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Authors

Brynley Hull

Alexandra Hendry

Kristine Macartney

Frank Beard

Corresponding author

Brynley Hull

National Centre for Immunisation Research and Surveillance

The Children's Hospital at Westmead and The University of Sydney

Locked Bag 4001

Westmead

NSW 2145

Telephone: +61 2 9845 1435

Email: brynley.hull@health.nsw.gov.au

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Vaccine abbreviations

13vPCV	13-valent pneumococcal conjugate vaccine
DTPa	diphtheria-tetanus-pertussis (children aged under 10 years formulation)
DT5aP	diphtheria-tetanus-pertussis (children aged under 10 years formulation)
dTpa	diphtheria-tetanus-pertussis (individuals aged 10 years and over formulation)
23vPPV	23-valent pneumococcal polysaccharide vaccine
Flu	influenza
Hep A	hepatitis A
Hep B	hepatitis B
Hib	*Haemophilus influenzae* type b
HPV	human papillomavirus
IPV	inactivated polio vaccine
MenACWY	meningococcal ACWY
MenC	meningococcal C
MMR	measles-mumps-rubella
MMRV	measles-mumps-rubella-varicella

Abstract

We analysed Australian Immunisation Register (AIR) data, predominantly for National Immunisation Program (NIP) funded vaccines, as at 4 February 2024 for children, adolescents and adults, focusing on the calendar year 2023 and trends from previous years.

This report aims to provide comprehensive analysis and interpretation of vaccination coverage data to inform immunisation policy and programs.

Children

Fully vaccinated coverage in Australian children in 2023 was lower than in 2022 at the 12-month (92.8%, down from 93.3%), 24-month (90.8%, down from 91.0%) and 60-month (93.3%, down from 93.4%) age assessment milestones. This follows the 1.1–1.5 percentage point decrease at these three milestones between the 2020 and 2022 reports, which came after eight years of generally increasing coverage. Fully vaccinated coverage in Aboriginal and Torres Strait Islander (hereafter, respectfully, Indigenous) children was also slightly lower in 2023 than in 2022 at the 12-month (89.7%, down from 90.0%), 24-month (87.8%, down from 87.9%) and 60-month (95.0%, down from 95.1%) milestones, following a 1.9–3.3 percentage point decrease between the 2020 and 2022 reports.

Due to the lag time involved in assessment, fully vaccinated coverage figures for 2023 predominantly reflect vaccinations due in 2022, when COVID-19 pandemic-related restrictions had largely been removed. Factors contributing to this ongoing decline in coverage in children include a combination of acceptance and access issues.

Adolescents

Among adolescents turning 15 years in 2023, 84.2% of girls and 81.8% of boys (80.9% and 75.0% of Indigenous girls and boys) had received at least one dose of human papillomavirus (HPV) vaccine by their 15th birthday, 1.1 and 1.3 percentage points lower than in 2022, respectively (2.1–3.1 percentage points lower for Indigenous adolescents). Coverage of an adolescent dose of meningococcal ACWY vaccine in adolescents turning 17 years in 2023 was 72.8% overall and 62.3% in Indigenous adolescents, 3.1 and 3.3 percentage points lower than in 2022, respectively. These decreases reflect impacts of the pandemic on school-based programs in 2020–2021. To provide an early insight into any immediate impacts on coverage of moving to the NIP single-dose HPV vaccine schedule in 2023 (offered in Year 7 in all jurisdictions), we calculated coverage of at least one dose of HPV vaccine by 31 December in adolescents turning 13 years, with South Australia excluded due to change of delivery from Year 8 in 2022, and found it to be around 3 percentage points lower in 2023 than 2022, and 6 percentage points lower in Indigenous girls, with

patterns of diphtheria-tetanus-pertussis vaccination (also single-dose at this age) and HPV vaccination coverage broadly similar. This decrease in vaccinations due in school programs after pandemic restrictions had been removed could be due to impacts of the single-dose HPV transition (i.e. if less opportunities for vaccination are provided due to fewer school visits) or may be due to other factors that have changed or disrupted previous school immunisation program operations or reduced parental confidence in vaccination. It is important to promote catch-up vaccination and monitor renewed efforts to ensure equitable coverage is achieved, particularly given HPV vaccine coverage by 15 years of age in 2023 was 4–8 percentage points lower in adolescents residing in socio-economically disadvantaged and remote areas.

Adults

Zoster vaccination coverage in adults turning 71 years was 41.0% overall in 2023, down from 41.3% in 2022, and 36.1% in Indigenous adults, down from 36.5%. However, the availability of the new (non-live) protein-based herpes zoster vaccine (Shingrix) from 1 November 2023 has resulted in increased uptake for the larger eligible cohort. Coverage of 13-valent pneumococcal conjugate vaccine (13vPCV) in adults turning 71 years was 37.6% in 2023, up from 33.8% in 2022, and 43.0% in Indigenous adults, up from 37.7%. Coverage of 13vPCV was lower among Indigenous adults turning 50–59 years (17.5%) and 60–69 years (23.4%) in 2023, despite this vaccine being funded under the NIP. Influenza vaccination coverage decreased across all adult age groups in 2023, both overall and in Indigenous adults, with decreases ranging from 5–11 percentage points.

Conclusions

There have continued to be modest but concerning declines in vaccination coverage in children and adolescents relative to pre-pandemic peaks, with decreases greater in Indigenous children and adolescents. Evidence suggests that the factors contributing to these ongoing declines are complex and variable but include both vaccine acceptance and access issues. The picture for adult coverage is more mixed, with coverage increasing for 13vPCV, stable for zoster and decreasing for influenza vaccination, though consistently suboptimal across all vaccines. Ongoing monitoring of vaccination coverage and further exploration of the reasons underpinning these decreases and suboptimal coverage are needed to inform approaches to address barriers effectively and increase vaccine uptake and equity of coverage.

Introduction

This is the 17th annual Australian immunisation coverage report, and these reports now cover the years 2007–2023.[1-15] This 2023 report is the fourth in the series to report 'whole-of-life' vaccination coverage – that is, vaccinations for children, adolescents and adults – using data from the Australian Immunisation Register (AIR), following the expansion of the AIR in 2016. This report complements and extends upon other vaccination coverage data published by the Australian Government Department of Health and Aged Care[16] and provides a comprehensive analysis of trends and interpretation of their relationship to factors including policy and program changes. It includes detailed analyses of coverage data for the calendar year 2023, with a particular focus on vaccines included on the National Immunisation Program (NIP) and changes in coverage since 2022, and presents trend data from 2014 onwards.

This report uses the longstanding international practice of reporting at key milestone ages to measure coverage – including against national targets, where applicable – and to track trends over time. Vaccination coverage and timeliness for 2023 were measured using AIR data as at 4 February 2024. Childhood cohort vaccination status was assessed for fully vaccinated (as defined by the Australian Government Department of Health and Aged Care, including certain specific vaccine or antigen [component of vaccine] doses that should have been received by the relevant age milestone) and for individual vaccines at the standard milestones – 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), including by Aboriginal and Torres Strait Islander (hereafter referred to, respectfully, as Indigenous) status and at small area levels (Primary Health Network [PHN] and Australian Bureau of Statistics Statistical Area 3 [SA3]). Coverage for vaccines included in the NIP for Indigenous children only was also assessed for relevant jurisdictions using appropriate milestones and cohorts. Timeliness of childhood vaccination was assessed by calculating on-time vaccination (within 30 days of recommended age) for selected vaccine doses, by Indigenous status, as well as by calculating fully vaccinated coverage at age milestones earlier than the standard ones (i.e. 9, 15, 21 and 51 months) by PHN and jurisdiction. Coverage for vaccines included in the NIP for adolescents and adults was assessed using appropriate milestones and cohorts. We assessed coverage of at least one dose of human papillomavirus (HPV) vaccine for adolescents and young adults aged 13–25 years (noting the NIP schedule changed in January 2023 from two doses to one dose of HPV vaccine), an adolescent dose of diphtheria-tetanus-pertussis (dTpa) vaccine for adolescents aged 13–19 years and an adolescent dose of meningococcal ACWY vaccine for adolescents aged 15–19 years, by jurisdiction, Indigenous status, age and sex. We assessed zoster vaccination coverage – including for the

inactivated recombinant vaccine Shingrix, which became available through private prescription in June 2021 and on the NIP from November 2023 – for adults turning 50 years and over in 2023 by jurisdiction, Indigenous status and age, as well as 13-valent pneumococcal conjugate vaccine (13vPCV) coverage for adults turning 50 years and over by Indigenous status and age. Influenza vaccination coverage for 2023, compared to 2022, was assessed across all ages by Indigenous status. We also calculated composite measures of vaccination coverage for vaccines included on the NIP for adolescents and adults.[17] A more detailed description of the methods used in this report is provided in the Appendix.

The NIP schedule in 2023 is summarised in Table A1 in the Appendix. Important recent and relevant changes to vaccination policy and fully vaccinated coverage algorithms are shown in Box 1 in the Appendix.

Results

Children

Coverage at 12, 24 and 60 months of age

Fully vaccinated

Fully vaccinated coverage decreased between 2022 and 2023 at all three age milestones: 12 months (from 93.3% to 92.8%), 24 months (from 91.0% to 90.8%) and 60 months (from 93.4% to 93.3%). (Table 1.) Trends in fully vaccinated coverage by quarter from 2014 to 2023 are shown in Figure A1 in the Appendix. Fully vaccinated coverage for 2023 at the three age milestones is also provided by PHN and jurisdiction in Table A3 in the Appendix. It should be noted that coverage estimates in this report may differ slightly from estimates published elsewhere that are calculated using rolling annualised quarterly coverage data.

Coverage by individual vaccines/antigens

Coverage for all individual vaccines/antigens at 12 months of age decreased between 2022 and 2023, by 0.5–1.1 percentage points (Table 1). Coverage for vaccines/antigens included in the fully vaccinated algorithm (see Table A2 in the Appendix for definition) was 93.2%–95.0% in 2023. Coverage for the second dose of rotavirus vaccine, which is not included in the fully vaccinated algorithm due to upper age limits, decreased by 1.1 percentage points, from 90.5% to 89.4%. Trends in individual vaccine/antigen coverage at 12 months of age by quarter from 2014 to 2023 are shown in Figure A2 in the Appendix.

Coverage for all individual vaccines/antigens included in the fully vaccinated algorithm at 24 months of age (see Table A2 in the Appendix for definition) decreased between 2022 and 2023 by 0.2–0.5 of a percentage point to be 91.9%–95.8% in 2023 (Table 1). Trends in individual vaccine/antigen coverage at 24 months of age by quarter from 2014 to 2023 are shown in Figure A3 in the Appendix.

Coverage for antigens included in the fully vaccinated algorithm at 60 months of age (see Table A2 in the Appendix for definition) decreased between 2022 and 2023, from 93.6% to 93.5% for the fourth (or fifth) dose of DTPa and from 93.8% to 93.6% for the fourth dose of polio vaccine (Table 1). Trends in individual vaccine/antigen coverage at 60 months of age by quarter from 2014 to 2023 are shown in Figure A4 in the Appendix.

Table 1. Vaccination coverage in children by age assessment milestone, vaccine/antigen and Indigenous status, Australia, 2022 versus 2023

Vaccine/antigen	Milestone age	Indigenous children (%)		All children (%)	
		2022	2023	2022	2023
Fully vaccinated*	12 months†	90.0	89.7	93.3	92.8
	24 months‡	87.9	87.8	91.0	90.8
	60 months§	95.1	95.0	93.4	93.3
Diphtheria-tetanus-pertussis	12 months† (dose 3)	90.2	89.9	93.9	93.3
	24 months‡ (dose 4)	89.1	89.1	92.3	91.9
	60 months§ (dose 4 or 5)	95.4	95.3	93.6	93.5
Polio	12 months† (dose 3)	90.2	89.9	93.9	93.3
	24 months‡ (dose 3)	96.1	95.6	96.1	95.8
	60 months§ (dose 4)	95.2	95.1	93.8	93.6
Haemophilus influenzae type b	12 months† (dose 3)	90.2	89.9	93.9	93.3
	24 months‡ (dose 4)	91.5	91.1	93.2	92.7
	60 months§ (dose 4)	98.2	98.1	95.8	95.8
Hepatitis B	12 months† (dose 3)	90.2	89.9	93.8	93.2
	24 months‡ (dose 3)	96.1	95.5	95.9	95.6
	60 months§ (dose 3)	98.5	98.4	96.5	96.6
Measles-mumps-rubella	12 months	N/A	N/A	N/A	N/A
	24 months‡ (dose 1)	95.3	94.9	95.1	94.7
	24 months‡ (dose 2)	90.2	90.7	92.7	92.5
	60 months§ (dose 2)	98.3	98.3	96.3	96.4
Varicella	12 months	N/A	N/A	N/A	N/A
	24 months‡ (dose 1)	90.0	90.6	92.7	92.5
	60 months§ (dose 1)	98.3	98.3	96.3	96.3
Meningococcal C-containing	12 months	N/A	N/A	N/A	N/A
	24 months‡ (dose 1)	95.7	95.4	95.0	94.7
	60 months§ (dose 1)	N/A	N/A	N/A	N/A
Meningococcal ACWY	24 months‡ (dose 1)	95.7	95.4	94.7	94.4

Vaccine/antigen	Milestone age	Indigenous children (%)		All children (%)	
		2022	2023	2022	2023
13-vPCV	12 months† (dose 2 or 3)	95.3	94.9	95.5	95.0
	24 months‡ (dose 3 or 4)	95.4	94.7	94.8	94.4
	60 months§ (dose 3 or 4)	97.4	97.3	95.4	95.3
Rotavirus	12 months† (dose 2)	83.7	82.5	90.5	89.4
	24 months	N/A	N/A	N/A	N/A
	60 months	N/A	N/A	N/A	N/A

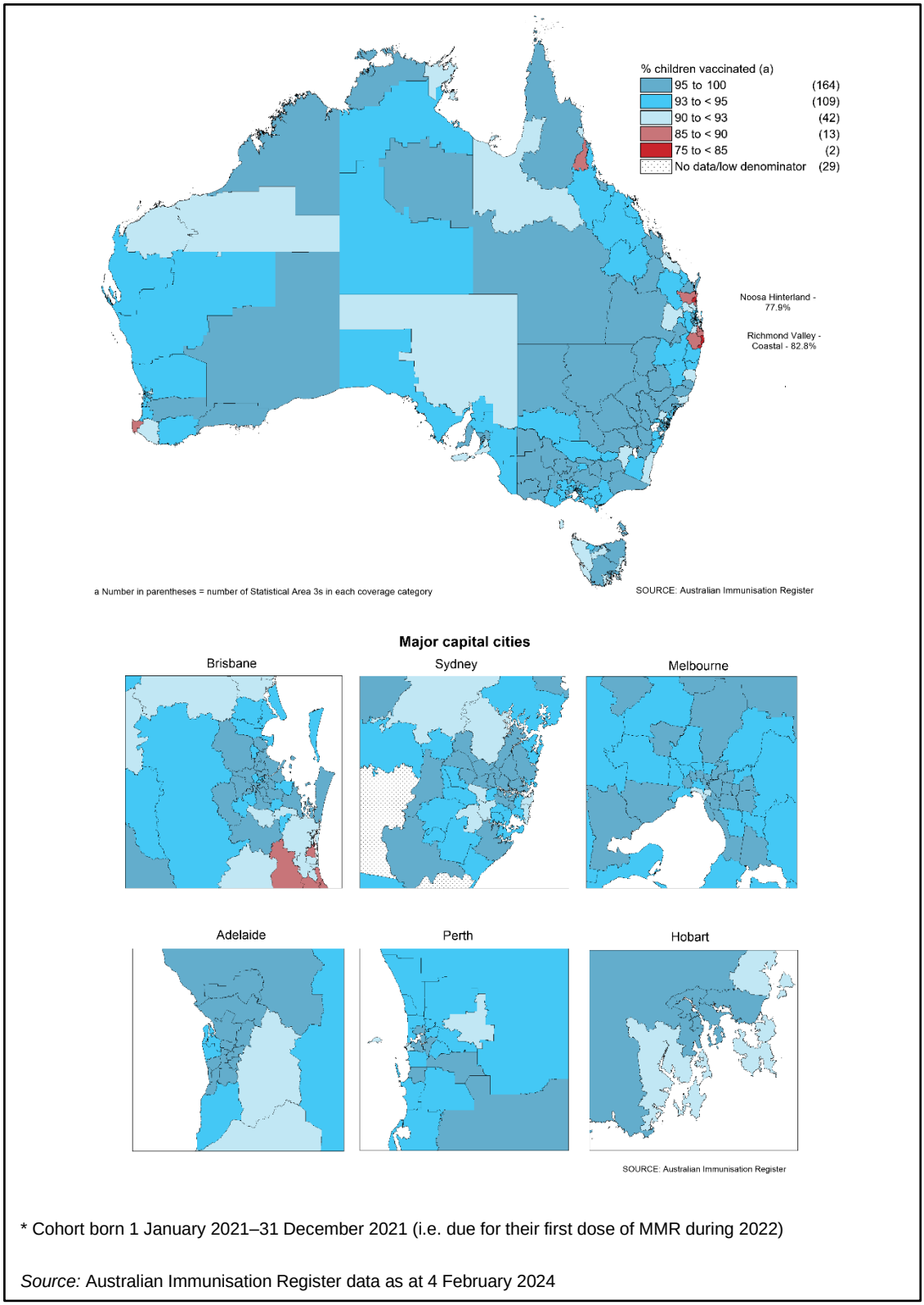
* Refer to the Appendix for details of fully vaccinated assessment algorithms used in this report (Table A2). Coverage estimates in this table are calculated using 12-month-wide cohorts and may differ slightly from estimates published elsewhere that use rolling annualised quarterly coverage data.
† Cohort born 1 January 2021–31 December 2021 (2022 estimate – i.e. vaccines due from mid-2021 to mid-2022) and 1 January 2022–31 December 2022 (2023 estimate – i.e. vaccines due from mid-2022 to mid-2023)
‡ Cohort born 1 January 2020–31 December 2020 (2022 estimate – i.e. vaccines due from mid-2020 [6-month doses] to mid-2022 [18-month doses]) and 1 January 2021–31 December 2021 (2023 estimate – i.e. vaccines due from mid-2021 [6-month doses] to mid-2023 [18-month doses])
§ Cohort born 1 January 2017–31 December 2017 (2022 estimate – i.e. vaccines due in 2021) and 1 January 2018–31 December 2018 (2023 estimate – i.e. vaccines due in 2022)
N/A = Not applicable; vaccine either not given prior to this milestone or contraindicated after previous milestone

Source: Australian Immunisation Register data as at 2 April 2023 (for 2022 coverage) and 4 February 2024 (for 2023 coverage)

Small area coverage analysis

Childhood vaccination coverage in 2023 at SA3 level varied across Australia. Coverage in some areas was substantially below the national average – especially the north coast region of New South Wales and the Gold Coast region of Queensland (Figure 1 and Figure 2). For example, coverage of 95% or higher at 24 months of age was achieved for 49.7% (164/330) of SA3 areas for the first dose of measles-mumps-rubella (MMR)-containing vaccine (Figure 1) and for 11.5% (38/330) of SA3 areas for the second dose of MMR-containing vaccine (Figure 2).

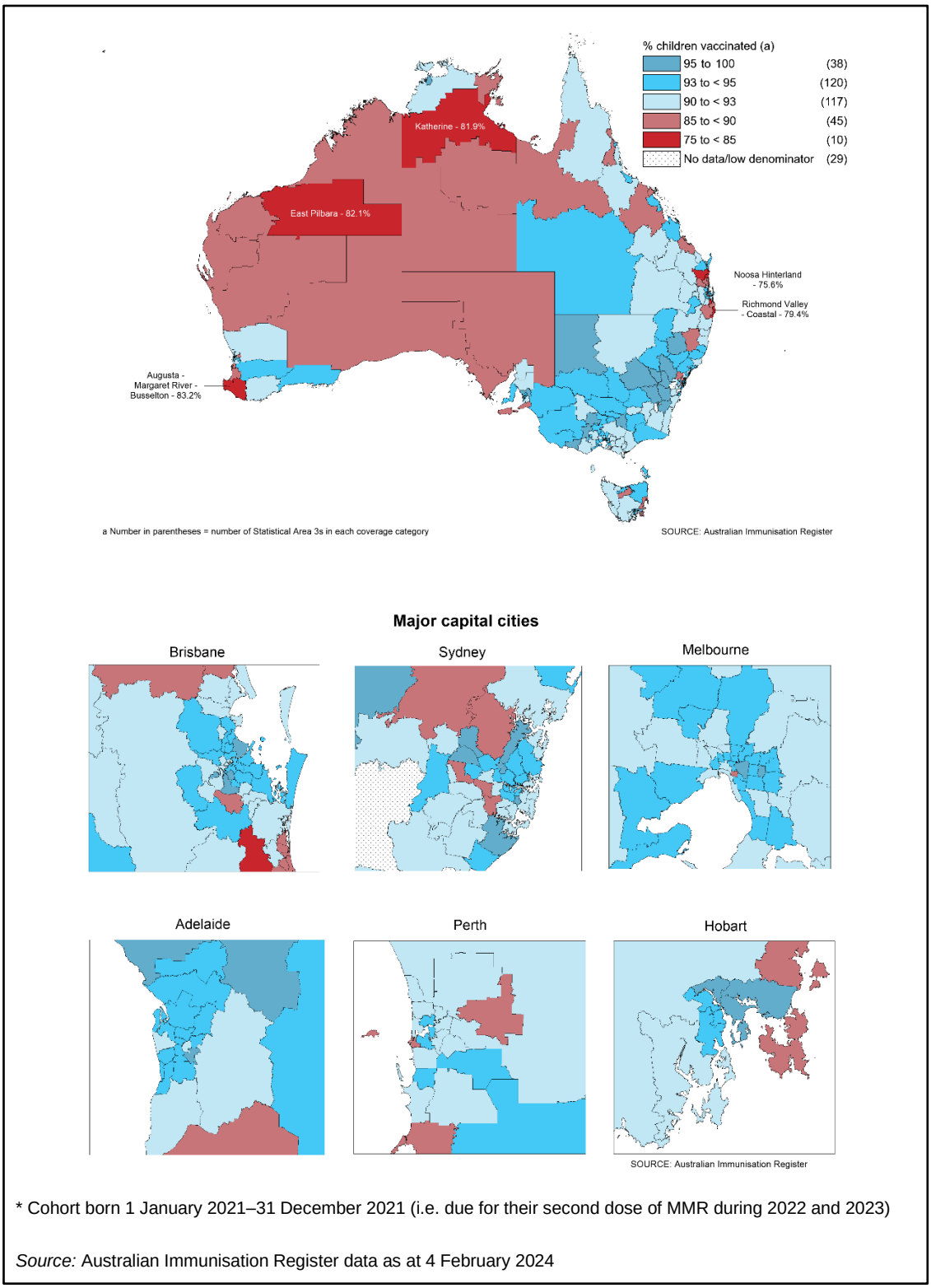
Figure 1. Coverage of the first dose of measles-mumps-rubella (MMR)-containing vaccine at 24 months of age* by Statistical Area 3, Australia and major capital cities, 2023



* Cohort born 1 January 2021–31 December 2021 (i.e. due for their first dose of MMR during 2022)

Source: Australian Immunisation Register data as at 4 February 2024

Figure 2. Coverage of the second dose of measles-mumps-rubella (MMR)-containing vaccine at 24 months of age* by Statistical Area 3, Australia and major capital cities, 2023



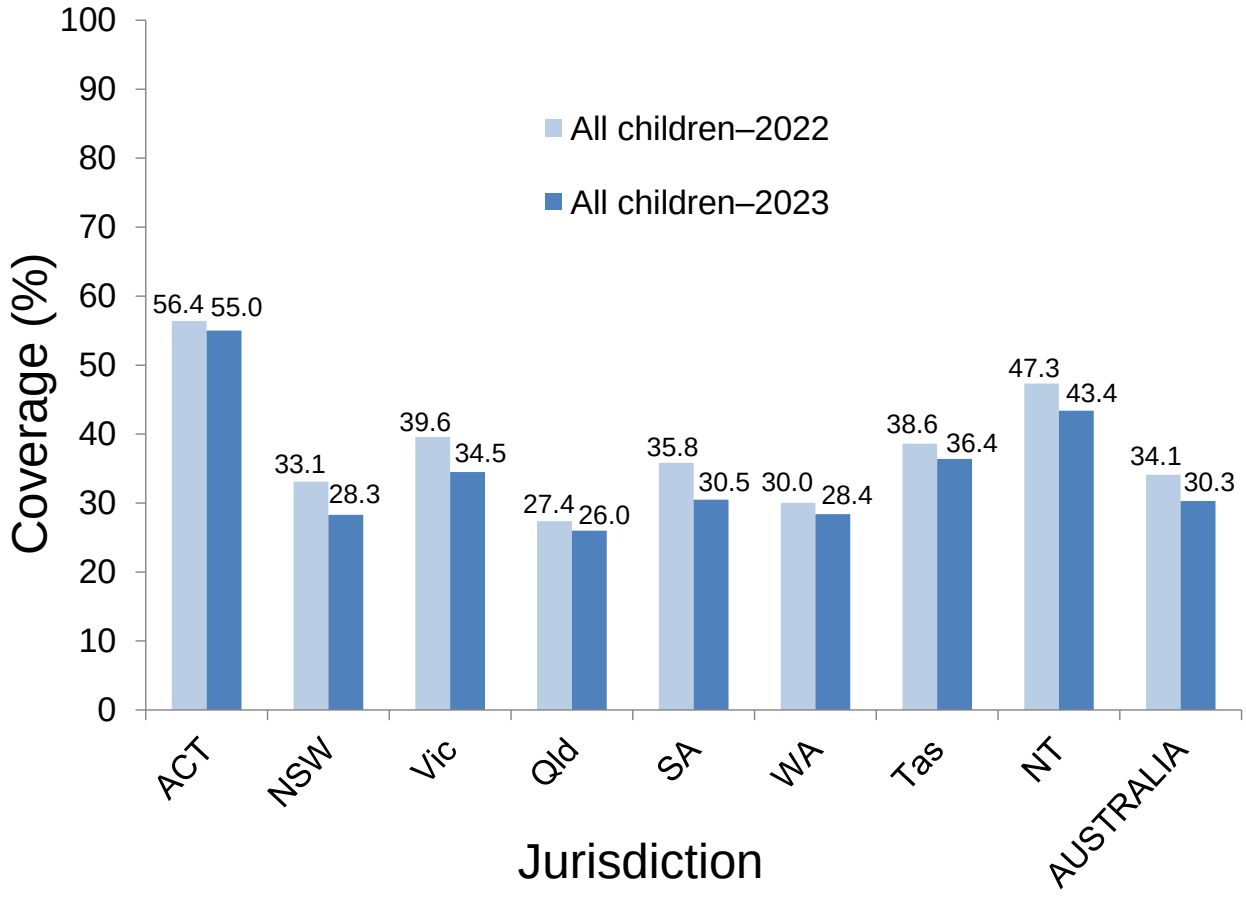
* Cohort born 1 January 2021–31 December 2021 (i.e. due for their second dose of MMR during 2022 and 2023)

Source: Australian Immunisation Register data as at 4 February 2024

Influenza vaccination coverage

Influenza vaccination coverage in children aged 6 months to <5 years decreased from 34.1% in 2022 to 30.3% in 2023 (Figure 3); in children aged 5 to <10 years, it decreased from 24.1% to 17.9% (Figure 4). Coverage for children aged 6 months to <5 years decreased in all jurisdictions, with the largest decrease seen in South Australia (from 35.8% in 2022 to 30.5% in 2023). There was substantial variation in recorded coverage for children aged 6 months to <5 years by jurisdiction in 2023, ranging from 26.0% in Queensland to 55.0% in the Australian Capital Territory (Figure 3). Influenza vaccination coverage in children aged 6 months to <5 years in 2023 at the SA3 level varied across Australia (Figure 5). Coverage was highest in SA3s in the Northern Territory, as high as 74.2% in the Daly–Tiwi-West Arnhem SA3 and 64.7% in Barkly, and also relatively high in many SA3s in inner areas of major capital cities compared with more outer SA3s (Figure 5). Some SA3s had influenza vaccination coverage estimates below 15%, including Whitsunday (9.6%) and Gympie-Colloola (10.6%) in Queensland and Merrylands-Guildford (12.1%) in Sydney (Figure 5).

