



## A PHE commissioned national survey of parental attitudes to immunisation

Our national vaccination programmes have been supported by a series of national surveys undertaken into the attitudes of parents towards childhood immunisation. These have helped establish parental views on: the seriousness of diseases that the vaccines prevent; concerns about vaccine safety; the type and amount of information that parents need; and what influences parental decisions to vaccinate children. Surveys were undertaken between 1991-2010 and PHE re-established these as annual surveys in 2015.

The 2018 survey will start in different locations across the country on 5 February and continue until 22 April. Approximately 1000 interviews will be undertaken with parents of children aged 0-2 years and 1000 interviews with parents of 3-4 year olds. These interviews are conducted face-to-face in the home by the independent research agency BMG Research on behalf of PHE. BMG Research interviewers are fully trained and will always show parents identification and a letter of authority that has been written by PHE and includes BMG and PHE contact points.

BMG also informs the local police that the survey is being conducted in that area and the letter of authority includes police reference numbers for each local authority that generates these and parents (and others) can contact the police to check the authenticity of this survey if they wish to do so.

The findings of these surveys are invaluable in informing our national programmes and we would very much welcome your support. Further information about the research can be found on PHE's website at [weblink 1](#).

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## Vaccine coverage for pertussis vaccination programme for pregnant women: July to September 2017 update

Prenatal pertussis vaccine coverage remains high at around 70% and, although slightly below coverage reported in 2016, increased between July and September 2017 in line with previous years.

PHE recently published a study that highlighted socio-demographic inequalities with regards to the prenatal pertussis programme. Based on April 2014 to March 2015 pre-natal pertussis coverage data, and after adjusting for geography and deprivation, coverage was lowest in black-other and black-Caribbean women compared with White British women (–16.3% and –15.4%, respectively). Coverage decreased with increasing deprivation, and was 14% lower in the most deprived quintile compared with the least deprived see [weblink 2](#) for the full report.

Continued support in the delivery of this important programme has been sought from service providers (GP practices and maternity units), Screening and Immunisation Teams and Health Protection Teams. It is essential that GPs and practice nurses continue to ensure that vaccination and date of delivery are recorded in the patient's GP record to enable coverage and the overall impact of the programme to be accurately monitored.

In areas that have commissioned maternity units to offer pertussis vaccines in pregnancy, it is important that providers ensure doses of vaccines given to individual women are also communicated to the woman's GP. Maternity units not offering pertussis vaccines to pregnant women should continue to discuss its importance, making use of available resources available at [weblink 3](#) and sign-post the woman to her GP to receive the vaccine. See latest data at [weblink 4](#).

## Latest school leaver MenACWY vaccine coverage estimates published

During the spring and summer of 2017 PHE, the Meningitis Research Foundation (MRF) and Meningitis Now urged young people in the eligible cohorts, whether starting university or not, to get vaccinated against meningitis and septicaemia. They were signposted to their GP, either at home or in their university town if they had not had the vaccine before the beginning of term. Further communications about receiving the vaccine at university fresher's fairs during September and October were expected to increase coverage estimates during the autumn.

National MenACWY vaccine coverage published this month show coverage for the third and final cohort of 18 to 19 year olds (born between 01/09/1998 and 31/08/1999) offered vaccine through a GP based catch-up programme since April 2017 increased from 29.4% at the end of August to 38.4% at the end of November 2017, an additional 8% compared with last year at the same point in time. Unvaccinated individuals in this cohort and the second and first priority catch-up cohorts (born between 01/09/1997 and 31/08/1998, now aged 19 to 20 years, and born between 01/09/1996 and 31/08/1997, now aged 20 to 21 years) continue to be eligible for vaccination until they reach age 25. The latest coverage report can be found at [weblink 5](#) and further immunisation information can be found in [weblink 6](#).

