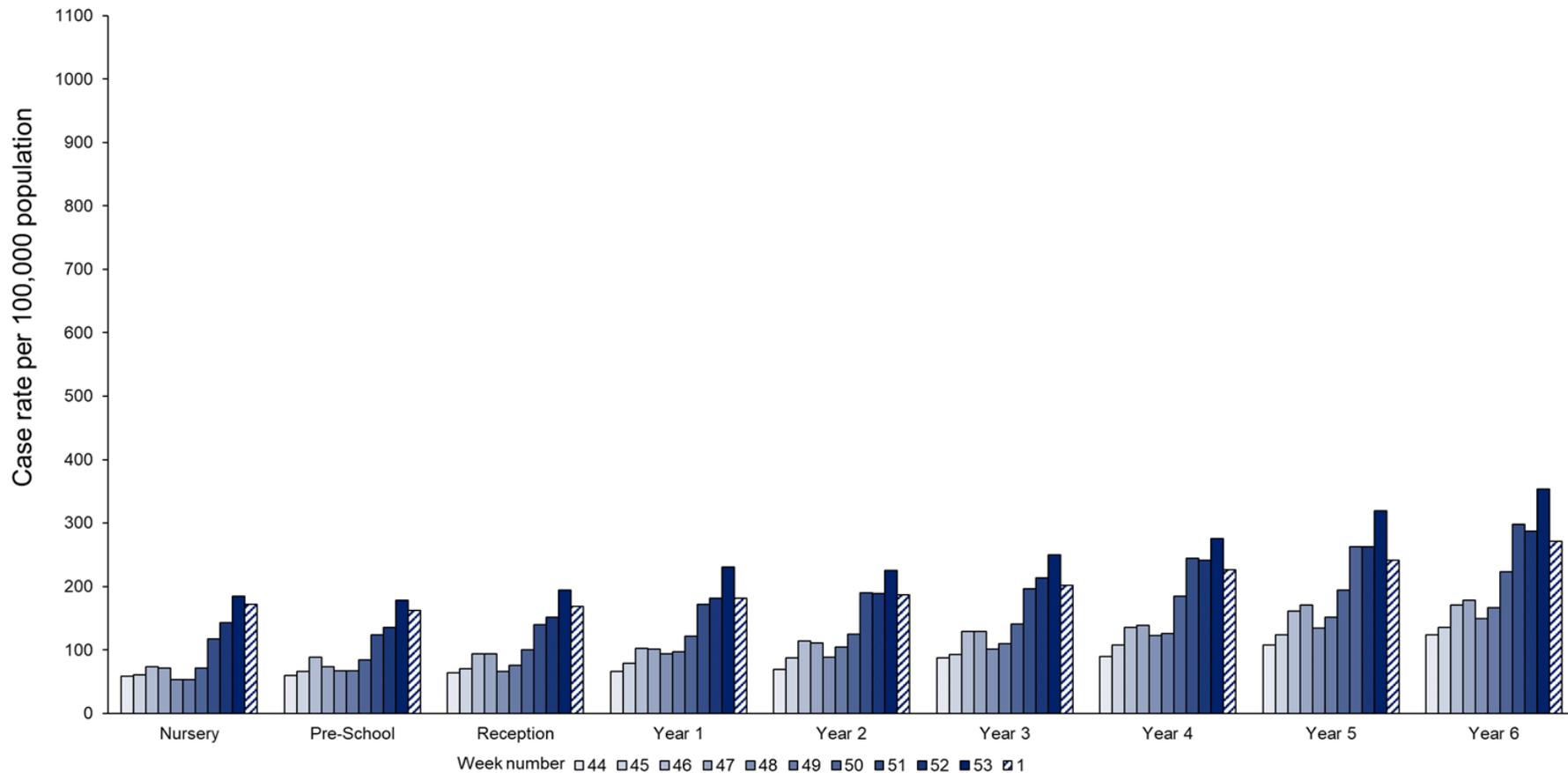


# Weekly incidence of laboratory confirmed COVID-19 cases per 100,000 population in nursery/preschool, primary school, secondary school and college/university age cohorts



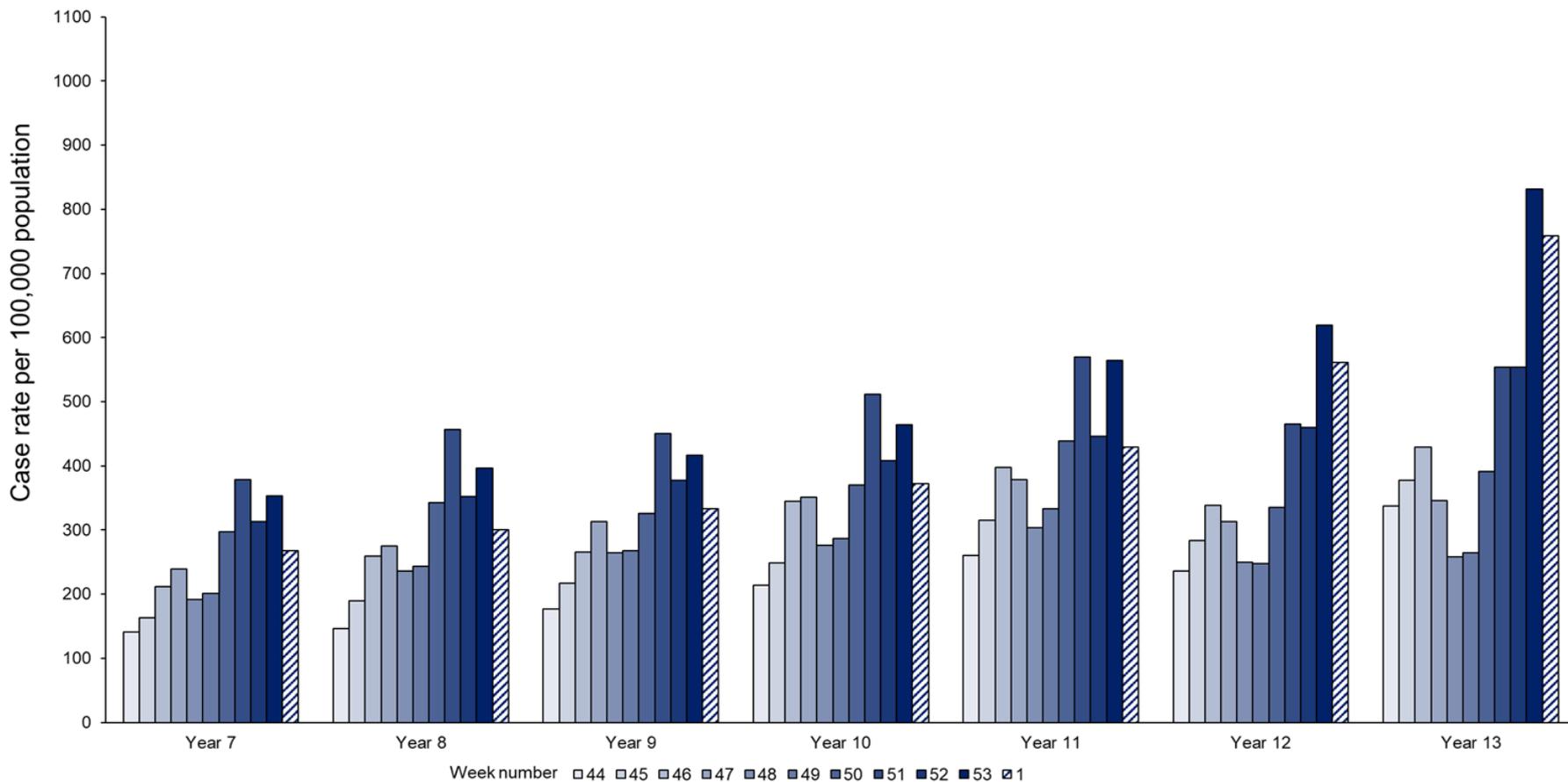


# Weekly incidence of laboratory confirmed COVID-19 cases per 100,000 population in educational age cohorts presented by Year group, from nursery to Year 6, week 44 to 1



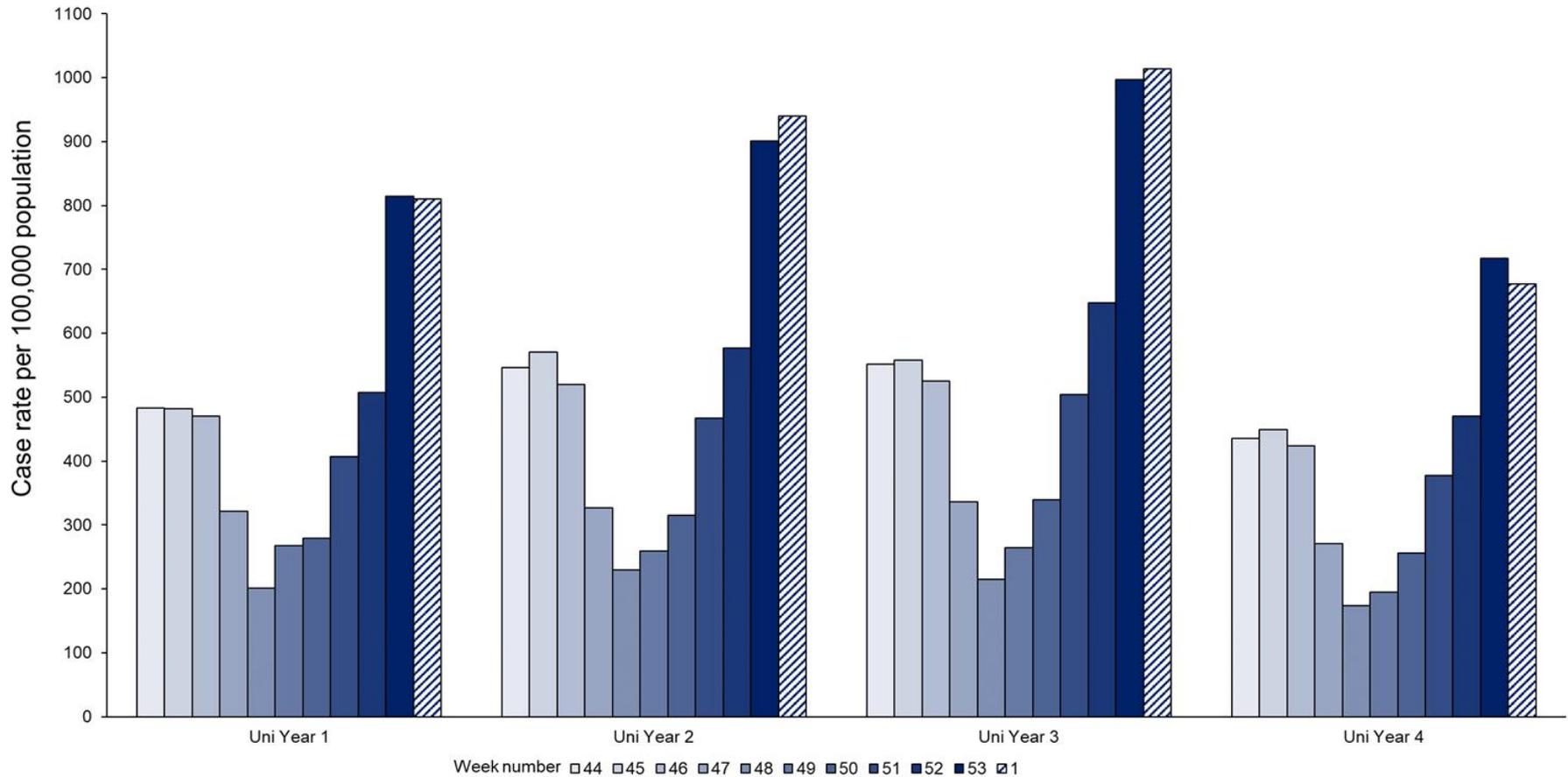


# Weekly incidence of laboratory confirmed COVID-19 cases per 100,000 population in educational age groups presented by secondary school year groups (Year 7 to Year 13), week 44 to 1





