

NSW Annual Immunisation Coverage Report, 2016

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Abstract: Introduction: This annual report documents trends in immunisation coverage in NSW for children, adolescents and the elderly, up to and including data for 2016. **Methods:** Data from the Australian Immunisation Register (previously known as 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:** Greater than 93% coverage has been reached for children in NSW at 12 and 60 months of age. Coverage for individual vaccines due at these milestones was greater than 93%, except for the second dose of rotavirus vaccine at 12 months of age that was just under 90%. 'Fully immunised' coverage at 24 months of age increased to greater than 90%. Coverage for individual vaccines due at this age was greater than 94%, except for the second dose of the measles, mumps and rubella vaccine (92.7%) and the varicella vaccine (92.4%). Delayed receipt of the third dose of diphtheria, tetanus, and acellular pertussis-containing vaccine and the second dose of the measles, mumps and rubella vaccine was still an issue for Aboriginal children. Adolescent human papillomavirus vaccine coverage in 2016 for females and males was higher for the first dose (86% and 83%, respectively) and second dose (84% and 82%, respectively) compared with the third dose (80% and 78%, respectively). Pneumococcal vaccination estimates in the elderly continue to be substantially lower than the influenza coverage

estimates (47.0% versus 71.6%). **Conclusion:** This report documents trends in vaccination coverage in NSW across the age spectrum. Data provided in this report reflects the continued successful delivery of the vaccination program in New South Wales with improved vaccination coverage achieved through a number of strategies including the Save the Date to Vaccinate campaign and smartphone app, the Aboriginal Immunisation Healthcare Worker program and other strategies implemented in low coverage areas.

Introduction

This series of *New South Wales (NSW) Annual Immunisation Coverage Reports* provides important information on trends and issues in vaccination coverage to facilitate the monitoring of NSW vaccination 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 2009.¹

High levels of reporting to the Australian Immunisation Register (AIR), previously known as the Australian Childhood Immunisation Registration (ACIR), are maintained by a system of incentive payments for immunisation providers and parents/guardians.² Reported vaccination coverage may be impacted by changes to immunisation policy, the incentive payment system and changes to the 'fully immunised' coverage algorithms. Some of these 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.⁶ Up until 31 December 2015 all vaccination records for a child remained on the register indefinitely, but no new vaccination encounter records were added after the 7th birthday.² From 1 January 2016 the register was changed to include records of vaccinations given up to less than 20 years of age and was further expanded from 30 September 2016 to become the AIR, which captures records of vaccinations given to eligible individuals in Australia throughout their life.⁷

Box 1. Recent significant changes in immunisation policy, immunisation incentives and coverage calculation algorithms for NSW³

March 2016: Booster dose of DTPa at 18 months of age added to the National Immunisation Program (NIP) schedule.

April 2015: New immunisation requirements for federal government family assistance payments (the 'No Jab, No Pay' policy⁴) came into effect. Only parents of children (aged less than 20 years) who are 'fully immunised' or on a recognised catch-up schedule 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 continue to be exempt from the requirements; however, conscientious objection is no longer a valid exemption from immunisation requirements.

March 2015: Booster dose of DTPa recommended at 18 months of age in NSW.

The dTpa vaccine was funded by NSW 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 added to the NIP schedule for Aboriginal and Torres Strait Islander children aged 6 months to less than 5 years. List of population groups for which seasonal influenza vaccination is recommended 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.

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.⁵

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

Immunisation coverage assessment algorithm for 'fully immunised' at the 12-month milestone amended to include a third dose of pneumococcal conjugate vaccine.

July 2013: The combined *Haemophilus influenzae* type b (Hib) and meningococcal serogroup C (MenC) vaccine, Menitorix[®], added to the 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 measles, mumps, rubella (MMR) vaccine previously given to 4 year olds, and the monovalent 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: dTpa vaccine funding by NSW restricted to new mothers in maternity units (or GP within 2 weeks of giving birth) under the cocoon strategy.

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 ≥ 65 years who do not have any condition that predisposes them to an increased risk of invasive pneumococcal disease, a repeat dose of 23-valent pneumococcal polysaccharide vaccine (Pneumovax 23[®]) is no longer recommended.

July 2011: Prevenar 13[®] (13-valent pneumococcal conjugate vaccine, 13vPCV) replaced Prevenar[®] (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).

Participation in the AIR is opt-out so it constitutes a nearly complete population register. Persons not enrolled in Medicare can be added to the AIR via a supplementary number. Since 2001, vaccinations given overseas may be recorded if a provider endorses their validity. Data are transferred to the AIR when a recognised immunisation provider supplies details of an eligible vaccination either via 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 vaccination was previously recorded on the register, but as of 1 January 2016 conscientious objection is no longer a valid reason for vaccination exemption and so data are no longer available.⁴

Table 1 outlines vaccines delivered through the NSW Immunisation Program in 2016. The only significant

Table 1. Schedule of vaccines delivered through the NSW Immunisation Program, 2016

Age	Vaccine					
Childhood vaccines						
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 ^a
12 months			Hib-MenC ^b	MMR		Flu ^a
18 months		DTPa ^c			MMRV ^d	Flu ^a
4 years		DTPa		Polio		Flu ^a
Adolescent vaccines						
12 years		dTpa		VZV ^e	HPV	
15 years						Flu ^a Pneumo ^f
Adult vaccines						
≥50 years						Pneumo ^g
≥65 years						Flu ^a Pneumo
70 years				HZ ^h		
Pregnant women		dTpa ⁱ				Flu ^j
<p>Hep B: hepatitis B vaccine; DTPa: diphtheria, tetanus, and acellular pertussis-containing vaccine; Hib: <i>Haemophilus influenzae</i> 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.</p> <p>^aAnnual 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.</p> <p>^bIn July 2013 the combined Hib and meningococcal C vaccine (Menitorix®) was added to the National Immunisation Program schedule at 12 months of age. This combination vaccine replaced the single dose of monovalent meningococcal C conjugate vaccine and booster dose of monovalent Hib vaccine previously scheduled at 12 months of age.</p> <p>^cBooster dose of DTPa at 18 months of age added onto the schedule on 1 April 2016.</p> <p>^dMeasles, mumps, rubella, varicella at 18 months of age introduced onto the schedule on 1 July 2013.</p> <p>^eCatch-up only.</p> <p>^fAboriginal adults with medical risk factors.</p> <p>^gAll Aboriginal adults only.</p> <p>^hFrom 1 November 2016, a single dose of herpes zoster (HZ) vaccine is recommended and funded for adults at 70 years of age. Adults aged 71–79 years are eligible under a 5-year catch-up program until 31 October 2021.</p> <p>ⁱDuring the third trimester of pregnancy.</p> <p>^jAt any stage of pregnancy.</p> <p>Source: NSW Immunisation Schedule.</p>						

change to the childhood schedule in 2016 was in April, with the addition of a booster dose of the diphtheria, tetanus, and acellular pertussis-containing vaccine (DTPa) at 18 months of age.

Methods

Measuring vaccination coverage using the Australian Immunisation Register

This report details vaccination coverage for 2016 using AIR data up to 31 March 2017. The cohort method has been used for calculating coverage at the population level (national and state/territory)⁸ since the inception of the immunisation register. Cohort vaccination status is 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

vaccinations to the AIR.⁸ 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.^{9,10}

The proportion of children designated as 'fully immunised' is calculated using 12-month-wide cohorts with the number of children completely vaccinated 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. The 12-month wide cohorts used are children born between 1 January 2015 and 31 December 2015 for the 12-month milestone, between 1 January 2014 and 31 December 2014 for the 24-month milestone, and between 1 January 2011 and 31 December 2011 for the 5-year (60-month) milestone. 'Fully immunised' at 12 months of age is defined as a child having a record on the AIR of a third dose of the

combined DTPa-hepB-IPV-Hib vaccine and a third dose of 13-valent pneumococcal conjugate vaccine. Vaccination coverage estimates were also calculated at the 12-month milestone for the second dose of rotavirus vaccine, a National Immunisation Program vaccine that is not included in calculations for incentive payments and ‘fully immunised’ status. ‘Fully immunised’ at 24 months of age is defined as a child having a record on the AIR of a third dose of the combined DTPa-hepB-IPV-Hib vaccine, a fourth dose of *Haemophilus influenzae* type b vaccine (or a third dose of the PRP-T vaccine if given after 11.5 months of age), a second dose of a measles, mumps and rubella-containing (MMR) vaccine, a first dose of varicella-containing vaccine and a first dose of meningococcal C-containing vaccine. In this report, we have not included the booster dose of the DTPa vaccine given at 18 months of age in the definition for ‘fully immunised’ at 24 months of age. ‘Fully immunised’ at 60 months of age is defined as a child having a record on the AIR of a fourth dose of a DTPa-IPV-containing vaccine, and a second dose of an MMR-containing vaccine.

