

# NSW Annual Immunisation Coverage Report, 2015

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while identifying some areas for improvement. Completion of the recommended immunisation schedule at the earliest appropriate age should be the public health goal at both the state and local health district level where high levels of vaccine coverage at milestone ages have been achieved.

**Abstract: Introduction:** This annual report documents trends in immunisation coverage in NSW for children, adolescents and the elderly, up to and including data for 2015. **Methods:** Data from the Australian Childhood Immunisation Register, the NSW School Vaccination Program and the NSW Population Health Survey were used to calculate various measures of population coverage, and vaccination timeliness for Aboriginal and non-Aboriginal children. **Results:** 'Fully immunised' coverage has increased marginally from 2014 for children at 12, 24 and 60 months of age. Greater than 92% coverage has been reached for children at 12 and 60 months of age. Whilst 'fully immunised' coverage at 24 months of age was 89.5%, coverage for individual vaccines due at this age was greater than 94%, except for the second dose of the measles, mumps and rubella vaccine (91.8%) and the varicella vaccine (91.5%). Delayed receipt of vaccines was still an issue for Aboriginal children. Coverage for adolescent vaccinations remained relatively stable between 2014 and 2015 for most vaccines apart from varicella vaccine coverage, which increased by more than 20%. Influenza and pneumococcal vaccination in the elderly has also remained stable between 2014 and 2015; however, pneumococcal vaccination estimates are substantially lower than the influenza coverage estimates. **Conclusion:** This report documents trends in immunisation coverage in NSW across the age spectrum. Data provided in this report reflect continued successful delivery of the vaccination program in New South Wales,

## Introduction

This series of *New South Wales (NSW) Annual Immunisation Coverage Reports* provides important information on trends and issues in immunisation coverage to facilitate the monitoring of NSW immunisation programs.

This report uses the longstanding international practice of reporting coverage at key milestone ages to measure coverage against national benchmarks and to track trends over time. It is adapted from annual national immunisation reports published since 2009.<sup>1</sup>

High levels of reporting to the Australian Childhood Immunisation Register (ACIR) are maintained by a system of incentive payments for immunisation providers and parents/guardians.<sup>2</sup> However, changes to immunisation policy, the incentive payment system and changes to the 'fully immunised' coverage algorithms may have an impact on reported vaccination coverage. Some recent changes are highlighted in Box 1 and are also referred to in this report.

The ACIR was established on 1 January 1996 by incorporating demographic data from Medicare on all enrolled children aged less than 7 years.<sup>3</sup> Participation in the ACIR is opt-out so it constitutes a nearly complete population register, as approximately 99% of children are registered with Medicare by 12 months of age.<sup>2</sup> Children not enrolled in Medicare can also be added to the ACIR via a supplementary number. Since 2001, immunisations given overseas may be recorded if a provider endorses their validity. Data are transferred to the ACIR when a recognised immunisation provider supplies details of an eligible immunisation either automatically from medical practice software or through the internet using the Medicare Australia website or by submitting paper encounter forms. The existence of medical contraindications and conscientious objection to immunisation was also recorded on the ACIR. As of 1 January 2016 conscientious objection will no longer be a valid reason for

## Box 1. Recent significant changes in immunisation policy, immunisation incentives and coverage calculation algorithms for NSW

*April 2015* – New immunisation requirements for family assistance payments were announced by the Federal government.<sup>4</sup> With the 'No Jab, No Pay' policy coming into effect as of 1 January 2016, only parents of children (aged less than 20 years) who are 'fully immunised' or on a recognised catch-up schedule will continue to receive the Child Care Benefit, Child Care Rebate, and/or the Family Tax Benefit Part A end-of-year supplement. Children with medical contraindications or natural immunity for certain diseases will continue to be exempt from the requirements; however, conscientious objection will no longer be a valid exemption from immunisation requirements.

*March 2015* – Booster dose of DTPa recommended at 18 months of age in NSW (funded as of March 2016).

The dTpa vaccine was recommended for women during the third trimester of pregnancy and for new mothers in maternity units of public hospitals (if not vaccinated in the third trimester) under the cocoon strategy.

Seasonal influenza vaccine funded for Aboriginal and Torres Strait Islander children aged 6 months to less than 5 years. The list of population groups for which seasonal influenza vaccination is recommended was further expanded to include Aboriginal and Torres Strait Islander children aged 5 to less than 15 years. The recommended upper age for children requiring two doses in the first year they receive influenza vaccine changed from less than 10 years to less than 9 years.

*December 2014* – Secondary school HPV vaccine catch-up program for Year 9 male students ceased.

*July 2014* – Immunisation coverage assessment algorithm for 'fully immunised' at the 24-month milestone amended to require a dose of meningococcal C vaccine, a dose of varicella vaccine and a second dose of a measles–mumps–rubella (MMR) vaccine. The expansion of the definition of 'fully immunised' reinforces the importance of these vaccines by linking them to payments to families and immunisation providers.<sup>14</sup>

*December 2013* – Secondary school Year 7 and age equivalent hepatitis B vaccine catch-up program ceased.

*July 2013* – The combined *Haemophilus influenzae* type b (Hib) and meningococcal serogroup C (MenC) vaccine, Menitorix<sup>®</sup>, was added to the National Immunisation Program (NIP) schedule at 12 months of age. This combination vaccine replaces the single dose of monovalent meningococcal C conjugate vaccine (MenCCV) and booster dose of monovalent Hib vaccine previously scheduled at 12 months of age.

A combination measles, mumps, rubella, varicella (MMRV) vaccine for children aged 18 months was also added to the NIP in July 2013. The MMRV vaccine replaces the separate MMR vaccine previously given to 4 year olds, and the varicella vaccine (for chickenpox) previously given to 18 month olds.

*February 2013* – Males aged 12–13 years received the HPV vaccine at school. Males aged 14–15 years also received the vaccine as part of a catch-up program until the end of the 2014 school year.

*July 2012* – Eligibility for the Family Tax Benefit Part A supplement requires that children are assessed as fully immunised in the year they turn 1, 2 or 5. This replaced the Maternity Immunisation Allowance.

*December 2011* – For non-Indigenous adults aged  $\geq 65$  years who do not have any condition that predisposes them to an increased risk of invasive pneumococcal disease (IPD), a repeat dose of 23-valent pneumococcal polysaccharide vaccine (Pneumovax 23<sup>®</sup>) is no longer recommended.

*July 2011* – Prevenar 13<sup>®</sup> (13-valent pneumococcal conjugate vaccine, 13vPCV) replaced Prevenar<sup>®</sup> (7-valent pneumococcal conjugate vaccine, 7vPCV) on the NIP for children at 2, 4 and 6 months of age in all states and territories except Northern Territory (adopted 13vPCV from 1 October 2011).

vaccination exemption and hence data for this will no longer be available.<sup>4</sup> Up to 31 December 2015 all vaccination records for a child remained on the register indefinitely, but no new immunisation encounter records were added after the 7th birthday.<sup>2</sup> From 1 January 2016 the register changed and now includes records of vaccinations given up to less than 20 years of age.<sup>5</sup>

Table 1 presents the NSW Immunisation Program in 2015. During 2015 the only change to the childhood Program

from 2014 was the addition of the annual seasonal influenza vaccine for Aboriginal and Torres Strait Islander children aged 6 months to less than 5 years.

### Methods

#### *Measuring immunisation coverage using the Australian Childhood Immunisation Register*

The cohort method has been used for calculating coverage at the population level (national and state/territory)<sup>6</sup> since the inception of the ACIR. Cohort immunisation status is

Table 1. Schedule of vaccines delivered through the NSW Immunisation Program, 2015

Age	Vaccine						
<b>Childhood vaccines</b>							
Birth	Hep B						
6–8 weeks	Hep B	DTPa	Hib	Polio		13vPCV	Rotavirus
4 months	Hep B	DTPa	Hib	Polio		13vPCV	Rotavirus
6 months	Hep B	DTPa	Hib	Polio		13vPCV	Flu <sup>b</sup>
12 months			Hib-MenC <sup>a</sup>		MMR		Flu <sup>b</sup>
18 months						MMRV <sup>c</sup>	Flu <sup>b</sup>
4 years		DTPa		Polio	MMR <sup>d</sup>		Flu <sup>b</sup>
<b>Adolescent vaccines</b>							
12 years		dTpa		VZV <sup>e</sup>	HPV		
15 years		dTpa					Flu <sup>b</sup> Pneumo <sup>f</sup>
<b>Adult vaccines</b>							
≥50 years							Pneumo <sup>g</sup>
≥65 years							Flu <sup>b</sup> Pneumo
Pregnant women		dTpa <sup>h</sup>					Flu <sup>i</sup>

Hep B: hepatitis B vaccine; DTPa: diphtheria, tetanus, and acellular pertussis-containing vaccine; Hib: *Haemophilus influenzae* type b vaccine; MMR: measles–mumps–rubella vaccine; VZV: varicella zoster virus vaccine; PCV: pneumococcal conjugate vaccine; Men C: meningococcal C vaccine; HPV: human papilloma virus vaccine; Flu: influenza vaccine; Pneumo: Pneumovax 23 vaccine.

<sup>a</sup>In July 2013, the combined *Haemophilus influenzae* type b (Hib) and meningococcal C vaccine, Menitorix®, was added to the National Immunisation Program schedule at 12 months of age. This combination vaccine replaces the single dose of monovalent meningococcal C conjugate vaccine and booster dose of monovalent Hib vaccine previously scheduled at 12 months of age.

<sup>b</sup>Annual vaccination, all aged ≥6 months with medical risk factors, Aboriginal children aged ≥6 months – 5 years, Aboriginal people aged ≥15 years, non-Aboriginal adults aged ≥65 years.

<sup>c</sup>Measles, mumps, rubella, varicella introduced onto Program on 1 July 2013.

<sup>d</sup>The dose of measles–mumps–rubella at 4 years of age ceased on 1 January 2016.

<sup>e</sup>Catch-up only.

<sup>f</sup>Aboriginal adults with medical risk factors.

<sup>g</sup>All Aboriginal adults only.

<sup>h</sup>During the third trimester of pregnancy.

<sup>i</sup>At any stage of pregnancy.

