This is a National Statistics Publication

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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.
Appendix A – Publication context

Immunity is the ability of the human body to protect itself from infectious disease.

Herd immunity is a term used to describe: ‘…a form of immunity that occurs when the vaccination of a significant proportion of a population (or herd) provides a measure of protection for individuals who have not developed immunity’

Herd immunity only applies to diseases that are transmissible from person to person. It does not apply to diseases such as tetanus which is not passed from person to person and where a vaccine protects only the vaccinated person from disease.

The complete vaccination schedule is available here: https://www.nhs.uk/conditions/vaccinations/nhs-vaccinations-and-when-to-have-them/

All vaccine coverage data reported by PHE, including vaccines not covered by this report, are available here:

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

Influenza immunisations for eligible GP patient groups

The PHE influenza surveillance team collate and report on seasonal influenza vaccine uptake for children aged two and three years on 31 August during the reporting year, reported by GP practices.

All figures presented are for flu vaccinations administered from the 1 September to the 28 February, inclusive of both dates.

Useful links
Further information on the vaccine and other groups receiving the vaccine is available from PHE via the following links:


PHE produce an annual summary of seasonal influenza activity in the UK, available here:

https://www.gov.uk/government/statistics/annual-flu-reports


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Appendix B – Coverage definitions

Vaccine coverage is defined as:

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

Coverage definitions for all vaccinations from the COVER programme are available from the following link:


Seasonal Flu for children aged 2 and 3 years

This includes all children aged two and three years old on 31\textsuperscript{st} August 2018. Patients who have had more than one dose of influenza vaccine are only counted once to avoid double counting as not all patients will require two doses of influenza vaccine.

It is calculated as follows:

\[
\frac{\text{Total number of persons aged 2 or 3 on 31st August 2018 at the time of data extraction, registered with a GP practice from 1 September 2018 to 28 February 2019 who have been immunised}}{\text{Total number of persons aged 2 or 3 on 31 August 2018 at the time of data extraction, registered with a GP practice from 1 September 2018 to 28 February 2019}} \times 100
\]

NB. In previous years the coverage definition was based on a date to 31 January. This is the first year NHS Digital have reported to the 28 February.
Appendix C – Summary of changes to UK childhood immunisation programme

<table>
<thead>
<tr>
<th>Year</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>From September 2018, the national flu vaccination programme was extended to include children in school year five (children aged nine) on 31 August. Children aged two and three years (but not four years or older) will be offered the vaccine through general practices. The delivery of flu vaccination for four year olds (but not five years or older on 31 August) changed from a GP mode of delivery to a school based programme. This report focuses only on children aged two and three years.</td>
</tr>
<tr>
<td>2017</td>
<td>From Autumn 2017, all babies born on or after 1 August 2017 became eligible for a hexavalent vaccine which protects against six different diseases including hepatitis B (HepB) for their primary immunisations. This vaccine replaced the pentavalent infant vaccines which protect against five diseases but do not protect against HepB.</td>
</tr>
<tr>
<td>2016</td>
<td>On 1 July 2016, the infant dose of the MenC vaccine given at 12 weeks was removed from the routine schedule. The combined <em>Haemophilus influenzae</em> type b and meningococcal group C (Hib/MenC) vaccine offered after the first birthday is the first MenC dose in the schedule. A second dose is offered as the MenACWY vaccine at age 13 to 14 years, in school year nine.</td>
</tr>
<tr>
<td>2015</td>
<td>Meningococcal B vaccine was added to the programme in September 2015. See the separate Quality Statement for more information. In addition meningococcal ACWY vaccine replaced the meningococcal C booster vaccine at around 14 years from August 2015.</td>
</tr>
<tr>
<td>2014</td>
<td>The HPV schedule for 12 to 13-year-old girls (school year eight) changed from three to two doses. Childhood flu vaccine extended to include all four year olds.</td>
</tr>
<tr>
<td>2013</td>
<td>Childhood flu (only offered to two and three year olds) and rotavirus vaccines for infants were added to the programme in 2013 and the schedule for administering the MenC vaccine changed from two to only primary dose at three months. See the separate Quality Statement for more information.</td>
</tr>
</tbody>
</table>

### 2010

Vaccines that were previously given separately at 12 months of age (Hib/MenC vaccine) and 13 months of age (MMR and PCV) were to be given at the same visit, between 12 and 13 months of age (i.e. within a month after the first birthday)\(^6\). In 2010, PCV was changed to a vaccine providing direct protection against 13 strains (PCV13)\(^7\).