Timeliness

Age-appropriate and timely vaccination is defined as receipt of a scheduled vaccine dose within 30 days of the recommended age. For example, a child who received the first dose of DTPa (due by 60 days of age) when he or she was more than 90 days of age is classified as late for that dose. For descriptive purposes, we categorised the delay outcome measure for each dose as either ‘delay of 1–<3 months’, delay of 3–<7 months or ‘delay \geq 7 months’. Timeliness of the third dose of DTPa and of the second dose of MMR vaccine is measured using 12-month-wide birth cohorts. However, children included in the timeliness analysis are assessed at 1–3 years after doses were due, to allow time for late vaccinations to be recorded. Cohorts assessed for timeliness are therefore not the same as those assessed for coverage milestones and the 12-month-wide cohorts used are children born between 1 January 2013 and 31 December 2013 for both the timeliness of the third dose of DTPa and of the second dose of the MMR vaccine. Timeliness was also compared by plotting the cumulative percentage receiving each vaccine dose by age.

Local health districts

Vaccination coverage estimates and vaccination delay estimates are presented in this report for NSW and 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 AIR 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 AIR. 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 Australian Statistical Geography Standard (ASGS).¹¹ 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 software¹² and the ABS Census Boundary Information. As postcode is the only geographical indicator on the AIR, the ABS Postal Area to SA3 Concordance 2011 was used to match AIR residential postcodes of the children to SA3s.¹³

Adolescents

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.¹⁴ Human papillomavirus (HPV) vaccination coverage includes dose 2 and 3 catch-up vaccination offered to students in Year 8 in Terms 1–2 in 2017 who commenced the three-dose course of HPV vaccine in Year 7 in 2016. Coverage for this cohort is preliminary as data are not yet available for catch-up doses given to students in Terms 3–4 in 2017.

Elderly people

Influenza and pneumococcal vaccination coverage estimates in the elderly were from the NSW Population Health Survey. This is a rolling telephone survey utilising random digit dialling, with vaccination status determined from patient recall to interview questions asking ‘Were you vaccinated or immunised against flu in the last 12 months?’ and ‘When were you last vaccinated or immunised against pneumonia?’

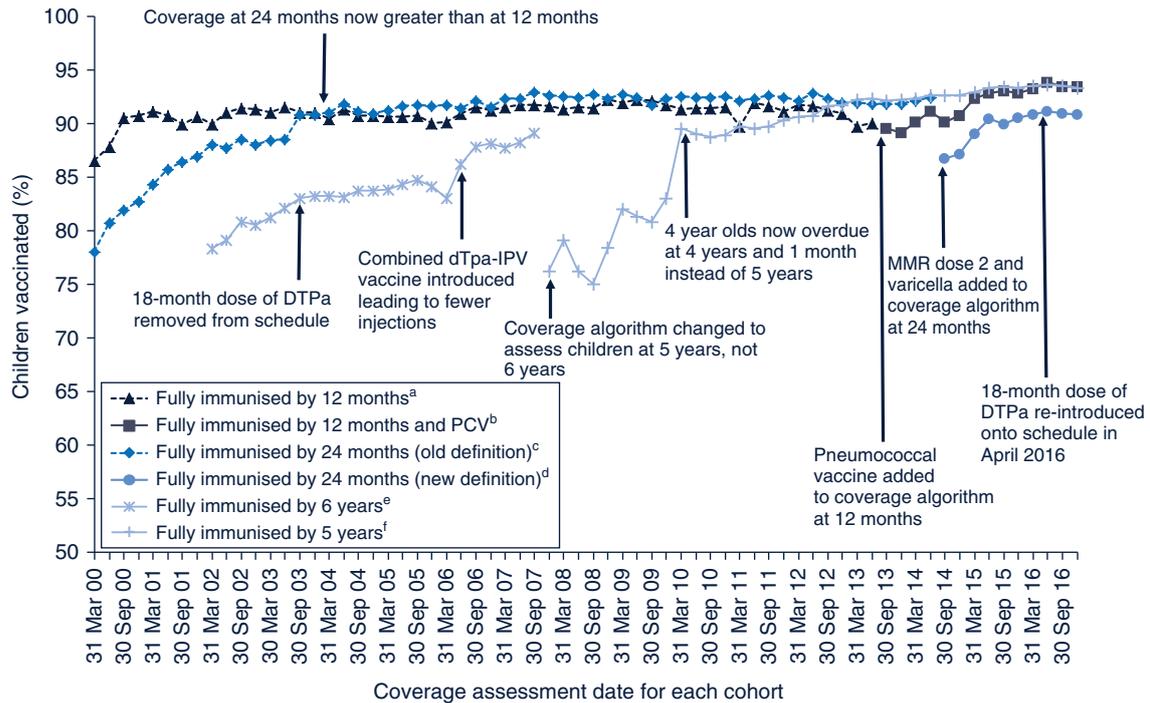


Figure 1. Trends in 'fully immunised'^{a,b,c,d,e} vaccination coverage, NSW, 2000–2016.

^aA third dose of the combined DTPa-hepB-IPV-Hib vaccine up until July 2013.

^bA third dose of the combined DTPa-hepB-IPV-Hib vaccine and a third dose of pneumococcal conjugate vaccine since July 2013.

^cA 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.

^dFrom July 2014, the 24-month algorithm changed to also include a second dose of MMR, a first dose of MenC and a first dose of varicella.

^eA 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.

^fA 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 Immunisation Register, data as at 31 March 2017.

Summary of results

Coverage (all children)

- Overall in NSW 'fully immunised' coverage measured at the 12-month milestone increased from 92.8% in 2015 to 93.5% in 2016 (Figure 1, Table 2).
- 'Fully immunised' coverage in NSW measured at the 24-month milestone increased from 89.6% in 2015 to 90.5% in 2016 (Figure 1, Table 3).
- NSW coverage measured at the 5-year milestone remained relatively stable between 2015 (93.1%) and 2016 (93.2%) (Figure 1, Table 4).
- 'Fully immunised' coverage at 12 months of age increased in 2016 in all LHDs in NSW except for Far West, Network with Victoria and Northern NSW, where marginal decreases were seen (Table 2).
- Coverage at 12 months of age for all individual vaccines (except rotavirus) in 2016 increased to greater than or equal to 94% in NSW overall (Figure 2) and greater than 93% for all LHDs except Mid North Coast and Northern NSW (Table 2).
- Coverage for rotavirus in NSW increased by more than 2 percentage points in 2016 to 89.9% (Table 2). In the last quarter of 2016, coverage for rotavirus in NSW reached 90.5% (Figure 2). Coverage for rotavirus remains 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, except Sydney, 'fully immunised' coverage at 24 months of age increased in 2016. At this milestone, 'fully immunised' coverage remained below 90% for Mid North Coast, Northern NSW, Northern Sydney, South Eastern Sydney, South Western Sydney, Sydney and Western Sydney, but was above 92% in all other LHDs in NSW (Table 3).
- Coverage in NSW for all individual vaccines (except the second dose of MMR and varicella) at the 24-month milestone remained greater than 94% in 2016 (Table 3, Figure 3) and increased to greater than 93% for all LHDs except for Northern NSW (Table 3).
- In NSW during 2016, the fourth dose of *Haemophilus influenzae* type b vaccine and the dose of meningococcal C vaccine were mostly given as the combined vaccine Menitorix® at 12 months of age (98.1%).
- In 2016, coverage at 24 months of age for the first dose of MMR was 94.9% (Table 3). Coverage for the second dose of MMR and the dose of varicella was greater than

Table 2. Percentage of children immunised at 12 months of age^a, by vaccine for each local health district in NSW, compared with NSW and Australia, 2016

Vaccine	Local Health District ^b																	Australia %
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %	WN %	WS %	NSW %	
Diphtheria–tetanus–pertussis	96.0	96.7	96.2	95.4	92.7	96.2	95.4	93.3	88.6	94.8	94.2	94.0	95.6	94.5	96.0	94.3	94.7	94.7
Poliomyelitis	96.0	96.7	96.1	95.4	92.7	96.2	95.3	93.3	88.6	94.7	94.1	94.0	95.6	94.4	95.9	94.3	94.6	94.7
<i>Haemophilus influenzae</i> type b	95.7	96.7	96.0	95.3	92.5	96.2	95.3	93.2	88.4	94.3	93.7	93.8	95.5	94.1	95.9	93.9	94.4	94.5
Hepatitis B	95.6	96.7	96.0	95.2	92.4	96.2	95.3	93.2	88.4	93.9	93.6	93.8	95.4	93.8	96.0	93.5	94.2	94.3
Rotavirus	92.3	94.3	91.8	91.7	87.5	91.6	90.8	90.4	83.6	90.2	90.2	88.3	91.2	89.1	91.6	89.2	89.9	86.7
13vPCV	95.6	96.7	95.9	95.1	92.0	95.9	95.3	93.6	88.2	93.8	93.4	93.2	95.3	93.6	95.8	93.4	94.0	94.1
Fully immunised ^c	95.3	96.7	95.6	94.9	92.0	95.8	95.1	93.0	87.8	93.0	92.8	92.8	95.0	93.0	95.7	92.3	93.5	93.7
Total number of children	4010	365	11083	4701	2324	2964	5210	762	3088	10398	10616	13840	2263	7622	3713	14679	97638	307266

^aCohort born 1 January 2015 – 31 December 2015.

