Childhood Vaccination Coverage Statistics

Quality Statement

England, 2018-19

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This is a National Statistics Publication

The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics Registration Service Act 2007 and signifying compliance with the Code of Practice for Statistics.

Designation can be broadly interpreted to mean that the statistics:

• meet identified user needs;
• are well explained and readily accessible;
• are produced according to sound methods; and
• are managed impartially and objectively in the public interest.

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.

Find out more about the Code of Practice for Statistics at: https://www.statisticsauthority.gov.uk/code-of-practice/

These statistics are used to inform the development and evaluation of government policy on immunisation and to assess the delivery of different immunisations in the national programme. They also help inform vaccine policy decisions, such as national and regional catch-up programmes for specific immunisations. At a local, regional and national level the statistics are used to monitor performance.

We would like to acknowledge the key contributions made by members of the Cover of vaccination evaluated rapidly (COVER) team at Public Health England (PHE), who have co-authored this report. The COVER team provide a significant contribution to the collection and interpretation of data, as well as acting as subject matter experts informing the production of this report.
Contents
(Click on text to go to the related section of the report)

Introduction 4
Data sources 5
Methods used to compile statistics 7
Accuracy and reliability 11
Timeliness and punctuality 12
Accessibility and clarity 13
Coherence and comparability 14
Performance cost and respondent burden 20
Confidentiality, transparency and security 21
Introduction

This document is designed to accompany the main publication report which can be found at the following link:

http://digital.nhs.uk/pubs/childvaccstats1819

The publication reports childhood vaccination statistics for England in 2018-19, and relates to routine and selective vaccinations offered to all children up to the age of 5 years.

The statistics show the number of children vaccinated as a proportion of the eligible population (coverage), and are derived from information collected by Public Health England (PHE) through the Cover of vaccination evaluated rapidly (COVER) and Seasonal Influenza programmes.

The statistics from this publication also contribute to indicators for the government’s Public Health Outcomes Framework (PHOF)\(^1\).


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Data sources (1)

Overview

Summary

• Most of the vaccination data used in this report are collected annually from Child Health Record Departments (CHRDs) and NHS England local teams.

• Data are extracted from Child Health Information Systems (CHISs), computerised systems storing clinical records supporting health promotion and prevention activities for children, including immunisation. These hubs are increasingly consolidating over time as larger CHIS hubs, leading to a decrease in the number of CHISs over time.

• Data on seasonal flu are collected from GP practices.

• Data are quality assured at the time of collection by the collecting agency (PHE for COVER and flu data).

• Further data validation and quality assurance of COVER data is carried out by NHS Digital prior to publication. (See Appendix D for more detailed information on validation).

1) Cover of Vaccination Evaluated Rapidly (COVER)

• Information on childhood immunisation coverage at ages one, two and five years, collected through the UK COVER collection by PHE.

• Aggregated data are collected from CHISs. In England, COVER data for 2018-19 have been collected for Upper Tier Local Authorities (LAs) using the COVER data collection form, available on the publication page: http://digital.nhs.uk/pubs/childvaccstats1819

• Further information on the COVER collection can be found in NHS Digital’s List of Administrative Sources: https://digital.nhs.uk/data-and-information/find-data-and-publications/statement-of-administrative-sources/list-of-administrative-sources

PHE also undertake quarterly collections of provisional COVER data, which provide early indications of vaccine coverage trends and are an important means of identifying any data quality issues prior to the annual collection: https://www.gov.uk/government/collections/vaccine-uptake#cover-of-vaccination-evaluated-rapidly-programme
Data sources (2)

2) Seasonal Flu

- Information on children aged 2 to 9 immunised against seasonal flu are collected by PHE.
- Data is collected from GP practices through PHE’s ImmForm® system.
- Patient age is identified by their age on the 31st August of the vaccinating year e.g. a patient aged 2 on the 31st August 2018 will be included in the aged 2 cohort.
- Data for ages 2 and 3 years is included in this report.
- Data collections are quality assured at the time of collection by the collecting agency.

Further information on PHE’s seasonal influenza collection can be found at the following links:

https://www.gov.uk/government/collections/vaccine-uptake#seasonal-flu-vaccine-uptake:-figures


Methods used to compile the statistics (1)

NHS Digital validates and analyses the COVER data using spreadsheets (Microsoft Excel) and automated processes developed in SAS\(^3\).