### 2008

A new programme to vaccinate all 12 to 13-year-old girls (school year 8) against HPV started at the beginning of the 2008-09 school year. HPV immunisation is offered to protect girls predominantly against their future risk of cervical cancer\(^8\).

### 2006

PCV\(^7\) vaccine was introduced to the routine childhood programme. This is given at two and four months with a booster dose around 13 months of age. Data on the primary course (given at two and four months) evaluated at 12 months of age were first published in this bulletin in 2007-08 as experimental statistics. Coverage data for the PCV booster evaluated at 24 months were first published in 2008-09, again, as experimental statistics\(^9\).

A combined Hib/MenC booster vaccine was introduced for children at around 12 months of age. Vaccine coverage data for the Hib/MenC booster evaluated at 24 months was first published in this bulletin in 2008-09 as Experimental Statistics. Coverage statistics for the Hib/MenC booster vaccination at five years were first published as experimental statistics in 2011-12.

### 2004

Following recommendations from JCVI that live oral polio vaccine (OPV) be replaced with inactivated polio vaccine (IPV) and acellular pertussis vaccines replaced the whole cell pertussis vaccine in the routine childhood immunisation programme, a number of vaccine changes were introduced. DTaP/IPV/Hib replaced the DTwP-Hib and OPV vaccines previously used for primary immunisation, DTaP/IPV replaced the DTaP and OPV vaccines for the pre-school booster and Td/IPV replaced the Td and OPV vaccines for the teenage booster\(^10\).

---

Appendix D – Data collection, validation & quality

COVER data

Information on childhood immunisation coverage at ages one, two and five are collected through the Cover of vaccination evaluated rapidly (COVER) data collection from Child Health Information Systems (CHISs) for most LAs or from GP systems for a small number of LAs.

Data collections are quality assured at the time of collection by PHE and further data validation and quality assurance are carried out by NHS Digital prior to publication.

PHE’s quality assurance processes include the following:

• Checks on data completeness.

• Comparisons with previous years’ data to identify and explain any large changes (eligible population and coverage).

• Comparisons with coverage figures for the same cohort of children in previous years to identify any unexpected changes.

• Where unexpected changes exist, data providers are contacted to verify and explain the data.

NHS Digital further checks include the following:

• Second check on data completeness.

• Review explanations for clarity and adequacy.

• Comparisons at a regional and local level for accuracy.

• Checks on the calculated coverage figures.

Data quality

Issues with some CHISs over recent years (including issues associated with the implementation of new IT systems) have affected the quality of some COVER data.

Appendix D also contains:

Data quality summary – 2018-19 data.

Appendix D – Data Quality summary, 2018-19

During the 2018-19 data collection and validation, the following data quality issues have been identified. These should be considered when interpreting the data.

Country level data quality issues

Wales: During 2018, a COVER data quality project identified procedures to make vaccination data held in the National Community Child Health Database more accurate. As a result, there have been increases in coverage rates reported for Wales in 2018-19 compared to previous years, particularly for children ages 4 years and above. This change is largely a result of improved data quality in the 2018-19 data. Data from previous years will not be re-issued.

This issue is also described here:

Wales Annual report:  
https://phw.nhs.wales/topics/immunisation-and-vaccines/

COVER quarterly reports:  

Region level data quality issues

• London: HepB data for London in 2018-19 is included in the report. The 2017-18 data was not included in last year’s report due to issues with data availability.

• London: General data quality issues were reported for COVER data in London in both 2017-18 and 2018-19. See next page for detail on the London issues in 2018-19.

LA level data quality issues


• Barnet: Historic issue. Reported that incorrect data submitted in previous year (2017-18). Revised data is not available for 2017-18.

Appendix D – Data Quality summary
London data quality issues

2017-18
• Data quality issues in some London COVER returns during 2017-18 were observed as new Hubs became responsible for generating coverage data. Changes in vaccine coverage within London for that year should be interpreted with caution.

