

Article

Coronavirus (COVID-19) vaccination uptake in school pupils, England: up to 22 July 2022

Coronavirus (COVID-19) vaccination uptake in school pupils attending state-funded schools. Including detailed analysis by demographic and geographic characteristics. Experimental Statistics produced by linking the English School Census (ESC) to the National Immunisation Management Service (NIMS) data.

Contact:
Alison Judd, Alex Jaggs, Anisah
Saib and Byron Davies
schools.infection.survey@ons.
gov.uk
+44 2080 390326

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1 . Main points

- As of 22 July 2022, 62.4% of pupils aged 12 to 15 years and 80.5% of pupils aged 16 to 17 years at the start of the 2021 to 2022 academic year had received at least one dose of a coronavirus (COVID-19) vaccine, while 45.3% and 69.8%, respectively, had received at least two doses.

Among those aged 12 to 15 years at the beginning of the 2021 to 2022 academic year in state-funded schools in England:

- Parental vaccination status had the biggest impact on vaccine uptake; pupils living in a household where at least one parent had received three or more doses of the COVID-19 vaccine were the most likely to have received a vaccine (81.6% received at least one dose) – this compares with 5.3% for pupils where no parent had been vaccinated.
- Vaccination uptake varied between ethnic groups – Chinese and Indian pupils were most likely to have received at least one dose (83.5% and 75.7%, respectively), while Gypsy or Roma and Black Caribbean pupils were least likely (15.8% and 16.5%, respectively); although this is in part related to different levels of deprivation, large differences in the odds of being vaccinated by ethnic group still exist after accounting for deprivation.
- Pupils eligible for free school meals (FSM) had much lower vaccination coverage than those not eligible (44.3% compared with 68.8% with at least one dose); schools with higher proportions of pupils eligible for FSM also had lower vaccination coverage.
- Pupils who speak English as an additional language (EAL) had lower vaccination coverage compared with those who speak English as a first language (47.2% compared with 65.4% with at least one dose).
- Pupils with an identified special educational need (SEN) had lower vaccination coverage compared with those with no identified needs (57.2% and 63.5%, respectively, with at least one dose).

2 . Coronavirus vaccination uptake by age and number of doses

As of 22 July 2022, 62.4% of pupils aged 12 to 15 years and 80.5% of pupils aged 16 to 17 years at the start of the academic year had received at least one dose of the coronavirus (COVID-19) vaccine (an increase on the figures seen in our [previous publication](#)). This is consistent with all pupils aged 16 to 17 years being offered the vaccine by 23 August 2021 and the rollout for all pupils aged 12 to 15 years starting later from 20 September 2021.

Among those aged 12 to 15 years, there was a large increase in second-dose uptake between the two time periods (45.3% at 22 July 2022 compared with 5.8% at 9 January 2022). This is to be expected as the second dose was only made available to this age group on 20 December 2021.

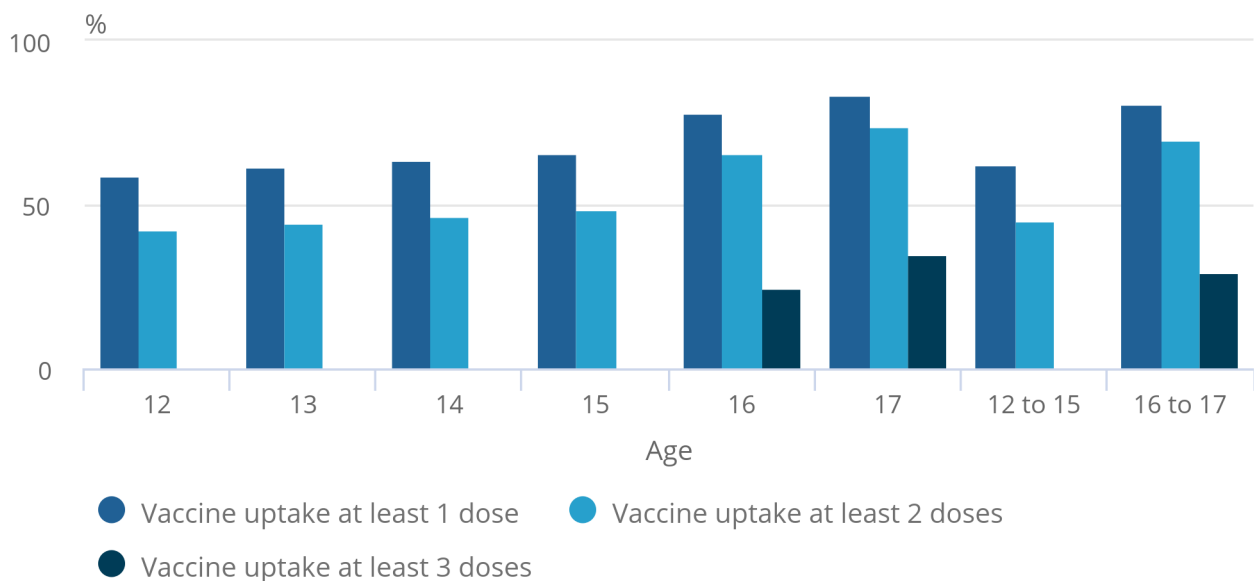
Uptake of the third dose was low with 29.5% of pupils aged 16 to 17 years receiving at least three doses.