All figures in the report are presented as simple counts or percentages (rounded to one decimal place). Coverage (see ‘Definitions’ section, below) is reported for the following routine childhood vaccinations:

- Diphtheria, tetanus, pertussis, polio and Haemophilus influenzae type b (DTaP/IPV/Hib/DTaP/IPV/Hib), known as the 5-in1. Since August 2017, 5-in-1 replaced by the 6-in-1 which additionally protects against HepB (DTaP/IPV/Hib/DTaP/IPV/Hib/HepB).
- Diphtheria, tetanus, pertussis, polio (DTaP/IPV)
- Pneumococcal conjugate vaccine (PCV)
- *Haemophilus influenzae* type b and Meningococcal group C (Hib/MenC)
- Measles/mumps/rubella (MMR)
- Meningococcal group B (MenB)
- Rotavirus

Vaccination data for selective neonatal hepatitis B (HepB) and Bacillus Calmette–Guérin (BCG) are reported by LA responsible population.

Some LAs were unable to supply vaccination data for one or both of these selective neonatal programmes.

HepB data collection is discussed in the main report, along with BCG Vaccination, in the ‘Selective Neonatal Vaccinations Programmes’ chapter. It would be inadvisable to draw conclusions from either of these sets of data at national or regional level.

Coverage for the seasonal flu vaccination offered to children aged 2 and 3 years is also reported. The data reported in this report is obtained from the published seasonal influenza data published by PHE.

https://www.gov.uk/government/collections/vaccine-uptake#seasonal-flu-vaccine-uptake:-figures

3. Statistical Analysis System (SAS) is an integrated system of software products which enables functions such as data management, statistical analysis and quality improvement.

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Methods used to compile the statistics (2)

Definitions

**Immunised:** Where a course consists of more than one dose of vaccine, administered at set intervals, immunised means having had all doses required for a full course. However, for some vaccines (i.e. Hib/MenC and PCV) the number of doses required to complete a course is age dependent. For example, a child who was not given the recommended two doses of PCV before 12 months but did receive a PCV booster dose after the first birthday will still be considered appropriately vaccinated for their age.

**Eligible population:** Different eligible populations are used for calculating coverage for different vaccinations. For the routine childhood vaccinations in this report, the eligible population is defined as the total number of children in the LA responsible population, reaching their nth birthday in the collection year (see next page for more information on the LA responsible population). Coverage is calculated for three separate cohorts (children reaching their first, second and fifth birthdays in the collection year) and so the eligible population differs for each cohort.

**Coverage:** Coverage is defined as the number of persons immunised as a proportion of the eligible population. The formula for the calculation of coverage is:

\[
\frac{\text{Total number of eligible persons immunised}}{\text{Total number of persons in the eligible population}} \times 100
\]

Specific and detailed formulae and links for all the coverage statistics presented in this report are provided in Appendix B of the publication. This includes definitions of the numbers of eligible persons immunised and specifies the number of doses of different vaccines that an individual is required to have by a particular age in order to be considered immunised.

4. Prior to the 2009-10 publication, this report used the term ‘uptake’ to describe the percentage of the eligible population who are vaccinated. It was decided to replace the term ‘uptake’ with ‘coverage’ in 2009-10 as this is more widely used in reporting the proportion of a target population known to have received the appropriate vaccine(s).
Methods used to compile the statistics (3)

Definitions

LA responsible population: 2018-19 is the third year that all data has been collected using LA responsible population. Coverage figures are supplied for patients registered with GPs based in that LA and for unregistered patients who were resident in that LA. The LA responsible population is therefore different from the estimated resident population figures produced by the Office of National Statistics (ONS) for each LA. For the COVER collection, the LA responsible population is usually derived from the population registers held on CHISs.

In previous years, for LAs that shared the same geographical boundaries as the old Primary Care Trusts (PCTs), i.e. were coterminous, the LA responsible population was estimated to be the same as the old PCT responsible population. Where LA and PCT boundaries were not coterminous, data suppliers were asked to supply figures for the LA responsible population if these were available.

Where data suppliers were not able to provide data for the LA responsible population, NHS Digital estimated LA figures by apportioning PCT data on the basis of population. Details of the apportioning methodology can be found in the quality statement of the 2015-16 report. All data received from 2016-17 onwards is supplied at LA responsible level, negating the need to use estimation.

Please note that the local, regional and national statistics reported in publications prior to 2016-17 were based on an LA dataset that included some estimated data (from supplied PCT data), and estimated figures were clearly marked with an “e” in the data tables which accompany those publications.