2018-19
• Data quality issues relating to complexities in data flows between providers and Child Health Information Systems (CHISs) were reported in London data in 2018-19. This is attributed to the data improvement work that is occurring due to the wider digital strategy being implemented. Changes in vaccine coverage within London in 2018-19 should be interpreted with caution.

• Submissions received by NHS Digital, for the London region, reported having a sub-set of records unavailable in their annual submissions. See Table 1, below, for details of issues reported by LAs.

• Our assessment of the London data quality issues in 2018-19 is that it is appropriate to publish the regional and LA level data. This is because the data quality issues reported in the annual data submissions relate primarily to partially incomplete data for some GP practices in some LAs.

Background on the London data quality issues for 2018-19:
• Significant data quality issues were reported by the 4 CHIS hubs covering the London area during the first half of 2018-19. (See COVER quarterly reports for Q1 and Q2 2018-19 for details of these issues11).

• Data availability and completeness improved throughout 2018-19. By the end of the 2018-19 financial year, when the 2018-19 annual data was collected, data completeness had improved.

The Quality Statement document, which is part of this publication, includes additional detailed information on:
• Data sources
• Definitions
• Methods used to compile the statistics
• Other background information readers may find useful.

The quality statement document can be found on the publication page, here:

## Appendix D – Data Quality summary

### Table 1 – Data quality issues reported by London LAs.

<table>
<thead>
<tr>
<th>Local Authority</th>
<th>LA code</th>
<th>Reported issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bexley</td>
<td>E09000004</td>
<td>Out of 24 practices, data not received since June for one practice and December for another. March's data is outstanding for a further 2 practices.</td>
</tr>
<tr>
<td>Lewisham</td>
<td>E09000023</td>
<td>Out of 36 practices, March's data is outstanding for one practice.</td>
</tr>
<tr>
<td>Southwark</td>
<td>E09000028</td>
<td>Out of 36 practices, data not received since December for one practice and January for another.</td>
</tr>
<tr>
<td>Lambeth</td>
<td>E09000022</td>
<td>Out of 42 practices, data not received since January for three practices. March's data is outstanding for a further practice.</td>
</tr>
<tr>
<td>Bromley</td>
<td>E09000006</td>
<td>Out of 44 practices, data not received since September for one practice. March's data is outstanding for one further practice.</td>
</tr>
<tr>
<td>Waltham Forest</td>
<td>E09000031</td>
<td>There has been no electronic transfer of immunisation data since September 2018, which has affected COVER. Immunisation histories were requested from individual GP Practices, however, not all responded.</td>
</tr>
<tr>
<td>Havering</td>
<td>E09000016</td>
<td>There has been no electronic transfer of immunisation data since September 2018, which has affected COVER. Immunisation histories were requested from individual GP Practices, however, not all responded.</td>
</tr>
<tr>
<td>Barking and Dagenham</td>
<td>E09000002</td>
<td>There has been no electronic transfer of immunisation data since September 2018, which has affected COVER. Immunisation histories were requested from individual GP Practices, however, not all responded.</td>
</tr>
<tr>
<td>Redbridge</td>
<td>E09000026</td>
<td>There has been no electronic transfer of immunisation data since September 2018, which has affected COVER. Immunisation histories were requested from individual GP Practices, however, not all responded.</td>
</tr>
</tbody>
</table>
Appendix E – Further information on selective programmes

**Bacillus Calmette–Guérin (BCG) vaccination**

The BCG immunisation programme is a risk-based programme recommended for individuals at higher risk of exposure to TB.

In addition to this risk-based approach, all infants (0-12 months) living in an area with an incidence above 40/100,000 should be offered the BCG vaccine.

Detailed information on the BCG programme can be found in the ‘Green Book’.


BCG Data can be found in Table 11a in the Data Tables.

In 2018-19 a universal BCG programme was offered by LAs with a three-year average annual TB rate equal or greater than 40 per 100,000 population.

In 2018-19 five LAs offered a universal BCG programme based on the criteria above, all based in London (Brent, Ealing, Hounslow, Newham and Redbridge).

An estimated coverage figure is only reported for these LAs running a universal programme.

Slough, which previously offered a universal programme, did not in 2018-19.