Figure 1: Coronavirus vaccination uptake among those aged 12 to 17 years increases with age

Percentage of pupils aged 12 to 17 years in state-funded schools who have been vaccinated, by age and number of doses, England, up to 22 July 2022

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Percentage of pupils aged 12 to 17 years in state-funded schools who have been vaccinated, by age and number of doses, England, up to 22 July 2022



Source: Office for National Statistics (ONS) - Linked English Schools Census (Department for Education) and National Immunisation Management System (NIMS) dataset

Notes:

1. Age has been defined as the age as at the beginning of the 2021 to 2022 academic year (31 August 2021). See [Section 11: Glossary](#) for further details.

3 . Coronavirus vaccination by pupil characteristics (for pupils aged 12 to 15 years)

More detailed analysis by pupil characteristics has been restricted to those aged 12 to 15 years because the data are more complete for this age group (see [Section 12](#) for more details on coverage).

There were large variations in coronavirus (COVID-19) vaccination uptake by ethnicity for pupils aged 12 to 15 years, with a 68-percentage-point difference between the most and least vaccinated ethnic groups.

Pupils from ethnic groups with the highest first-dose uptake also had a higher proportion going on to receive a second dose.

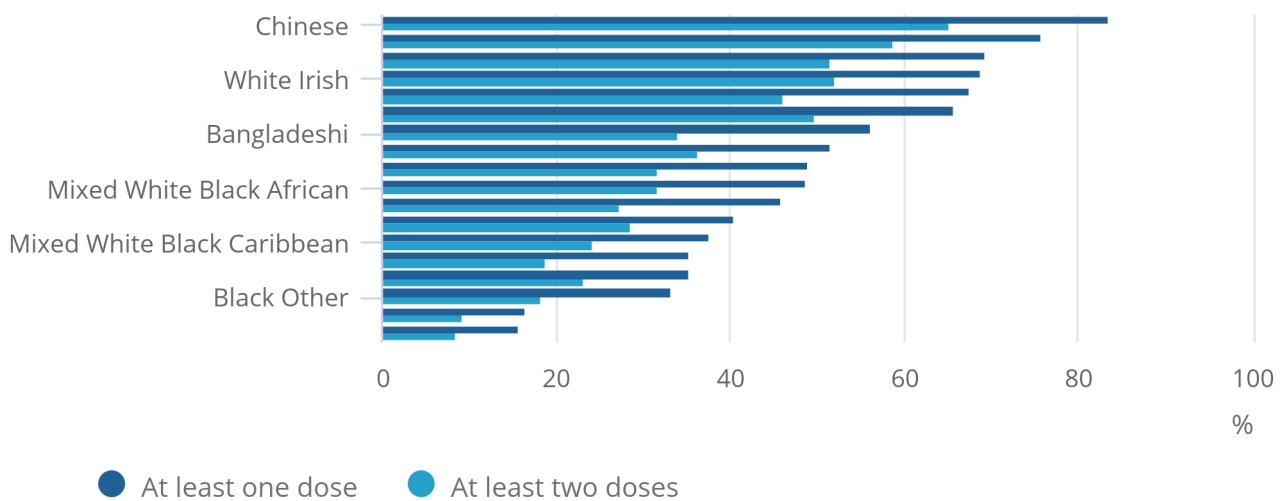
Figure 2 does not control for socio-economic factors associated with both ethnicity and vaccine uptake. However, the analysis in [Section 7](#) shows that large differences in vaccination uptake still exist after controlling for available deprivation measures.