Source: National Immunisation Program Schedule.

assessed at 12 months of age (for vaccines due at 6 months), 24 months of age (for vaccines due at 12 and 18 months), and 5 years of age (for vaccines due at 4 years). A 3-month lag period is allowed for the late notification of immunisations to the ACIR.<sup>6</sup> If a child's record indicates receipt of the last dose of a vaccine that requires more than one dose to complete the series, it is assumed that earlier vaccinations in the sequence have been given. This assumption has been shown to be valid.<sup>7,8</sup>

The proportion of children designated as 'fully immunised' is calculated using the number of children completely immunised with the vaccines of interest by the designated age as the numerator, and the total number of Medicare-registered children in the age cohort as the denominator. 'Fully immunised' at 12 months of age was defined as a child having a record on the ACIR of a third dose of the combined DTPa-hepB-IPV-Hib vaccine and a third dose of

13-valent pneumococcal conjugate vaccine. 'Fully immunised' at 24 months of age was defined as a child having a record on the ACIR of a third dose of the combined DTPa-hepB-IPV-Hib vaccine, a fourth dose of *Haemophilus influenzae* type b (PRP-T) vaccine (if given before 11.5 months of age), a second dose of a measles, mumps and rubella (MMR)-containing vaccine, a first dose of varicella-containing vaccine and a first dose of meningococcal C-containing vaccine. 'Fully immunised' at 60 months of age was defined as a child having a record on the ACIR of a fourth dose of a DTPa-IPV-containing vaccine, and a second dose of an MMR-containing vaccine.

Immunisation coverage estimates were also calculated at the 12-month milestone for the second dose of rotavirus vaccine, a National Immunisation Program vaccine not included in calculations for incentive payments and 'fully immunised' status.

### Timeliness

Delayed vaccination was categorised as 1–≤2 months delay, greater than 2–≤6 months delay or a delay of 7 months and greater. All children included in the analysis were old enough to potentially experience delays in immunisation greater than 6 months for immunisations assessed at 24 months of age or earlier. Timeliness of different vaccines and doses was also compared by plotting the cumulative percentage receiving each vaccine dose by age.

### Local health districts

Immunisation coverage estimates and vaccination delay estimates are presented in this report by NSW local health district (LHD). LHDs were introduced in January 2011, replacing area health services. There are 15 LHDs in NSW – eight in metropolitan NSW and seven in rural and regional NSW.

### Aboriginal status

Indigenous status on the ACIR is recorded nationally as ‘Indigenous’, ‘non-Indigenous’ or ‘unknown’, as reported by the child’s carer to Medicare, or by the immunisation provider to the ACIR. For this report, two categories of children were considered: ‘Aboriginal’ (Indigenous) and ‘non-Aboriginal’ (non-Indigenous). Children with unknown Aboriginal status were presumed to be ‘non-Aboriginal’.

### Small area coverage

Coverage was calculated for the Australian Bureau of Statistics (ABS)-defined SA3s (statistical area level 3), which form part of the new Australian Statistical Geography Standard (ASGS).<sup>9</sup> SA3s were chosen as areas to be mapped because they provide more detail than LHDs but are not too small to render maps unreadable (population sizes for a year-wide birth cohort of children for SA3s in NSW range from 110 to 2799 children). SA3s with a population size for a year-wide birth cohort of children less than 26 were excluded from any mapping due to the imprecision of any coverage estimates calculated for these areas. Maps were created using MapInfo mapping software<sup>10</sup> and the ABS Census Boundary Information. As postcode is the only geographical indicator on the ACIR, the ABS Postal Area to SA3 Concordance 2011 was used to match ACIR residential postcodes of the children to SA3s.<sup>11</sup>

### Vaccine objection status

Up until the end of 2015 parents who objected to vaccination could lodge a conscientious objection to immunisation form with the ACIR. These rendered them eligible for relevant federal government family assistance payments despite their children not being vaccinated. Other parents who do object to immunisation may not necessarily

register an objection. Among children recorded as not fully immunised on the ACIR, three subgroups were examined, defined by the following information recorded on the ACIR: (1) registered vaccine objection and no vaccines recorded on the ACIR; (2) registered vaccine objection and at least one vaccine recorded on the ACIR; and (3) no registered vaccine objection and no vaccines recorded on the ACIR (some, but not all, of whom may be unvaccinated due to unregistered objection). Proportions of children in these subgroups were calculated for all LHDs from the cohort of children registered with Medicare and born between 1 January 2009 and 31 December 2014. At the time of data extraction these children were aged between 1 year and less than 7 years. This cohort was chosen for calculating proportions so that children under the age of 1 year were not included, to allow sufficient time for registration of objection.

### Coverage in the elderly and adolescents

Influenza and pneumococcal vaccination coverage estimates in the elderly were from the 2015 NSW Population Health Survey. This is a rolling random digit-dialled telephone survey, with vaccination status determined from patient recall at the time of the interview. Influenza and pneumococcal vaccination coverage estimates are based on 4849 and 4721 respondents in NSW, respectively.<sup>12</sup> Coverage for vaccines given to adolescents was collected from the NSW School Vaccination Program. Vaccination status is recorded by school immunisation teams and the counts of children vaccinated are collated by LHDs and NSW Health. The denominator is the school population, start of year enrolments. The coverage rates may underestimate true vaccination coverage as they represent only those vaccinations received through the school program and do not include doses received from general practitioners or other immunisation providers.<sup>13</sup>

## Summary of results

### Coverage (all children)

- Overall in NSW ‘fully immunised’ coverage measured at the 12-month milestone was 92.8% during 2015 (Table 2).
- ‘Fully immunised’ coverage in NSW measured at the 24-month milestone increased marginally from 2014 to 89.6% (Table 3).
- NSW coverage at the 5-year milestone also increased marginally in 2015 to 93.1% (Table 4).
- The overall trend in NSW ‘fully immunised’ coverage at each of the 12, 24 and 60-month milestones has continued improving (Figure 1).
- For all LHDs in NSW, ‘fully immunised’ coverage at 12 months of age increased in 2015 from the previous year. Coverage for all individual vaccines (except rotavirus) was greater than 93% in NSW overall (Figure 2) and greater than 92% for all LHDs except Mid North Coast and Northern NSW (Table 2).

**Table 2. Percentage of children immunised at 12 months of age<sup>a</sup>, by vaccine for each local health district in NSW, compared with NSW and Australia, 2015**

Vaccine	Local Health District <sup>b</sup>																	Australia %
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %	WN %	WS %	NSW %	
Diphtheria, tetanus, pertussis	95.1	97.6	95.0	95.2	91.5	95.4	94.5	96.1	89.6	94.1	94.0	93.4	93.7	93.9	94.2	93.1	93.9	93.8
Poliomyelitis	95.1	97.6	95.0	95.2	91.5	95.4	94.5	95.9	89.6	94.0	93.9	93.4	93.7	93.8	94.2	93.1	93.9	93.8
<i>Haemophilus influenzae</i> type b	95.0	97.6	94.9	95.0	91.3	95.3	94.3	95.9	89.5	93.4	93.7	93.1	93.6	93.5	94.2	92.5	93.6	93.5
Hepatitis B	95.0	97.6	94.8	95.0	91.1	95.3	94.3	95.9	89.4	93.2	93.4	93.2	93.5	93.3	94.2	92.5	93.5	93.4
Rotavirus	90.3	95.7	90.3	90.3	86.6	90.5	90.0	92.5	84.4	89.2	89.1	87.6	89.2	88.4	87.9	87.5	88.7	85.4
13vPCV	94.7	97.6	94.8	95.0	91.0	95.2	94.3	95.9	88.9	92.9	93.4	92.9	93.5	93.1	94.3	92.2	93.3	93.3
Fully immunised <sup>c</sup>	94.7	97.6	94.6	94.8	90.7	95.0	94.0	95.8	88.6	92.0	92.8	92.5	93.3	92.3	94.1	91.4	92.8	92.9
Total number of children	4026	368	11 057	4511	2284	2949	5096	662	3159	10 890	10 979	13 790	2170	7843	3871	14 822	99 313	309 337

<sup>a</sup>Cohort born 1 January 2014 – 31 December 2014.  
<sup>b</sup>CC: Central Coast; FW: Far West; HNE: Hunter New England; IS: Illawarra Shoalhaven; MN: Mid North Coast; MM: Murrumbidgee; NBM: Nepean Blue Mountains; NV: Network with Victoria; NN: Northern NSW; NS: Northern Sydney; SES: South Eastern Sydney; SWS: South Western Sydney; SN: Southern NSW; SYD: Sydney; WN: Western NSW; WS: Western Sydney; NSW: New South Wales.  
<sup>c</sup>Three doses of the combined DTPa-hepB-IPV-Hib vaccine plus 13vPCV. The third dose assumption is applied.  
Source: Australian Childhood Immunisation Register, data as at 31 March 2016.