Figure 3. Coverage* of seasonal influenza vaccine in children aged 6 months to <5 years, by jurisdiction, Australia, 2022 versus 2023

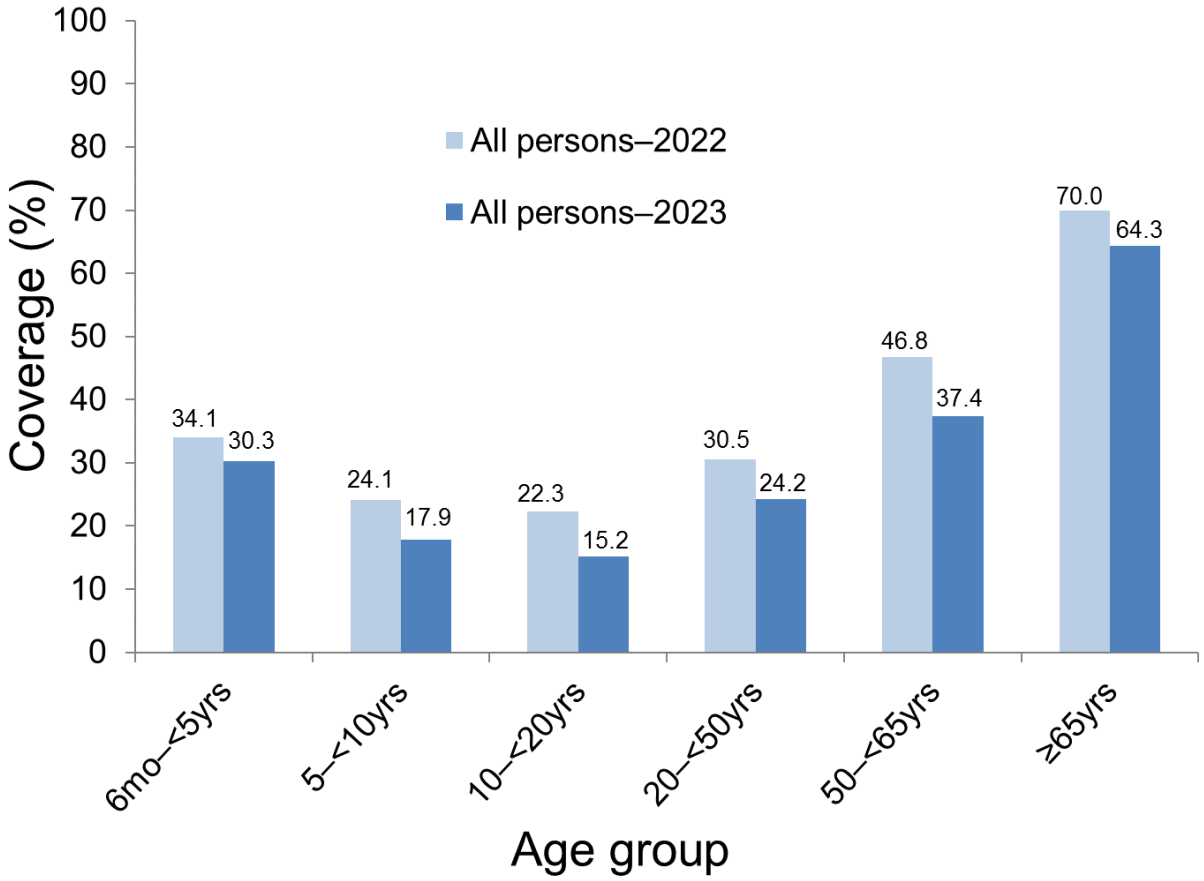


* Coverage calculated by dividing the number of Medicare-registered children aged 6 months to <5 years with at least one dose of influenza vaccine administered in the calendar year of interest by the total number of Medicare-registered children in the 6 months to <5 years age group. Vaccination numerators based on age at vaccination and age group denominators based on age at 30 June in relevant year. Coverage data in this table may differ slightly from estimates published elsewhere due to differences in calculation methodologies and/or the AIR data being used in the calculation having been downloaded on different dates.

ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

Source: Australian Immunisation Register data as at 2 April 2023 (for 2022 data) and as at 4 February 2024 (for 2023 data)

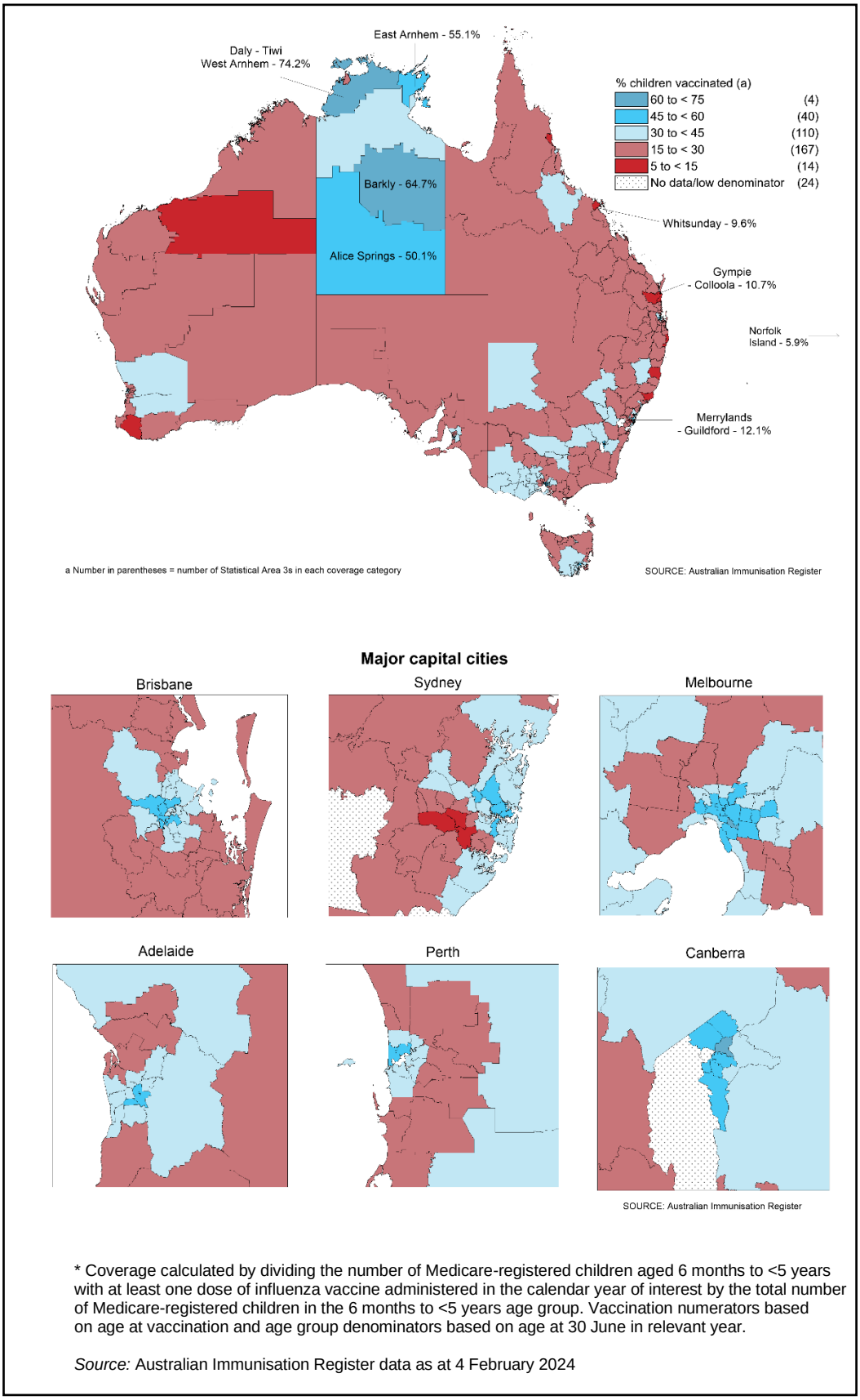
Figure 4. Coverage* of seasonal influenza vaccine by age group, Australia, 2022 versus 2023



* Coverage calculated by dividing the number of Medicare-registered people with at least one dose of influenza vaccine administered in the calendar year of interest by the total number of Medicare-registered people registered in each age group. Vaccination numerators based on age at vaccination and age group denominators based on age at 30 June in relevant year. Coverage data in this table may differ slightly from estimates published elsewhere due to differences in calculation methodologies and/or the AIR data being used in the calculation having been downloaded on different dates.

Source: Australian Immunisation Register data as at 2 April 2023 (for 2022 data) and as at 4 February 2024 (for 2023 data)

Figure 5. Coverage* of seasonal influenza vaccine, in children aged 6 months to <5 years, by Statistical Area 3, Australia, 2023



* Coverage calculated by dividing the number of Medicare-registered children aged 6 months to <5 years with at least one dose of influenza vaccine administered in the calendar year of interest by the total number of Medicare-registered children in the 6 months to <5 years age group. Vaccination numerators based on age at vaccination and age group denominators based on age at 30 June in relevant year.

Source: Australian Immunisation Register data as at 4 February 2024

Coverage by Indigenous status

Fully vaccinated at 12, 24 and 60 months of age

Between 2022 and 2023, fully vaccinated coverage for Indigenous children decreased at all three age milestones: 12 months (from 90.0% to 89.7%), 24 months (from 87.9% to 87.8%) and 60 months (95.1% to 95.0%). (Table 1.)

The disparity in fully vaccinated coverage between Indigenous children and children overall decreased slightly at 12 months of age, from 3.3 percentage points in 2022 to 3.1 percentage points in 2023, and at 24 months, from 3.1 percentage points in 2022 to 3.0 percentage points in 2023 (Table 1). Fully vaccinated coverage at 60 months of age in 2023 remained higher in Indigenous children than in children overall, by 1.7 percentage points.

Trends in fully vaccinated coverage by Indigenous status by quarter from 2013 to 2022 are shown in Figure A5, Figure A6 and Figure A7 in the Appendix.

Coverage by individual vaccines/antigens at 12, 24 and 60 months of age

Coverage at 12 months of age in Indigenous children decreased for all individual vaccines/antigens between 2022 and 2023, by 0.3–1.2 percentage points (Table 1).

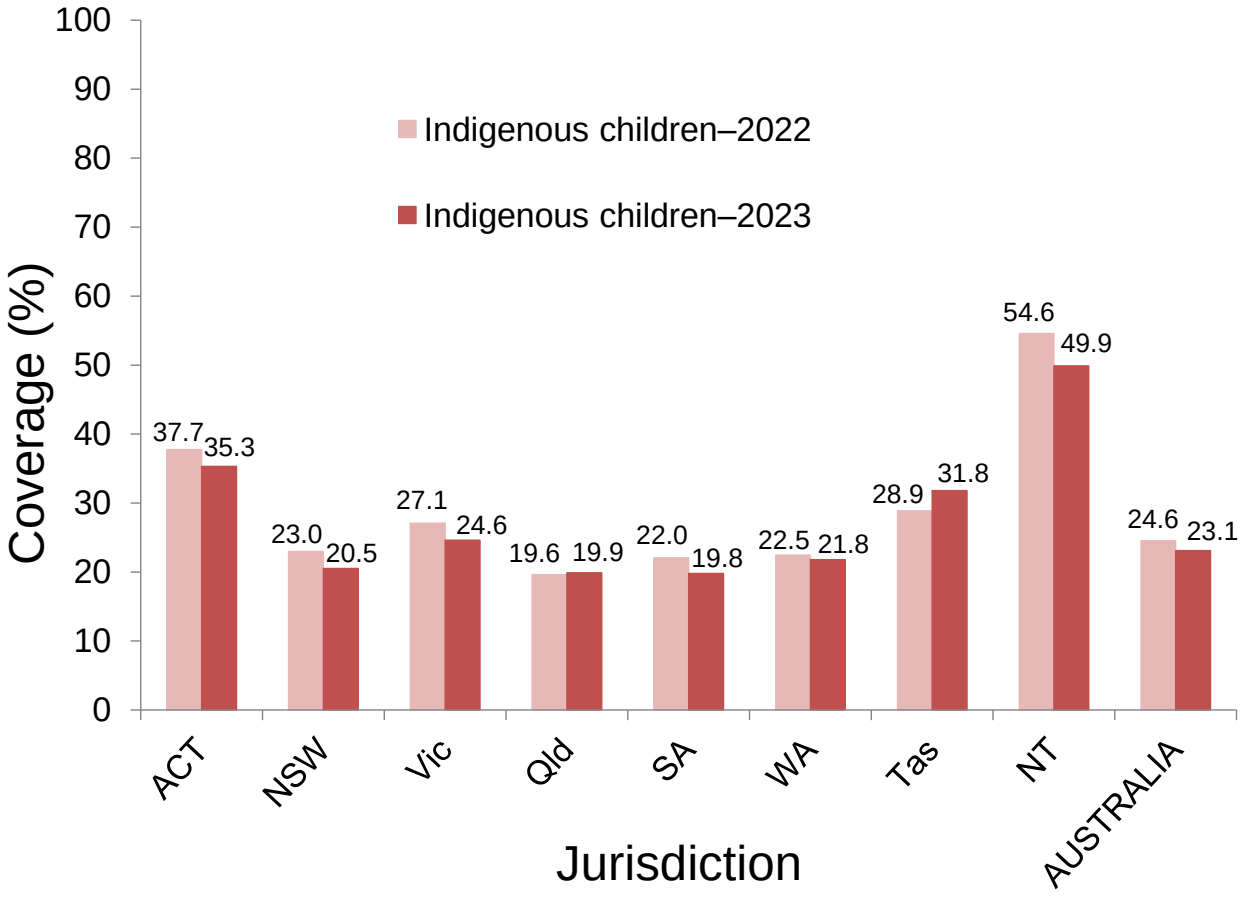
Between 2022 and 2023, coverage at 24 months of age in Indigenous children decreased for individual vaccines/antigens, by 0.3–0.7 percentage points, except for coverage of the fourth dose of DTPa, which remained the same, and the second dose of MMR and varicella vaccines for which coverage increased by 0.5 and 0.6 percentage points, respectively (Table 1). Coverage in Indigenous children in 2023 was 0.2–0.7 of a percentage point higher than in children overall for the first dose of MMR, meningococcal C-containing vaccine and the third dose of 13vPCV, but 0.1–2.8 percentage points lower for the fourth dose of DTPa and *Haemophilus influenzae* type b (Hib), the third dose of polio, the third dose of hepatitis B, the second dose of MMR and the dose of varicella vaccine (Table 1).

Coverage at 60 months of age in Indigenous children in 2023 remained very high (over 95%) for all vaccines/antigens and was higher than in children overall (Table 1). However, coverage decreased marginally, by 0.1 of a percentage point, for all individual vaccines/antigens from 2022 to 2023, except for the second dose of MMR and the dose of varicella, which remained the same.

Influenza vaccination coverage

Influenza vaccination coverage in Indigenous children decreased from 24.6% in 2022 to 23.1% in 2023 in those aged 6 months to <5 years (Figure 6) and from 18.1% to 14.6% in those aged 5 to <10 years (Figure 7). Coverage in both of these age groups was lower for Indigenous children than for children overall. Coverage in Indigenous children aged 6 months to <5 years decreased in all jurisdictions except Queensland and Tasmania, with the largest decreases seen in the Northern Territory (from 54.6% in 2022 to 49.9% in 2023). There was substantial variation in coverage for Indigenous children aged 6 months to <5 years by jurisdiction in 2023, ranging from 19.8% in South Australia to 49.9% in the Northern Territory (Figure 6). Coverage for Indigenous children was lower than for children overall in all jurisdictions except the Northern Territory, where it was 6.5 percentage points higher for Indigenous children (Table 1 and Table 4).

Figure 6. Coverage of seasonal influenza vaccine* in Indigenous children aged 6 months to <5 years,† by jurisdiction, Australia, 2022 versus 2023

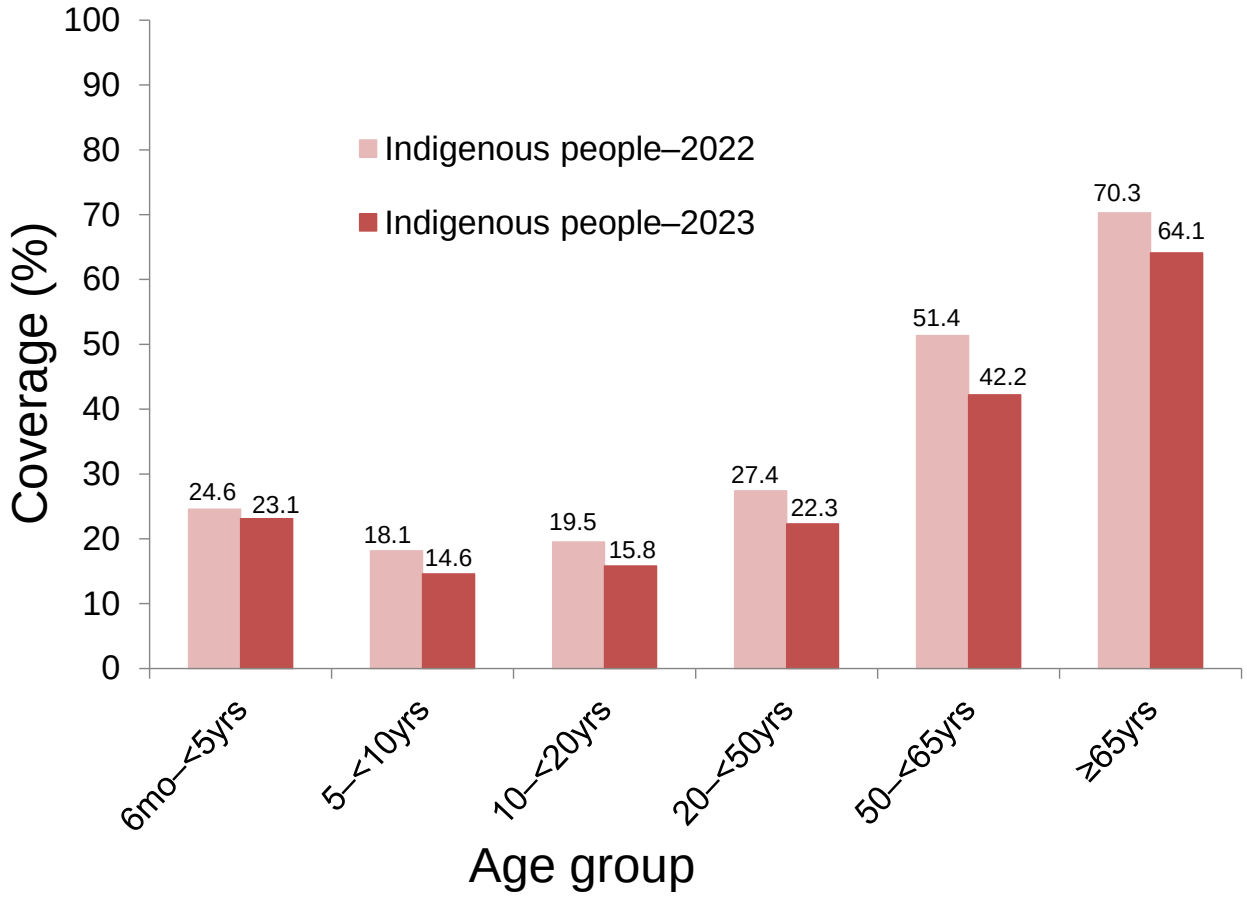


* Coverage calculated by dividing the number of Medicare-registered children aged 6 months to <5 years with at least one dose of influenza vaccine administered in the calendar year of interest by the total number of Medicare-registered children in the 6 months to <5 years age group. Vaccination numerators based on age at vaccination and age group denominators based on age at 30 June in relevant year. Coverage data in this table may differ slightly from estimates published elsewhere due to differences in calculation methodologies and/or the AIR data being used in the calculation having been downloaded on different dates.

ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

Source: Australian Immunisation Register data as at 2 April 2023 (for 2022 data) and as at 4 February 2024 (for 2023 data)

Figure 7. Coverage* of seasonal influenza vaccine in Indigenous people by age group, Australia, 2022 versus 2023



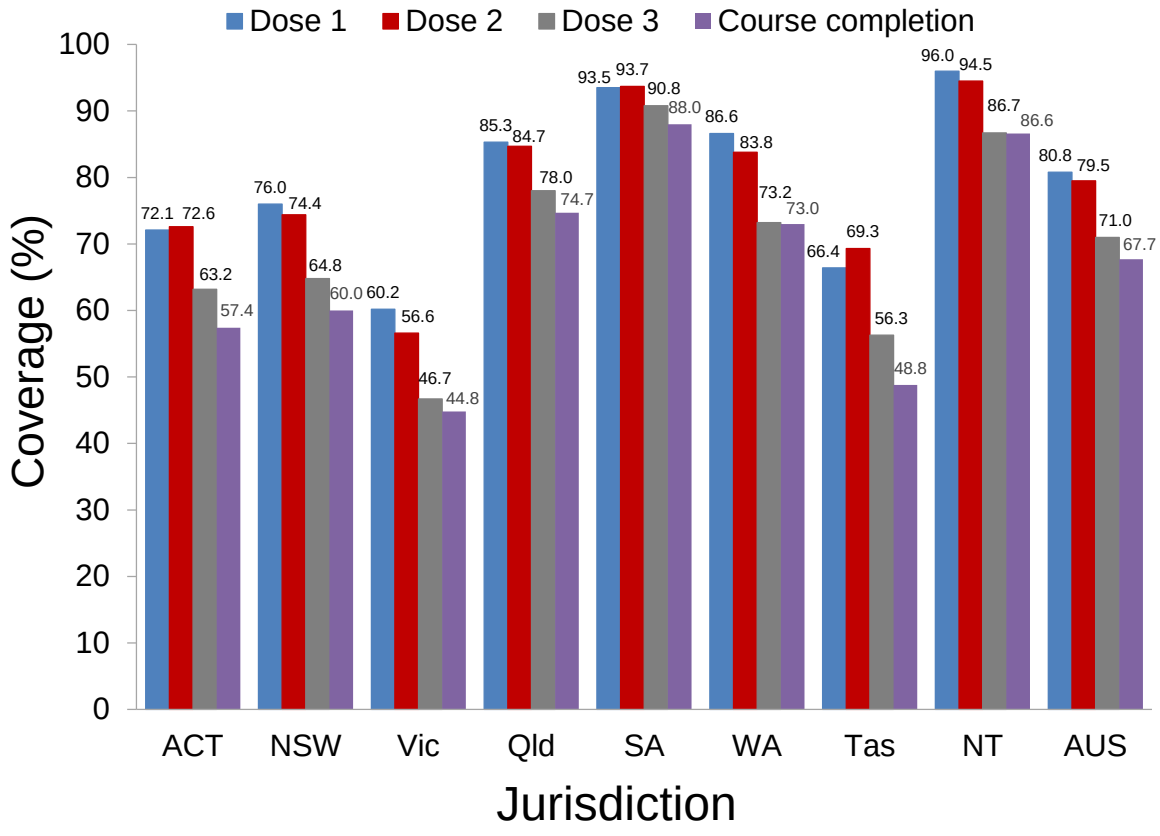
* Coverage calculated by dividing the number of Medicare-registered people with at least one dose of influenza vaccine administered in the calendar year of interest by the total number of Medicare-registered people registered in each age group. Vaccination numerators based on age at vaccination and age group denominators based on age at 30 June in relevant year. Coverage data in this table may differ slightly from estimates published elsewhere due to differences in calculation methodologies and/or the AIR data being used in the calculation having been downloaded on different dates.

Source: Australian Immunisation Register data as at 2 April 2023 (for 2022 data) and as at 4 February 2024 (for 2023 data)

Meningococcal B vaccination coverage for Indigenous children

Meningococcal B vaccination coverage in 2023 for the cohort of Indigenous children born in 2021 and eligible to have received doses at 2, 4 and 12 months of age by 24 months of age is shown in Figure 8. Nationally, 80.8% of this cohort had received their first dose of meningococcal B vaccine, 79.5% their second dose and 71.0% their third dose. Coverage of each dose was highest in South Australia and the Northern Territory and lowest in Victoria and Tasmania (Figure 8). Completion of the meningococcal B vaccination schedule (i.e. receipt of three doses if dose 1 was received before 12 months of age or receipt of two doses if dose 1 was received after 12 months of age) was 67.7% nationally and varied substantially by jurisdiction, ranging from 44.8% in Victoria to 88.0% in South Australia (Figure 8).

Figure 8. Coverage of meningococcal B vaccine for Indigenous children,* dose number and course completion, by jurisdiction, Australia, 2023



* Coverage assessed by 24 months of age for cohort of Indigenous children born 1 January 2021–31 December 2021. Only two doses of meningococcal B vaccine are required if the first dose is administered after 12 months of age.

Note: Coverage may be underestimated, particularly for dose 1, due to under-reporting to the AIR of doses given prior to children being registered on Medicare.[18]

ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

Source: Australian Immunisation Register data as at 4 February 2024

Hepatitis A vaccination coverage for Indigenous children

Coverage for the first dose of hepatitis A vaccine by 30 months of age for the four jurisdictions (combined) where it is funded under the NIP (Northern Territory, Queensland, South Australia and Western Australia) was 79.2% in December 2023, down one percentage point from December 2022, with coverage for the second dose under the new schedule (due at 4 years of age) not yet able to be assessed. Longer-term trends in hepatitis A vaccination coverage (Figure A8 in the Appendix) show the highest coverage levels are consistently achieved in the Northern Territory (89.6% for dose 1 in the June 2023 quarter).

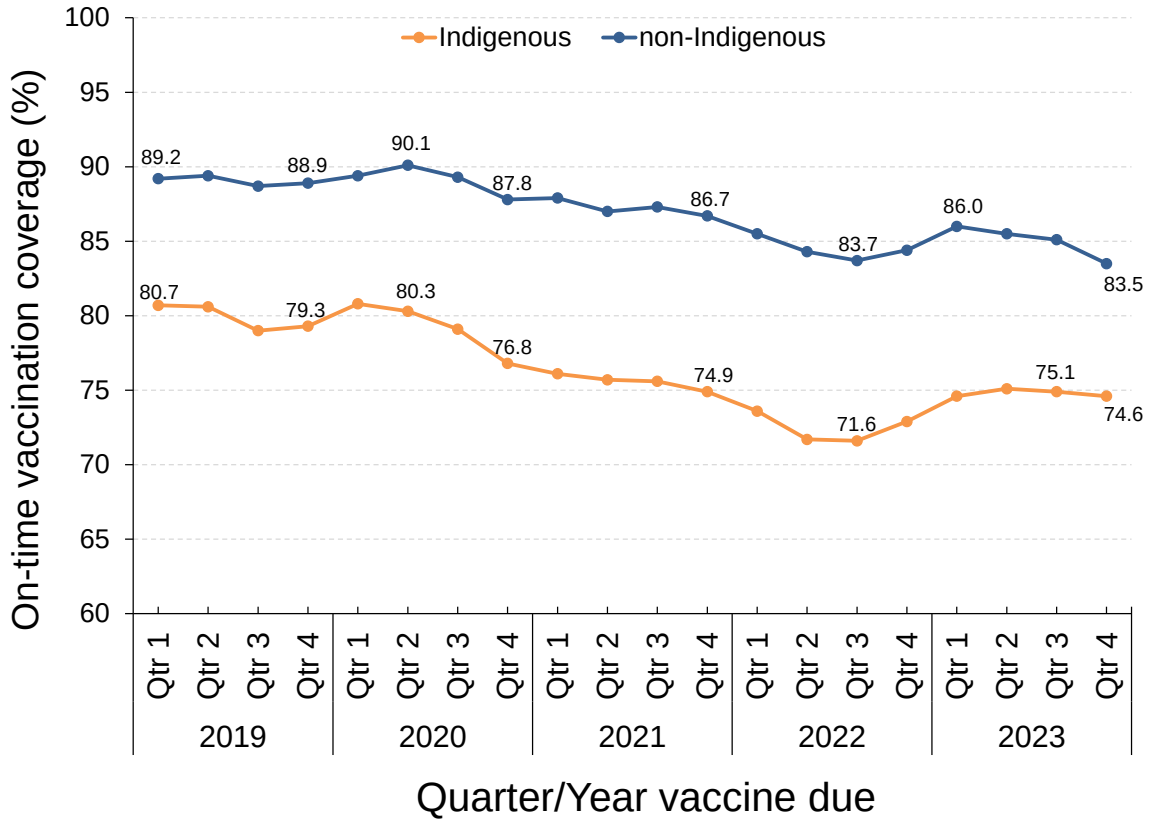
Pneumococcal vaccination coverage for Indigenous children

Coverage for the additional fourth dose of 13vPCV by 30 months of age for the four jurisdictions (combined) where it is funded for Indigenous children (Northern Territory, Queensland, South Australia and Western Australia) increased from 79.9% in December 2022 to 80.5% in December 2023. Longer-term trends in 13vPCV fourth-dose coverage (Figure A9 in the Appendix) show the highest coverage levels are consistently achieved in the Northern Territory (86.9% in the March 2023 quarter).

Timeliness of vaccination

The proportion of non-Indigenous children vaccinated on time (i.e. within 30 days of the recommended age) with the second dose of DTPa-containing vaccine, while exhibiting some fluctuations, decreased from 90.1% in the second quarter of 2020 to 83.5% in the last quarter of 2023 (Figure 9). On-time vaccination coverage for Indigenous children followed a similar pattern but was approximately 10 percentage points lower than for non-Indigenous children, decreasing from 80.3% in the second quarter of 2020 to 74.6% in the last quarter of 2023 (Figure 9). Similarly, the proportion of those vaccinated on time with the first dose of MMR-containing vaccine decreased for non-Indigenous children, from 77.3% in the first quarter of 2020 to 67.2% in the last quarter of 2023, and for Indigenous children, from 69.5% to 56.0% (Figure 10).

Figure 9 Trends in on-time vaccination coverage* for the second dose of DTPa-containing vaccine, by Indigenous status and quarter,† Australia, 2019–2023

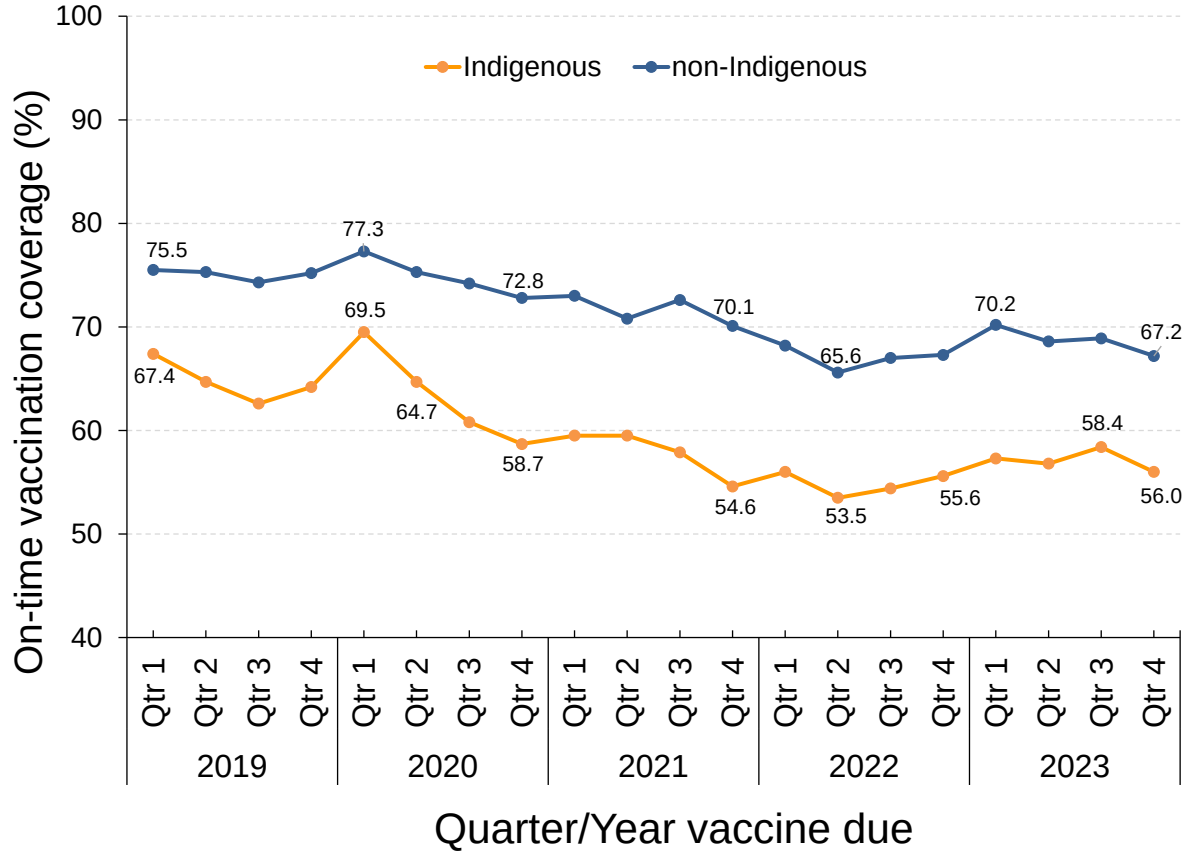


* On-time vaccination coverage calculated using 3-month-wide birth cohorts due to have received the second dose of DTPa-containing vaccine in the relevant quarter/year. To be considered on-time, a child must have received the second dose of DTPa-containing vaccine by 5 months of age

† The quarter in which the vaccine dose is due is used to define the birth cohorts (e.g. if the second dose of DTPa-containing vaccine was due in 2023: children born 1 September 2022–30 November 2022 were due in Quarter 1, children born 1 December 2022–28 February 2023 were due in Quarter 2, children born 1 March 2023–31 May 2023 were due in Quarter 3 and children born 1 June 2023–31 August 2023 were due in Quarter 4)

Source: Australian Immunisation Register data as at 4 February 2024

Figure 10 Trends in on-time vaccination coverage* for the first dose of MMR-containing vaccine, by Indigenous status and quarter,† Australia, 2019–2023



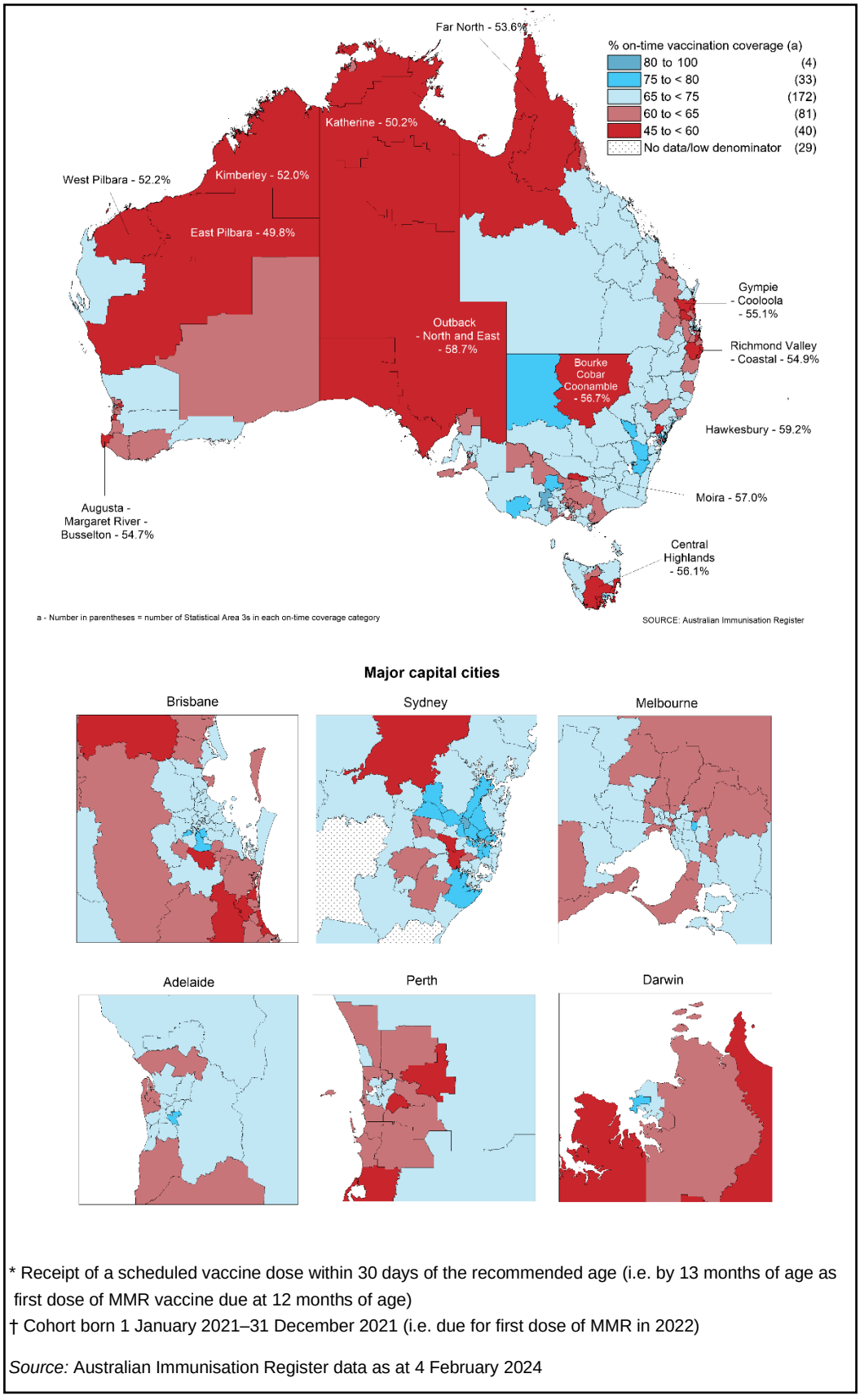
* On-time vaccination coverage calculated using 3-month-wide birth cohorts due to have received the first dose of MMR-containing vaccine in the relevant quarter/year. To be considered on-time, a child must have received the first dose of MMR-containing vaccine by 13 months of age

† The quarter in which the vaccine dose is due is used to define the birth cohorts (e.g. if first dose of MMR-containing vaccine was due in 2023: children born 1 January 2022–31 March 2022 were due in Quarter 1, children born 1 April 2022–30 June 2022 were due in Quarter 2, children born 1 July 2022–30 September 2022 were due in Quarter 3 and children born 1 October 2022–31 December 2022 were due in Quarter 4)

Source: Australian Immunisation Register data as at 4 February 2024

On-time vaccination coverage for the first dose of MMR-containing vaccine, assessed at 13 months of age in 2023 at SA3 level, varied across Australia (Figure 11). Coverage in many remote areas of Western, Central and Far North Australia was substantially lower than in Southeast Australia, with 49.8% on-time vaccination in East Pilbara, 50.2% in Katherine and 52.0% in Kimberley. Fully vaccinated coverage assessed at the standard (12, 24 and 60 months) and earlier (9, 15, 21 and 51 months) age milestones in 2023, by PHN, are provided in Table A3 in the Appendix.

Figure 11. On-time* vaccination coverage of first dose of MMR-containing vaccine assessed at 13 months of age† by Statistical Area 3, Australia, 2023



* Receipt of a scheduled vaccine dose within 30 days of the recommended age (i.e. by 13 months of age as first dose of MMR vaccine due at 12 months of age)

† Cohort born 1 January 2021–31 December 2021 (i.e. due for first dose of MMR in 2022)

Source: Australian Immunisation Register data as at 4 February 2024

Adolescents

Human papillomavirus (HPV) vaccination coverage – cohorts turning 15 years

Among adolescents turning 15 years in 2023, 84.2% of girls and 81.8% of boys had received at least one dose of HPV vaccine before their 15th birthday, down from 85.3% and 83.1%, respectively, in 2022 (Table 2). Coverage decreased between 2022 and 2023 for girls and boys in all jurisdictions except the Australian Capital Territory and Tasmania (where it increased for boys only). In 2023, coverage for girls and boys ranged from 78.3% and 72.5%, respectively, in the Northern Territory to 90.5% and 87.9%, respectively, in the Australian Capital Territory (Table 2).

Among Indigenous adolescents turning 15 years in 2023, 80.9% of girls and 75.0% of boys had received at least one dose of HPV vaccine before their 15th birthday, down from 83.0% and 78.1%, respectively, in 2022 (Table 2). Coverage decreased between 2022 and 2023 for Indigenous girls and boys in all jurisdictions except the Australian Capital Territory (girls only) and Tasmania (boys only). In 2023, coverage for Indigenous girls and boys ranged from 66.4% and 59.2%, respectively, in South Australia to 91.7% for girls in the Australian Capital Territory and 82.2% for boys in Tasmania (Table 2).

In girls, coverage of at least one dose of HPV vaccine by the 15th birthday in 2023 was 5.3 percentage points higher overall (and 12.1 percentage points higher in Indigenous girls) in those living in the most socioeconomically advantaged (fifth quintile) areas than in those living in the least advantaged (first quintile) areas (overall: 86.6% versus 81.3%; Indigenous: 88.9% versus 76.8%), and these disparities were greater than in 2022 (0.3 of a percentage point more for girls overall and 5.7 percentage points more for Indigenous girls). (Table 3.)

In boys, coverage of at least one dose of HPV vaccine by the 15th birthday in 2023 was 7.7 percentage points higher overall (and 13.6 percentage points higher in Indigenous boys) in those living in the most socioeconomically advantaged areas than in those living the least advantaged areas (overall: 85.2% versus 77.5%; Indigenous 84.5% versus 70.9%), and these disparities were greater than in 2022 (1.1 percentage points more for boys overall and 5.7 percentage points more for Indigenous boys). (Table 3.)

Coverage of at least one dose of HPV vaccine by the 15th birthday in 2023 was lower in adolescents who resided in remote and very remote areas compared to major cities, with the disparity greater for boys than girls (4.8 and 7.9 percentage points more for boys overall and Indigenous boys, respectively, compared to 4.0 and 6.8 points for girls overall and Indigenous girls,

respectively) and greater than in 2022 (2.0 percentage points more for boys overall and 4.6 percentage points for Indigenous boys, and 0.8 percentage points more for girls, both overall and Indigenous). (Table 4.)

Table 2. Coverage* of at least one dose of HPV vaccine, received before 15th birthday, in adolescents turning 15 years of age in the relevant year,† by gender, Indigenous status and jurisdiction, Australia, 2022 and 2023

	Girls		Boys	
	2022	2023	2022	2023
ACT				
All	89.8	90.5	87.5	87.9
Indigenous	88.5	91.7	82.7	75.3
NSW				
All	86.7	86.1	84.2	82.7
Indigenous	88.1	86.9	81.7	80.2
Vic				
All	86.8	85.2	84.2	83.4
Indigenous	82.5	80.4	78.8	75.9
Qld				
All	82.4	81.7	80.5	79.0
Indigenous	80.3	79.5	76.4	74.2
SA				
All	85.1	83.1	83.3	80.5
Indigenous	74.6	66.4	65.6	59.2
WA				
All	84.5	82.4	83.1	82.0
Indigenous	81.4	78.5	78.6	73.4
Tas				
All	84.0	83.5	80.3	80.7
Indigenous	84.6	81.2	79.5	82.2
NT				
All	81.6	78.3	78.3	72.5
Indigenous	78.4	72.7	75.2	65.6
AUS				
All	85.3	84.2	83.1	81.8
Indigenous	83.0	80.9	78.1	75.0

* Coverage calculated using the number of Medicare-registered adolescents in each year-wide birth cohort with an AIR record of having received at least one dose of HPV vaccine after their 9th birthday (since HPV is registered to be given from 9 years of age) but before their 15th birthday as the numerator and the total number of Medicare-registered adolescents in the relevant birth cohort as the denominator, expressed as a percentage

† Cohort born 1 January–31 December 2007 for 2022 coverage estimates (i.e. vaccines due from early 2019 to late 2020) and cohort born 1 January–31 December 2008 for 2023 coverage estimates (i.e. vaccines due from early 2020 to late 2021)

ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

Source: Australian Immunisation Register data as at 2 April 2023 (for 2022 data) and as at 4 February 2024 (for 2023 data)

Table 3. Coverage* of at least one dose of HPV vaccine, received before 15th birthday, in adolescents turning 15 years of age in the relevant year,† by gender, Indigenous status and socioeconomic status,‡ Australia, 2022 and 2023

	All girls		Indigenous girls	
SEIFA‡ quintile	**2022**	**2023**	**2022**	**2023**
First (least advantaged)	82.7	81.3	79.0	76.8
Second	85.0	84.0	84.6	82.1
Third	85.2	83.9	83.6	81.9
Fourth	85.4	84.5	85.5	84.1
Fifth (most advantaged)	87.7	86.6	89.3	88.9
	All boys		**Indigenous boys**	
	2022	**2023**	**2022**	**2023**
First (least advantaged)	79.4	77.5	74.9	70.9
Second	82.6	80.9	78.7	74.6
Third	82.9	81.3	79.9	77.0
Fourth	83.7	82.7	81.3	80.0
Fifth (most advantaged)	86.0	85.2	82.8	84.5

* Coverage calculated using the number of Medicare-registered adolescents in each year-wide birth cohort with an AIR record of having received at least one dose of HPV vaccine after their 9th birthday (since HPV is registered to be given from 9 years of age) but before their 15th birthday as the numerator and the total number of Medicare-registered adolescents in the relevant birth cohort as the denominator, expressed as a percentage

† Cohort born 1 January–31 December 2007 for 2022 coverage estimates (i.e. vaccines due from early 2019 to late 2020) and cohort born 1 January–31 December 2008 for 2023 coverage estimates (i.e. vaccines due from early 2020 to late 2021)

‡ Socio-Economic Indexes for Areas Index of Economic Resources

Source: Australian Immunisation Register data as at 2 April 2023 (for 2022 data) and as at 4 February 2024 (for 2023 data)

Table 4. Coverage* of at least one dose of HPV vaccine, received before 15th birthday, in adolescents turning 15 years of age in relevant year,† by gender, Indigenous status and remoteness‡ of area of residence, Australia, 2022 and 2023

	All girls		Indigenous girls	
Remoteness category‡	**2022**	**2023**	**2022**	**2023**
Major cities	85.4	84.3	84.9	82.7
Inner and outer regional	85.4	84.4	82.8	81.0
Remote and very remote	82.2	80.3	78.7	75.9
	All boys		**Indigenous boys**	
Remoteness category‡	**2022**	**2023**	**2022**	**2023**
Major cities	83.1	82.0	80.1	77.5
Inner and outer regional	83.4	81.4	76.9	74.8
Remote and very remote	80.3	77.2	76.8	69.6