Figure 2: There is a large variation in coronavirus vaccination uptake between different ethnic groups

Percentage of pupils aged 12 to 15 years in state-funded schools who have been vaccinated, by ethnicity, England, up to 22 July 2022

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Percentage of pupils aged 12 to 15 years in state-funded schools who have been vaccinated, by ethnicity, England, up to 22 July 2022



Source: Office for National Statistics (ONS) - Linked English Schools Census (Department for Education) and National Immunisation Management System (NIMS) dataset

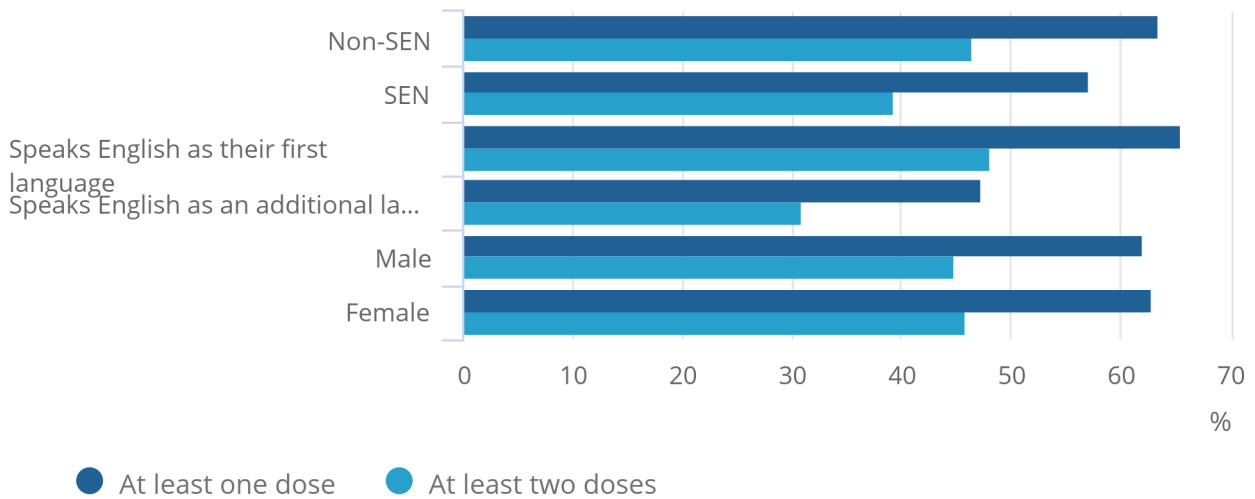
Figure 3 shows the percentage of pupils in state-funded schools who have been vaccinated by special educational needs status, sex, and English as an additional language status.

Figure 3: Pupils with special educational needs, and who speak English as an additional language, both had lower coronavirus vaccination uptake

Percentage of pupils in state-funded schools who have been vaccinated by special educational needs status, sex, and English as an additional language status, England, up to 22 July 2022

Figure 3: Pupils with special educational needs, and who speak English as an additional language, both had lower coronavirus vaccination uptake

Percentage of pupils in state-funded schools who have been vaccinated by special educational needs status, sex, and English as an additional language status, England, up to 22 July 2022



Source: Office for National Statistics (ONS) - Linked English Schools Census (Department for Education) and National Immunisation Management System (NIMS) dataset

4 . Coronavirus vaccination by deprivation measures (for pupils aged 12 to 15 years)

Vaccination uptake by Income Deprivation Affecting Children Index (IDACI)

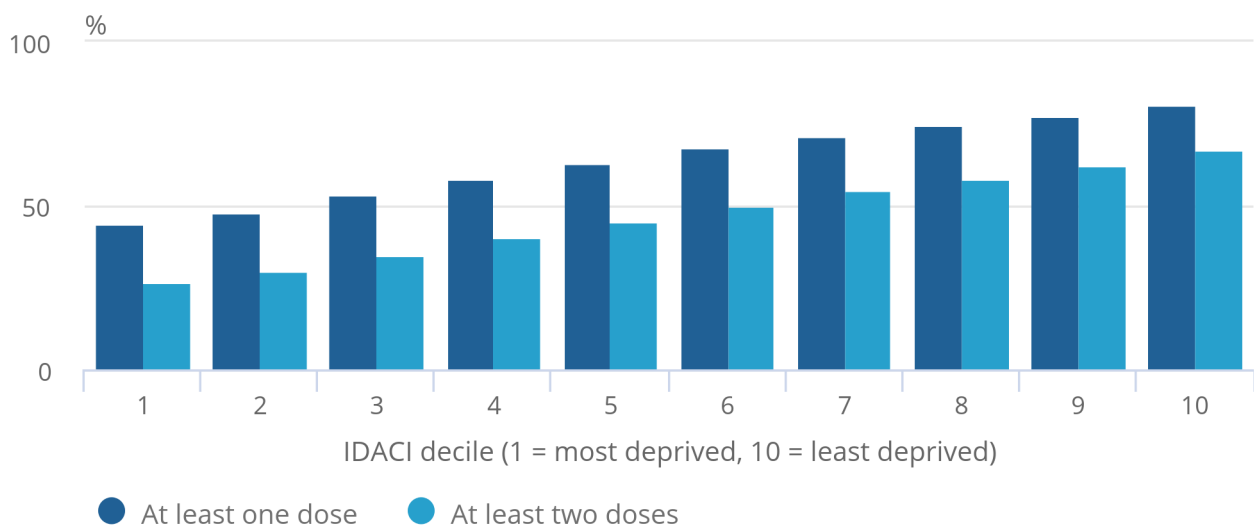
Pupils aged 12 to 15 years living in more deprived areas were less likely to have received a coronavirus (COVID-19) vaccination. Vaccination uptake increased as the IDACI deprivation level decreased. Figure 4 shows 44.8% in IDACI decile 1 (most deprived) have had at least one dose, compared with 80.7% in IDACI decile 10 (least deprived). [Section 11](#) has further information on how IDACI deciles are derived.