From April 2015, as part of the COVER programme, neonatal BCG was included in the data extraction template from local Child Health Information Systems (CHISs), alongside extraction of coverage data for other vaccines offered under the age of five years.

This provides an opportunity for BCG vaccine coverage to be estimated only for local authorities offering a universal neonatal programme.

It is not possible to calculate LA level coverage for the selective programme offered in the rest of England as the number of eligible children is not defined in the CHISs.

COVER collections for BCG data have only recently been established and data are of variable quality. A shortage of BCG vaccine that started in May 2015 and may have persisted in some areas into 2016 is likely to have impacted on coverage for those evaluated in 2017-18 (born between 1 April 2016 and 31 March 2017).

From June 2016, an alternative BCG vaccine was supplied by PHE to enable the continuation of the neonatal programme.


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Appendix E – Further information on selective programmes - continued

Neonatal hepatitis B (HepB) vaccination

Information on neonatal hepatitis B (HepB) vaccination can be found in the ‘Green Book’:

Following the introduction of universal antenatal testing for hepatitis B (and subsequent vaccination of babies born to mothers who are chronically infected with HBV) in April 2000, PHE has been collecting coverage data on infants born to hepatitis B positive mothers at their first and second birthdays.

Since April 2005, this data collection has been integrated into the routine COVER programme and has been a statutory requirement since 2006.

HepB coverage statistics have been published in this bulletin since 2010 and were published at LA level for the first time in 2015-16.

The data presented in Tables 11b and 11c in the Data Tables represents reported vaccine coverage for infants born to mothers who are chronically infected with HBV who received three doses of HepB vaccine by one year of age, and coverage for four doses of vaccine in such infants who reached two years of age in the year (2018-19).

Given that some or all of the data required on infants born to hepatitis B positive mothers could not be supplied for all LAs, it would be inadvisable to draw conclusions from these data at national or regional level.

Further details of the LAs for which full data could not be supplied are available in the HepB Excel Tables (11b and 11c).

For the 2018-19 collection, HepB data reported for the 151 Upper Tier Local Authorities were derived as follows:

For the 12 month cohort, 142 LAs submitted a full data set.

For the 24 month cohort, 144 LAs submitted a full data set.
Appendix E – Further information on selective programmes - continued

Neonatal Hepatitis B (HepB) vaccination

Despite the issues mentioned with neonatal hepatitis B data, it remains important that these data continue to be reported for a number of reasons;

• The Joint Committee for Vaccination and Immunisation (JCVI) recommended a universal infant hepatitis B programme, which was implemented from autumn 2017 (see appendix G). In addition to HepB doses received at two, three and four months through this routine programme, infants born to hepatitis B positive mothers will continue to receive doses at birth and one month, as well as a booster dose at 12 months.

• Official and National Statistics are important drivers for improvements locally in systems and care pathways which include data reporting. Feedback from stakeholders has been positive.

• PHE’s hepatitis team is undertaking a mapping exercise to help local teams identify gaps in the infant hepatitis B pathway, including reporting of data. Published data helps to identify those gaps and to engage local teams to address them resulting in improving data quality.

• The data has been invaluable in monitoring and evaluating the impact of various interventions – e.g. dry blood spot testing service for infants at 12 months old; GP payments for HepB vaccinations and testing.
Appendix F – Meningococcal B (MenB) vaccination

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)\(^\text{13}\).

The vaccine is offered alongside other routine immunisations at eight and 16 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).

In 2016-17, the MenB primary, evaluated at 12 months, was included in the report for the first time as experimental statistics. It was included in the main body of the report, badged as National Statistics, in 2017-18.

In 2017-18, MenB booster data, evaluated at 24 months, was included in the report for the first time as experimental statistics. It has been included in the main body of the report, badged as National Statistics, this year.

\(^{13}\) Quarterly coverage statistics were first published by PHE in February 2016 and related to the September – December 2015 quarter.
Appendix G – Introduction of the hexavalent vaccine

From autumn 2017, all babies born on or after 1 August 2017 have been eligible for a hexavalent vaccine which protects against six diseases (diphtheria, tetanus, pertussis, hepatitis B, poliomyelitis and disease caused by *Haemophilus influenzae* type b) for their primary immunisations.

This vaccine, called Infanrix hexa®, replaces the pentavalent infant vaccines Infanrix®-IPV+Hib and Pediacel®, which protected against five diseases.