^bCC: 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.

^cThree doses of the combined DTPa-hepB-IPV-Hib vaccine plus 13vPCV. The third dose assumption is applied.

Source: Australian Immunisation Register, data as at 31 March 2017.

Table 3. Percentage of children immunised at 24 months of age^a, by vaccine for each local health district in NSW, compared with NSW and Australia, 2016

Vaccine	Local Health District ^b																	Australia %
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %	WN %	WS %	NSW %	
Diphtheria–tetanus–pertussis	96.9	98.0	97.3	97.2	94.7	97.6	96.9	97.5	92.4	95.9	95.7	96.3	96.4	96.1	97.2	95.9	96.3	96.4
Poliomyelitis	96.8	98.0	97.2	97.1	94.6	97.5	96.6	97.7	92.2	95.8	95.5	96.1	96.3	95.8	97.1	95.7	96.1	96.3
<i>Haemophilus influenzae</i> type b (Hib)	95.8	96.9	96.3	95.9	93.1	96.5	95.9	96.4	91.0	93.4	93.6	94.2	95.1	93.5	96.4	93.7	94.5	94.8
Meningococcal C (MenC)	95.9	97.1	96.5	96.0	93.5	96.5	96.0	96.4	91.4	93.7	93.9	94.3	95.4	93.9	96.5	93.4	94.6	95.0
Hepatitis B	96.5	98.0	97.0	96.8	94.3	97.3	96.5	97.4	91.9	94.1	94.8	95.8	96.1	95.0	97.0	94.7	95.5	95.7
Measles–mumps–rubella (MMR) Dose 1	96.1	97.1	96.6	96.0	93.6	96.6	95.9	96.9	91.5	94.1	93.9	94.6	95.5	94.2	96.4	94.4	94.9	95.3
Measles–mumps–rubella (MMR) Dose 2	94.5	96.0	95.0	94.7	90.9	95.3	93.6	94.2	88.4	91.3	91.8	92.6	93.41	92.0	94.4	91.6	92.7	93.0
Varicella	94.4	96.0	94.7	94.5	90.4	94.7	93.5	94.3	88.1	91.4	91.7	91.6	93.3	91.7	93.9	91.6	92.4	92.7
Fully immunised ^c	93.2	95.7	93.5	93.4	89.5	93.9	92.4	93.4	87.0	88.3	89.4	89.8	92.3	89.0	93.1	88.6	90.5	91.0
Total number of children	4150	349	11326	4690	2359	3049	5241	685	3271	11136	10717	14345	2232	7541	3898	15176	100165	314989

^aCohort born 1 January 2014 – 31 December 2014.

^bCC: 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.

^cA 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 and rubella (MMR)-containing vaccine, first dose of meningococcal and first dose of varicella.

Source: Australian Immunisation Register, data as at 31 March 2017.

91% for all LHDs except for Northern NSW and the Mid North Coast. The second dose of MMR and the dose of varicella were mostly given as the combined MMRV vaccine (either Priorix Tetra® or ProQuad®) at 18 months (91.0%).

- Coverage of the second dose of MMR at the 24-month milestone increased from 91.8% in 2015 to 92.7% in 2016 (Table 3). Coverage of the second dose of MMR at

5 years of age was higher at 94.1% (Table 4). The differential between the two milestone estimates in 2015 and 2016 decreased from 1.9 to 1.4 percentage points respectively.

- Varicella coverage at 24 months of age continued to increase in NSW and was 92.4% overall in 2016 and above 91% in all LHDs except for Mid North Coast and Northern NSW.

Table 4. Percentage of children immunised at 5 years of age^a, by vaccine for each local health district in NSW, compared with NSW and Australia, 2016

Disease	Local Health District ^b																	Australia %
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %	WN %	WS %	NSW %	
Diphtheria–tetanus–pertussis	95.8	97.9	96.4	96.1	93.3	96.0	95.1	97.7	89.2	91.5	92.2	94.0	94.0	92.0	96.3	93.6	93.9	93.8
Poliomyelitis	95.8	97.6	96.5	96.1	93.3	96.0	95.1	97.7	89.2	91.6	92.3	94.0	94.0	92.2	96.3	93.7	93.9	93.8
Measles–mumps–rubella	95.6	97.9	96.4	96.1	93.7	96.6	95.3	97.7	89.7	91.7	92.4	94.4	94.5	92.4	96.5	93.9	94.1	94.1
Fully immunised ^c	95.1	97.1	95.8	95.5	92.9	95.6	94.5	97.2	88.3	90.6	91.6	93.3	93.6	91.3	95.7	92.7	93.2	93.1
Total number of children	4455	339	11896	4969	2814	3122	5340	639	3652	11798	10271	14323	2418	6786	3869	14886	101577	317381

^aCohort born 1 January 2011 – 31 December 2011.

^bCC: 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.

^cA fourth dose of combined DTPa-IPV vaccine, and a second dose of a measles, mumps and rubella (MMR)-containing vaccine.

Source: Australian Immunisation Register, data as at 31 March 2017.

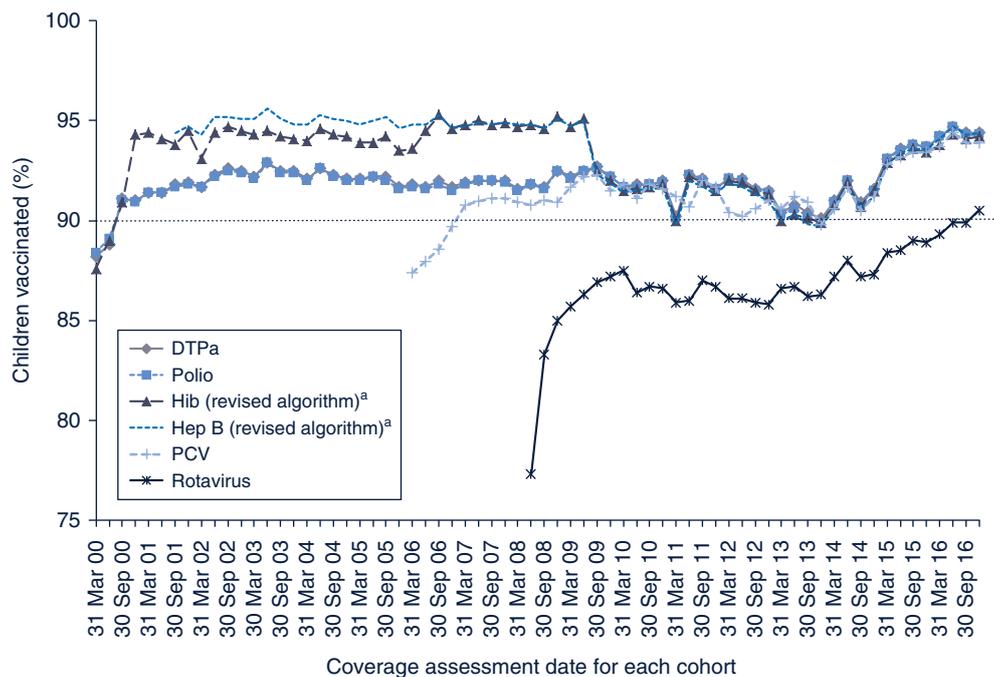


Figure 2. Trends in vaccination coverage estimates by vaccine at 12 months of age, third dose of DTPa, polio, hepatitis B, Hib, rotavirus and PCV, NSW, 2000–2016.

By 3-month birth cohorts born between 1 January 1999 and 31 December 2015. Coverage assessment date was 12 months after the last birth date of each cohort.

^aPrior 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 two or three doses of PRP-OMP containing Hib vaccine or three doses of any other Hib vaccine, and two or three doses of Comvax® hepatitis B vaccine or three doses of all other hepatitis B vaccines.