Figure 4: Pupils living in more deprived areas were less likely to have had a coronavirus vaccination

Percentage of pupils aged 12 to 15 years in state-funded schools who have been vaccinated, by Income Deprivation Affecting Children Index (IDACI) deprivation deciles, England, up to 22 July 2022

Figure 4: Pupils living in more deprived areas were less likely to have had a coronavirus vaccination

Percentage of pupils aged 12 to 15 years in state-funded schools who have been vaccinated, by Income Deprivation Affecting Children Index (IDACI) deprivation deciles, England, up to 22 July 2022



Source: Office for National Statistics (ONS) - Linked English Schools Census (Department for Education) and National Immunisation Management System (NIMS) dataset

Notes:

- 1 indicates the most deprived areas while 10 indicates the least deprived areas.

Vaccination uptake by free school meals

Pupils eligible for free school meals (FSM) had a lower COVID-19 vaccination uptake (44.3% for first dose and 25.6% for second dose) than those not eligible for FSM (68.8% for first dose and 52.3% for second dose).

5 . Coronavirus vaccination by parental vaccination status

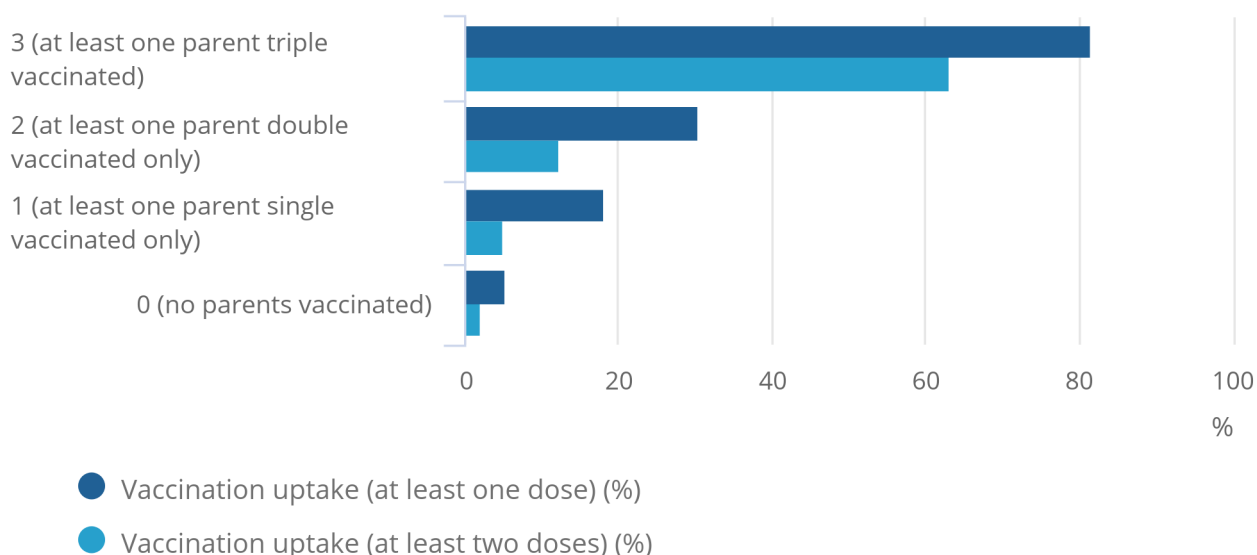
Pupils living in a household where at least one parent had received three or more doses of the coronavirus (COVID-19) vaccine were the most likely to have received a COVID-19 vaccine (81.6% received at least one dose and 63.0% at least two). This compares with 30.5% and 12.4%, respectively, for pupils where at least one parent had received two doses (but no parent had received three). Figure 5 shows that, for pupils living in a household where no parent had been vaccinated, 5.3% had received at least one dose (and 2.1% at least two doses).