Hepatitis B is the additional disease that is now also protected against.

Hepatitis B Background

Hepatitis B is an infection of the liver caused by the hepatitis B virus (HBV). Most new infections with HBV are sub-clinical or may only cause a flu-like illness.

However, acute infection occasionally leads to sudden and severe liver damage which can be fatal.

Chronic HBV infection can result in progressive liver disease, leading to cirrhosis (development of scar tissue) in some patients and an increased risk of developing liver cancer.

In 1992, the World Health Assembly recommended that every country should have a universal hepatitis B immunisation programme by 1997.

As the UK is a low prevalence and low incidence country for hepatitis B however, introducing a universal hepatitis B programme using a monovalent hepatitis B vaccine would not have been cost-effective.

Recently, infant combination hepatitis B vaccines (which also protect against diphtheria, tetanus, polio, pertussis and Hib) have become available in the UK.

In 2014, therefore, the Joint Committee of Vaccination and Immunisation (JCVI) re-evaluated the benefits and cost-effectiveness of a universal hepatitis B infant immunisation programme in the UK and subsequently recommended the use of the hexavalent DTaP/IPV/Hib/HepB combination vaccine for all infants subject to securing the vaccine at a cost-effective price.

By providing hepatitis B vaccine as part of the combined infant vaccine, as well as being protected against diphtheria, tetanus, pertussis, polio and Hib, infants will now have the benefit of protection against hepatitis B virus.

Appendix H – Future data collections

Data Transfer and collection from April 2019

• New COVER Information Standard published in April 2019\textsuperscript{16}.

• Contingent on a successful pilot, the collection of COVER data will be transferred during 2019/20 from PHE to NHS Digital's Strategic Data Collection Service (SDCS) and merged with the current SDCS practice level vaccine coverage collection (formerly collected via the Child Immunisation Unify2 data collection).

• Analysis and reporting of the quarterly COVER report remains with PHE.

• Analysis and reporting of the annual vaccine coverage report is now published as a joint PHE / NHS Digital report.

• From 2019-20 it is therefore anticipated that the COVER collection will include both LA and GP level coverage.


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Appendix I – Uses of Statistics by Users

PHE

- Used as the authoritative source of figures for annual coverage data when referring to immunisation programmes at all levels within England.
- Locally, Screening and Immunisation teams use the report to review statistics for their local populations and compare against regional and national statistics.

Department of Health and Social Care (DHSC)

- Use the report together with provisional quarterly COVER data published by PHE to inform the development and evaluation of government policy on immunisation and to assess the delivery of different immunisations in the national programme.
- Used to help inform vaccine policy decisions, such as national and regional catch-up programmes for specific immunisations.
- Used to input to public and parliamentary business & input to the Public Health Outcomes Framework (PHOF).

NHS England and Local Teams

- Used in conjunction with provisional quarterly COVER data as the authoritative source of figures for annual coverage data when referring to the immunisation programme at their area level.
- One local team reported using the statistics to highlight potential quality issues to a Clinical Commissioning Group (CCG) and provide a basis for discussions between relevant stakeholders around local performance.

Local Authorities (LAs)

- Used to monitor local performance.

Organisation for Economic Co-operation and Development (OECD)

- Seasonal flu statistics are supplied to OECD to be used in the OECD Health Database and Health Care Quality Indicator project.
Appendix I cont.

Other publications

• Data from this report is published in the following:
  
  • Child Health Profiles published in ChiMat: http://makingthelink.net/chimat-%E2%80%93-national-child-and-maternal-health-network
  
  • Fingertips (Public Health Profiles): https://fingertips.phe.org.uk/

Unknown users

• The publication is free to access via the NHS Digital website, therefore many users will access the report without being known to NHS Digital.

• It is important to put mechanisms in place to try to understand how these additional users are using the statistics and gain feedback on how we can make the data more useful.