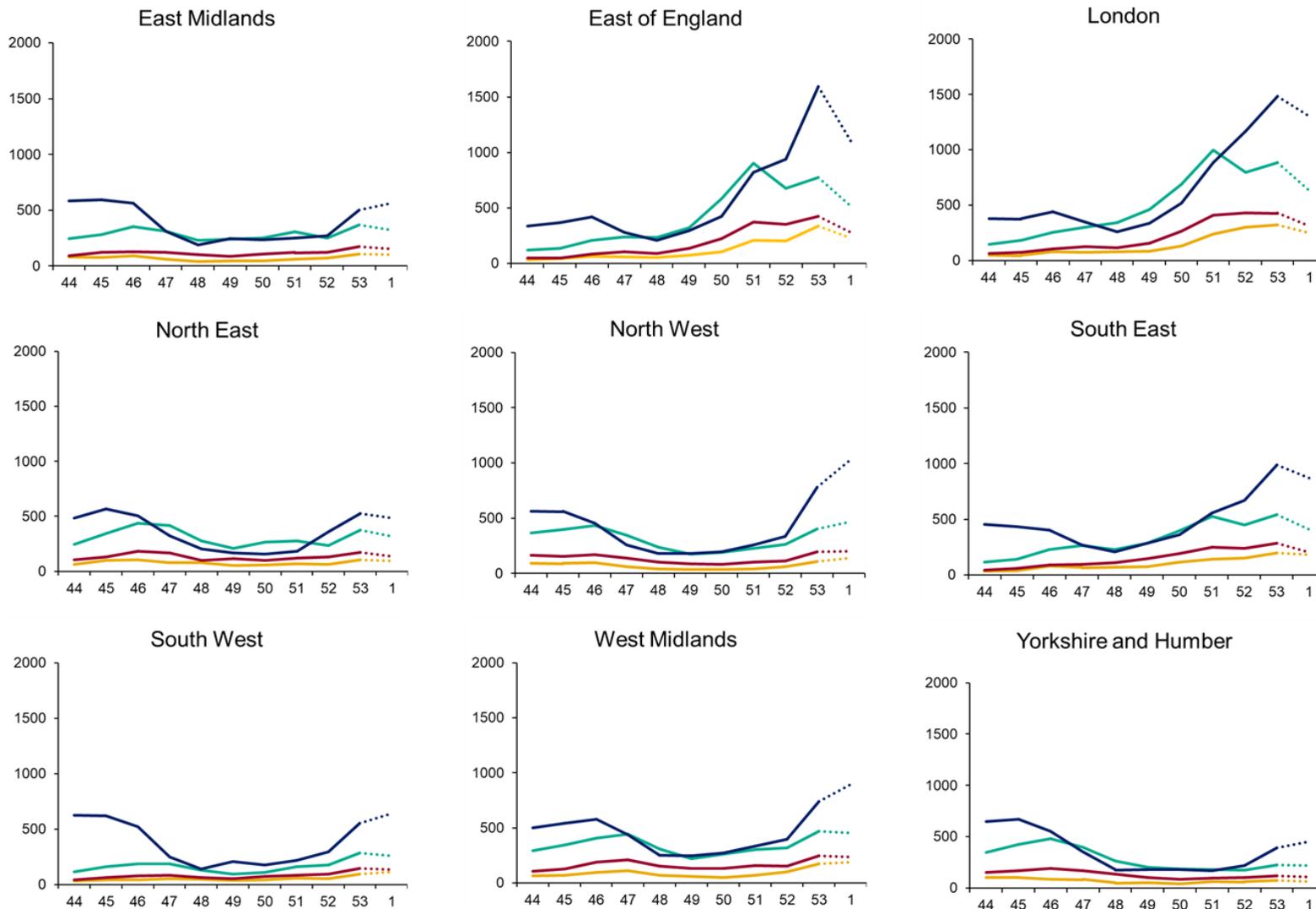
# Weekly incidence of laboratory confirmed COVID-19 cases per 100,000 population in educational age cohorts corresponding to university/college year groups, week 44 to 1





# Weekly incidence of laboratory confirmed COVID-19 cases per 100,000 population by educational age cohorts and PHE region, week 44 to 1

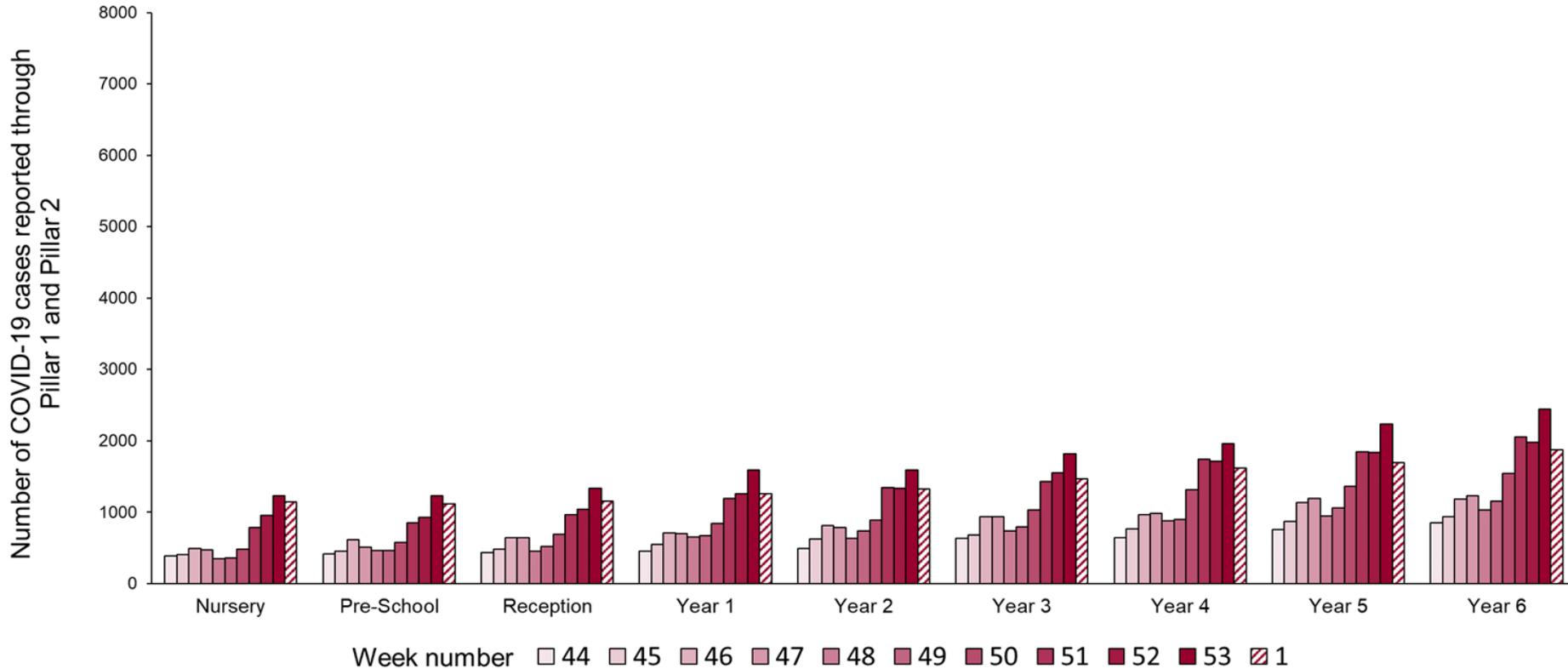
Case rate per 100,000 population



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

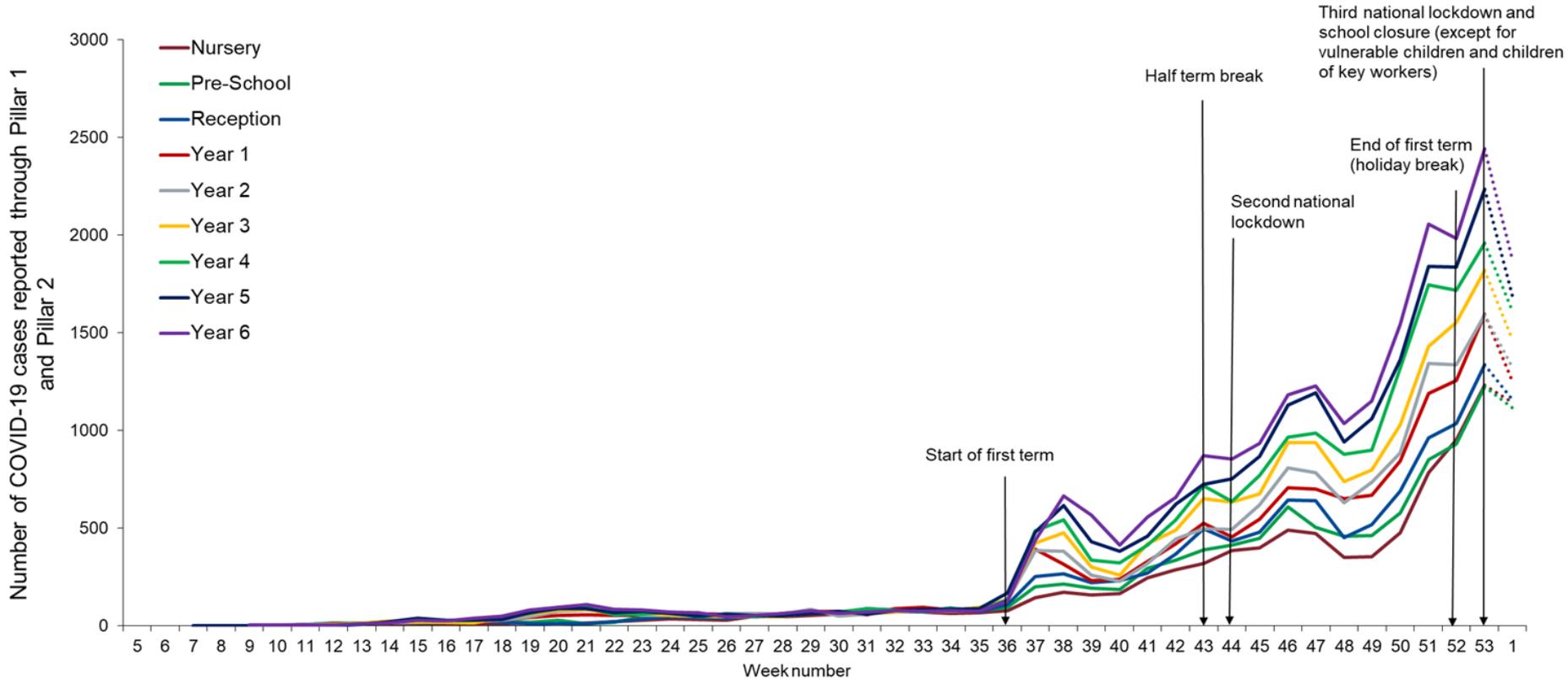


# Weekly number of new laboratory confirmed COVID-19 cases in educational age cohorts presented by Year group, from nursery to Year 6, week 44 to 1



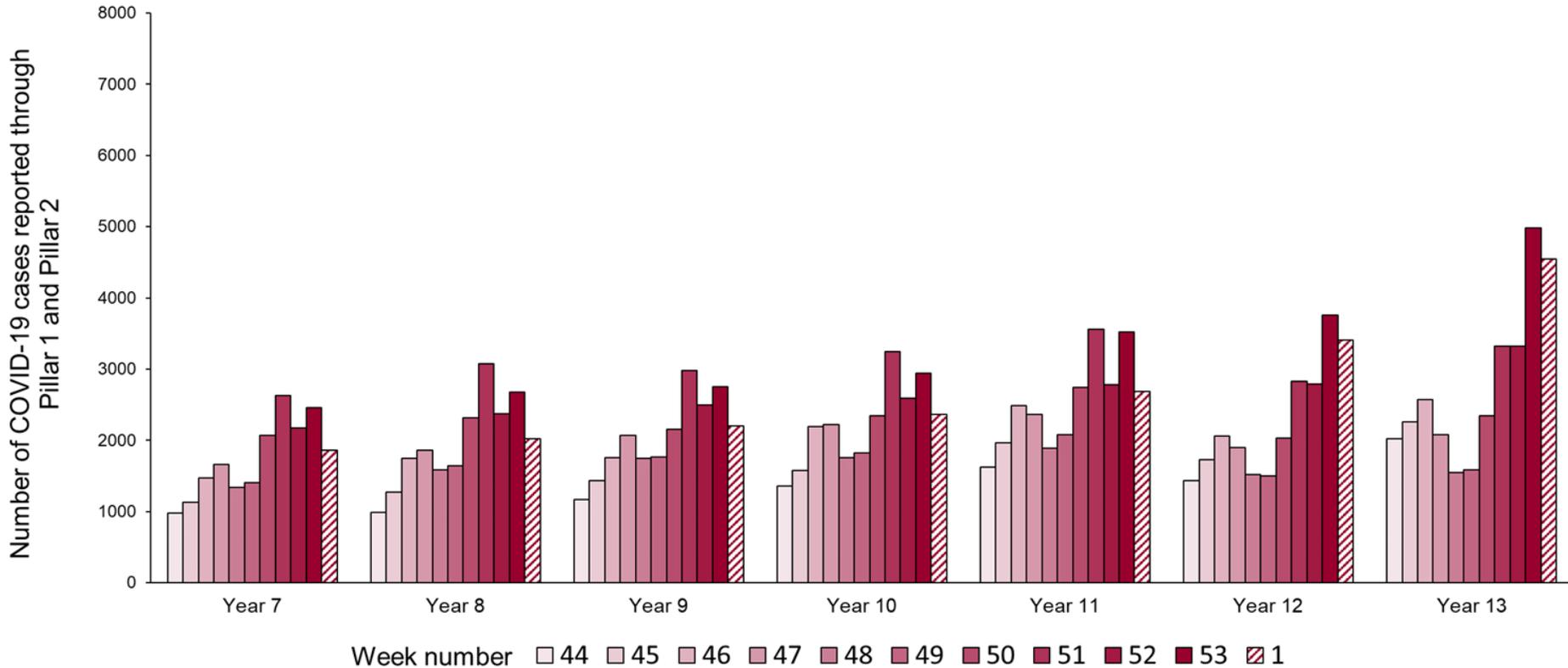


# Weekly number of new laboratory confirmed COVID-19 cases in educational age cohorts presented by Year group, from nursery to Year 6