**Table 3. Percentage of children immunised at 24 months of age<sup>a</sup>, by vaccine for each local health district in NSW, compared with NSW and Australia, 2015**

Vaccine	Local Health District <sup>b</sup>																	Australia %
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %	WN %	WS %	NSW %	
Diphtheria, tetanus, pertussis	97.0	96.5	97.0	96.9	94.5	97.1	96.0	96.8	90.9	95.0	95.4	95.9	95.6	95.5	97.8	95.0	95.7	95.8
Poliomyelitis	97.0	96.5	97.0	96.8	94.6	97.1	96.0	96.8	90.9	94.9	95.4	95.9	95.6	95.4	97.7	94.9	95.7	95.8
<i>Haemophilus influenzae</i> type b (Hib)	95.9	94.3	96.1	95.7	93.1	96.0	94.8	95.0	88.9	92.8	93.5	94.5	94.2	93.6	96.6	92.9	94.1	94.0
Meningococcal C (MenC)	96.4	95.1	96.6	96.3	93.4	96.3	95.0	95.5	89.3	93.4	94.0	94.6	94.4	93.8	97.0	92.7	94.4	94.4
Hepatitis B	96.8	96.2	96.9	96.6	94.4	96.9	95.9	96.6	90.3	93.8	94.8	95.7	95.4	94.8	97.6	94.3	95.5	95.3
Measles–mumps–rubella (MMR) Dose 1	95.9	95.7	96.4	95.9	93.6	96.1	94.9	95.7	89.3	93.3	93.9	94.4	94.3	93.9	96.8	93.5	94.4	94.7
Measles–mumps–rubella (MMR) Dose 2	93.6	92.7	93.8	93.5	89.9	94.4	92.3	93.4	86.3	90.7	91.3	91.8	91.9	91.8	93.9	90.3	91.8	91.8
Varicella	93.2	91.6	93.4	93.1	89.4	93.4	91.8	93.3	85.8	90.8	91.1	91.5	91.4	91.5	93.5	90.5	91.5	91.5
Fully immunised <sup>c</sup>	92.0	90.5	91.9	91.8	88.2	92.4	90.3	92.1	84.8	88.1	89.1	89.6	89.9	89.1	92.1	87.6	89.6	89.5
Total number of children	4245	369	11 454	4705	2430	3006	5073	681	3373	10 830	10 632	13 817	2227	7443	3830	14 765	99 688	308 623

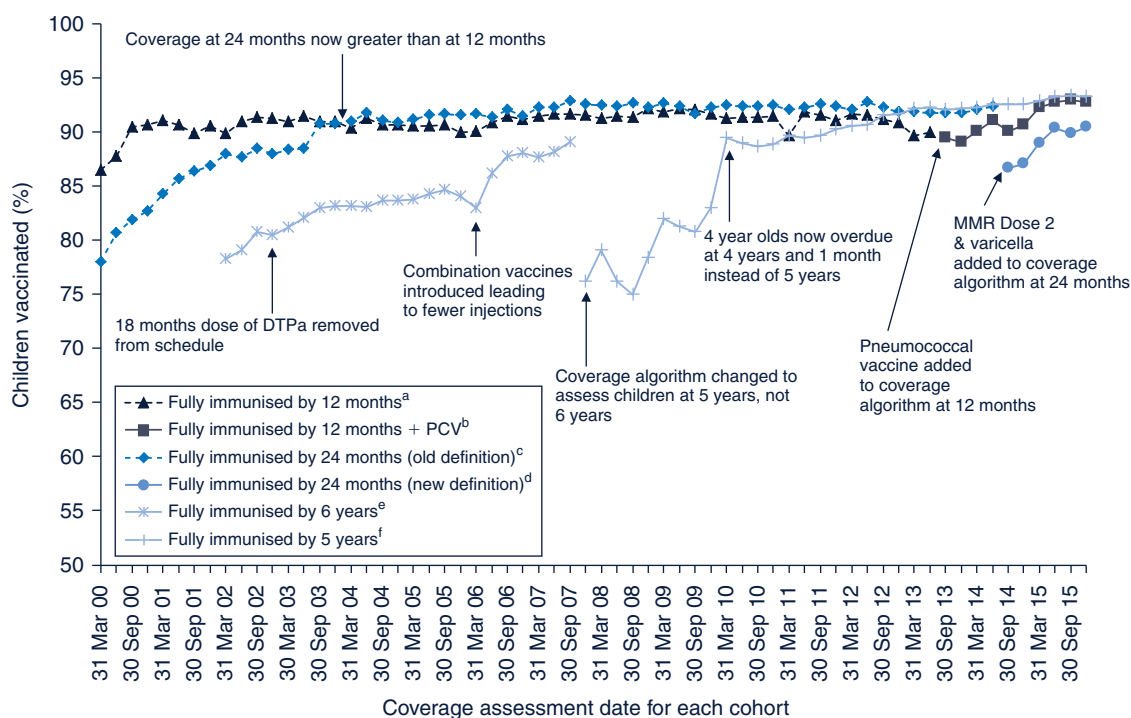
<sup>a</sup>Cohort born 1 January 2013 – 31 December 2013.  
<sup>b</sup>CC: Central Coast; FW: Far West; HNE: Hunter New England; IS: Illawarra Shoalhaven; MN: Mid North Coast; MM: Murrumbidgee; NBM: Nepean Blue Mountains; NV: Network with Victoria; NN: Northern NSW; NS: Northern Sydney; SES: South Eastern Sydney; SWS: South Western Sydney; SN: Southern NSW; SYD: Sydney; WN: Western NSW; WS: Western Sydney; NSW: New South Wales.  
<sup>c</sup>A third dose of the combined DTPa-hepB-IPV-Hib vaccine, a fourth dose of *Haemophilus influenzae* type b (PRP-T) vaccine, and a second dose of a measles–mumps–rubella (MMR)-containing vaccine, first dose of meningococcal and first dose of varicella.  
Source: Australian Childhood Immunisation Register, data as at 31 March 2016.

- Coverage for rotavirus in NSW increased marginally in 2015 to 88.7%. Increases were seen in all LHDs except Western NSW. Coverage for rotavirus remained lower than other vaccines as catch-up cannot be given once infants turn 15 weeks (dose 1) and 25 weeks (dose 2) of age.
- For all LHDs ‘fully immunised’ coverage at 24 months of age increased in 2015. At this milestone, ‘fully immunised’ coverage for Mid North Coast, Northern NSW, Northern Sydney, South Eastern Sydney, South Western Sydney, Southern NSW, Sydney and Western Sydney remained below 90%, whilst in the Central Coast, Murrumbidgee, Network with Victoria and Western NSW, ‘fully immunised’ coverage at 24 months of age increased above 92% (Table 3).
- Coverage in NSW for all individual vaccines (except the second dose of MMR and varicella) at the 24-month milestone was greater than 94% (Table 3, Figure 3) and greater than 92% for all LHDs except for Northern NSW (Table 3).

**Table 4. Percentage of children immunised at 5 years of age<sup>a</sup>, by vaccine for each local health district in NSW, compared with NSW and Australia, 2015**

Disease	Local Health District <sup>b</sup>																	Australia %
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %	WN %	WS %	NSW %	
Diphtheria, tetanus, pertussis	94.9	97.1	96.1	95.0	92.9	96.4	95.2	95.1	88.7	91.7	91.7	94.4	94.3	92.5	96.3	93.2	93.7	93.2
Poliomyelitis	94.9	97.1	96.1	95.0	92.8	96.3	95.2	95.3	88.7	91.8	91.7	94.5	94.3	92.5	96.4	93.3	93.7	93.2
Measles–mumps–rubella	94.8	97.1	96.2	94.9	92.8	96.2	95.0	95.8	88.8	91.4	91.6	94.6	94.5	92.5	96.4	93.3	93.7	93.2
Fully immunised <sup>c</sup>	94.3	96.6	95.7	94.5	92.3	95.8	94.4	94.7	88.2	90.8	91.0	94.0	93.7	91.9	96.1	92.6	93.1	92.6
Total number of children	4288	382	11 585	4888	2656	3190	5098	695	3536	11 994	10 202	13 803	2445	6881	3955	14 462	100 926	312 424

<sup>a</sup>Cohort born 1 January 2010 – 31 December 2010.  
<sup>b</sup>CC: Central Coast; FW: Far West; HNE: Hunter New England; IS: Illawarra Shoalhaven; MN: Mid North Coast; MM: Murrumbidgee; NBM: Nepean Blue Mountains; NV: Network with Victoria; NN: Northern NSW; NS: Northern Sydney; SES: South Eastern Sydney; SWS: South Western Sydney; SN: Southern NSW; SYD: Sydney; WN: Western NSW; WS: Western Sydney; NSW: New South Wales.  
<sup>c</sup>A fourth dose of combined DTPa-IPV vaccine, and a second dose of a measles–mumps–rubella (MMR)-containing vaccine.  
 Source: Australian Childhood Immunisation Register, data as at 31 March 2016.



**Figure 1. Trends in ‘fully immunised’<sup>a,b,c,d,e</sup> vaccination coverage, NSW, 2000–2015.**

- <sup>a</sup>A third dose of the combined DTPa-hepB-IPV-Hib vaccine up until July 2013.
- <sup>b</sup>A third dose of the combined DTPa-hepB-IPV-Hib vaccine and a third dose of pneumococcal conjugate vaccine since July 2013.
- <sup>c</sup>A third dose of the combined DTPa-hepB-IPV-Hib vaccine, a fourth dose of *Haemophilus influenzae* type b (PRP-T) vaccine, and a first dose of a measles, mumps and rubella (MMR)-containing vaccine.
- <sup>d</sup>From July 2014, 24-month algorithm changed to also include a second dose of MMR, a first dose of MenC and a first dose of varicella.
- <sup>e</sup>A fourth dose of combined DTPa-IPV vaccine, and a second dose of an MMR-containing vaccine by 6 years of age up to December 2007.
- <sup>f</sup>A fourth dose of combined DTPa-IPV vaccine, and a second dose of an MMR-containing vaccine by 5 years of age since January 2008.

Source: Australian Childhood Immunisation Register, data as at 31 March 2016.

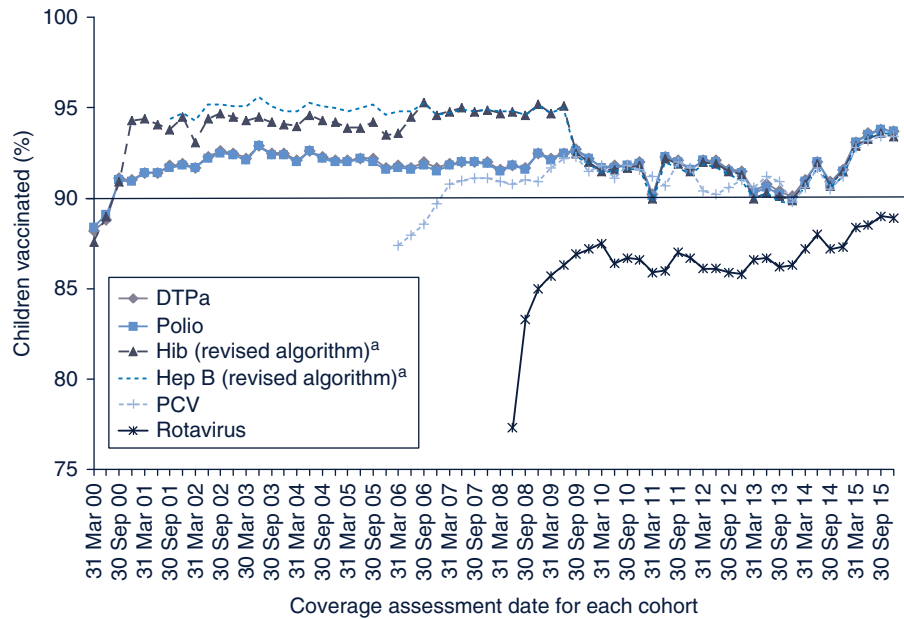


Figure 2. Trends in vaccination coverage estimates by vaccine at 12 months of age, third dose of DTPa, polio, hepatitis B, Hib, rotavirus and PCV, NSW, 2000–2015.

