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# **NSW Annual Immunisation Coverage Report 2022**

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## Abstract

**Introduction:** This report documents vaccination coverage in NSW up to 2022 and reports 'whole-of-life' coverage data for vaccines given to children, adolescents and adults under the National Immunisation Program (NIP).

**Methods:** Data from the Australian Immunisation Register (AIR) and the NSW School Adolescent Vaccination Program were used to calculate childhood, adolescent and adult vaccination coverage and childhood vaccination timeliness in 2022, with comparisons made to 2021 where relevant.

**Results:** Fully vaccinated coverage at 12, 24 and 60 months of age in NSW was 0.4 – 1.1 percentage points lower in 2022 than 2021, dropping to 93.5%, 91.0% and 93.4%, respectively, reflecting impacts of the COVID-19 pandemic on childhood coverage. For Aboriginal children in NSW, fully vaccinated coverage at the three milestone ages was 92.8%, 90.8% and 96.1%, respectively, 0.8 – 1.5 percentage points lower than in 2021. Coverage at 60 months of age was higher in Aboriginal children than in non-Aboriginal children. Whilst timeliness of most vaccines assessed was lower in 2022 than in 2021, it was generally more so in Aboriginal children. Fully vaccinated coverage assessed at earlier/more timely milestones (9, 15, 21 & 51 months of age) was 6.2 – 9.4 percentage points lower than at the standard milestones in Aboriginal children, compared to 3.0 – 6.7 percentage points lower in non-Aboriginal children, and on-time vaccination (within 30 days of due date of the vaccines assessed) was 1.8 – 13.1 percentage points lower in Aboriginal than in non-Aboriginal children. The proportion of Year 7 students receiving the first dose of human papillomavirus (HPV) vaccine and the diphtheria-tetanus-acellular pertussis vaccine through the NSW Adolescent School Vaccination program was 7 – 8 percentage points lower in 2022 than 2021, whilst the proportion of Year 10 students receiving meningococcal ACWY vaccine was 4 percentage points higher. Of NSW adolescents turning 15 years of age in 2022, 86.7% of girls and 84.2% of boys (88.1% and 81.7% of Aboriginal girls and boys, respectively) had at least one dose of HPV vaccine recorded on AIR by their 15th birthday, 1.0 – 1.6 percentage points lower than for previous years (2.7 – 4.9 percentage points lower for Aboriginal adolescents). Vaccination coverage of HPV, the adolescent dose of diphtheria-tetanus-acellular pertussis, and the adolescent dose of meningococcal ACWY, increased with increasing age. Whilst coverage of the adolescent vaccines assessed was mostly higher in non-Aboriginal adolescents than in Aboriginal adolescents, the disparity reduced with

increasing age. In 2022, zoster vaccine and 13-valent pneumococcal conjugate vaccine (13vPCV) coverage in adults turning 71 years of age was 36.2% and 29.0%, respectively. Whilst still suboptimal, zoster and 13vPCV coverage was 2.7 and 9.2 percentage points higher, respectively, than coverage in 2021, likely due in part to the impact of mandatory reporting to the AIR introduced in mid-2021. Influenza vaccination coverage in 2022 was higher than in 2021 across all age groups for both Aboriginal and non-Aboriginal people, ranging from 2.6 – 10.5 percentage points higher. In adults aged 50 years and over, coverage was approximately 6 percentage points higher in Aboriginal than non-Aboriginal adults. However, although influenza vaccine is funded for all Aboriginal people aged 6 months of age and over, coverage was lower in Aboriginal than non-Aboriginal people for all age groups under 50 years with the greatest disparity of 10.8 percentage points in children aged 6 months to less than 5 years. Following the phased roll-out of the COVID-19 vaccination program from February 2021, 97.1% and 95.8% of people aged  $\geq 16$  years had received a first and second dose, respectively, of a COVID-19 vaccine by 4 January 2023. COVID-19 vaccination coverage of dose 1 and dose 2 was approximately 10 percentage points lower in Aboriginal people, however this may be due in part to the younger age structure of the Aboriginal population. Whilst coverage of a third COVID-19 vaccine dose in people aged  $\geq 16$  years was higher overall (67.5%) than in Aboriginal people (53.2%), coverage of a fourth dose in people aged  $\geq 30$  years was 4.3 percentage points higher in Aboriginal people (37.9%) than overall (33.6%), most likely due to the COVID-19 booster vaccination recommendations in place during 2022. COVID-19 vaccination coverage of the first and second dose was substantially lower in adolescents aged 12 – 15 years (78.2% and 74.1%, respectively) and younger children aged 5 – 11 years (47.5% and 39.1%, respectively).

**Conclusions:** Some impacts of the COVID-19 pandemic on vaccination coverage and timeliness are evident in NSW. It will be important to ensure that these pandemic-related dips in coverage are reversed through implementation of successful catch-up vaccination programs. Strategies focusing on equitable and timely access to vaccines are also required to increase vaccine uptake across the life-course.

## Introduction

This is the 14th NSW annual immunisation coverage report. It aims to facilitate the continued monitoring of NSW vaccination programs through comprehensive analysis of vaccination trends and interpretation of their relationship to factors including policy and program changes. This 2022 report is the second in the series to report ‘whole-of-life’ coverage data from the Australian Immunisation Register (AIR), i.e. data for vaccines given to children, adolescents and adults under the National Immunisation Program (NIP), following the AIR’s expansion in 2016.<sup>1-3</sup> Comprehensive analyses of coverage data for the calendar year 2022 are included in this report. Whilst vaccination coverage trend data from 2013 onwards are shown, there is a particular focus on changes in coverage from 2021<sup>4</sup> to 2022.

This report uses the longstanding international practice of reporting coverage at key milestone ages to measure coverage against national targets and to track trends over time. Its format is adapted from the annual national immunisation coverage reports published by the National Centre for Immunisation Research and Surveillance (NCIRS) since 2009.<sup>5</sup> Vaccination coverage can be impacted by changes to immunisation policy and programs, including changes to the fully vaccinated coverage algorithms defined by the Australian Government Department of Health and Aged Care. Some key changes in Australian and NSW immunisation policies and programs are highlighted in **Box 1**, with the vaccines delivered through the NSW Immunisation Program in 2022 outlined in **Table 1**.

### **Box 1. Significant changes in immunisation policy and programs relevant to NSW, 2018 – 2022<sup>6</sup>**

#### 1 June – 17 July 2022

One time influenza vaccination program funded by NSW Health for all people not eligible for an NIP-funded influenza vaccine, to encourage higher uptake due to concerns about a severe influenza season following removal of COVID-19 pandemic-related restrictions and reduced immunity due to low levels of circulating influenza in 2020 and 2021.

#### January 2022

Commonwealth-funded COVID-19 vaccination program for children aged 5 – 11 years commenced.

#### October 2021

Inactivated recombinant zoster vaccine (Shingrix) recommended by ATAGI over the live zoster vaccine (Zostavax) in individuals aged ≥50 years for prevention of herpes zoster and its complications, because of higher efficacy.

September 2021

Commonwealth-funded COVID-19 vaccination program for adolescents aged 12 – 15 years commenced.

July 2021

All vaccinations given under the NIP required to be reported to AIR.

June 2021

Inactivated recombinant zoster vaccine (Shingrix) available on private prescription.

March 2021

All influenza vaccinations given required to be reported to AIR.

February 2021

Commonwealth-funded COVID-19 vaccination program began, implemented in phases based on population groups prioritised according to the advice of ATAGI. Mandatory reporting to AIR of COVID-19 vaccinations commenced.

July 2020

Meningococcal B vaccine funded under the NIP for all Aboriginal children at 6 weeks, 4 months and 12 months of age, with catch-up program for Aboriginal children less than 2 years of age.

A single dose of 13vPCV funded for Aboriginal adults at 50 years of age, followed by a dose of 23-valent pneumococcal polysaccharide vaccine (23vPPV) 2–12 months later and then a second dose of 23vPPV 5–10 years after that. For non-Aboriginal adults, a single dose of 13vPCV is funded from 70 years of age, replacing the previously funded dose of 23vPPV at 65 years of age.

March 2020

Influenza vaccine funded under the NIP for all children aged 6 months – <5 years.

Enhanced quadrivalent influenza vaccine (adjuvanted) funded under the NIP for people aged ≥65 years.

April 2019

Meningococcal ACWY conjugate vaccine funded under the NIP for adolescents aged 14 – 16 years, delivered through the adolescent school vaccination program, and adolescents aged 15 – 19 years delivered through primary care providers as part of an ongoing catch-up program.

February 2019

Annual seasonal influenza vaccination funded under the NIP for Aboriginal people aged 5–14 years, meaning all Aboriginal people aged ≥6 months now eligible for funded vaccine.

July 2018

Schedule for routine childhood vaccination with 13vPCV changed from 2, 4 and 6 months to 2, 4 and 12 months of age.

Meningococcal ACWY conjugate vaccine funded for all children at 12 months of age, replacing the combined *Haemophilus influenzae* type b (Hib) and meningococcal C vaccine, with the Hib component moved to 18 months of age and given as monovalent vaccine.

April 2018

Annual seasonal influenza vaccination funded by NSW Health for all children aged 6 months – < 5 years; enhanced trivalent influenza vaccines (high-dose and adjuvanted) funded nationally for all adults aged  $\geq 65$  years.

February 2018

2-dose schedule of 9-valent human papillomavirus (9vHPV) vaccine funded under the NIP for adolescents aged 12 –14 years, delivered through the adolescent school vaccination program.

January 2018

Further strengthening of vaccination requirements for childcare enrolment in NSW.

Meningococcal ACWY adolescent school vaccination program funded for all NSW secondary school students in Years 10 and 11, as well as adolescents aged 15 to 19 years who had not received the vaccine at school.

## Methods

### *The Australian Immunisation Register (AIR)*

The Australian Childhood Immunisation Register (ACIR) was established on 1 January 1996 by incorporating demographic data from Medicare on all enrolled children aged <7 years.<sup>7</sup> Up to 31 December 2015, while all vaccination records for a child remained on the ACIR indefinitely, no new vaccination encounter records were added after their seventh birthday.<sup>8</sup> The register was expanded from 1 January 2016 to include records of vaccinations given up to less than 20 years of age and from 30 September 2016 to become the AIR, capturing records of vaccinations given to individuals in Australia throughout their life.<sup>1-3</sup> All people registered with Medicare are automatically added to AIR and assigned a unique Personal Identification Number (PIN) which travels with that person for life, across all relevant Medicare card numbers (e.g. where multiple due to family circumstances or maturity). Participation in the AIR is opt-out so it constitutes a nearly complete population register for Australian residents.<sup>7</sup> Individuals who are not Medicare-registered, but for whom a vaccination encounter is reported to AIR, are assigned a Supplementary Identification Number (SIN),<sup>8</sup> with subsequent assignment of a PIN where the individual is identified to be Medicare-registered. A person remains on the AIR until Medicare is notified that the person has died or permanently left Australia, at which time an 'end-date' is applied to that person's AIR record. All vaccination records for a person remain on the register indefinitely.

Since 2001, vaccinations given overseas can 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. This occurs predominantly via medical practice management software or through direct data entry on the AIR website. Mandatory reporting to the AIR was introduced in 2021 for all vaccines given to people of any age under the NIP, and influenza and COVID-19 vaccines.<sup>9</sup>

The AIR contains limited demographic information for each individual (date of birth, gender, Indigenous status, postcode and PIN/SIN) and information regarding vaccinations received (brand/type, dose number, date of encounter, immunisation provider type/postcode, and method of reporting to AIR). Prior to completing the analyses for this report duplicate individual records were excluded (i.e. where the PIN was identical) with the most up-to-date record kept based on the Medicare number registration date. Duplicate vaccination records were also excluded where the PIN, vaccine type, vaccine dose and encounter date were identical. Other exclusions included individuals with an 'end-date' applied, individuals with a postcode not matched to a state/territory, and individuals assigned a SIN (i.e. not Medicare-registered).

Vaccination coverage and vaccination timeliness are presented in this report for the overall NSW population and by Aboriginal status. Aboriginal and Torres Strait Islander status on AIR is recorded as 'Indigenous', 'non-Indigenous' or 'unknown'. For this report, two categories of Aboriginal status were used: 'Aboriginal' (Indigenous) and 'non-Aboriginal' (non-Indigenous and unknown combined). Completeness of Aboriginal identification for children in the ACIR was shown to have been acceptable by 2005.<sup>10</sup> Aboriginal status was not specified for approximately 0.6% of the all-age NSW population registered on AIR as at 2 April 2023.

Vaccination coverage and vaccination timeliness are presented in this report for NSW overall and by local health district (LHD). There are 15 geographically-based LHDs in NSW – six metropolitan and nine rural/regional. Data for an additional LHD (Network with Victoria) is also reported on. Analysis of childhood coverage was also undertaken at small area level using the Australian Bureau of Statistics (ABS)-defined statistical area 3 (SA3),<sup>11</sup> chosen because each is small enough to show differences within areas and provide more detail than LHDs, but not too small to render maps unreadable. For



reasons of confidentiality and accuracy, SA3s with a population size less than 26 for a year-wide birth cohort of children were excluded prior to any mapping and small area analyses. Maps were created using version 15 of MapInfo mapping software.<sup>12</sup> ABS Census Boundary Information (ABS Postal Area to SA3 Concordance 2021) was used to match residential postcode to SA3.<sup>13</sup>

This report details childhood, adolescent and adult vaccination coverage in the 2022 calendar year using AIR data as at 2 April 2023. Where relevant, comparisons are made to vaccination coverage in 2021<sup>4</sup> and trends are presented from 2013 onwards.

### ***Measuring childhood vaccination coverage using the AIR***

Childhood vaccination status was assessed at 12 months of age (for vaccines due at 6 months), 24 months of age (for vaccines due at 6, 12 and 18 months), and 60 months of age (for vaccines due at 48 months) using the cohort method, which has been used for calculating national and state/territory coverage at the population level since the inception of the register<sup>14</sup>. Only vaccines given on or before a child's first, second or fifth birthday, respectively, were included in coverage calculations.<sup>14</sup> If a child's record indicated receipt of the last dose of a vaccine that requires more than one dose to complete the series, it was assumed that earlier vaccinations in the sequence had been given.<sup>15</sup>

For most analyses in this report the proportion of children designated as fully vaccinated at each milestone was calculated using 12-month wide cohorts (shown in **Box 2**). However, to assess trends over time for fully vaccinated at 12, 24 and 60 months of age, three-month-wide birth cohorts were used, with children aged 12 – <15 months for the 12-month assessment age, children aged 24 – <27 months for the 24-month assessment age and children aged 60 – <63 months for the 60-month assessment age. The number of children completely vaccinated with the vaccines of interest by the designated age was used as the numerator, and the total number of Medicare-registered children in the relevant 12-month wide cohort was used as the denominator. The nationally agreed definitions of fully vaccinated coverage at 12, 24 and 60 months of age, as outlined in **Box 2**, are set by the Australian Government Department of Health and Aged Care for the purpose of standardised reporting.<sup>16</sup> Vaccination coverage

estimates in this report may however differ slightly from estimates published elsewhere that are calculated using rolling annualised quarterly coverage data.<sup>17</sup>

<b>Box 2. Vaccinations required to be deemed fully vaccinated by each assessment age</b>	
<b>Milestone</b>	<b>Vaccinations</b>
<b>9 months/12 months</b> (Cohort born 1 January 2021 – 31 December 2021)	Dose 3 DTPa (due at 6 months) Dose 3 polio (due at 6 months) Dose 3 HepB (due at 6 months) Dose 3 Hib (due at 6 months) Dose 2 or 3 13vPCV (due at 4 or 6 months)
<b>15 months</b> (Cohort born 1 January 2020 – 31 December 2020)	Dose 3 DTPa (due at 6 months) Dose 3 polio (due at 6 months) Dose 3 HepB (due at 6 months) Dose 3 Hib (due at 6 months) Dose 3 13vPCV (due at 6 or 12 months) Dose 1 meningococcal C-containing vaccine (due at 12 months) Dose 1 MMR (due at 12 months)
<b>21 months/24 months</b> (Cohort born 1 January 2020 – 31 December 2020)	Dose 4 DTPa (due at 18 months) Dose 3 polio (due at 6 months) Dose 3 HepB (due at 6 months) Dose 4 Hib (due at 18 months) Dose 1 meningococcal C-containing vaccine (due at 12 months) Dose 1 varicella (due at 18 months) Dose 2 MMR (due at 18 months) Dose 3 13vPCV (due at 6 or 12 months)
<b>51 months/60 months</b> (Cohort born 1 January 2017 – 31 December 2017)	Dose 4 or 5 DTPa (due at 48 months) Dose 4 polio (due at 48 months)

Vaccination coverage was also calculated separately for the second dose of rotavirus vaccine (an NIP vaccine not included in the calculation for fully vaccinated) by 12 months of age. Coverage of dose 1 – 3 of meningococcal B vaccine was assessed for the first year-wide cohort of Aboriginal children eligible to have received the full infant meningococcal B vaccination schedule at 2, 4 and 12 months of age.

Childhood vaccination coverage (fully vaccinated and individual vaccines/antigens) was calculated for each milestone age by Aboriginal status, LHD and SA3, as well as for NSW and Australia overall.

### ***Measuring childhood vaccination timeliness using the AIR***

To capture aspects of vaccination timeliness, fully vaccinated coverage was also assessed at 9, 15, 21 and 51 months of age, as outlined in **Box 2**. The algorithms used at 9, 21 and 51 months of age were the same as those used in the standard milestones of 12, 24 and 60 months of age, respectively, whilst the algorithm used at 15 months of age was the same as that used as one of the Key Performance Indicator measures of the Aboriginal Immunisation Healthcare Worker (AIHCW) program, funded by NSW Health since July 2012 with the aim of improving vaccination coverage and timeliness in Aboriginal children throughout NSW.<sup>18</sup>

Timeliness was assessed for the first and third dose of DTPa-containing vaccine, the second dose of 13vPCV and the first and second dose of MMR-containing vaccine, using 12-month wide birth cohorts with on-time vaccination defined as receipt within 30 days of the recommended age. Timeliness of these vaccine doses was compared in Aboriginal and non-Aboriginal children by plotting the cumulative percentage receiving the vaccine dose by age in months. Timeliness of the third dose of DTPa-containing vaccine and the second dose of MMR-containing vaccine was also assessed by Aboriginal status using a vaccination delay measure categorised as 'no delay', 'delay of 1 – <3 months', 'delay of 3 – <7 months' or 'delay ≥7 months'. To allow time for very late vaccinations to be included in the timeliness analyses, children were assessed up to 2 years after doses were due, and therefore these cohorts were not the same as those assessed for fully vaccinated coverage estimates.

Vaccination timeliness was assessed by Aboriginal status and LHD, and for NSW and Australia overall.

### ***Measuring adolescent vaccination coverage in the NSW school vaccination program***

Coverage data for vaccines given to adolescents in 2022 through the NSW Adolescent School Vaccination Program were provided by NSW Health. Vaccination data for HPV vaccine and dTpa vaccine for Year 7 students, and meningococcal ACWY vaccine for Year 10 students, are recorded by school immunisation teams and collated by the LHDs and NSW Health. Coverage for each vaccine was calculated using the counts of students vaccinated as the numerator and the NSW school population enrolments, as at

the start of year, as the denominator, and may be an underestimate of 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. In NSW, school-based HPV catch-up vaccination has been offered since 2012 to Year 8 students who commenced the course in Year 7, to support course completion. Annual Year 7 HPV vaccination coverage from 2012 to 2021 include school catch-up vaccinations given in Year 8 in the following year.

### ***Measuring adolescent vaccination uptake and coverage using the AIR***

The number of dose 1 and dose 2 HPV vaccinations given during 2022 to NSW adolescents aged 11 – <15 years was determined. Of the adolescents aged 11 – <15 years with a record on AIR of a first dose of HPV vaccine given during 2022, the proportion who also received dose 2 by 31 December 2022 was calculated to assess course completion within the same calendar year. This proportion was compared to the proportion of dose 1 recipients in 2021 who had also received dose 2 in 2021. The proportion of adolescents who commenced HPV vaccination in 2021 and then completed the 2-dose schedule by receiving a catch-up second dose in 2022 was also calculated. Adolescent HPV vaccination uptake during 2021 and 2022 was calculated by gender, Aboriginal status and LHD, and for NSW and Australia overall.

The World Health Organization recommends assessing coverage by 15 years of age for the purpose of international comparison over time.<sup>19</sup> As HPV vaccination in NSW is delivered routinely in Year 7, usually around 12 – 13 years of age, all adolescents should have had the opportunity to have been vaccinated by 15 years of age. HPV vaccination coverage by 15 years of age was calculated using the cohort method for 2020 – 2022. In the cohorts of Medicare-registered adolescents turning 15 years of age in the relevant year (i.e. cohorts born in 2005 – 2007), the proportion who had received at least one dose of HPV vaccine prior to their 15th birthday was calculated by gender, Aboriginal status and LHD, as well as for NSW and Australia overall. In this report, coverage of at least one dose of HPV vaccine is presented as Australia switched to a single-dose schedule in 2023.

Vaccination coverage in 2022 of adolescent vaccines was also assessed using a broader range of single year-wide birth cohorts, with reference to the age each cohort

was turning in 2022, and including doses received by the end of 2022 (rather than before the relevant birthday). Coverage of at least one dose of HPV vaccine given at  $\geq 9$  years of age was assessed in cohorts turning 13 – 26 years (i.e. cohorts born 1996 – 2009), coverage of an adolescent dose of diphtheria-tetanus-acellular pertussis vaccine given at  $\geq 10$  years of age was assessed in cohorts turning 13 – 19 years (i.e. cohorts born 2003 – 2009), and coverage of an adolescent dose of meningococcal ACWY vaccine given at  $\geq 10$  years of age was assessed in cohorts turning 15 – 19 years (i.e. cohorts born 2007 – 2009). Analysis for each vaccine was undertaken at the state level by birth cohort and Aboriginal status.

### ***Measuring adult vaccination coverage using the AIR***

For the second time in this series of reports, adult vaccination coverage of zoster vaccine and 13vPCV was calculated using AIR data. Zoster vaccination coverage was defined as receipt of one dose of Zostavax vaccine or two doses of Shingrix vaccine and 13vPCV vaccination coverage was defined as receipt of an adult dose of 13vPCV. Coverage was calculated for the cohorts of Medicare-registered adults turning 71 years of age during 2022 or 2021 (i.e. cohorts born in 1951 or 1950, respectively) by LHD, as well as for NSW and Australia, who had received the relevant vaccine by 31 December of the year coverage was being assessed. Vaccination coverage of zoster vaccine and 13vPCV was also assessed at state level, by age at vaccination, for cohorts of Medicare-registered Aboriginal and non-Aboriginal adults turning 50 – <60 years, 60 – <70 years, 70 – <80 years (by single year of age), and  $\geq 80$  years of age during 2022 who had received the relevant vaccine by 31 December 2022.

### ***Measuring influenza vaccination coverage***

Influenza vaccination coverage was calculated for specific age groups (6 months – <5 years, 5 – <15 years, 15 – <50 years, 50 – <65 years and  $\geq 65$  years) by dividing the number of Medicare-registered people in the relevant age group with at least one dose of influenza vaccine recorded on the AIR in the calendar year of interest (i.e. 2021 or 2022) by the total number of Medicare-registered people in the relevant age group (based on birth cohorts with age assessed at 30 June in the year of interest). Influenza vaccination coverage was calculated by age group, Aboriginal status and LHD, as well as for NSW and Australia overall. Influenza vaccination data for adults aged  $\geq 65$  years from the NSW Adult Population Health Survey were not available to present in this

report, as the question pertaining to influenza vaccination status was removed from the survey in 2022 following the introduction of mandatory reporting of all NIP vaccines to AIR.

### ***Measuring COVID-19 vaccination coverage***

COVID-19 vaccination coverage data including doses given in 2021 and 2022 for children aged 5 – 11 years, adolescents aged 12 – 15 years and for people aged  $\geq 16$  years,  $\geq 30$  years, and  $\geq 65$  years in NSW and Australia were obtained from available data as at 4 January 2023, published by the Australian Government Department of Health and Aged Care.<sup>20</sup> Using these publicly available data, coverage for people aged 16 – 29 years and 30 – 64 years were also calculated for NSW and Australia. Coverage of doses 1 – 4 was calculated using the number of people with the relevant dose of a COVID-19 vaccine recorded on AIR for people in each age group as at 4 January 2023 as the numerator and the Australian Bureau of Statistics Estimated Resident Population for each age group as at 30 June 2021 as the denominator. Coverage data of doses 1 – 3 for Aboriginal people aged  $\geq 16$  years in NSW and Australia were also obtained from the publicly available data.<sup>20</sup> These used the number of Aboriginal people aged  $\geq 16$  years with the relevant dose of a COVID-19 vaccine recorded on AIR as the numerator and the total number of Aboriginal people aged  $\geq 16$  years registered on AIR as at 4 January 2023 as the denominator. Dose 4 coverage data for people (overall and Aboriginal) aged  $\geq 30$  years were also obtained from the publicly available data.<sup>20</sup>

## Summary of Results

### Childhood vaccination coverage

#### Quarterly data (3-month wide age cohorts)

- Fully vaccinated coverage in NSW, assessed at 12 months, 24 months and 60 months of age, was 93.4%, 91.0% and 94.0%, respectively, in the December 2022 quarter (**Figure 1**).
- Coverage in the December 2022 quarter was lower at 12 months and 24 months than the December 2021 quarter, by 0.5 of a percentage point and 1.5 percentage points, respectively, whilst coverage at 60 months was 0.1 of a percentage point higher. However, fully vaccinated coverage at all three milestone ages decreased by 0.2 – 0.9 of a percentage point between the March 2022 and December 2022 quarterly data points (**Figure 1**).
- Coverage for the individual vaccines/antigens assessed at each of the three milestone ages also decreased between the March 2022 and December 2022 quarterly data points. Coverage at 12 months of age decreased by 0.3 of a percentage point for all vaccines, except rotavirus vaccine (which cannot be given once infants turn 15 weeks [dose 1] and 25 weeks [dose 2] of age), which decreased by 1.2 percentage points (**Figure 2**). Coverage at 24 months of age decreased by 0.3 – 0.7 of a percentage point for all vaccines (**Figure 3**) and coverage at 60 months of age decreased by 0.1 and 0.2 of a percentage point for the fourth or fifth dose of DTPa-containing vaccine and the fourth dose of polio-containing vaccine, respectively (**Figure 4**).