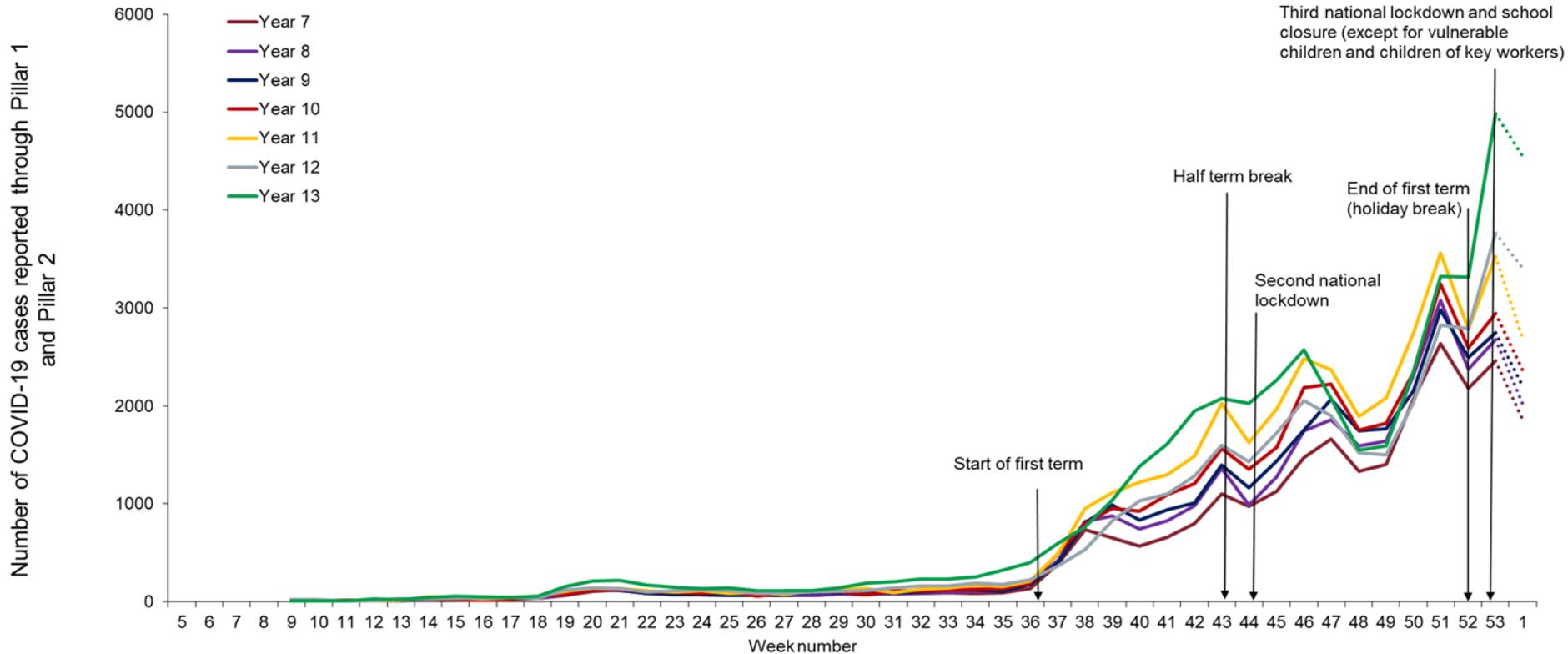


# Weekly number of new laboratory confirmed COVID-19 cases in educational age groups presented by secondary school year groups (Year 7 to Year 13), week 44 to 1



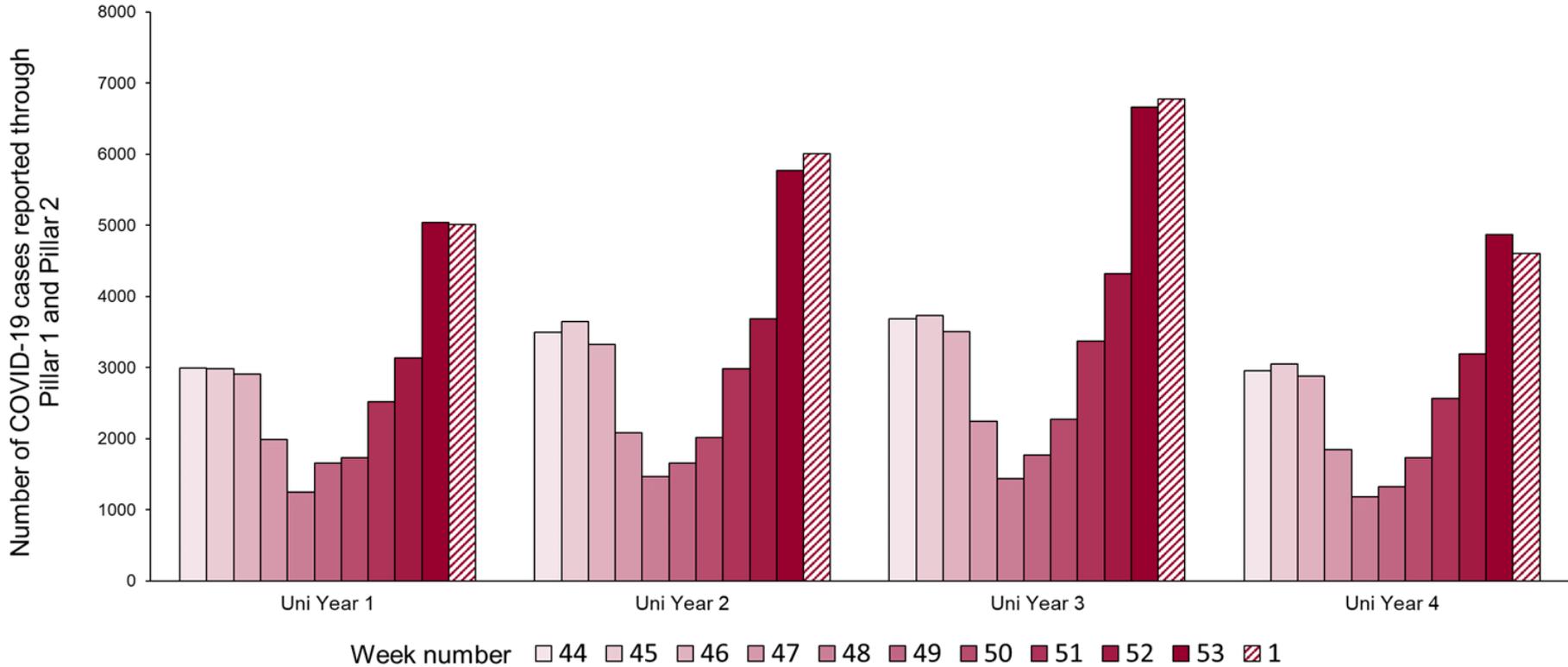


# Weekly number of new laboratory confirmed COVID-19 cases in educational age groups presented by secondary school year groups (Year 7 to Year 13)



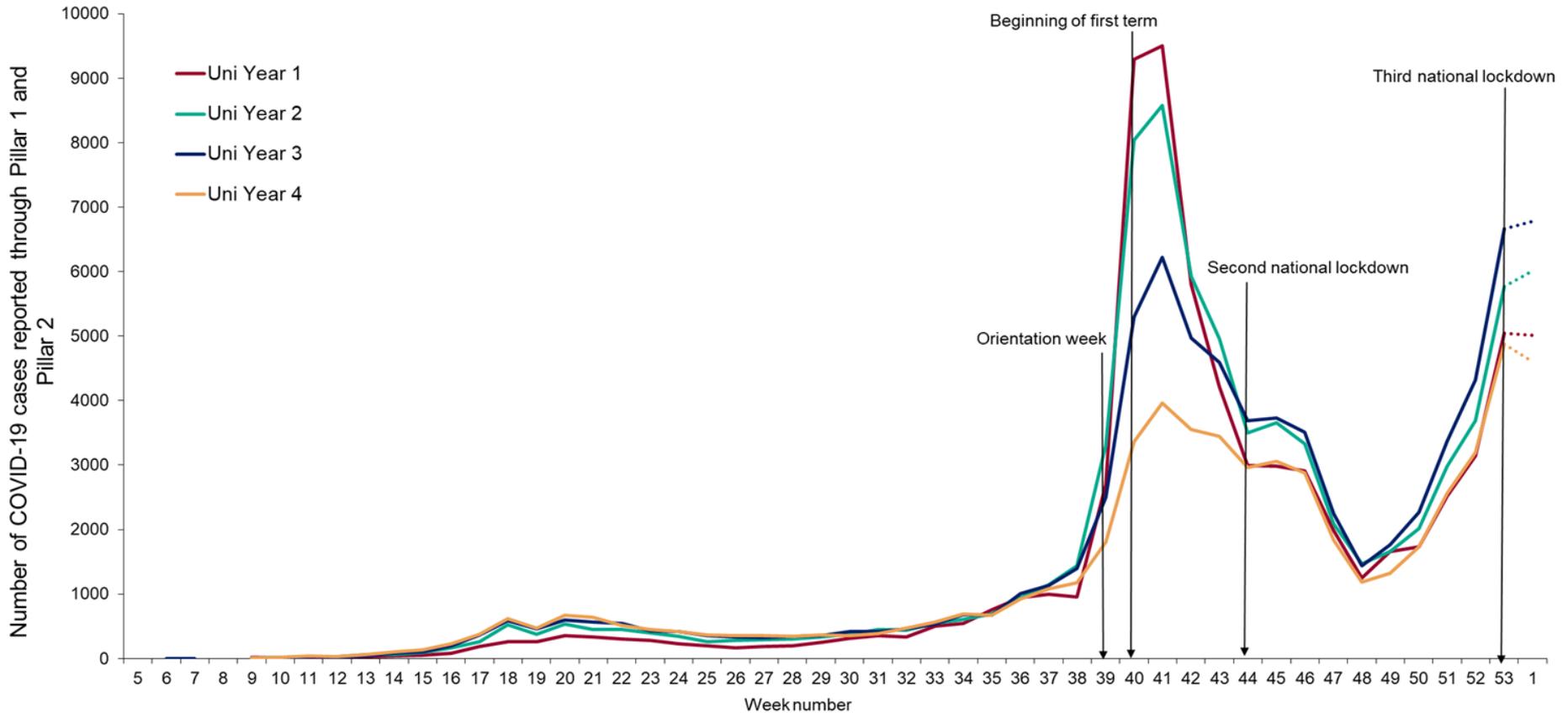


# Weekly number of new laboratory confirmed COVID-19 cases in educational age cohorts corresponding to university/college year groups, week 44 to 1