## Had trivalent flu vaccine, need quadrivalent flu vaccine?

PHE have received a number of enquiries about re-calling eligible patients and health care workers who have already received trivalent influenza vaccine (TIV) to additionally give them quadrivalent influenza vaccine (QIV). This is unlikely to be of benefit and recall of such vaccinated individuals is not recommended because:

- Vaccinated individuals will have already received reasonable protection from TIV. This season the UK has seen both A(H3N2) influenza virus and some A(H1N1)pdm09 virus circulating, both of which are well matched to this season's trivalent influenza vaccine (TIV) and quadrivalent influenza vaccine (QIV). In addition, there has been influenza B virus circulation, mainly of viruses belonging to the B/Yamagata lineage, with some B/Victoria lineage viruses. A B/Yamagata lineage virus (B/Phuket/3073/2013-like virus) and a B/Victoria lineage virus (B/Brisbane/60/2008-like virus) is contained in this season's QIV, but not in the TIV, which contains the B/Victoria lineage vaccine virus. It is not known at this stage what cross protection TIV will provide against the circulating B/Yamagata viruses, however, previous studies from earlier seasons have shown that there often remains influenza B lineage cross protection.
- The priority should be to immunise eligible individuals who have not yet been vaccinated this season, potentially prioritising QIV to higher risk groups who remain unvaccinated, though immunisation should not be delayed if TIV is the only vaccine available. Such groups might include at-risk patients <65 years of age e.g. immunosuppressed and health care workers who are looking after vulnerable patients.
- PHE does not support routine revaccination of those already vaccinated with TIV to receive QIV again as besides the uncertain additional benefit, there will be a further interval of two weeks for this to take effect.
- For the 2018/19 flu season, the Joint Committee on Vaccination and Immunisation (JCVI) have recommended that adjuvanted trivalent influenza vaccine (aTIV) is more cost-effective than the non-adjuvanted vaccines for those aged 65 years and over, with a priority for aTIV vaccine for those aged 75 years and over. NHS England have issued advice on the use of aTIV for the 2018/19 flu season at [weblink 13](#). In addition, the Green Book flu chapter advises QIV is more beneficial in at risk adults under 65 years of age, including pregnant women and by extension health care workers, whereas the health benefits from the use of QIV compared with TIV in the elderly are likely to be small.

## Immunisation of pregnant women and newborn infants training slides

A training resource focussing on the Immunisation of pregnant women and newborn infants is now available. This resource has been developed to support the delivery of immunisation training to health care workers providing or advising on immunisation to pregnant women. The resource consists of five slide sets covering:

1. maternal vaccination: Background, history and attitudes towards maternal vaccination
2. vaccine recommendations for pregnant women: Influenza and pertussis vaccines
3. Selective vaccination programmes for neonates
4. vaccine for pre or post natal vaccination
5. governance considerations, challenges to achieving high vaccine coverage, horizon scanning and resources

The resource can be accessed on Gov.UK at [weblink 14](#) or by using the links below:

- immunisation in pregnancy slides section 1 – Background history and attitudes: [weblink 8](#)
- immunisation in pregnancy slides section 2 – Influenza and Pertussis: [weblink 9](#)
- immunisation in pregnancy slides section 3 – Selective programme for neonates: [weblink 10](#)
- immunisation in pregnancy slides section 4 – Pre and post-natal viral rash illness inadvertent vaccination: [weblink 11](#)
- immunisation in pregnancy slides section 5 – Governance, challenges and horizon scanning and resources: [weblink 12](#)

## Training

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### Fundamentals of Immunisation

**12 and 13 March 2018,  
UCL Great Ormond Street Institute of Child Health  
30 Guilford Street, London WC1N 1EH**

~ Course fee: £150 for both days ~

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Public Health England and UCL Great Ormond Street Institute of Child Health are running a Fundamentals of Immunisation course in March next year. This annually held, two day intense theoretical course is designed for those new to a role in immunisation and is most suited to those who give or advise on a range of different vaccines. The course comprises a series of lectures from national immunisation experts and will provide delegates with up-to-the-minute information on the range of topics included in PHE's 'Core Curriculum for Immunisation Training'. A basic level of prior immunisation knowledge and familiarity with the Green Book (Immunisation against infectious disease) will be assumed.

Programme and booking information available at [weblink 16](#)

## NIN 2018 Keynote speaker and booking opens soon

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### NATIONAL IMMUNISATION MEETING 2018

**Tuesday 24 and Wednesday 25 April 2018**  
**Grand Connaught Rooms, Holborn, London**

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This two day meeting comprises of a day of presentations focusing on new and current scientific issues in immunisation and a second day focusing on the implementation issues relating to our national immunisation programme.

This year's National Immunisation Network Meeting is being held in European Immunization Week (EIW), which is being celebrated between 23–29 April 2018 in conjunction with other World Health Organization (WHO) regional initiatives and World Immunization Week.