#### Annual data (12-month wide age cohorts)

- NSW-level fully vaccinated coverage at the 12-month milestone was 93.5% in 2022 (**Table 2**), 0.7 of a percentage point lower than in 2021, and was lower in 2022 compared to 2021 in all LHDs except Hunter New England, where it was 0.1 of a percentage point higher. Fully vaccinated coverage at 12 months of age in 2022 was above 93.0% in all LHDs except Mid North Coast, Northern NSW and South Western Sydney (**Table 2**).

- NSW-level coverage at 12 months of age in 2022 was 94.0% or greater for all individual vaccines/antigens, except for rotavirus vaccine (**Table 2**), but 0.4 – 0.8 of a percentage point lower than in 2021.
- At LHD level, coverage at 12 months of age in 2022 was 93.5% or greater for all individual vaccines/antigens (except rotavirus) in all LHDs except Mid North Coast, Northern NSW and South Western Sydney (**Table 2**).
- Fully vaccinated coverage at the 24-month milestone was 91.0% at state level in 2022 (**Table 3**), 1.1 percentage points lower than in 2021, and lower in all LHDs except Far West and Murrumbidgee, where it was 0.9 of a percentage point and 1.1 percentage points higher, respectively. Fully vaccinated coverage at 24 months of age in 2022 was above 90.0% in all LHDs except Northern NSW, South Western Sydney and Western Sydney (**Table 3**).
- Whilst state level annual coverage for all individual vaccines/antigens at 24 months of age was greater than 92.0% in 2022 (**Table 3**), it was 0.3 – 1.1 percentage points lower than in 2021.
- At LHD level, coverage for all individual vaccines/antigens at 24 months of age in 2022 was greater than 92.0% in all except Mid North Coast, Northern NSW, South Western Sydney and Western Sydney (**Table 3**).
- Coverage of the fourth dose of DTPa-containing vaccine at 24 months of age was 92.3% at state level in 2022 (1.0 percentage point lower than in 2021), and greater than 92.0% in all LHDs, except for Mid North Coast, Northern NSW, South Western Sydney and Western Sydney (**Table 3**).
- Coverage of MMR-containing vaccine at 24 months of age was 95.1% at state level in 2022 for dose 1 and 92.7% for dose 2 (**Table 3**), 0.3 and 0.9 of a percentage point lower than in 2021, respectively, and greater than 93.0% (dose 1) and 91.0% (dose 2) in all LHDs except for Northern NSW, where coverage was 88.7% for dose 1 and 85.7% for dose 2 (**Table 3**).
- At state level, fully vaccinated coverage at the 60-month milestone was 93.4% in 2022 (**Table 4**), 0.4 of a percentage point lower than in 2021. Fully vaccinated coverage at 60 months of age in 2022 was greater than 93.0% in all LHDs except Mid North Coast, Northern NSW, Northern Sydney, South Eastern Sydney and Sydney (**Table 4**).



- Coverage at state level for all vaccines/antigens at the 60-month milestone in 2022 was greater than 93.5% (**Table 4**), despite being up to 0.6 of a percentage point lower than 2021.
- At LHD level, coverage for all individual vaccines/antigens at 60 months of age was greater than 95.0% in 2022 in Far West, Hunter New England, Illawarra Shoalhaven, Murrumbidgee, Nepean Blue Mountains, Network with Victoria, Southern NSW and Western NSW (**Table 4**).

### **Aboriginal children vaccination coverage**

#### Annual data (12-month wide age cohorts)

- Fully vaccinated coverage at the state level for Aboriginal children at the 12-month milestone was 92.8% in 2022, 0.7 of a percentage point lower than non-Aboriginal children at the same age (**Table 5**). Compared to 2021, coverage at the 12-month milestone in 2022 was 0.8 of a percentage point lower for both Aboriginal and non-Aboriginal children.
- At LHD level, fully vaccinated coverage for Aboriginal children at the 12-month milestone in 2022 ranged from 87.0% in Northern NSW to 98.2% in Network with Victoria, and was higher than non-Aboriginal children in Central Coast, Mid North Coast, Network with Victoria, Northern NSW, South Western Sydney and Southern NSW but lower in other LHDs (**Table 5**).
- In 2022, coverage at the state level for all individual vaccines/antigens at the 12-month milestone, excluding rotavirus vaccine, was 93.0% or above for Aboriginal children and 94.1% or above for non-Aboriginal children (**Table 6**). Compared to 2021, coverage in 2022 for individual vaccine/antigens at the 12-month milestone was 0.1 of a percentage point – 1.4 percentage points lower for Aboriginal children and 0.5 of a percentage point – 1.3 percentage points lower for non-Aboriginal children.
- State level Aboriginal coverage of individual vaccines/antigens at the 12-month milestone was 0.9 – 1.2 percentage points lower than non-Aboriginal children in 2022, except for rotavirus vaccine which was 2.6 percentage points lower and 13vPCV which was 0.9 of a percentage point higher. (**Table 6**).
- Fully vaccinated coverage at the state level for Aboriginal children at the 24-month milestone in 2022 was 90.8%, 0.2 of a percentage point lower than for

non-Aboriginal children at the same age (**Table 5**). Coverage in 2022 was lower than in 2021 for both Aboriginal and non-Aboriginal children, by 1.5 percentage points and 1.1 percentage points, respectively.

- Fully vaccinated coverage for Aboriginal children at the 24-month milestone in 2022 varied by LHD, ranging from 86.7% in Sydney to 96.5% in Far West, and was higher than for non-Aboriginal children in Far West, Mid North Coast, Nepean Blue Mountains, Northern NSW, South Western Sydney and Western Sydney but lower in other LHDs (**Table 5**).
- In 2022, coverage at the state level for individual vaccines/antigens at the 24-month milestone was 93.0% or above for both Aboriginal and non-Aboriginal children, except for the fourth dose of diphtheria-tetanus-pertussis (acellular), the second dose of MMR and the dose of varicella, (**Table 6**). Coverage in 2022 for individual vaccine/antigens at the 24-month milestone was 0.3 of a percentage point – 1.5 percentage points lower than in 2021 for Aboriginal children and 0.3 of a percentage point – 1.0 percentage point lower for non-Aboriginal children.
- State level coverage in 2022 was higher for Aboriginal than non-Aboriginal children at the 24-month milestone for the third dose of polio-containing vaccine, third dose of hepatitis B-containing vaccine, the first dose of MMR-containing vaccine, the first dose of meningococcal C-containing vaccine and the third dose of 13vPCV, whilst it was lower for the other vaccines (**Table 6**).
- Fully vaccinated coverage at the state level for Aboriginal children at the 60-month milestone was 96.1% in 2022, 2.8 percentage points higher than for non-Aboriginal children at the same age (**Table 5**). Coverage was lower in 2022 than 2021 for both Aboriginal and non-Aboriginal children, by 0.9 and 0.3 of a percentage, respectively.
- Fully vaccinated coverage for Aboriginal children at the 60-month milestone in 2022 was higher than for non-Aboriginal children in all LHDs, except in Northern Sydney where it was 1.7 percentage points lower, and was higher than 95% in all LHDs, except Mid North Coast, Northern NSW, Northern Sydney, South Western Sydney and Western Sydney (**Table 5**).
- In 2022, coverage at the state level for all individual vaccines/antigens at the 60-month milestone was 96.2% or above for Aboriginal children and 93.4% or above for non-Aboriginal children (**Table 6**). Coverage was 0.3 – 0.8 of a percentage

point lower in 2022 than 2021 for Aboriginal children and 0.1 – 0.5 of a percentage point lower for non-Aboriginal children.

- State level coverage of individual vaccines/antigens at the 60-month milestone was 2.0 – 3.0 percentage points higher for Aboriginal than non-Aboriginal children in 2022 (**Table 6**).
- Meningococcal B vaccination coverage for the first year-wide cohort of Aboriginal children in NSW eligible to have received 3 doses of meningococcal B vaccine by 31 December 2022 (under the NIP program implemented 1 July 2020) was 75.2% for the first dose, 73.1% for the second dose and 63.2% for the third dose (**Table 7**).
- Meningococcal B vaccination coverage varied by LHD – for dose 1 ranging from 60.4% in South Western Sydney to 84.5% in Far West, and for dose 3 ranging from 37.6% in South Western Sydney to 79.4% in Far West (**Table 7**).

### Timeliness of childhood vaccination

- Fully vaccinated coverage assessed at 9, 15, and 21 months of age (i.e. at 3 months after the last vaccine dose due, earlier than the standard milestone ages) at state level was lower for Aboriginal than non-Aboriginal children, with the greatest disparity between Aboriginal and non-Aboriginal coverage seen at 9 months of age (4.0 percentage point differential) (**Figure 5**). This was 0.7 of a percentage point greater than the disparity seen at this age in 2021. Fully vaccinated coverage assessed at 51 months of age at state level was marginally higher for Aboriginal than non-Aboriginal children.
- Fully vaccinated coverage assessed at 9 months of age in 2022 was 6.3 percentage points lower than at 12 months for Aboriginal children (86.5% versus 92.8%) and 3.0 percentage points lower for non-Aboriginal children (90.5% versus 93.5%) in NSW (**Figure 5**), a 1.4 percentage point and 0.7 of a percentage point greater disparity than in 2021, respectively.
- Fully vaccinated coverage assessed at 21 months of age in 2022 was 6.2 percentage points lower than at 24 months for Aboriginal children (84.6% versus 90.8%) and 3.5 percentage points lower for non-Aboriginal children (87.5% versus 91.0%) in NSW (**Figure 5**), a 0.6 and 0.3 of a percentage point greater disparity than in 2021, respectively.

- Fully vaccinated coverage assessed at 51 months of age in 2022 was 9.4 percentage points lower than at 60 months for Aboriginal children (86.7% versus 96.1%) compared to 6.7 percentage points lower for non-Aboriginal children (86.6% versus 93.3%) in NSW (**Figure 5**), a 1.1 percentage point and 0.9 of a percentage point greater disparity than in 2021, respectively.
- In 2022, 96.3% of children in NSW who received a first dose of DTPa-containing vaccine were vaccinated on time (within 30 days of the 6-week schedule point), with on-time vaccination 1.8 percentage points higher for non-Aboriginal (96.4%) than Aboriginal (94.6%) children (**Figure 6**). On-time vaccination for the first dose of DTPa-containing vaccine was lower in 2022 than 2021 for both Aboriginal and non-Aboriginal children, by 0.8 and 0.7 of a percentage point, respectively.
- In 2022, 90.4% of children in NSW who received a second dose of 13vPCV vaccine were vaccinated on time (before 5 months of age), with on-time vaccination 7.1 percentage points higher for non-Aboriginal (91.0%) than Aboriginal (83.9%) children, however by 8 months of age this differential had reduced to less than 1 percentage point (**Figure 7**). On-time vaccination for the second dose of 13vPCV was lower in 2022 than 2021 for both Aboriginal and non-Aboriginal children, by 3.1 and 2.1 percentage points, respectively.
- In 2022, the proportion of children in NSW who received a third dose of a DTPa-containing vaccine on time (before 7 months of age) was 81.4%, with on-time vaccination 13.1 percentage points higher for non-Aboriginal (82.4%) than Aboriginal (69.3%) children, however by 10 months of age this differential had reduced to 2.9 percentage points (**Figure 8**). On-time vaccination for the third dose of DTPa-containing vaccine was lower in 2022 than 2021 for both Aboriginal and non-Aboriginal children, by 5.8 and 3.8 percentage points, respectively.
- On-time vaccination for the third dose of DTPa-containing vaccine in 2022 varied by LHD, ranging from 76.4% in South Western Sydney to 87.1% in Western NSW for non-Aboriginal children, and from 52.1% in Far West to 83.6% in Northern Sydney for Aboriginal children (**Table 8**). Whilst the majority of delayed vaccination for the third dose of DTPa-containing vaccine was in the 1 – <3 months delay category across all LHDs for both non-Aboriginal and Aboriginal children, 3.3 – 10.3% of Aboriginal children had a delay of 3 – <7 months, compared to 2.0 – 5.2% of non-Aboriginal children, and 0.0 – 3.3% of Aboriginal

children had a delay of  $\geq 7$  months, compared to 0.3 – 1.5% of non-Aboriginal children (**Table 8**).

- In 2022, 78.0% of children in NSW who received the first dose of MMR were vaccinated on time (before 13 months of age), with on-time vaccination 11.3 percentage points higher for non-Aboriginal (78.8%) than Aboriginal (67.5%) children, however by 16 months of age, this differential had reduced to 1.9 percentage points (**Figure 9**). On-time vaccination for the first dose of MMR was lower in 2022 than 2021 in both Aboriginal and non-Aboriginal children, by 5.9 and 3.2 percentage points, respectively.
- In 2022, 66.4% of children in NSW vaccinated with the second dose of MMR-containing vaccine were vaccinated on time (before 19 months of age), with on-time vaccination 12.8 percentage points higher in non-Aboriginal (67.3%) than Aboriginal (54.5%) children, however by 22 months of age, this differential had reduced to 2.1 percentage points (**Figure 10**). On-time vaccination for the second dose of MMR-containing vaccine was lower in 2022 than 2021 for both Aboriginal and non-Aboriginal children, by 3.6 and 3.7 percentage points, respectively.
- On-time vaccination for the second dose of MMR-containing vaccine varied by LHD in 2022, ranging from 57.6% in Northern NSW to 72.9% in Northern Sydney for non-Aboriginal children, and from 43.5% in Northern NSW to 70.1% in Northern Sydney for Aboriginal children (**Table 9**). Whilst the majority of delayed vaccination for the second dose of MMR-containing vaccine was in the 1 – <3 months delay category across all LHDs for both non-Aboriginal and Aboriginal children, 3.4 – 15.3% of Aboriginal children had a delay of 3 – <7 months, compared to 3.4 – 6.2% of non-Aboriginal children, and 0.0 – 3.8% of Aboriginal children had a delay of  $\geq 7$  months, compared to 0.0 – 1.6% of non-Aboriginal children (**Table 9**).

### Small area vaccination coverage

#### Annual data (12-month wide age cohorts)

- Coverage for rotavirus vaccine by SA3 in 2022 (**Figure 11**) ranged from 74.0% in Richmond Valley-Coastal to 96.2% in Broken Hill and Far West, and was above 95% in six SA3s, four less than in 2021. Rotavirus coverage was between 90 – <95% in 57 SA3s (compared to 70 in 2021) and between 85 – <90% in 22 SA3s (compared to six in 2021). Four SA3s (Richmond Valley-Coastal, Richmond

Valley-Hinterland, Merrylands-Guildford, and Tweed Valley) had rotavirus vaccination coverage below 85%.

- Coverage for the fourth dose of DTPa-containing vaccine measured at the 24-month milestone by SA3 in 2022 (**Figure 12**) ranged from 77.6% in Richmond Valley-Coastal to 97.8% in Broken Hill and Far West. Coverage was above 95% in 11 SA3s, compared to 27 in 2021, and below 90% in 11 SA3s, four more than in 2021. Richmond Valley-Coastal and Merrylands-Guildford were the only SA3s with coverage below 85%.
- Coverage for the second dose of MMR-containing vaccine measured at the 24-month milestone by SA3 in 2022 (**Figure 13**) ranged from 79.7% in Richmond Valley-Coastal to 97.4% in Broken Hill and Far West. Coverage was above 95% in 13 SA3s (compared to 30 in 2021) and between 90 – <95% in 68 SA3s. Eight SA3s had coverage below 90%, compared to six in 2021, and Richmond Valley-Coastal was the only SA3 with coverage below 85%.

### Adolescent vaccination coverage

#### *NSW Adolescent School Vaccination Program data*

- In 2022, 75% of Year 7 girls and 71% of Year 7 boys received a first dose of HPV vaccine through the NSW adolescent school vaccination program, with completion of the two-dose HPV vaccine course achieved by 61% of Year 7 girls and 58% of Year 7 boys in the same calendar year (**Table 10**).
- With the inclusion of catch-up second dose vaccinations offered in 2022 to Year 8 students who had received a first dose whilst during Year 7 in 2021, HPV schedule completion increased from 23% to 72% in 2022 for girls and from 22% to 71% for boys (**Table 10**).
- Coverage of the adolescent dTpa booster dose given in 2022 to Year 7 students was 71% and coverage of the meningococcal ACWY conjugate vaccine in NSW Year 10 students was 64% in 2022 (**Table 10**).

#### *Australian Immunisation Register data*

##### HPV vaccinations given to adolescents aged 11 – 14 years

- AIR data (i.e. vaccinations in all settings not just schools) showed that 41,237 girls and 41,004 boys aged 11 – 14 years received a first dose of HPV vaccine in

2022 (**Table 11**). Of these, 74.4% of girls and 72.7% of boys also received their second dose in 2022 (**Table 11**), substantially higher than in 2021 (32.1% of girls and 30.5% of boys) when COVID-19 pandemic public health measures were in place.

- Of girls and boys aged 11 – 14 years who received a first dose of HPV vaccine in 2022, the proportion who went on to complete the 2-dose course in 2022 varied substantially by LHD, ranging from 55.6% (girls) and 52.7% (boys) in Northern NSW to 80.9% (girls) and 81.1% (boys) in Northern Sydney (**Table 11**).
- Substantial catch-up of the second dose of HPV vaccine occurred in 2022 for those who had commenced the two-dose schedule in 2021, with course completion at the state level for girls and boys increasing from 32.1% and 30.5% at the end of 2021 to 91.7% and 91.2% at the end of 2022, respectively (**Table 11**).
- Due to lower completion of the two-dose HPV schedule within 2021 in metropolitan LHDs compared to regional LHDs, 44.6 – 85.5% of girls and boys living in metropolitan LHDs who received the first dose in 2021, received the second dose as a catch-up vaccine in 2022, compared to 15.1 – 80.9% in regional LHDs (**Table 11**).
- By the end of 2022, course completion for those who had commenced the two-dose HPV schedule in 2021 ranged from 79.9% (girls) and 75.8% (boys) in the Far West to 96.0% (girls) and 95.6% (boys) in Northern Sydney (**Table 11**).
- Of the non-Aboriginal and Aboriginal girls aged 11 – 14 years in NSW who received a first dose of HPV vaccine in 2022, the proportion who received a second dose of HPV vaccine within the same calendar year was 75.0% and 60.5%, 43.1 and 26.4 percentage points higher, respectively, than the relevant proportion in 2021 (**Table 12**).
- Of those who commenced the two-dose HPV vaccine schedule in 2021, a higher proportion of non-Aboriginal girls (60.4%) received the second dose of HPV as a catch-up vaccination in 2022 compared to Aboriginal girls (47.6%), increasing course completion from 31.9% and 34.1% at the end of 2021 to 92.3% and 81.7% at the end of 2022 for non-Aboriginal and Aboriginal girls, respectively (**Table 12**).
- Of the non-Aboriginal and Aboriginal boys aged 11 – 14 years in NSW who received a first dose of HPV vaccine in 2022, the proportion who received a

second dose of HPV vaccine within the same calendar year was 73.3% and 59.2%, 42.8 and 27.2 percentage points higher, respectively, than the relevant proportion in 2021 (**Table 12**).

- Of those who commenced the two-dose HPV vaccine schedule in 2021, a higher proportion of non-Aboriginal boys (61.3%) received the second dose of HPV as a catch-up vaccination in 2022 compared to Aboriginal boys (48.7%), increasing course completion from 30.5% and 32.0% at the end of 2021 to 91.8% and 80.6% at the end of 2022 for non-Aboriginal and Aboriginal boys, respectively (**Table 12**).

#### HPV vaccination coverage in adolescents turning 15 years of age

- In the cohort of adolescents turning 15 years in 2022, coverage of at least one dose of HPV vaccine received before their 15th birthday was 86.7% and 84.2%, for girls and boys, respectively, at the state level (**Figure 14**), 1.0 – 1.6 percentage points lower than in 2021 and 2020. In each cohort of adolescents turning 15 years in 2020 – 2022, coverage of at least one dose of HPV vaccine received before their 15th birthday was higher for both girls and boys in NSW than Australia (**Figure 14**).
- In the cohort of Aboriginal and non-Aboriginal girls and boys turning 15 years in 2022, coverage of at least one dose of HPV vaccine received before their 15th birthday was 0.9 of a percentage point – 5.1 percentage points higher in NSW than Australia (**Table 13**).
- In the cohort of Aboriginal girls turning 15 years in 2022, coverage of at least one dose of HPV vaccine received before their 15th birthday was 1.5 percentage points higher than non-Aboriginal girls (88.1% versus 86.6%) at the state level (**Table 13**). Compared to 2021, coverage in 2022 was 1.0 percentage point lower for non-Aboriginal girls and 2.7 percentage points lower for Aboriginal girls. Coverage in 2022 varied by LHD – from 80.5% in South Eastern Sydney to 97.3% in the Central Coast for Aboriginal girls and from 76.4% in Northern NSW to 90.1% in Murrumbidgee for non-Aboriginal girls (**Table 13**).
- In the cohort of Aboriginal boys turning 15 years in 2022, coverage of at least one dose of HPV vaccine received before their 15th birthday was 2.6 percentage points lower than non-Aboriginal boys (81.7% versus 84.3%) at the state level



(**Table 13**). Compared to 2021, coverage in 2022 was 0.9 of a percentage point lower for non-Aboriginal boys and 4.9 percentage points for Aboriginal boys. Coverage in 2022 varied by LHD – from 57.1% in the Network with Victoria to 95.8% in Northern Sydney for Aboriginal boys and from 74.5% in Northern NSW to 89.1% in the Central Coast for non-Aboriginal boys (**Table 13**).

#### HPV vaccination coverage in adolescents turning 13 – 26 years of age

- Assessing a broader range of single-year age cohorts, and including vaccine doses received by the end of 2022 (i.e. rather than before the relevant birthday), coverage of at least one dose of HPV vaccine was higher in each cohort of Aboriginal and non-Aboriginal females compared to males. Coverage increased with increasing age, up to those turning 18 years of age (females) and up to those turning 17 years of age (males), however with less marked increases in the older cohorts, and then decreased with increasing age in both females and males (**Table 14**).
- In the NSW cohort of adolescent girls turning 13 years of age in 2022, coverage of at least one dose of HPV vaccine by 31 December 2022 was 5.2 percentage points higher in non-Aboriginal girls than Aboriginal girls (79.2% versus 74.0%). However, coverage in females turning 14 – 26 years of age or older in 2022 was higher in Aboriginal than non-Aboriginal females in all age cohorts assessed, ranging from 0.1 of a percentage point – 8.4 percentage points higher (**Table 14**).
- In the NSW cohort of adolescent boys turning 13 years of age in 2022, coverage of at least one dose of HPV vaccine by 31 December 2022 was 12.1 percentage points higher in non-Aboriginal boys than Aboriginal boys (73.8% versus 61.7%). Coverage was 3.6 and 1.9 percentage points higher in non-Aboriginal boys than Aboriginal boys turning 14 and 15 years of age in 2022, respectively. However, coverage in boys turning 14 – 19 years of age or older in 2022 was higher than non-Aboriginal boys across all age cohorts, ranging from 0.1 – 2.5 percentage points higher, but was 0.4 – 9.0 percentage points lower in the cohorts turning 20 – 26 years in 2022 (**Table 14**).

### Adolescent diphtheria-tetanus-acellular pertussis vaccination coverage in adolescents turning 13 – 19 years of age

- Assessing a broad range of single-year age cohorts, and including vaccine doses received by the end of 2022, coverage of an adolescent dose of diphtheria-tetanus-acellular pertussis vaccine in NSW increased with increasing age up to 16 years for both Aboriginal and non-Aboriginal adolescents (**Figure 15**).
- In adolescents turning 13 years of age in 2022, coverage of an adolescent dose of diphtheria-tetanus-acellular pertussis vaccine was 8.9 percentage points lower in Aboriginal than non-Aboriginal adolescents (68.0% versus 76.9%), however this disparity decreased to 2.5 percentage points and 1.3 percentage points in those turning 14 and 15 years of age, respectively, and coverage was marginally higher in Aboriginal adolescents turning 16, 17 and 19 years of age in 2022 (**Figure 15**).

### Adolescent meningococcal ACWY vaccination coverage in adolescents turning 15–19 years of age

- Assessing a broad range of single-year age cohorts, and including vaccine doses received by the end of 2022, coverage of an adolescent dose of meningococcal ACWY vaccine increased with increasing age (**Figure 16**), but was lower than other adolescent vaccines assessed for both Aboriginal and non-Aboriginal adolescents.
- Whilst coverage of an adolescent dose of meningococcal ACWY vaccine in 2022 was lower in Aboriginal adolescents than non-Aboriginal, across all age cohorts, the disparity reduced with increasing age, from 20.1 percentage points in those turning 16 years to 10.5 percentage points in those turning 19 years (**Figure 16**).

## **Adult vaccination coverage**

### Zoster vaccine

- At state level, zoster vaccination coverage (i.e. receipt of one dose of Zostavax or two doses of Shingrix by 31 December 2022) for adults turning 71 years of age in 2022 was 36.2%, up from 33.5% in 2021, but 5.1 percentage points lower than coverage at the national level (**Table 15**).

- Zoster vaccination coverage was higher for adults turning 71 years of age in 2022 than in 2021 across all LHDs, with coverage in 2022 ranging from 28.3% in Sydney to 45.0% in Hunter New England (**Table 15**).
- At state level, zoster vaccination coverage in Aboriginal adults turning 71 years of age was 0.2 of a percentage point lower than non-Aboriginal (36.0% versus 36.2%), but for the older age groups assessed, coverage in Aboriginal adults was 0.7– 6.4 percentage points higher than non-Aboriginal (**Figures 17 and 18**).
- At state level, cumulative zoster vaccination coverage was highest for adults turning 75 years in 2022 in both non-Aboriginal (50.3%, **Figure 17**) and Aboriginal (53.4%, **Figure 18**).
- Most non-Aboriginal and Aboriginal adults turning 70 – 75 years in 2022 who had received zoster vaccine by 31 December 2022 were vaccinated at 70 years of age, the recommended NIP schedule point (**Figures 17 and 18**).
- In contrast, most non-Aboriginal and Aboriginal adults turning 76 – 79 years in 2022 were vaccinated through the catch-up program (i.e. at 71 – 79 years of age) (**Figures 17 and 18**).