PCV: pneumococcal conjugate vaccine

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

Source: Australian Immunisation Register, data as at 31 March 2017.

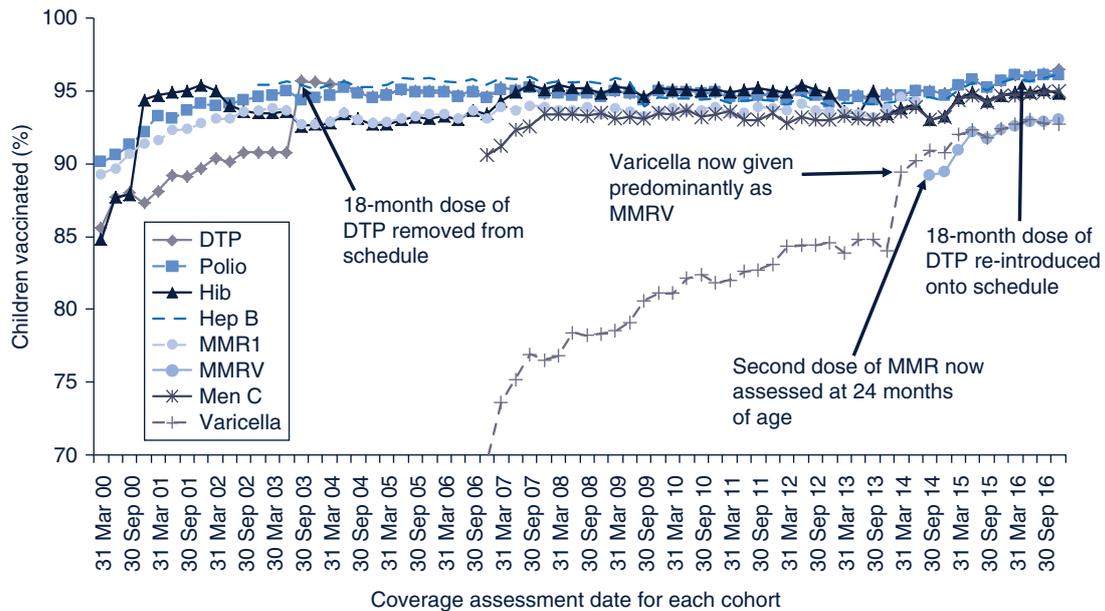


Figure 3. Trends in vaccination coverage estimates by vaccine at 24 months of age, third dose of DTPa (fourth dose – pre September 2003), third dose of polio, third dose of hepatitis B, fourth dose of Hib, second dose of MMR (first dose – pre July 2014), one dose of varicella and one dose of men C, NSW 2000–2016.

By 3-month birth cohorts born between 1 January 1998 and 31 December 2014. 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 Immunisation Register, data as at 31 March 2017.

- ‘Fully immunised’ coverage and coverage for all individual vaccines for the 5-year milestone in NSW remained greater than 93% in 2016 (Table 4, Figure 4) and greater than 90% in all LHDs except Northern NSW (Table 4).

Indigenous coverage

- In 2016, ‘fully immunised’ coverage for NSW Aboriginal children at the 12-month milestone increased by 1.8 percentage points to 93.8% (Table 5), higher than for non-Aboriginal children at the same age (93.5%).
- ‘Fully immunised’ coverage for Aboriginal children at the 12-month milestone in 2016 was higher compared with non-Aboriginal children in Central Coast, Illawarra Shoalhaven, Mid North Coast, Northern New South Wales, South Western Sydney and Sydney LHDs but lower in the other LHDs (Table 5).
- ‘Fully immunised’ coverage for NSW Aboriginal children at the 24-month milestone increased by 3.3 percentage points to 92.2% in 2016 (Table 5), higher than for non-Aboriginal children at the same age (90.4%).
- At the 24-month milestone, ‘fully immunised’ coverage for Aboriginal children in 2016 was higher compared

with non-Aboriginal children in the Central Coast, Mid North Coast, Nepean Blue Mountains, Northern NSW, Northern Sydney, South Eastern Sydney, South Western Sydney, Sydney and Hunter New England LHDs, but lower in the other LHDs (Table 5).

- ‘Fully immunised’ coverage for NSW Aboriginal children at the 60-month milestone increased by 1 percentage point to 96.6% in 2016 (Table 5), higher than for non-Aboriginal children at the same age (93.0%).
- At the 60-month milestone, ‘fully immunised’ coverage was higher in 2016 for Aboriginal compared with non-Aboriginal children in all LHDs (Table 5).
- Coverage estimates for all individual vaccines in 2016 were similar or marginally lower in Aboriginal children at 12 months of age compared with non-Aboriginal children (Table 6). However, coverage for rotavirus vaccine was 2 percentage points lower in Aboriginal children.
- Coverage estimates for all individual vaccines in 2016 were higher in Aboriginal children at 24 months of age compared with non-Aboriginal children, including the second dose of MMR and the varicella vaccine, which both increased by more than 2 percentage points (Table 6).

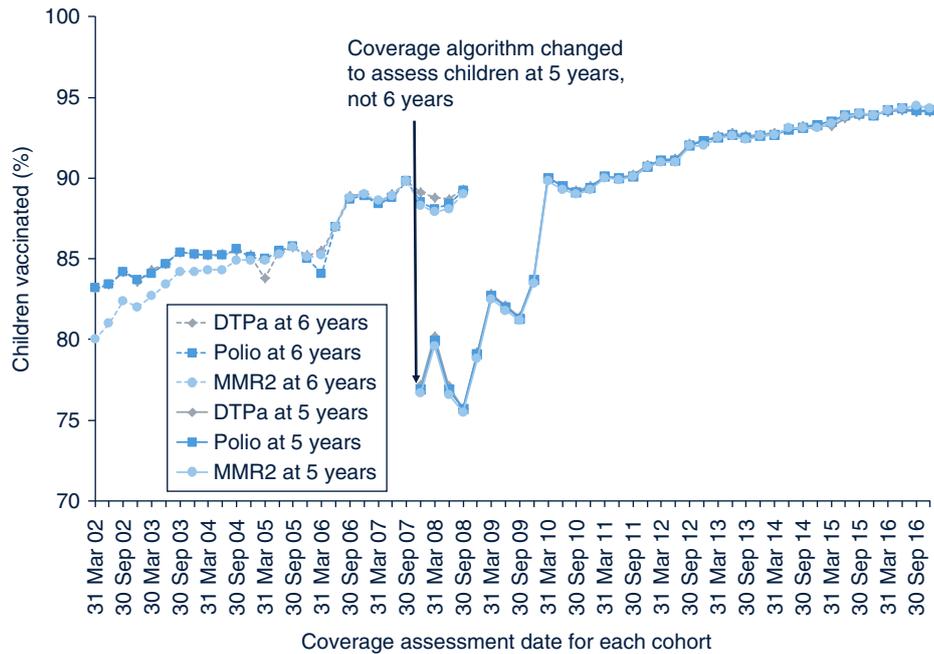


Figure 4. Trends in vaccination coverage estimates by vaccine, fourth dose of DTPa and polio and second dose of MMR at 5 years of age (6 years up to December 2007), NSW, 2002–2016.

By 3-month birth cohorts born between 1 January 1996 and 31 December 2011. 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 Immunisation Register, data as at 31 March 2017.

- Coverage estimates for all individual vaccines in 2016 remained higher in Aboriginal children at 60 months of age compared with non-Aboriginal children (Table 6).

Timeliness

- For the third dose of DTPa and second dose of MMR vaccines, there were greater delays in vaccination for Aboriginal children than non-Aboriginal children in all LHDs in 2016 (Tables 7 and 8).
- The majority of delayed vaccination fell into the 1–<3 months delay category for both Aboriginal and non-Aboriginal children in all LHDs.
- For the third dose of DTPa due at 6 months of age, the percentage of children vaccinated on time decreased marginally in 2016 for both Aboriginal and non-Aboriginal children. Despite this, the disparity in ‘on-time vaccination’ between Aboriginal and non-Aboriginal children has decreased by 0.2 of a percentage point to 13.4% in 2016 (Figure 5).
- For the second dose of MMR due at 18 months, the percentage of children vaccinated on time decreased marginally in 2016 for both Aboriginal and non-Aboriginal children. Despite this, the disparity in ‘on-time vaccination’ between Aboriginal and non-Aboriginal children has decreased by 0.8 of a percentage point to 11.6% in 2016 (Figure 6).
- In 2016, the percentage of children in NSW who received their first dose of hexavalent combination

vaccine between 6 and less than 8 weeks increased to 84% (Figure 7). This percentage has been increasing since 2009 when vaccination at 6 weeks was encouraged to provide early protection against pertussis.