Our theme this year is 'Vaccines: our immunisation story' in conjunction with the EIW theme Prevent, protect, immunize. This will form the theme for our two-day event allowing us to explore immunisation at every stage of life and every age. As well as presentations from world-class epidemiologists and experts in immunisation from the UK, and Europe, we look forward to welcoming Professor Natasha Crowcroft, Chief of Applied Immunization research and evaluation, Public Health Ontario, Canada, as our keynote speaker.

**Booking will open shortly. Please save the dates!**



## Green Book chapter 25 – Pneumococcal has been published!

Pneumococcal disease is the term used to describe infections caused by the bacterium *Streptococcus pneumoniae* (also called pneumococcus). *S. pneumoniae* is an encapsulated gram-positive coccus. This chapter has been reformatted, revised and published and can be downloaded at [weblink 15](#). The risk group section (pg 8) has been rewritten for clarity and pneumococcal vaccine and supplier information updated.

**Coming soon – The Green Book club – Best practice and how a local group keep up to date.**

## Vaccine supply

ImmForm customers are asked to consider best practices around ordering, receipt and storage of vaccines which are provided centrally for the national immunisation programme. This could help towards reducing overall vaccine wastage and cost to the NHS, and towards ensuring that there is enough vaccine available for those who need it. Vaccine wastage due to both avoidable and unavoidable incidents remains significant, during 2017 it is estimated that the value of vaccines wasted was £5million.

If you are responsible for ordering or receipt of vaccines please remember the following:

### **Vaccine ordering**

- hold no more than two to four weeks' worth of stock
- know your designated delivery day and don't forget your ordering cut-off day and time
- it is best to order smaller amounts of vaccine regularly
- edit existing orders rather than opening new orders - this reduces delivery costs to the NHS
- some vaccines come in multi-dose packs – check you are ordering the correct number of doses
- check Vaccine Update newsletter for latest information on vaccine supply.

### **Receipt and storage of vaccines**

- check your delivery is correct and undamaged before you sign for it. Any errors can be raised with Movianto up to 48 hours after delivery
- refrigerate the stock as soon as you have checked it off against the order, between 2-8°C (strive for 5°C) and continue to monitor by recording the temperature twice a day
- do not over fill the fridge or place vaccines against the back and sides as this restricts the airflow
- ensure the shortest-dated stock is placed at the front of the fridge and used first
- record any wastage on the ImmForm website and also inform local NHS England Screening and Immunisation Teams before disposing of vaccines.



## Keep your vaccines healthy poster available to order now!

Vaccines which are wasted through mis-ordering, being left out of the cold chain, being allowed to go beyond their use-by dates, and fridge failures cost the NHS millions of pounds every year. At a time when we are all having to be much more careful with our budgets it is particularly important that we are vigilant around the use of valuable resources. Following the advice in this poster will ensure that vaccine wastage is kept to a minimum. This poster includes sections to write on for:

- customers' account details (which should be filled in locally)
- ordering and delivery dates
- contact information in the event of a fridge failure.

You can download and print it locally but we recommend that you order free copies from the order line using the product code: CCPVP01 at [weblink 7](#).

## Change to MMRVaxPro and PPD2TU packs

Please note that there is new packaging for MMRVaxPro® (Measles, Mumps and Rubella) vaccine and Tuberculin Purified Protein Derivative 2TU (Mantoux test) centrally supplied and distributed by PHE. The manufacturer's logo has changed on the MMR, and the PPD2TU has been redesigned following change of ownership from the Statens Serum Institut to AJVaccines as shown in the images below. Stock in the old packaging will continue to be delivered to ImmForm customers until used up.



## Flu Vaccine Information and Availability 2017/18 for the children's national immunisation programme

### Expiry dates for Fluenz Tetra®

The batches highlighted below in red have now expired, and the next batch (JK2516) expires on 29 January 2018.