#### Pneumococcal vaccine (13vPCV)

- At state level, 13vPCV coverage (i.e. receipt of an adult dose of 13vPCV by 31 December 2022) for adults turning 71 years of age in 2022 was 29.0%, up from 19.8% in 2021, but 4.8 percentage points lower than coverage at the national level (**Table 15**).
- 13vPCV coverage was higher for adults turning 71 years of age in 2022 than in 2021 in all LHDs, with coverage in 2022 ranging from 20.9% in South Western Sydney to 38.9% in Hunter New England (**Table 15**).
- At state level, 13vPCV coverage in Aboriginal adults was 4.1 – 16.6 percentage points higher than non-Aboriginal in all age groups assessed (**Figures 19 and 20**).
- At state level, cumulative 13vPCV coverage was highest in adults turning 71 years of age in 2022 in both Aboriginal (37.5%, **Figure 20**), and non-Aboriginal (28.8%, **Figure 19**).
- Most non-Aboriginal adults turning 70 – 72 years in 2022 who had received an adult dose of 13vPCV by 31 December 2022 were vaccinated at 70 years of age,

whereas those turning 73 years and older were predominantly vaccinated at 71 years or older. Only a small percentage (0.6 – 2.3%) of non-Aboriginal adults turning 50 – 71 years in 2022 had received an adult dose of 13vPCV before turning 70 years of age (**Figure 19**).

- A similar pattern was seen in Aboriginal adults, although a much higher percentage (7.8 – 18.2%) of Aboriginal adults turning 50 – 71 years in 2022 had received an adult dose of 13vPCV before turning 70 years of age (**Figure 20**).
- In younger Aboriginal adults turning 50 – 59 years or 60 – 69 years in 2022, 13vPCV coverage was 13.2% and 18.2%, respectively (**Figure 20**).

### Influenza vaccination coverage

- In 2022, influenza vaccine uptake commenced in early April with the trajectory of uptake in age groups  $\geq 50$  years highest from mid to late April and in age groups  $< 50$  years from mid to late May. (**Figure 21**).
- Influenza vaccination coverage in children aged 6 months –  $< 5$  years reached 33.1% in NSW in 2022, 9.8 percentage points higher than in 2021 (**Figure 22**).
- In 2022, influenza vaccination coverage at the state level in children aged 6 months –  $< 5$  years continued to be higher in non-Aboriginal than Aboriginal children (33.8% versus 23.0%), but slightly lower than national coverage (34.7% and 24.6%, respectively (**Table 16**).
- Influenza vaccination coverage for children aged 6 months –  $< 5$  years in 2022 varied by LHD, ranging from 13.8% and 18.5% in Northern NSW for Aboriginal and non-Aboriginal children, respectively, to 45.1% and 47.7% in Northern Sydney (**Table 16**). Coverage by LHD was 4.9 – 18.4 percentage points higher in 2022 than 2021 for non-Aboriginal children. For Aboriginal children, coverage in 2022 by LHD was 0.1 – 16.3 percentage points higher than in 2021 for all LHDs except Mid North Coast, Network with Victoria and Southern NSW, where it was 0.1 – 4.4 percentage points lower (**Table 16**).
- At the state level, influenza vaccination coverage was higher in all age groups in 2022 than in 2021, by 7.6 – 10.5 percentage points for non-Aboriginal people and 2.6 – 5.6 percentage points for Aboriginal people (**Figure 23**).
- Influenza vaccination coverage at the state level in adults aged  $\geq 65$  years was 67.5% in 2022, 6.1 percentage points higher than in 2021 (**Table 17**). At LHD

level, coverage in 2022 was 3.1 – 7.7 percentage points higher than in 2021, ranging from 54.1% in Sydney to 77.0% in Hunter New England (**Table 17**).

### COVID-19 vaccination coverage

- Data as at 4 January 2023 showed that 97.1% of all people aged  $\geq 16$  years in NSW had received a first dose of a COVID-19 vaccine, 95.8% had received a second dose, and 67.5% had received a third dose, slightly lower than at the national level (97.4%, 96.0% and 69.5%, respectively) (**Figure 24**).
- At state level, coverage of the first and second dose of COVID-19 vaccine in people aged  $\geq 16$  years by 4 January 2023 was 9.2 and 9.7 percentage points lower in Aboriginal people than overall (87.9% and 86.1%, respectively), whilst coverage of a third dose was 14.3 percentage points lower in Aboriginal people, at 53.2% (**Figure 24**).
- Coverage in Aboriginal people aged  $\geq 16$  years by 4 January 2023 was higher in NSW than at the national level for the first and second dose of COVID-19 vaccine (by 2.4 and 3.8 percentage points, respectively), but 3.4 percentage points lower for the third dose (**Figure 24**).
- Coverage of a fourth dose of COVID-19 vaccine in people aged  $\geq 30$  years was substantially lower than coverage of the first, second and third doses both in NSW and nationally, 33.6% and 33.4%, respectively (**Figure 24**).
- In Aboriginal people aged  $\geq 30$  years, coverage of a fourth dose of COVID-19 vaccine was 37.9% at the state level and 35.1% nationally (**Figure 24**), 4.3 and 1.7 percentage points, respectively, higher than overall coverage.
- At state level, 47.5% of children aged 5 – 11 years had received a first dose of COVID-19 vaccine and 39.1% had received a second dose by 4 January 2023, following the funding of vaccination for all children in this age group from mid-January 2022 (**Figure 25**).
- Coverage of COVID-19 vaccine in NSW adolescents aged 12 – 15 years reached 78.2% for the first dose and 74.1% for the second dose by 4 January 2023 (**Figure 25**).
- Coverage of the first and second dose of COVID-19 vaccine in NSW increased by age group, reaching above 95% in people aged 30 – 64 years and above 99% in people aged  $\geq 65$  years (**Figure 25**). Coverage of a third and fourth dose of

COVID-19 vaccine in NSW reached 91.9% and 69.4%, respectively, by 4 January 2023 in adults aged  $\geq 65$  years, but was markedly lower in younger age groups eligible to have received these doses (**Figure 25**).

## Discussion

### Children

Fully vaccinated coverage of children in NSW assessed using 12-month wide age cohorts was lower overall in 2022 than in 2021 for each of the three milestone ages assessed, the second consecutive year where fully vaccinated coverage at the 12-month and 60-month milestones was lower. Coverage in 2022 was 0.7 of a percentage point lower than 2021 at the 12-month milestone (93.5% versus 94.2%), 1.1 percentage points lower at the 24-month milestone (91.0% versus 92.1%), and 0.4 of a percentage point lower at the 60-month milestone (93.4% versus 93.8%). The fully vaccinated coverage figures presented in this 2022 report reflect vaccinations due from mid-2020 through to mid-2022 and hence show a modest impact of the COVID-19 pandemic on childhood coverage. Decreases of similar magnitude have been seen nationally<sup>17,21</sup> and in comparable developed countries such as the United Kingdom<sup>22</sup> and United States.<sup>23</sup>

Childhood coverage of individual vaccines/antigens in NSW in 2022 was up to 1.3 percentage points lower than in 2021 but remained above 90%. Coverage was above the 95% target for 13vPCV at 12 months, polio, hepatitis B, meningococcal C, and the first dose of MMR at 24 months, and *Haemophilus influenzae* type b, hepatitis B, meningococcal C, first and second doses of MMR, varicella and 13vPCV at 60 months. Maintaining and preferably increasing vaccination coverage should be a key public health focus, particularly given the decreases in vaccination coverage globally since the start of the pandemic,<sup>22-27</sup> which have increased the risk of importation of diseases such as measles and polio to Australia.

Vaccination coverage in Aboriginal children in NSW has increased over the past decade through implementation of the NSW AIHCW program, funded by NSW Health since 2012.<sup>18</sup> Whilst the COVID-19 pandemic has had a negative impact on vaccination coverage of Aboriginal children in NSW, with fully vaccinated coverage at the three milestone ages 0.8 of a percentage point – 1.5 percentage points lower in 2022 than 2021, fully vaccinated coverage for Aboriginal children has remained higher than non-Aboriginal children at 60 months of age. Relatively high coverage has also been achieved in the first year-wide cohort of Aboriginal children eligible for meningococcal B vaccination with coverage by the end of 2022 reaching 75.2% and 73.1% for the first and second doses, respectively. Coverage of the third dose was lower, at 63.2%,

however this could be partly due to three doses not being required if the first dose was received after having turned 1 year of age. Additionally, only vaccinations given by 31 December 2022 were included so eventual coverage, with late doses factored in, will likely be higher.

Whilst vaccination coverage achieved in Aboriginal children is similar to or higher than that in non-Aboriginal children, issues with timeliness persist. This is a concern as Aboriginal children have a higher risk of severe disease at a younger age than non-Aboriginal children. The vaccines assessed for timeliness in this report were predominantly due in 2020 – 2021 and the proportion of children vaccinated on time (within 30 days of the recommended age) for the vaccines/antigens assessed in this report was 1.8 – 13.1 percentage points lower in Aboriginal children than non-Aboriginal children. Fully vaccinated coverage assessed at earlier milestones (i.e. 3 months after the due date of the last scheduled vaccine) was 6.3 – 9.4 percentage points lower than at the standard milestones for Aboriginal children, but only 3.0 – 6.7 percentage points lower for non-Aboriginal children.

Following the removal of COVID-19 pandemic-related restrictions at the end of 2021 and the reopening of international borders, there were concerns of a severe influenza season in 2022 due to reduced immunity because of very low levels of circulating influenza in 2020 and 2021. Despite annual influenza vaccination for children aged 6 months – <5 years having been funded on the NIP for Aboriginal children since 2015 and for all children since 2020 (state-funded in NSW from 2018),<sup>28</sup> influenza vaccination coverage in this age group only reached 33.1% in NSW in 2022. Whilst this was 9.8 percentage points higher than in 2021, it was 8.8 percentage points lower than in 2020. Coverage in NSW Aboriginal children in 2022 was only 23.0%, 10.8 percentage points lower than in non-Aboriginal children.

Coverage of both one and two doses of COVID-19 vaccine by the end of 2022 was substantially lower for children aged 5 – 11 years than in older age groups, partly contributed to by the shorter period of eligibility, with vaccination only funded in this age group from January 2022.<sup>29</sup>



## **Adolescents**

Throughout 2022, delivery of the NSW School Vaccination Program faced a number of challenges contributing to lower proportion of Year 7 and Year 10 students receiving their adolescent vaccines through the school-based program than in 2021. Some of the challenges reported by Public Health Units included major flooding, high absenteeism due to students/nurses staying home with cold and flu-like symptoms and/or COVID-19 outbreaks within school communities, as well as an anecdotal increase in vaccine hesitancy/fatigue.<sup>30</sup> Whilst the percentage of Year 7 students who received the first dose of HPV vaccine was 7 – 8 percentage points lower in 2022 than in 2021, the percentage of students who also received the second dose within the same calendar year was much higher in 2022 than in 2021 for both girls (61% compared to 23%) and boys (58% compared to 22%).<sup>4</sup> Following the major pandemic-related disruptions to the delivery of school-based vaccinations in 2021, substantial catch-up vaccinations were given in 2022 and the proportion of the 2021 Year 7 student cohort completing the two-dose HPV schedule increased by almost 50 percentage points from 23% to 72% for girls and from 22% to 71% for boys. Catch up vaccination of the second HPV dose will however no longer be required from 2023 following the change to a one-dose schedule from February 2023.<sup>31,32</sup> It will still be important to ensure catch-up vaccination occurs for those Year 7 students who did not receive any dose of HPV and/or dTpa vaccine and Year 10 students who missed receiving a dose of meningococcal ACWY vaccine, particularly as the proportion of students receiving these vaccines in 2022 was 10 – 13 percentage points lower than pre-pandemic levels in 2019.

Adolescent vaccinations given in NSW during 2022 analysed using data from the AIR showed broadly similar findings to the NSW school-based data, although slightly higher, as doses given both in and outside of the school-based vaccination program were included. The number of NSW adolescents aged 11 to 14 years recorded on AIR to have commenced HPV vaccination in 2022 was lower than in 2021, however the proportion of dose 1 recipients who completed the two-dose course within the same calendar was higher in 2022 than in 2021. Substantial catch-up of the second dose of HPV occurred in 2022 for those who commenced the two-dose course in 2021, with over 91% of the 2021 dose 1 recipients completing the course by the end of 2022. In adolescents who commenced the two-dose course in 2021, catch-up vaccination of the second dose in 2022 was substantially lower in Aboriginal than non-Aboriginal

adolescents. As a result, the proportion of the 2021 dose 1 recipients completing the course by the end of 2022 was more than 10 percentage points lower in Aboriginal adolescents than non-Aboriginal. Although less than 75% of adolescents overall, and less than 60% of Aboriginal adolescents, who commenced the two-dose course in NSW in 2022 received the second dose, catch-up vaccinations of dose 2 in subsequent years will not be required following the change to a one-dose schedule from February 2023.<sup>31,32</sup>

In 2022, 86.7% of girls in NSW had received at least one dose of HPV vaccine by 15 years of age, down from 87.7% in 2021, and 84.2% of boys, down from 85.3%. These figures compare well with coverage in 2022 nationally and in similar developed countries using the same WHO-recommended assessment methodology.<sup>33</sup> The decreases seen in NSW HPV coverage are likely due to impacts of the COVID-19 pandemic, as the 2022 coverage figures reflect vaccinations due in school-based programs predominantly during the COVID-19 pandemic, whilst 2021 coverage reflects vaccinations due predominantly before the pandemic. The disruption of school-based vaccination programs due to public health measures, lengthy school closures during 2020 and 2021, and the roll-out of the COVID-19 vaccination program in 2021 has been documented.<sup>34</sup>

Coverage of at least one dose of HPV vaccine by 15 years of age was 1.5 percentage points higher in Aboriginal girls than non-Aboriginal girls, but 2.6 percentage points lower in Aboriginal boys than non-Aboriginal boys. However, compared to 2021, coverage for Aboriginal girls and boys in 2022 was 2.7 and 4.9 percentage points lower, respectively. These decreases in coverage were substantially larger than the decreases seen in non-Aboriginal girls and boys. Whilst a single dose of HPV vaccine is highly effective in preventing infection and subsequent disease,<sup>35-37</sup> it will be important to ensure that the switch to a single dose schedule does not exacerbate existing equity issues.

Assessment of coverage of at least one dose of HPV vaccine by broader year-wide birth cohorts showed that coverage peaked in adolescents turning 17 years of age in 2022 and then decreased with increasing age to below 80% in females turning 23 – 26 years and in males turning 21 – 26 years. Coverage in males turning 25 and 26 years of age in 2022 was substantially lower than in younger cohorts, reflecting the later commencement of the male HPV vaccination program.<sup>32</sup> The disparity between

Aboriginal and non-Aboriginal coverage was more evident in males than females. Whilst there was a 5.2 percentage point disparity between Aboriginal and non-Aboriginal coverage in girls turning 13 years of age in 2022, coverage was higher in Aboriginal females turning 14 – 26 years of age in 2022 than non-Aboriginal. However, whilst coverage was higher in Aboriginal than non-Aboriginal males turning 16 – 19 years in 2022, it was lower in those turning 13 – 15 and 20 – 24 years. With HPV vaccine now funded as a single dose under the NIP for people 9 – 25 years of age,<sup>31,32</sup> there is scope for catch-up vaccination in these cohorts to achieve more equitable coverage. It will be important to monitor HPV vaccination coverage following the switch to a single dose schedule in 2023 and ensure coverage is maintained and increases over time.

Coverage of an adolescent dose of diphtheria-tetanus-acellular pertussis vaccine in NSW was broadly similar to that of at least one dose of HPV vaccine, with coverage peaking at around 90% in adolescents turning 16 and 17 years of age in 2022. Coverage was 8.9 percentage points lower in Aboriginal than non-Aboriginal adolescents turning 13 years of age in 2022, but this disparity reduced to 1.3 percentage points in those turning 15 years of age, with coverage then higher in Aboriginal than non-Aboriginal adolescents turning 16, 17 and 19 years of age.

Coverage of an adolescent dose of meningococcal ACWY vaccine in NSW was substantially lower than coverage of at least one dose of HPV vaccine and coverage of an adolescent dose of diphtheria-tetanus-acellular pertussis vaccine. Coverage was less than 80% in non-Aboriginal adolescents turning 19 years in 2022, and less than 70% in their Aboriginal counterparts. Strategies are required to improve meningococcal ACWY coverage, particularly in Aboriginal adolescents, given the elevated risk of meningococcal disease in this age group and serogroup W outbreaks in Aboriginal communities in recent years.<sup>38</sup>

Coverage of both one dose and two doses of COVID-19 vaccine in adolescents aged 12 – 15 years was up to 25 percentage points lower than in older age groups, although contributed to by later eligibility for this age group (from September 2021).<sup>29</sup>

## **Adults**

Zoster vaccination coverage in adults turning 71 years of age in 2022 was 36.2%, up from 33.5% in 2021. Coverage was highest in adults turning 75 years, reflecting a combination of vaccinations given at the recommended NIP schedule point of 70 years of age and at 71 – 79 years as part of the funded catch-up program.<sup>39</sup> Zoster vaccination coverage was similar in Aboriginal and non-Aboriginal adults. Whilst true zoster vaccination coverage is likely to be somewhat higher, given previously documented under-reporting to the AIR,<sup>40-42</sup> it is certainly suboptimal given the age-related increase in disease risk. It will be important to continue monitoring zoster vaccination coverage following the implementation, in November 2023, of a two-dose Shingrix vaccination program funded under the NIP for all adults aged 65 years and over, replacing the single-dose Zostavax vaccination program.<sup>43</sup>

Coverage of an adult dose of 13vPCV, introduced onto the NIP in July 2020 for all adults aged 70 years and over and Aboriginal adults aged 50 years and over,<sup>44</sup> was higher in Aboriginal than non-Aboriginal adults in each cohort assessed. Coverage in 2022 was highest at 37.4% in Aboriginal adults turning 71 years, but only 13.2% in those turning 50 – 59 years and 18.2% in those turning 60 – 69 years. While true coverage of 13vPCV is likely somewhat higher, it is also suboptimal, and strategies are needed to improve uptake, particularly in younger Aboriginal adults.

Influenza vaccination coverage in 2022 increased with increasing age for both Aboriginal and non-Aboriginal adults. Coverage was considerably higher than in 2021 across all adult age groups, although lower uptake in 2021 was in the context of historically low levels of circulating influenza (due to COVID-19 pandemic related public health measures).<sup>45</sup> Influenza vaccination coverage has previously been thought to be substantially underestimated, particularly in younger adults, due to under-reporting of vaccinations administered in workplaces and other non-GP settings.<sup>40,46</sup> The proportionate increase from 2021 to 2022 was approximately two to four times higher in the younger adult age groups than in adults aged 65 years and older, and likely partly reflects increased completeness of data following introduction of mandatory reporting of influenza vaccination to the AIR in March 2021,<sup>9,46,47</sup> along with a number of new immunisation provider types now also reporting vaccinations to the AIR (e.g. pharmacies). Whilst influenza vaccination coverage was relatively high in Aboriginal

adults aged 65 years and over, at 73.4%, it was only 50.4% for those aged 50 to 64 years, and was less than 25% in all age groups under 50 years. Given that all Aboriginal people aged 6 months and over are eligible for annual influenza vaccination under the NIP due to their increased risk of severe disease, strategies promoting greater uptake are needed.

Almost two years since the COVID-19 vaccination program commenced in late February 2021,<sup>29</sup> 97.1% of people aged 16 years and over in NSW had received one dose of COVID-19 vaccine, 95.8% had received two doses, and 67.5% had received three doses. Despite the increased risk of severe disease, coverage of one dose and two doses in Aboriginal people compared to all people in NSW was almost 10 percentage points lower, whilst coverage of the third dose was almost 15 percentage points lower. However, this may be in part due to the younger age structure of the Aboriginal population. In line with the COVID-19 booster vaccination recommendations in place during 2022,<sup>29</sup> coverage of the fourth dose in people aged 30 years and over was just under five percentage points higher in Aboriginal people compared to all people in NSW.

## **Conclusion**

In 2022, vaccination coverage in NSW has remained relatively high by national and global standards, however this report demonstrates that the major disruptions associated with the COVID-19 pandemic have had an impact on vaccination coverage and timeliness in NSW, particularly in children and adolescents. Whilst adult vaccination coverage increased in 2022, likely due in part to the introduction of mandatory reporting to the AIR in 2021, it remains suboptimal. Identification of strategies to enable equitable and timely access to vaccines across the life-course, as well as a strengthened focus on populations requiring catch-up vaccinations, are needed to ensure the pandemic-related dips in coverage documented in this report are reversed.

Table 1. NSW Immunisation Program Schedule for children, adolescents and adults in 2022

Age	Vaccine/antigen												
<b>Children</b>													
Birth	Hep B												
6 weeks	Hep B <sup>a</sup>	DTPa <sup>a</sup>	Hib <sup>a</sup>	IPV <sup>a</sup>		MenB <sup>b</sup>			13vPCV	Rotavirus			
4 months	Hep B <sup>a</sup>	DTPa <sup>a</sup>	Hib <sup>a</sup>	IPV <sup>a</sup>		MenB <sup>b</sup>			13vPCV	Rotavirus			
6 months	Hep B <sup>a</sup>	DTPa <sup>a</sup>	Hib <sup>a</sup>	IPV <sup>a</sup>		MenB <sup>c</sup>			13vPCV <sup>c</sup>		Flu <sup>d</sup>		
12 months					MMR	MenB <sup>b</sup>	Men ACWY <sup>e</sup>		13vPCV		Flu <sup>d</sup>		
18 months		DTPa	Hib <sup>f</sup>		MMRV						Flu <sup>d</sup>		
4 years		DTPa <sup>g</sup>		IPV <sup>g</sup>							Flu <sup>d</sup>		
≥ 5 years												COVID-19 <sup>h</sup>	
<b>Adolescents</b>													
11 – 13 years (Year 7)		dTpa						HPV <sup>i</sup>			Flu <sup>d</sup>	COVID-19 <sup>h</sup>	
15 – 17 years (Year 10)							Men ACWY				Flu <sup>d</sup>	COVID-19 <sup>h</sup>	
<b>Adults</b>													
≥ 50 years											Flu <sup>d</sup>	13vPCV & 23vPPV <sup>j</sup>	COVID-19 <sup>h</sup>
≥ 65 years											Flu <sup>d</sup>		COVID-19 <sup>h</sup>
70 years						HZ <sup>k</sup>						13vPCV <sup>l</sup>	COVID-19 <sup>h</sup>
Pregnant women		dTpa <sup>m</sup>									Flu <sup>n</sup>		COVID-19 <sup>h</sup>

Hep B: hepatitis B; DTPa: diphtheria–tetanus–pertussis (acellular) – paediatric formulation; Hib: *Haemophilus influenzae* type b; IPV: inactivated polio vaccine; 13vPCV: 13-valent pneumococcal conjugate vaccine; Flu: influenza; MMR: measles-mumps-rubella; Men ACWY: meningococcal ACWY conjugate vaccine; MMRV: measles-mumps-rubella-varicella; dTpa: diphtheria–tetanus–pertussis (acellular) – formulation for individuals aged ≥10 years; HPV: human papilloma virus; 23vPPV: Pneumovax 23 vaccine; HZ: herpes zoster

<sup>a</sup> Usually given as combined DTPa-HepB-IPV-Hib vaccine.

<sup>b</sup> Funded for Aboriginal children only.

<sup>c</sup> Children with medical risk factors require an additional dose at 6 months of age as well as the routine schedule.

<sup>d</sup> Annual vaccination for all children aged 6 months – < 5 years, all people with medical risk conditions and all Aboriginal people aged ≥6 months, and non-Aboriginal adults aged ≥65 years.

<sup>e</sup> As of 1 July 2018, MenACWY vaccine replaced Hib-MenC vaccine given at 12 months of age.

<sup>f</sup> As of 1 July 2018, a monovalent Hib vaccine given at 18 months of age.

<sup>g</sup> Usually given as combined DTPa-IPV vaccine.

<sup>h</sup> COVID-19 vaccination program commenced in February 2021 (initially for people aged ≥16 years and then for adolescents aged 12 to 15 years from September 2021). Children aged ≥5 years were eligible for vaccination from January 2022). The roll-out of the vaccination program was implemented in phases, with population groups prioritised according to the advice of ATAGI.

<sup>i</sup> Two-dose schedule.

<sup>j</sup> All Aboriginal adults aged ≥50 years receive a dose of 13vPCV, followed by a first dose of 23vPPV 2 – 12 months later and then a second dose of 23vPPV at least 5 years later.

<sup>k</sup> From 1 November 2016, a single dose of HZ vaccine is recommended and funded for adults at 70 years of age. Adults aged 71 – 79 years are eligible under a five-year catch-up program until 31 October 2023.

<sup>l</sup> From July 2020, the 23vPPV dose at 65 years of age was replaced by a dose of 13vPCV from 70 years of age.

<sup>m</sup> Usually given to pregnant women at 28 weeks gestation but can be given anytime between 20 – 32 weeks gestation of each pregnancy and should be given as early as possible (from 20 weeks) to women identified as being at risk of early delivery.