Figure 5: Coronavirus vaccine uptake in pupils was higher among those with higher parental vaccination uptake

Percentage of pupils aged 12 to 15 years in state-funded schools who have been vaccinated, by parental vaccination status, England, up to 22 July 2022

Figure 5: Coronavirus vaccine uptake in pupils was higher among those with higher parental vaccination uptake

Percentage of pupils aged 12 to 15 years in state-funded schools who have been vaccinated, by parental vaccination status, England, up to 22 July 2022



Source: Office for National Statistics (ONS) – Linked English Schools Census (Department for Education) and National Immunisation Management System (NIMS) dataset, and Census 2021

Notes:

1. Pupils have been grouped using the number of vaccines received by the most vaccinated parent (or stepparent) living in the same household on Census Day (21 March 2021). See [Section 12](#).
2. The following pupils have been excluded from the chart: those who were not matched to a census record, pupils where no parents were matched to an NHS number, and those where no parent or stepparent was recorded as living in the same household. This constitutes 10.5% of those aged 12 to 15 years.

6 . Coronavirus vaccination by household composition

Pupils living in a household with an elderly member (aged 75 years and over) were slightly more likely to have received a coronavirus (COVID-19) vaccine compared with those living in a household with no-one aged 75 years and over, but the difference was small (67.1% compared with 64.3%, respectively, had received at least one dose).

7 . Logistic regression for factors affecting coronavirus vaccination uptake

Figure 6 compares the likelihood of having had a coronavirus (COVID-19) vaccine. For more information on the methodology, see [Section 12](#).

After controlling simultaneously for all variables, distinct trends by ethnicity and deprivation still remain. Black African and Caribbean pupils were less than half as likely to be vaccinated than White pupils, and there was a still a strong trend of lower likelihood of vaccination in pupils from more deprived areas.

Pupils for whom at least one parent had two doses of a COVID-19 vaccine were 87.4% less likely to be vaccinated than pupils for whom at least one parent had three doses. Pupils without any vaccinated parents were 98.3% less likely to be vaccinated than those with at least one triple-vaccinated parent.

Figure 6: Pupils without any vaccinated parents were less likely to be vaccinated than pupils with at least one parent who is triple vaccinated

Odds of pupils being vaccinated by demographic, socio-economic and geographic variables, England, up to 22 July 2022

Notes:

1. The odds ratio is a measure of how likely an outcome is given a particular characteristic. A value greater than one indicates that pupils in that group are more likely to have at least one dose of a coronavirus (COVID-19) vaccine than those in the relevant baseline category.
2. The baseline categories are as follows: age – 12, maximum parental vaccine – 3 doses, ethnicity – White British, Income Deprivation Affecting Children Index (IDACI) decile – 10, region – London.

Download the data

[.xlsx](#)

Figure 7: Pupils in more deprived areas are still less likely to have had a coronavirus vaccine after controlling for parental vaccination status

Odds of pupils being vaccinated by demographic, socio-economic and geographic variables, England, up to 22 July 2022

Notes:

1. The baseline categories are as follows: age – 12, maximum parental vaccine number – 3 or more doses, ethnicity – White British, Income Deprivation Affecting Children Index (IDACI) decile – 10, region – London.
2. The odds ratio is a measure of how likely an outcome is given a particular characteristic. A value greater than one indicates that people in that group are more likely to be vaccinated than those in the relevant baseline category.

[.xlsx](#)

8 . Coronavirus vaccination rates: school-level analysis by free school meal band

We have calculated the percentage of pupils aged 12 to 15 years vaccinated against coronavirus (COVID-19) in each school.

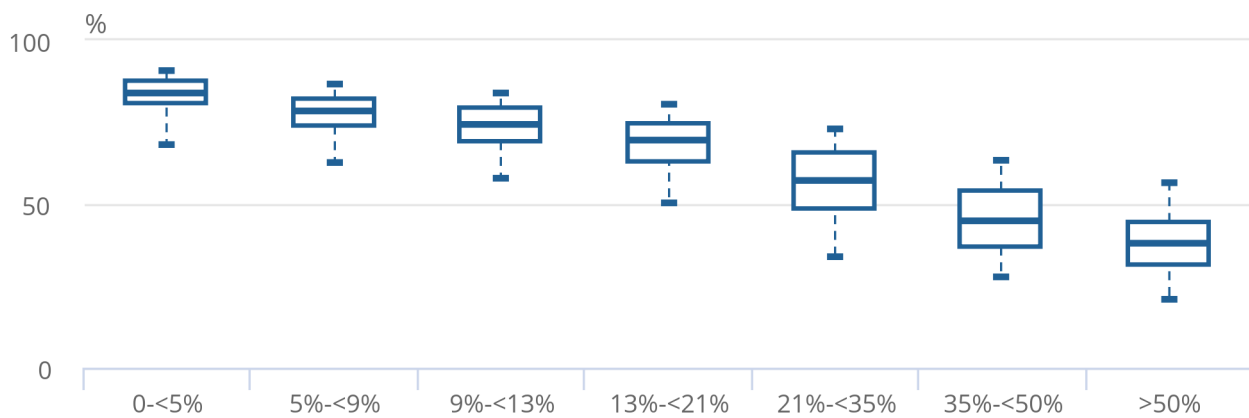
Schools with higher proportions of pupils eligible for free school meals (FSM) have lower COVID-19 vaccination rates (Figure 8). Schools with less than 5% of pupils accessing FSM had the largest median vaccination rate. The secondary school in the middle of the distribution in this band had 84.3% of its pupils vaccinated, compared with a median rate of 38.5% for schools with more than 50% of pupils accessing FSM.