Feedback

• Feedback on this publication can be sent to the following email address: enquiries@nhsdigital.nhs.net

Useful feedback themes

• How useful did you find the content?
• How did you find out about this publication?
• What type of organisation do you work for?
• What did you use the report for?
• What information was the most useful?
• Were you happy with the data quality?
• What changes would be helpful to improving the publication? (content or timing)
• Would you like to take part in any future consultations on our publications?
# Appendix J – Related publications and useful web links

Previous editions of this publication (2004-05 onwards)


Previous editions of this publication (prior to 2004-05)


Quarterly COVER programme data (PHE)

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

Background information on COVER data collection


‘Immunisation against Infectious Diseases – the Green Book’, Public Health England


Further immunisation information for health professionals and immunisation practitioners

https://www.gov.uk/government/collections/immunisation

Data and reports for England on the coverage for all vaccinations routinely offered under the national immunisation programme

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

Statistics relating to hepatitis B (from PHE)

Appendix J – Related publications and useful web links – cont.

More information on the seasonal flu vaccination
https://www.gov.uk/government/collections/annual-flu-programme

Data on seasonal flu vaccine coverage amongst people with long-term medical conditions

Quarterly PHE Health Protection Reports and Communicable Disease Reports on the COVER programme for childhood immunisation

Routine childhood immunisation data at GP Practice and CCG levels (experimental management information from NHS England)

The numbers of vaccinations GP Practices are paid for administering (not coverage data) published as part of the GP Contract Services publication series
Appendix K – Selected relevant peer-reviewed publications, 2018-19

The following studies, published in 2018-19, provide examples of how vaccine coverage data is used to provide insights about the national vaccination programme that contribute to identifying and addressing the programmatic gaps beyond the proportion of individuals who are vaccinated. The results of these studies may be of interest to those involved in planning, commissioning, delivering, or monitoring the national vaccination programme at the local, regional and national level.


   **Key message:** In England, at general practice level, appointment length and total time spent on vaccination-related activities were not related to coverage, whereas capacity in terms of appointments per eligible patient may improve coverage.


   **Key message:** The majority of children who get vaccinated receive their vaccinations on time, but those who are not vaccinated by one year of age tend to never get vaccinated. Certain ethnic groups are more likely to have not received any vaccinations by one year of age. These inequalities suggest that tailored approaches may be required to target specific groups with regards to improving vaccine uptake.


   **Key message:** Population factors have different effects on vaccine uptake for the various target groups. Groups that achieve lower influenza uptake include young children in areas with high deprivation and high proportions of Black, Minority and Ethnic (BME), pregnant women in deprived areas, patients 65 years and older in the most deprived populations, and patients age 16-65 in areas with the highest Muslim and BME populations. These findings support segmenting public health activities to improve vaccine uptake and reduce inequalities.
## Appendix L - Disease summary (1)

For further information on the diseases summarised below see the ‘Immunisation against Infectious Diseases – the Green Book’

<table>
<thead>
<tr>
<th>Disease</th>
<th>Description</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diphtheria</strong></td>
<td>A highly contagious and potentially fatal disease that usually affects the nose, throat and air passages, and may also affect the skin.</td>
<td><a href="https://www.nhs.uk/conditions/diphtheria/">https://www.nhs.uk/conditions/diphtheria/</a></td>
</tr>
<tr>
<td><strong>Haemophilus influenzae type b (Hib)</strong></td>
<td>A bacterial infection that can cause a number of serious illnesses such as pneumonia, blood poisoning and meningitis, especially in young children.</td>
<td><a href="https://www.nhs.uk/conditions/hib/">https://www.nhs.uk/conditions/hib/</a></td>
</tr>
<tr>
<td><strong>Hepatitis B (HBV)</strong></td>
<td>A serious and potentially life-threatening viral infection that attacks the liver and can cause both acute and chronic disease.</td>
<td><a href="https://www.nhs.uk/conditions/hepatitis-b/">https://www.nhs.uk/conditions/hepatitis-b/</a></td>
</tr>
<tr>
<td><strong>Human-papilloma virus (HPV)</strong></td>
<td>A family of viruses that affect the skin and the moist membranes that line the body, such as those in the cervix, anus, mouth and throat. It can cause warts as well as abnormal tissue growth and other changes to cells, which can lead to cervical and other cancers.</td>
<td><a href="https://www.nhs.uk/conditions/human-papilloma-virus-hpv/">https://www.nhs.uk/conditions/human-papilloma-virus-hpv/</a></td>
</tr>
<tr>
<td><strong>Influenza (Seasonal flu)</strong></td>
<td>A highly infection illness cause by a flu virus. The virus infects the lungs and upper airways causing a sudden high temperature and general aches and pains.</td>
<td><a href="https://www.nhs.uk/conditions/flu/">https://www.nhs.uk/conditions/flu/</a></td>
</tr>
</tbody>
</table>
## Appendix L - Disease summary (2)