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

Source: <http://www.health.nsw.gov.au/immunisation/Publications/nsw-immunisation-schedule.pdf>

**Table 2. Percentage of children vaccinated at 12 months of age<sup>a</sup> by antigen/dose and local health district, NSW, compared with NSW overall and Australia, 2022**

Antigen / Dose	Local Health District <sup>b</sup>																	
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %	WN %	WS %	NSW %	AUS %
Diphtheria-tetanus-pertussis (acellular) Dose 3	94.5	96.2	95.6	94.8	92.8	94.7	93.7	94.4	86.2	95.8	94.7	92.4	94.4	95.4	95.9	93.9	94.2	93.9
Poliomyelitis Dose 3	94.5	96.2	95.5	94.8	92.8	94.7	93.7	94.4	86.1	95.7	94.7	92.4	94.4	95.4	95.8	93.9	94.1	93.9
<i>Haemophilus influenzae</i> type b Dose 3	94.5	96.2	95.5	94.8	92.8	94.7	93.6	94.4	86.1	95.8	94.7	92.4	94.6	95.3	95.8	93.8	94.1	93.9
Hepatitis B Dose 3	94.4	96.2	95.5	94.7	92.6	94.6	93.5	94.4	86.0	95.4	94.6	92.4	94.4	95.2	95.8	93.8	94.0	93.8
Rotavirus Dose 2	90.7	94.5	92.4	92.1	88.1	91.5	90.5	89.1	81.8	93.5	92.0	89.0	91.8	92.6	92.8	90.7	91.0	90.5
13-valent pneumococcal conjugate Dose 2 or 3 <sup>c</sup>	95.8	98.0	96.8	95.9	94.4	95.8	95.4	94.9	87.8	96.5	95.9	94.4	95.5	96.1	97.4	95.6	95.5	95.5
<b>Fully vaccinated<sup>c</sup></b>	<b>94.1</b>	<b>96.2</b>	<b>95.3</b>	<b>94.1</b>	<b>92.2</b>	<b>94.2</b>	<b>93.1</b>	<b>93.7</b>	<b>85.6</b>	<b>94.7</b>	<b>94.0</b>	<b>91.7</b>	<b>93.8</b>	<b>94.5</b>	<b>95.6</b>	<b>93.2</b>	<b>93.5</b>	<b>93.3</b>
Total number of children	4203	346	11497	5143	2445	3088	5246	763	3260	9606	10191	15165	2302	6818	3911	14506	98863	309588

<sup>a</sup> Cohort born 1 January 2021 – 31 December 2021 with vaccines due from mid-2021 through to mid-2022.

<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; AUS: Australia

<sup>c</sup> Fully vaccinated at 12 months of age was defined as having a record on the AIR of a third dose of diphtheria-tetanus-acellular pertussis-containing vaccine, third doses of polio-containing, *Haemophilus influenzae* type b-containing and hepatitis B-containing vaccines and a second or third dose of 13-valent pneumococcal conjugate vaccine.

Source: Australian Immunisation Register, data as at 2 April 2023.



**Table 3. Percentage of children vaccinated at 24 months of age<sup>a</sup> by antigen/dose and local health district, NSW, compared with NSW overall and Australia, 2022**

Antigen / Dose	Local Health District <sup>b</sup>															NSW %	AUS %	
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %	WN %			WS %
Diphtheria-tetanus-pertussis (acellular) Dose 4	93.2	96.3	93.6	93.8	90.9	93.4	93.0	92.1	84.6	93.1	92.6	90.9	93.0	92.6	94.4	91.7	92.3	92.3
Poliomyelitis Dose 3	96.5	98.5	96.8	96.7	94.8	97.0	96.8	95.8	89.4	96.6	96.6	95.7	96.2	96.7	97.6	95.9	96.2	96.1
<i>Haemophilus influenzae</i> type b Dose 4	94.0	96.3	94.4	94.4	92.0	94.0	94.0	92.9	86.3	93.8	93.3	92.1	93.6	93.2	95.0	92.5	93.1	93.2
Hepatitis B Dose 3	96.4	98.5	96.7	96.6	94.7	96.8	96.6	95.5	89.3	96.0	96.4	95.6	96.1	96.3	97.5	95.5	95.9	95.9
Meningococcal ACWY Dose 1 <sup>c</sup>	95.4	97.9	96.0	95.7	93.7	96.2	95.8	94.3	88.4	94.3	94.4	94.2	95.2	94.8	96.7	94.4	94.7	94.7
Meningococcal C-containing Dose 1	95.7	98.2	96.2	95.9	93.9	96.3	95.9	94.8	88.6	95.0	95.1	94.3	95.4	95.3	96.8	94.6	95.0	95.0
Measles-mumps-rubella Dose 1 <sup>c</sup>	95.7	97.6	96.1	95.9	93.7	96.4	95.9	94.9	88.7	95.6	95.0	94.3	95.6	95.5	96.5	94.8	95.1	95.1
Measles-mumps-rubella Dose 2	93.3	96.3	94.0	93.9	91.5	93.9	93.4	92.6	85.7	93.4	92.7	91.6	93.3	93.0	94.6	92.2	92.7	92.7
Varicella Dose 1	93.4	96.3	94.0	93.9	91.3	93.7	93.4	92.8	85.7	93.8	92.9	91.5	93.4	93.0	94.7	92.2	92.7	92.7
13-valent pneumococcal conjugate Dose 3	95.4	97.9	95.9	95.7	93.4	95.9	95.6	94.5	87.3	95.3	94.6	93.8	95.3	95.0	96.7	94.5	94.7	94.8
<b>Fully vaccinated<sup>d</sup></b>	<b>92.4</b>	<b>96.0</b>	<b>93.0</b>	<b>93.0</b>	<b>90.1</b>	<b>95.6</b>	<b>92.0</b>	<b>91.1</b>	<b>83.6</b>	<b>91.3</b>	<b>91.0</b>	<b>89.5</b>	<b>92.0</b>	<b>91.0</b>	<b>93.7</b>	<b>89.9</b>	<b>91.0</b>	<b>91.0</b>
Total number of children	3992	327	10729	4729	2247	2932	5095	707	3064	8752	8841	14804	2251	6248	3585	14113	92788	293947

<sup>a</sup> Cohort born 1 January 2020 – 31 December 2020 with vaccines due from mid-2020 (6 month doses) through to mid-2022 (18 month doses).

<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; AUS: Australia

<sup>c</sup> Not included in definition of fully vaccinated at 24 months of age.

<sup>d</sup> Fully vaccinated at 24 months of age defined as having a record on the AIR of a fourth dose of diphtheria-tetanus-pertussis (acellular)-containing vaccine, third doses of polio-containing and hepatitis B-containing vaccines, a fourth dose of *Haemophilus influenzae* type b-containing vaccine (or a third dose of the Haemophilus B conjugate (PRP-T) vaccine if given after 11.5 months of age), a second dose of measles-mumps-rubella-containing vaccine, a first dose of varicella-containing vaccine, a first dose of meningococcal C-containing vaccine and a third dose of 13-valent pneumococcal conjugate vaccine.

Source: Australian Immunisation Register, data as at 2 April 2023.

**Table 4. Percentage of children vaccinated at 60 months of age<sup>a</sup> by antigen/dose and local health district, NSW, compared with NSW overall and Australia, 2022**

Antigen / Dose	Local Health District <sup>b</sup>																NSW %	AUS %	
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %	WN %	WS %			
Diphtheria- tetanus- pertussis (acellular) Dose 4 or 5	94.8	97.4	95.3	95.1	92.2	95.3	95.3	95.5	87.6	92.2	91.3	94.3	95.9	91.1	96.1	93.8	93.6	93.6	
Poliomyelitis Dose 4	94.9	97.4	95.4	95.1	92.5	95.3	95.2	95.7	87.6	92.7	91.6	94.3	95.9	91.3	96.0	94.2	93.8	93.8	93.8
<i>Haemophilus influenzae</i> type b Dose 4 <sup>d</sup>	96.6	98.5	97.0	96.9	94.3	96.5	96.9	97.6	90.4	95.3	95.1	96.3	97.0	94.6	97.8	95.5	95.8	95.8	95.8
Hepatitis B Dose 3 <sup>d</sup>	97.0	98.3	97.4	97.3	94.8	96.9	97.5	97.9	90.6	95.2	95.8	97.2	97.6	95.9	98.1	95.9	96.4	96.5	96.5
Meningococcal C-containing Dose 1 <sup>d</sup>	96.9	99.1	97.2	97.2	94.7	97.1	97.4	98.0	90.9	96.2	96.1	97.1	97.5	95.6	98.1	96.7	96.6	96.4	96.4
Measles- mumps-rubella Dose 2 <sup>c,d</sup>	96.7	99.1	97.1	97.1	94.8	97.0	97.1	97.8	90.4	95.8	95.4	96.9	97.2	95.1	98.1	96.6	96.3	96.3	96.3
Varicella Dose 1 <sup>d</sup>	96.7	99.1	97.1	97.0	94.6	97.0	97.0	97.9	90.4	95.8	95.4	96.8	97.2	95.2	98.1	96.6	96.3	96.3	96.3
13-valent pneumococcal conjugate Dose 3 <sup>d</sup>	96.2	98.3	96.6	96.4	92.8	95.9	96.7	96.6	88.6	95.1	95.4	95.5	97.0	94.6	97.1	94.7	95.3	95.4	95.4
<b>Fully vaccinated<sup>e</sup></b>	<b>94.7</b>	<b>97.4</b>	<b>95.2</b>	<b>94.8</b>	<b>92.1</b>	<b>95.3</b>	<b>95.1</b>	<b>95.5</b>	<b>87.3</b>	<b>92.0</b>	<b>91.1</b>	<b>94.0</b>	<b>95.8</b>	<b>90.8</b>	<b>95.9</b>	<b>93.6</b>	<b>93.4</b>	<b>93.4</b>	<b>93.4</b>
Total number of children	4241	343	11474	4927	2581	3139	5134	759	3446	10440	9207	15226	2330	6260	3810	15444	99318	317470	317470

<sup>a</sup> Cohort born 1 January 2017 – 31 December 2017 with vaccines due from mid-2017 (6 month doses) through to end of 2021 (48 month doses).

<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; AUS: Australia

<sup>c</sup> As of mid-2017, the second dose of MMR-containing vaccine no longer included in the definition of fully vaccinated at 60 months of age.

<sup>d</sup> Not included in definition of fully vaccinated at 60 months of age.

<sup>e</sup> Fully vaccinated at 60 months of age defined as having a record on the AIR of a fourth or fifth dose of diphtheria-tetanus-pertussis (acellular)-containing vaccine and a fourth dose of polio-containing vaccine.

Source: Australian Immunisation Register, data as at 2 April 2023.

**Table 5. Percentage of children fully vaccinated at 12 months<sup>a</sup>, 24 months<sup>b</sup> and 60 months<sup>c</sup> of age by Aboriginal status and local health district, NSW, compared with NSW overall and Australia, 2022**

Child age and Aboriginal status	Local Health District <sup>d</sup>																	
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %	WN %	WS %	NSW %	AUS %
<b>12 months – fully vaccinated<sup>a</sup></b>																		
Aboriginal	94.8	93.8	94.1	92.1	92.9	92.5	92.1	98.2	87.0	90.9	92.7	92.6	95.4	92.6	93.2	90.0	92.8	90.0
Non-Aboriginal	94.0	97.2	95.5	94.3	92.1	94.4	93.2	93.4	85.4	94.8	94.0	91.6	93.6	94.5	96.4	93.3	93.5	93.6
<b>24 months – fully vaccinated<sup>b</sup></b>																		
Aboriginal	91.4	96.5	91.0	90.6	90.2	91.8	94.3	88.9	87.4	87.5	87.4	89.9	88.3	86.7	91.9	90.5	90.8	87.9
Non-Aboriginal	92.5	95.9	93.4	93.2	90.1	92.7	91.8	91.3	83.0	91.3	91.1	89.5	92.4	91.1	94.2	89.9	91.0	91.2
<b>60 months – fully vaccinated<sup>c</sup></b>																		
Aboriginal	97.4	97.6	96.5	96.4	94.0	97.9	96.3	98.4	94.4	90.3	95.4	94.9	98.1	95.6	96.2	94.9	96.1	95.1
Non-Aboriginal	94.5	97.3	95.0	94.7	91.8	94.9	95.0	95.3	86.5	92.0	91.1	94.0	95.7	90.8	95.8	93.6	93.3	93.3

<sup>a</sup> Cohort born 1 January 2021 – 31 December 2021: Fully vaccinated at 12 months of age defined as having a record on the AIR of a third dose of diphtheria-tetanus-pertussis (acellular)-containing vaccine, third doses of polio-containing, *Haemophilus influenzae* type b-containing and hepatitis B-containing vaccines, and a second or third dose of 13-valent pneumococcal conjugate vaccine. Vaccines included in this algorithm were due from mid-2021 through to mid-2022.

<sup>b</sup> Cohort born 1 January 2020 – 31 December 2020: Fully vaccinated at 24 months of age defined as having a record on the AIR of a fourth dose of diphtheria-tetanus-pertussis (acellular)-containing vaccine, third doses of polio-containing and hepatitis B-containing vaccines, a fourth dose of *Haemophilus influenzae* type b-containing vaccine (or a third dose of the *Haemophilus B* conjugate (PRP-T) vaccine if given after 11.5 months of age), a second dose of measles-mumps-rubella-containing vaccine, a first dose of varicella-containing vaccine, a first dose of meningococcal C-containing vaccine and a third dose of 13-valent pneumococcal conjugate vaccine. Vaccines included in this algorithm were due from mid-2020 through to mid-2022.

<sup>c</sup> Cohort born 1 January 2017 – 31 December 2017: Fully vaccinated at 60 months of age defined as having a record on the AIR of a fourth or fifth dose of diphtheria-tetanus-pertussis (acellular)-containing vaccine and a fourth dose of polio-containing vaccine. Vaccines included in this algorithm were due in 2021.

<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; AUS: Australia

Source: Australian Immunisation Register, data as at 2 April 2023.

**Table 6. Vaccination coverage by age, vaccine/antigen and Aboriginal status, NSW, 2022**

Vaccine / Antigen	Milestone age	Aboriginal (%)	Non-Aboriginal (%)
Diphtheria-tetanus-pertussis (acellular)	12 months <sup>a</sup> (Dose 3)	93.1	94.2
	24 months <sup>b</sup> (Dose 4)	91.6	92.3
	60 months <sup>c</sup> (Dose 4 or 5)	96.4	93.4
Poliomyelitis	12 months <sup>a</sup> (Dose 3)	93.1	94.2
	24 months <sup>b</sup> (Dose 3)	96.6	96.1
	60 months <sup>c</sup> (Dose 4)	96.2	93.7
<i>Haemophilus influenzae</i> type b	12 months <sup>a</sup> (Dose 3)	93.0	94.2
	24 months <sup>b</sup> (Dose 4)	93.0	93.1
	60 months <sup>c</sup> (Dose 4)	98.3	95.7
Hepatitis B	12 months <sup>a</sup> (Dose 3)	93.0	94.1
	24 months <sup>b</sup> (Dose 3)	96.5	95.9
	60 months <sup>c</sup> (Dose 3)	98.4	96.2
Measles-mumps-rubella	12 months	Not Assessed	Not Assessed
	24 months <sup>b</sup> (Dose 1)	96.0	95.0
	24 months <sup>b</sup> (Dose 2)	92.5	92.7
	60 months <sup>c</sup> (Dose 2)	98.4	96.2
Meningococcal C-containing	12 months	Not Assessed	Not Assessed
	24 months <sup>b</sup> (Dose 1)	96.1	94.9
	60 months <sup>c</sup> (Dose 1)	98.5	96.4
Meningococcal ACWY	12 months	Not Assessed	Not Assessed
	24 months <sup>b</sup> (Dose 1)	96.1	94.6
	60 months <sup>c</sup> (Dose 1)	Not Assessed	Not Assessed
Varicella	12 months	Not Assessed	Not Assessed
	24 months <sup>b</sup> (Dose 1)	92.4	92.7
	60 months <sup>c</sup> (Dose 1)	98.3	96.2
Pneumococcal conjugate vaccine	12 months <sup>a</sup> (Dose 2 or 3)	96.3	95.4
	24 months <sup>b</sup> (Dose 3)	95.3	94.7
	60 months <sup>c</sup> (Dose 3)	97.2	95.2
Rotavirus	12 months <sup>a</sup> (Dose 2)	88.6	91.2
	24 months	Not Assessed	Not Assessed
	60 months	Not Assessed	Not Assessed

<sup>a</sup> Cohort born 1 January 2021 – 31 December 2021 with vaccines due from mid-2021 through to mid-2022.

<sup>b</sup> Cohort born 1 January 2020 – 31 December 2020 with vaccines due from mid-2020 (6 month doses) through to mid-2022 (18 month doses).

<sup>c</sup> Cohort born 1 January 2017 – 31 December 2017 with vaccines due from mid-2017 (6 month doses) through to end of 2021 (48 month doses).

Source: Australian Immunisation Register, data as at 2 April 2023.

**Table 7. Coverage of meningococcal B vaccine in a cohort of Aboriginal children,<sup>a</sup> by dose number and local health district, NSW, and Australia, 2022**

	Local Health District <sup>b</sup>																	
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %	WN %	WS %	NSW %	AUS %
<b>Dose 1</b>	74.5	84.5	81.8	76.4	74.2	75.2	69.5	63.6	64.6	71.2	69.1	60.4	77.1	72.6	82.5	65.8	<b>75.2</b>	<b>80.4</b>
<b>Dose 2</b>	75.9	87.6	81.7	72.3	73.5	72.9	66.7	60.0	65.2	63.6	65.5	52.2	76.6	67.7	80.8	59.5	<b>73.1</b>	<b>78.6</b>
<b>Dose 3</b>	67.3	79.4	73.5	64.6	66.5	65.3	50.7	50.9	54.4	43.9	53.3	37.6	61.7	59.7	70.5	51.1	<b>63.2</b>	<b>69.8</b>

<sup>a</sup> Cohort born 1 July 2020 – 30 June 2021. This is the first year-wide cohort of Aboriginal children eligible to have received 3 doses of meningococcal B vaccine under the NIP from 1 July 2020 – 31 December 2022. Note: Coverage may be underestimated, particularly for dose 1, due to under-reporting to AIR (e.g. of doses given prior to child being registered on Medicare) and for dose 3 as only two doses of meningococcal B vaccine are required if the first dose is administered after 12 months of age.

<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; AUS: Australia

Source: Australian Immunisation Register, data as at 2 April 2023.

**Table 8. Coverage for the third dose of DTPa-containing vaccine due at 6 months of age<sup>a</sup> by vaccination delay category, Aboriginal status and local health district, NSW, compared with NSW overall and Australia, 2022**

Vaccination delay / 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 %	AUS %	
<b>No delay<sup>c</sup></b>																			
Aboriginal	71.6	52.1	71.2	69.7	64.9	69.4	70.6	80.0	63.2	83.6	69.1	70.0	67.1	64.7	68.1	69.1	69.3	62.0	
Non-Aboriginal	80.6	81.0	84.5	84.0	80.5	84.0	80.7	80.0	76.5	86.8	84.5	76.4	83.4	85.1	87.1	81.6	82.4	78.8	
<b>1 – &lt;3 months late</b>																			
Aboriginal	22.2	38.3	20.5	22.5	23.4	23.7	21.0	16.4	24.3	11.5	22.2	19.5	22.4	25.0	21.1	21.8	21.7	25.0	
Non-Aboriginal	14.9	16.9	12.3	12.6	14.1	12.8	14.1	16.1	17.1	10.6	11.9	17.0	12.9	11.7	10.5	13.4	13.3	16.5	
<b>3 – &lt;7 months late</b>																			
Aboriginal	5.2	7.5	6.9	6.3	9.7	5.3	5.1	3.6	10.3	3.3	6.4	8.8	10.0	8.6	8.3	7.0	7.3	10.3	
Non-Aboriginal	3.9	2.1	2.6	2.7	4.4	2.6	4.5	3.4	4.9	2.2	3.1	5.2	2.9	2.7	2.0	4.0	3.5	3.9	
<b>≥7months late</b>																			
Aboriginal	1.0	2.1	1.4	1.5	2.0	1.6	3.3	0.0	2.2	1.6	2.3	1.7	0.5	1.7	2.5	2.1	1.7	2.7	
Non-Aboriginal	0.6	0.0	0.6	0.7	1.0	0.6	0.7	0.5	1.5	0.4	0.5	1.4	0.8	0.5	0.4	1.0	0.8	0.8	

<sup>a</sup> Cohort born 1 January 2021 – 31 December 2021 with the third dose of DTPa-containing vaccine due at 6 months of age (i.e. from mid-2021 through to mid-2022).

<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; AUS: Australia

<sup>c</sup> No delay = third dose of DTPa-containing vaccine given before 7 months of age.

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

Source: Australian Immunisation Register, data as at 2 April 2023.



**Table 9. Coverage for the second dose of MMR-containing vaccine due at 18 months of age<sup>a</sup> by vaccination delay category, Aboriginal status and local health district, NSW, compared with NSW overall and Australia, 2022**

Vaccination delay / 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 %	AUS %	
<b>No delay<sup>c</sup></b>																			
Aboriginal	53.3	49.4	57.1	55.1	55.9	55.6	56.2	59.3	43.5	70.1	46.0	52.1	55.4	46.9	53.2	56.7	54.5	47.2	
Non-Aboriginal	63.0	66.8	70.2	67.7	64.7	68.0	65.4	66.4	57.6	72.9	68.7	61.9	70.2	70.1	71.0	68.1	67.3	64.1	
<b>1 – &lt;3 months late</b>																			
Aboriginal	38.4	32.9	33.7	35.4	35.4	31.5	36.6	37.3	48.3	24.6	44.6	38.2	33.2	38.5	37.2	33.1	36.0	39.6	
Non-Aboriginal	31.6	28.5	25.3	27.3	29.7	27.3	28.7	28.0	35.4	22.6	26.0	30.5	25.3	24.9	24.6	25.3	26.9	30.0	
<b>3 – &lt;7 months late</b>																			
Aboriginal	7.2	15.3	7.5	8.7	6.0	9.8	6.7	3.4	7.6	5.3	7.4	8.6	7.6	12.8	7.9	7.7	7.8	10.4	
Non-Aboriginal	4.6	4.7	3.6	4.2	4.9	3.7	5.0	4.6	5.9	3.4	4.3	6.2	3.8	4.0	3.6	5.0	4.7	4.8	
<b>≥7 months late</b>																			
Aboriginal	1.1	2.4	1.7	0.8	2.7	3.1	0.5	0.0	0.6	0.0	2.0	1.1	3.8	1.8	1.7	2.5	1.7	2.8	
Non-Aboriginal	0.8	0.0	0.9	0.8	0.7	1.0	0.9	1.0	1.1	1.1	1.0	1.4	0.7	1.0	0.8	1.6	1.1	1.1	

<sup>a</sup> Cohort born 1 January 2020 – 31 December 2020 with the second dose of MMR-containing vaccine due at 18 months of age (i.e. from mid-2021 through to mid-2022).

<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; AUS: Australia

<sup>c</sup> No delay = second dose of MMR-containing vaccine given before 19 months of age.

MMR: measles-mumps-rubella

Source: Australian Immunisation Register, data as at 2 April 2023.

**Table 10. Adolescent vaccination coverage and doses given through the NSW Adolescent School Vaccination Program, for individual vaccines, NSW, 2018-2022<sup>a</sup>**

		2022 <sup>b</sup>		2021 <sup>c</sup>		2020 <sup>c</sup>		2019 <sup>c</sup>		2018 <sup>c</sup>	
Gender	Vaccine	Coverage (%)	Doses given	Coverage (%)	Doses given	Coverage (%)	Doses given	Coverage (%)	Doses given	Coverage (%)	Doses given
Girls	HPV schedule initiated <sup>d,e</sup>	75	36 284	83	39 938	82	39 709	85	40 185	85	38 961
	HPV schedule completed <sup>d,f</sup>	61	29 405	72	34 981	77	37 295	81	38 377	82	37 421
Boys	HPV schedule initiated <sup>d,e</sup>	71	35 740	80	40 137	80	40 716	82	40 880	83	39 983
	HPV schedule completed <sup>d,f</sup>	58	29 000	71	35 913	76	38 646	79	39 249	80	38 575
	dTpa <sup>d</sup>	71	70 345	81	79 884	81	80 889	84	81 218	85	79 333
	Varicella <sup>d</sup>	na	na	na	na	na	na	na	na	na	na
	Men ACWY <sup>g</sup>	64	62 002	66	61 830	73	66 555	75	67 157	70	61 797
	Men ACWY <sup>g,h</sup>	na	na	na	na	na	na	na	na	70	58 114

<sup>a</sup> Adolescent coverage presented in this table are for school attendees only who were vaccinated through the NSW Adolescent School Vaccination Program. Doses administered by other immunisation providers in non-school settings (e.g. general practice) are not included. Doses and coverage for 2018-2021 include catch-up vaccinations given through the NSW Adolescent School Vaccination Program in the following year and therefore differ from what was included in the published report for the previous year.

<sup>b</sup> Vaccination coverage in 2022 is provisional and does not include catch-up vaccinations offered to Year 8 students in 2023.

<sup>c</sup> Vaccination coverage in 2018 – 2021 has been updated from the published annual reports for the previous year to include catch-up vaccinations given to Year 8 students in the following year.

<sup>d</sup> Year 7 school attendees

<sup>e</sup> Schedule initiated = the percentage of Year 7 students receiving their first dose of HPV vaccine.

<sup>f</sup> Schedule completed = the percentage of Year 7 students completing the HPV vaccine schedule. Completion of HPV vaccination schedule required 3 doses up to end of 2016. In 2017 NSW adopted a 2-dose HPV schedule in line with the World Health Organization recommendations. HPV vaccination coverage includes the students who received the HPV vaccine in Year 7 in the year of interest, as well catch-up vaccination offered to students in Year 8 in Terms 1 – 4 of the following year (2018-2021 only).

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

<sup>h</sup> Year 11 school attendees.

dTpa: diphtheria–tetanus–pertussis (acellular) – formulation for individuals aged  $\geq 10$  years

HPV: human papillomavirus

Men ACWY: meningococcal ACWY vaccine

na: not applicable

Note: Schools in NSW were closed for periods during 2020 and 2021 due to the COVID-19 pandemic, which led to disruption of the adolescent school vaccination program. Coverage data for 2021 has been updated from what was published in the 2021 NSW Annual Report<sup>4</sup> and reflects the significant catch-up vaccination which occurred in 2022. As the HPV vaccination schedule was changed to a one-dose in February 2023, no Year 8 catch-up vaccination of the second dose will be required in 2023 for the students who only received one dose in 2022 whilst in Year 7.