*Coverage calculated using the number of Medicare-registered adolescents in each year-wide birth cohort with an AIR record of having received at least one dose of HPV vaccine after their 9th birthday (since HPV is registered to be given from 9 years of age) but before their 15th birthday as the numerator and the total number of Medicare-registered adolescents in the relevant birth cohort as the denominator, expressed as a percentage

† Cohort born 1 January–31 December 2007 for 2022 coverage estimates (i.e. vaccines due from early 2019 to late 2020) and cohort born 1 January–31 December 2008 for 2023 coverage estimates (i.e. vaccines due from early 2020 to late 2021)

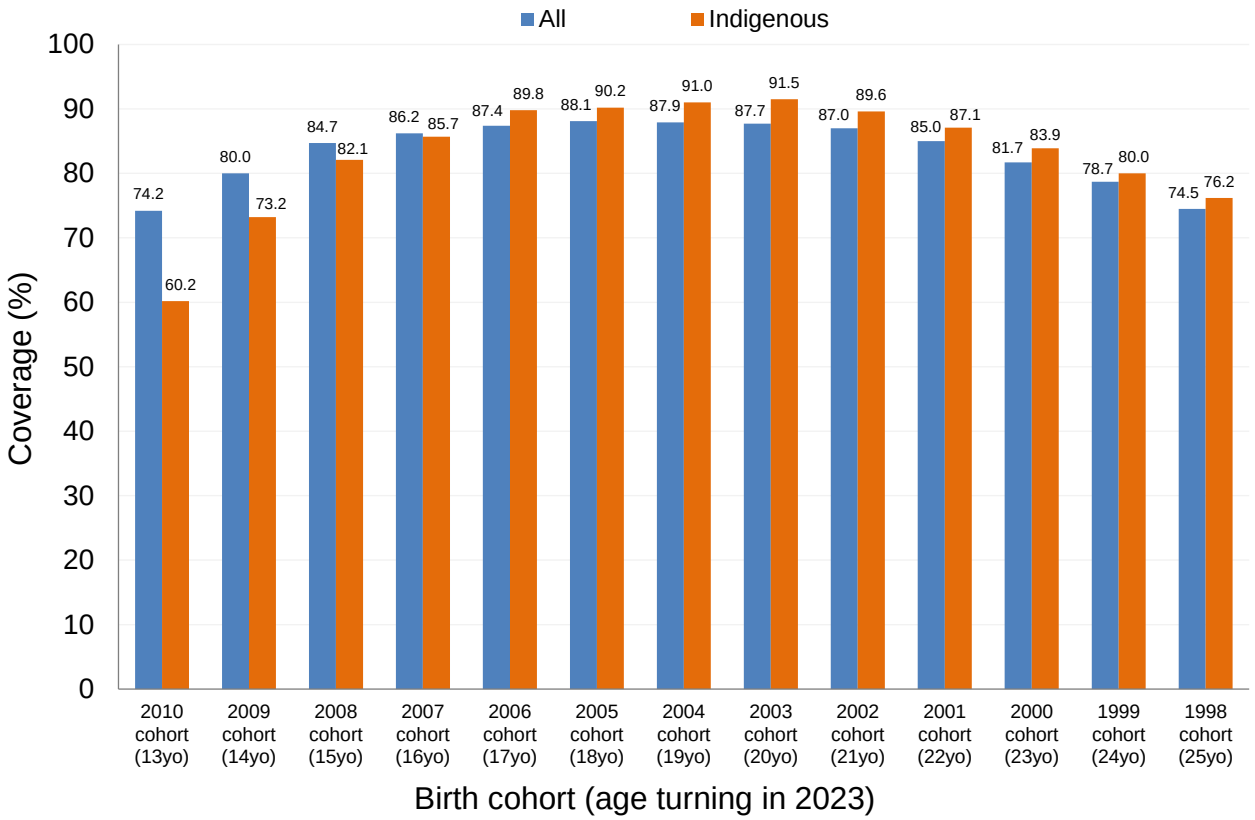
‡ Accessibility/Remoteness Index of Australia ($ARIA^{++}$)

Source: Australian Immunisation Register data as at 2 April 2023 (for 2022 data) and as at 4 February 2024 (for 2023 data)

HPV vaccination coverage – cohorts turning 13–25 years

Assessing a broader range of year-wide birth cohorts and including vaccine doses received by the end of 2023 (i.e. rather than before the relevant birthday), 74.2% of girls turning 13 years of age in 2023 had received at least one dose of HPV vaccine by 31 December 2023. Coverage increased with age – 80.0% of those turning 14 years and 84.7% of those turning 15 years had received at least one dose, with marginal increases seen in each successive age group up to those turning 18 years (Figure 12). Coverage then decreased with increasing age, down to 74.5% for those turning 25 years. Coverage in Indigenous females was 14 percentage points lower than overall coverage in those turning 13 years of age in 2023, but this disparity decreased with increasing age, with coverage higher in Indigenous females than overall in all cohorts turning 17–25 years of age (Figure 12). Coverage of at least one dose of HPV vaccine by birth cohort/age turning in 2023, Indigenous status and jurisdiction is provided in Table A5 in the Appendix. National coverage for girls turning 13 years of age, recalculated with South Australia excluded (as HPV vaccination in its school-based program moved from Year 8 in 2022 to Year 7 in 2023) decreased from 77.4% in 2022 to 74.3% in 2023 overall and from 66.7% to 60.8% for Indigenous girls (data not shown).

Figure 12. Coverage of at least one dose of HPV vaccine* for females by birth cohort/age and Indigenous status, Australia, 2023



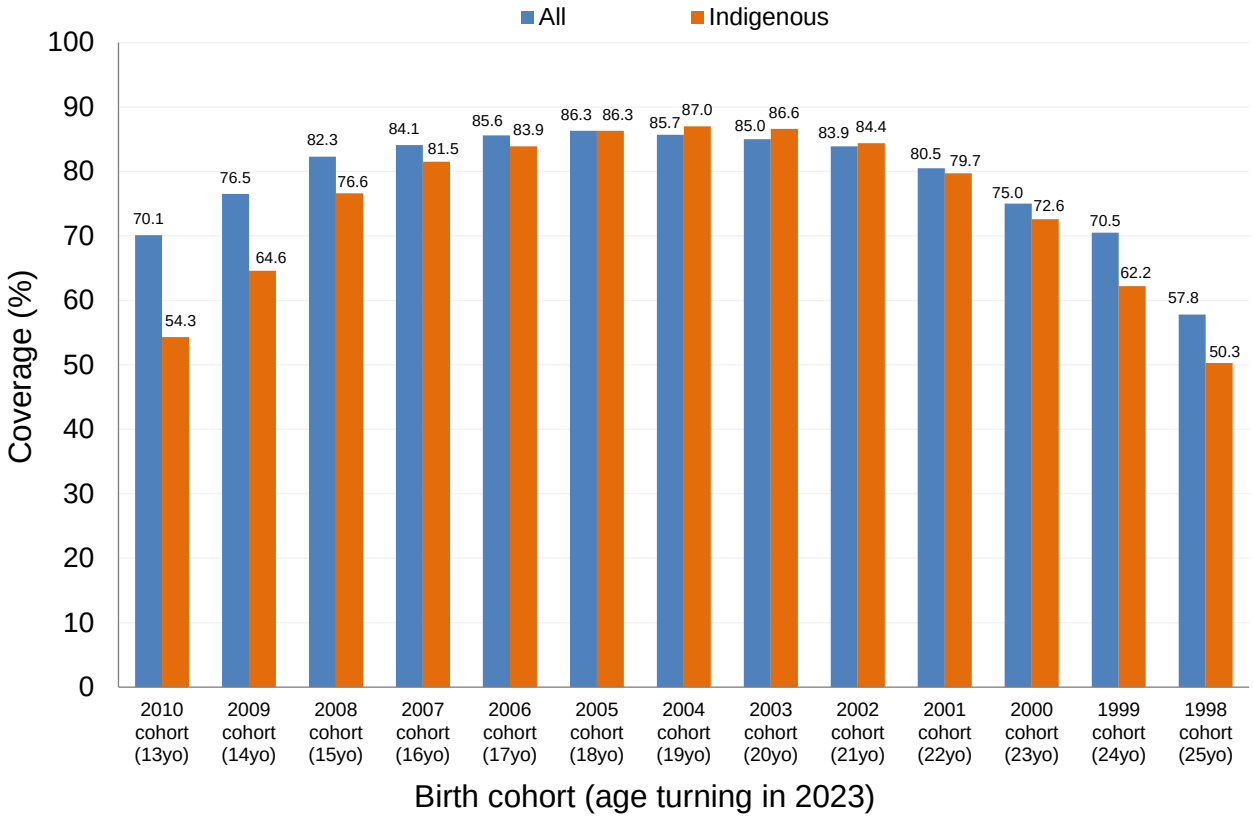
* Coverage calculated using the number of Medicare-registered individuals in each year-wide cohort with an AIR record of having received at least one dose of HPV vaccine after their 9th birthday (since HPV is registered to be given from 9 years of age) and given by 31 December 2023 as the numerator and the total number of Medicare-registered individuals in the relevant cohort as the denominator, expressed as a percentage

Source: Australian Immunisation Register data as at 4 February 2024

Figure 13 shows a similar pattern for males, with 70.1% of adolescent boys turning 13 years of age in 2023 having received at least one dose of HPV vaccine by 31 December 2023. Coverage increased with age – 76.5% of those turning 14 years and 82.3% of those turning 15 years had received at least one dose, with marginal increases in each successive age group up to those turning 18 years (Figure 13). Coverage then decreased with increasing age, down to 57.8% for those turning 25 years, noting that HPV vaccination was only funded for males from 2013 (i.e. from the 1998 cohort onwards). Coverage in Indigenous males was 15.8 percentage points lower than overall coverage in those turning 13 years of age in 2023, but the disparity decreased with increasing age in cohorts turning up to 18 years of age, with coverage higher in Indigenous males than overall in those turning 19–21 years but lower in those turning 22–25 years (Figure 13). Coverage of at least one dose of HPV vaccine in males by birth cohort/age turning in 2023,

Indigenous status and jurisdiction is provided in Table A6 in the Appendix. National coverage for boys turning 13 years of age, recalculated with South Australia excluded (as HPV vaccination in its school-based program moved from Year 8 in 2022 to Year 7 in 2023) decreased from 73.1% in 2022 to 70.1% in 2023 overall and from 58.3% to 54.9% for Indigenous boys (data not shown).

Figure 13. Coverage of at least one dose of HPV vaccine* for males by birth cohort/age and Indigenous status, Australia, 2023



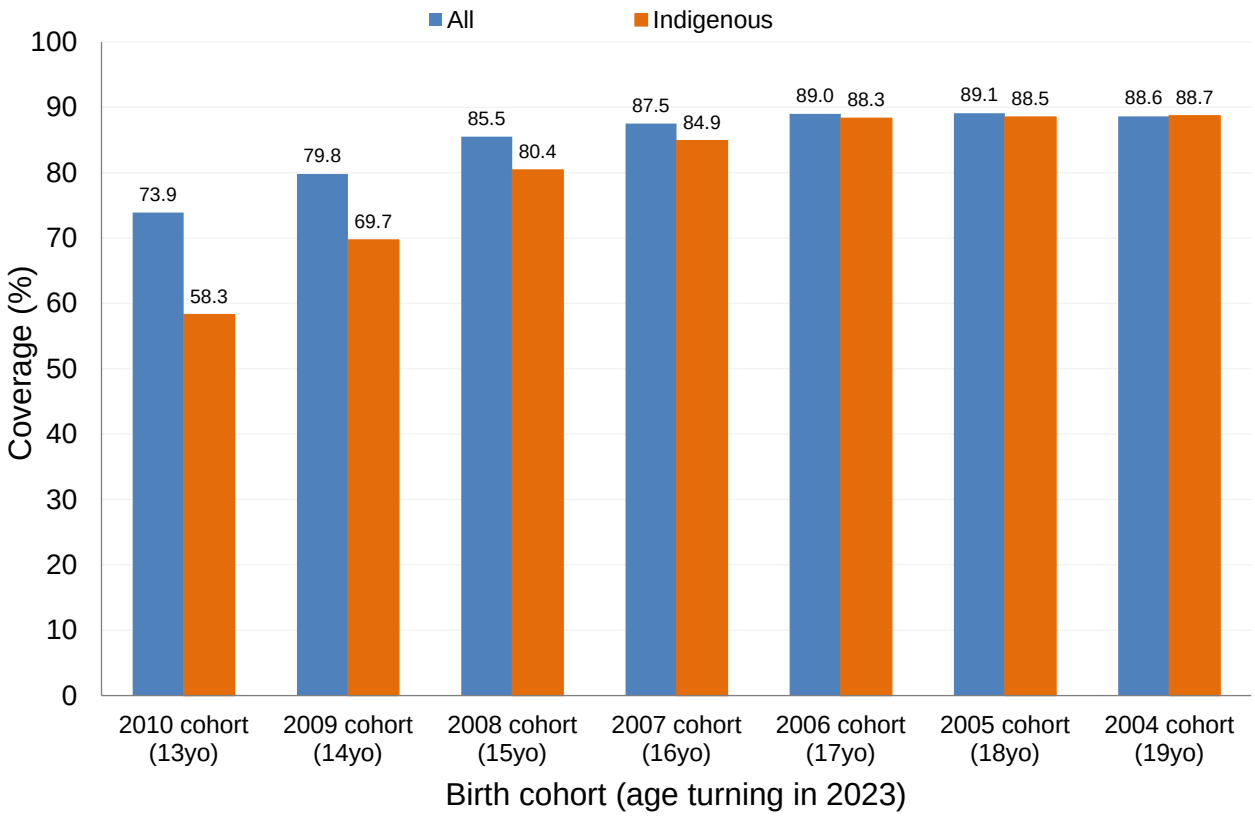
* Coverage calculated using the number of Medicare-registered individuals in each year-wide cohort with an AIR record of having received at least one dose of HPV vaccine after their 9th birthday (since HPV is registered to be given from 9 years of age) and given by 31 December 2023 as the numerator and the total number of Medicare-registered individuals in the relevant cohort as the denominator, expressed as a percentage.

Source: Australian Immunisation Register data as at 4 February 2024

Diphtheria-tetanus-pertussis vaccination coverage – cohorts turning 13–19 years

Assessing a broad range of year-wide birth cohorts, 73.9% of adolescents turning 13 years of age in 2023 had received an adolescent dose of diphtheria-tetanus-pertussis vaccine by 31 December 2023. Coverage increased with age – 79.8% of those turning 14 years and 85.5% of those turning 15 years had received a dose, with marginal increases seen in each successive age group up to those turning 18 years (Figure 14). Coverage in Indigenous adolescents was 15.6 percentage points lower than overall coverage in those turning 13 years of age in 2023, but the disparity decreased with increasing age, with coverage 0.1 of a percentage point higher than overall in Indigenous adolescents turning 19 years of age (Figure 14). Coverage of an adolescent dose of diphtheria-tetanus-pertussis vaccine in adolescents by birth cohort/age turning in 2023, Indigenous status and jurisdiction is provided in Table A7 in the Appendix. National coverage for adolescents turning 13 years of age, recalculated with South Australia excluded (as dTpa vaccination in their school-based program moved from Year 8 in 2022 to Year 7 in 2023) decreased from 76.2% in 2022 to 73.9% in 2023 overall and from 62.9% to 58.8% for Indigenous girls (data not shown).

Figure 14. Coverage of an adolescent dose of diphtheria-tetanus-pertussis vaccine* by birth cohort/age and Indigenous status, Australia, 2023



* Coverage calculated using the number of Medicare-registered adolescents in each year-wide cohort with an AIR record of having received an adolescent (i.e. ≥ 10 years of age) dose of a diphtheria-tetanus-pertussis vaccine (recorded as either dTpa or DTPa) by 31 December 2023 as the numerator and the total number of Medicare-registered adolescents in the relevant cohort as the denominator, expressed as a percentage

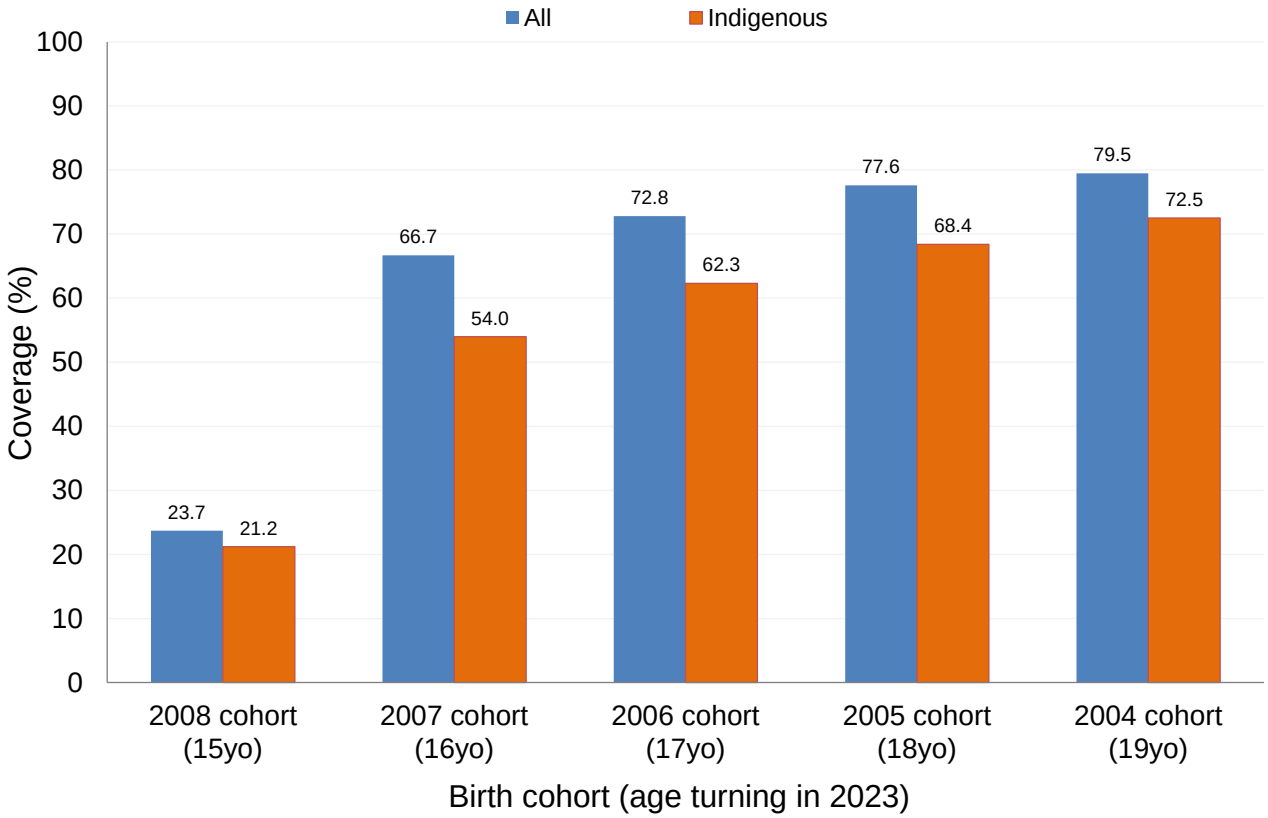
dTpa = diphtheria–tetanus–pertussis – formulation for individuals aged ≥10 years; DTPa = diphtheria–tetanus–pertussis – paediatric formulation

Source: Australian Immunisation Register data as at 4 February 2024

Meningococcal ACWY vaccination coverage – cohorts turning 15–19 years

Figure 15 shows 66.7% of adolescents turning 16 years in 2023 had received an adolescent dose of meningococcal ACWY vaccine by 31 December 2023. Coverage increased with age – 72.8% of those turning 17 years, 77.6% of those turning 18 years and 79.5% of those turning 19 years had received a dose. Coverage in Indigenous adolescents was 12.7 percentage points lower than overall coverage in those turning 16 years of age in 2023, but the disparity decreased with increasing age and had almost halved to a 7.0 percentage point difference in those turning 19 years of age in 2023 (Figure 15). Coverage of an adolescent dose of meningococcal ACWY vaccine varied by jurisdiction, and coverage in adolescents by birth cohort/age turning in 2023, Indigenous status and jurisdiction is provided in Table A8 in the Appendix.

Figure 15. Coverage of an adolescent dose of meningococcal ACWY vaccine* by birth cohort/age and Indigenous status, Australia, 2023



* Coverage calculated using the number of Medicare-registered adolescents in each year-wide cohort with an AIR record of having received an adolescent (i.e. ≥10 years of age) dose of a meningococcal ACWY vaccine given by 31 December 2023 as the numerator and the total number of Medicare-registered adolescents in the relevant cohort as the denominator, expressed as a percentage

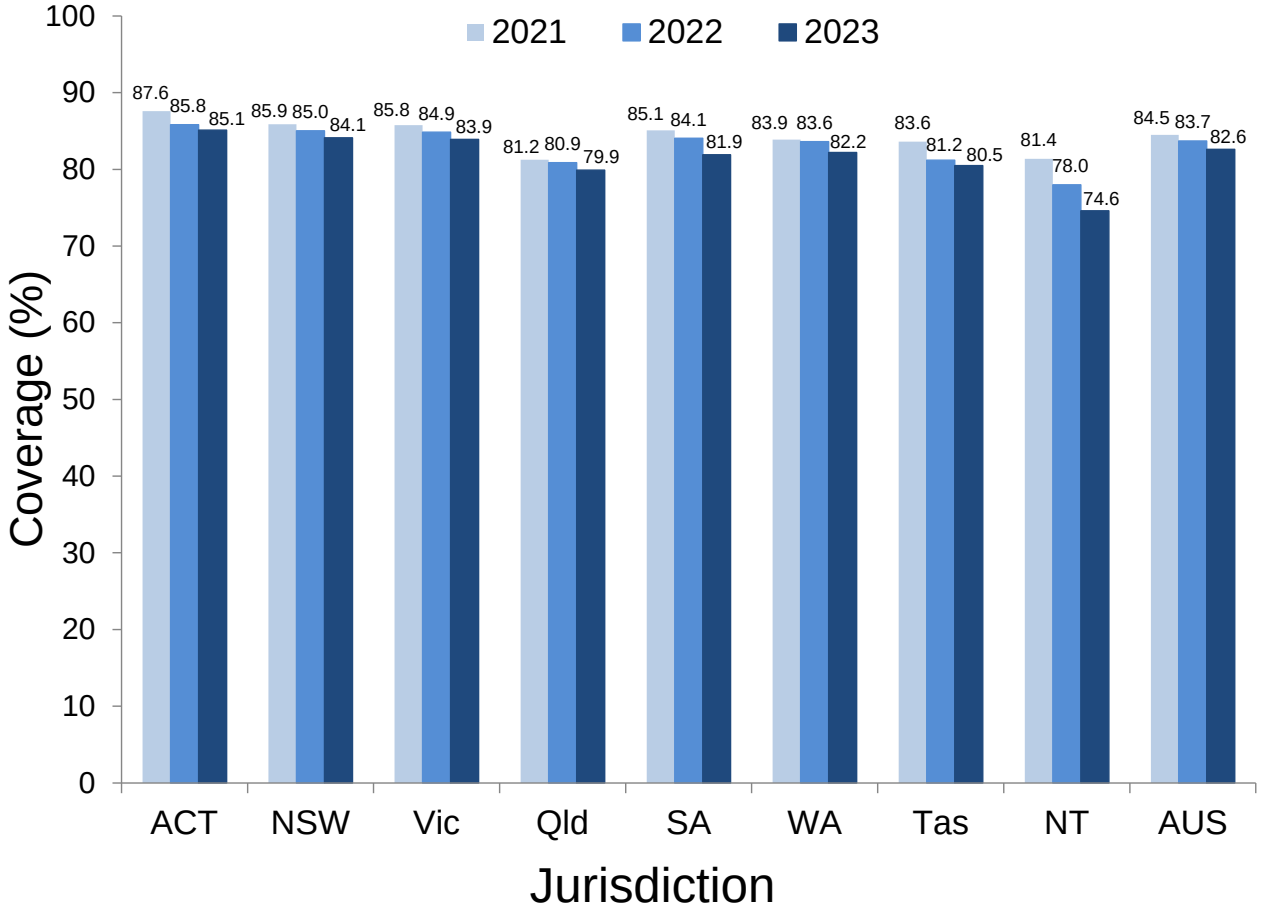
Source: Australian Immunisation Register data as at 4 February 2024

Adolescent composite measures of vaccination coverage

HPV + diphtheria-tetanus-pertussis

Using a composite measure – receipt of both an HPV vaccine dose and an adolescent dose of diphtheria-tetanus-pertussis vaccine by 31 December 2023 – coverage was 82.6% for adolescents turning 15 years of age in 2023, down from 83.7% in 2022 and 84.5% in 2021 (Figure 16). Coverage in 2023 varied by jurisdiction, ranging from 74.6% in the Northern Territory to 85.1% in the Australian Capital Territory (Figure 16). Coverage using this composite measure was 4.7 percentage points lower than overall in Indigenous adolescents turning 15 years in 2023, at 77.9%, down from 80.1% in 2022 and 82.3% in 2021, and ranged from 63.0% in South Australia to 83.5% in New South Wales (Figure 17).