Figure 8: Coronavirus vaccination uptake varies between schools in the same free school meal band

Percentage of pupils in state-funded secondary schools who have been vaccinated, grouped by the percentage of pupils accessing free school meals, England, up to 22 July 2022

Figure 8: Coronavirus vaccination uptake varies between schools in the same free school meal band

Percentage of pupils in state-funded secondary schools who have been vaccinated, grouped by the percentage of pupils accessing free school meals, England, up to 22 July 2022



Source: Office for National Statistics (ONS) - Linked English Schools Census (Department for Education) and National Immunisation Management System (NIMS) dataset

9 . Association between new coronavirus infections and first-dose vaccination coverage by school

A generalised estimating equation model was used to estimate the rate ratio of reporting a new coronavirus (COVID-19) infection per school, while controlling for first-dose coverage and other factors (for example, region and deprivation levels). For more information on the methodology, see [Section 12](#).

These are Experimental Statistics. The analysis uses data from NHS Test and Trace to identify coronavirus (COVID-19) infections. Test and Trace data rely on infections being diagnosed and recorded and are affected by variation in testing behaviour between different demographics and changes to testing guidance. We advise caution when using the data.

The results are presented as rate ratios, which give the rates of a new infection in schools that fall into a specified group compared with schools in the reference group (in this case, schools where 0 to 20% of pupils have obtained a first dose of the COVID-19 vaccine).

Figure 9 shows that in the autumn 2021 term, the rate of reported new coronavirus infections in schools with pupils' first-dose vaccination coverage greater than 60% was 39.1% (95% confidence interval: 33.5 to 44.7%) lower than schools where 0 to 20% of pupils had at least one vaccine dose.

The rate of new pupils' infections in schools with 20 to 40% and 40 to 60% first-dose uptake was 18.1% (95% confidence interval: 14.7 to 21.6%) and 36.8% (95% confidence interval: 32.8% to 40.7%) lower, respectively, compared with schools where 0 to 20% of pupils had at least one vaccine dose.

Figure 9: Schools with the highest proportion of first-dose vaccination uptake had the lowest rate of reported new coronavirus infections in the autumn 2021 term

Rate ratio of schools reporting new coronavirus infections, England, 30 August to 20 December 2021

Notes:

1. The rate ratio is a measure of the ratio of rates of an outcome given a particular characteristic. A value greater than one indicates that state-funded secondary schools in that group experienced higher rates of reported new COVID-19 infections than those in the relevant baseline category.

Download the data

[.xlsx](#)

Figure 10 shows the association between new infections and first-dose vaccination coverage during the spring 2022 term.

There was little difference in the rate of reported new COVID-19 infections between schools with over 20% first-dose vaccination coverage. Compared with other first-dose coverage groups, schools in the baseline category (less than 20% of pupils vaccinated) reported new COVID-19 infections at a lower rate; however, the number of schools in this category is low in the spring term.

Analysis on spring 2022 Test and Trace data should be treated with caution. Our [previous publication](#) provides more detail on the potential bias present in the Test and Trace data, particularly in the spring term once the guidance for secondary school pupils to test twice a week was dropped. This analysis showed that the frequency of testing appeared to be lower in pupils who lived in more deprived areas (where vaccine uptake is also lower). Although the model controls for different levels of deprivation between schools, there may still be unexplained differences that influence both vaccine uptake and COVID-19 testing that the model does not control for.

Figure 10: There was little difference in the rate of reported new coronavirus infections between schools with over 20% first-dose vaccination coverage in the spring 2022 term

Rate ratio of schools reporting new coronavirus infections, England, 3 January to 4 April 2022

Notes:

1. The rate ratio is a measure of the ratio of rates of an outcome given a particular characteristic. A value greater than one indicates that state-funded secondary schools in that group experienced higher rates of reported new COVID-19 infections than those in the relevant baseline category.

Download the data

[.xlsx](#)

10 . Coronavirus (COVID-19) vaccination uptake in school pupils, England

[Coronavirus \(COVID-19\) vaccination uptake in school pupils, England](#)

Dataset | Released 23 September 2022

Figures on coronavirus (COVID-19) vaccine uptake in school pupils aged 12 to 17 years attending state-funded secondary, sixth form and special schools, broken down by demographic and geographic characteristics, using a linked English Schools Census and National Immunisation Management System dataset. Experimental Statistics.