This year most of the Public Health Outcomes Framework (PHOF) 3.03 indicators will be sourced from the National Statistics reported in this publication. Further information is available via the link below:

http://www.phoutcomes.info/public-health-outcomes-framework
Methods used to compile the statistics (4)

Definitions

Mapping LA COVER data to create Commissioning Region and Local Team data

COVER statistics for NHS England Commissioning Regions and Local Teams have been produced by aggregating LA data using the mapping list used by the PHE COVER team. This can be found on the ‘LA to LT lookups’ worksheet on the accompanying Excel data tables file.

Flu data has been calculated directly from GP practice level data, and mapped directly to Local Team. The methodology is described in the Flu annual publication:


Due to the different data sources, the methods used in aggregating Local Team data are different between the COVER and Flu data.
Accuracy and reliability

These are established collections based on total populations rather than a sample.

COVER data

For the COVER collection, submissions were made by data suppliers (CHISSs) on behalf of all 152 Upper Tier Local Authorities (LA). In 2018-19, Hackney’s LA submissions included data for City of London LA, so 151 submissions were received, representing data from all 152 Local Authorities.

Some caution should be exercised when comparing coverage figures over time due to data quality issues reported by some data suppliers in recent years. Apparent trends could reflect changes in the quality of data reported as well as real changes in vaccination coverage. While this issue will be more apparent at a local level, it will also have an impact on the national figures.

Similarly some caution should also be exercised when comparing coverage between different areas where data quality issues have been reported.

Any missing data are clearly marked within the data tables.

Data quality issues are discussed in more detail in Appendix D of the publication on Data collection, validation and quality.

Flu data

For seasonal influenza vaccinations in children aged 2 and 3, coverage data are based on submissions made for GP practices. The data represents 96.2% of GP practices in England in 2018-19.

The LA and Local Team Flu data presented in this report are provided already calculated by the PHE Flu team. Government Office Region level data has been calculated by NHS Digital from the LA level data.


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Timeliness and punctuality

Data on immunisations are made available as soon as possible after they have been compiled and validated (usually in the September following the end of the financial year to which the data relate).

The NHS Digital publication series can be found here:

Accessibility and clarity

This publication includes a PDF report, Excel data tables, CSV files, and an interactive dashboard.

The underlying data is published in the Data Tables, which are available as Excel files and CSV files, on NHS Digital’s childhood vaccination publication web pages:

http://digital.nhs.uk/pubs/childvaccstats1819

Further analysis may be available on request, subject to resource limits and compliance with disclosure control requirements. Note that the data held by NHS Digital cannot be disaggregated below LA level.

An interactive dashboard is provided as part of the data resources for this publication. The dashboard has been developed in software called Microsoft Power BI and is designed to make data more meaningful by allowing local, regional and national comparisons over time.

The dashboard can be accessed directly here:


Versions of this statistical publication are available on both NHS Digital’s and The National Archives websites dating back to 1997-98.

The bulletin was originally published by the Department of Health and Social Care (DHSC). Responsibility for the publication transferred to the Health and Social Care Information Centre (HSCIC) after its formation in 2005. The HSCIC is now known as NHS Digital.

Prior to 2004/05 this bulletin was published by the Department of Health. These editions can be found at:
Coherence and comparability

Changes in the UK Immunisation Programme

A number of changes to the immunisation programme have been made since 2003 and these are detailed in full in Appendix C of the publication. Changes in the schedule need to be considered when interpreting trend data. Importantly, when a new vaccine is first introduced, implementation and recording/reporting issues may affect completeness. The same issue may also occur when the number of doses required or the timing of doses is changed.

In 2013-14, the introduction of influenza vaccination for healthy children began with vaccines offered to all children aged two and three years of age.

Coverage of children aged 2 and 3 is included in this report. Coverage for the school-delivered programme, targeting children aged 4 and over, is reported elsewhere. The seasonal flu vaccine data collection window changed in 2018-19, it is now 1st September to 28th February. Prior to this the collection window was 1st September to 31st January.

https://www.gov.uk/government/collections/vaccine-uptake#seasonal-flu-vaccine-uptake:-figures

From July 2013 an infant rotavirus vaccination was introduced and a reduction from two to one dose of MenC to be offered in the first year of life. MenC was subsequently removed from the schedule in 2016. Protection is still offered against MenC through the Hib/MenC vaccine administered at 12-13 months.

A more recent change to the immunisation schedule in 2015 was the introduction of infant MenB vaccine.