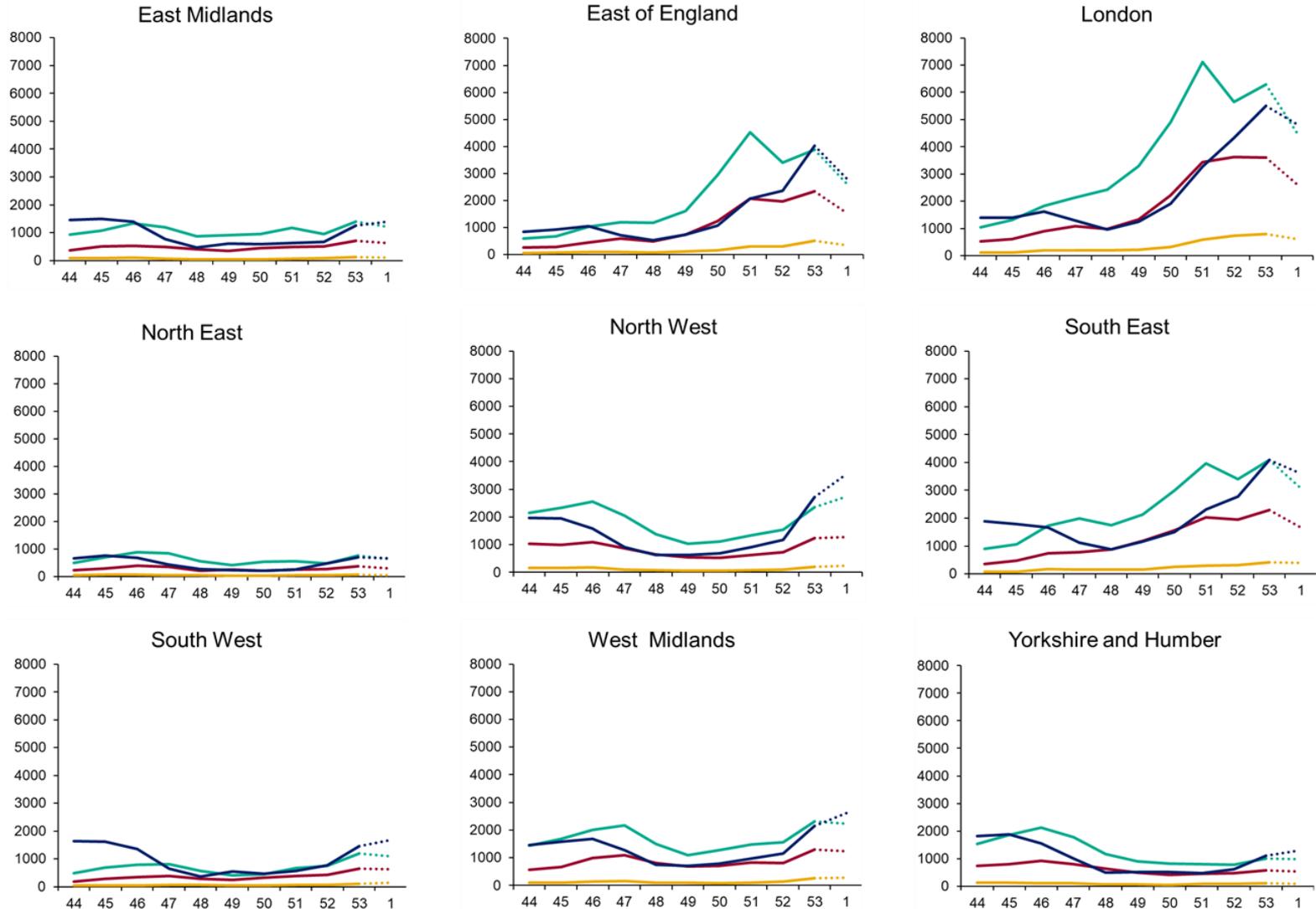
# Weekly number of new laboratory confirmed COVID-19 cases in educational age cohorts corresponding to university/college year groups





# Weekly number of new laboratory confirmed COVID-19 cases by educational age cohorts and PHE region, week 44 to 1

Number of new laboratory confirmed COVID-19 cases

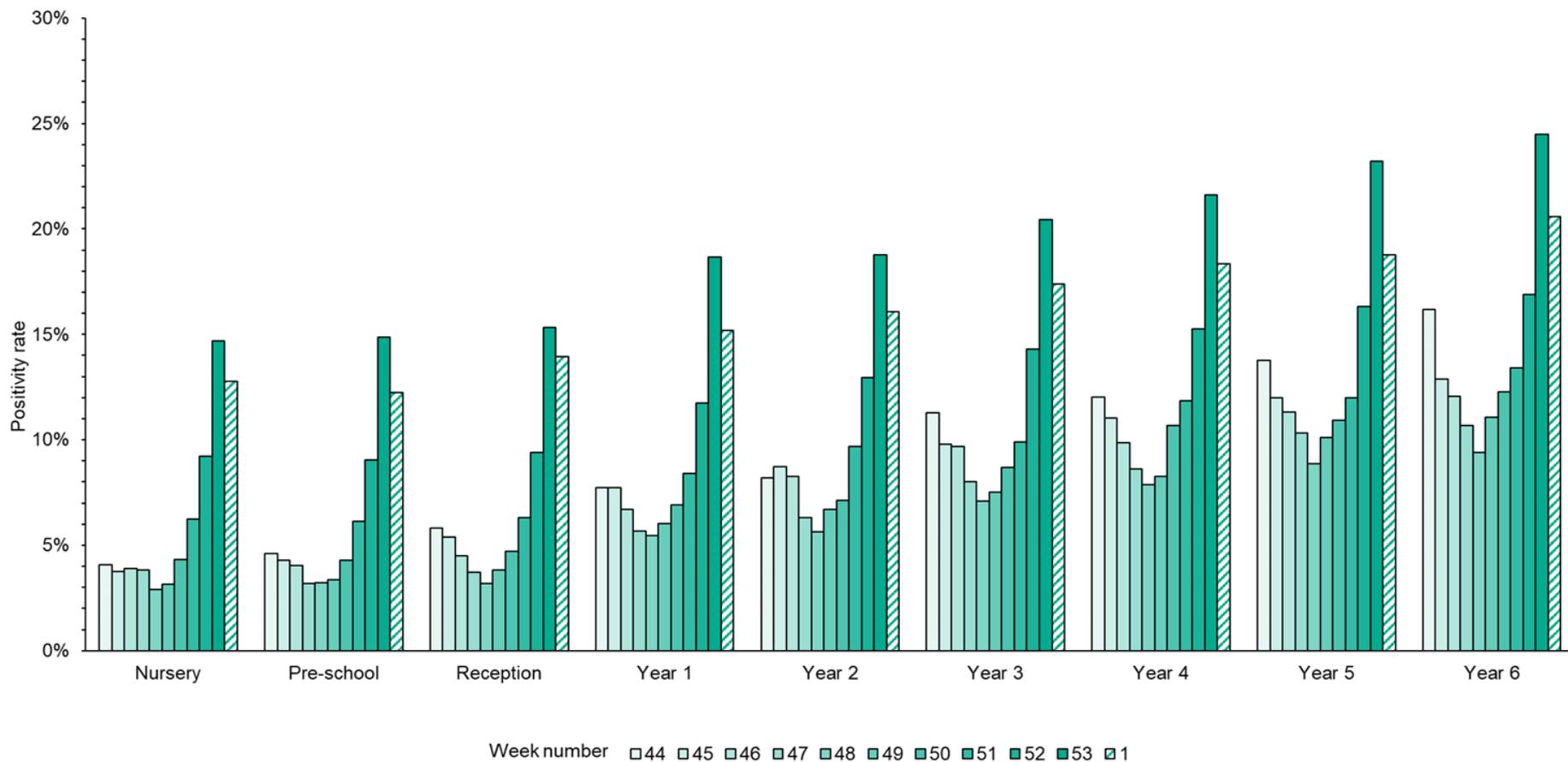


— Nursery/Pre-school age cohorts — Primary school age cohorts — Secondary school age cohorts — College/University age cohorts

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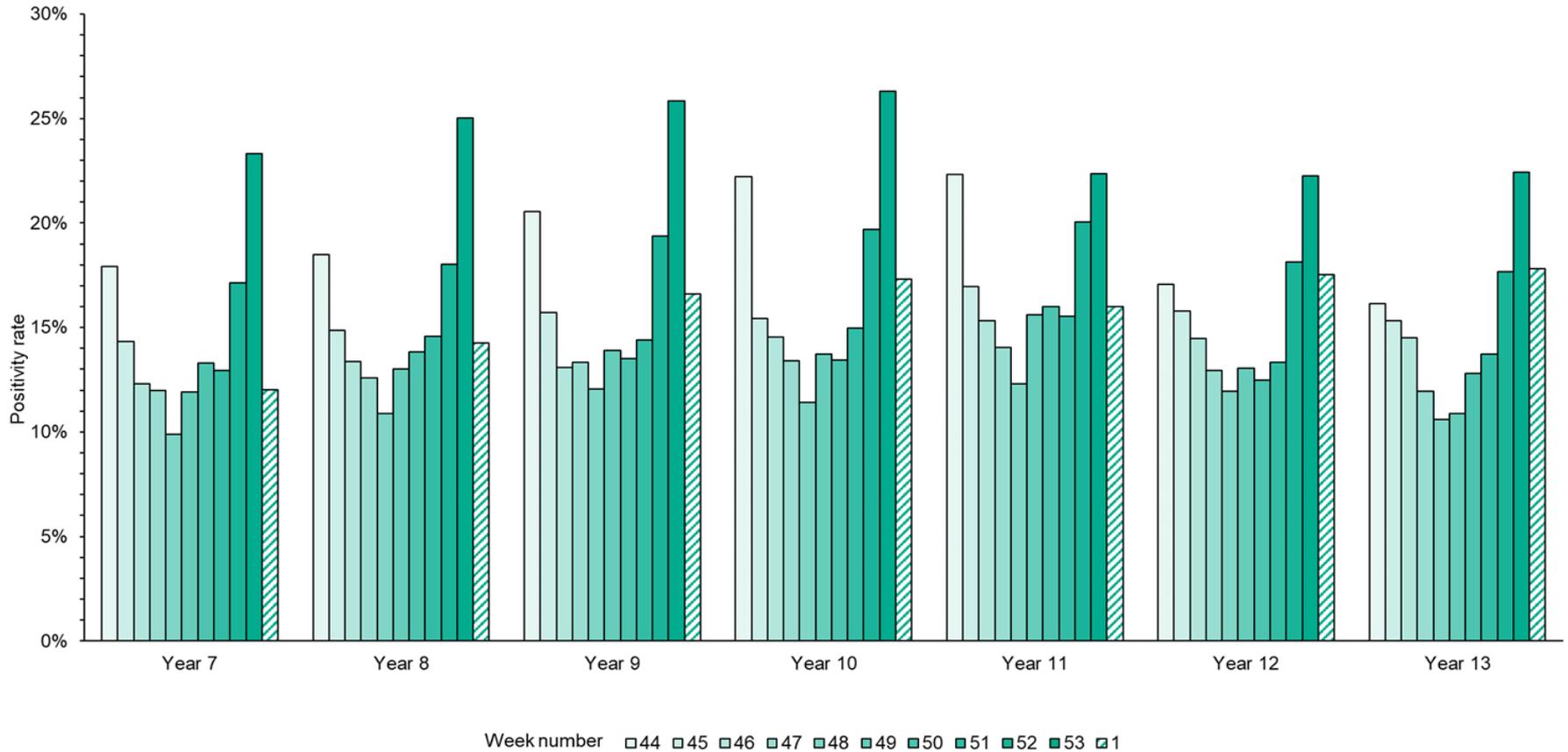


# Weekly positivity rates of confirmed COVID-19 cases in educational age cohorts presented by Year group, from nursery to Year 6, week 44 to 1