By 3-month birth cohorts born between 1 January 1999 and 31 December 2014. Coverage assessment date was 12 months after the last birth date of each cohort.

<sup>a</sup>Prior to September 2009, the algorithm stated that receipt of two or three doses of *Haemophilus influenzae* type b (Hib) and hepatitis B vaccines rendered a child 'fully immunised' for these vaccines. After September 2009, changes to the algorithm were made to tighten the rules regarding 'fully immunised' for Hib and hepatitis B vaccines. The new algorithm assessed 2 or 3 doses of PRP-OMP containing Hib vaccine or 3 doses of any other Hib vaccine, and 2 or 3 doses of Comvax® hepatitis B vaccine or 3 doses of all other hepatitis B vaccines.

PCV: pneumococcal conjugate vaccine

DTPa: diphtheria–tetanus–pertussis (acellular) – paediatric formulation

Source: Australian Childhood Immunisation Register, data as at 31 March 2016.

- In NSW during 2015, the majority of the fourth dose of *Haemophilus influenzae* type b vaccine and the dose of meningococcal C vaccine was given as the combined vaccine Menitorix® given at 12 months of age (92.7%).
- In 2015, coverage at 24 months of age for the first dose of MMR was 94.4% (Table 3). Coverage for the second dose of MMR and the dose of varicella increased to greater than 90% for all LHDs except for Northern NSW and the Mid North Coast. The majority of the second dose of MMR and the dose of varicella were given as the combined MMRV vaccine (either Priorix Tetra® or ProQuad®) at 18 months (90.2%).
- Coverage of the second dose of MMR at the 24 month milestone increased from 2014 by over 2 percentage points to 91.8% (Table 3). Coverage at 5 years of age remained higher at 93.7% (Table 4). The differential between the two milestone estimates decreased from 3.4 to 1.9 percentage points.
- Varicella coverage at 24 months of age continued to increase in NSW and was above 90% in all LHDs except for Mid North Coast and Northern NSW.
- 'Fully immunised' coverage and coverage for all individual vaccines for the 5-year milestone in NSW was greater than 93% (Table 4, Figure 4) and greater than 90% in all LHDs except Northern NSW (Table 4).

#### Indigenous coverage

- In 2015, 'fully immunised' coverage was lower for Aboriginal children than non-Aboriginal children at the 12-month milestone (92.0% versus 92.9%) and the 24-month milestone (88.9% versus 89.6%) but was higher (95.6% versus 93.0%) for Aboriginal children at the 60-month milestone (Table 5).
- 'Fully immunised' coverage for Aboriginal children at the 12-month milestone was lower compared to non-Aboriginal children in most LHDs apart from Northern NSW, Northern Sydney and South Eastern Sydney where 'fully immunised' coverage was higher for Aboriginal children. Coverage in the Central Coast and Mid North Coast was similar for Aboriginal and non-Aboriginal children.

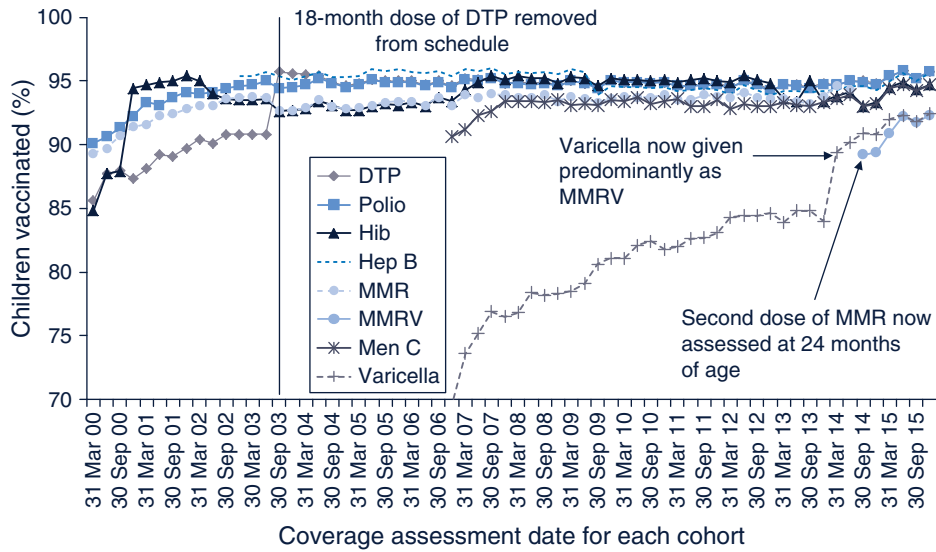


Figure 3. Trends in vaccination coverage estimates by vaccine at 24 months of age, third dose of DTPa (fourth dose – pre September 2003), third dose of polio, third dose of hepatitis B, fourth dose of Hib, second dose of MMR (first dose – pre July 2014), one dose of varicella and one dose of men C, NSW 2000–2015.

By 3-month birth cohorts born between 1 January 1998 and 31 December 2013. Coverage assessment date was 24 months after the last birth date of each cohort.

DTPa: diphtheria–tetanus–pertussis (acellular) – paediatric formulation

Hep B: hepatitis B

Hib: *Haemophilus influenzae* type b

Men C: meningococcal C

MMR: measles–mumps–rubella

MMRV: measles–mumps–rubella–varicella

Source: Australian Childhood Immunisation Register, data as at 31 March 2016.

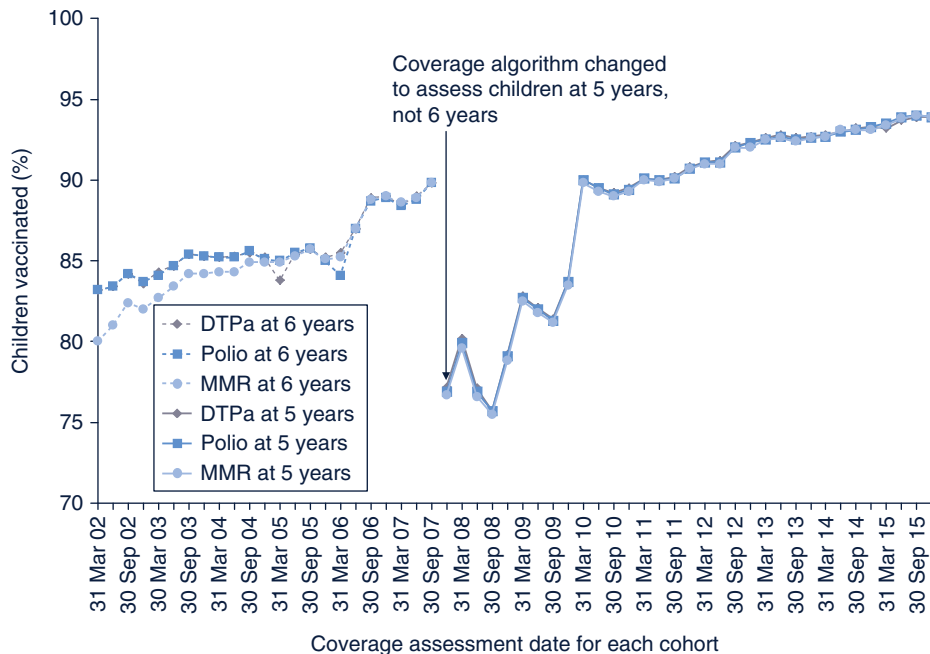


Figure 4. Trends in vaccination coverage estimates by vaccine, fourth dose of DTPa and polio and second dose of MMR at 5 years of age (6 years up to December 2007), NSW, 2002–2015.

By 3-month birth cohorts born between 1 January 1996 and 31 December 2010. Coverage assessment date was 72 months after the last birth date of each cohort up to December 2007 and then 60 months after the last birth date of each cohort.

DTPa: diphtheria–tetanus–pertussis (acellular) – paediatric formulation

MMR: measles–mumps–rubella

Source: Australian Childhood Immunisation Register, data as at 31 March 2016.



Table 5. Percentage of children fully immunised at 12 months<sup>a</sup>, 24 months<sup>b</sup> and 5 years of age<sup>c</sup>, by Aboriginal status for each local health district in NSW, compared with NSW and Australia, 2015

Child age and Aboriginal status	Local Health District <sup>d</sup>														NSW %	Australia %		
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %			WN %	WS %
<b>12 months – fully immunised<sup>a</sup></b>																		
Aboriginal	94.6	93.6	93.9	91.4	90.8	93.1	91.6	95.0	94.4	100.0	94.6	92.0	90.1	90.7	88.9	88.4	92.0	89.6
Non-Aboriginal	94.7	98.6	94.7	95.1	90.7	95.2	94.1	95.9	87.9	92.0	92.8	92.5	93.5	92.4	95.4	91.5	92.9	93.0
<b>24 months – fully immunised<sup>b</sup></b>																		
Aboriginal	92.4	90.6	90.0	88.6	93.3	87.2	89.3	93.9	85.0	90.9	87.9	94.2	85.4	88.6	86.1	85.0	88.9	86.4
Non-Aboriginal	92.0	90.5	92.2	92.0	87.5	93.0	90.4	91.9	84.7	88.1	89.1	89.5	90.3	89.1	93.5	87.6	89.6	89.7
<b>5 years – fully immunised<sup>c</sup></b>																		
Aboriginal	96.7	100.0	97.1	95.1	95.2	96.4	95.5	98.0	93.4	94.6	92.5	94.8	97.9	93.6	95.2	93.6	95.6	94.4
Non-Aboriginal	94.2	95.7	95.5	94.5	92.0	95.7	94.4	94.4	87.7	90.8	91.0	93.9	93.5	91.8	96.3	92.5	93.0	92.5

<sup>a</sup>Cohort born 1 January 2014 – 31 December 2014: three doses of the combined DTPa-hepB-IPV-Hib vaccine plus 13vPCV. The third dose assumption is applied.