Figure 16. Vaccination coverage using composite measure (dose of HPV and adolescent dose of diphtheria-tetanus-pertussis vaccine)* in adolescents turning 15 years,† by jurisdiction, 2021–2023



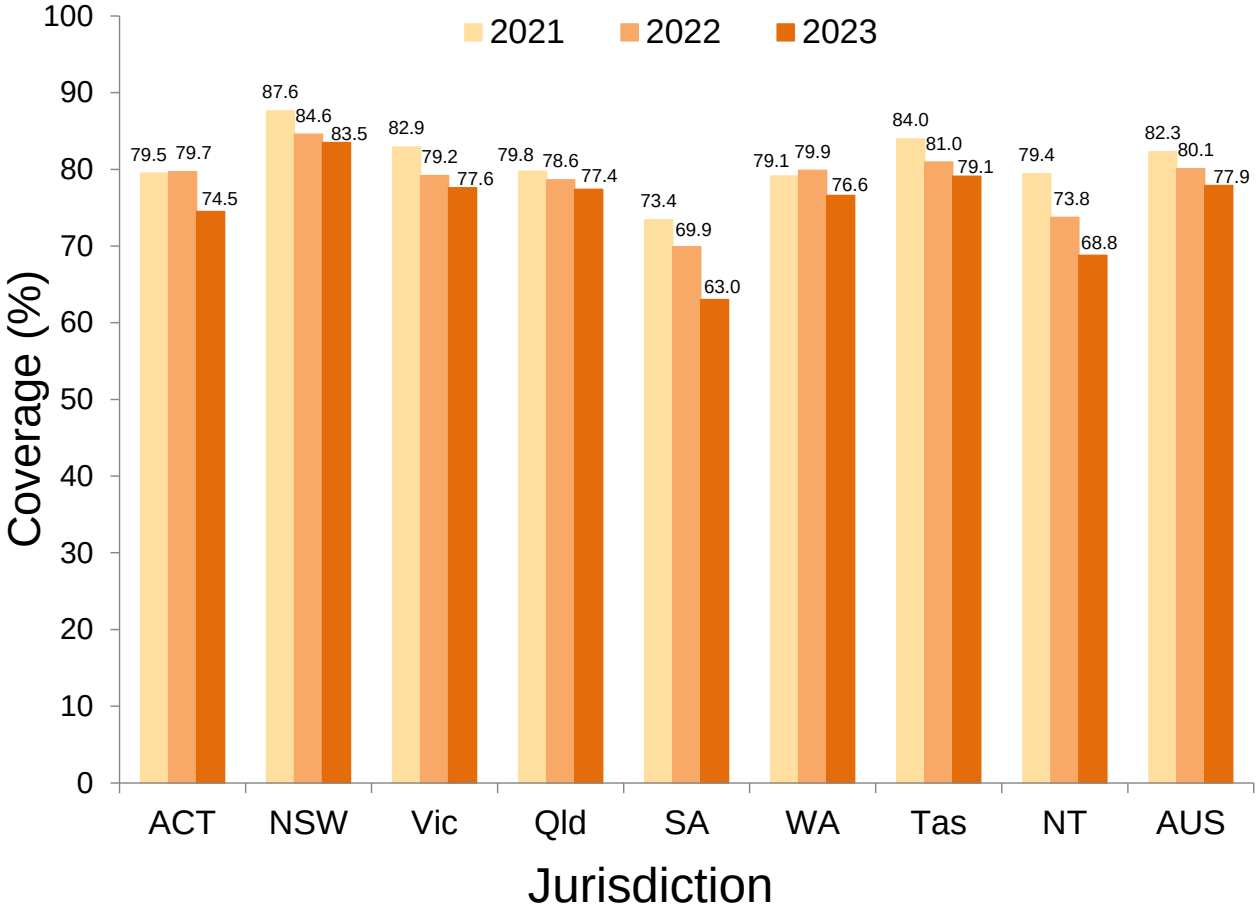
* Coverage calculated using the number of Medicare-registered adolescents in each year-wide cohort with an AIR record of having received at least one dose of HPV vaccine ≥9 years of age and an adolescent (i.e. ≥10 years of age) dose of diphtheria-tetanus-pertussis vaccine (recorded as either dTpa or DTPa) by 31 December of the relevant year as the numerator and the total number of Medicare-registered adolescents in the relevant cohort as the denominator, expressed as a percentage

† Cohorts: 1 January–31 December 2006 for 2021; 1 January–31 December 2007 for 2022; 1 January–31 December 2008 for 2023

ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

Source: Australian Immunisation Register data as at 3 April 2022 for 2021, 2 April 2023 for 2022 and 2 February 2024 for 2023

Figure 17. Vaccination coverage using composite measure (dose of HPV and adolescent dose of diphtheria-tetanus-pertussis vaccine)* in Indigenous adolescents turning 15 years,† by jurisdiction, 2021–2023



* Coverage calculated using the number of Medicare-registered Indigenous adolescents in each year-wide cohort with an AIR record of having received at least one dose of HPV vaccine (≥9 years of age) and an adolescent (i.e. ≥10 years of age) dose of diphtheria-tetanus-pertussis vaccine (recorded as either dTpa or DTPa) by 31 December of the relevant year as the numerator and the total number of Medicare-registered Indigenous adolescents in the relevant cohort as the denominator, expressed as a percentage

† Cohorts: 1 January–31 December 2006 for 2021; 1 January–31 December 2007 for 2022; 1 January–31 December 2008 for 2023

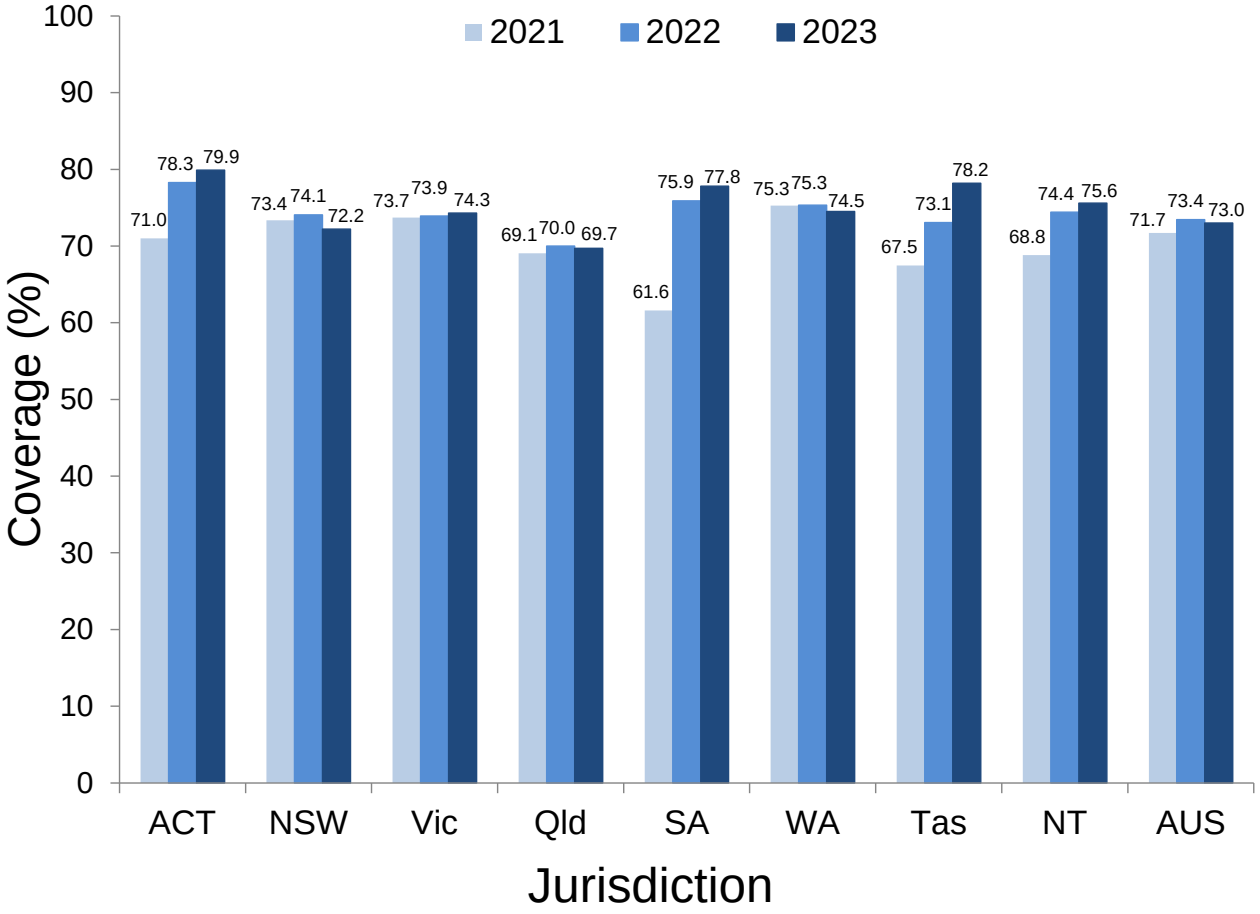
ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

Source: Australian Immunisation Register data as at 3 April 2022 for 2021, 2 April 2023 for 2022 and 2 February 2024 for 2023

HPV + diphtheria-tetanus-pertussis + meningococcal ACWY vaccine

Using another composite measure – receipt of an HPV vaccine dose and adolescent doses of both diphtheria-tetanus-pertussis and meningococcal ACWY vaccine by 31 December 2023 – coverage was 73.0% for adolescents turning 18 years of age in 2023, down from 73.4% in 2022 and 71.7%% in 2021 (Figure 18). Coverage in 2023 varied by jurisdiction and ranged from 69.7% in Queensland to 79.9% in the Australian Capital Territory (Figure 18). Coverage using this composite measure was 9.4 percentage points lower than overall in Indigenous adolescents turning 18 years in 2023, at 63.6%, down from 65.4% in 2022 and 65% in 2021, and ranged from 57.4% in South Australia to 81.1% in the Northern Territory (Figure 19).

Figure 18. Vaccination coverage using composite measure (dose of HPV and adolescent doses of diphtheria-tetanus-pertussis and meningococcal ACWY vaccine)* in adolescents turning 18 years,† by jurisdiction, 2021–2023



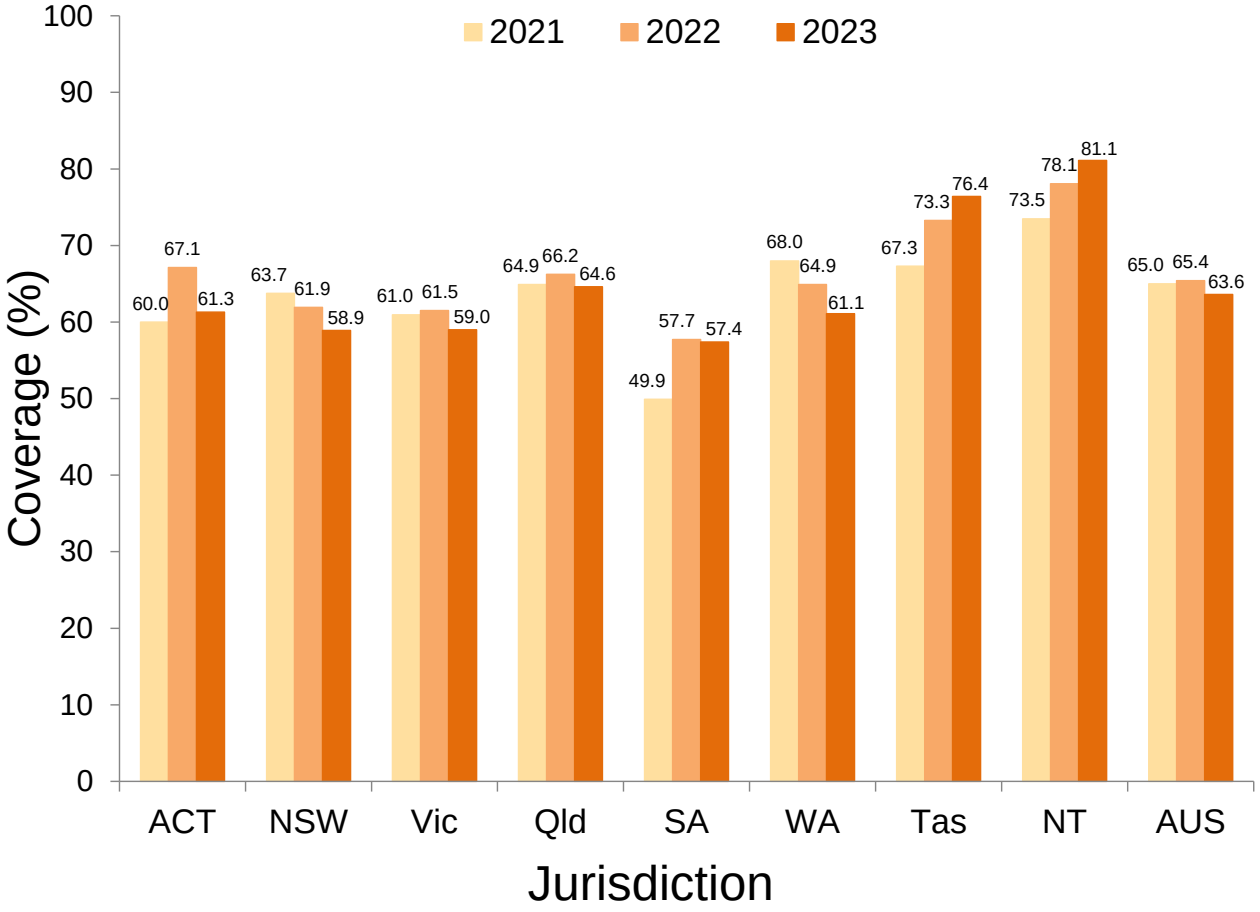
* Coverage calculated using the number of Medicare-registered adolescents in each year-wide cohort with an AIR record of having received at least one dose of HPV vaccine (≥9 years of age) and an adolescent (i.e. ≥10 years of age) dose of both diphtheria-tetanus-pertussis vaccine (recorded as either dTpa or DTPa) and meningococcal ACWY vaccine by 31 December of the relevant year as the numerator and the total number of Medicare-registered adolescents in the relevant cohort as the denominator, expressed as a percentage

† Cohorts: 1 January–31 December 2003 for 2021; 1 January–31 December 2004 for 2022; 1 January–31 December 2005 for 2023

ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

Source: Australian Immunisation Register data as at 3 April 2022 for 2021, 2 April 2023 for 2022 and 4 February 2024 for 2023

Figure 19. Vaccination coverage using composite measure (dose of HPV and adolescent doses of diphtheria-tetanus-pertussis and meningococcal ACWY vaccine)* in Indigenous adolescents turning 18 years,† by jurisdiction, 2021–2023



* Coverage calculated using the number of Medicare-registered Indigenous adolescents in each year-wide cohort with an AIR record of having received at least one dose of HPV vaccine (≥9 years of age) and an adolescent (i.e. ≥10 years of age) dose of both diphtheria-tetanus-pertussis vaccine (recorded as either dTpa or DTPa) and meningococcal ACWY vaccine by 31 December of the relevant year as the numerator and the total number of Medicare-registered Indigenous adolescents in the relevant cohort as the denominator, expressed as a percentage

† Cohorts: 1 January–31 December 2003 for 2021; 1 January–31 December 2004 for 2022; 1 January–31 December 2005 for 2023

ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

Source: Australian Immunisation Register data as at 3 April 2022 for 2021, 2 April 2023 for 2022 and 4 February 2024 for 2023

Influenza vaccination coverage

Influenza vaccination coverage in adolescents aged 10 to <20 years decreased by 7.1 percentage points between 2022 and 2023, to 15.2% (Figure 2), with decreases seen in all jurisdictions (Table A9 in the Appendix).

Influenza vaccination coverage in Indigenous adolescents aged 10 to <20 years in 2023 was 0.6 of a percentage point higher than overall, at 15.8%, but 3.7 percentage points lower than in 2022 (Figure 5), with decreases seen in all jurisdictions (Table A9 in the Appendix).

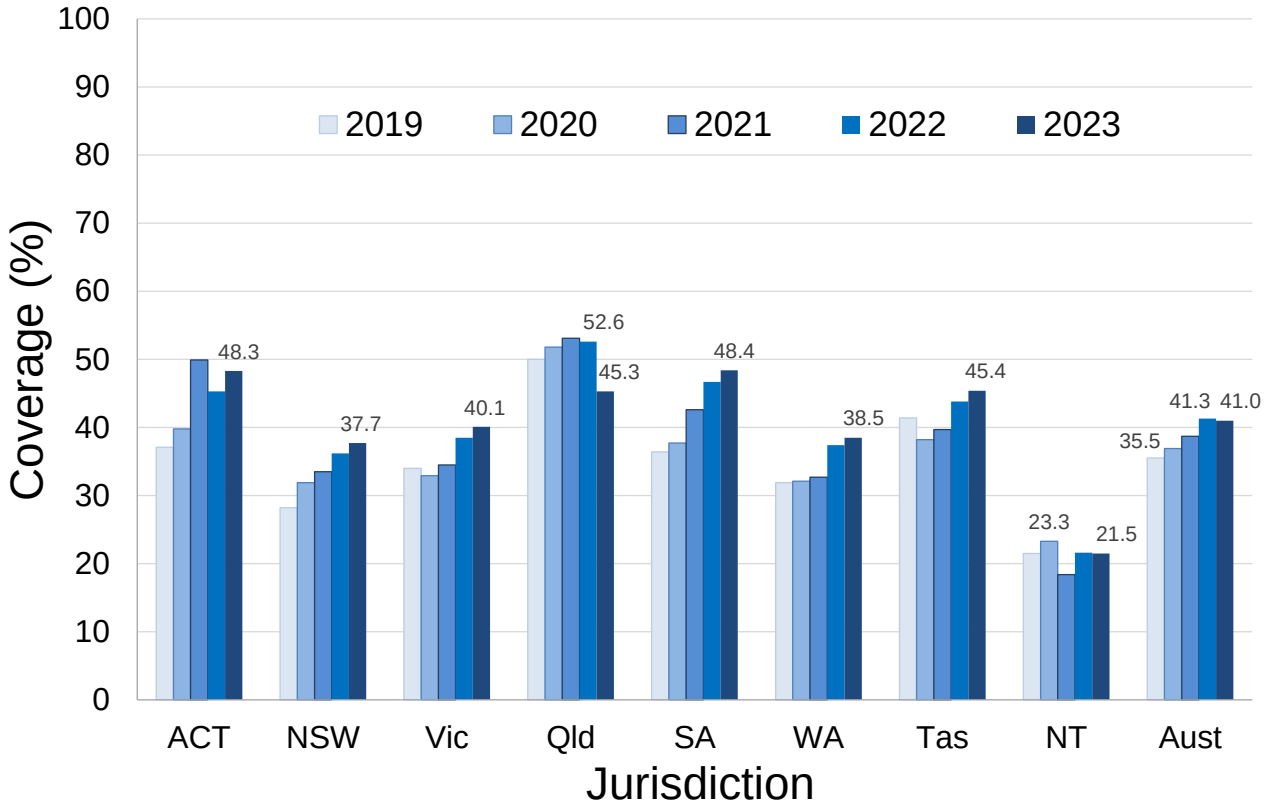
Adults

Zoster vaccination coverage

Zoster vaccination coverage (i.e. receipt of one dose of Zostavax or two doses of Shingrix, given at least 4 weeks apart) for Australian adults turning 71 years of age in 2023 was 41.0% in 2023, down from 41.3% in 2022, with coverage in 2023 ranging from 21.5% in the Northern Territory to 48.4% in South Australia (Figure 20). Coverage in Indigenous adults turning 71 years was 36.1% in 2023, down from 36.5% in 2022 (Figure 21), with coverage in 2023 ranging from 22.0% in the Northern Territory to 52.7% in Tasmania.

Assessing a broad range of age cohorts, zoster vaccination coverage increased with age, reaching 57.6% in those turning 76 years in 2023. The majority of adults turning 70–75 years in 2023 who were considered covered for zoster vaccine by 31 December 2023 were vaccinated at the 70-year schedule point, although a substantial proportion were vaccinated through the catch-up program offered to adults aged 71–79 years; adults turning 77–79 years were predominantly vaccinated through the catch-up program (Figure 22). In the entire cohort of adults turning 70 years and older in 2023, overall zoster vaccination coverage was 42.3%. Coverage patterns for Indigenous adults were similar (Figure 23), with coverage for the entire cohort of Indigenous adults turning 70 years and older in 2023 higher than overall coverage at 43.6%.

Figure 20. Zoster vaccination coverage* for adults turning 71 years of age† in the year of interest, by jurisdiction, Australia, 2019–2023



* Coverage calculated using the number of Medicare-registered adults in each year-wide cohort with an AIR record of having received one dose of Zostavax or two doses of Shingrix (given at least 4 weeks apart) by 31 December of the relevant year as the numerator and the total number of Medicare-registered adults in the relevant cohort as the denominator, expressed as a percentage

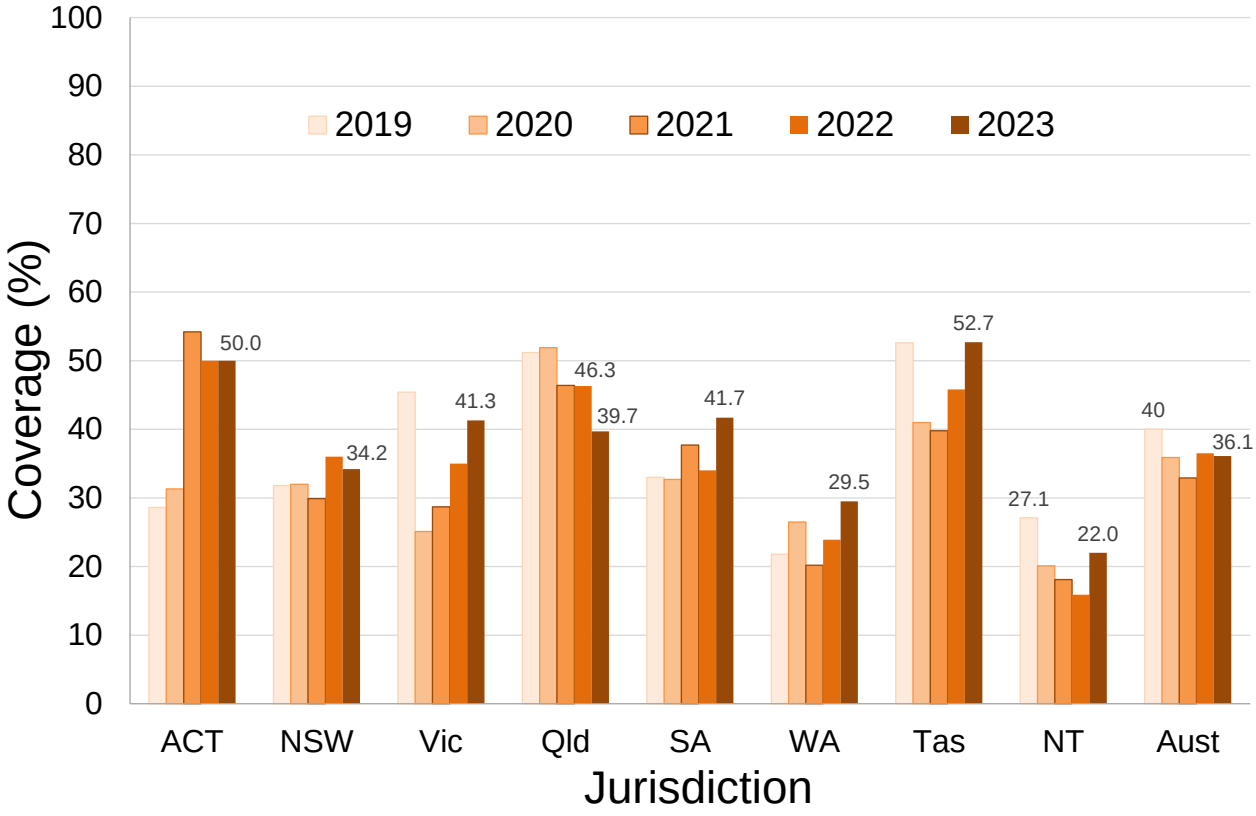
Note: The 2020 and 2021 data points differ to what was presented in the 2021 report due to vaccinations given after 71 years of age now being included in the coverage calculations.

† Cohorts born 1 January–31 December 1948 for 2019 coverage; 1 January–31 December 1949 for 2020 coverage; 1 January–31 December 1950 for 2021 coverage; 1 January–31 December 1951 for 2022 coverage; and 1 January–31 December 1952 for 2023 coverage.

ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

Source: Australian Immunisation Register data as at 3 April 2022 (for 2019–2021 coverage), 2 April 2023 (for 2022 coverage) and 4 February 2024 (for 2023 coverage)

Figure 21. Zoster vaccination coverage* for Indigenous adults turning 71 years of age† in the year of interest, by jurisdiction, Australia, 2019–2023



* Coverage calculated using the number of Medicare-registered Indigenous adults in each year-wide cohort with an AIR record of having received one dose of Zostavax or two doses of Shingrix (given at least 4 weeks apart) by 31 December of the relevant year as the numerator and the total number of Medicare-registered Indigenous adults in the relevant cohort as the denominator, expressed as a percentage

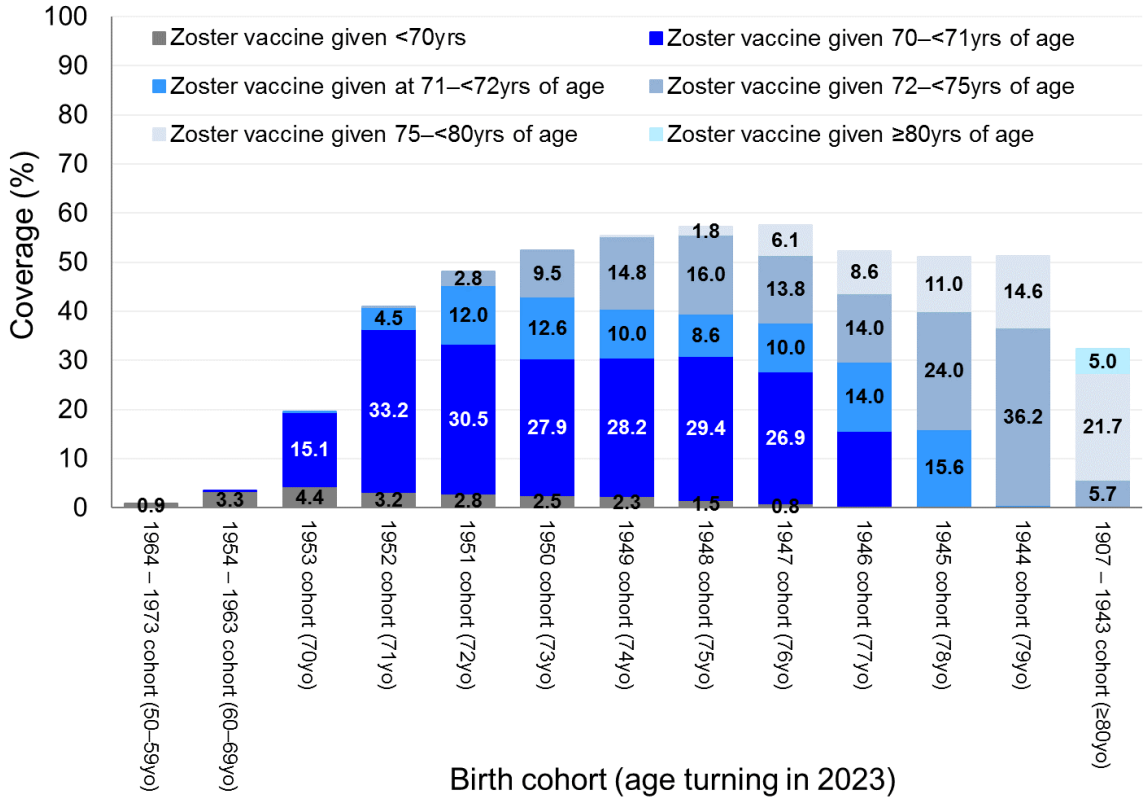
Note: The 2020 and 2021 data points differ to what was presented in the 2021 report due to vaccinations given after 71 years of age now being included in the coverage calculations

† Cohorts born 1 January–31 December 1948 for 2019 coverage; 1 January–31 December 1949 for 2020 coverage; 1 January–31 December 1950 for 2021 coverage; 1 January–31 December 1951 for 2022 coverage; and 1 January–31 December 1952 for 2023 coverage

ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

Source: Australian Immunisation Register data as at 3 April 2022 (for 2019–2021 coverage), 2 April 2023 (for 2022 coverage) and 4 February 2024 (for 2023 coverage)

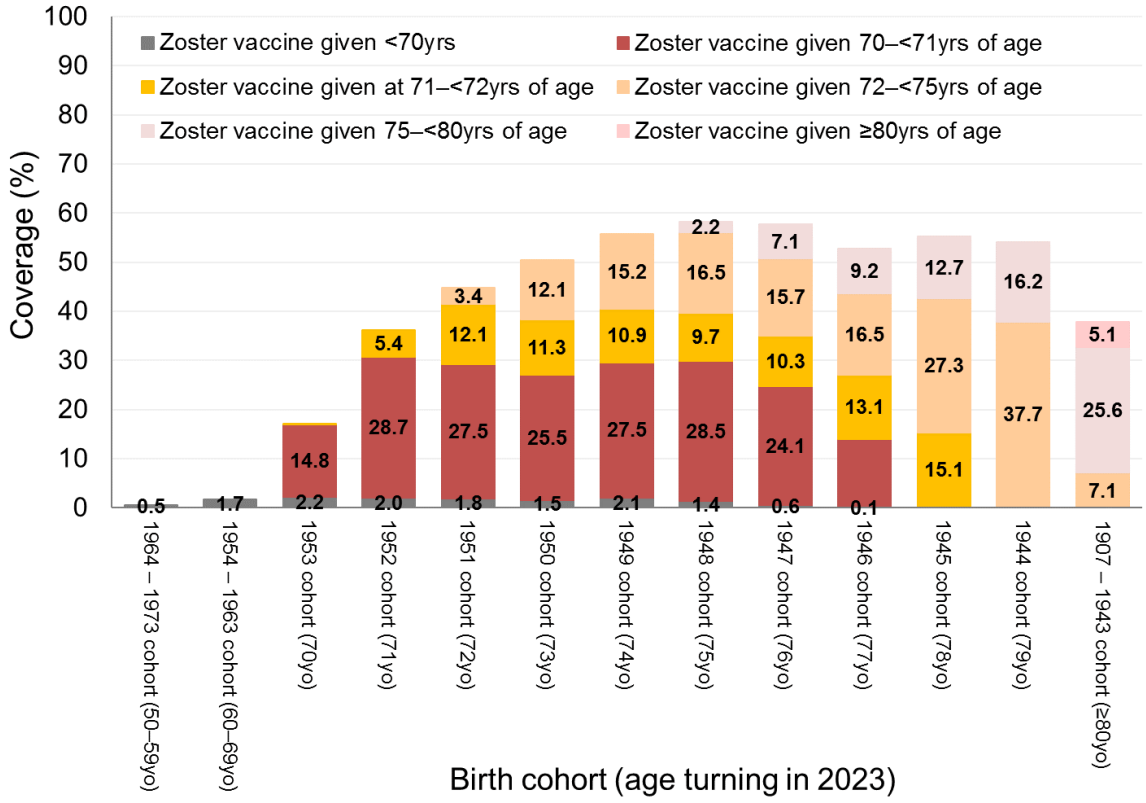
Figure 22. Zoster vaccination coverage* in adults by birth cohort and age at vaccination, Australia, 2023



* 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 (given at least 4 weeks apart) as the numerator and the total number of Medicare-registered adults in the relevant cohort as the denominator, expressed as a percentage. Vaccinations given up to 31 December 2023 are included in the numerator

Source: Australian Immunisation Register data as at 4 February 2024

Figure 23. Zoster vaccination coverage* in Indigenous adults by birth cohort and age at vaccination, Australia, 2023



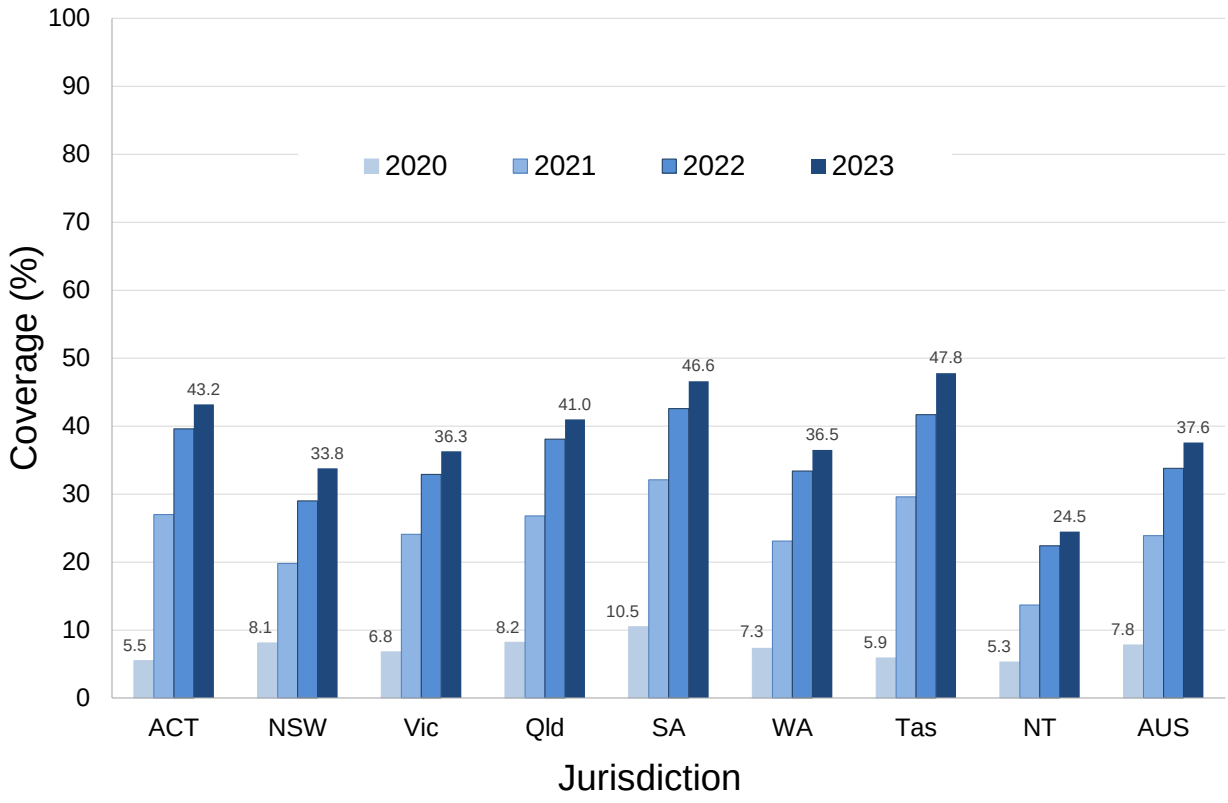
* Coverage calculated using the number of Medicare-registered Indigenous adults in each cohort with an AIR record of having received either one dose of Zostavax vaccine or two doses of Shingrix vaccine (given at least 4 weeks apart) as the numerator and the total number of Medicare-registered adults in the relevant cohort as the denominator, expressed as a percentage. Vaccinations given up to 31 December 2023 are included in the numerator

Source: Australian Immunisation Register data as at 4 February 2024

Pneumococcal vaccination coverage

Coverage of an adult dose of 13vPCV in the cohort of Australian adults turning 71 years in 2023 was 37.6% overall, up from 33.8% in 2022, with coverage ranging from 24.5% in the Northern Territory to 47.8% in Tasmania (Figure 24). Coverage in the cohort of Indigenous adults turning 71 years in 2023 was 43.0% in 2023, up from 37.7% in 2022, and ranged from 39.4% in the Northern Territory to 60.3% in Tasmania (Figure 25).

Figure 24. Coverage of an adult dose of 13vPCV* in the cohort of adults turning 71 years of age† in the year of interest, by jurisdiction, Australia, 2020–2023



* Coverage calculated using the number of Medicare-registered adults in each year-wide cohort with an AIR record of having received an adult dose of 13vPCV by 31 December of the relevant year as the numerator and the total number of Medicare-registered adults in the relevant cohort as the denominator, expressed as a percentage

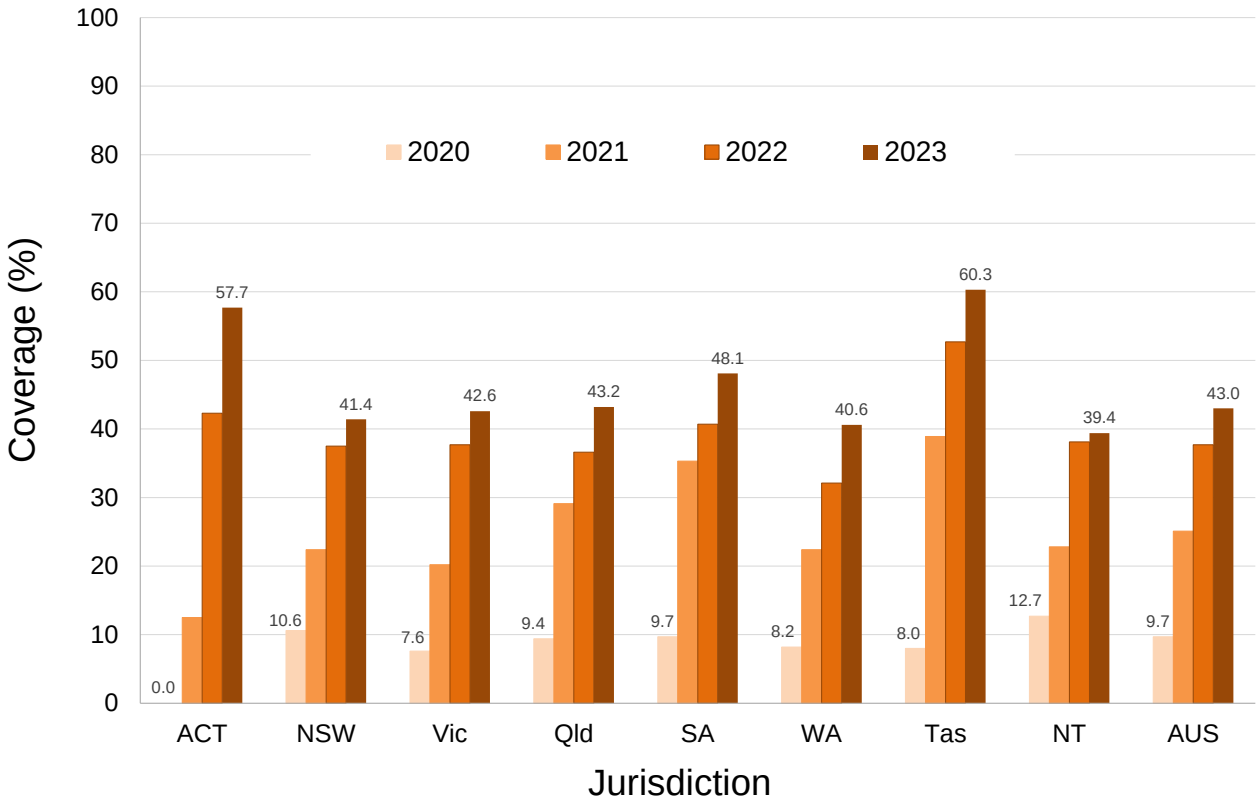
Note: The 2020 and 2021 data points differ to what was presented in the 2021 report due to vaccinations given after 71 years of age now being included in the coverage calculations.

† Cohorts born 1 January–31 December 1949 for 2020 coverage; 1 January–31 December 1950 for 2021 coverage; 1 January–31 December 1951 for 2022 coverage; and 1 January–31 December 1952 for 2023 coverage

ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

Source: Australian Immunisation Register data as at 3 April 2022 (for 2020 and 2021 coverage), 2 April 2023 (for 2022 coverage) and 4 February 2024 (for 2023 coverage)

Figure 25. Coverage of an adult dose of 13vPCV* in the cohort of Indigenous adults turning 71 years of age† in the year of interest, by jurisdiction, Australia, 2020–2023



* Coverage calculated using the number of Medicare-registered Indigenous adults in each year-wide cohort with an AIR record of having received an adult dose of 13vPCV by 31 December of the relevant year as the numerator and the total number of Medicare-registered Indigenous adults in the relevant cohort as the denominator, expressed as a percentage

Note: The 2020 and 2021 data points differ to what was presented in the 2021 report due to vaccinations given after 71 years of age now being included in the coverage calculations.

† Cohorts born 1 January–31 December 1949 for 2020 coverage; 1 January–31 December 1950 for 2021 coverage; 1 January–31 December 1951 for 2022 coverage; and 1 January–31 December 1952 for 2023 coverage

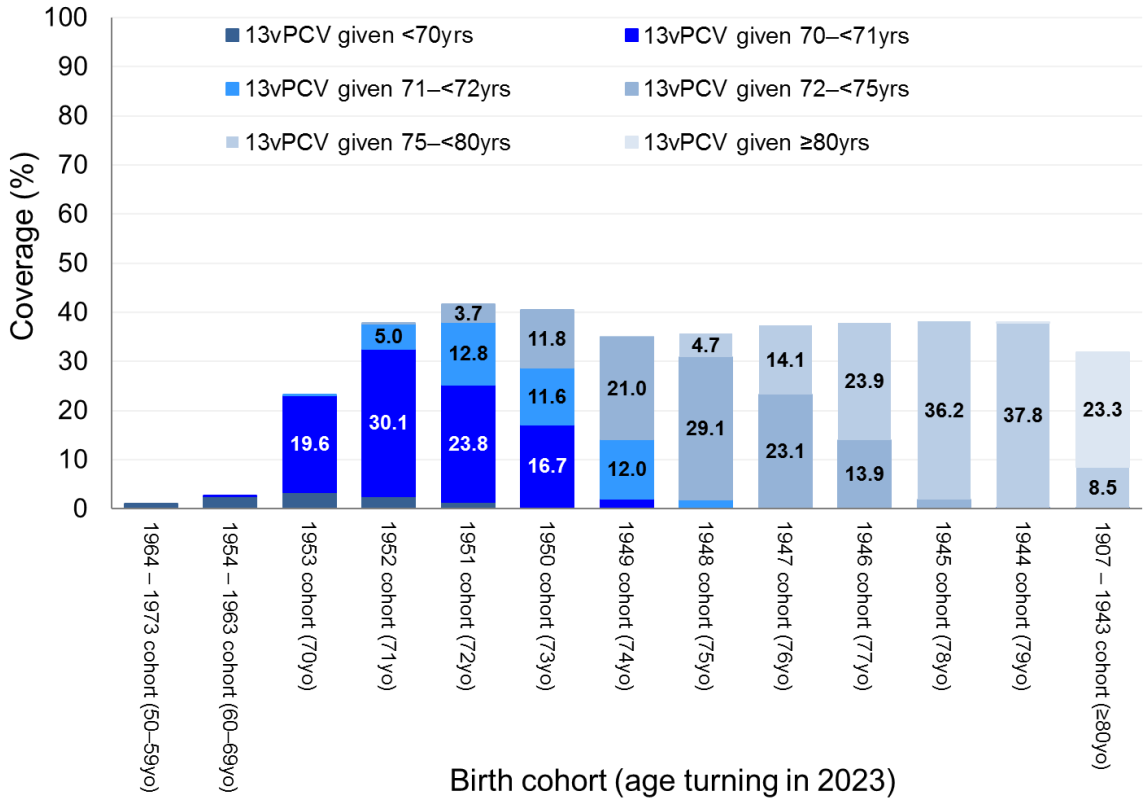
ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

Source: Australian Immunisation Register data as at 3 April 2022 (for 2020 and 2021 coverage), 2 April 2023 (for 2022 coverage) and 4 February 2024 (for 2023 coverage)

Assessing a broad range of age cohorts, coverage of an adult dose of 13vPCV was highest for adults turning 72 years (41.7% overall). The majority of adults turning 70–72 years of age in 2023 who had received an adult dose of 13vPCV by 31 December 2023 were vaccinated at 70 years of age, whereas adults turning 73 years and over in 2023 were predominantly vaccinated at 71 years of age or older (Figure 26). In the entire cohort of adults turning 70 years or older in 2023, overall coverage of an adult dose of 13vPCV was 34.6%. Coverage patterns for Indigenous adults aged 70 years and over were similar (Figure 27), with coverage for the entire cohort of Indigenous adults

turning 70 years or older in 2023 higher than for adults overall at 39.7%. Coverage for Indigenous adults turning 50–59 years in 2023 was 17.5% and coverage for those turning 60–69 years was 23.4%. This was substantially higher than overall coverage (by 1.1 and 2.5 percentage points, respectively) but lower than coverage in older age groups. Coverage for the entire cohort of Indigenous adults turning 50 years or older in 2023 was 23.9%.

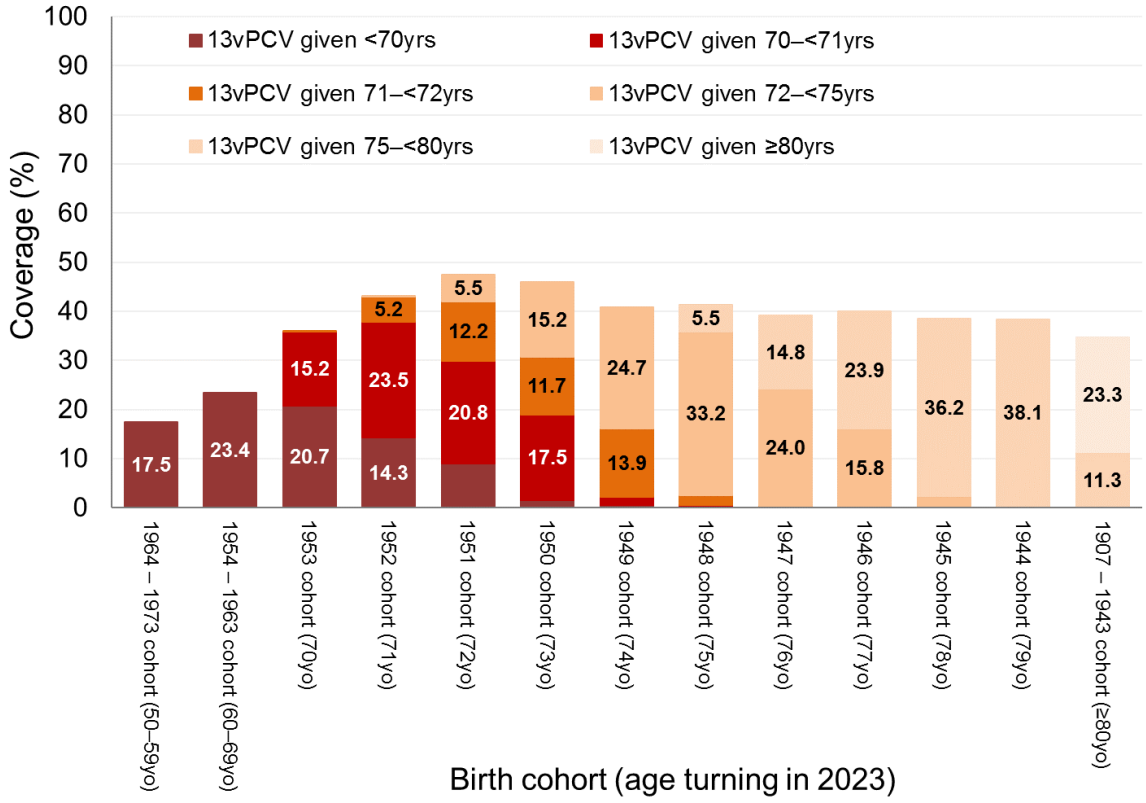
Figure 26. Coverage of an adult dose of 13vPCV* by birth cohort and age at vaccination, Australia, 2023



* Coverage calculated using the number of Medicare-registered adults in each cohort with an AIR record of having received an adult dose of 13vPCV as the numerator and the total number of Medicare-registered adults in the relevant cohort as the denominator, expressed as a percentage. Vaccinations given up to 31 December 2023 are included in the numerator

Source: Australian Immunisation Register data as at 4 February 2024

Figure 27. Coverage of an adult dose of 13vPCV* in Indigenous adults by birth cohort and age at vaccination, Australia, 2023



* Coverage calculated using the number of Medicare-registered Indigenous adults in each cohort with an AIR record of having received an adult dose of 13vPCV as the numerator and the total number of Medicare-registered adults in the relevant cohort as the denominator, expressed as a percentage. Vaccinations given up to 31 December 2023 are included in the numerator

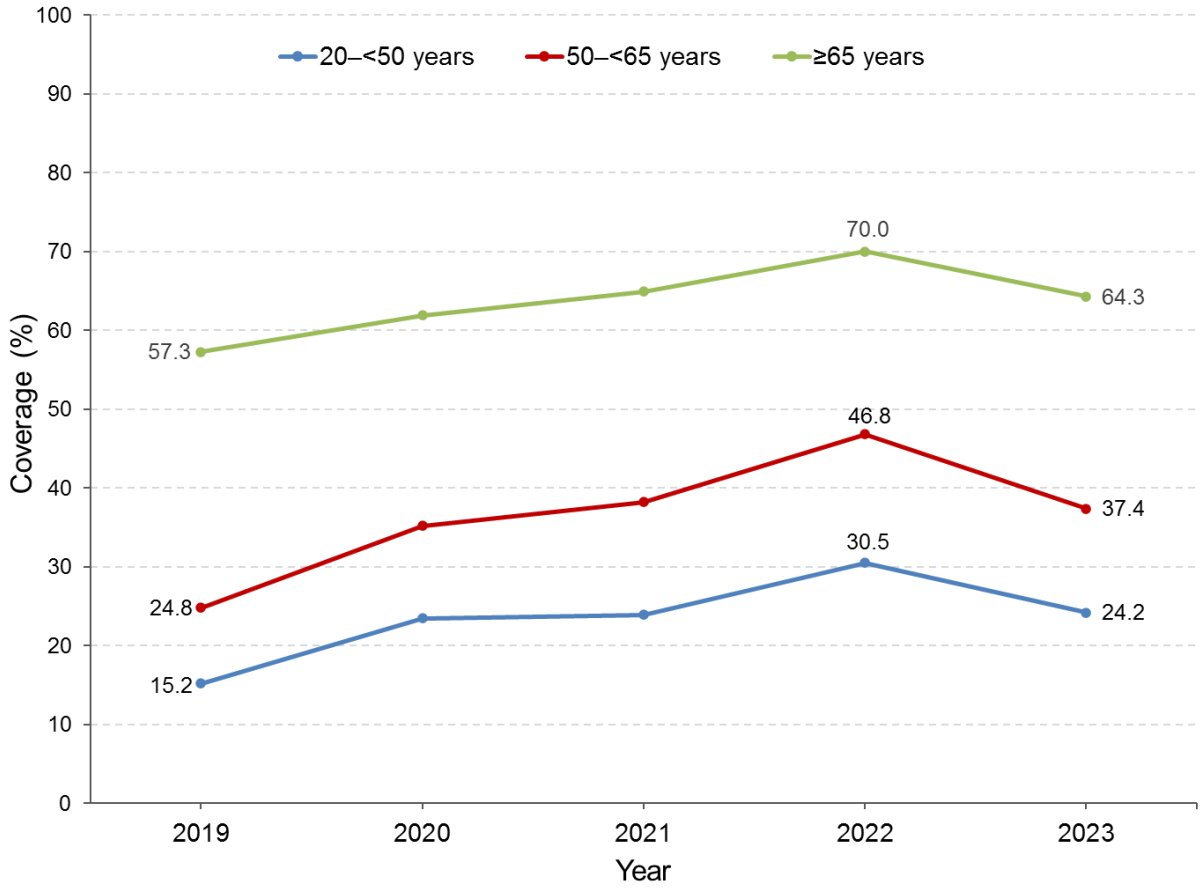
Source: Australian Immunisation Register data as at 4 February 2024

Influenza vaccination coverage

After increasing each year between 2019 and 2022, influenza vaccination coverage in adults decreased in 2023 across all three adult age groups, from 30.5% to 24.2% in the 20 to <50 years age group, 46.8% to 37.4% in the 50 to <65 years age group and 70.0% to 64.3% in the ≥65 years age group (Figure 4 and Figure 28). Coverage was lower in 2023 than in 2022 in all adult age groups in all jurisdictions (Table A9 in the Appendix).