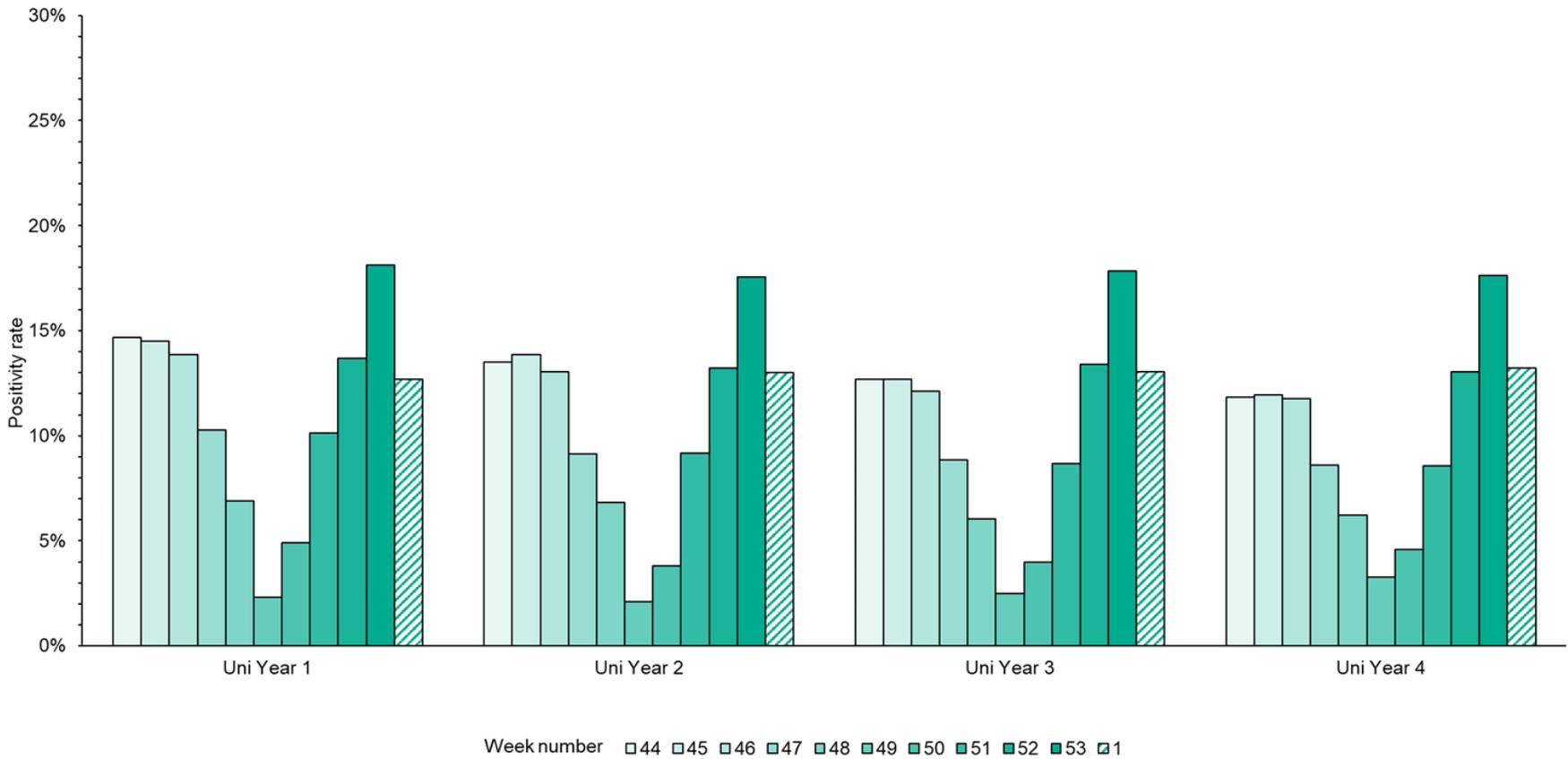


# Weekly positivity rates of confirmed COVID-19 cases in educational age cohorts presented by secondary school year group (Year 7 to Year 13), week 44 to 1



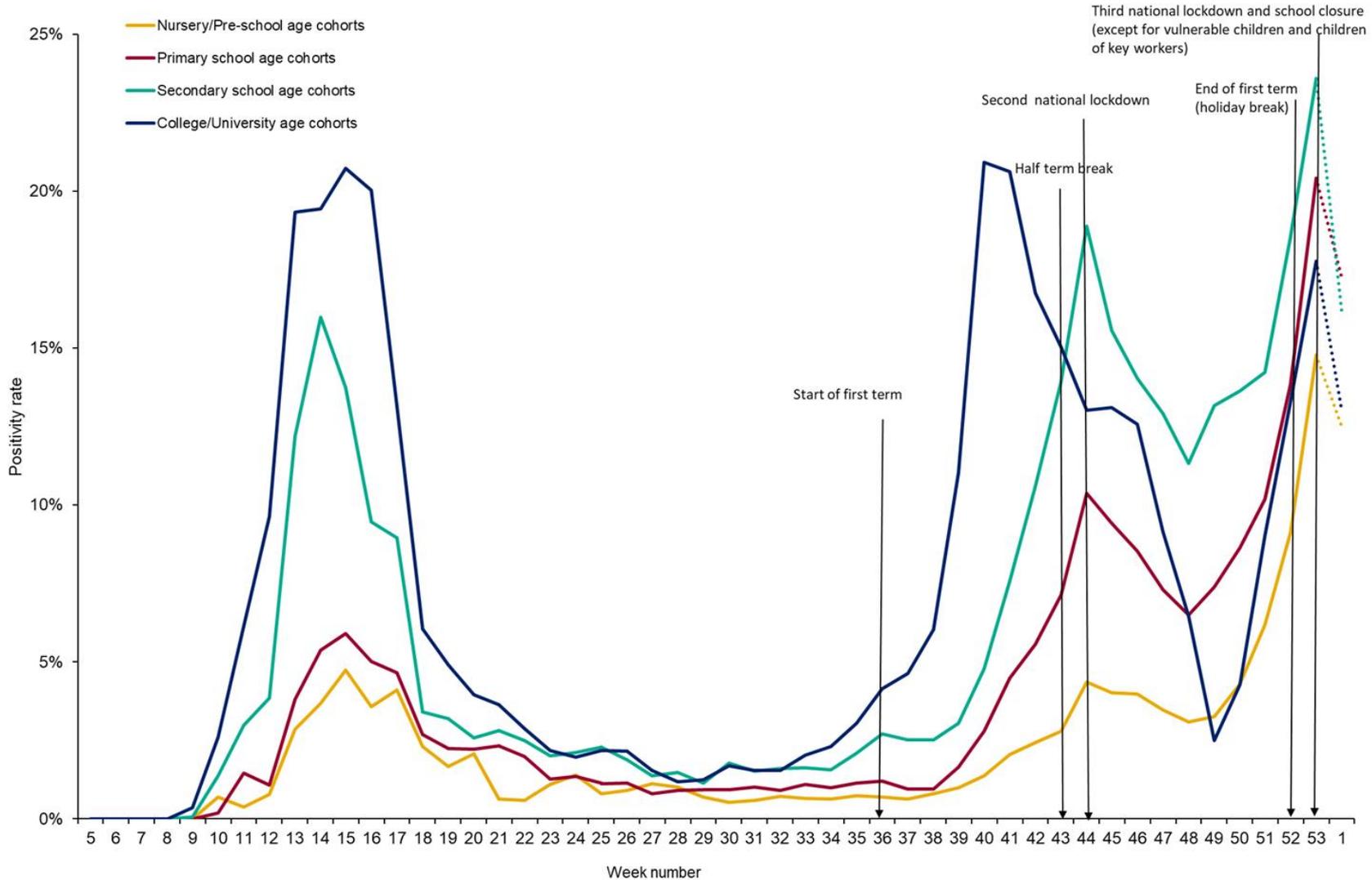


# Weekly positivity rates of confirmed COVID-19 cases in educational age cohorts corresponding to university/college year groups, week 44 to 1



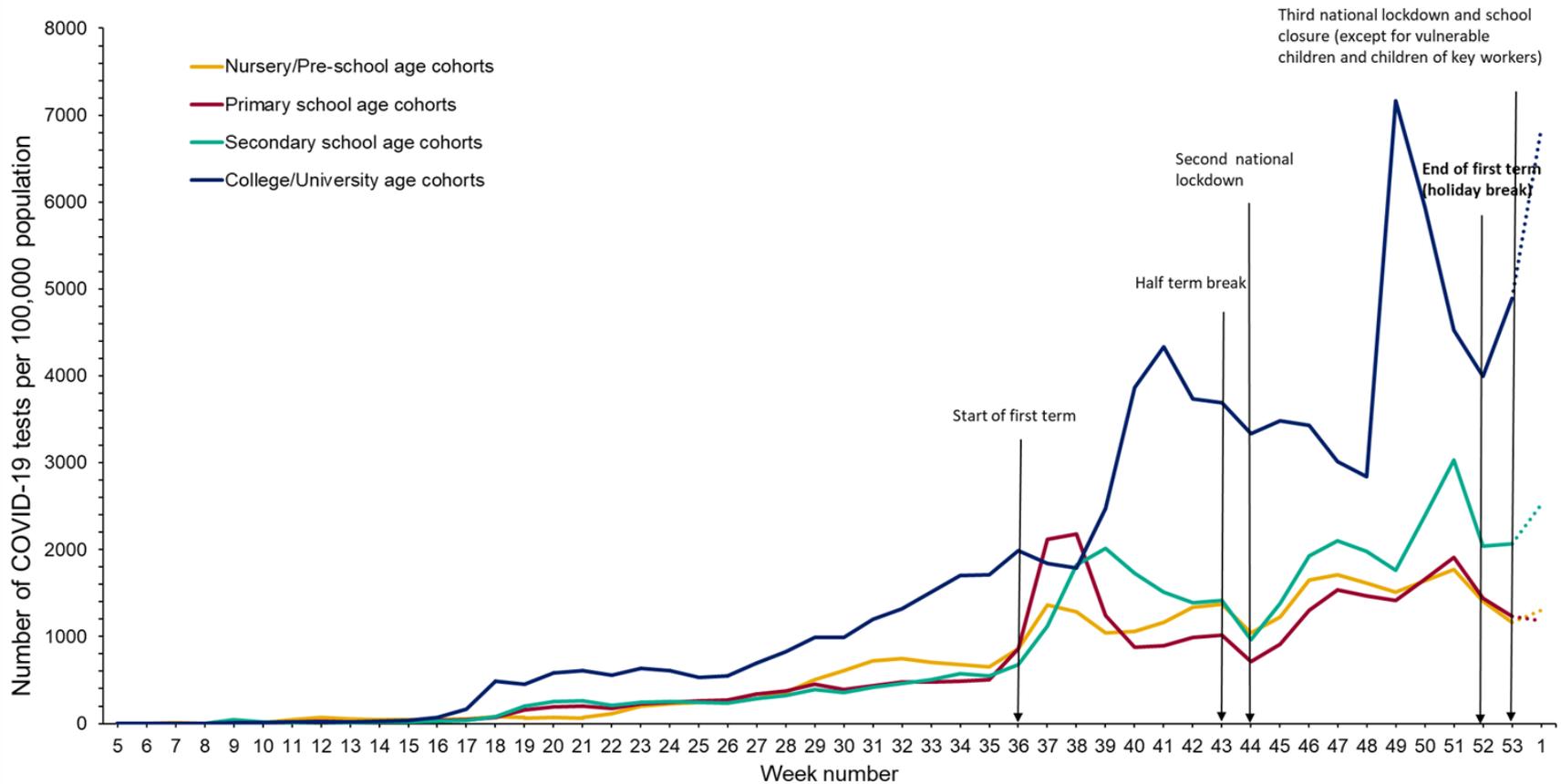


# Weekly positivity rates of confirmed COVID-19 cases, in nursery/preschool, primary school, secondary school and college/University age cohorts, week 44 to 1