<sup>b</sup>Cohort born 1 January 2013 – 31 December 2013: three or four doses of a DTP-containing vaccine, three doses of polio vaccine, three or four doses of PRP-OMP containing Hib vaccine or four doses of any other Hib vaccine, three or four doses of Comvax<sup>®</sup> hepatitis B vaccine or four doses of all other hepatitis B vaccines, and two doses of a measles-mumps-rubella (MMR)-containing vaccine, one dose of a varicella vaccine and one dose of a meningococcal C vaccine.

<sup>c</sup>Cohort born 1 January 2010 – 31 December 2010: four or five doses of a DTP-containing vaccine, four doses of polio vaccine, and two doses of an MMR-containing vaccine.

<sup>d</sup>CC: Central Coast; FW: Far West; HNE: Hunter New England; IS: Illawarra Shoalhaven; MN: Mid North Coast; MM: Murrumbidgee; NBM: Nepean Blue Mountains; NV: Network with Victoria; NN: Northern NSW;

NS: Northern Sydney; SES: South Eastern Sydney; SWS: South Western Sydney; SN: Southern NSW; SYD: Sydney; WN: Western NSW; WS: Western Sydney; NSW: New South Wales.

Source: Australian Childhood Immunisation Register, data as at 31 March 2016.

- At the 24-month milestone, ‘fully immunised’ coverage for Aboriginal children was lower in half of the NSW LHDs. ‘Fully immunised’ coverage at this milestone in the Far West was similar for Aboriginal and non-Aboriginal children, but higher for Aboriginal children in the Central Coast, Mid North Coast, Network with Victoria, Northern NSW, Northern Sydney and South Western Sydney.
- At the 60-month milestone, ‘fully immunised’ coverage was higher for Aboriginal than non-Aboriginal children in all LHDs except Western NSW.
- Coverage estimates for all individual vaccines were lower in Aboriginal children at 12 months of age (Table 6). Coverage estimates for individual vaccines were higher in Aboriginal children at 24 months of age, except for the second dose of MMR and the varicella vaccine. Coverage estimates for all individual vaccines were higher in Aboriginal children at 60 months of age (Table 6).

#### Timeliness

- For the third dose of DTPa and the second dose of MMR vaccines, there were greater delays in immunisation for Aboriginal children than non-Aboriginal children in NSW and for most LHDs (Tables 7 and 8).
- The majority of delayed vaccination fell into the 1–≤2 months delay category for both Aboriginal and non-Aboriginal children in all LHDs.
- For DTPa coverage measured at the 12-month milestone, the disparity in ‘on time vaccination’ between Aboriginal and non-Aboriginal decreased from the 2014 report by 3.6 percentage points to 13.6% (Figure 5), due to improved timeliness of DTPa vaccination for Aboriginal children. The disparity in ‘on time vaccination’ for the second dose of MMR due at 18 months of age remained steady in 2015 at 12.4% (Figure 6).
- During 2015, the percentage of children in NSW who received their first dose of hexavalent combination

Table 6. Vaccination coverage estimates by age, vaccine antigen and Aboriginal status in NSW, 2015

Disease	Milestone age	Aboriginal	Non-Aboriginal
Diphtheria–tetanus–pertussis	12 months <sup>a</sup>	92.1	94.0
	24 months <sup>b</sup>	96.8	95.7
	5 years <sup>c</sup>	96.1	93.6
Poliomyelitis	12 months <sup>a</sup>	92.1	93.9
	24 months <sup>b</sup>	96.8	95.6
	5 years <sup>c</sup>	96.1	93.6
<i>Haemophilus influenzae</i> type b	12 months <sup>a</sup>	92.1	93.6
	24 months <sup>b</sup>	95.3	94.0
	5 years <sup>c</sup>	NI	NI
Hepatitis B	12 months <sup>a</sup>	92.1	93.6
	24 months <sup>b</sup>	96.8	95.1
	5 years <sup>c</sup>	NI	NI
Measles–mumps–rubella	12 months <sup>a</sup>	NI	NI
	24 months <sup>b</sup> Dose 1	96.0	94.3
	24 months <sup>b</sup> Dose 2	91.0	91.8
	5 years <sup>c</sup>	96.1	93.6
Meningococcal C	12 months <sup>a</sup>	NI	NI
	24 months <sup>b</sup>	96.1	94.3
	5 years <sup>c</sup>	NI	NI
Varicella	12 months <sup>a</sup>	NI	NI
	24 months <sup>b</sup>	90.4	91.6
	5 years <sup>c</sup>	NI	NI
Pneumococcal conjugate vaccine	12 months <sup>a</sup>	92.2	93.4
	24 months <sup>b</sup>	NI	NI
	5 years <sup>c</sup>	NI	NI
Rotavirus	12 months <sup>a</sup>	85.1	88.9
	24 months <sup>b</sup>	NI	NI
	5 years <sup>c</sup>	NI	NI

<sup>a</sup>Cohort born 1 January 2014 – 31 December 2014.

<sup>b</sup>Cohort born 1 January 2013 – 31 December 2013.

<sup>c</sup>Cohort born 1 January 2010 – 31 December 2010.

NI: this vaccine at this age milestone is not included in the calculation of coverage estimates.

vaccine between 6 and less than 8 weeks steadily rose to its highest reported level of 82% (Figure 7). This percentage has been increasing since 2009 when vaccination at 6 weeks was encouraged to provide early protection against whooping cough.

#### Small area coverage

- Coverage by small area (SA3) varied across the state for rotavirus (77.4–97.2%) and pneumococcal conjugate vaccine (83.5–98.8%) measured at the 12-month milestone, and the second dose of MMR (80.3–97.4%) measured at the 24-month milestone (Figures 8–10).

#### Vaccine objection status

- The percentage of children with a registered vaccine objection varied by LHD, from a high of 7.2% in Northern NSW to a low of 0.9% in Western Sydney (Table 9). The percentage of children with no vaccines recorded and with no registered objection also varied by LHD and ranged from 0.8% in the Far West to 2.7% in Sydney (Table 9).

#### Adolescent coverage

- Coverage in adolescents varied by vaccine and dose with coverage for varicella substantially lower than the coverage estimates for the three doses of human

Table 7. Percentage of children<sup>a</sup> with vaccination delay for the third dose of DTPa by Aboriginal status for each local health district in NSW, 2015

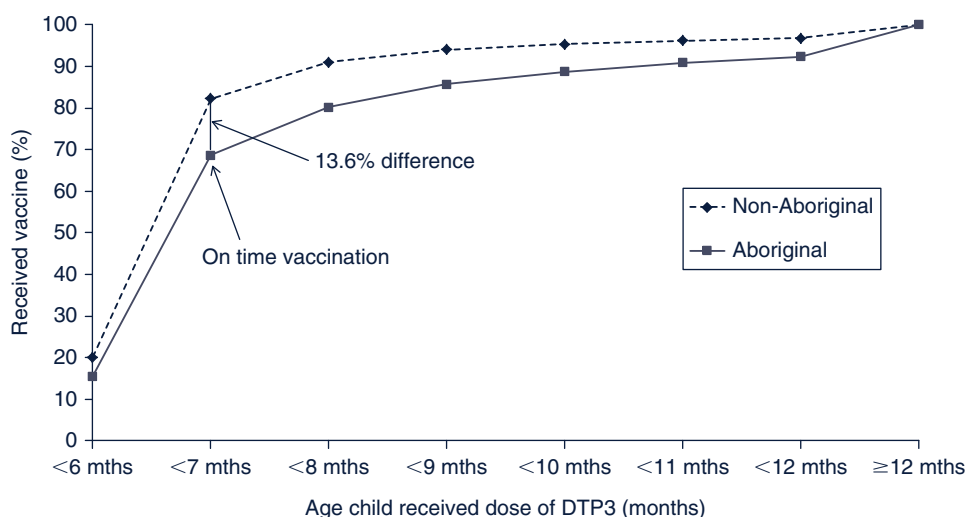
Vaccination delay and Aboriginal status	Local Health District <sup>b</sup>																	
	CC	FW	HNE	IS	MN	MM	NBM	NV	NN	NS	SES	SWS	SN	SYD	WN	WS	NSW	
<b>1–≤2 months late</b>																		
Aboriginal (%)	13.9	15.8	15.3	18.0	18.2	12.6	21.2	26.5	20.2	21.2	11.7	20.2	15.7	19.7	18.8	18.3	17.2	
Non-Aboriginal (%)	13.6	15.0	10.0	13.3	12.9	12.7	13.2	12.0	12.9	10.5	9.8	14.4	12.7	10.1	11.3	11.6	11.8	
<b>3–≤6 months late</b>																		
Aboriginal (%)	8.0	2.1	7.8	6.1	7.5	8.3	4.2	8.2	7.6	6.1	6.8	7.0	15.0	9.2	10.0	9.9	8.1	
Non-Aboriginal (%)	4.3	3.4	3.1	3.4	3.5	3.3	3.8	3.9	3.7	2.5	2.5	4.0	3.8	2.8	2.7	3.0	3.2	
<b>≥7 months late</b>																		
Aboriginal (%)	4.2	9.5	5.0	5.2	3.3	9.4	4.2	4.1	5.3	6.1	5.8	4.5	7.1	2.6	9.0	7.3	6.1	
Non-Aboriginal (%)	2.3	3.0	2.9	2.5	3.3	2.9	2.9	2.6	4.1	2.4	2.1	3.2	2.8	2.3	2.2	3.4	2.8	

<sup>a</sup>Cohort born 1 January 2013 – 31 December 2013.  
<sup>b</sup>CC: Central Coast; FW: Far West; HNE: Hunter New England; IS: Illawarra Shoalhaven; MN: Mid North Coast; MM: Murrumbidgee; NBM: Nepean Blue Mountains; NV: Network with Victoria; NN: Northern NSW; NS: Northern Sydney; SES: South Eastern Sydney; SWS: South Western Sydney; SN: Southern NSW; SYD: Sydney; WN: Western NSW; WS: Western Sydney; NSW: New South Wales.  
DTPa: diphtheria–tetanus–pertussis (acellular) – paediatric formulation.  
Source: Australian Childhood Immunisation Register, data as at 31 March 2016.