Small area coverage

- Coverage by small area (SA3) varied across the state for rotavirus (77.6–95.5%) and pneumococcal conjugate vaccines (81.8–97.5%) measured at the 12-month milestone, and the second dose of MMR (82.4–97.1%) measured at the 24-month milestone (Figures 8–10).

Adolescent coverage

- Coverage in adolescents varied by vaccine and dose with coverage for varicella vaccine substantially lower in 2016 than the coverage estimates for the first two doses of HPV vaccine (both females and males) and the dTpa vaccine (Table 9).
- Varicella vaccine is recommended in the school program for children not previously vaccinated or who have not had the disease. Coverage for this vaccine increased by 4 percentage points to 70% in 2016 (Table 9).
- Coverage of each dose of HPV was higher in female Year 7 students than their male counterparts. Coverage of the third dose was lower, compared with the first and second doses, in both females and males (Table 9, Figure 11).

Table 5. Percentage of children fully immunised at 12 months^a, 24 months^b and 5 years of age^c, by Aboriginal status for each local health district in NSW, compared with NSW and Australia, 2016

Child age and Aboriginal status	Local Health District ^d														NSW %	Australia %		
	CC %	FW %	HNE %	IS %	MIN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %			WN %	WS %
12 months – fully immunised^a																		
Aboriginal	96.5	94.9	94.0	95.8	94.6	94.5	94.2	86.4	92.6	88.9	91.2	96.1	90.9	97.3	93.1	89.2	93.8	92.0
Non-Aboriginal	95.2	97.2	95.9	94.9	91.5	96.0	95.1	93.6	87.3	93.0	92.8	92.7	95.3	92.9	96.4	92.4	93.5	93.8
24 months – fully immunised^b																		
Aboriginal	95.1	90.5	93.6	91.7	91.6	93.3	93.8	92.5	91.1	92.3	90.7	93.1	91.6	92.6	90.3	88.5	92.2	90.1
Non-Aboriginal	93.1	97.1	93.5	93.6	89.2	93.9	92.3	93.5	86.6	88.2	89.4	89.7	92.4	88.9	93.8	88.6	90.4	91.0
5 years – fully immunised^c																		
Aboriginal	98.8	100.0	96.1	97.7	97.7	96.1	98.1	100.0	93.6	93.8	98.0	96.6	94.7	94.3	96.6	96.0	96.6	95.3
Non-Aboriginal	94.9	96.2	95.7	95.4	92.3	95.5	94.3	97.0	87.8	90.6	91.6	93.3	93.5	91.3	95.5	92.6	93.0	92.9

^aCohort born 1 January 2015 – 31 December 2015: three doses of the combined DTPa-hepB-IPV-Hib vaccine plus 13vPCV. The third dose assumption is applied.

^bCohort born 1 January 2014 – 31 December 2014: three or four doses of a DTP-containing vaccine, three doses of polio vaccine, and two doses of all other hepatitis B vaccines, and two doses of a measles, mumps, and rubella (MMR)-containing vaccine, one dose of a varicella vaccine and one dose of a meningococcal C vaccine.

^cCohort born 1 January 2011 – 31 December 2011: four or five doses of a DTP-containing vaccine, four doses of polio vaccine, and two doses of an MMR-containing vaccine.

^dCC: 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 Immunisation Register, data as at 31 March 2017.

Table 6. Vaccination coverage estimates by age, vaccine antigen and Aboriginal status in NSW, 2016

Disease	Milestone age	Aboriginal	Non-Aboriginal
Diphtheria–tetanus–pertussis	12 months ^a	94.0	94.7
	24 months ^b	97.5	96.2
	5 years ^c	97.4	93.7
Poliomyelitis	12 months ^a	94.0	94.6
	24 months ^b	97.3	96.0
	5 years ^c	97.4	93.7
<i>Haemophilus influenzae</i> type b	12 months ^a	93.9	94.4
	24 months ^b	96.4	94.4
	5 years ^c	NI	NI
Hepatitis B	12 months ^a	94.0	94.2
	24 months ^b	97.3	95.4
	5 years ^c	NI	NI
Measles–mumps–rubella	12 months ^a	NI	NI
	24 months ^b Dose 1	96.7	94.8
	24 months ^b Dose 2	93.6	92.6
	5 years ^c	97.5	93.9
Meningococcal C	12 months ^a	NI	NI
	24 months ^b	96.6	94.5
	5 years ^c	NI	NI
Varicella	12 months ^a	NI	NI
	24 months ^b	93.1	92.4
	5 years ^c	NI	NI
Pneumococcal conjugate vaccine	12 months ^a	94.0	94.0
	24 months ^b	NI	NI
	5 years ^c	NI	NI
Rotavirus	12 months ^a	87.9	90.0
	24 months ^b	NI	NI
	5 years ^c	NI	NI

^aCohort born 1 January 2015 – 31 December 2015.
^bCohort born 1 January 2014 – 31 December 2014.
^cCohort born 1 January 2011 – 31 December 2011.
NI: vaccine at this age milestone not included in the calculation of coverage estimates.
Source: Australian Immunisation Register, data as at 31 March 2017.

Table 7. Percentage of children^a with vaccination delay for the third dose of DTPa by Aboriginal status for each local health district in NSW, 2016

Vaccination delay and Aboriginal status	Local Health District ^b														NSW		
	CC	FW	HNE	IS	MN	MM	NBM	NV	NN	NS	SES	SWS	SN	SYD		WN	WS
1–<3 months late																	
Aboriginal (%)	16.7	19.4	13.8	20.8	18.4	17.7	15.5	20.8	20.1	26.9	18.7	19.3	21.2	16.3	19.8	21.1	17.7
Non-Aboriginal (%)	12.1	9.9	10.2	12.0	12.2	11.2	12.7	7.6	11.4	9.6	9.4	13.7	10.3	9.2	12.3	11.1	11.1
3–<7 months late																	
Aboriginal (%)	6.8	4.2	6.8	6.2	9.9	6.5	6.0	9.4	9.4	7.7	9.4	8.1	7.3	6.5	8.4	7.9	7.5
Non-Aboriginal (%)	3.7	4.8	3.0	3.5	3.6	2.7	3.3	4.2	4.4	2.3	2.3	4.6	2.8	2.4	3.5	3.5	3.2
≥7 months late																	
Aboriginal (%)	5.3	6.9	6.0	5.6	7.8	8.8	4.4	11.3	2.9	0.0	3.7	5.1	6.6	9.8	9.5	7.9	6.6
Non-Aboriginal (%)	1.9	1.5	6.4	3.1	3.9	4.2	2.5	1.9	3.8	7.0	4.0	3.7	3.4	4.9	1.9	3.8	4.3

^aCohort born 1 January 2014 – 31 December 2014.

^bCC: 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 Immunisation Register, data as at 31 March 2017.

Table 8. Percentage of children^a 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, 2016

Vaccination delay and Aboriginal status	Local Health District ^b																
	CC	FW	HNE	IS	MN	MM	NBM	NV	NN	NS	SES	SWS	SN	SYD	WN	WS	NSW
1-<3 months late																	
Aboriginal (%)	29.0	20.3	24.2	25.3	28.3	25.9	27.0	26.9	29.7	19.2	19.2	23.6	28.4	19.8	26.4	24.3	25.6
Non-Aboriginal (%)	20.9	23.3	18.3	20.3	21.1	20.7	21.4	19.0	21.3	18.3	18.5	21.9	22.7	16.4	20.1	19.5	19.7
3-<7 months late																	
Aboriginal (%)	7.6	11.6	9.2	11.6	10.5	8.0	7.7	17.3	11.9	7.7	10.6	5.8	8.1	15.4	12.3	13.2	10.1
Non-Aboriginal (%)	5.3	4.8	4.4	4.7	5.7	4.3	6.0	4.9	6.9	4.3	4.6	6.7	4.4	4.0	4.5	5.2	5.1
≥ 7 months late																	
Aboriginal (%)	1.9	1.5	2.1	2.1	2.8	3.0	2.0	0.0	2.0	7.7	1.0	2.7	1.4	2.2	3.9	2.6	2.5
Non-Aboriginal (%)	1.4	1.1	1.1	1.4	2.0	1.1	1.5	1.5	2.2	2.1	1.6	2.0	1.4	1.9	1.0	2.4	1.8

^aCohort born 1 January 2014 – 31 December 2014.

^bCC: 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 Immunisation Register, data as at 31 March 2017.