# 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 44 to 1



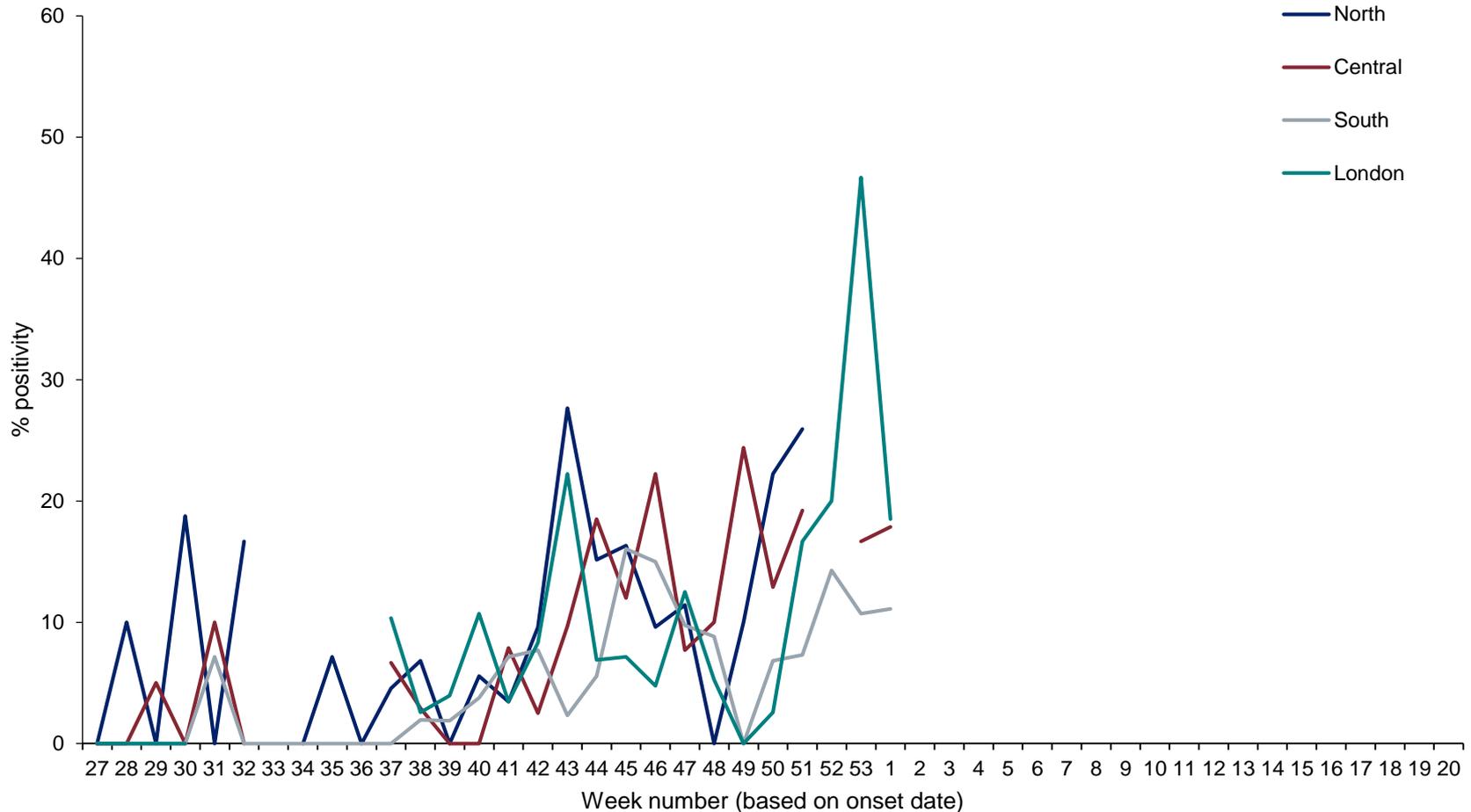
\* From early December a mass testing programme has been rolled out in Higher Education Institutions using Lateral Flow Devices ahead of students returning home for the Christmas break. This will impact testing trends and positivity data during this period.



# Primary care surveillance



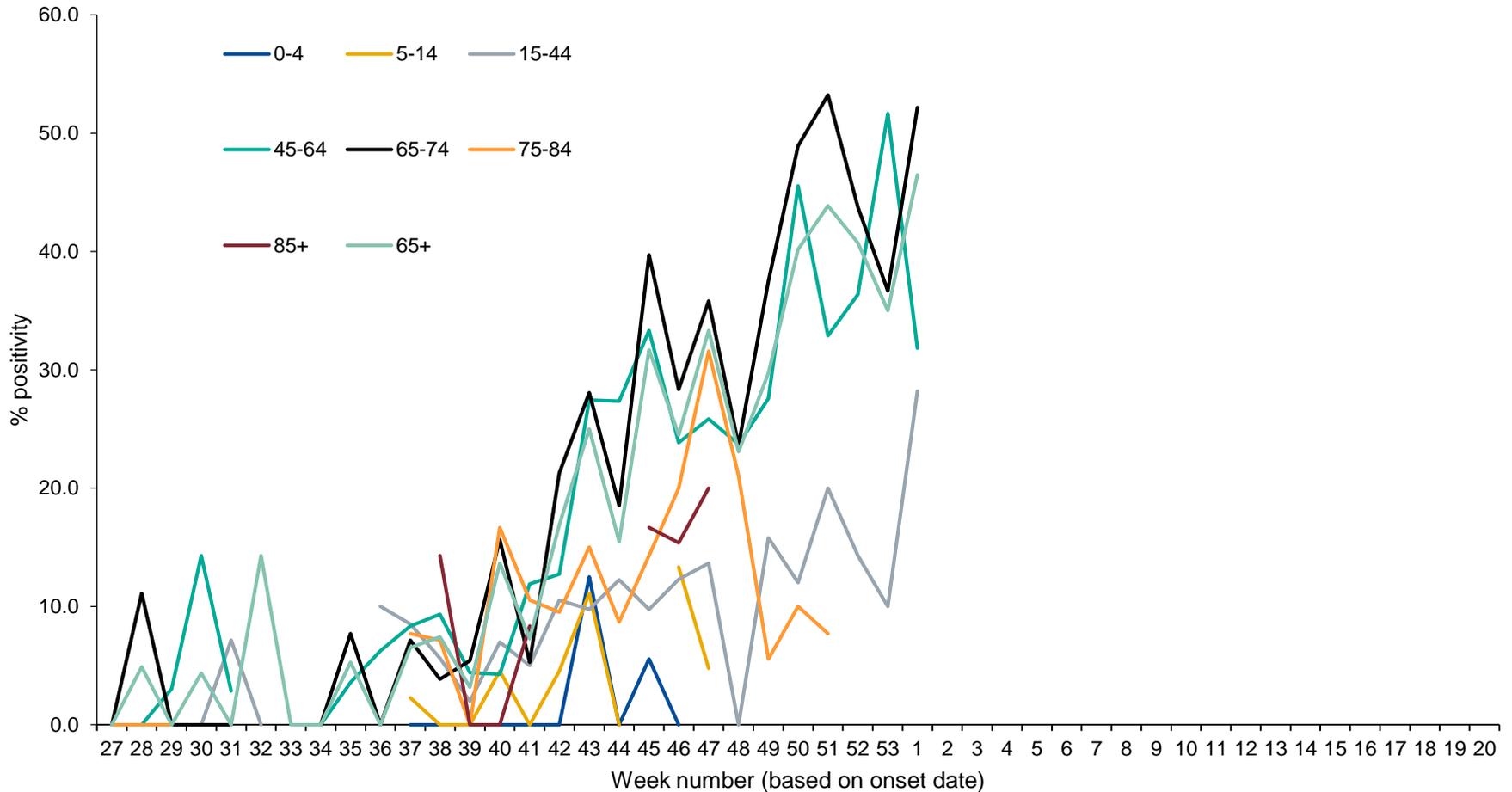
# Overall SARS-CoV-2 positivity (%) (weekly) by PHE Region, England (RCGP)



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)



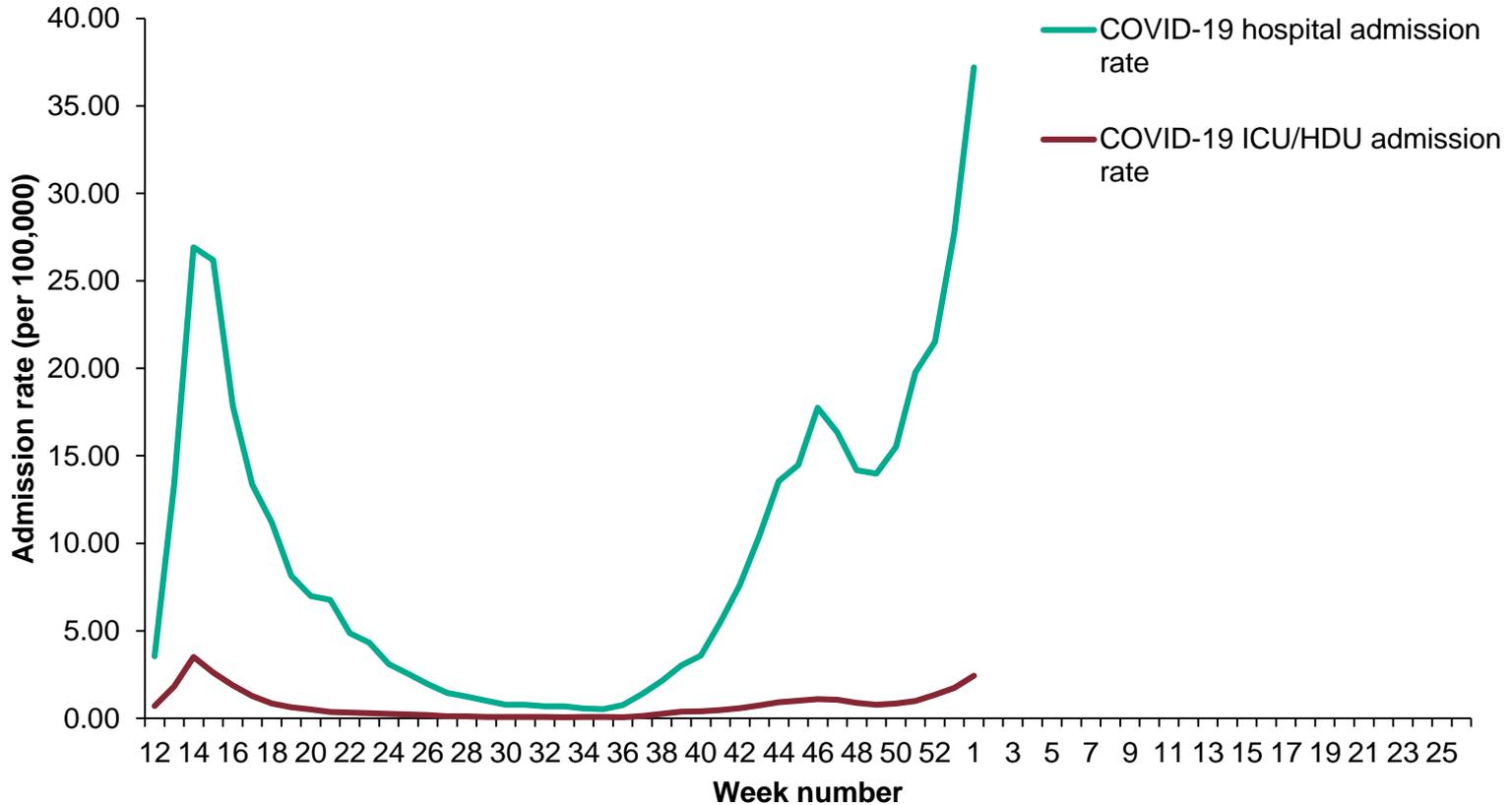
For the most recent week, more samples are expected to be tested therefore the graph should be interpreted with caution. Positivity (%) is not calculated when the total number tested is less than 10