Source: NSW Adolescent School Vaccination Program. Data as at 21 July 2023

Table 11. HPV vaccination<sup>a</sup> in adolescents aged 11 – 14 years, by gender, local health district, NSW and Australia, 2022

Gender	Vaccine Dose	Local Health District <sup>b</sup>																	
		CC	FW	HNE	IS	MN	MM	NBM	NV	NN	NS	SES	SWS	SN	SYD	WN	WS	NSW	AUS
Girls	HPV Dose 1 (n) received in 2021	1953	159	5414	2275	1256	1481	2189	297	1554	5306	4070	6103	1130	2542	1731	5893	43702	137987
	HPV Dose 2 received in 2021 (% of adolescents who received dose 1 in 2021)	60.7	52.2	14.8	9.9	55.8	69.8	35.3	74.7	67.0	51.5	46.1	6.5	33.2	14.4	74.8	13.6	32.1	59.5
	HPV Dose 2 catch-up received in 2022 (% of adolescents who received dose 1 in 2021)	31.5	27.7	73.4	78.1	31.9	21.0	54.7	17.2	22.3	44.6	47.9	85.5	54.1	80.0	15.1	79.8	59.7	28.7
	Total HPV Dose 2 received in 2021 or 2022 (% of adolescents who received dose 1 in 2021)	92.2	79.9	88.2	88.0	87.7	90.7	90.0	91.9	89.3	96.0	94.1	92.0	87.3	94.4	89.9	93.4	91.7	88.3
	HPV Dose 1 received in 2022 (n)	1738	143	4950	2161	1186	1373	2105	315	1247	5233	3740	5733	1022	2550	1518	5914	41237	130638
	HPV Dose 2 (% of 2022 Dose 1 recipients)	72.9	62.2	73.7	69.4	67.2	77.1	72.1	74.6	55.6	80.9	77.9	71.4	73.8	79.5	68.2	77.1	74.4	76.8
Boys	HPV Dose 1 (n) received in 2021	2025	128	5358	2318	1224	1519	2210	323	1572	5415	4099	6003	1139	2457	1707	5972	43796	141251

HPV Dose 2 received in 2021 (% of adolescents who received dose 1 in 2021)	57.2	40.6	12.8	8.4	52.9	70.1	30.6	70.9	60.3	45.3	46.7	6.8	32.0	15.2	74.3	14.2	30.5	57.8
HPV Dose 2 catch-up received in 2022 (% of adolescents who received dose 1 in 2021)	31.2	35.2	74.3	80.9	34.3	21.2	59.3	18.3	26.1	50.3	48.1	84.6	54.6	78.4	16.1	78.6	60.6	29.0
Total HPV Dose 2 received in 2021 or 2022 (% of adolescents who received dose 1 in 2021)	88.4	75.8	87.1	89.3	87.3	91.3	89.9	89.2	86.5	95.6	94.8	91.4	86.6	93.6	90.3	92.8	91.2	86.8
HPV Dose 1 received in 2022 (n)	1868	122	4870	2081	1081	1439	2020	277	1252	5391	3855	5466	1041	2482	1525	5929	41004	131689
HPV Dose 2 (% of 2022 Dose 1 recipients)	74.3	64.8	72.2	70.2	64.1	73.4	72.8	67.1	52.7	81.1	73.9	69.0	72.7	73.0	70.2	75.5	72.7	75.4

<sup>a</sup> Vaccines given 1 January – 31 December 2021 and/or 1 January – 31 December 2022.

<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; AUS: Australia

HPV: human papillomavirus

Source: Australian Immunisation Register, data as at 2 April 2023.

**Table 12. HPV vaccination<sup>a</sup> in adolescents aged 11 – 14 years, by gender and Aboriginal status, NSW 2021-2022**

	Girls		Boys	
	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal
<b>HPV Dose 1 (n) received in 2021</b>	2515	41187	2343	41453
<b>HPV Dose 2 received in 2021 (% of adolescents who received dose 1 in 2021)</b>	34.1	31.9	32.0	30.5
<b>HPV Dose 2 catch-up received in 2022 (% of adolescents who received dose 1 in 2021)</b>	47.6	60.4	48.7	61.3
<b>Total HPV Dose 2 received in 2021 or 2022 (% of adolescents who received dose 1 in 2021)</b>	<b>81.7</b>	<b>92.3</b>	<b>80.6</b>	<b>91.8</b>
<b>HPV Dose 1 (n) received in 2022</b>	1832	39405	1652	39352
<b>HPV Dose 2 received in 2022 (% of adolescents who received dose 1 in 2022)</b>	<b>60.5</b>	<b>75.0</b>	<b>59.2</b>	<b>73.3</b>

<sup>a</sup> Vaccines given 1 January – 31 December 2021 and/or 1 January – 31 December 2022.

HPV: human papillomavirus

Source: Australian Immunisation Register, data as at 2 April 2023.

**Table 13. Coverage of at least one dose of HPV vaccine<sup>a</sup> by 15 years of age, by gender, Aboriginal status, local health district, NSW and Australia, 2022**

Gender	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 %	AUS %
Girls	Aboriginal	97.3	88.6	89.6	86.4	91.6	88.5	85.8	88.9	84.2	89.3	80.5	86.9	87.4	83.0	85.5	89.2	88.1	83.0
	Non-Aboriginal	88.2	90.0	89.6	88.8	83.6	90.1	86.9	88.1	76.4	85.9	85.1	86.4	85.9	83.9	89.1	87.7	86.6	85.5
Boys	Aboriginal	90.5	85.7	84.0	82.7	77.5	84.4	87.0	57.1	72.9	95.8	81.6	87.4	72.8	79.6	77.3	80.8	81.7	78.1
	Non-Aboriginal	89.1	82.8	86.9	88.7	80.4	89.0	82.4	85.7	74.5	84.5	83.4	83.0	85.1	81.6	87.6	84.6	84.3	83.4

<sup>a</sup> HPV vaccination coverage calculated using the number of Medicare-registered individuals in the cohort born in 2007 with an AIR record of having received a dose of HPV vaccine after their 9th birthday (as HPV registered to be given from 9 years of age), but before 15th birthday as the numerator and the total number of Medicare-registered individuals in the 2007 cohort as the denominator, expressed as a percentage. Coverage of a dose of HPV vaccine by 15 years of age is in line with international reporting as recommended by the World Health Organization.

<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; AUS: Australia

HPV: human papillomavirus

Note: In NSW, adolescent vaccines are typically given as part of the adolescent school vaccination programs with HPV vaccine given in Year 7, usually around 12 – 13 years of age. As such the 2007 cohort were due for the HPV vaccine in early 2019 to late 2020. HPV vaccination was also available from vaccination providers outside of the school program as catch-up vaccination up to the age of 19 years (inclusive) in 2022. As of 2023, catch-up vaccination is available up to the age of 25 years (inclusive).

Source: Australian Immunisation Register, data as at 2 April 2023.

**Table 14. Coverage of at least one dose of HPV vaccine<sup>a</sup> by birth cohort/age,<sup>b</sup> by gender and Aboriginal status, NSW, 2022**

Birth cohort (age in 2022)	Girls		Boys	
	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal
2009 cohort (13yo)	74.0	79.2	61.7	73.8
2008 cohort (14yo)	85.5	85.4	78.4	82.0
2007 cohort (15yo)	88.6	86.9	82.8	84.7
2006 cohort (16yo)	91.6	88.1	87.1	85.7
2005 cohort (17yo)	92.7	88.4	88.2	86.7
2004 cohort (18yo)	92.8	88.4	86.1	86.0
2003 cohort (19yo)	92.3	88.3	87.8	85.3
2002 cohort (20yo)	89.6	87.1	83.5	83.9
2001 cohort (21yo)	85.6	84.9	76.9	79.3
2000 cohort (22yo)	85.0	82.0	68.5	73.2
1999 cohort (23yo)	78.4	77.9	60.4	69.4
1998 cohort (24yo)	72.6	71.4	46.4	49.6
1997 cohort (25yo)	73.0	69.8	6.9	4.2
1996 cohort (26yo)	77.0	68.6	3.5	0.6

<sup>a</sup> HPV vaccination coverage calculated using the number of Medicare-registered individuals in each year-wide cohort with an AIR record of having received a dose of HPV vaccine after their 9<sup>th</sup> birthday (as HPV registered to be given from 9 years of age) and given by 31 December 2022 as the numerator and the total number of Medicare-registered individuals in the relevant cohort as the denominator, expressed as a percentage.

<sup>b</sup> Birth cohort based on age at 31 December 2022.

HPV: human papillomavirus

Note: In NSW, adolescent vaccines are typically given as part of the adolescent school vaccination programs with HPV vaccine given in Year 7, usually around 12 – 13 years of age. However, HPV vaccination is also available from vaccination providers outside of the school program as catch-up vaccination up to the age of 19 years (inclusive) in 2022. As of 2023, catch-up vaccination is available up to the age of 25 years (inclusive).

Source: Australian Immunisation Register, data as at 2 April 2023.



**Table 15. Zoster vaccine<sup>a</sup> and 13vPCV coverage for adults turning 71 years of age in the year of interest<sup>b</sup> by local health district, compared with NSW overall and Australia, 2021 versus 2022**

	Local Health District <sup>c</sup>																NSW %	AUS %	
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %	WN %	WS %			
<b>Zoster</b>																			
2021	40.7	26.0	39.5	38.3	37.7	32.8	36.2	36.8	34.8	35.2	26.8	28.6	36.5	26.7	29.2	33.2	33.5	38.7	
2022	43.6	30.0	45.0	42.5	41.8	37.7	38.2	40.6	35.3	35.9	29.5	30.0	38.1	28.3	34.3	33.7	36.2	41.3	
<b>13vPCV</b>																			
2021	26.5	18.5	26.7	23.7	22.8	18.1	20.6	10.6	17.3	22.2	16.1	12.7	22.6	16.6	16.2	18.5	19.8	23.9	
2022	37.4	25.0	38.9	35.1	33.9	28.0	29.9	26.2	28.3	29.1	21.9	20.9	33.4	22.4	28.6	26.3	29.0	33.8	

<sup>a</sup> Coverage calculated using the number of Medicare-registered adults in each cohort with an AIR record of having received either one dose of Zostavax vaccine or two doses of Shingrix vaccine as the numerator and the total number of Medicare-registered adults in the relevant cohort as the denominator, expressed as a percentage. All vaccinations given up to 31 December 2022 (inclusive) are included in the numerator.

<sup>b</sup> Cohorts: 1 Jan – 31 Dec 1950 for 2021 coverage; 1 Jan – 31 Dec 1951 for 2022 coverage.

<sup>c</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; AUS: Australia

Source: Australian Immunisation Register, data as at 03 April 2022 (for 2021 data) and as at 02 April 2023 (for 2022 data).

**Table 16. Percentage of children aged 6 months – <5 years<sup>a</sup> vaccinated with at least one dose of influenza vaccine<sup>b</sup> by Aboriginal status and local health district, compared with NSW overall and Australia, 2021 versus 2022**

	Local Health District <sup>c</sup>																	
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %	WN %	WS %	NSW %	AUS %
<b>Aboriginal status and year vaccine received</b>																		
<b>Aboriginal</b>																		
2021	20.4	22.8	25.5	13.7	16.0	20.8	15.8	24.8	13.0	28.8	15.5	14.1	21.9	14.2	23.7	12.9	19.9	22.5
2022	29.4	31.5	25.6	20.2	15.9	24.7	21.2	20.4	13.8	45.1	27.8	18.5	21.1	23.5	26.1	16.5	23.0	24.6
<b>Non-Aboriginal</b>																		
2021	21.5	36.2	31.3	21.7	13.9	28.1	19.1	29.8	13.2	29.3	23.5	15.4	28.3	28.4	35.4	22.0	23.5	26.8
2022	33.8	41.1	38.9	31.9	19.4	34.3	27.8	36.4	18.5	47.7	38.5	21.8	36.0	43.6	42.1	31.8	33.8	34.7

<sup>a</sup> Age assessed at 30 June in relevant year.

<sup>b</sup> Vaccines given 1 January – 31 December in calendar year of interest.

<sup>c</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; AUS: Australia

Source: Australian Immunisation Register, data as at 03 April 2022 (for 2021 data) and as at 02 April 2023 (for 2022 data).

**Table 17. Percentage of adults aged  $\geq 65$  years<sup>a</sup> vaccinated with at least one dose of influenza vaccine<sup>b</sup> by local health district, compared with NSW overall and Australia, 2021 versus 2022**

Year	Local Health District <sup>c</sup>																	
	CC %	FW %	HNE %	IS %	MN %	MM %	NBM %	NV %	NN %	NS %	SES %	SWS %	SN %	SYD %	WN %	WS %	NSW %	AUS %
2021	69.3	63.4	72.1	69.6	68.2	71.6	62.0	73.0	63.9	58.1	52.9	54.8	68.4	47.3	68.5	55.9	61.4	64.9
2022	75.2	69.0	77.0	75.3	74.1	76.2	68.9	76.1	69.4	65.8	59.9	60.8	73.7	54.1	73.6	62.0	67.5	70.0

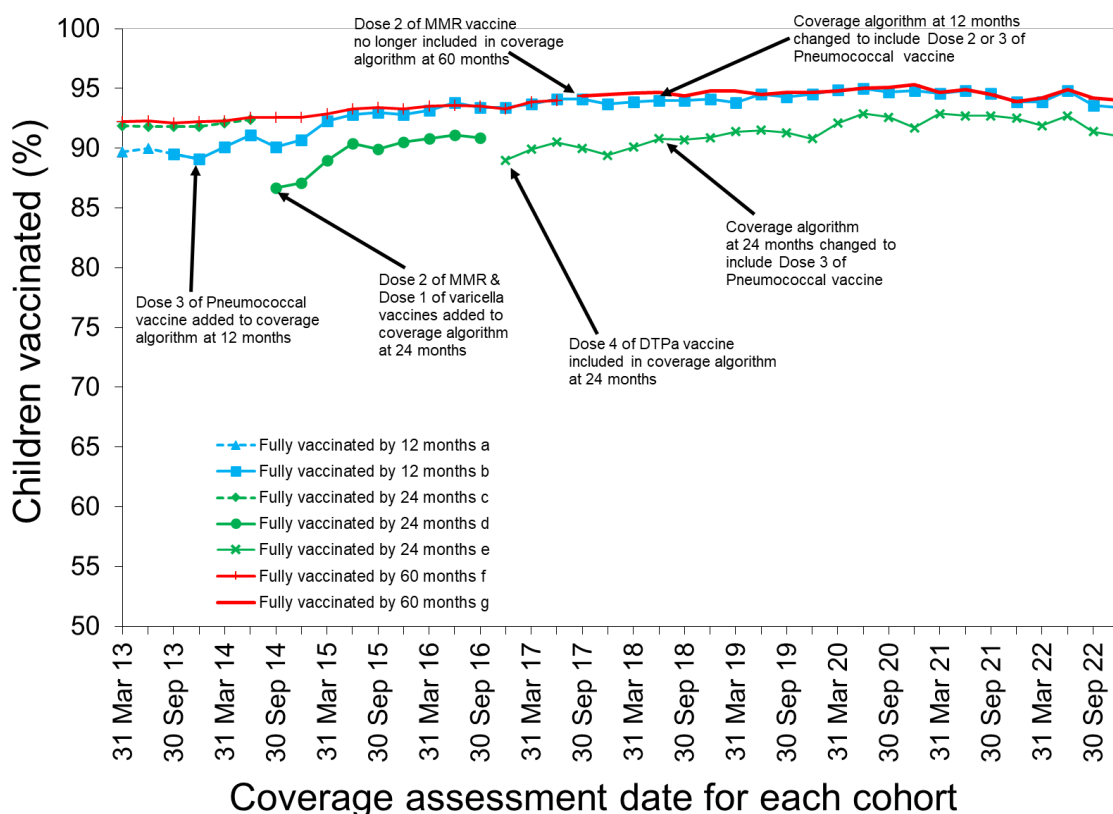
<sup>a</sup> Age assessed at 30 June in relevant year.

<sup>b</sup> Vaccines given 1 January – 31 December in calendar year of interest.

<sup>c</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; AUS: Australia

Source: Australian Immunisation Register, data as at 03 April 2022 (for 2021 data) and as at 02 April 2023 (for 2022 data).

**Figure 1. Trends in fully vaccinated coverage, NSW, 2013–2022**



Coverage calculated for 3-month birth cohorts born between 1 January 2012 and 31 December 2021. Coverage assessment date was 12, 24 or 60 months after the last birth date of each cohort. Vaccination coverage estimates are calculated by quarter and may differ slightly from estimates published elsewhere using rolling annualised data.

For the Fully vaccinated by 12 months quarterly data points in 2022, the 3-month cohorts were born between 1 January 2021 – 31 December 2021 with vaccines due from mid-2021 through to mid-2022 (6 month doses).

For the Fully vaccinated by 24 months quarterly data points in 2022, the 3-month cohorts were born between 1 January 2020 – 31 December 2020 with vaccines due from mid-2020 (6 month doses) through to mid-2022 (18 month doses).

For the Fully vaccinated by 60 months quarterly data points in 2022, the 3-month cohorts were born between 1 January 2017 – 31 December 2017 with vaccines due in 2021 (48 month doses).

<sup>a</sup> Up until 30 June 2013, fully vaccinated at 12 months of age was defined as having a record of a third dose of DTPa-containing vaccine, and third doses of polio-containing, Hib-containing and Hep B-containing vaccines.

<sup>b</sup> Between 1 July 2013 and 31 March 2018, fully vaccinated at 12 months of age was defined as having a record of a third dose of DTPa-containing vaccine, third doses of polio-containing, Hib-containing and Hep B-containing vaccines, and a third dose of 13-valent PCV. Since 1 April 2018, the definition was changed to include a second or third dose of 13-valent PCV.

<sup>c</sup> Up until 30 June 2014, fully vaccinated at 24 months of age was defined as having a record of a third dose of DTPa-containing vaccine, third doses of polio-containing and Hep B-containing vaccines, a fourth dose of Hib-containing vaccine, and a first dose of MMR-containing vaccine.

<sup>d</sup> Between 1 July 2014 and 30 September 2016, fully vaccinated at 24 months of age was defined as having a record of a third dose of DTPa-containing vaccine, third doses of polio-containing and Hep B-containing vaccines, a fourth dose of Hib-containing vaccine, a second dose of MMR-containing vaccine, a first dose of varicella-containing vaccine and a first dose of Men C-containing vaccine.

<sup>e</sup> Between 1 October 2016 and 31 March 2018, fully vaccinated at 24 months of age was defined as having a record of a fourth dose of DTPa-containing vaccine, third doses of polio-containing and Hep B-containing vaccines, a fourth dose of Hib-containing vaccine, a second dose of MMR-containing vaccine, a first dose of varicella-containing vaccine and a first dose of Men C-containing vaccine. Since 1 April 2018, the definition was changed to include a third dose of 13-valent PCV.

<sup>f</sup> Between 1 October 2007 and 30 June 2017 fully vaccinated at 60 months of age was defined as having a record of a fourth dose of DTPa-containing vaccine, a fourth dose of polio-containing vaccine and a second dose of MMR-containing vaccine.

<sup>g</sup> Since 1 July 2017, fully vaccinated at 60 months of age was defined as having a record of a fourth or fifth dose of DTPa-containing vaccine and a fourth dose of polio-containing vaccine.

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

Hep B: hepatitis B

Hib: *Haemophilus influenzae* type b

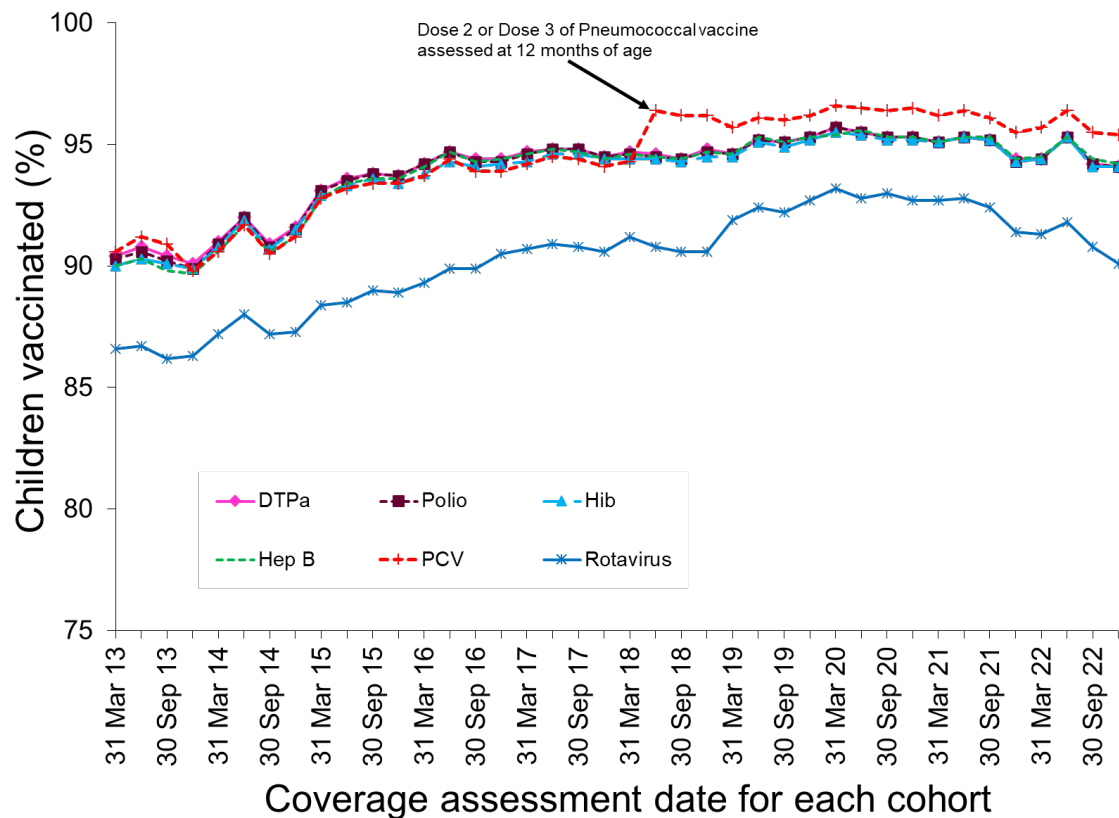
Men C: meningococcal C

MMR: measles-mumps-rubella

PCV: pneumococcal conjugate vaccine

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 2. Trends in vaccination coverage at 12 months of age by vaccine/antigen,<sup>a</sup> NSW, 2013–2022**



By 3-month birth cohorts born between 1 January 2012 and 31 December 2021. Coverage assessment date was 12 months after the last birth date of each cohort. Vaccination coverage estimates are calculated by quarter and may differ slightly from estimates published elsewhere using rolling annualised data.

The 2022 quarterly data points used the 3-month cohorts born between 1 January 2021 – 31 December 2021 with vaccines due from mid-2021 through to mid-2022 (6 month doses).

<sup>a</sup> Third doses of DTPa-containing, polio-containing, Hib-containing and Hep B-containing vaccines, a third dose of 13-valent PCV (second or third dose as of 1 April 2018) and a second dose of rotavirus vaccine.

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

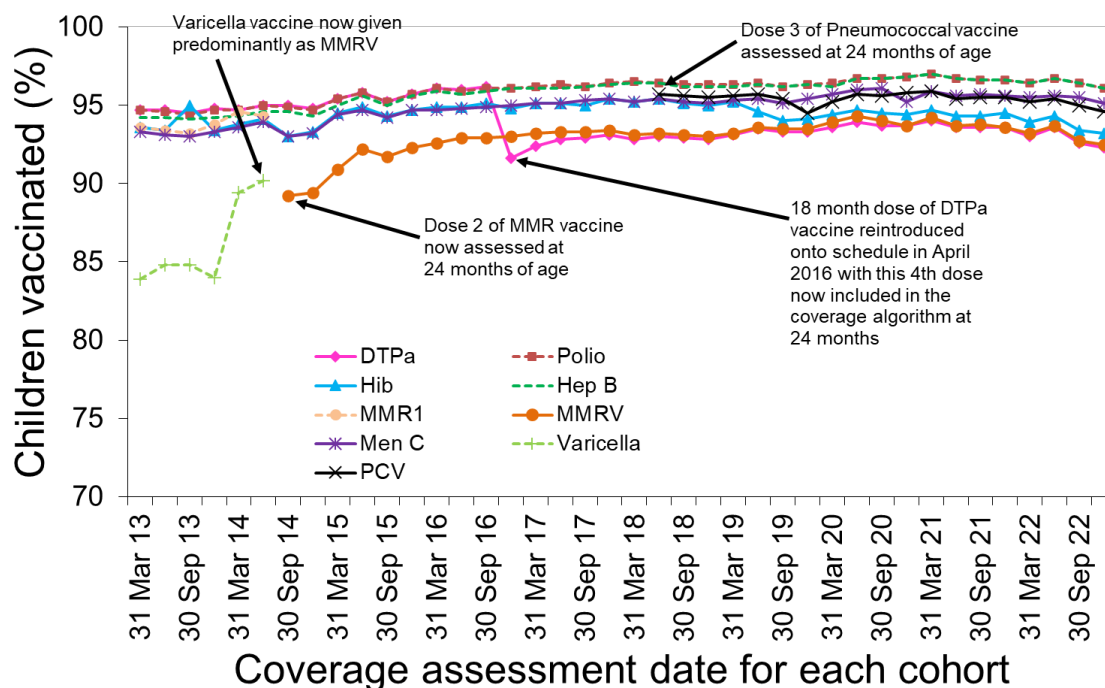
Hep B: hepatitis B

Hib: *Haemophilus influenzae* type b

PCV: pneumococcal conjugate vaccine

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 3. Trends in vaccination coverage at 24 months of age by vaccine/antigen,<sup>a</sup> NSW, 2013–2022**



By 3-month birth cohorts born between 1 January 2011 and 31 December 2020. Coverage assessment date was 24 months after the last birth date of each cohort. Vaccination coverage estimates are calculated by quarter and may differ slightly from estimates published elsewhere using rolling annualised data.

The 2022 quarterly data points used the 3-month cohorts born between 1 January 2020 – 31 December 2020 with vaccines due from mid-2020 (6 month doses) through to mid-2022 (18 month doses).

<sup>a</sup> DTPa-containing vaccine (third dose assessed up until 30 September 2016, fourth dose assessed from 1 October 2016), third doses of polio-containing and Hep B-containing vaccines, a fourth dose of Hib-containing vaccine, MMR-containing vaccine (first dose assessed up until 30 June 2014, second dose assessed from 1 July 2014), a first dose of varicella-containing vaccine, a first dose of Men C-containing vaccine, and a third dose of 13-valent PCV (assessed from 1 April 2018).