Coverage data for another recent change, the replacement in 2015 of the adolescent MenC vaccine with the MenACWY vaccine, are not evaluated in this report but can be accessed at the link below:

https://www.gov.uk/government/collections/vaccine-uptake#menacwy-vaccine-uptake

A copy of the most recent formal immunisation schedule (Autumn 2019) is available at the following link below:

Coherence and comparability

Rotavirus vaccine

A vaccine to protect babies against rotavirus was introduced into the childhood immunisation schedule from July 2013. The rotavirus vaccine is offered routinely to all babies at the age of 8 weeks and again at 12 weeks when they attend for their first and second routine childhood immunisations. Opportunities for children to catch up missed doses are limited as rotavirus vaccine cannot be given beyond six months of age.

The quality and completeness for the rotavirus data have improved to allow them to be included under the National Statistics designation within this publication since 2016-17.

Meningococcal group B (MenB) vaccine

The MenB vaccination was introduced from 1 September 2015 for infants due to receive their primary immunisations starting at eight weeks of age on or after 1 September 2015 (i.e. those born on or after 1 July 2015). The vaccine is offered alongside other routine immunisations at eight and sixteen weeks of age, with a booster dose at 12-13 months. A limited one-off catch-up programme was also delivered targeting infants born in May (one dose only) and June 2015 (two doses).

This report contains data for MenB primary (12 months) and MenB booster (24 months) vaccinations. MenB booster data is available as National Statistics for the first time in 2018-19.
Coherence and comparability

DTaP-IPV-Hib-HepB vaccine (6-in-1)

The most recent change to the primary immunisation schedule is the replacement of the pentavalent vaccine (DTaP/IPV/Hib) with a hexavalent vaccine which includes hepatitis B (DTaP/IPV/Hib/HepB) for all babies born on or after 1 August 2017. This universal hepatitis B immunisation programme is implemented in addition to the selective programme targeting high risk babies. Links to the announcement of the hexavalent vaccine and the formal immunisation schedules are available on the following links:


In the 2018-19 publication, for the 12 month age cohort, children received either the 5-in-1 or the 6-in-1 vaccine, depending on when in the year they were vaccinated. The COVER programme has recorded children who were eligible for either the 5-in-1 or the 6-in-1 vaccine under a single group heading. This vaccine has been reported as DTaP-IPV-Hib (5-in-1), as not every child reaching 12 months of age during 2018-19 will have been eligible for the 6-in-1 vaccine, but all will have been eligible for the components in the 5-in-1.

In future publications, the hexavalent vaccine will be reported when all children in the reported age cohort have been eligible for the vaccine. Each age band will be eligible in the years listed below:

- 12 months: 2019-20
- 24 months: 2020-21
- 5 years: 2023-24
Changes to the COVER data collection

Changes to the COVER collection form were made by PHE from April 2013 to enable collection by Local Authority. The data collection form has also been subject to amendments to reflect changes to the routine schedule when vaccines have been added, amended or withdrawn.

Statistics on the number of persons receiving BCG vaccinations were previously published in this bulletin until the KC50 data collection was suspended following a review in 2013. Neonatal BCG coverage data are now collected as part of the COVER programme in accordance with an updated COVER Information Standards Notice (ISN) published in November 2014. Data on BCG vaccination coverage are published, along with HepB data, in the ‘Selective neonatal vaccination programmes’ chapter of the main report. Subsequent updates to the ISN were made in November 2017 and April 2019.

Time Series

The report shows trends in vaccine coverage and where possible seeks to explain these. The main Excel Data Tables contain historical data, which enable examination of trends in vaccination coverage.

Throughout the main report, coverage statistics for 2018-19 are compared with previous years and where applicable time series data are shown.

The time series for MMR vaccine coverage evaluated at two years are extended back to 1988, the year the MMR vaccine was first introduced and when current definitions for measuring coverage came into effect.

Completed DTaP/IPV/Hib vaccine primary course coverage at one year are presented back to 2006-07. Historical interpretation of time series data in the main report section has been assisted by experts in PHE.

**Coherence and comparability**

**Local and regional comparisons**

The statistics are presented at a national and regional level and by Upper Tier Local Authority (LA). Due to the different sources and methods by which the LA data have been derived (see definition of LA responsible population under Definitions in section 'Methods Used to Compile the Statistics'), some caution should be exercised when comparing coverage figures over time.

Statistics are also presented by NHS England Commissioning Region and Local Team in the COVER data tables (tables 8d, 9d and 10d). These are derived from LA data supplied by PHE and have been calculated using the most appropriate Local Team geography - see 'Notes and definitions' and 'LA to LT Lookups' tabs within the data tables for more information.