Batch	Expiry date	Batch	Expiry date
JH2616	26-Dec-17	JH2617	27-Dec-17
JH2618	28-Dec-17	JH2619	02-Jan-18
JH3127	04-Jan-18	JJ2069	04-Jan-18
JJ2071	09-Jan-18	JJ2609	10-Jan-18
JJ2612	15-Jan-18	JJ2837	15-Jan-18
JJ2838	17-Jan-18	JK2130	22-Jan-18
JK2131	23-Jan-18	JK2516	29-Jan-18
JK2516B	13-Feb-18	JK2516C	15-Mar-18

Please ensure that the expiry date is always checked before use and that any expired stock is disposed of in line with local policies. Please record any stock that is disposed of due to expiry before use through the ImmForm Stock Incident page.

### Reporting any remaining unused Flu Vaccine ordered for the Children's Flu Programme

As the vaccination period for flu draws to a close, it is important to remember that any vaccine that has expired, or remains otherwise unused at the end of the season, is recorded on ImmForm, using the Stock Incident page. This is to ensure that all stock is accounted for and supports efforts across the system to reduce the level of vaccine which may go unused at the end of the season.

Please ensure that you select the appropriate reason (i.e. 'expired before use' or 'cold chain failure') when recording the disposal of any stock.

**Report an incident**

Organisation: EnglandHHS  
 Incident Date: 13/01/2017  
 Incident Reason: Fluaz vaccine expired before it could be used

Incident Description:

Actions taken or planned following the incident:

When investigating a possible breach of the cold chain, healthcare professionals are strongly encouraged to make contact with their local NHS England Screening and Immunisation Team (SIT) in the first instance (<https://www.england.nhs.uk/contact-us/>). It is important that all vaccines exposed to temperatures outside of the manufacturers recommendations are embargoed inside the same fridge until further advice from the SIT has been obtained. If possible, the vaccine fridge environment should not change. The fridge should remain switched on at the electrical supply and vaccines should be labelled as not for use - do not discard vaccines.

Vaccine	No. of doses
20710 - WHO	
ZTU - WHO	
BCG SS2 - BCG	
Bevaxo - Heringtons B	
Boostrix IPV - Boostrix IPV	
Fluarix Tetra - Fluarix Tetra (Quadrivalent inactivated)	
Gardasil - HPV	
Inactivated Influenza Vaccine (Split Virion) BP - Flu (	
Inflaviv (IPV)+Hb - DTap (IPV)+Hb	
Inflaviv (IPV - DTap) (IPV	
Menitorix - HB/HEB C	
MMR Vaccine - MMR	
Menivac C - MEN C	
Menomix - Meningococcal Group ACWY Vaccine	
Menomix EXP - Meningococcal Group ACWY Vaccine	

**Report an incident**

Organisation: EnglandHHS  
 Incident Date: 11/01/2017  
 Incident Reason: HPV vaccine unused as part of pilot programme for MSH  
 Incident Description: HPV vaccine lost through cold chain failure, intended for the MSH pilot. Faulty stock - reported to manufacturer. Vaccine expired before it could be used. Fridge equipment failure NCF as a result of loss of power. Fridge switched off in error. Fridge door left open in error. Excess stock ordered in error. MenC vaccine disposed of due to switch to MenACWY. Stock left out of fridge in error.

Actions taken or planned following the incident:

Screen shot of incident reporting on ImmForm website – drop down reason list

## Flu vaccines available for the children's programme

The following vaccines remain available to order by providers of the children's national flu programme via the ImmForm website:

Vaccine	Manufacturer
Fluenz Tetra® (LAIV)	AstraZeneca UK Ltd
Inactivated influenza vaccine (split virion) BP	Sanofi Pasteur
Fluarix Tetra	GSK

Please refer to the news item on the ImmForm website for the latest updates on availability.

## Influenza Vaccines for the 2017 to 2018 influenza season

Aside from this central procurement of vaccine for children less than 18 years of age, it remains the responsibility of GPs and other providers to order sufficient flu vaccine directly from manufacturers for older eligible patients of the flu programme in 2017/18. The vaccines available for the 2017/18 season are:

Supplier	Name of product	Vaccine Type	Age indications	Ovalbumin content micrograms/ml (micrograms/dose)	Contact details
AstraZeneca UK Ltd	Fluenz Tetra ▼	Live attenuated, nasal (quadrivalent)	From 24 months to less than 18 years of age	≤0.12 (≤0.024/0.2ml dose)	0845 139 0000
GSK	Fluarix™ Tetra ▼	Split virion inactivated virus (quadrivalent)	From 3 years	≤0.1 (≤0.05/0.5ml dose)	0800 221 441
MASTA	Imuvac®	Surface antigen, inactivated virus	From 6 months	0.2 (0.1/0.5ml dose)	0113 238 7552
	Inactivated Influenza Vaccine (Split Virion) BP	Split virion, inactivated virus	From 6 months	≤0.1 (≤0.05/0.5ml dose)	
	Quadrivalent Influenza Vaccine (Split Virion, inactivated) ▼	Split virion, inactivated virus	From 3 years	≤0.1 (≤0.05/0.5ml dose)	
Mylan (BGP Products)	Influvac® sub-unit	Surface antigen, inactivated virus	From 6 months	0.2 (0.1/0.5ml dose)	0800 358 7468
	Imuvac®	Surface antigen, inactivated virus	From 6 months	0.2 (0.1/0.5ml dose)	
	Influenza vaccine, suspension for injection (influenza vaccine, surface antigen, inactivated)	Surface antigen, inactivated virus	From 6 months	0.2 (0.1/0.5ml dose)	
Pfizer Vaccines	Influenza vaccine (Split Virion, inactivated), pre-filled syringe	Split virion, inactivated virus	From 5 years	≤2 (≤1/0.5ml dose)	0800 089 4033
	Enzira®	Split virion Inactivated virus	From 5 years	≤2 (≤1/0.5ml dose)	
Sanofi Pasteur Vaccines	Quadrivalent Influenza Vaccine (Split Virion, inactivated) ▼	Split virion, inactivated virus	From 3 years	≤0.1 (≤0.05/0.5ml dose)	0800 854 430
	Inactivated Influenza Vaccine (Split Virion) BP	Split virion, inactivated virus	From 6 months	≤0.1 (≤0.05/0.5ml dose)	
Seqirus Vaccines Ltd	Agrippal®	Surface antigen, inactivated virus	From 6 months	≤0.4 (≤0.2/0.5ml dose)	08457 451 500

## Vaccine supply for non routine programmes

### Hepatitis A vaccine

#### Adult

- GSK: Havrix adult vaccines will be available to order from end Jan 2018
- Sanofi Pasteur: Limited supplies of Avaxim are available. It is likely that there will be order restrictions in place.
- MSD: Currently unavailable and there will be intermittent supplies of VAQTA during 2018

#### Paediatric

- GSK: Havrix Paediatric singles and packs of 10 will experience supply constraints until spring 2018
- MSD: Limited stocks are currently available.

### Hepatitis B vaccine

All hepatitis B containing monovalent and bivalent vaccines are currently under supply management processes. This approach has been developed with support from PHE and DH.

#### Adult

- GSK: Limited supplies of Engerix B PFS singles are available
- GSK: Engerix B PFS packs of 10 are now available
- GSK: Very limited supplies of Engerix B vials are available
- GSK: Fendrix is available to order
- MSD: Limited supplies of HBVAXPRO 10µg are available. Supplies are expected to be restricted throughout 2018
- MSD: Limited supplies of HBVAXPRO 40µg are available. Supplies are expected to be restricted throughout 2018

#### Paediatric

- GSK: Engerix B Paediatric singles are available
- MSD: Limited supplies of HBVAXPRO 5µg are available. Supplies are expected to be restricted throughout 2018

### Combined hepatitis A and hepatitis B vaccine

- GSK: Twinrix Adult and Paediatric presentations are available
- GSK: Ambirix is available

### Combined Hepatitis A and Typhoid vaccine

- GSK: GSK is discontinuing Hepatyrix vaccine that has been under constrained supply for several years due to challenges associated with its manufacturing.
- Sanofi Pasteur: Limited supplies of Viatim are available. It is likely there will be order restrictions in place.

### Typhoid vaccine

- GSK: GSK is discontinuing Typherix vaccine that has been under constrained supply for several years due to challenges associated with its manufacturing.
- Sanofi Pasteur: Typhim is available to order without restrictions.
- PaxVax: Vivotif is available

## Rabies vaccine

- GSK: limited supplies of Rabipur are available.
- Sanofi Pasteur: Limited supplies of Rabies BP are available. It is likely that there will be order restrictions in place.

## PPV (Pneumococcal Polysaccharide Vaccine):

- MSD: Very limited stocks are currently available Further replenishment is due mid/end quarter one 2018.