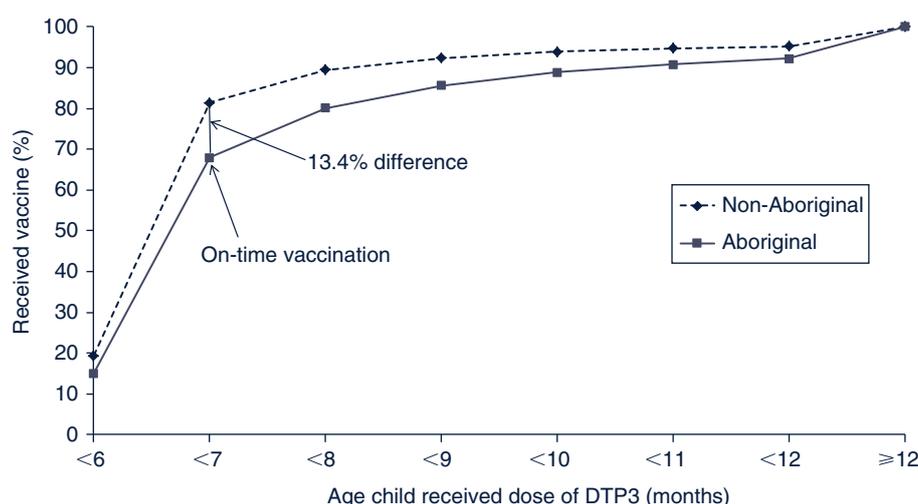


Figure 5. Timeliness of the third dose of DTPa vaccine (DTPa3) by Aboriginal status for the cohort of children born in 2014 in NSW.

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 Immunisation Register, data as at 31 March 2017.

Coverage in the elderly

- Influenza coverage estimates are based on 10 860 respondents in NSW aged 65 years and over. Pneumococcal vaccination coverage estimates are based on 10 561 respondents in NSW and includes Aboriginal and Torres Strait Islander adults aged 50–64 years and all adults aged 65 years and over.¹⁵
- The proportion of people aged 65 years and over reporting vaccination for influenza in the previous 12 months has remained relatively stable between 2002 and 2016 (Figure 12). In 2016, 71.6% of surveyed adults

reported they had received influenza vaccine in the previous 12 months. Coverage varied from 65.7% in the Northern Sydney LHD to 75.9% in the Far West (Table 10).

- The percentage of people aged 65 years and over reporting ever having received pneumococcal vaccination (23-valent pneumococcal polysaccharide vaccine) in 2016 was 47.0%, considerably lower than influenza vaccine coverage. There was variation in reported vaccination between LHDs, ranging from 37.0% in Sydney to 53.2% in the Far West (Table 10).

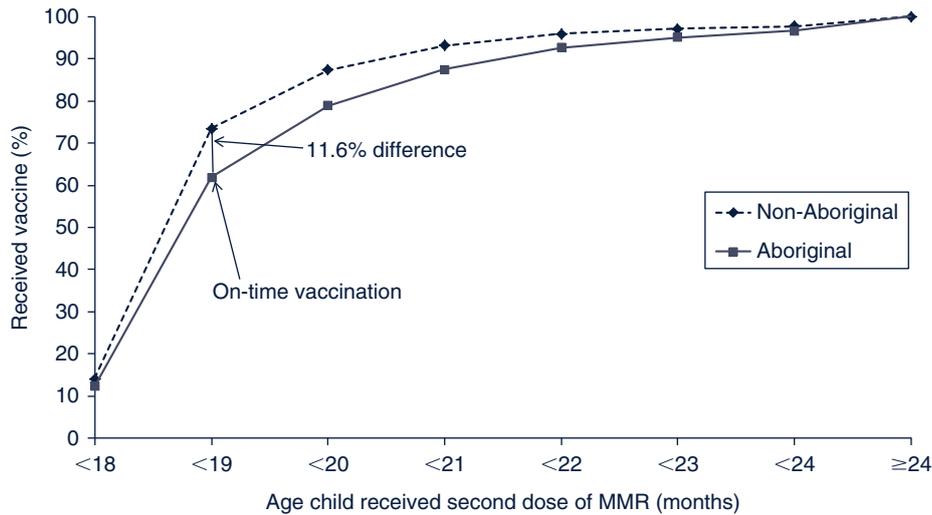


Figure 6. Timeliness of the second dose of MMR vaccine due at 18 months of age by Aboriginal status for the cohort of children born in 2014 in NSW.

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 Immunisation Register, data as at 31 March 2017.

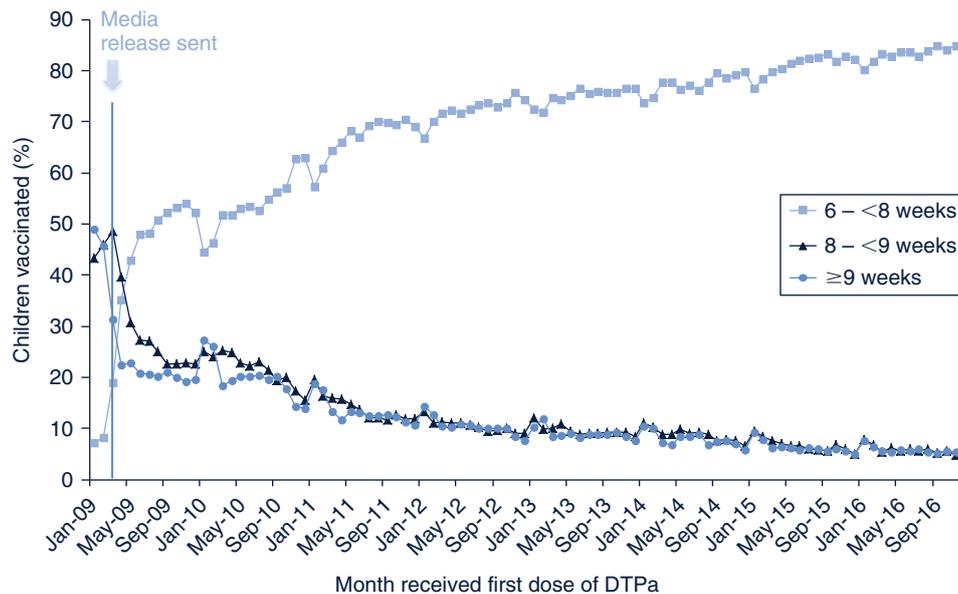


Figure 7. Age at which children in NSW received their first dose of hexavalent combination vaccine by month of receipt, January 2009–December 2016.

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 Immunisation Register, data as at 31 March 2017.

- The percentage of people reporting pneumococcal vaccination 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 required a repeat dose. It is possible that difficulty in recall may result in underestimation of pneumococcal vaccine uptake.

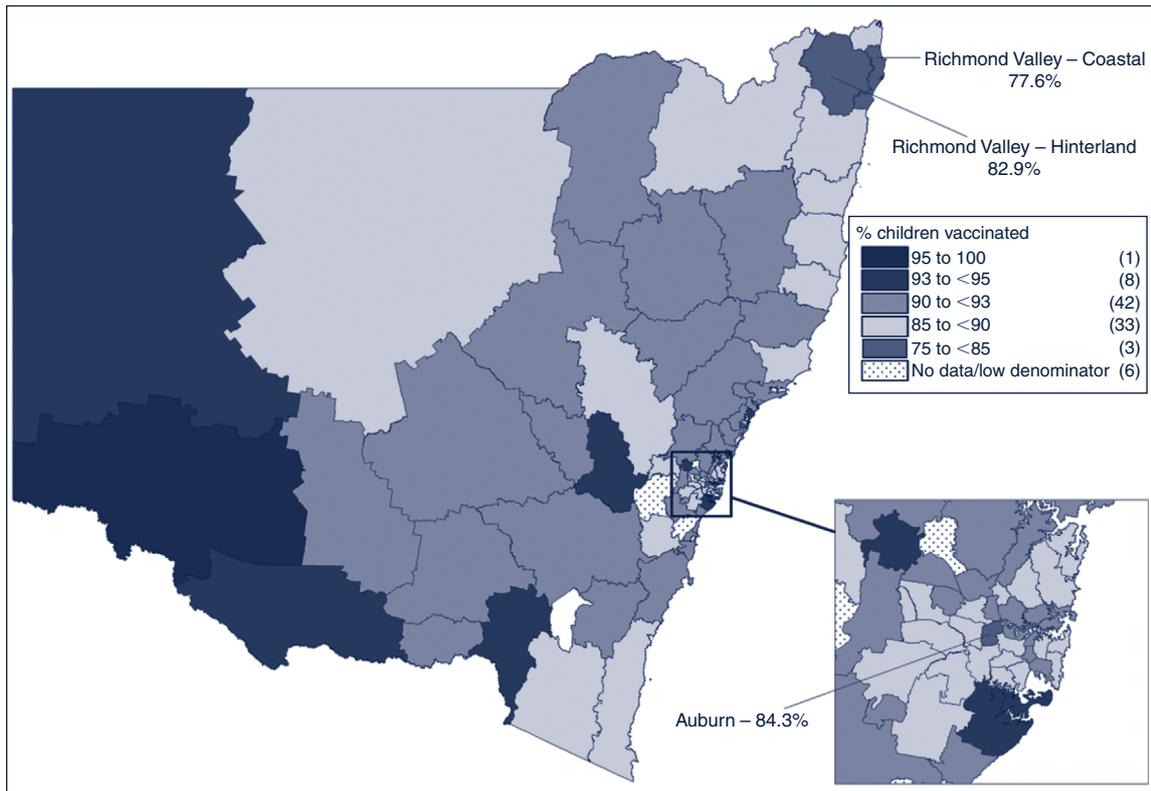


Figure 8. Rotavirus vaccine coverage at 12 months of age, by statistical area level 3, NSW, for the cohort of children born in 2015.