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

Hep B: hepatitis B

Hib: *Haemophilus influenzae* type b

Men C: meningococcal C

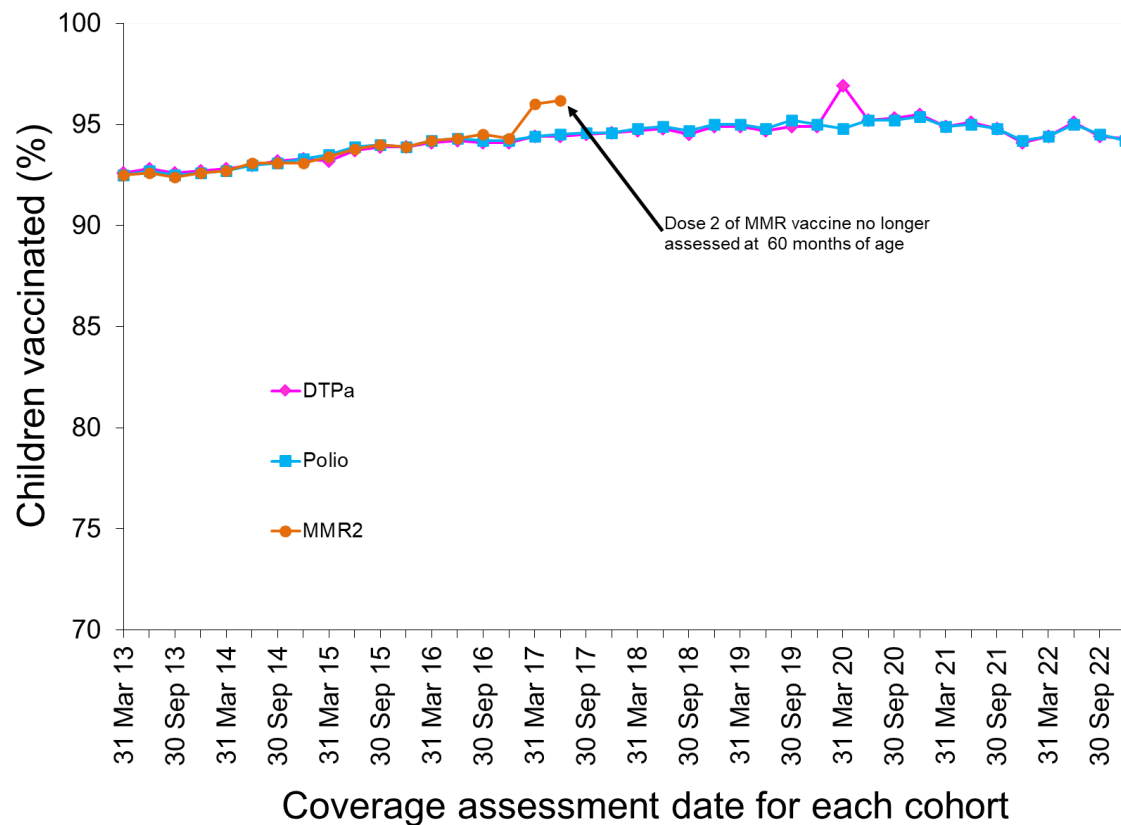
MMR: measles-mumps-rubella

MMRV: measles-mumps-rubella-varicella

PCV: pneumococcal conjugate vaccine

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 4. Trends in vaccination coverage at 60 months of age by vaccine/antigen,<sup>a</sup> NSW, 2013–2022**



By 3-month birth cohorts born between 1 January 2008 and 31 December 2017. Coverage assessment date was 60 months after the last birth date of each cohort. Vaccination coverage estimates are calculated by quarter and may differ slightly from estimates published elsewhere using rolling annualised data.

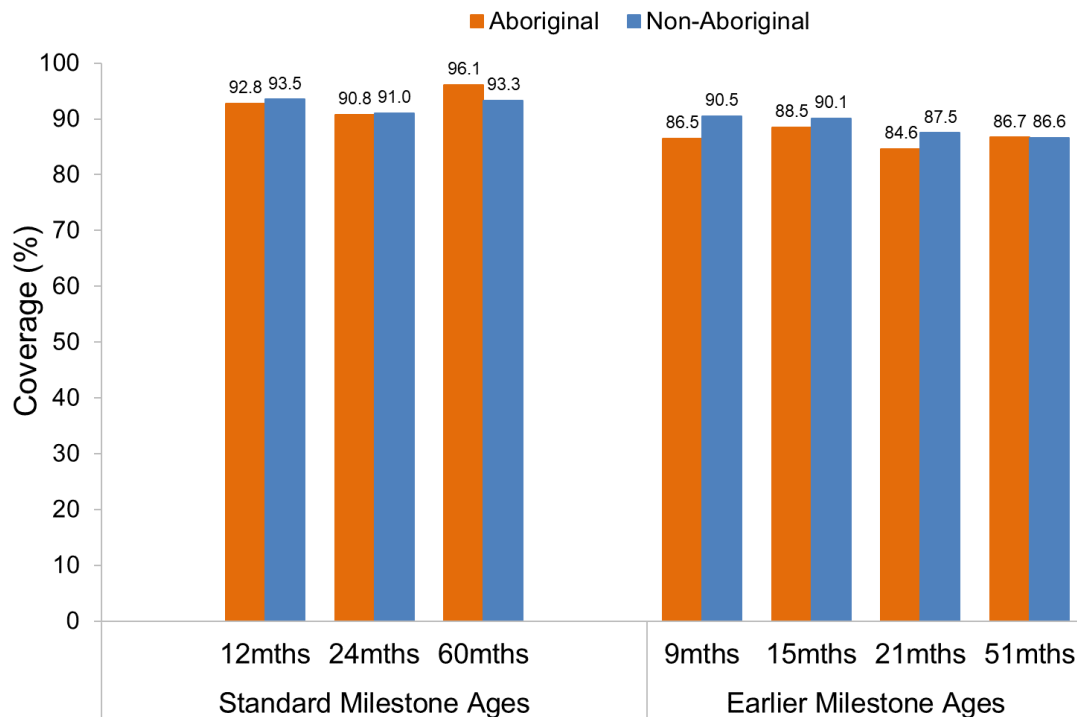
The 2022 quarterly data points used the 3-month cohorts born between 1 January 2017 – 31 December 2017 with vaccines due in 2021 (48 month doses).

<sup>a</sup> DTPa-containing vaccine (fourth dose assessed up until 30 September 2016, fourth or fifth doses assessed from 1 October 2016), a fourth dose of polio-containing vaccine, and up until 30 June 2017, a second dose of MMR-containing vaccine.

DTPa: diphtheria–tetanus–pertussis (acellular) – paediatric formulation  
MMR: measles-mumps-rubella

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 5. Fully vaccinated coverage assessed at earlier milestone ages (9,<sup>a</sup> 15,<sup>b</sup> 21<sup>c</sup> and 51<sup>d</sup> months) versus standard milestone ages (12,<sup>a</sup> 24,<sup>c</sup> and 60<sup>d</sup> months) by Aboriginal status, NSW, 2022**



<sup>a</sup> Cohort born 1 January 2021 – 31 December 2021: Fully vaccinated at 9 and 12 months of age defined as having a record on the AIR of a third dose of diphtheria-tetanus-pertussis (acellular)-containing vaccine, third doses of polio-containing, Haemophilus influenzae type b-containing and hepatitis B-containing vaccines, and a second or third dose of 13-valent pneumococcal conjugate vaccine. Vaccines due from mid-2021 through to mid-2022 (6 month doses).

<sup>b</sup> Cohort born 1 January 2020 – 31 December 2020: Fully vaccinated at 15 months of age defined as having a record on the AIR of a third dose of diphtheria-tetanus-pertussis (acellular)-containing vaccine, third doses of polio-containing and hepatitis B-containing vaccines, a third dose of Haemophilus influenzae type b-containing vaccine (or a third dose of the Haemophilus B conjugate (PRP-T) vaccine if given after 11.5 months of age), a third dose of 13-valent pneumococcal conjugate vaccine, a first dose of measles-mumps-rubella-containing vaccine, and a first dose of meningococcal C-containing vaccine. Vaccines due from mid-2020 (6 month doses) through to end-2021 (12 month doses).

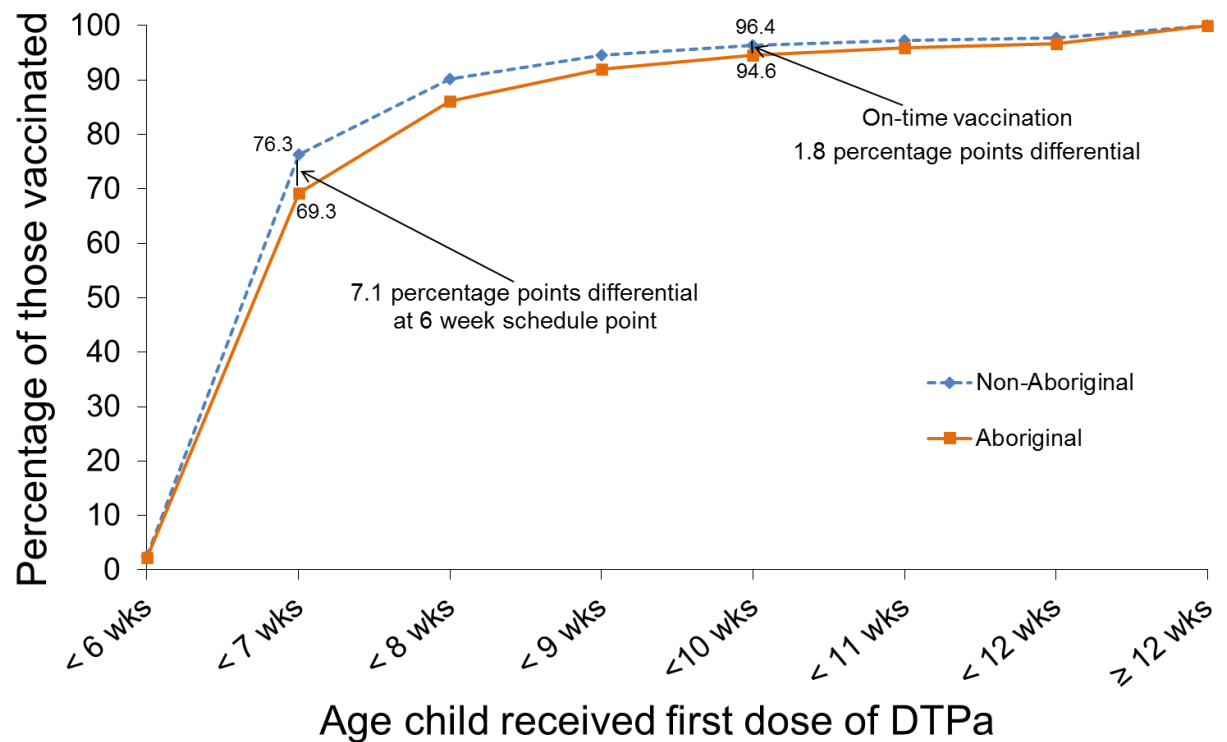
<sup>c</sup> Cohort born 1 January 2020 – 31 December 2020: Fully vaccinated at 21 and 24 months of age defined as having a record on the AIR of a fourth dose of diphtheria-tetanus-pertussis (acellular)-containing vaccine, third doses of polio-containing and hepatitis B-containing vaccines, a fourth dose of Haemophilus influenzae type b-containing vaccine (or a third dose of the Haemophilus B conjugate (PRP-T) vaccine if given after 11.5 months of age), a third dose of 13-valent pneumococcal conjugate vaccine, a first dose of meningococcal C-containing vaccine, a second dose of measles-mumps-rubella-containing vaccine and a first dose of varicella-containing vaccine. Vaccines due from mid-2020 (6 month doses) through to mid-2022 (18 month doses).

<sup>d</sup> Cohort born 1 January 2017 – 31 December 2017: Fully vaccinated at 51 and 60 months of age defined as having a record on the AIR of a fourth or fifth dose of diphtheria-tetanus-pertussis (acellular)-containing vaccine and a fourth dose of polio-containing vaccine. Vaccines due in 2021 (48 month doses).

Source: Australian Immunisation Register, data as at 02 April 2023.



**Figure 6. Cumulative percentage of children<sup>a</sup> vaccinated with the first dose of DTPa-containing vaccine<sup>b</sup> by age in weeks and Aboriginal status, NSW, 2022**



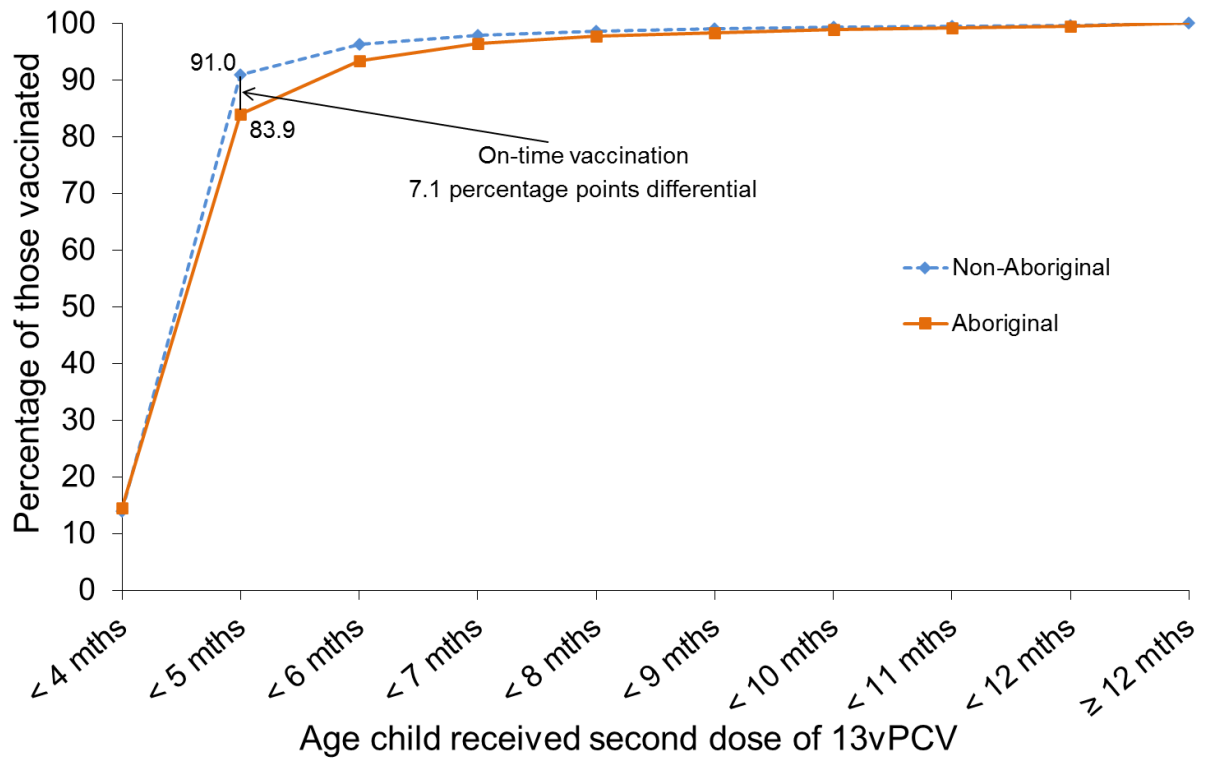
<sup>a</sup> Cohort born 1 January 2021 – 31 December 2021 with the first dose of DTPa-containing vaccine due at 6 weeks of age (i.e. from early-2021 through to early-2022).

<sup>b</sup> Shown as cumulative percentage of children vaccinated (number of children who received vaccine dose at particular age divided by the total number of children who received the vaccine dose, expressed as a percentage).

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

Source: Australian Immunisation Register, data as at 02 April 2023.

**Figure 7. Cumulative percentage of children<sup>a</sup> vaccinated with the second dose of 13vPCV<sup>b</sup> by age in months and Aboriginal status, NSW, 2022**



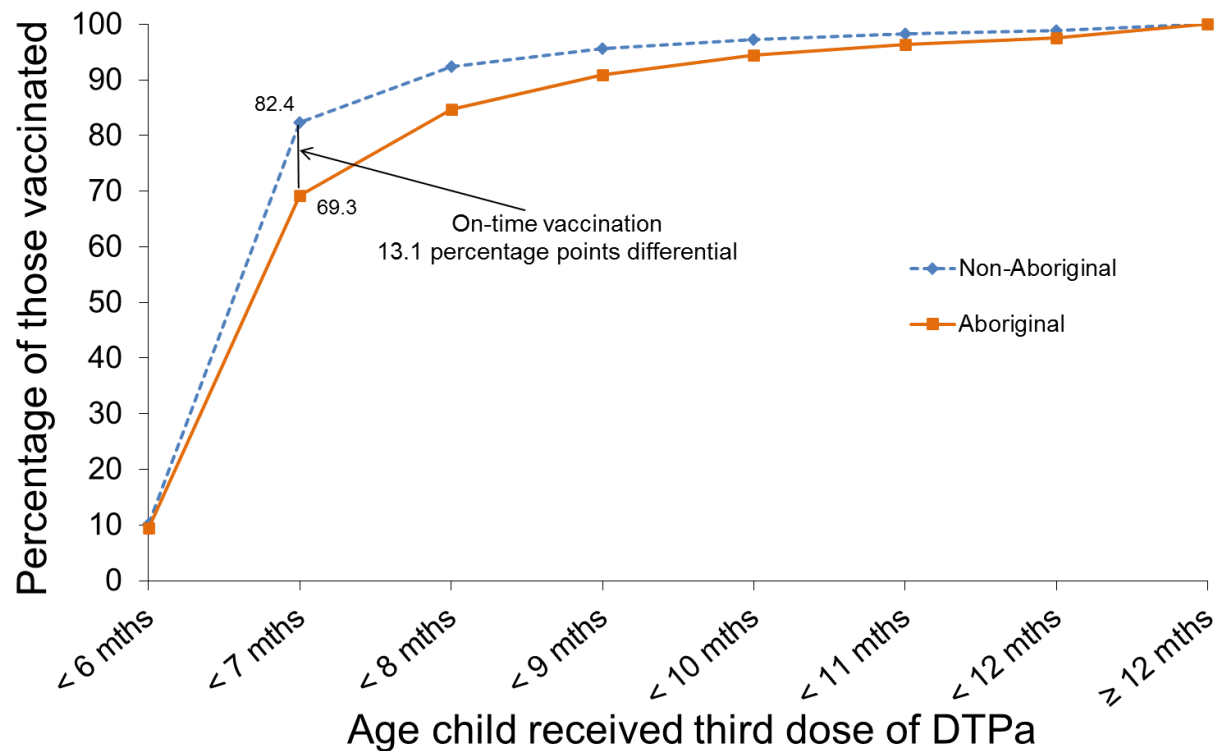
<sup>a</sup> Cohort born 1 January 2021 – 31 December 2021 with the second dose of 13vPCV due at 4 months of age (i.e. from April 2021 through to April 2022).

<sup>b</sup> Shown as cumulative percentage of children vaccinated (number of children who received vaccine dose at particular age divided by the total number of children who received the vaccine dose, expressed as a percentage).

13vPCV: 13-valent pneumococcal conjugate vaccine

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 8. Cumulative percentage of children<sup>a</sup> vaccinated with the third dose of DTPa-containing vaccine<sup>b</sup> by age in months and Aboriginal status, NSW, 2022**



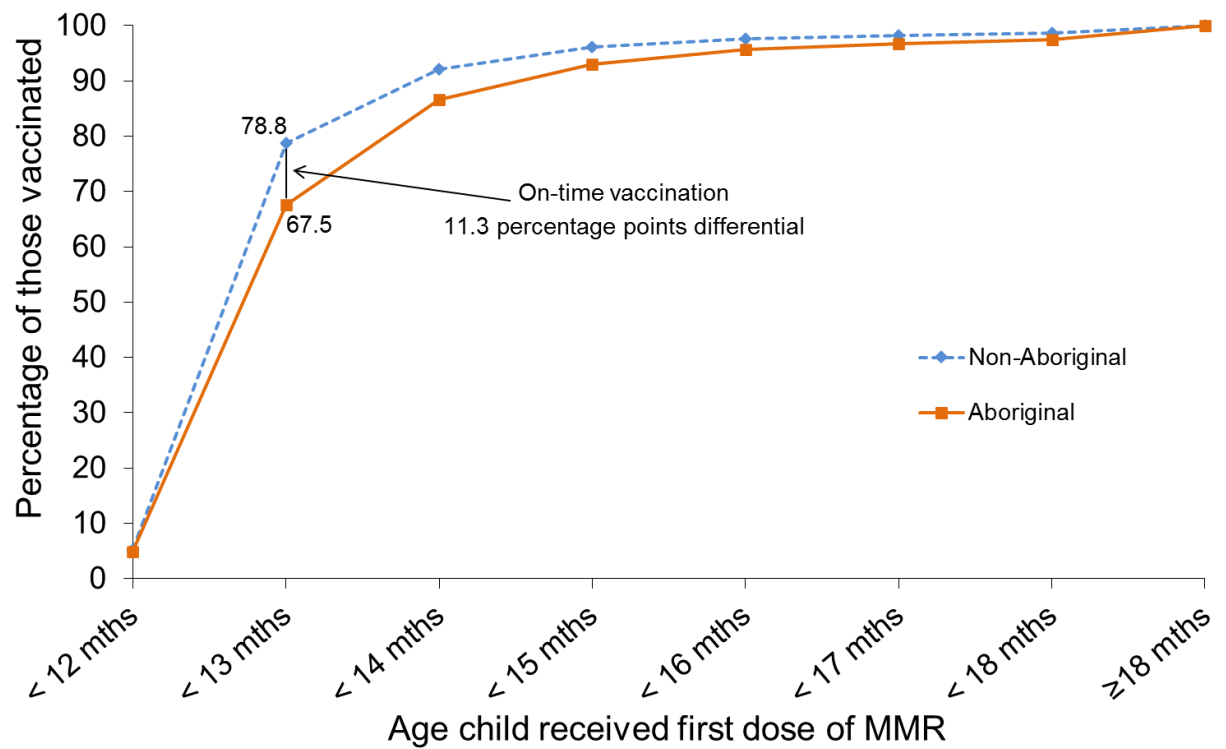
<sup>a</sup> Cohort born 1 January 2021 – 31 December 2021 with the third dose of DTPa-containing vaccine due at 6 months of age (i.e. from mid-2021 through to mid-2022).

<sup>b</sup> Shown as cumulative percentage of children vaccinated (number of children who received vaccine dose at particular age divided by the total number of children who received the vaccine dose, expressed as a percentage).

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

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 9. Cumulative percentage of children<sup>a</sup> vaccinated with the first dose of MMR-containing vaccine<sup>b</sup> by age in months and Aboriginal status, NSW, 2022**



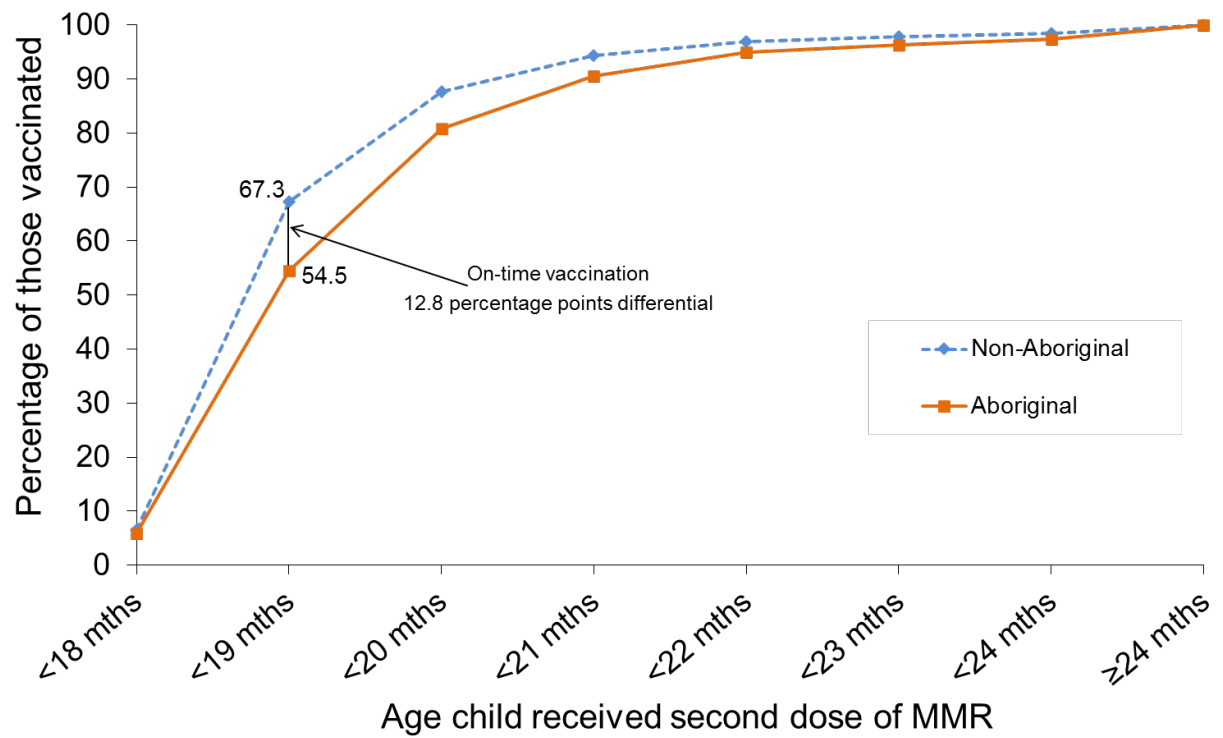
<sup>a</sup> Cohort born 1 January 2020 – 31 December 2020 with the first dose of MMR-containing vaccine due at 12 months of age (i.e. in 2021).

<sup>b</sup> Shown as cumulative percentage of children vaccinated (number of children who received vaccine dose at particular age divided by the total number of children who received the vaccine dose, expressed as a percentage).