Similarly, influenza vaccination coverage in Indigenous adults in 2023 was lower than in 2022 for all adult age groups, decreasing from 27.4% to 22.3% in the 20 to <50 years age group, 51.4% to 42.2% in the 50 to <65 years age group and 70.3% to 64.1% in the ≥65 years age group (Figure 7). Coverage by jurisdiction is shown in Table A9 in the Appendix.

Figure 28. Coverage of seasonal influenza vaccine* by adult age group,† Australia, 2019–2023



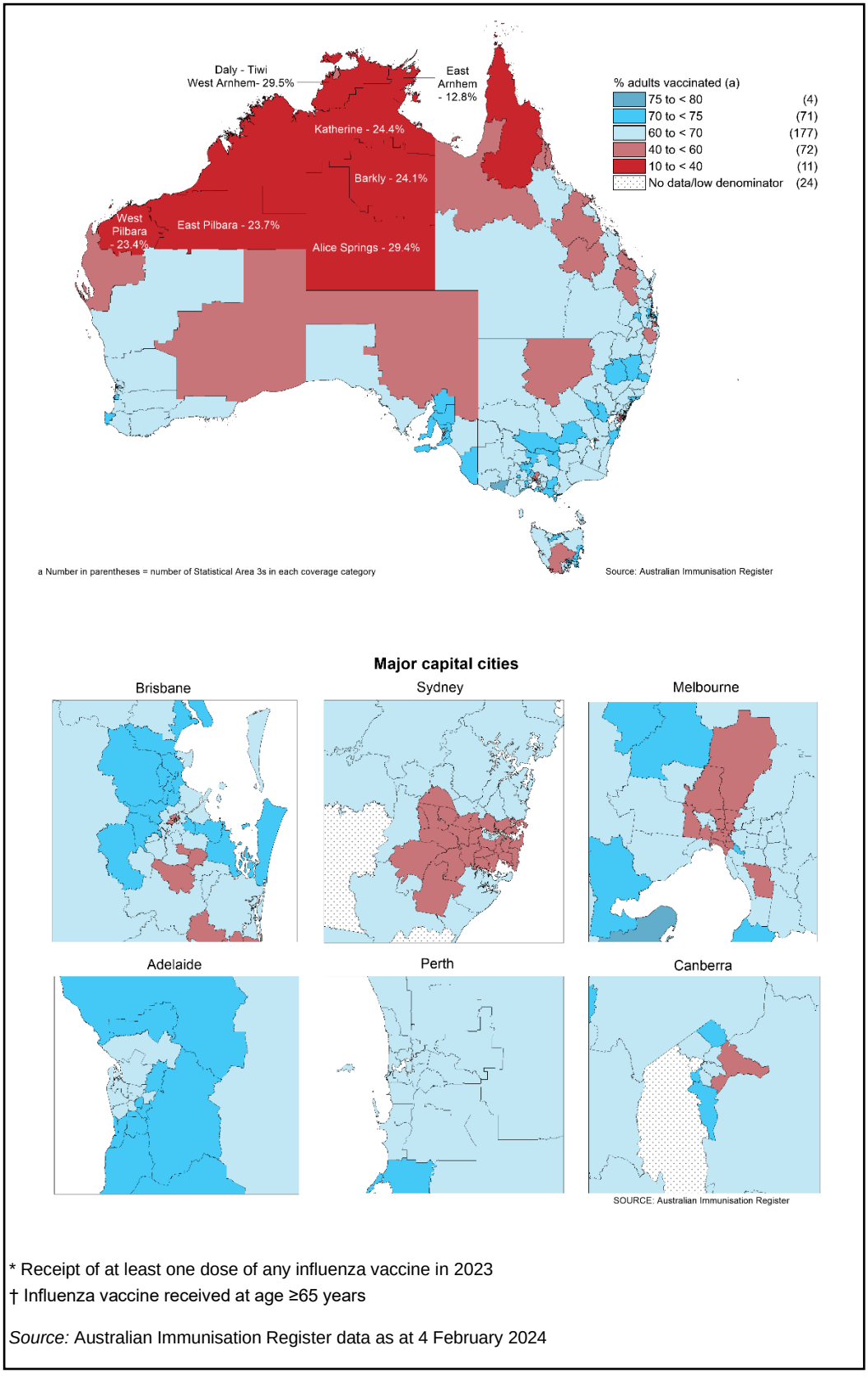
* Receipt of at least one dose of any influenza vaccine in the calendar year of interest

† Categorised into age groups based on age at vaccination

Source: Australian Immunisation Register data as at 31 March 2020 (for 2019 data), 31 March 2021 (for 2020 data), 3 April 2022 (for 2021 data), 2 April 2023 (for 2022 data) and 2 February 2024 (for 2023 data)

Influenza vaccination coverage for adults aged ≥65 years in 2023 varied across Australia (Figure 29). Coverage in many remote areas of Western, Central and Far North Australia was substantially lower than in Southeast Australia, with only 12.8% coverage in East Arnhem, 23.4% in the West Pilbara region, 24.4% in Katherine and 29.4% in Alice Springs. There were also certain inner areas of some capital cities, notably Sydney, Melbourne and Brisbane, where influenza coverage was lower than the national average of 64.3% and lower than in adjacent areas (Figure 29).

Figure 29. Coverage of seasonal influenza vaccine* in adults aged ≥65 years,† by Statistical Area 3, Australia, 2023



* Receipt of at least one dose of any influenza vaccine in 2023

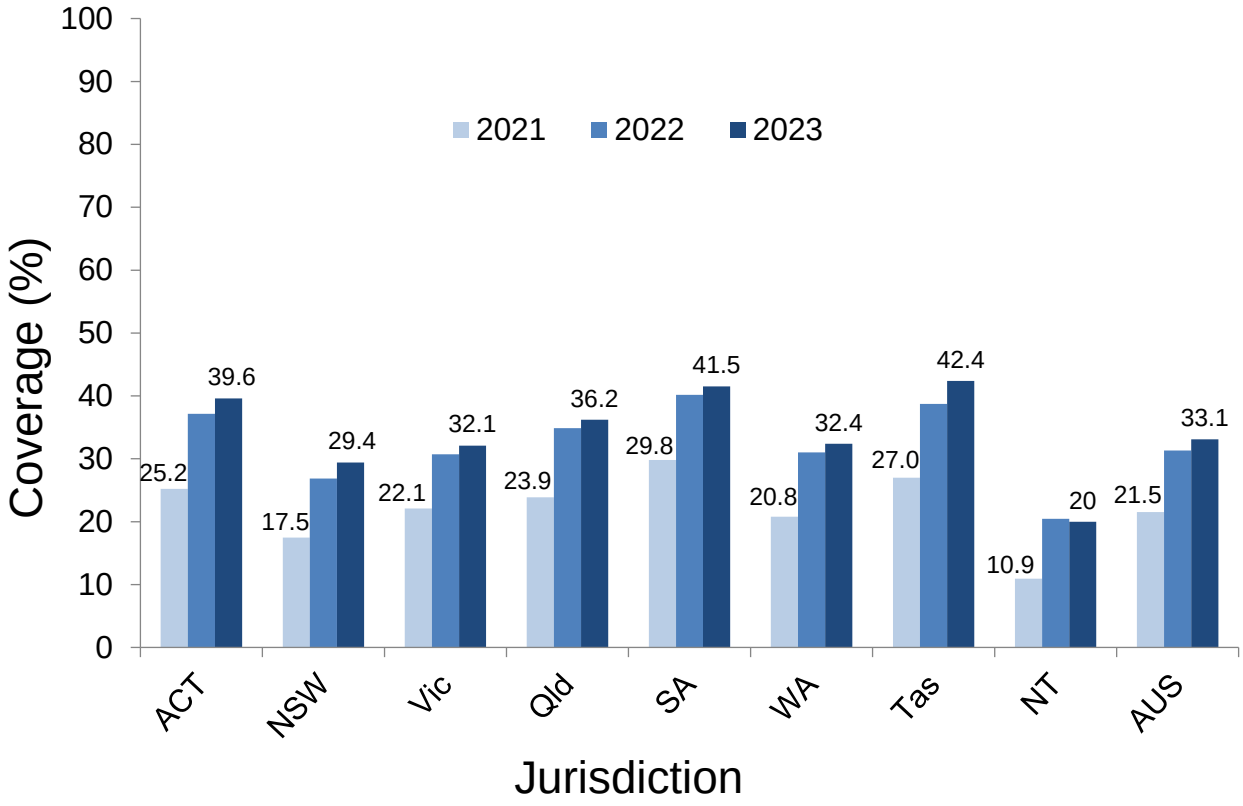
† Influenza vaccine received at age ≥65 years

Source: Australian Immunisation Register data as at 4 February 2024

Adult composite measure of vaccination coverage

Using a composite measure – a dose of influenza vaccine in the calendar year of interest and an adult dose of 13vPCV – coverage was 33.1% overall in adults turning 71 years in 2023, 1.8 and 11.6 percentage points higher than the corresponding figures for 2022 and 2021, respectively (Figure 30). Coverage in Indigenous adults turning 71 years in 2023 was 3.0 percentage points higher than overall, at 36.1%, and 2.5 and 14.8 percentage points higher than in 2022 and 2021, respectively (Figure 31). Coverage using the composite measure varied by jurisdiction, with overall coverage in 2023 ranging from 20.0% in the Northern Territory to 42.4% in Tasmania (Figure 30) and coverage for Indigenous adults ranging from 55.0% in Tasmania to 31.4% in the Northern Territory (Figure 31).

Figure 30. Vaccination coverage* using composite measure (influenza vaccine dose in calendar year of interest and an adult dose of 13vPCV), adults turning 71 years of age in relevant year,† by jurisdiction, 2021–2023

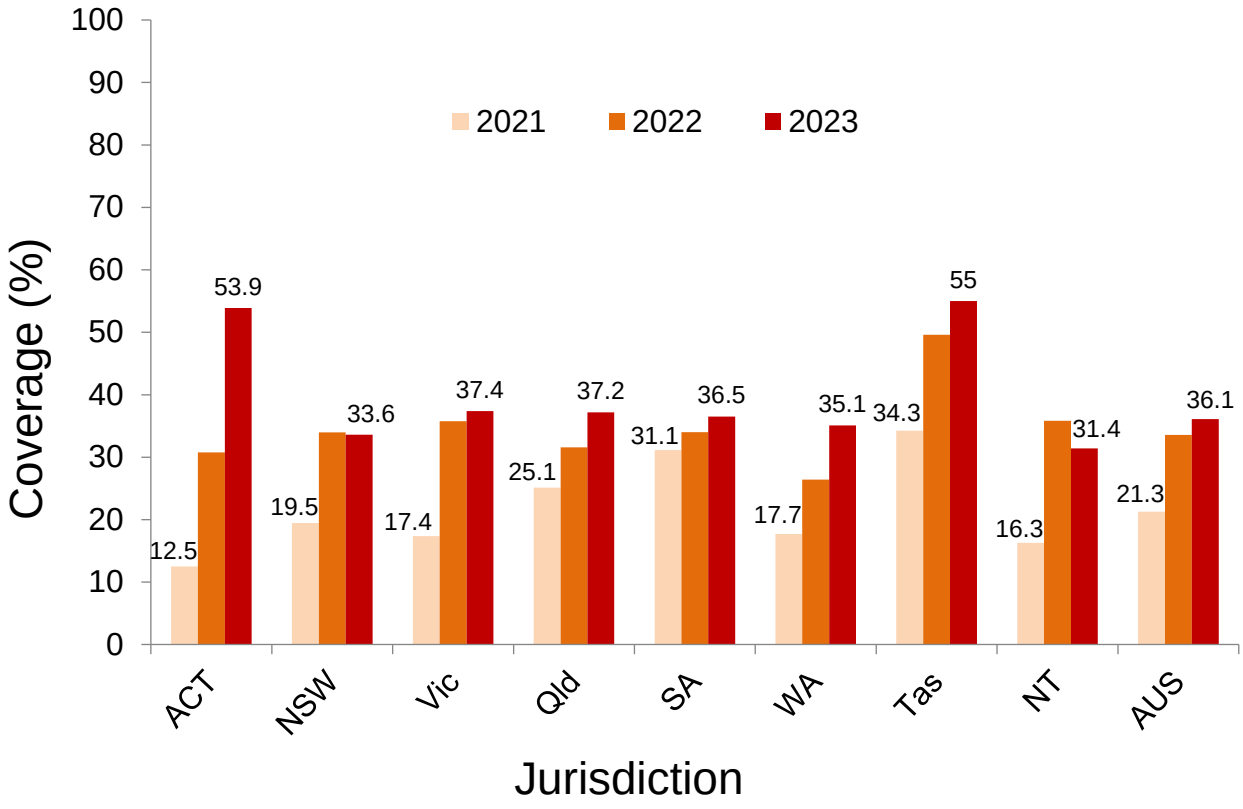


* Coverage calculated using the number of Medicare-registered adults in each cohort with an AIR record of a dose of influenza vaccine in the calendar year of interest and an adult dose of 13vPCV by the end of the relevant year as the numerator and the total number of Medicare-registered adults in the relevant cohort as the denominator, expressed as a percentage

† Cohorts born 1 January–31 December 1950 for 2021 coverage, 1 January–31 December 1951 for 2022 coverage and 1 January–31 December 1952 for 2023 coverage

Source: Australian Immunisation Register data as at 3 April 2022 (for 2021 coverage), 2 April 2023 (for 2022 coverage) and 4 February 2024 (for 2023 coverage)

Figure 31. Vaccination coverage* using composite measure (influenza vaccine dose in past 12 months and an adult dose of 13vPCV), Indigenous adults turning 71 years of age in relevant year,† by jurisdiction, 2021–2023



* Coverage calculated using the number of Medicare-registered Indigenous adults in each cohort with an AIR record of a dose of influenza vaccine in the calendar year of interest and an adult dose of 13vPCV by the end of the relevant year as the numerator and the total number of Medicare-registered Indigenous adults in the relevant cohort as the denominator, expressed as a percentage

† Cohorts born 1 January–31 December 1950 for 2021 coverage, 1 January–31 December 1951 for 2022 coverage and 1 January–31 December 1952 for 2023 coverage

Source: Australian Immunisation Register data as at 3 April 2022 (for 2021 coverage), 2 April 2023 (for 2022 coverage) and 4 February 2024 (for 2023 coverage)

Provider setting

In 2023, the majority (60.9%) of vaccinations given to people of all ages in Australia were administered in general practice settings, with the Northern Territory the only jurisdiction in which a minority (28.0%) of vaccinations were given in general practice (Figure A10). Overall, 18.2% of vaccinations were given in pharmacies (with the proportion highest in the Australian Capital Territory and Western Australia, both at 26.7%); 13.4% were given in local council clinic settings (highest in Victoria, at 19.6%); 2.9% were given in community health service settings (highest in the Northern Territory, at 22.4%); 0.6% were given in Indigenous health service settings (highest in the Northern Territory, at 22.8%); and 3.1% were given in hospitals (Figure A10).

Discussion

This report documents relatively high vaccination coverage in Australia, by global standards, in line with NIP and World Health Organization (WHO) Immunization Agenda 2030 (IA2030)[19] aims to reduce vaccine preventable disease burden across the life course. Opportunities for improvement, particularly in the context of modest but concerning declines in coverage since the advent of the COVID-19 pandemic in 2020, are discussed below.

Vaccination coverage in population overall

Children

Fully vaccinated coverage in Australian children in this 2023 report was 0.1–0.5 of a percentage point lower than in our 2022 report at the 12-month (92.8%, down from 93.3%), 24-month (90.8%, down from 91.0%) and 60-month (93.3%, down from 93.4%) age assessment milestones.[15] This follows the 1.1–1.5 percentage points decrease at these three milestones between the 2020 and 2022 reports,[14,20] which came after approximately eight years of generally increasing coverage.[8-14] Due to the lag time involved in fully vaccinated coverage assessment, fully vaccinated childhood coverage figures in this 2023 report predominantly represent vaccinations due in 2022, when COVID-19 pandemic-related restrictions such as border closures, physical distancing and mask wearing requirements had largely been removed. Decreases of similar magnitude have been seen in comparable developed countries, such as the United Kingdom[21] and New Zealand.[22] Factors contributing to the ongoing decline in coverage in Australian children include a combination of acceptance issues (concerns regarding the safety of vaccines and the increasing number of vaccines on the NIP schedule, 'vaccine fatigue', reduced confidence in the importance of childhood vaccination, and increased polarisation related to the intense attention given to COVID-19 vaccination and associated mandates) and access issues (such as difficulty obtaining GP appointments, reduced bulk-billing and reduced parental/carer prioritisation of vaccination in relation to competing priorities).[23-27]

We also found ongoing impacts on on-time (within 30 days of recommended age) vaccination in young children, with on-time coverage in 2023 approximately 5 percentage points lower than in 2019 for the second dose of DTPa and 10 percentage points lower for the first dose of MMR-containing vaccine.

Coverage was lower in 2023 than in 2022 for all individual vaccines/antigens assessed at the 12-, 24- and 60-month age milestones, other than for Hib at 60 months. The largest decrease was for rotavirus assessed at 12 months of age (1.1 percentage points lower). In the context of Australia's

95% coverage targets – which are particularly critical to measles control – coverage was slightly lower at 24 months of age in 2023 than 2022 for both the first dose of measles-containing vaccine (94.7% versus 95.1%, respectively) and the second dose (92.5% versus 92.7%), but slightly higher for the second dose assessed at 60 months of age (96.4% versus 96.3%). A global resurgence in measles and increasing importations to Australia increase the risk of local transmission, especially to more vulnerable unvaccinated young children, underpinning the need to improve timely and more complete vaccine uptake.

Influenza vaccination coverage in children aged 6 months to 4 years continued to decline, reaching 30.3% in 2023, down from 34.1% in 2022.[20] Conversely, the achievement of high coverage of 74.2% in the Daly–Tiwi–West Arnhem SA3 and 64.7% in the Barkly SA3 area, both of which have a majority Indigenous population, provides an important example to other parts of Australia. Strategies are needed to address the ongoing slide in coverage in young children, noting that influenza vaccination coverage in children aged 6 months to 4 years was over 40% in both 2019 and 2020,[14] following inclusion of influenza vaccination on the NIP in 2018.[28]

Adolescents

In 2023, 84.2% of Australian girls had received at least one dose of HPV vaccine by 15 years of age, down from 85.3% in 2022 and 86.6% in 2020,[14] and 81.8% of boys, down from 83.1% in 2022 and 84.9% in 2020.[14] These figures compare relatively favourably with coverage in 2023 in similar high income countries using the same WHO-recommended assessment methodology: 80% and 75% in girls and boys, respectively, in the UK; 80% and 78% in the US; and 86% and 81% in Canada but are below the 90% coverage target.[29] Modelling indicates that sustained coverage of at least 80% is required in a both sex program to eventually achieve elimination of targeted HPV types in the population;[30] the downward trend with coverage in some subpopulations below 80% is concerning. Reaching and maintaining goals, such as for cervical cancer elimination in 2030 as committed to by the Australian Government,[31] requires higher ongoing coverage levels. Australian coverage figures by 15 years in this report reflect vaccinations predominantly due in school-based programs in 2020 and 2021 i.e. at the height of COVID-19 pandemic restrictions when many school closures occurred, with extent and duration varying by jurisdiction, suggesting additional catch-up strategies for these cohorts are required.

Assessment of coverage of at least one dose of HPV vaccine by 31 December 2023 across broader year-wide birth cohorts showed that coverage in Australia was highest in adolescents turning 18 years in 2023, at 88.1% in girls and 86.3% in boys, approximately half a percentage point higher than in the same age cohorts in 2022 for both girls and boys.[20] However, while national coverage in adolescents turning 13 years in 2023 was superficially similar to that in

2022,[20] when recalculated with South Australia excluded (due to change in delivery of HPV [and dTpa] vaccination in that state from Year 8 in 2022 to Year 7 in 2023) it was around three percentage points lower in 2023 than 2022. While the issues noted above in relation to declining childhood coverage may have contributed to this, the greater decrease suggests possible impacts of the switch to a single-dose HPV vaccine schedule in 2023 such as through the reduction in number of school visits, which may have reduced opportunities for catch-up vaccination in students absent at initial visits, in the context of school absenteeism levels that have not yet returned to pre-pandemic levels.[32] It will be important to further investigate the reasons underpinning these declines and to design and implement additional catch-up vaccination strategies. In particular, such strategies should ensure equitable coverage across disadvantaged groups, given we found that coverage of at least one dose of HPV vaccine in 2023 by 15 years of age was 4–8 percentage points lower in adolescents residing in socio-economically disadvantaged and remote areas. Australia's national strategy for the elimination of cervical cancer calls for a focus on equity in elimination and has an HPV vaccination target of 90% for both females and males, building on WHO's global target of 90% coverage for all girls by age 15 by 2030, in the context of our gender-neutral vaccination program.[31]

With HPV vaccine now funded under the NIP up to 26 years of age, there is also substantial scope for catch-up vaccination in older adolescents and young adults, given that we found coverage of at least one dose of HPV vaccine to be below 80% in females turning 24–25 years and males turning 23–25 years in 2023.

Coverage of an adolescent dose of diphtheria-tetanus-pertussis vaccine in adolescents turning 15 years in 2023 was 85.5%, 1.4 percentage points lower than in 2022.[20] National coverage in adolescents turning 13 years in 2023, recalculated with South Australia excluded, was 2.3 percentage points lower overall in 2023 than 2022, and 4.1 percentage points lower in Indigenous adolescents. Coverage of an adolescent dose of meningococcal ACWY vaccine in adolescents turning 17 years in 2023 was 72.8%, 3.1 percentage points lower than in 2022.[20] It will be important to investigate and address the factors underlying these declines and to promote catch-up vaccination, which for these vaccines is funded on the NIP up to 20 years of age.