11 . Glossary

Age

In this publication, age has been defined as the age as at the beginning of the 2021 to 2022 academic year (31 August 2021) to keep pupils in the same year group together. As the data have been extracted near the end of the academic year, the majority of those in each age group will be one calendar year older.

Confidence interval

A confidence interval gives an indication of the degree of uncertainty of an estimate, showing the precision of a sample estimate. The 95% confidence intervals are calculated so that if we repeated the study many times, 95% of the time the true unknown value would lie between the lower and upper confidence limits. A wider interval indicates more uncertainty in the estimate. Overlapping confidence intervals indicate that there may not be a true difference between two estimates.

For more information, see our methodology page on [statistical uncertainty](#).

English as an additional language (EAL)

The Department for Education's [English proficiency of pupils with English as an additional language \(PDF, 720KB\)](#) report defines EAL as "if a pupil is exposed to a language at home that is known or believed to be other than English. It is not a measure of English language proficiency or a good proxy for recent immigration". In this publication, we use information recorded about whether a pupil has EAL as recorded by schools as part of the English Schools Census.

Free school meals (FSM)

FSM is a statutory benefit available to school-aged children from families who meet the qualifying criteria (predominantly based around income), which is [published by the Department for Education](#). In this publication, we define FSM as pupils having been eligible for FSM in the last six years, using information recorded by schools as part of the English Schools Census.

Special educational needs (SEN)

The Department for Education and Department for Health and Social Care's [Special educational needs and disability code of practice: 0 to 25 years \(PDF, 3.23MB\)](#) guidance defines a child as having SEN if "they have a learning difficulty or disability which calls for special educational provision to be made for him or her. A child of compulsory school age or a young person has a learning difficulty or disability if he or she: has a significantly greater difficulty in learning than the majority of others of the same age, or has a disability which prevents or hinders him or her from making use of facilities of a kind generally provided for others of the same age in mainstream schools or mainstream post-16 institutions."

In this publication, we use information recorded about whether a pupil has SEN recorded by schools as part of the English Schools Census. Pupils attending special schools are included in all analysis in this article except the school-level analysis ([Section 7](#)), which focuses on secondary schools.

Odds ratio

An odds ratio indicates the likelihood of pupils having received at least one dose of a coronavirus (COVID-19) vaccine given a particular characteristic or variable. When a characteristic or variable has an odds ratio of one, this means there is neither an increase nor a decrease in the likelihood of having received a vaccination compared with the baseline category. An odds ratio greater than one indicates an increased likelihood of having received a COVID-19 vaccination compared with the baseline category. An odds ratio less than one indicates a decreased likelihood of having received a COVID-19 vaccination compared with the baseline category.

Income Deprivation Affecting Children Index (IDACI)

The IDACI, used for our deprivation figures, calculates deprivation deciles based on the proportion of children aged 0 to 15 years living in deprived-income households, that is, households not working or working on low incomes eligible for means-tested benefits. The index ranks the 32,844 small areas in England from most deprived to least deprived and divides them into 10 equal groups. For example, small area X is ranked 5,000 out of 32,844 small areas in England, where 1 is the most deprived. This means that small area X is among the 20% most deprived small areas in the country and therefore would be in IDACI decile 2. The Department for Levelling Up, Housing and Communities (DLUHC), formerly the Ministry for Housing, Communities and Local Government, has published [further information](#).

12 . Data sources and quality

Measuring the data

The English Schools Census (ESC) is a mandatory annual return to the Department for Education by state-funded schools and local authorities. All pupils attending state-funded primary schools, secondary schools (including sixth forms attached to schools), nurseries and special schools in England are recorded.

The ESC covers pupil and school characteristics for a set date. Data in this article have been updated since the previous publication with data for the 2021 to 2022 academic year, which was collected on Thursday 15 February 2022.

For further information on how the ESC data were linked to data from the National Immunisation Management System, please see our [previous publication](#).

As this dataset covers pupils in state-funded schools only and age has been taken as at the beginning of the 2021 to 2022 academic year, the data will differ from [the administrative data on vaccinations published weekly by NHS England](#). The NHS weekly data cover all vaccinations given to individuals who have an NHS number and are currently alive in the resident population.

For [Section 5](#) and [Section 6](#), Census 2021 data were used. Each pupil in the ESC was linked to their census record. As the census contains a unique household ID, those living in the same household on Census Day (21 March 2021) can be identified. To produce Figure 5, those listed as parents or stepparents were identified, and their vaccination status was attached using an existing link between Census ID and NHS number. In households with more than one parent, the parent with the most vaccinations was used to create the groupings displayed in the chart.