Flu data reported at Local Team level (please see data tables 12c and 13c) is aggregated directly from GP Practice level data collected via ImmForm.

**Comparison with other UK countries**

The Childhood Vaccination Coverage Statistics, England publication series has included additional annual coverage statistics for other countries in the UK since 2009-10. This report includes the following coverage statistics for all UK countries:

- **At 12 months:** DTaP/IPV/Hib, PCV, Rotavirus, MenB
- **At 24 months:** DTaP/IPV/Hib, Hib/MenC, PCV booster, MMR1, MenB booster
- **At 5 years:** DTaP/IPV/Hib, DTaP/IPV, MMR1, MMR2, Hib/MenC

Vaccination data for Northern Ireland, Scotland and Wales are also available through the following links:

- **Northern Ireland:** [http://www.publichealth.hscni.net/directorate-public-health/health-protection/vaccination-coverage](http://www.publichealth.hscni.net/directorate-public-health/health-protection/vaccination-coverage)
- **Scotland:** [http://www.isdscotland.org/Health-Topics/Child-Health/Publications/index.asp](http://www.isdscotland.org/Health-Topics/Child-Health/Publications/index.asp)

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11. From 1st April 2015 Local Team data has been reported replacing Area Team.

12. MMR1 is used to indicate at least one dose of MMR has been received. MMR2 indicates that two doses of MMR have been received (anytime from 12 months up to the child’s 5th birthday).
Coherence and comparability

Comparisons with countries outside the UK

Outside the UK, national vaccination policies differ and countries use different methods to calculate vaccine coverage, therefore direct comparison with countries outside the UK is not always appropriate. However, the World Health Organisation (WHO) and UNICEF attempt to determine the most accurate and up-to-date estimates of immunisation coverage for different countries through their joint annual reporting form submission from national experts. These estimates of national immunisation coverage are reported on the WHO website and available through the following link:

http://www.who.int/immunization/monitoring_surveillance/en/

Information on research undertaken to examine comparability of vaccination coverage amongst European countries can be found on the VENICE Project website:

http://venice.cineca.org/reports.html

and

http://venice.cineca.org/publications.html
Performance cost and respondent burden

The data used in the publication are aggregated LA level data gathered by PHE as part of their management of the immunisation programme. These are the only sources of the data required for the report.

In November 2017, the revised COVER ISN\textsuperscript{13} was published following approval from the Data Coordination Board (DCB).

All data collections used in this publication are subject to the Burden Advice and Assessment Service (BAAS) procedure (previously known as Review of Central Returns (ROCR)) and licensed by BAAS. The BAAS is now known as the Challenging Burden Service (CBS).

This is to ensure that data collections do not duplicate other collections, minimise the cost to all parties and have a specific use for the data collected.

Information on CBS can be found at:

https://digital.nhs.uk/services/the-challenging-burden-service

\textsuperscript{13} http://www.content.digital.nhs.uk/isce/publication/dcb0089

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Confidentiality, transparency and security

The standard NHS security and confidentiality policies have been applied in the production of these statistics\(^{14}\).

The data is received in aggregate form from the COVER team and the Flu team at PHE via the secure NHSmail system.

An annual risk assessment is undertaken prior to publication which addresses any potential issues around disclosure in accordance with the Anonymisation Standard for Publishing Health and Social Care Data.

Disclosure controls have been applied to the neonatal hepatitis B data in tables 11b and 11c, in accordance with the standard and are as follows:

- Suppress all data (number of children eligible, number vaccinated and coverage) where the number eligible is 1 or 2 (cells with 2 are suppressed as otherwise it would be clear all suppressed cells have a value of 1).

- Where the number of eligible children is greater than 0 and the number of children vaccinated is 0 or 1 suppress the number of children vaccinated and the coverage (cells with 1 need to be suppressed as otherwise it would be clear that all suppressed cells have a value of 0).

The eligible populations in three LAs are very small and in these instances their data have been combined and reported under other LAs.

Data for the Isles of Scilly are reported under Cornwall, City of London data are reported under Hackney and Rutland is reported under Leicestershire.

Statistics in this report are therefore presented by 149 Upper Tier Local Authorities for all routine vaccinations.

14. Available from: [https://digital.nhs.uk/binaries/content/assets/legacy/pdf/b/o/1523202010spec.pdf](https://digital.nhs.uk/binaries/content/assets/legacy/pdf/b/o/1523202010spec.pdf)