Source: Australian Immunisation Register, data as at 31 March 2017.

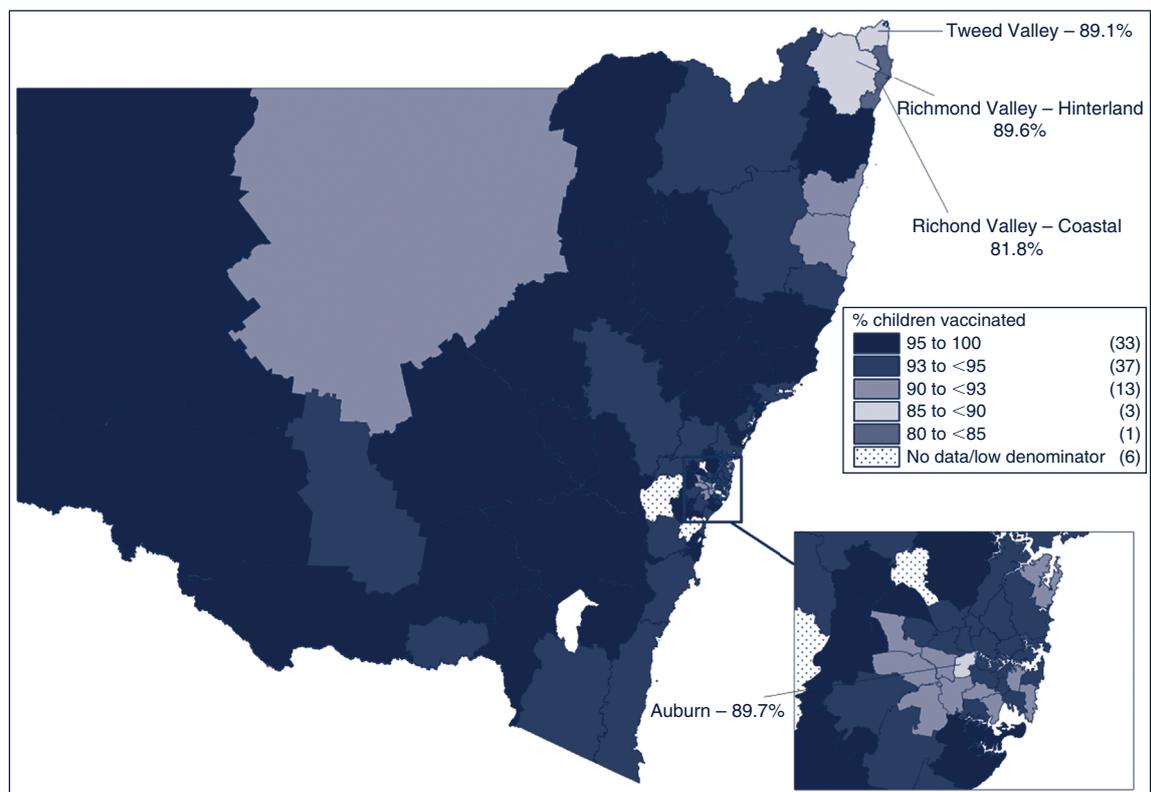


Figure 9. Pneumococcal conjugate vaccine coverage at 12 months of age, by statistical area level 3, NSW, for the cohort of children born in 2015.

Source: Australian Immunisation Register, data as at 31 March 2017.

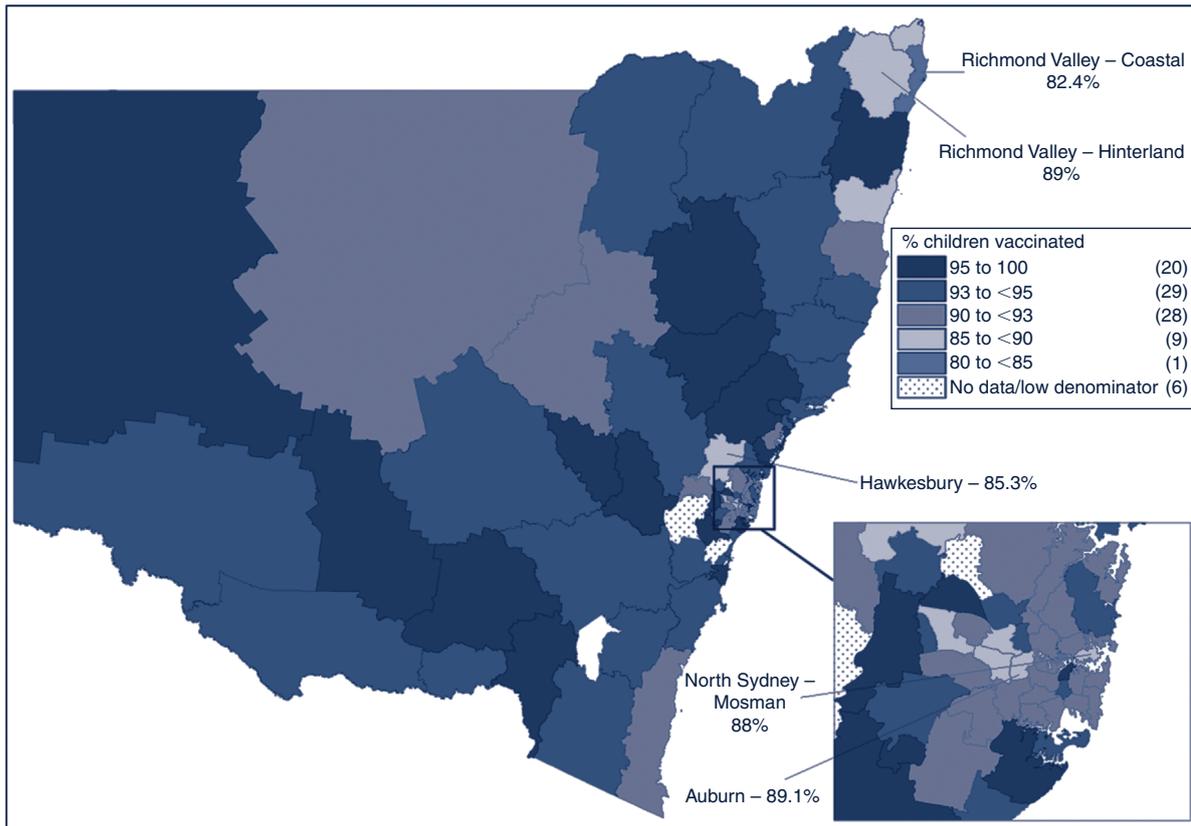


Figure 10. Second dose MMR vaccine coverage at 24 months of age, by statistical area level 3, NSW, for the cohort of children born in 2014.

Source: Australian Immunisation Register, data as at 31 March 2017.

Conclusion

The NSW Immunisation Program has continued to be successfully delivered during 2016. Increases in the ‘fully immunised’ coverage estimates occurred across each of the three milestones.

‘Fully immunised’ estimates at 12, 24 and 60 months of age improved substantially for Aboriginal children across NSW in 2016. The gap in coverage between Aboriginal and non-Aboriginal children in NSW has completely closed and the percentage of ‘fully immunised’ children is now higher in Aboriginal children compared with non-Aboriginal children at each milestone. While the percentage of Aboriginal children with vaccination delay for the third dose of DTPa and the second dose of MMR is still higher than that observed in non-Aboriginal children, the disparity in ‘on-time vaccination’ between Aboriginal and non-Aboriginal children for these two vaccine doses decreased in 2016. The NSW Aboriginal Immunisation Healthcare Worker program, funded by NSW Health since July 2012, is likely to have contributed to these observed improvements, suggesting that the commitment

of significant resources to a dedicated program can have a pronounced impact on closing the gap in relation to Aboriginal vaccination.