# Secondary Care surveillance

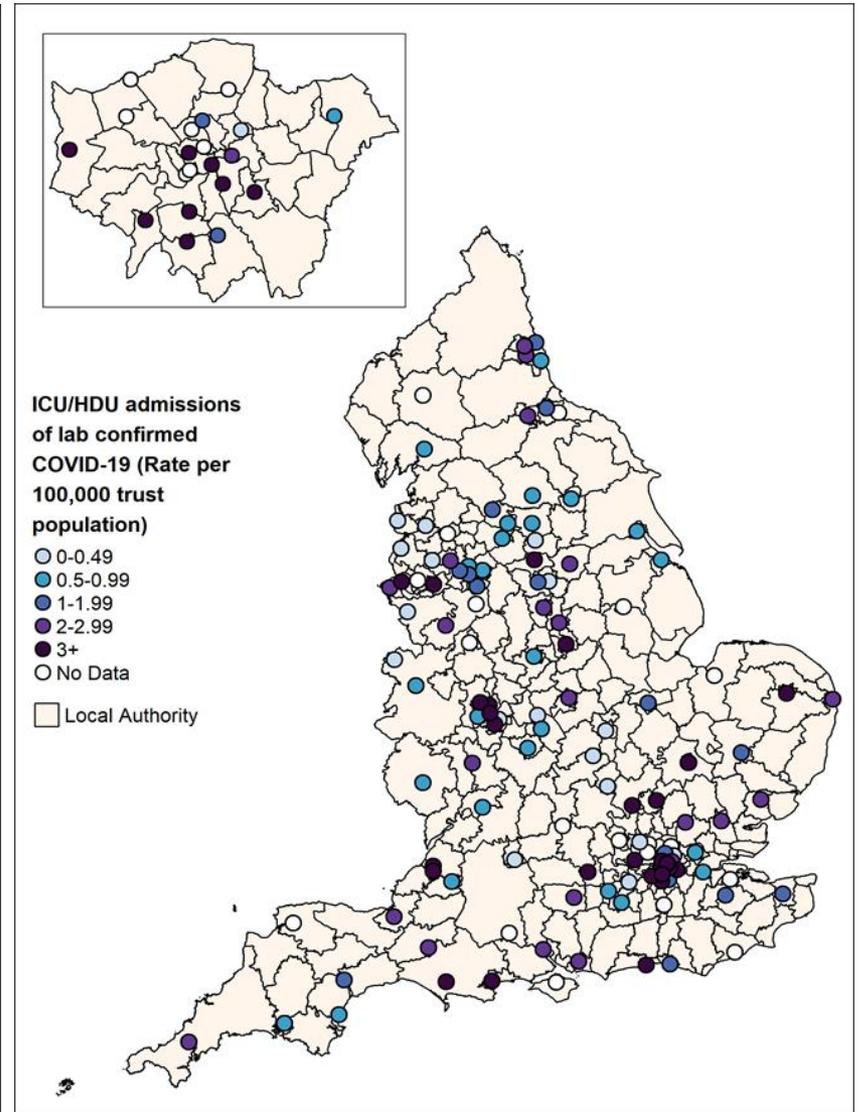
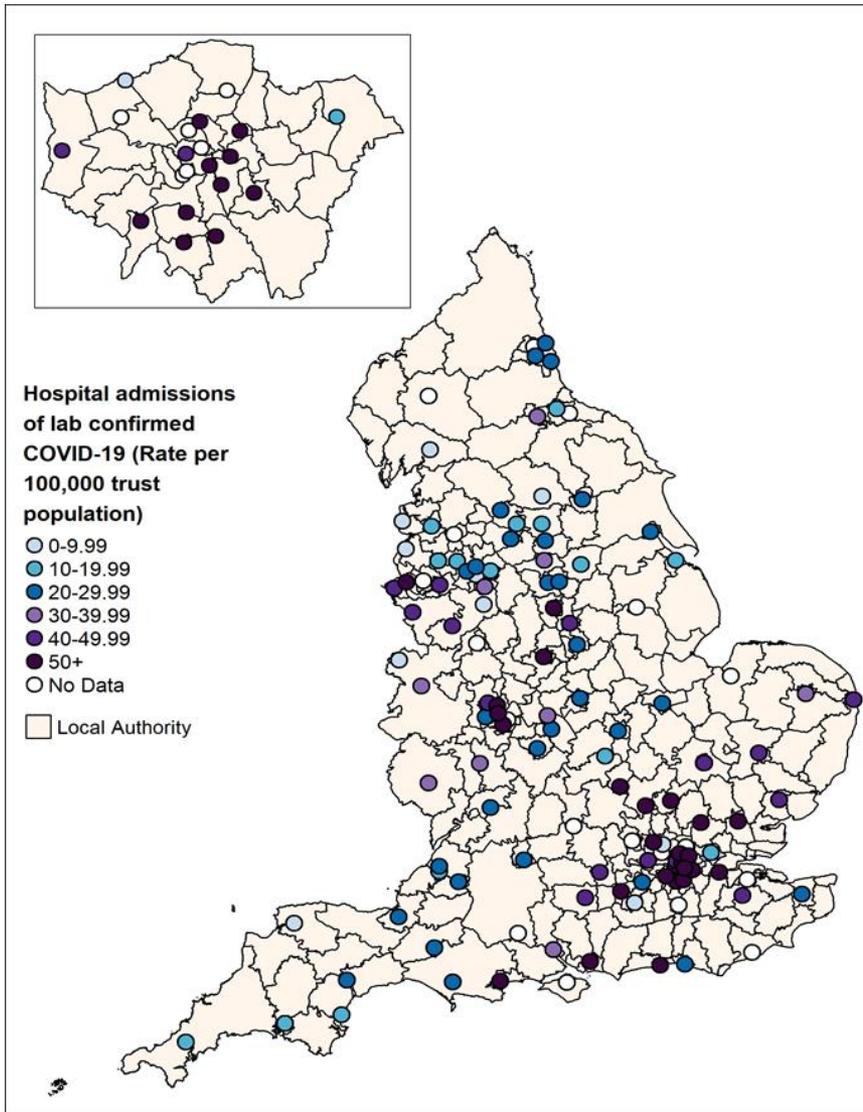


# Weekly overall hospital and ICU/HDU admission rates per 100,000 of new COVID-19 positive cases reported through SARI Watch, England since week 12

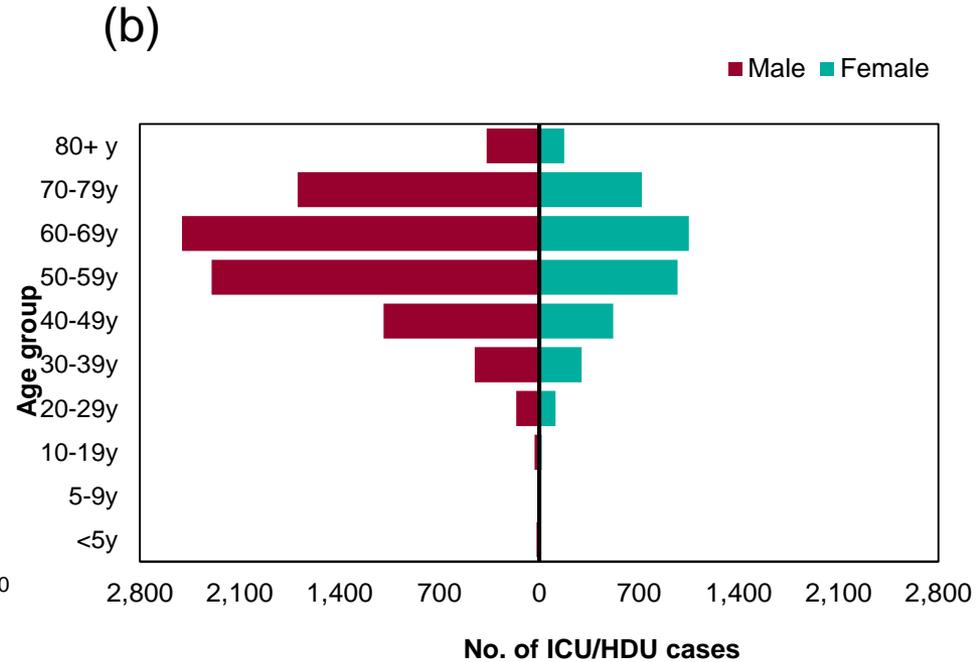
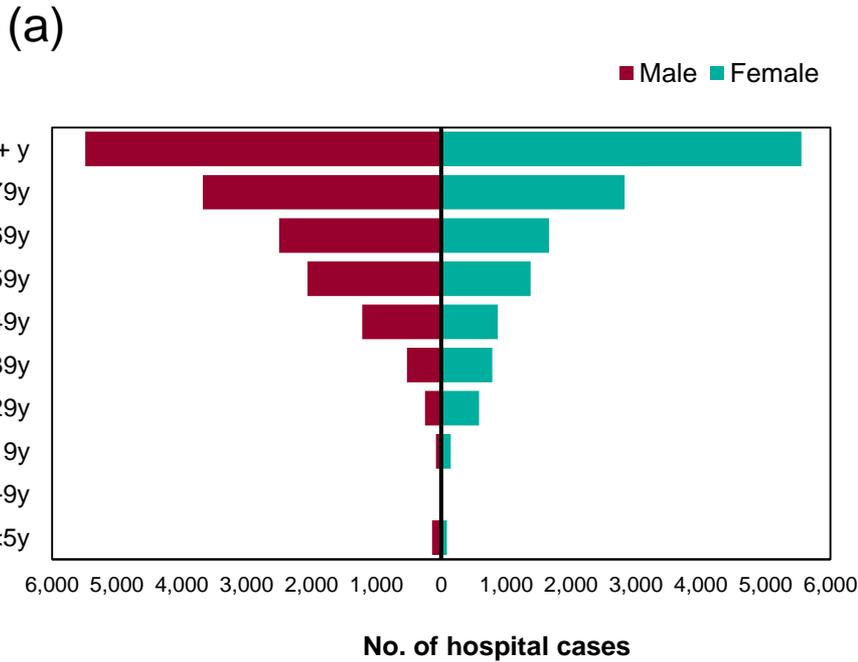




# Weekly admission rates for hospital and ICU/HDU laboratory confirmed COVID-19 cases reported through SARI Watch, week 1



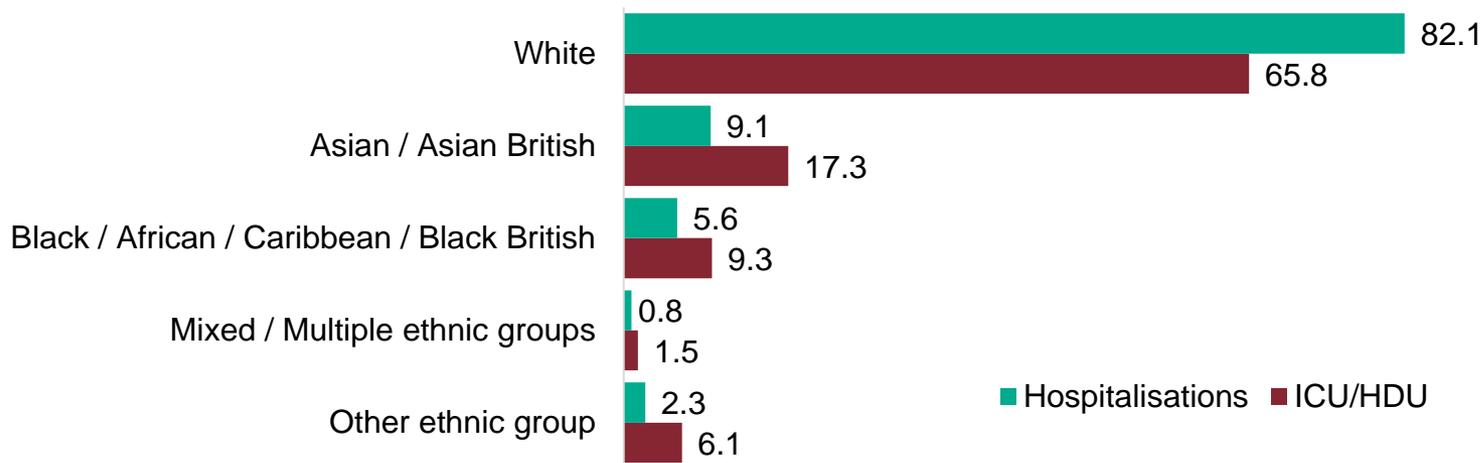
# Age/sex pyramid of new (a) hospital (lower level of care) (n=29,886) and (b) ICU/HDU (n=12,500) COVID-19 cases reported through SARI Watch, England



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=28,799) and ICU/HDU (n=11,608) COVID-19 cases reported through SARI Watch, England