MMR: measles-mumps-rubella

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 10. Cumulative percentage of children<sup>a</sup> vaccinated with the second dose of MMR-containing vaccine<sup>b</sup> by age in months and Aboriginal status, NSW, 2022**



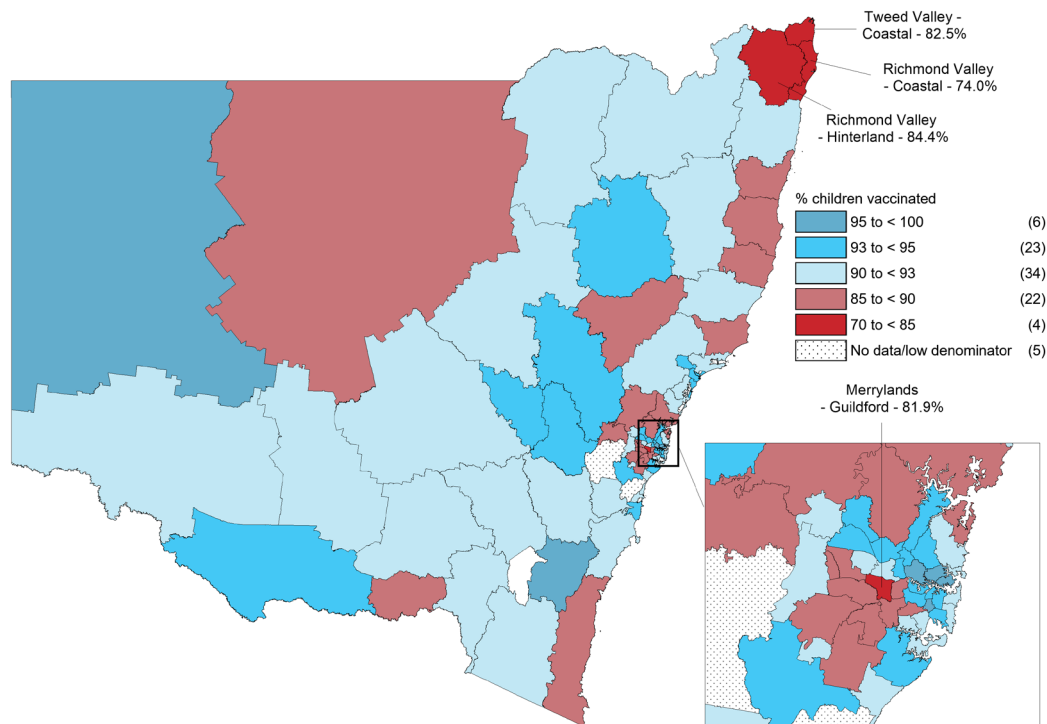
<sup>a</sup> Cohort born 1 January 2020 – 31 December 2020 with the second dose of MMR-containing vaccine due at 18 months of age (i.e. from mid-2021 through to mid-2022).

<sup>b</sup> Shown as cumulative percentage of children vaccinated (number of children who received vaccine dose at particular age divided by the total number of children who received the vaccine dose, expressed as a percentage).

MMR: measles-mumps-rubella

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 11. Coverage for second dose of rotavirus vaccine at 12 months of age<sup>a</sup> by Statistical Area level 3,<sup>b</sup> NSW, 2022**

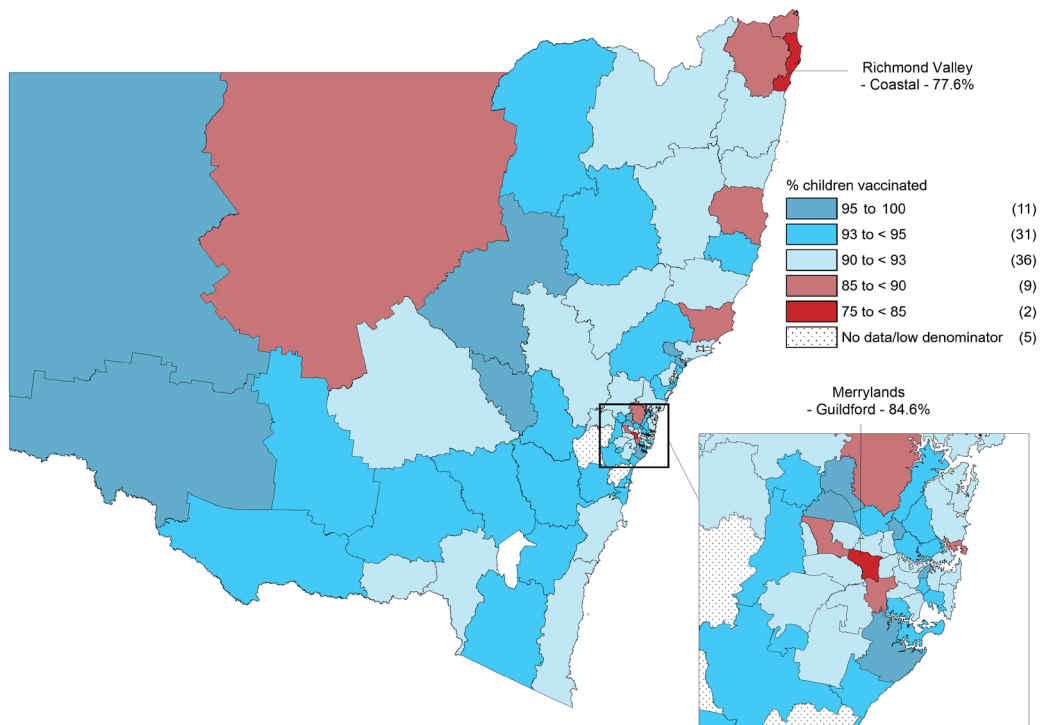


<sup>a</sup> Cohort born 1 January 2021 – 31 December 2021 with the second dose of rotavirus vaccine due at 4 months of age (i.e. from April 2021 through to April 2022).

<sup>b</sup> Numbers in brackets = number of Statistical Area 3s in each coverage category.

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 12. Coverage for the fourth dose of DTPa-containing vaccine at 24 months of age<sup>a</sup> by Statistical Area level 3,<sup>b</sup> NSW, 2022**



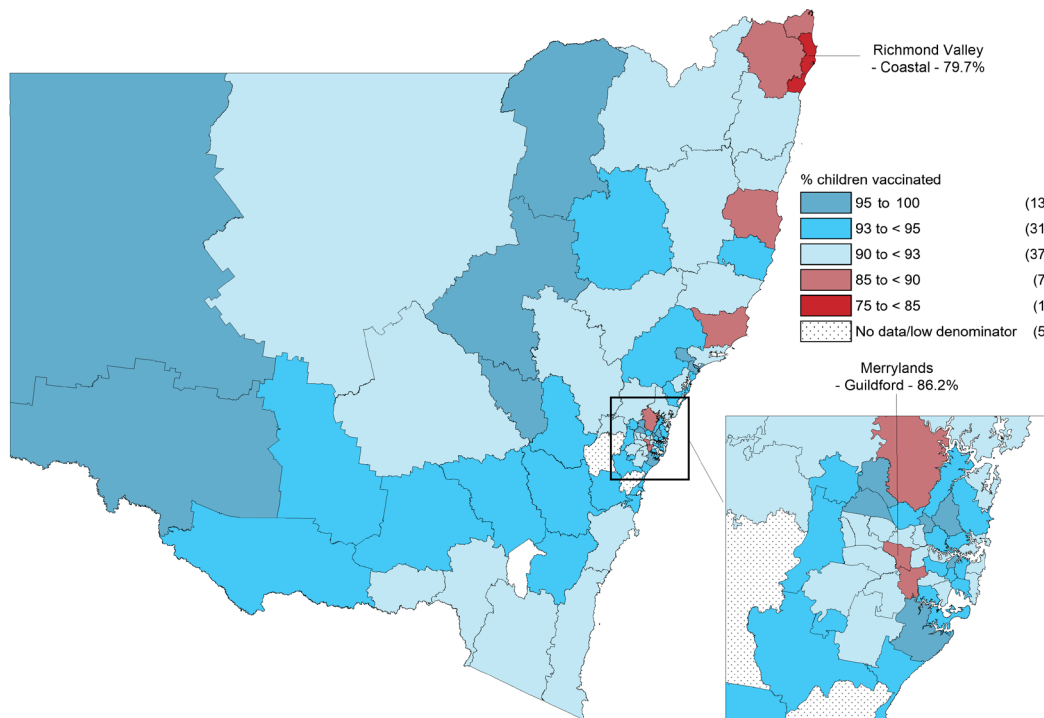
<sup>a</sup> Cohort born 1 January 2020 – 31 December 2020 with the fourth dose of DTPa-containing vaccine due at 18 months of age (i.e. from mid-2021 through to mid-2022).

<sup>b</sup> Numbers in brackets = number of Statistical Area 3s in each coverage category.

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

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 13. Coverage for the second dose of MMR-containing vaccine at 24 months of age<sup>a</sup> by Statistical Area level 3,<sup>b</sup> NSW, 2022**



<sup>a</sup> Cohort born 1 January 2020 – 31 December 2020 the second dose of MMR-containing vaccine due at 18 months of age (i.e. from mid-2021 through to mid-2022).

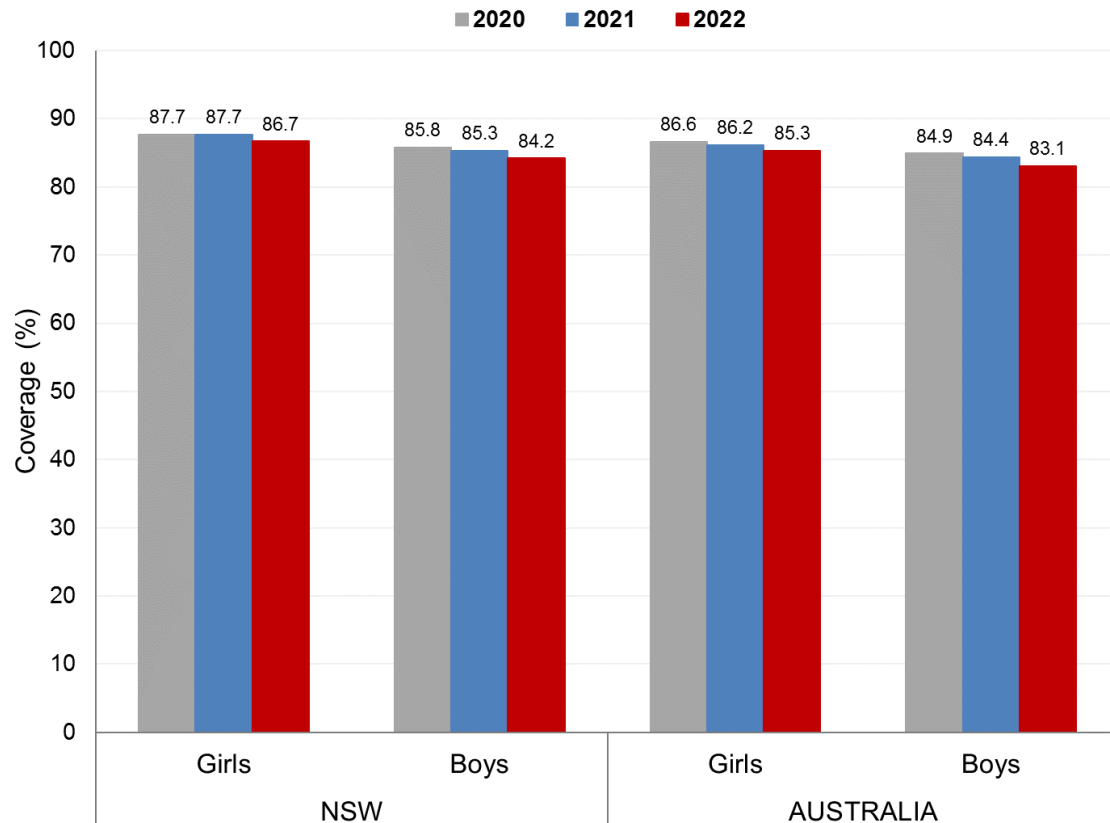
<sup>b</sup> Numbers in brackets = number of Statistical Area 3s in each coverage category.

MMR: measles-mumps-rubella

Source: Australian Immunisation Register, data as at 2 April 2023.



**Figure 14. Coverage of at least one dose of HPV vaccine<sup>a</sup> by 15 years of age,<sup>b</sup> by gender, NSW versus Australia, 2020 - 2022**



<sup>a</sup> HPV vaccination coverage calculated using the number of Medicare-registered individuals in the relevant birth cohort with an AIR record of having received a dose of HPV vaccine (as HPV registered to be given from 9 years of age), but before 15th birthday as the numerator and the total number of Medicare-registered individuals in the birth cohort as the denominator, expressed as a percentage.

<sup>b</sup> Adolescents born:

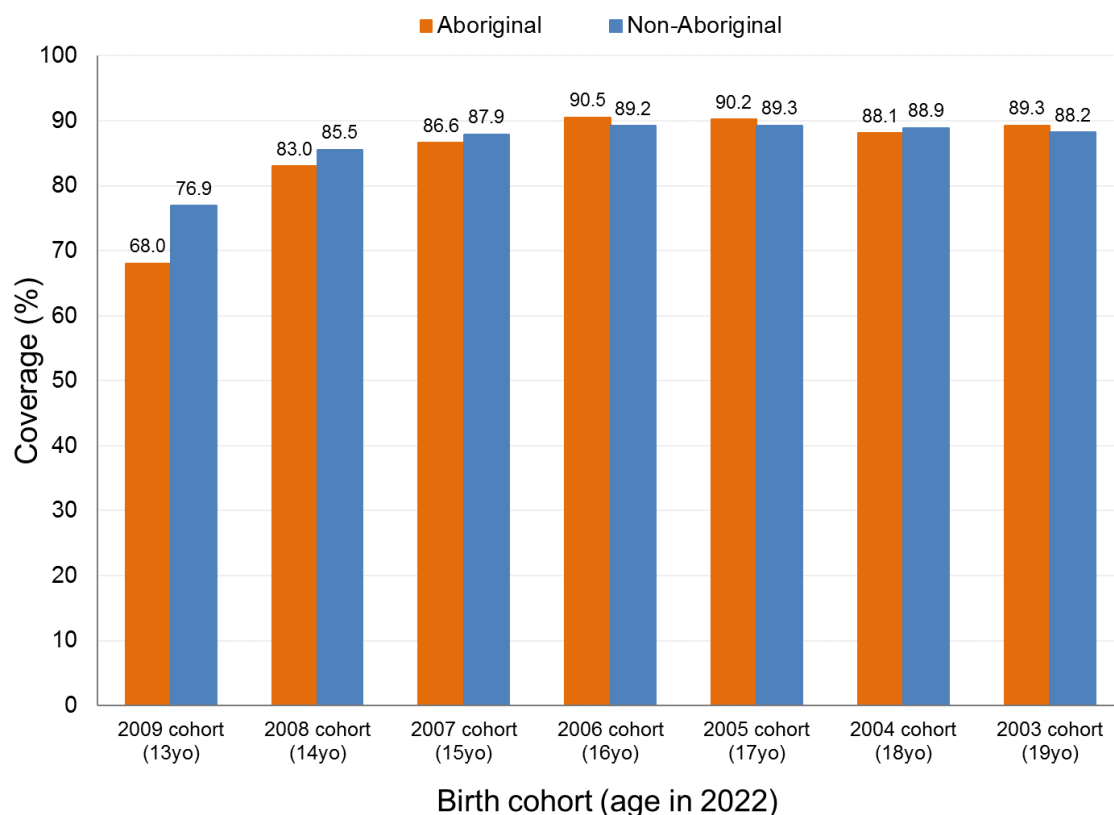
- 1 January – 31 December 2005 for coverage assessed in 2020,
- 1 January – 31 December 2006 for coverage assessed in 2021 and
- 1 January – 31 December 2007 for coverage assessed in 2022

HPV: human papillomavirus

Note: In NSW, adolescent vaccines are typically given as part of the school vaccination programs with HPV vaccine scheduled in Year 7, usually around 12 – 13 years of age. As such the HPV vaccine was due in early 2017 to late 2018 for the 2005 cohort, in early 2018 to late 2019 for the 2006 cohort, and in early 2019 to late 2020 for the 2007 cohort. However, HPV vaccination is also available from vaccination providers outside of the school program as catch-up vaccination up to the age of 19 years (inclusive) in 2022. As of 2023, catch-up vaccination is available up to the age of 25 years (inclusive).

Source: Australian Immunisation Register, data as at 31 March 2021 (for 2020 data), as at 3 April 2022 (for 2021 data) and as at 2 April 2023 (for 2022 data).

**Figure 15. Coverage of an adolescent dose of diphtheria-tetanus-acellular pertussis vaccine<sup>a</sup> by birth cohort/age<sup>b</sup> and Aboriginal status, NSW, 2022**



<sup>a</sup> Coverage calculated using the number of Medicare-registered individuals in each year-wide cohort with an AIR record of having received an adolescent (i.e.  $\geq 10$  years of age) dose of a diphtheria-tetanus-acellular pertussis vaccine (recorded as either dTpa or DTPa) given by 31 December 2022 as the numerator and the total number of Medicare-registered adolescents in the relevant cohort as the denominator, expressed as a percentage.

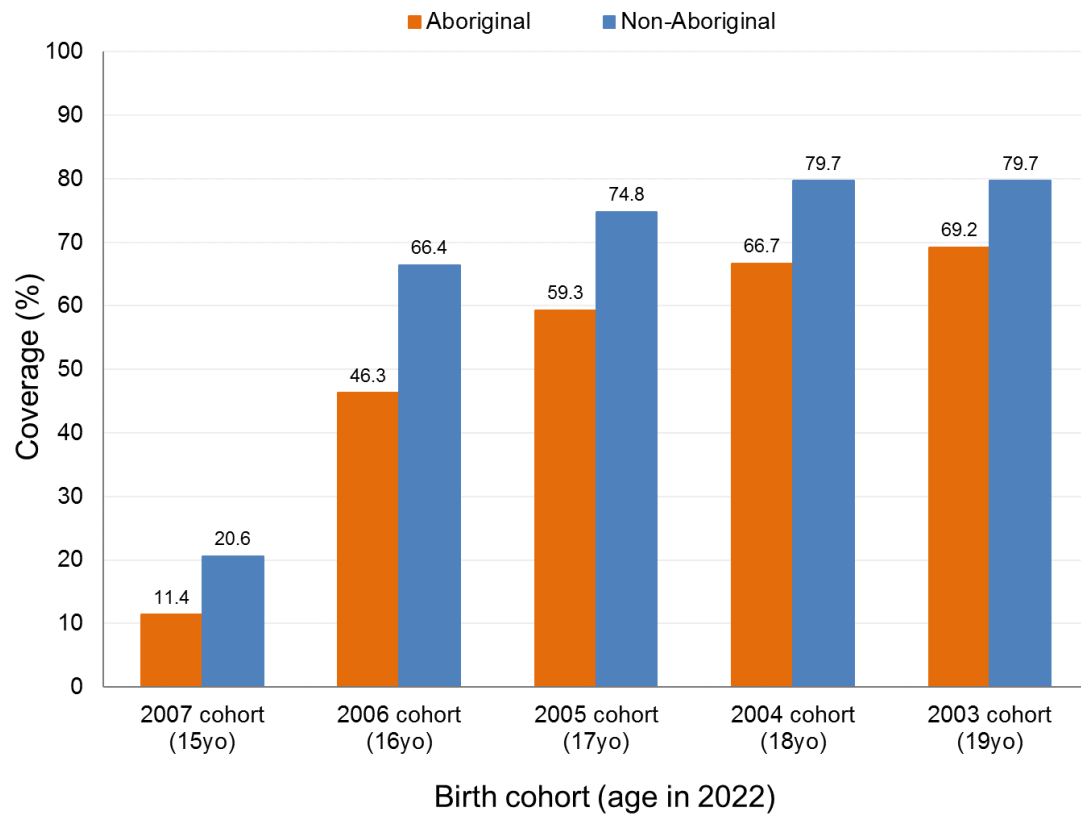
<sup>b</sup> Birth cohort based on age at 31 December 2022.

dTpa: diphtheria–tetanus–pertussis (acellular) – formulation for individuals aged  $\geq 10$  years; DTPa: diphtheria–tetanus–pertussis (acellular) – paediatric formulation;

Note: In NSW, adolescent vaccines are typically given as part of the school vaccination programs with dTpa vaccine given in Year 7, usually around 12 – 13 years of age. However, dTpa vaccination at other ages is also available from vaccination providers outside of the school program.

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 16. Coverage of an adolescent dose of meningococcal ACWY vaccine<sup>a</sup> by birth cohort/age<sup>b</sup> and Aboriginal status, NSW, 2022**



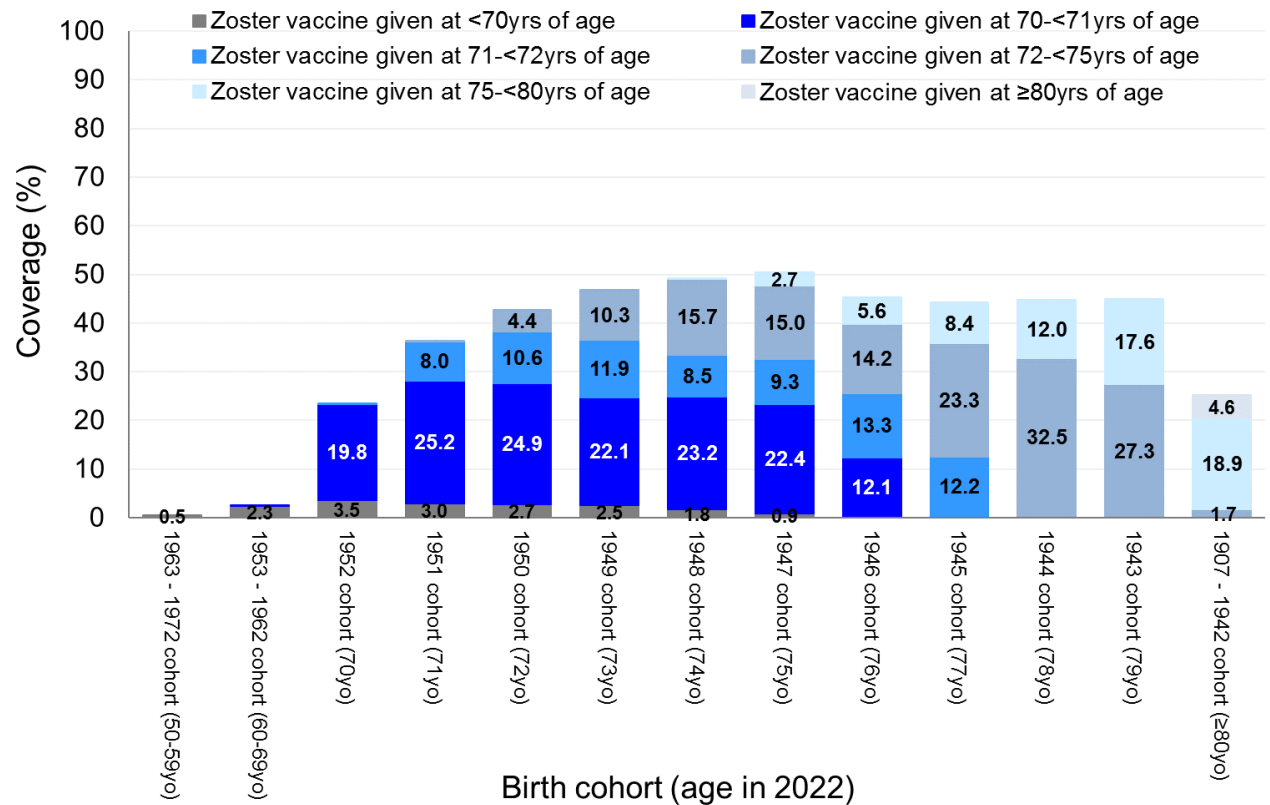
<sup>a</sup> Coverage calculated using the number of Medicare-registered individuals in each year-wide cohort with an AIR record of having received an adolescent (i.e.  $\geq 10$  years of age) dose of a meningococcal ACWY vaccine given by 31 December 2022 as the numerator and the total number of Medicare-registered individuals in the relevant cohort as the denominator, expressed as a percentage.

<sup>b</sup> Birth cohort based on age at 31 December 2022.

Note: In NSW, adolescent vaccines are typically given as part of the school vaccination programs with meningococcal ACWY vaccine given in Year 10, usually around 15 – 16 years of age. However, it is also available from vaccination providers outside of the school program as a catch-up vaccination up to the age of 19 years (inclusive).

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 17. Zoster vaccination coverage<sup>a</sup> in non-Aboriginal adults by birth cohort<sup>b</sup> and age at vaccination, NSW, 2022**

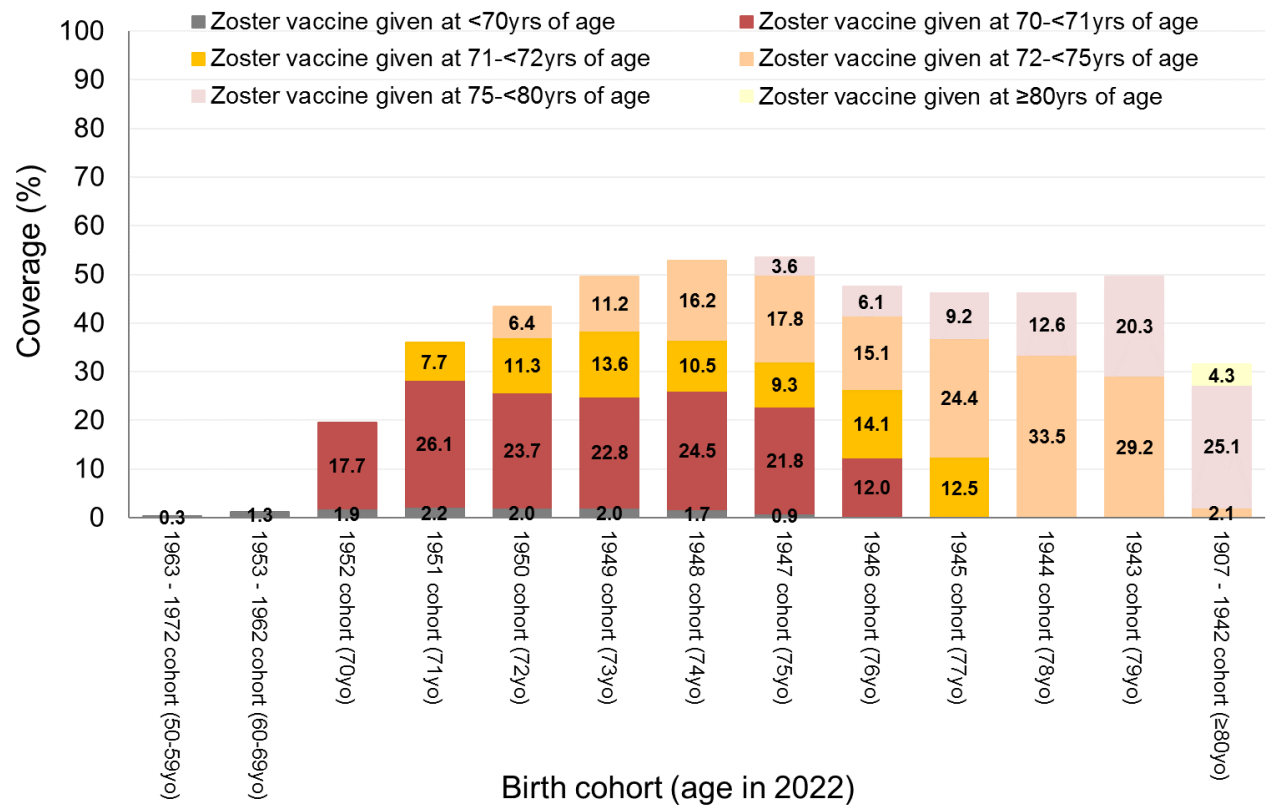


<sup>a</sup> Calculated using the number of Medicare-registered non-Aboriginal adults in each cohort with an AIR record of having received either one dose of Zostavax vaccine or two doses of Shingrix vaccine as the numerator and the total number of Medicare-registered non-Aboriginal adults in the relevant cohort as the denominator, expressed as a percentage. Vaccinations given up to 31 December 2022 (inclusive) are included in the numerator.