The NSW School Vaccination Program is continuing its success with 86% of females and 83% of males in Year 7 receiving the first dose of HPV in 2016. Coverage for the adolescent dose of varicella vaccine increased in 2016, while coverage for adolescent dTpa vaccine remained relatively stable.

Self-reported vaccination coverage in the elderly suggests that almost three-quarters of adults aged 65 years and over receive an annual influenza vaccine; however, less than half report ever receiving the pneumococcal vaccine.

The AIR, 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 9. Vaccination coverage estimates for individual vaccines, NSW adolescent school attendees^a in NSW, 2012–2016

Vaccine	2016 Coverage (%)	2016 Doses given	2015 Coverage (%)	2015 Doses given	2014 Coverage (%)	2014 Doses given	2013 Coverage (%)	2013 Doses given	2012 Coverage (%)	2012 Doses given
HPV dose 1 ^{b,c} – females	86	37 061	87	37 572	87	37 119	86	36 911	86	36 811
HPV dose 2 ^{b,c} – females	84	36 152	86	36 849	85	36 320	84	35 888	84	35 965
HPV dose 3 ^{b,c} – females	80	34 699	82	35 512	82	35 054	82	34 977	78	33 381
HPV dose 1 ^{b,c} – males	83	38 505	84	37 945	83	37 155	80	36 268	na	na
HPV dose 2 ^{b,c} – males	82	37 799	83	37 266	81	36 465	78	35 449	na	na
HPV dose 3 ^{b,c} – males	78	36 086	80	35 950	78	35 311	76	34 404	na	na
Hepatitis B dose 1 ^c	na	na	na	na	na	na	51	44 933	69	60 925
Hepatitis B dose 2 ^c	na	na	na	na	na	na	46	40 233	63	54 948
dTpa ^c	85	76 342	86	75 633	84	73 856	81	71 918	81	70 997
dTpa ^d	na	na	na	na	na	na	na	na	67	58 065
Varicella ^c	70	62 429	66	58 630	42	37 123	53	46 738	50	43 714
HPV dose 1 ^e – males	na	na	na	na	74	33 714	70	31 940	na	na
HPV dose 2 ^e – males	na	na	na	na	71	32 252	67	30 373	na	na
HPV dose 3 ^e – males	na	na	na	na	59	26 669	56	25 277	na	na

^aCoverage estimates are for school attendees only and do not include doses administered in general practice.

^bHPV vaccination coverage includes dose 2 and 3 catch-up vaccination offered to students in Year 8 in Terms 1–2 in 2017 who commenced the three-dose course of HPV vaccine in Year 7 in 2016. Coverage for this cohort is preliminary as data are not yet available for catch-up doses given to students in Terms 3–4 in 2017.

^cYear 7 school attendees.

^dYear 10 school attendees.

^eYear 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.

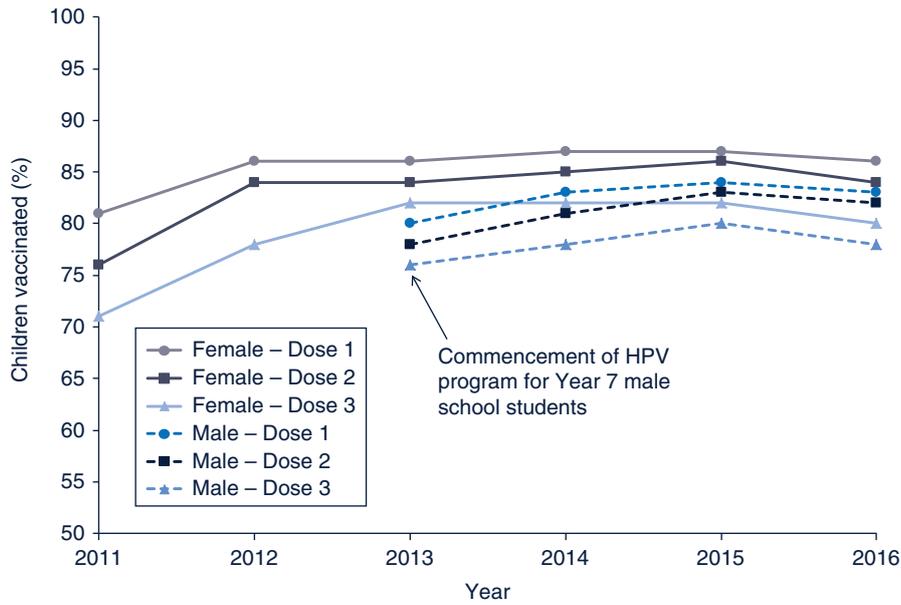


Figure 11. Trends in human papillomavirus vaccine coverage for adolescents^a in NSW, 2011–2016.

^aAdolescent 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.

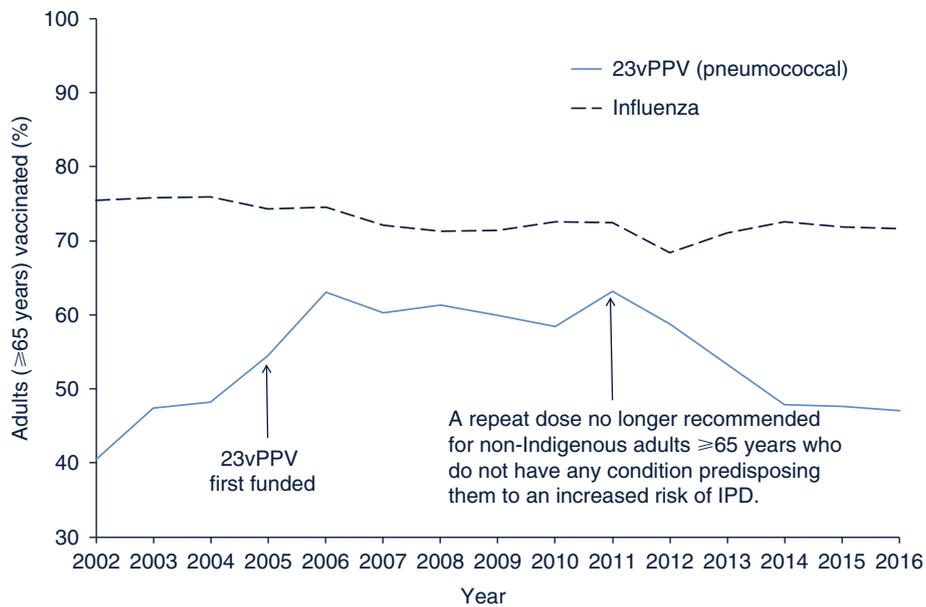


Figure 12. Trends in vaccination coverage estimates by vaccine for adults aged 65 years and over in NSW, ever vaccinated against pneumococcal disease^a and vaccinated against influenza^b in the last 12 months, 2002–2016.

^aVaccinated against pneumococcal disease. Indicator includes Aboriginal and Torres Strait Islander adults aged 50–64 years.

^bVaccinated against influenza in the last 12 months.

23vPPV: 23-valent pneumococcal polysaccharide vaccine

IPD: invasive pneumococcal disease

Source: New South Wales Population Health Survey (SAPHaRI). Centre for Epidemiology and Evidence, NSW Ministry of Health. Data from www.healthstats.nsw.gov.au (updated 20 June 2017).

Table 10. Percentage of adults aged 65 years and over reporting vaccination against pneumococcal disease^a and influenza^b for each local health district in NSW, and for NSW, 2016

Vaccine	Local Health District ^c															
	CC	FW	HNE	IS	MNC	MM	NBM	NNSW	NS	SES	SWS	SNSW	SYD	WNSW	WS	NSW
Pneumococcal % vaccinated	48.6	53.2	50.7	51.1	47.3	52.2	50.0	50.6	43.0	45.5	42.2	48.0	37.0	51.5	45.4	47.0
Influenza % vaccinated	69.9	75.9	74.5	73.6	68.7	71.3	67.1	69.9	65.7	69.6	74.4	75.5	71.1	72.5	75.3	71.6

^aVaccinated against pneumococcal disease. Indicator includes Aboriginal and Torres Strait Islander adults aged 50–64 years.

^bVaccinated against influenza in the last 12 months.

^cCC: 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 (SAPHaRI). Centre for Epidemiology and Evidence, NSW Ministry of Health. Data from www.healthstats.nsw.gov.au (updated 20 June 2017).

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