Table 8. Percentage of children<sup>a</sup> with vaccination delay for the second dose of measles–mumps–rubella due at 18 months of age by Aboriginal status for each local health district in NSW, 2015

Vaccination delay and Aboriginal status	Local Health District <sup>b</sup>																	
	CC	FW	HNE	IS	MN	MM	NBM	NV	NN	NS	SES	SWS	SN	SYD	WN	WS	NSW	
<b>1–≤2 months late</b>																		
Aboriginal (%)	22.3	22.1	21.0	20.2	24.3	21.2	24.2	18.4	25.2	28.1	21.0	26.0	28.9	23.4	23.2	25.5	22.8	
Non-Aboriginal (%)	19.8	18.5	16.0	18.2	18.1	18.3	17.7	17.3	20.4	16.4	16.7	19.7	21.7	15.2	17.1	16.9	17.5	
<b>3–≤6 months late</b>																		
Aboriginal (%)	8.8	2.1	9.7	7.5	8.2	10.6	11.9	12.2	12.3	6.3	5.0	12.3	12.6	14.3	13.2	12.9	10.5	
Non-Aboriginal (%)	6.0	5.8	4.4	5.5	6.8	4.3	5.7	3.8	5.8	4.6	4.5	6.4	6.4	4.4	6.1	5.2	5.2	
<b>≥7 months late</b>																		
Aboriginal (%)	2.8	5.3	3.7	5.9	2.6	5.8	4.2	4.1	5.4	3.2	4.0	0.4	4.4	1.3	4.8	4.2	4.0	
Non-Aboriginal (%)	1.8	2.7	1.7	1.7	2.4	1.6	2.5	2.1	2.9	2.1	2.0	2.4	2.1	1.8	1.4	3.0	2.2	

<sup>a</sup>Cohort born 1 January 2013 – 31 December 2013.  
<sup>b</sup>CC: Central Coast; FW: Far West; HNE: Hunter New England; IS: Illawarra Shoalhaven; MN: Mid North Coast; MM: Murrumbidgee; NBM: Nepean Blue Mountains; NV: Network with Victoria; NN: Northern NSW; NS: Northern Sydney; SES: South Eastern Sydney; SWS: South Western Sydney; SN: Southern NSW; SYD: Sydney; WN: Western NSW; WS: Western Sydney; NSW: New South Wales.  
Source: Australian Childhood Immunisation Register, data as at 31 March 2016.

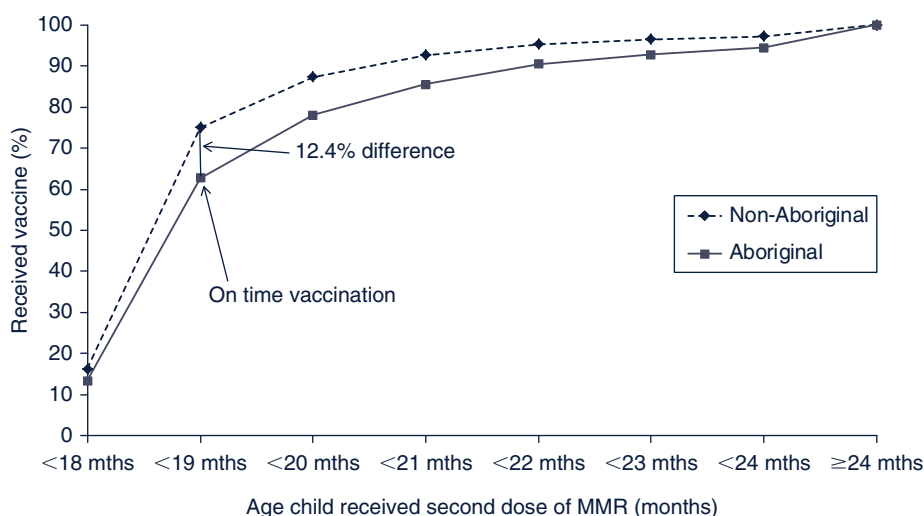


**Figure 5. Timeliness of the third dose of DTPa vaccine (DTPa3) by Aboriginal status for the cohort of children born in 2013 in NSW.**

Percentage covered = number of children who received vaccine dose at particular ages/the total number of children who received the vaccine dose.

DTPa: diphtheria–tetanus–pertussis (acellular) – paediatric formulation

Source: Australian Childhood Immunisation Register, data as at 31 March 2016.



**Figure 6. Timeliness of the second dose of MMR vaccine due at 18 months of age by Aboriginal status for the cohort of children born in 2013 in NSW.**

Percentage covered = number of children who received vaccine dose at particular ages/the total number of children who received the vaccine dose.

MMR: measles–mumps–rubella

Source: Australian Childhood Immunisation Register, data as at 31 March 2016.

- papillomavirus (HPV) vaccine (both females and males) and the dTpa vaccine (Table 10).
- Compared to the first and second doses of HPV vaccine, the third dose was lower in both females and males (Table 10).
- Coverage of each dose of HPV was higher in female Year 7 students than their male counterparts (Figure 11).
- Over the past 5 years there has been an increase in adolescent coverage for most vaccines (Table 10).
- Varicella vaccine is only recommended for children who were not vaccinated in infancy or who have not had the disease. Coverage for this vaccine increased in 2015 by more than 20% compared to 2014 (Table 10).

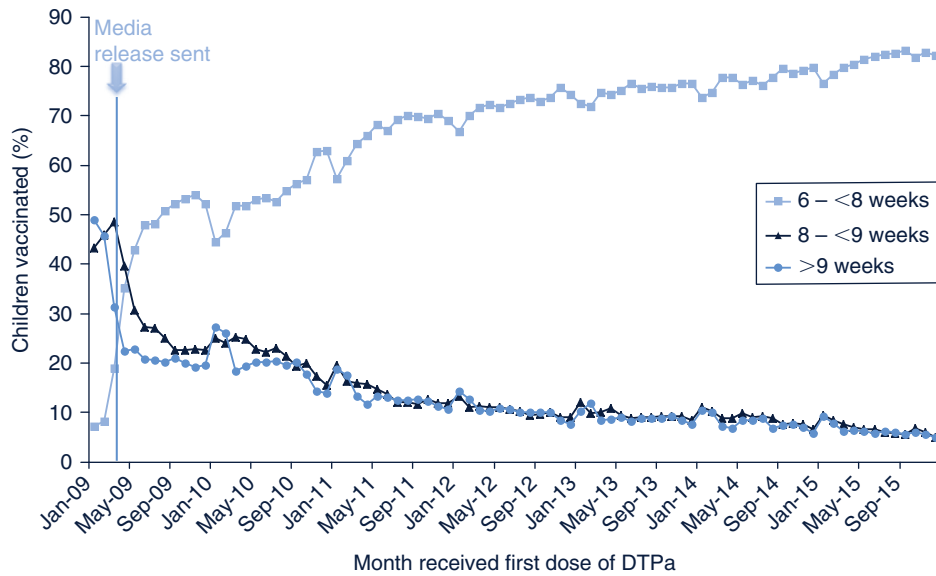


Figure 7. Age at which children in NSW received their first dose of hexavalent combination vaccine by month of receipt, January 2009–December 2015.

The media release was a message for providers and the public on 10 March 2009 that asked parents and providers to consider bringing the first dose of pertussis-containing vaccine forward to 6 weeks of age to provide earlier protection. Hexavalent combination: diphtheria–tetanus–pertussis (acellular), polio, Hib, hepatitis B – paediatric formulation.

Source: Australian Childhood Immunisation Register, data as at 31 March 2016.

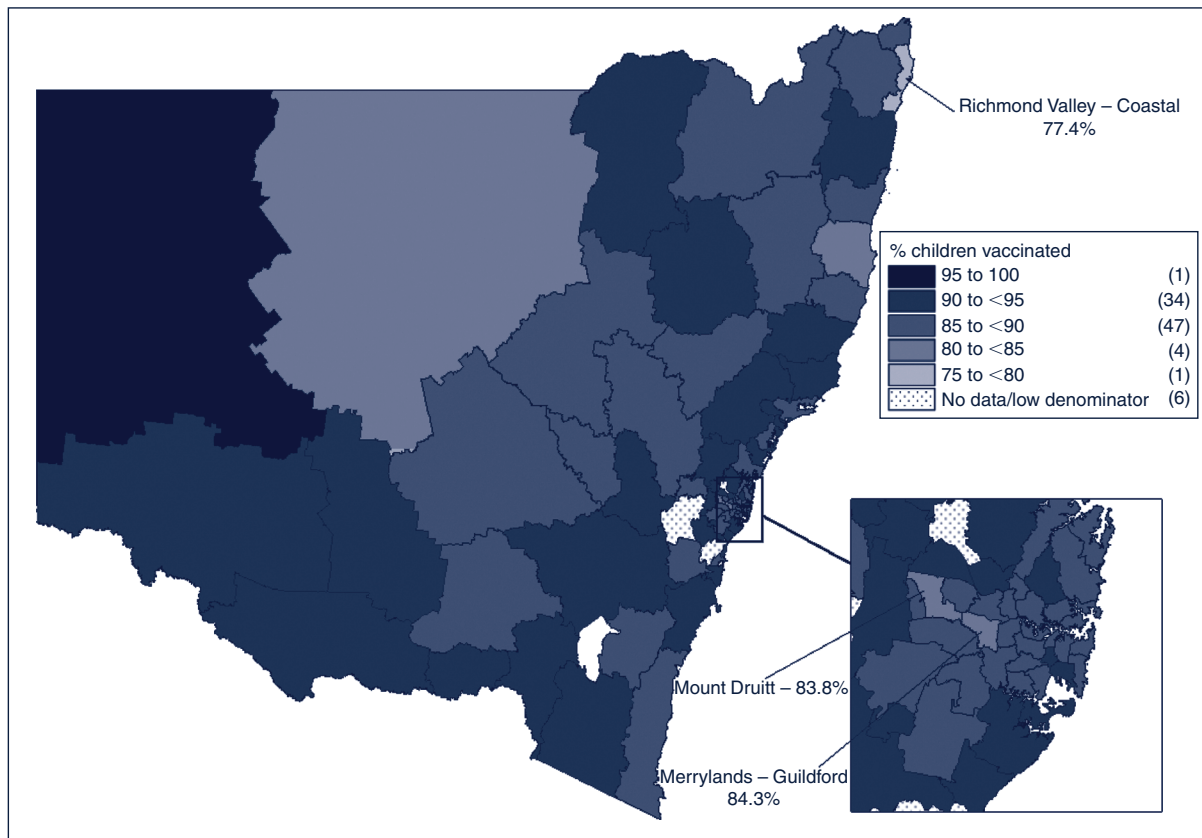


Figure 8. Rotavirus vaccine coverage at 12 months of age, by statistical area level 3, NSW, for the cohort of children born in 2014.