<sup>b</sup> Birth cohort based on age at 31 December 2022.

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 18. Zoster vaccination coverage<sup>a</sup> in Aboriginal adults by birth cohort<sup>b</sup> and age at vaccination, NSW, 2022**

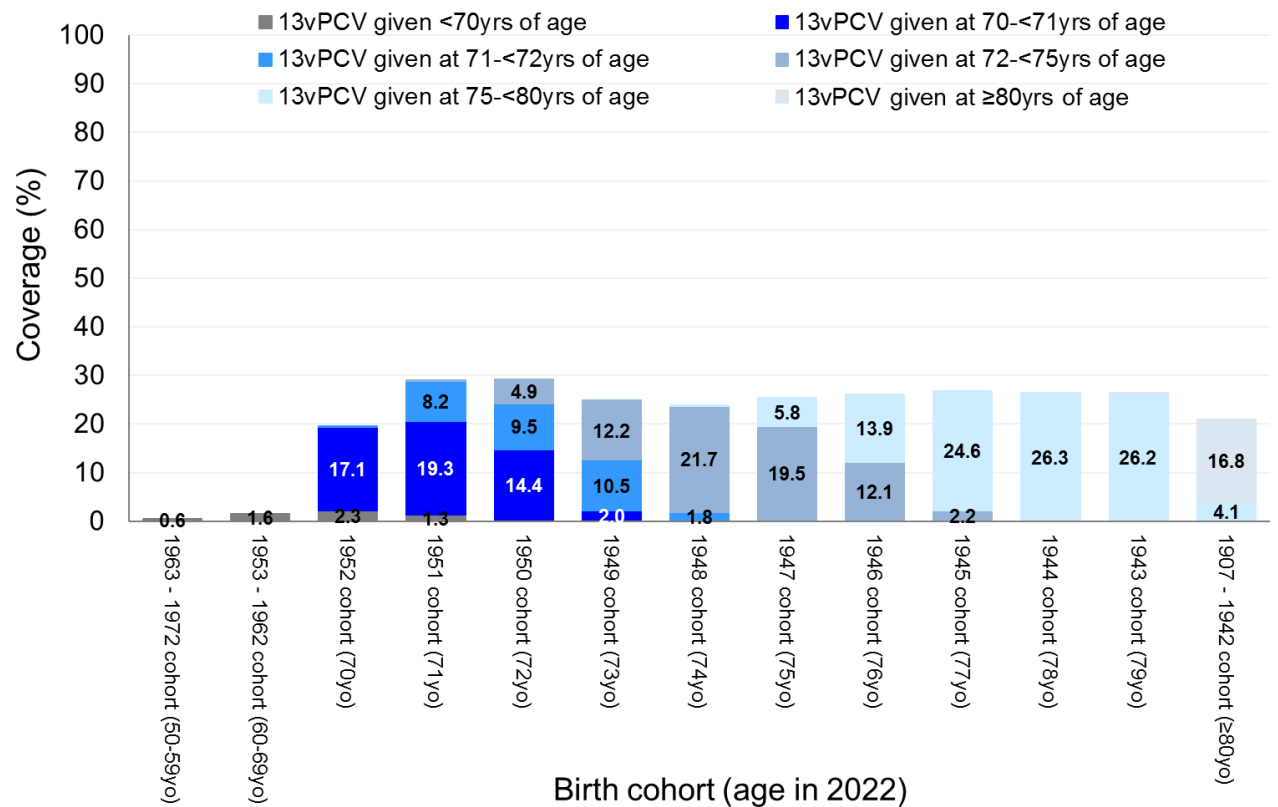


<sup>a</sup> Calculated using the number of Medicare-registered Aboriginal adults in each cohort with an AIR record of having received either one dose of Zostavax vaccine or two doses of Shingrix vaccine as the numerator and the total number of Aboriginal Medicare-registered adults in the relevant cohort as the denominator, expressed as a percentage. Vaccinations given up to 31 December 2022 (inclusive) are included in the numerator.

<sup>b</sup> Birth cohort based on age at 31 December 2022.

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 19. 13vPCV coverage<sup>a</sup> in non-Aboriginal adults by birth cohort<sup>b</sup> and age at vaccination, NSW, 2022**

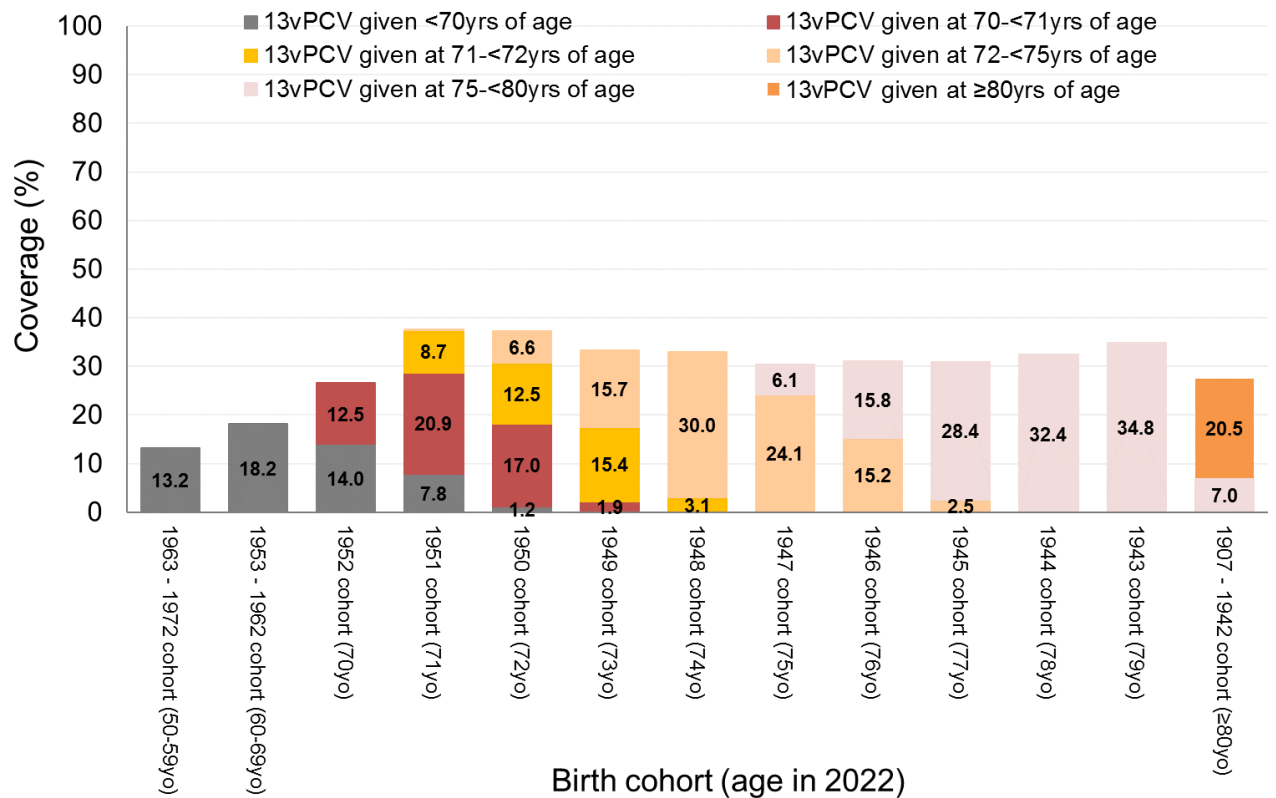


<sup>a</sup> Calculated using the number of Medicare-registered non-Aboriginal adults in each age cohort with an AIR record of having received a dose of 13vPCV as the numerator and the total number of Medicare-registered non-Aboriginal adults in the relevant age cohort as the denominator, expressed as a percentage. Vaccinations given up to 31 December 2022 (inclusive) are included in the numerator.

<sup>b</sup> Birth cohort based on age at 31 December 2022.

Source: Australian Immunisation Register, data as at 2 April 2023.

**Figure 20. 13vPCV coverage<sup>a</sup> in Aboriginal adults by birth cohort<sup>b</sup> and age at vaccination, NSW, 2022**

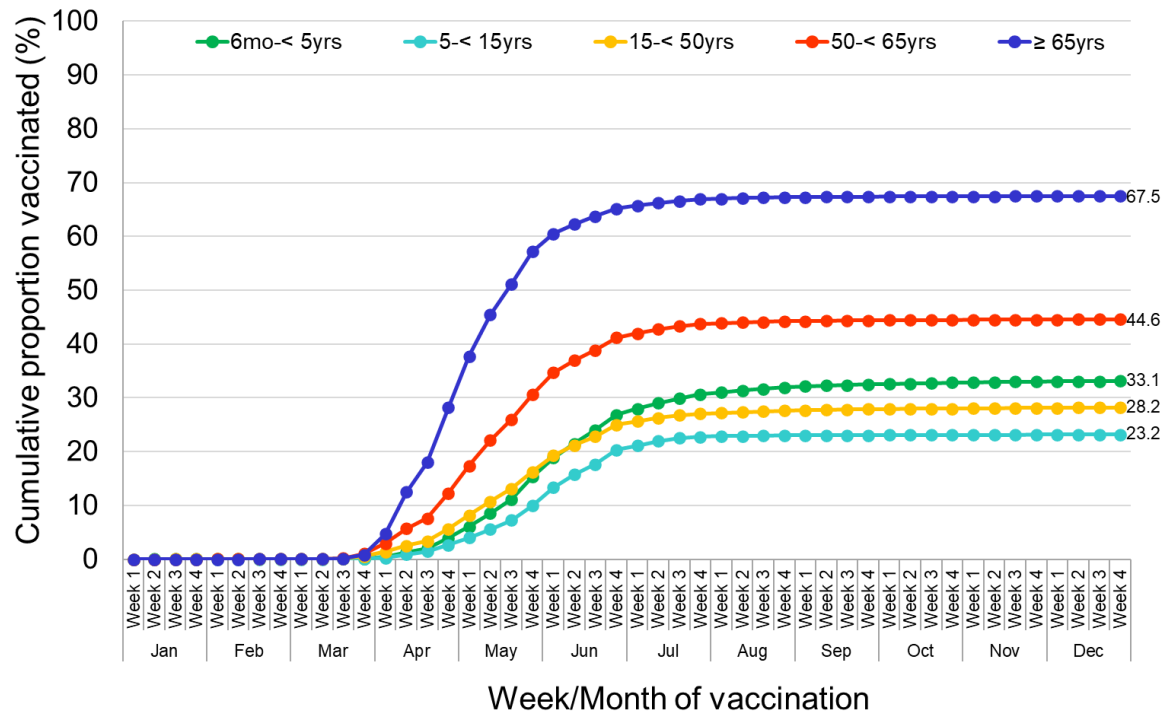


<sup>a</sup> Calculated using the number of Medicare-registered Aboriginal adults in each age cohort with an AIR record of having received a dose of 13vPCV as the numerator and the total number of Medicare-registered Aboriginal adults in the relevant age cohort as the denominator, expressed as a percentage. Vaccinations given up to 31 December 2022 (inclusive) are included in the numerator.

<sup>b</sup> Birth cohort based on age at 31 December 2022.

Source: Australian Immunisation Register, data as at 2 April 2023.

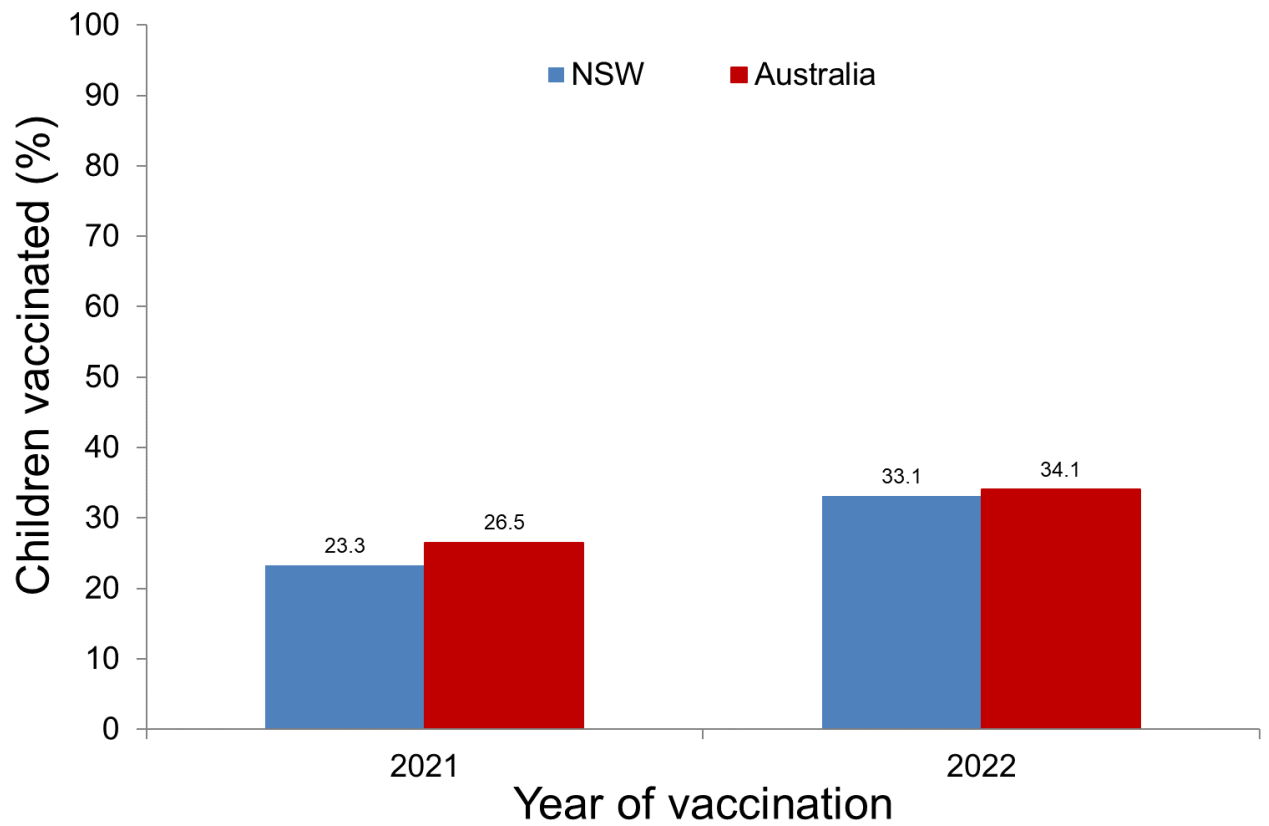
**Figure 21. Weekly cumulative uptake of at least one dose of influenza vaccine by age group, NSW, 2022**



Source: Australian Immunisation Register, data as at 02 April 2023 for influenza vaccines given 1 January – 31 December 2022.



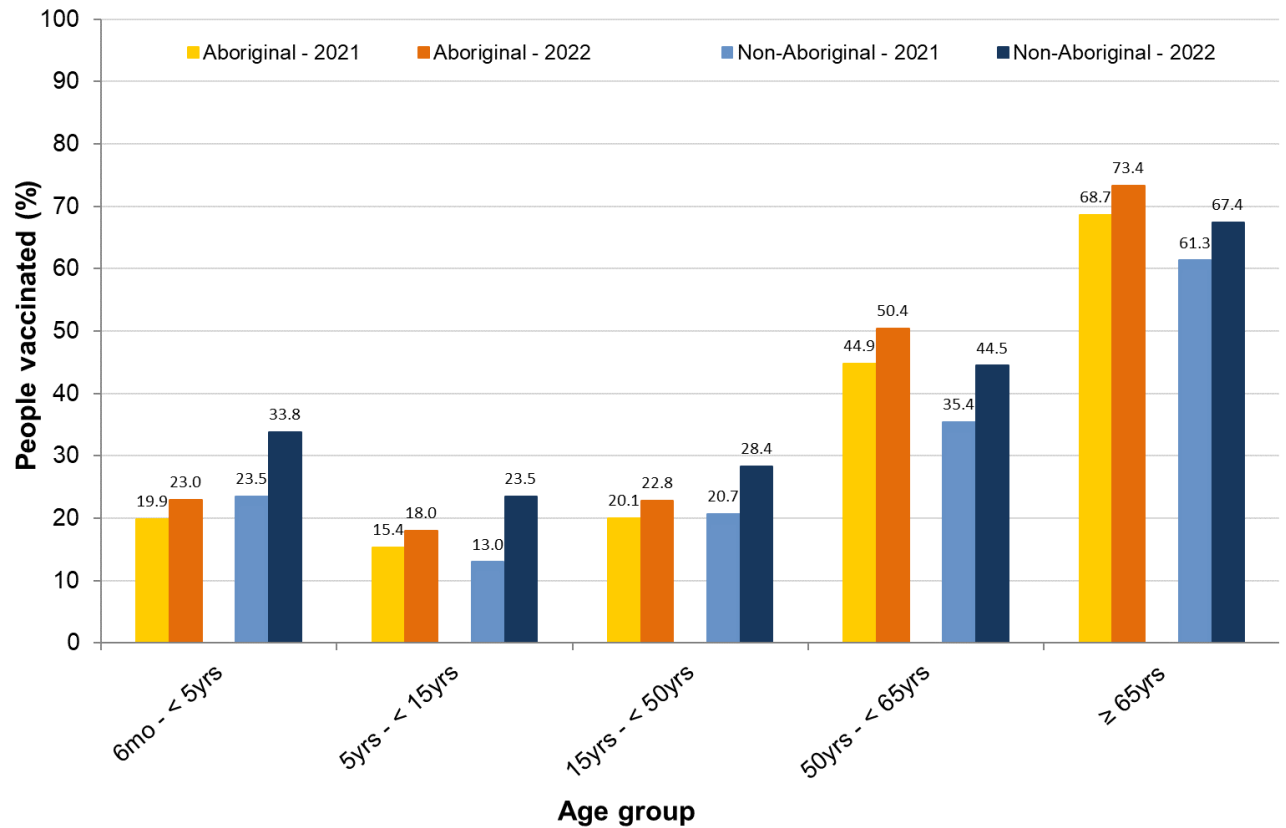
**Figure 22. Percentage of children aged 6 months – < 5 years vaccinated with at least one dose of influenza vaccine<sup>a</sup>, NSW and Australia, 2021 versus 2022**



<sup>a</sup> Vaccines given 1 January – 31 December in calendar year of interest.

Source: Australian Immunisation Register, data as at 03 April 2022 (for 2021 data) and as at 02 April 2023 (for 2022 data).

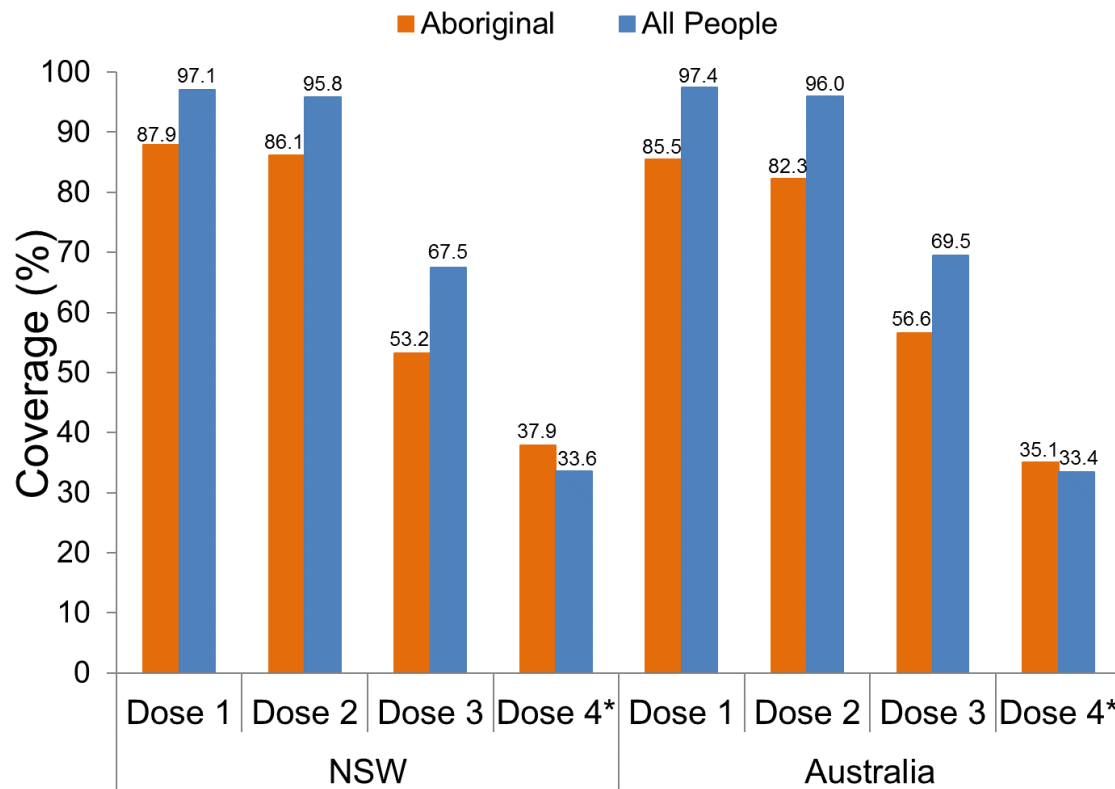
**Figure 23. Percentage of people aged  $\geq 6$  months vaccinated with at least one dose of influenza vaccine<sup>a</sup> by age group and Aboriginal status, NSW, 2021 versus 2022**



<sup>a</sup> Vaccines given 1 January – 31 December in calendar year of interest.

Source: Australian Immunisation Register, data as at 03 April 2022 (for 2021 data) and 02 April 2023 (for 2022 data).

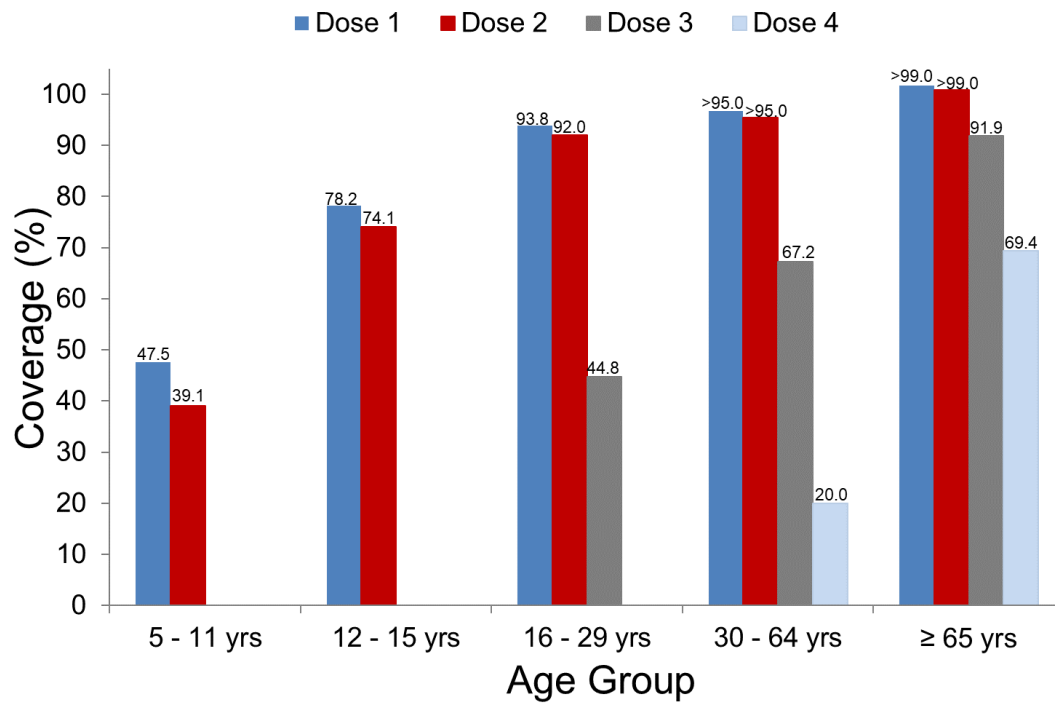
**Figure 24. Coverage (%) of COVID-19 vaccines (Dose 1 – 4) in people aged  $\geq 16$  years\* by Aboriginal status, NSW and Australia, 2022**



\* People aged  $\geq 30$  years for coverage of Dose 4.

Source: Australian Department of Health and Aged Care, as at 4 January 2023<sup>20</sup>

**Figure 25. Coverage (%) of COVID-19 vaccines (Dose 1 – 4) in people aged  $\geq 5$  years by age group, NSW, 2022**



Source: Adapted from Australian Department of Health and Aged Care, as at 4 January 2023<sup>20</sup>

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