Logistic regression model

The characteristics associated with coronavirus (COVID-19) vaccination uptake are all interlinked. We used logistic regression to estimate the odds ratios of being vaccinated associated with each demographic, socio-economic and geographical factor.

The following factors were entered simultaneously into a model to check the association between each factor and the likelihood of vaccination, once the difference because of all other variables in the model has been accounted for:

- age
- sex
- maximum parental vaccination status (the highest number of doses any parent or stepparent linked to a pupil has had)
- living with elderly household member
- ethnicity
- special educational needs status
- English as an additional language status
- free school meals (FSM) status
- Income Deprivation Affecting Children Index decile
- region
- urban or rural

This model was initially fitted without parental vaccination status or living with an elderly person. When adding parental vaccination status to the model, the impact of the important variables associated with vaccination uptake (ethnicity and deprivation) reduces in size. This is to be expected as these variables are also correlated with parental vaccine uptake. For example, 19% of pupils eligible for FSM lived in a household where all parents were unvaccinated compared with 6% of non-FSM pupils.

Generalised estimating equation model

A generalised estimating equation model was used to estimate the rate ratios of new infections among those aged 12 to 15 years per school in the autumn 2021 term and spring 2022 term to investigate the association between vaccine coverage in a school and COVID-19 infection rates.

This analysis uses data from 30 August 2021 to 4 April 2022, and the factors entered into the model were:

- the week
- the percentage of pupils who have received a first dose of a COVID-19 vaccination per school – grouped into categories
- the overall school population for all students aged 12 to 15 years
- region of England
- urban or rural classification
- percentage of pupils receiving FSM
- percentage of pupils who are White British
- percentage of pupils who speak English as their first language

To compensate for the difference in the number of pupils per school, as larger schools may be expected to have more COVID-19 infections than smaller schools, the log of school pupils at risk of an infection (those who have not had an infection in the past 90 days during Omicron and the past 120 days during the Delta period) was used as an offset, to allow us to model rates rather than counts.

Strengths

One strength of the dataset is its size. The English Schools Census (ESC) contains pupil-level data collected from all state-funded schools in England. This represents over 3.2 million pupils aged 12 to 17 years and allows for potential analysis of smaller under-representative groups.

The data contain a rich source of background characteristics, which allow us to analyse how rates of COVID-19 vaccination differ by socio-demographic group and examine the extent to which these differences are driven by other factors.

Making use of already existing administrative data sources avoids the need to set up bespoke surveys, which can be costly and suffer from response bias. The addition of the Census 2021 data provides more detail on the pupils' households.

Limitations

Coverage is lower among those who have finished Year 11 (those aged 16 or 17 years as of 31 August 2021). Those studying in Years 12 or 13 in sixth forms attached to schools will be included in the ESC, but those studying in further education colleges or sixth form colleges will not be included. Some data items are only collected for those in Year 11 and below (for example, FSM status), meaning the more detailed breakdowns in this article are restricted to those aged 12 to 15 years.

As we are using existing administrative data sources, we cannot explore the reasons for lower vaccination rates among different groups.

Using Test and Trace data to monitor trends in COVID-19 infection relies on infections being diagnosed. Our [previous publication](#) provides more detail on the sources of bias that may exist in this data.

13 . Acknowledgments

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UK Health
Security
Agency

This analysis was produced by the Office for National Statistics (ONS) with support from our School Infection Survey research partners at the London School of Hygiene and Tropical Medicine and UK Health Security Agency.

14 . Related links

[COVID-19 Schools Infections Survey](#)

Dataset | Released 27 October 2021

Initial estimates of staff and pupils testing positive for coronavirus (COVID-19) across a sample of schools within selected local authority areas in England.

[Coronavirus and vaccinations rates in people aged 50 years and over by socio-demographic characteristic, England: 8 December 2020 to 12 December 2021](#)

Bulletin | Released 24 December 2021

First, second, third dose and booster COVID-19 vaccination rates among people aged 50 years and older who live in England, including estimates by socio-demographic characteristic.

[Characteristics associated with the risk of death involving coronavirus \(COVID-19\) among people receiving a booster vaccination, England: January to March 2022](#)

Bulletin | Released 8 September 2022

An analysis of the socio-demographic characteristics associated with the risk of coronavirus (COVID-19) death in boosted individuals in England.

[Coronavirus \(COVID-19\) Infection Survey, antibody data, UK: 24 August 2022](#)

Bulletin | Released 24 August 2022

Antibody data by UK country and age in England from the Coronavirus (COVID-19) Infection Survey.

[Coronavirus \(COVID-19\) latest insights](#)

Interactive tool | Updated as and when data become available

A live roundup of the latest data and trends about the coronavirus (COVID-19) pandemic from the ONS and other sources.

15 . Cite this article

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