Source: Australian Childhood Immunisation Register, data as at 31 March 2016.

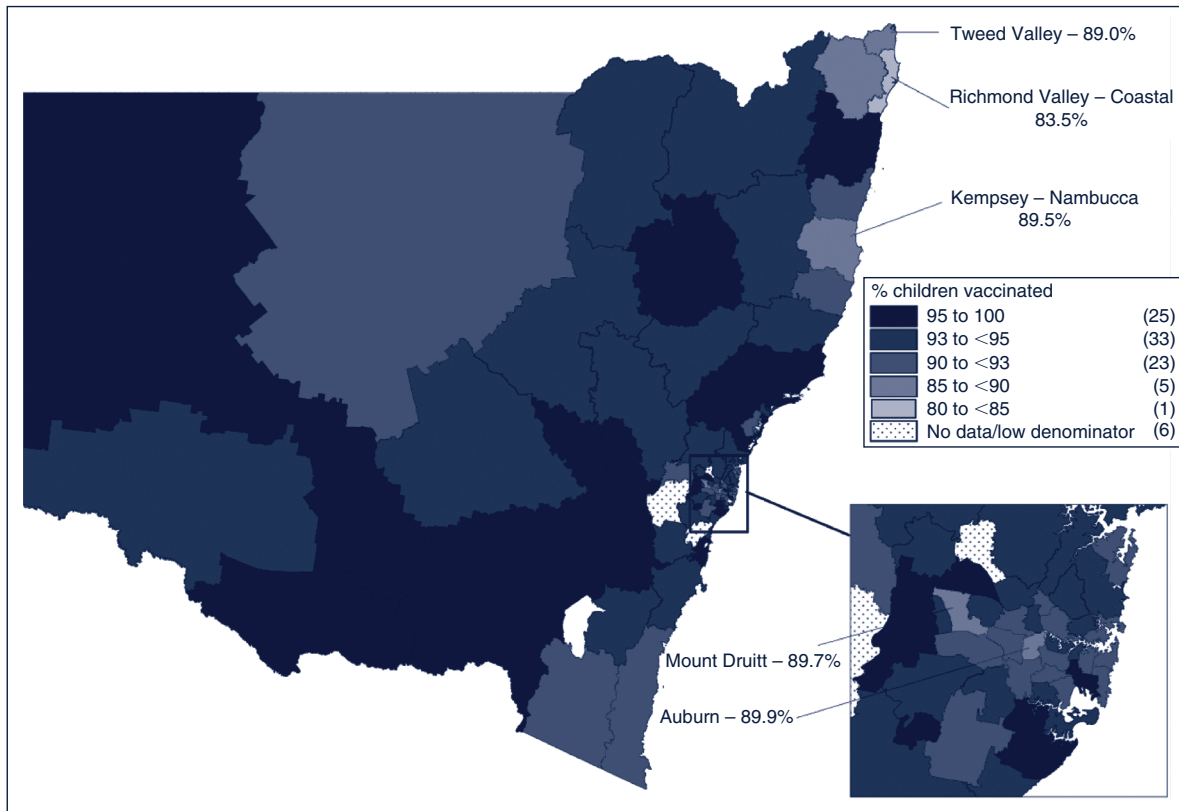


Figure 9. Pneumococcal conjugate vaccine coverage at 12 months of age, by statistical area level 3, NSW, for the cohort of children born in 2014.

Source: Australian Childhood Immunisation Register, data as at 31 March 2016.

#### Coverage in the elderly

- The proportion of people aged 65 years and over with reported vaccination for influenza in the previous 12 months has remained relatively stable between 2002 and 2015 (Figure 12). In 2015, 71.9% of surveyed adults reported they had received the influenza vaccine in the 12 months prior. Coverage did vary between LHDs and ranged from 67.1% in the Mid North Coast to 77.1% in the Central Coast (Table 11).
- The percentage of people aged 65 years and over with reported pneumococcal vaccination (23-valent pneumococcal polysaccharide vaccine) is lower than influenza coverage and has been decreasing since 2011 (Figure 12), when it was recommended that non-Indigenous adults aged 65 years and over who do not have any condition predisposing them to an increased risk of invasive pneumococcal disease no longer require a repeat dose. It is possible that difficulty in recall may result in underestimation of pneumococcal vaccine uptake. Compared to 2014, pneumococcal coverage did remain stable at 47% in 2015; however, there was variation in reported vaccination between LHDs, ranging from 40.9% in South Western Sydney and 54.1 in Western NSW (Table 11).

#### Conclusion

ACIR data presented in this 2015 report reflects the continued successful delivery of the National Immunisation Program in NSW. This is the first report where the ‘fully immunised’ coverage estimates have increased across each of the three milestones when compared to the previous report. Between 2014 and 2015, the increase in the ‘fully immunised’ estimates for the 12-month milestone is the largest increase that has been observed since the inception of these reports. Recorded vaccination objection remained steady across NSW.

The report identifies some areas for improvement, especially with regard to vaccination coverage in Aboriginal children. Whilst ‘fully immunised’ and individual vaccine coverage has improved for Aboriginal children across NSW, ‘fully immunised’ coverage estimates do remain lower in Aboriginal children compared to non-Aboriginal children at the 12 and 24-month milestones. Encouragingly, at the 60-month milestone, ‘fully immunised’ coverage for Aboriginal children is more than 2.5 percentage points higher than for non-Aboriginal children in NSW, and is in fact over 93% in all LHDs except for South

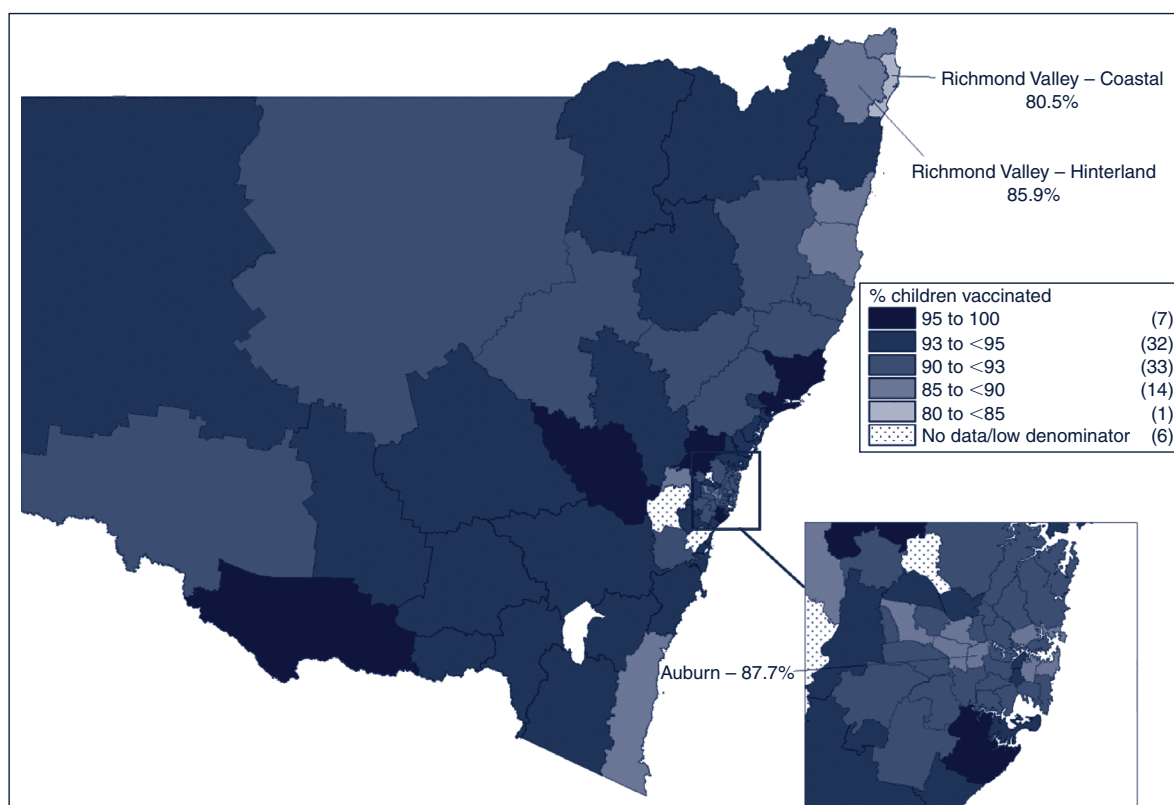


Figure 10. Second dose MMR vaccine coverage at 24 months of age, by statistical area level 3, NSW, for the cohort of children born in 2013.

Source: Australian Childhood Immunisation Register, data as at 31 March 2016.

Table 9. Percentage of children aged 1–<7 years<sup>a</sup> by recorded vaccination objection status and immunisation status for each local health district in NSW, compared with NSW

Vaccine	Local Health District <sup>b</sup>																
	CC	FW	HNE	IS	MN	MM	NBM	NV	NN	NS	SES	SWS	SN	SYD	WN	WS	NSW
Objection with no vaccines recorded (%)	1.0	0.5	0.8	0.9	2.4	0.7	0.9	1.1	4.3	0.8	0.8	0.5	1.5	0.6	0.5	0.5	0.9
Objection with at least one vaccine recorded (%)	1.0	0.5	0.7	0.9	1.7	0.6	0.7	1.0	2.9	1.0	0.9	0.5	1.1	0.7	0.5	0.4	0.8
<b>Total recorded objection</b>	<b>2.0</b>	<b>1.0</b>	<b>1.5</b>	<b>1.8</b>	<b>4.1</b>	<b>1.3</b>	<b>1.6</b>	<b>2.1</b>	<b>7.2</b>	<b>1.8</b>	<b>1.7</b>	<b>1.0</b>	<b>2.6</b>	<b>1.3</b>	<b>1.0</b>	<b>0.9</b>	<b>1.7</b>
No objection and no vaccines recorded (%)	1.2	0.8	0.9	1.1	1.5	1.0	1.2	1.1	2.2	2.6	2.3	1.7	1.4	2.7	0.9	2.2	1.8

<sup>a</sup>Cohort born 1 January 2009 – 31 December 2014.