<table>
<thead>
<tr>
<th>Disease</th>
<th>Description</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measles</strong></td>
<td>A highly infectious viral illness. It causes a range of symptoms including fever, coughing and distinctive red-brown spots on the skin and can lead to serious complications.</td>
<td><a href="https://www.nhs.uk/conditions/measles/">https://www.nhs.uk/conditions/measles/</a></td>
</tr>
<tr>
<td><strong>Meningococcal disease</strong></td>
<td>The disease can cause meningitis (infection of the protective membranes that surround the brain and spinal cord) and septicaemia (bacterial infection of the blood).</td>
<td><a href="https://www.nhs.uk/conditions/vaccinations/men-acwy-vaccine/">https://www.nhs.uk/conditions/vaccinations/men-acwy-vaccine/</a></td>
</tr>
<tr>
<td><strong>Mumps</strong></td>
<td>A highly contagious viral infection that usually affects children. The most common symptom is a swelling of the parotid glands, located on one of both sides of the face.</td>
<td><a href="https://www.nhs.uk/conditions/mumps/">https://www.nhs.uk/conditions/mumps/</a></td>
</tr>
<tr>
<td><strong>Pertussis (whooping cough)</strong></td>
<td>An bacterial infection in the lining of the airways.</td>
<td><a href="https://www.nhs.uk/conditions/whooping-cough/">https://www.nhs.uk/conditions/whooping-cough/</a></td>
</tr>
<tr>
<td><strong>Pneumococcal disease</strong></td>
<td>Acute infections cause by the Streptococcus pneumoniae bacterium, which enters the human body through the nose and mouth.</td>
<td><a href="https://www.nhs.uk/conditions/vaccinations/pneumococcal-vaccination/">https://www.nhs.uk/conditions/vaccinations/pneumococcal-vaccination/</a></td>
</tr>
<tr>
<td><strong>Polio (Poliomyelitis)</strong></td>
<td>Caused by a highly infectious virus. For most people polio is a mild illness with flu type symptoms. It can be potentially fatal if it attacks the nerve cells that help muscles to function and can cause severe muscle paralysis (paralytic polio).</td>
<td><a href="https://www.nhs.uk/conditions/polio/">https://www.nhs.uk/conditions/polio/</a></td>
</tr>
<tr>
<td>Disease</td>
<td>Description</td>
<td>Reference</td>
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<tr>
<td>Tetanus</td>
<td>A serious acute condition (serious but short-lived) that is caused by infection with a bacterium known as Clostridium tetani. It causes severe muscle spasms and stiffness and is potentially fatal if untreated.</td>
<td><a href="https://www.nhs.uk/conditions/tetanus/">https://www.nhs.uk/conditions/tetanus/</a></td>
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<tr>
<td>Tuberculosis (TB)</td>
<td>A bacterial infection spread by inhaling tiny droplets of saliva from the coughs or sneezes of an infected person.</td>
<td><a href="https://www.nhs.uk/conditions/tuberculosis-tb/">https://www.nhs.uk/conditions/tuberculosis-tb/</a></td>
</tr>
<tr>
<td>Rotavirus</td>
<td>A highly infectious virus that typically affects babies and young children, causing diarrhoea, sometimes with vomiting, abdominal pain and fever.</td>
<td><a href="https://www.nhs.uk/conditions/vaccinations/rotavirus-vaccine/">https://www.nhs.uk/conditions/vaccinations/rotavirus-vaccine/</a></td>
</tr>
<tr>
<td>Rubella (German measles)</td>
<td>A viral infection that can cause a high temperature (fever) of 38°C (100.4°F) or over, and a distinctive red-pink rash. In most cases rubella is a mild condition, but it can be serious in pregnant women because it can harm the unborn baby.</td>
<td><a href="https://www.nhs.uk/conditions/rubella/">https://www.nhs.uk/conditions/rubella/</a></td>
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