## Varicella Zoster vaccine

- GSK: Varilrix is currently available
- MSD: VARIVAX is currently available.
- MSD: ZOSTAVAX is currently available.

## Diphtheria, tetanus and poliomyelitis (inactivated) vaccine

- Sanofi Pasteur: Limited supplies of Revaxis are available. There are likely to be order restrictions in place for travellers. Please contact Sanofi Pasteur for information regarding availability.

## MMR

- MSD: currently have very limited MMR stocks available for private market sales and do not currently have dates for further replenishment.
- There is no impact on the National Immunisation Programme. **It should be noted that central MMR vaccine stock can be used to catch-up anyone of any age. Occupational Health Departments who are having difficulty obtaining MMR stock from manufacturers should contact the PHE vaccine supply team on [vaccine.supply@phe.gov.uk](mailto:vaccine.supply@phe.gov.uk).**

## Human Papillomavirus vaccine

### MSD Updates

- MSD currently has limited stocks of Gardasil 9 as does their wholesaler.
- The shortage is due to an unexpected increase in demand which has led to depletion in the market sooner than expected. MSD apologise for any inconvenience and are doing everything to expedite the supply of Gardasil 9. Supply should improve during 2018.
- In the meantime, MSD are working closely with their wholesaler to minimise disruption to patients as much as possible and will work with customers to ensure course completion is prioritised ahead of new course initiations.
- GARDASIL – Limited stocks of GARDASIL are available for private market sales and MSD currently do not have dates for replenishment. There is no impact on the National Immunisation Programme.
- Gardasil-9 Vaccine – Limited supplies of GARDASIL-9 are due to be available week beginning 15 Jan-18, with further replenishment due mid-Jan-18.

## Weblinks

- weblink 1 [www.gov.uk/government/collections/parental-attitudes-to-vaccination-in-young-children](http://www.gov.uk/government/collections/parental-attitudes-to-vaccination-in-young-children)
- weblink 2 <https://www.cambridge.org/core/journals/epidemiology-and-infection/article/predictors-of-coverage-of-the-national-maternal-pertussis-and-infant-rotavirus-vaccination-programmes-in-england/64426E8E9ADC993674273DD0C81B6C72>
- weblink 3 <https://www.gov.uk/government/publications/pregnancy-how-to-help-protect-you-and-your-baby>
- weblink 4 <https://www.gov.uk/government/publications/pertussis-immunisation-in-pregnancy-vaccine-coverage-estimates-in-england-october-2013-to-march-2014>
- weblink 5 <https://www.gov.uk/government/publications/meningococcal-acwy-immunisation-programme-vaccine-coverage-estimates>
- weblink 6 <https://www.gov.uk/government/publications/meningococcal-the-green-book-chapter-22>
- weblink 7 [https://www.orderline.dh.gov.uk/ecom\\_dh/public/saleproduct.jsf?catalogueCode=CCPVP01](https://www.orderline.dh.gov.uk/ecom_dh/public/saleproduct.jsf?catalogueCode=CCPVP01)
- weblink 8 <https://publichealthengland-immunisati.app.box.com/s/p0b1wkrfliu6ss5941im5eecoynvhgfkw>
- weblink 9 <https://publichealthengland-immunisati.app.box.com/s/dfj14tasy89d3tfj2g1e2h6ipc62uev6>
- weblink 10 <https://publichealthengland-immunisati.app.box.com/s/3mnbnl2ei8cklghsejymw2co690suls>
- weblink 11 <https://publichealthengland-immunisati.app.box.com/s/4f21r0wcagf2qkw3sv0uldzzi00vhrnk>
- weblink 12 <https://publichealthengland-immunisati.app.box.com/s/5yhzyyhv8snaddigoku38q602q3yy518>
- weblink 13 <https://www.england.nhs.uk/wp-content/uploads/2017/12/2018-19-aTIV-vaccine.pdf>
- weblink 14 <https://www.gov.uk/government/collections/immunisation#immunisation-training-resources-for-healthcare-professionals>
- weblink 15 <https://www.gov.uk/government/publications/pneumococcal-the-green-book-chapter-25>
- weblink 16 <https://onlinestore.ucl.ac.uk/conferences-and-events/faculty-of-population-health-sciences-c09/ucl-great-ormond-street-institute-of-child-health-d13/d13-fundamentals-of-immunisation-2018>