<sup>b</sup>CC: Central Coast; FW: Far West; HNE: Hunter New England; IS: Illawarra Shoalhaven; MN: Mid North Coast; MM: Murrumbidgee; NBM: Nepean Blue Mountains; NV: Network with Victoria; NN: Northern NSW; NS: Northern Sydney; SES: South Eastern Sydney; SWS: South Western Sydney; SN: Southern NSW; SYD: Sydney; WN: Western NSW; WS: Western Sydney; NSW: New South Wales.

Source: Australian Childhood Immunisation Register, data as at 31 March 2016.

Eastern Sydney. Timeliness of vaccination for Aboriginal children remains a concern across NSW; however, clear improvements have been seen since 2014, especially with regards to the DTPa timeliness.

In general, coverage for adolescent vaccinations has increased for most vaccines over the past 5 years with

varicella vaccine coverage in Year 7 students having increased by more than 20%.

The ACIR, the NSW Population Health Survey and monitoring through the NSW School Vaccination Program continue to be very useful tools for administering the National Immunisation Program and monitoring its implementation in NSW.

Table 10. Vaccination coverage estimates for individual vaccines, NSW adolescent school attendees<sup>a</sup> in NSW, 2011–2015

Vaccine	2015 Coverage (%)	2015 Doses given	2014 Coverage (%)	2014 Doses given	2013 Coverage (%)	2013 Doses given	2012 Coverage (%)	2012 Doses given	2011 Coverage (%)	2011 Doses given
HPV dose 1 <sup>b,c</sup> – females	87	37 572	87	37 119	86	36 911	86	36 811	81	34 524
HPV dose 2 <sup>b,c</sup> – females	85	36 799	85	36 333	84	35 855	83	35 749	76	32 582
HPV dose 3 <sup>b,c</sup> – females	81	34 892	81	34 594	79	34 090	73	31 562	71	30 426
HPV dose 1 <sup>b,c</sup> – males	84	37 945	83	37 155	80	36 268	na	na	na	na
HPV dose 2 <sup>b,c</sup> – males	83	37 213	81	36 424	78	35 406	na	na	na	na
HPV dose 3 <sup>b,c</sup> – males	78	35 054	77	34 742	75	33 857	na	na	na	na
Hepatitis B dose 1 <sup>c</sup>	na	na	na	na	51	44 933	69	60 925	68	30 426
Hepatitis B dose 2 <sup>c</sup>	na	na	na	na	46	40 233	63	54 948	63	53 517
dTpa <sup>c</sup>	86	75 633	84	73 856	81	71 918	81	70 997	77	65 756
dTpa <sup>d</sup>	na	na	na	na	na	na	67	58 065	66	57 633
Varicella <sup>c</sup>	66	58 630	42	37 123	53	46 738	50	43 714	45	38 409
HPV dose 1 <sup>e</sup> – males	na	na	74	33 714	70	31 940	na	na	na	na
HPV dose 2 <sup>e</sup> – males	na	na	71	32 252	67	30 373	na	na	na	na
HPV dose 3 <sup>e</sup> – males	na	na	59	26 669	56	25 277	na	na	na	na

<sup>a</sup>Coverage estimates are for school attendees only and do not include doses administered in general practice.

<sup>b</sup>HPV vaccination coverage includes dose 2 and 3 catch-up vaccination offered to students in Year 8 in Terms 1–2 in 2016 who commenced the three-dose course of HPV vaccine in Year 7 in 2015. Coverage for this cohort is preliminary as data are not yet available for catch-up doses given to students in Terms 3–4 in 2016.

<sup>c</sup>Year 7 school attendees.

<sup>d</sup>Year 10 school attendees.

<sup>e</sup>Year 9 school attendees – this program ended at the end of 2014.

na: not applicable.

HPV: human papillomavirus.

dTpa: diphtheria–tetanus–pertussis (acellular) – adolescent and adult formulation.

Source: NSW School Vaccination Program.



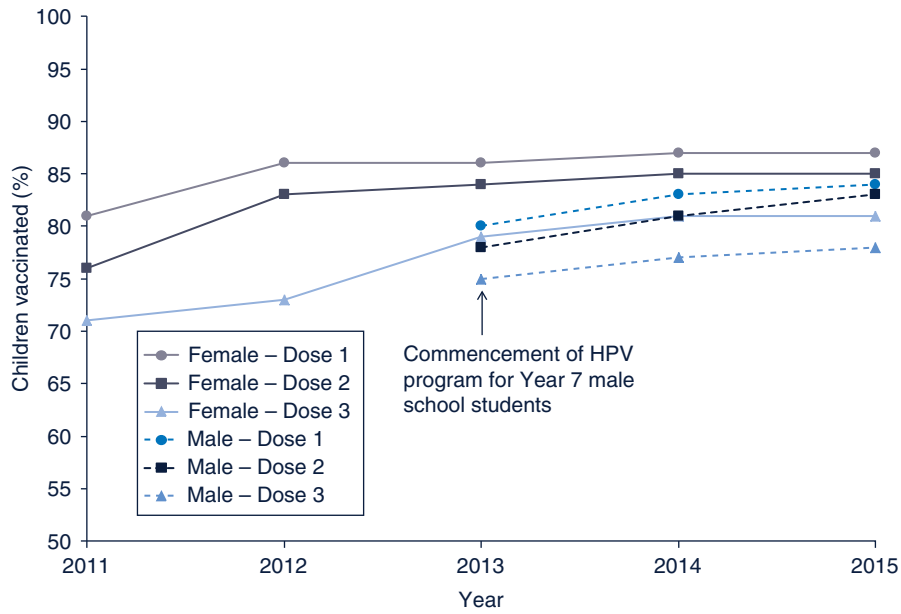


Figure 11. Trends in human papillomavirus vaccine coverage for adolescents\* in NSW, 2011–2015.

\*Adolescent school attendees (males and females) in Year 7 at time of vaccination. Coverage estimates are for school attendees only and do not include doses administered in general practice.  
 HPV: human papillomavirus vaccine

Source: NSW School Vaccination Program.

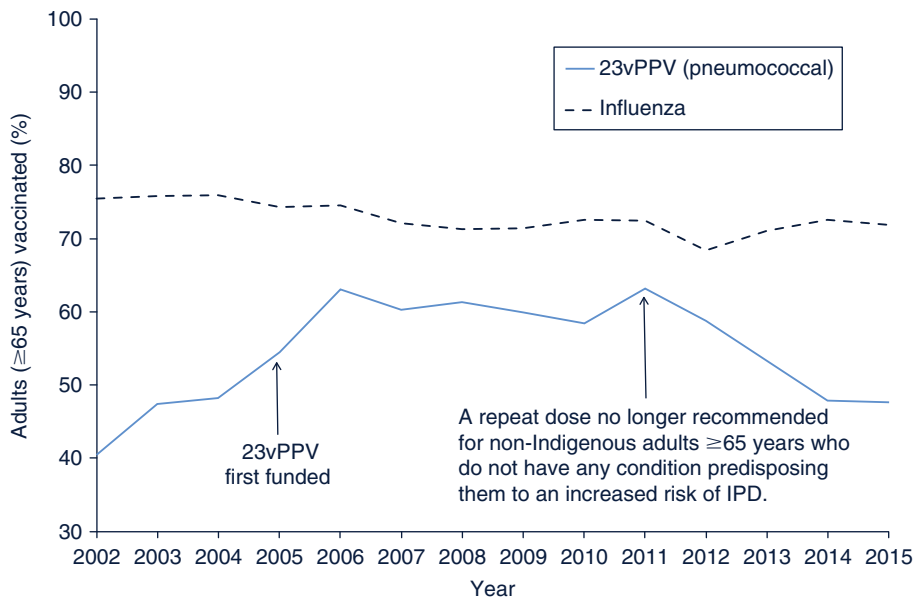


Figure 12. Trends in vaccination coverage estimates by vaccine for adults aged 65 years and over in NSW, ever vaccinated against pneumococcal disease and vaccinated against influenza in the last 12 months, 2002–2015.

23vPPV: 23-valent pneumococcal polysaccharide vaccine

Source: NSW Population Health Survey 2015 (SAPHaRI). Centre for Epidemiology and Evidence, NSW Ministry of Health.

Table 11. Percentage of adults aged 65 years and over reporting vaccination against pneumococcal disease<sup>a</sup> and influenza<sup>b</sup> for each local health district in NSW, and for NSW, 2015

Vaccine	Local Health District <sup>c</sup>															
	CC	FW	HNE	IS	MNC	MM	NBM	NNSW	NS	SES	SWS	SNSW	SYD	WNSW	WS	NSW
Pneumococcal % vaccinated	50.5	53.4	53.0	51.2	46.4	50.1	48.4	48.0	47.1	43.0	40.9	42.9	41.9	54.1	48.2	47.6
Influenza % vaccinated	77.1	74.9	74.6	73.7	67.1	69.2	67.9	69.3	70.5	70.7	69.9	72.6	69.9	74.0	75.6	71.9

<sup>a</sup>Vaccinated against pneumococcal disease.  
<sup>b</sup>Vaccinated against influenza in the last 12 months.  
<sup>c</sup>CC: Central Coast; FW: Far West; HNE: Hunter New England; IS: Illawarra Shoalhaven; MNC: Mid North Coast; MM: Murrumbidgee; NBM: Nepean Blue Mountains; NNSW: Northern NSW; NS: Northern Sydney; SES: South Eastern Sydney; SWS: South Western Sydney; SNSW: Southern NSW; SYD: Sydney; WNSW: Western NSW; WS: Western Sydney; NSW: New South Wales.  
Source: New South Wales Population Health Survey 2015 (SAPHaRI). Centre for Epidemiology and Evidence, NSW Ministry of Health.

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