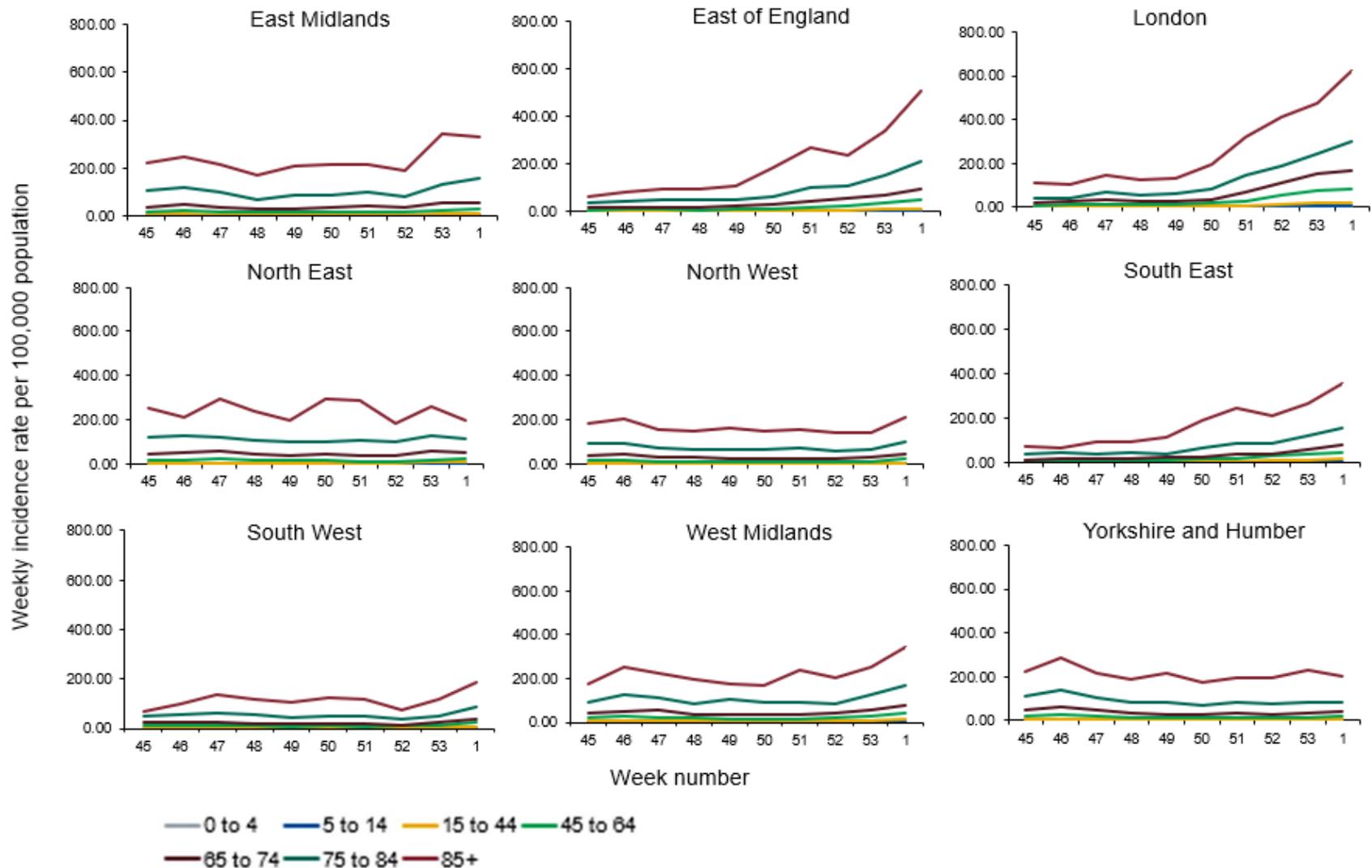


proportion of admitted cases (%)

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 45 to 1

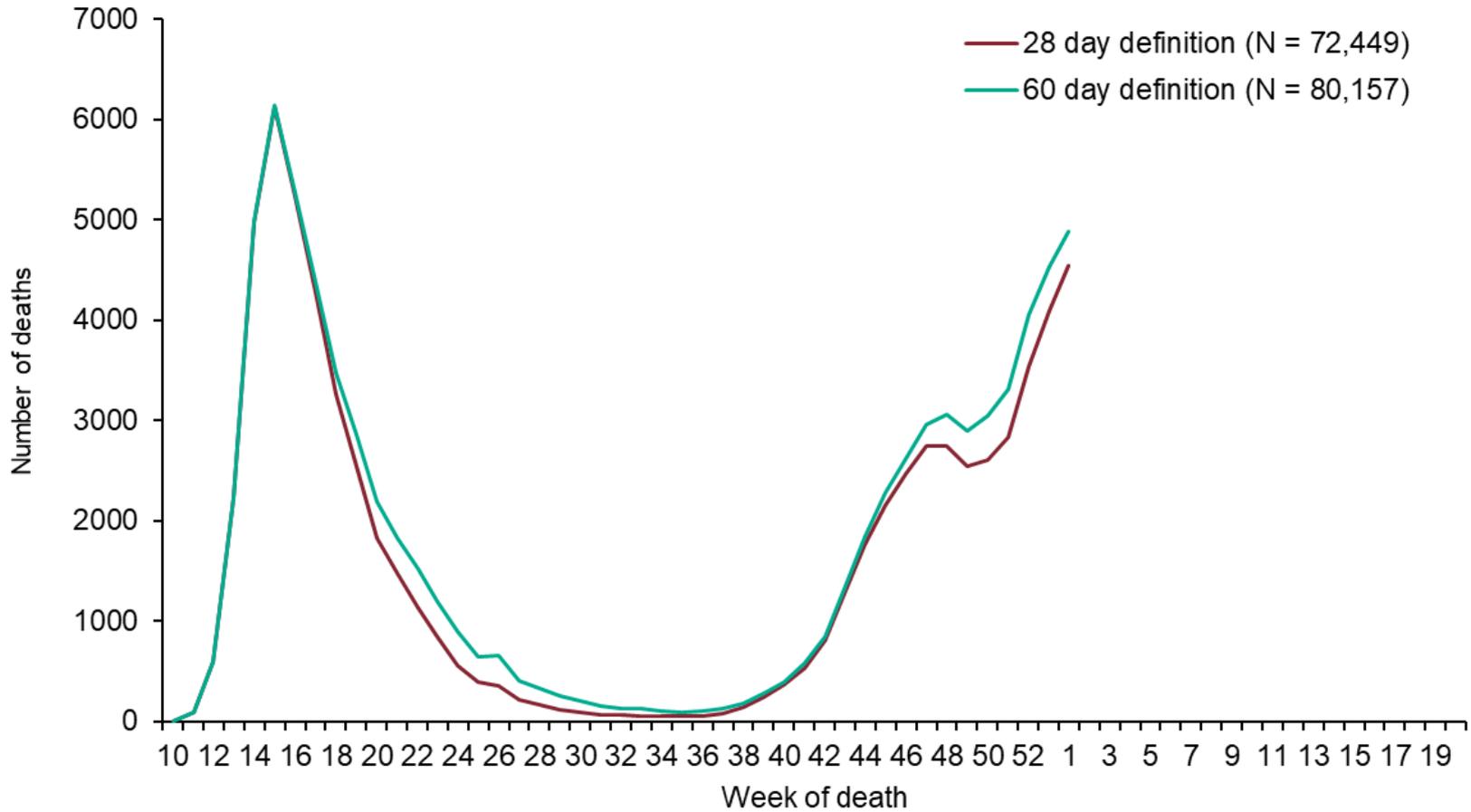




# Mortality surveillance



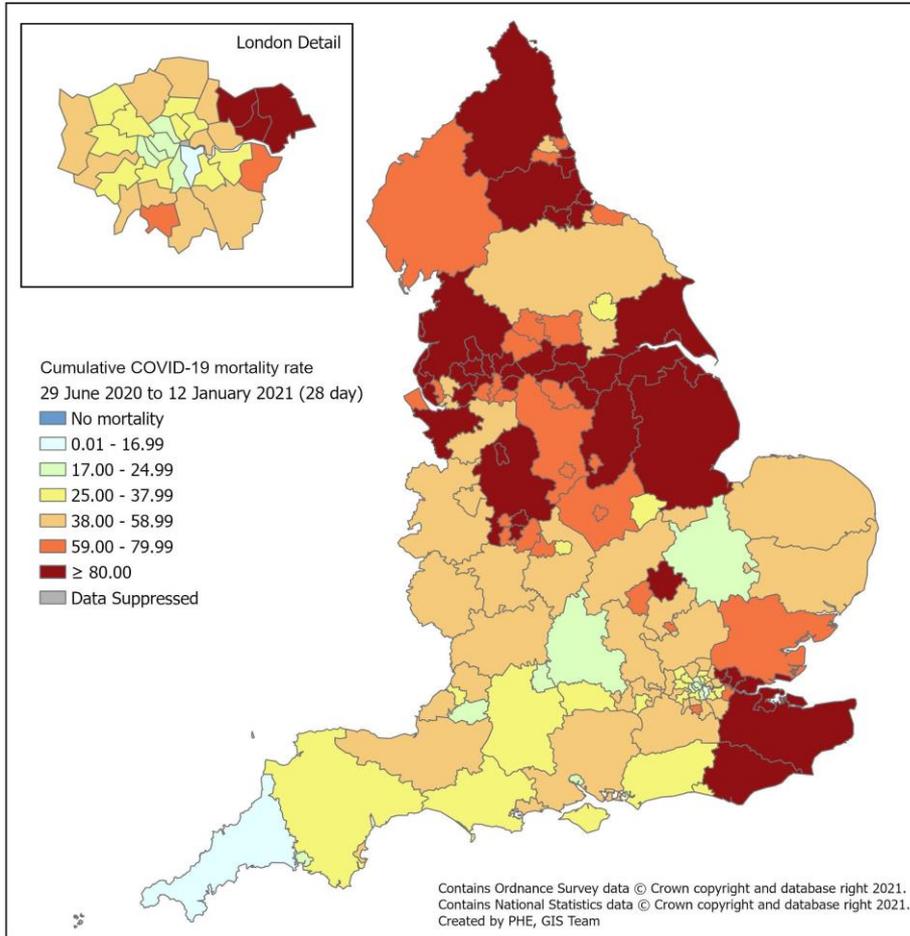
# Number of deaths since week 10 by week of death and time since laboratory confirmation of COVID-19, England



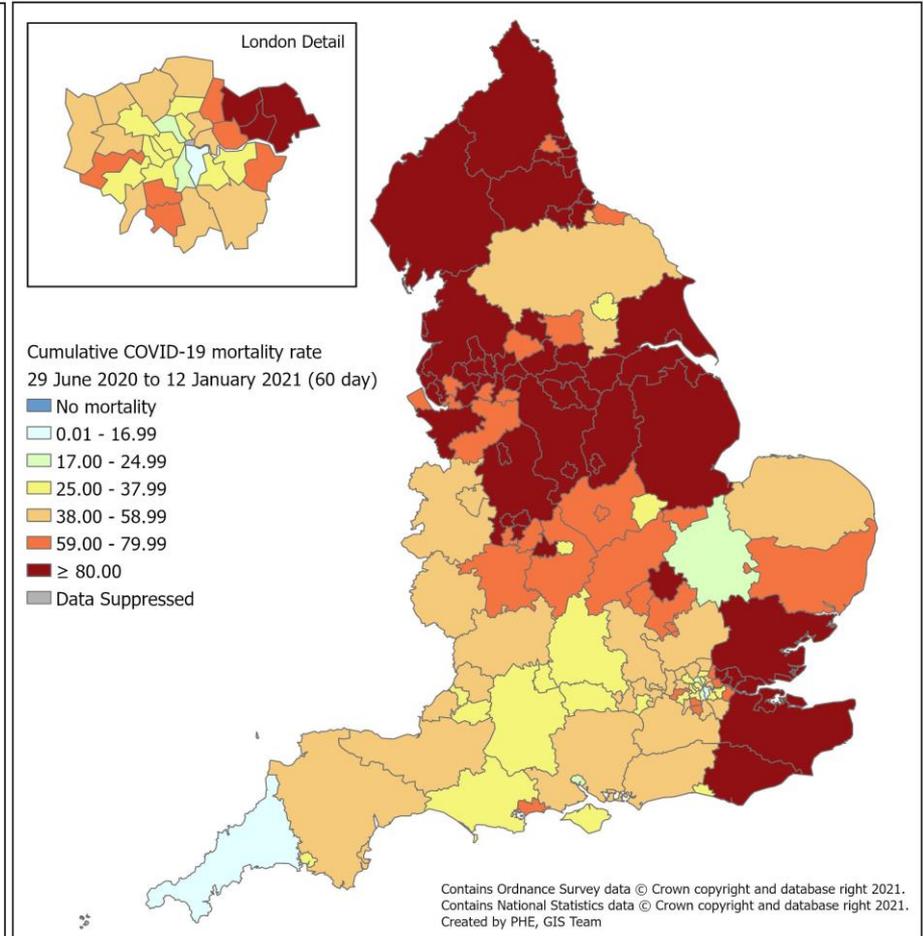


# Cumulative mortality rate of COVID-19 cases per 100,000 population tested under Pillar 1 and 2 since week 27 by (a) 28 day definition and (b) 60 day definition

(a)



(b)



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

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# 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 pneumonia*.
- 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).

Data in this slide is cumulative from January 2020 to 4th November 2020 and supersedes data presented in slides from previous weeks



# 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