For the second time in this series of annual reports, we also calculated adolescent coverage using composite measures, as previously recommended,[17] to assess overall uptake in the adolescent immunisation program. Coverage for adolescents turning 15 years of age using a composite measure comprising at least one dose of HPV vaccine and an adolescent dose of diphtheria-tetanus-pertussis vaccine was 82.6% in 2023, down from 83.7% in 2022 and 84.5% in 2021.[20] Coverage for adolescents turning 18 years of age using a composite measure comprising at least one dose of HPV vaccine, an adolescent dose of diphtheria-tetanus-pertussis vaccine and an

adolescent dose of meningococcal ACWY was 73.0% in 2023, down slightly from 2022 (73.4%) but higher than in 2021 (71.7%).[20] While these figures show relatively high overall adolescent coverage, there is room for improvement, given one in five 15-year-olds and one in four 18-year-olds had not received all the adolescent doses recommended under the NIP.

Adults

Zoster vaccination coverage in adults turning 71 years of age in 2023 was 41.0% in 2023, 0.3 of a percentage point lower than in 2022.[15] Zoster coverage in 2023 was highest in adults turning 76 years (57.6%), reflecting a combination of vaccinations given both at the 70-year NIP schedule point and from 71 years onwards via the catch-up vaccination program, and overall coverage for adults aged 70 years and above was 42.3%. True zoster vaccination coverage is likely higher – particularly in older cohorts – given previously documented under-reporting to the AIR,[33-35] but still suboptimal. Following the replacement of Zostavax on the NIP with Shingrix from November 2023 for all adults aged 65 years and over, Indigenous adults aged 50 years and over, and immunocompromised people aged 18 years and over at high risk,[36] we are monitoring zoster vaccination coverage quarterly to evaluate the uptake of Shingrix in these populations.[37]

Coverage of 13vPCV – which was introduced onto the NIP for all adults aged 70 years and over in July 2020 – was 37.6% in adults turning 71 years of age in 2023, 3.8 percentage points higher than in 2022, with overall coverage of 34.6% for adults aged 70 years and above.[35]

Influenza vaccination coverage in adults, after increasing across all age groups over several years, likely due in part to greater completeness of reporting, including from commercial immunisation providers and others previously unable to report to the AIR, decreased in 2023, with the largest decrease in the 50 to <65 years age group, down from 46.8% in 2022 to 37.4% in 2023.[38,39] This may reflect ‘vaccine fatigue’ and other acceptance and access-related issues, as discussed above.

We also calculated adult coverage using a composite measure (influenza vaccine dose in past 12 months and a previous adult dose of 13vPCV), as previously recommended,[17] to assess overall uptake in the adult immunisation program. Coverage for adults turning 71 years of age using this measure was 33.1% in 2023, up from 31.3% in 2022 but clearly suboptimal. We plan to calculate coverage in the 2024 report using an expanded composite measure that includes Shingrix, now that it is on the NIP.

Vaccination coverage in Indigenous people

Children

Fully vaccinated coverage for Indigenous children decreased marginally between 2022 and 2023 at all three standard age milestones: 12 months (from 90.0% to 89.7%), 24 months (from 87.9% to 87.8%) and 60 months (from 95.1% to 95.0%). This follows the 1.9–3.3 percentage point decrease at these three milestones between the 2020 and 2022 reports.[14,20] Coverage in Indigenous children in 2023 remained around three percentage points lower at 12 and 24 months than in children overall, reflecting longstanding timeliness issues[1,9] exacerbated by the COVID-19 pandemic, but around two percentage points higher at the 60-month milestone. While on-time vaccination coverage for the second dose of DTPa and first dose of MMR-containing vaccines in Indigenous children stabilised in 2023, it remained around five to 10 percentage points lower than prior to the pandemic and around 10 percentage points lower than in non-Indigenous children. Timeliness of vaccination in Indigenous children is particularly an issue in relation to vaccines/antigens due 6 months before the standard assessment milestones, whereas coverage of individual vaccines/antigens due at 6 or 12 months of age with no further doses required at 18 months (meningococcal ACWY, polio and hepatitis B vaccines) was 95.4% or greater in Indigenous children at 24 months in 2023. Similarly, although coverage in 2023 for the second dose of MMR and varicella (usually given as measles-mumps-rubella-varicella [MMRV] vaccine at 18 months) in Indigenous children was 90.7% at 24 months, it was 98.3% at 60 months.

Coverage of meningococcal B vaccine – which was introduced onto the NIP for all Indigenous children in July 2020 – was higher in 2023 than 2022 – 81.0% versus 80.4% for the first dose, 80.0% versus 78.6% for the second dose and 71.7% versus 69.8% for the third dose.[20] Third-dose coverage figures likely underestimate course completion, as only two doses are required if the first dose is administered after 12 months of age.

Influenza vaccination coverage in Indigenous children aged 6 months to 4 years was 1.5 percentage points lower in 2023 (23.1%) than in 2022 (24.6%) and 3.8 percentage points lower in those aged 5 to 9 years (14.6% in 2023 versus 18.4% in 2023). Coverage was 7.2 percentage points lower in Indigenous children aged 6 months to 4 years than overall coverage, and 3.3 percentage points lower in those aged 5 to 9 years, despite influenza vaccination being funded under the NIP for all Indigenous age groups.

Coverage by 30 months of age for the first dose of hepatitis A vaccine and the fourth dose of 13vPCV – funded under the NIP for Indigenous children in four jurisdictions only (South Australia, Northern Territory, Queensland and Western Australia) – remained largely stable in 2023 at around

80%. Improving uptake for both of these additional vaccines is important, but particularly so for the fourth dose of 13vPCV, as invasive pneumococcal disease notification rates are twice as high in Indigenous children than other children and 5–10 times as high in adults.[40] In contrast, despite relatively modest hepatitis A vaccine coverage through the targeted NIP program, hepatitis A notification rates have remained consistently lower in Indigenous people of all ages than others since 2007.[40]

Adolescents

Coverage of at least one dose of HPV vaccine for Indigenous girls and boys by 15 years of age was 2–3 percentage points lower in 2023 than 2022 (80.9% versus 83.0%, respectively, for girls and 75.0% versus 78.1% for boys). These decreases were larger than the decreases in adolescents overall, leading to coverage in 2023 being 3.3 percentage points lower than overall for Indigenous girls and 6.8 percentage points lower for Indigenous boys. National coverage in Indigenous adolescents turning 13 years in 2023, recalculated with South Australia excluded due to aforementioned program changes, was three percentage points lower in 2023 than 2022 for boys and six percentage points lower for girls. These decreases, which were larger than those observed overall, suggest possible greater impacts on Indigenous adolescents of the switch to a single-dose HPV vaccine schedule and any associated reduction in number of school visits, potentially due to higher levels of absenteeism among Indigenous students.[32,41]

As a result, coverage of at least one dose of HPV vaccine by the end of 2023 was 14 percentage points lower in Indigenous girls turning 13 years of age in 2023 than overall, and 15.8 percentage points lower in Indigenous boys. While the disparity decreased with increasing age, with coverage higher than overall in Indigenous girls turning 17 years and Indigenous boys turning 19 years of age in 2023, more than two-fifths of Indigenous women and men turning 24–25 years in 2023 had not been vaccinated, indicating substantial scope for catch-up vaccination. Efforts to address declines and improve HPV vaccination coverage across all eligible Indigenous age groups are crucial, given the much higher rates of cervical cancer in Indigenous women.[42] A stronger focus on ensuring equitable HPV vaccine coverage is particularly needed given the increasing disparities in coverage we document in socio-economically disadvantaged and remote areas, where Indigenous adolescents are more likely to live than their non-Indigenous counterparts.[43,44]

Patterns of diphtheria-tetanus-pertussis vaccination coverage among Indigenous adolescents were broadly similar to HPV vaccination coverage, which was as expected, given the two vaccines are usually given together at the same school visit. National diphtheria-tetanus-pertussis coverage in Indigenous adolescents turning 13 years in 2023, with South Australia excluded, was four percentage points lower in 2023 (58.8%) than in 2022 (62.9%) and 15 percentage points lower

than overall coverage. The disparity decreased with increasing age, with coverage 0.1 of a percentage point higher than overall in Indigenous adolescents turning 19 years of age in 2023.

Coverage of meningococcal ACWY vaccination in Indigenous adolescents turning 17 years was 3.1 percentage points lower in 2023 (62.3%) than 2022 (65.6%)[20] and 10.5 percentage points lower than overall coverage. This disparity decreased with increasing age, but not to the extent seen with HPV and diphtheria-tetanus-pertussis vaccination, with coverage reaching 72.5% in Indigenous adolescents turning 19 years in 2023, seven percentage points below overall coverage. Strategies to improve meningococcal ACWY coverage in Indigenous adolescents are particularly needed given the elevated risk of meningococcal disease in this age group and serogroup W outbreaks in Indigenous communities in recent years.[40]

Adults

Zoster vaccination coverage in Indigenous adults turning 71 years in 2023 was 36.1%, 0.4 of a percentage point lower than in 2022, with coverage highest for those turning 75 years (58.3%) and coverage for the entire cohort of Indigenous adults turning 70 years or older in 2023 higher than overall coverage (43.6% versus 42.3%).

Coverage of an adult dose of 13vPCV in Indigenous adults turning 71 years in 2023 was 43.0%, 5.3 percentage points higher than in 2022, with coverage highest for those turning 72 years (47.5%) and coverage for the entire cohort of Indigenous adults turning 70 years or older in 2023 five percentage points higher than for adults overall (39.7% versus 34.6%). However, only 17.5% of Indigenous adults aged 50–59 years in 2023, and 23.4% of those aged 60–69 years, were recorded as having received an adult dose of 13vPCV, despite the vaccine being funded under the NIP for all Indigenous adults in this age group since July 2020. The funding of Shingrix on the NIP for Indigenous adults aged 50 years and older from November 2023 may provide opportunities to increase coverage of both 13vPCV and zoster vaccine in younger Indigenous adults, including through promotion of concomitant vaccination.

Influenza vaccination coverage was 5–11 percentage points lower in 2023 than 2022 across Indigenous adult age groups. While relatively high for those aged ≥65 years (64.1%), coverage was considerably lower for those aged 20 to <50 years (22.3%) and 50–64 years (42.2%), despite influenza vaccine being funded on the NIP for all Indigenous adults due to the increased risk of severe disease. However, coverage in these age groups in the Australian Capital Territory and the Northern Territory was substantially higher than in other jurisdictions.

Conclusions

Vaccination coverage in Australia is relatively high by global standards, in line with NIP and IA2030 aims to reduce vaccine preventable disease burden across the life course. However, this report shows that in the fourth year of the COVID-19 pandemic and after the removal of COVID-19 pandemic related restrictions there have continued to be modest but concerning declines in vaccination coverage in children and adolescents relative to pre-pandemic peaks, with decreases greater in Indigenous children and adolescents. Factors contributing to these ongoing declines likely include a combination of acceptance issues (concerns about and reduced confidence in vaccination) and access issues (actual or perceived barriers to vaccination, including prioritisation by parents and carers in relation to other competing priorities). Declines in adolescent coverage of HPV and diphtheria-tetanus-pertussis vaccines, potentially influenced by a reduced number of school visits and thus opportunities for catch-up vaccination, in the context of the new one-dose HPV vaccine schedule and school absenteeism levels that have not yet returned to pre-pandemic levels, also need to be addressed. The picture for adult coverage in 2023 is more mixed, with coverage increasing for 13vPCV, stable for zoster and decreasing for influenza vaccination, though consistently suboptimal across all vaccines. Ongoing monitoring of vaccination coverage and further exploration of the reasons underpinning these decreases and suboptimal coverage are needed. Evidence-based approaches to effectively address barriers and increase uptake and equity of coverage are needed to close growing immunity gaps and improve protection against the wide range of vaccine preventable diseases.

Appendix

Table A1. Australian NIP Schedule in 2023

Age	Vaccine											
Children												
Birth	Hep B											
2 months	Hep B	DTPa	Hib	Polio					13vPCV	Rotavirus		MenB*
4 months	Hep B	DTPa	Hib	Polio					13vPCV	Rotavirus		MenB*
6 months	Hep B	DTPa	Hib	Polio					13vPCV#			MenB*
12 months					MMR		Men ACWY		13vPCV			MenB*
18 months		DTPa	Hib			MMRV		Hep A‡				
24 months												
48 months		DTPa		Polio				Hep A‡	23vPPV§			
6 months–9 years											Flu†	
Adolescents												
9–14 years									23vPPV§			
12–15 years		dTpa										HPV
14–19 years							Men ACWY					
10–19 years											Flu†	
Adults												
20–49 years											Flu†	
≥50 years						HZ‡‡					Flu†	13vPCV, 23vPPV¶
≥65 years											Flu†	
Pregnant women (any age)		dTpa**									Flu††	
70 years						HZ‡‡						13vPCV§§

Hep B = hepatitis B; DTPa = diphtheria–tetanus–pertussis – 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; MenB = meningococcal B vaccine; MMRV = measles-mumps-rubella-varicella; dTpa = diphtheria–tetanus–pertussis – adolescent/adult formulation; HPV = human papilloma virus; 23vPPV = 23-valent pneumococcal polysaccharide vaccine'; HZ = herpes zoster* Indigenous children only (since July 2020) receive a dose of meningococcal B vaccine at 2, 4 and 12 months of age, with an additional dose at 6 months of age for those with specific medical risk conditions
Indigenous children living in the Northern Territory, Western Australia, Queensland and South Australia, and children with specified underlying medical conditions that predispose them to invasive pneumococcal disease
† Annual vaccination – all Indigenous persons aged over 6 months; non-Indigenous adults aged ≥65 years
‡ Indigenous children – doses at 18 months and 4 years of age in the Northern Territory, Western Australia, Queensland and South Australia
§ Medically at-risk children/adolescents and Indigenous children living in the Northern Territory, South Australia, Queensland and Western Australia
¶ Indigenous adults aged ≥50 years and all adults aged ≥65 years. 13vPCV vaccine replaced 23vPPV vaccine in mid-2020
** During the third trimester of pregnancy
†† At any stage of pregnancy

‡‡ A single dose of HZ vaccine was funded for adults aged 70 years (with catch-up for 71–79 year olds to 2021) who have not previously received a dose of HZ vaccine. In November 2023, Shingrix replaced Zostavax on the NIP and was funded for adults aged ≥65 years, Indigenous people aged ≥50 years and immunocompromised people aged ≥18 years at high risk of herpes zoster infection
§§ A 13vPCV vaccine for non-Indigenous elderly adults from mid-2020

Box 1. Significant changes in immunisation policy and coverage calculation algorithms, Australia, 2019–2023[45]

November 2023

* Shingrix replaced Zostavax on the NIP and funded for adults aged ≥65 years, Indigenous people aged ≥50 years and immunocompromised people aged ≥18 years at high risk of herpes zoster infection

July 2023

* Combined DT5aP-hepB-IPV-Hib(PRP-OMP) vaccine (Vaxelis) funded under the NIP as an alternative vaccine to Infanrix hexa

* Catch-up program of meningococcal B vaccine (Bexsero) available for all Aboriginal and Torres Strait Islander infants under 2 years of age (originally due to end on 30 June 2023)

February 2023

* Funded schedule of 9vHPV, routinely offered to adolescents in Year 7 (around the age of 12−13 years), changed from two doses to a single dose

* Funded catch-up 9vHPV program extended to young adults up to and including 25 years of age, increasing from 19 years of age

October 2021

* The Australian Technical Advisory Group on Immunisation recommends first inactivated recombinant zoster vaccine (Shingrix) over first live zoster vaccine (Zostavax) in individuals aged ≥50 years for prevention of herpes zoster and its complications because of the higher efficacy of Shingrix

May 2021

* First recombinant quadrivalent influenza vaccine registered for use in people aged ≥18 years

July 2020

* Funded schedule expanded for Indigenous children living in the NT, SA, Qld and WA from 13vPCV at 2, 4, 6 and 12 months (3+1) to include an additional dose of 23-valent pneumococcal polysaccharide vaccine (23vPPV) at 4 years of age and a 2nd dose 5–10 years later

(Cont.)

* A single dose of 13vPCV is recommended and funded for Indigenous adults at 50 years of age, followed by a dose of 23vPPV 12 months later and a 2nd dose of 23vPPV 5–10 years after that

* A single dose of 13vPCV is recommended and funded for non-Indigenous adults at 70 years of age, replacing the previously funded dose of 23vPPV at 65 years of age

* Meningococcal B vaccine funded for all Indigenous children aged <12 months and individuals of any age with specified high-risk medical conditions. Catch-up available for all Indigenous children aged <2 years (up to 23 months)

* Scheduled ages for funded hepatitis A vaccination (2 doses) for Indigenous children in the NT, Qld, SA and WA changed to 18 months and 4 years

March 2020

* All children aged 6 months to <5 years funded for influenza vaccine under NIP

* First enhanced quadrivalent influenza vaccine (adjuvanted) funded nationally for adults aged 65 years and over

April 2019

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

March 2019

* Annual seasonal influenza vaccination funded by the NT for all children aged 6 months to <5 years

February 2019

* Indigenous children and adolescents aged 5–14 years funded for influenza vaccine under NIP (all Indigenous people aged 6 months and older now eligible for a funded annual influenza vaccine)

Detailed methods

The Australian Immunisation Register

The Australian Childhood Immunisation Register (ACIR) was established on 1 January 1996 by transferring demographic data from Medicare on all enrolled children aged <7 years.[46] On 30 September 2016, the ACIR expanded to become the Australian Immunisation Register (AIR), which collects data on all vaccinations given from birth to death.[47] All people registered with Medicare are automatically added to the AIR and assigned a unique Personal Identification Number (PIN) that then travels with that person for life, across all relevant Medicare card numbers (e.g. where there are multiple cards due to family circumstances or maturity). Participation in the AIR is 'opt-out', and so the AIR constitutes a nearly complete population register for Australian residents.[46] Individuals who are not Medicare-registered but for whom a vaccination encounter is reported to the AIR are assigned a Supplementary Identification Number (SIN),[48] with subsequent assignment of a PIN where the individual is identified to be Medicare-registered. Since 2001, vaccinations given overseas can be recorded if an Australia-based provider endorses their validity. Data are transferred to the AIR when a recognised Australia-based immunisation provider supplies details of an eligible vaccination. This occurs predominantly via medical practice management software or direct data entry on the AIR website. A person remains active on the AIR until Medicare is notified that they have either died or permanently left Australia, after which an 'end date' is applied to their AIR record. All vaccination encounter records for a person remain on the register indefinitely. Mandatory reporting to the AIR was introduced from 1 July 2021 for all vaccines given to people of any age under the NIP, as well as earlier for COVID-19 vaccines (from 20 February 2021) and influenza vaccines (from 1 March 2021).

Data source

The AIR contains limited information for each individual (PIN/SIN status, date of birth, gender, Indigenous status, postcode) and regarding vaccinations received (brand/type, dose number, encounter date, immunisation provider). Individuals with a SIN (i.e. not Medicare-registered) are excluded from all coverage analyses in this report, along with those whose records have an 'end date'. Prior to analysis, NCIRS removes duplicate AIR person records (i.e. where the PIN is identical), retaining only the most up-to-date record based on Medicare registration date, as well as duplicate vaccination records (i.e. where the PIN, vaccine type, vaccine dose and encounter date are identical). To allow for known data entry errors at the time of reporting to AIR, NCIRS uses statistical programs to calculate coverage for particular vaccines that look for vaccine dose

numbers greater than the nominal last dose (e.g. for second MMR dose coverage, the programs look for doses 2, 3 or 4 of MMR).

Indigenous status

Indigenous status on the AIR is recorded as ‘Indigenous’, ‘non-Indigenous’ or ‘unknown’. For this report, individuals whose Indigenous status was not specified (0.6% of persons on the AIR, as at 4 February 2024) were classified as non-Indigenous for the purposes of analysis. While Indigenous status is available in AIR, other demographic parameters such as country of birth, ethnicity and medical conditions (including pregnancy) are not.

Provider setting

The proportion of all vaccinations recorded as administered in 2023 in the AIR was calculated by provider setting and by jurisdiction, for people of all ages combined.

Vaccination coverage – children

This report predominantly uses AIR data as at 4 February 2024. The cohort method has been used for calculating coverage at the population level (national and state/territory) since the inception of the ACIR.[49] Vaccine/antigen doses included in the algorithms to assess whether a child is fully vaccinated are set by the Australian Government Department of Health and Aged Care (‘the Department’). The standard methodology used by Services Australia/the Department and NCIRS assesses coverage at 6–12 months after vaccines are due, to allow time for delayed vaccination. Cohort vaccination status is 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). Only vaccines given on or before a child’s 1st, 2nd or 5th birthday, respectively, are included in coverage calculations.[49] If a child’s records indicate receipt of the last dose of a vaccine that required more than one dose to complete the series, it is assumed that earlier vaccines in the sequence were given.

For most analyses in this report, 12-month-wide cohorts were used; specifically, children born between 1 January 2022 and 31 December 2022 for the 12-month milestone, between 1 January 2021 and 31 December 2021 for the 24-month milestone, and between 1 January 2018 and 31 December 2018 for the 60-month milestone. However, to assess fully vaccinated trends over time, we used three-month-wide birth cohorts, with children aged 12 to <15 months for the 12-month assessment age, children aged 24 to <27 months for the 24-month assessment age and children aged 60 to <63 months for the 60-month assessment age.

The proportion of children fully vaccinated was calculated using the number of Medicare-registered children fully vaccinated with the vaccines of interest by the designated age as the numerator and the total number of Medicare-registered children in the relevant age cohort as the denominator. Definitions of fully vaccinated coverage are provided in Table A2 in the Appendix; definitions for the 12-, 24- and 60-month milestones have been developed by the Department for the purpose of standardised reporting. However, vaccination coverage estimates in this report may differ slightly from estimates published elsewhere that are calculated using rolling annualised quarterly coverage data.

Vaccination coverage was also calculated for individual NIP vaccines/antigens, including those given in early childhood but not routinely reported on and not part of fully vaccinated calculations at 12, 24 and 60 months of age. This additional coverage assessment included the second dose of rotavirus vaccine by 12 months of age, the first dose of hepatitis A vaccine in Indigenous children by 30 months of age and the fourth dose of 13vPCV in Indigenous children by 30 months of age. Coverage of doses 1–3 of meningococcal B vaccine by 24 months of age, as well as course completion (defined as receipt of three doses if the first meningococcal B vaccine dose was received prior to 1 year of age or receipt of two doses if the first dose was received after having turned 1 year of age) was assessed for the cohort of Indigenous children born in 2021. The proportion of children vaccinated with the relevant vaccine/antigen dose was calculated using the number of Medicare-registered children vaccinated with the relevant vaccine/antigen dose by the designated age as the numerator and the total number of Medicare-registered children in the relevant age cohort as the denominator.

Influenza vaccination coverage for children aged 6 months to <5 years and 5 to <10 years was calculated using the number of children 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. 2022 or 2023) as the numerator and the total number of children registered on the AIR in each relevant age group as the denominator. Vaccination numerators were based on age at vaccination, and age group denominators were based on age at 30 June in the year of interest. Analyses were undertaken by age group, Indigenous status, jurisdiction and year.

Table A2. Vaccinations required to be deemed fully vaccinated by each assessment milestone, 2023

Milestone	Vaccinations
9 months/12 months (Cohort born 1 January 2022–31 December 2022)	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)
15 months (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 3 or 4 13vPCV (due at 6 or 12 months) Dose 1 meningococcal C-containing vaccine (due at 12 months) Dose 1 MMR (due at 12 months)
21 months/24 months (Cohort born 1 January 2021–31 December 2021)	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 or 4 13vPCV (due at 6 or 12 months)
51 months/60 months (Cohort born 1 January 2018–31 December 2018)	Dose 4 or 5 DTPa (due at 48 months) Dose 4 polio (due at 48 months)

* Children who had Comvax, Generic HIB and/or PedvaxHIB recorded on the AIR only require dose 2 Hib to be deemed fully vaccinated by 12 months and dose 3 or 4 to be deemed fully vaccinated by 24 months. Children who had ActHIB, Hexaxim, Hiberix, HibTITER, Infanrix Hexa, Menitorix, Pediacel, ProHIBit and Poliacel recorded on the AIR only require dose 3 if it was given at over 15 months of age to be deemed fully vaccinated by 24 months

DTPa = diphtheria-tetanus-pertussis paediatric formulation; Hep B = hepatitis B; Hib = *Haemophilus influenzae* type b; 13vPCV = 13-valent pneumococcal conjugate vaccine; MMR = measles-mumps-rubella

On-time vaccination coverage

On-time vaccination was defined as receipt of the scheduled vaccine dose within 30 days of the recommended age. Specifically, children who received the second dose of DTPa-containing vaccine (due at 4 months of age under the NIP) before they were more than 5 months of age were classified as on time for that dose, and children who received the first dose of MMR-containing vaccine (due at 12 months of age under the NIP) before they were more than 13 months of age were classified as on-time for that dose. On-time vaccination was measured in three-month-wide birth cohorts, defined by the quarter and year in which the children in each cohort were due to receive the vaccine dose being assessed. The proportion of each cohort vaccinated on time was calculated using the number of Medicare-registered children vaccinated within 30 days of the recommended age of the vaccine of interest as the numerator and the total number of Medicare-registered children in the relevant cohort as the denominator. This is a more timely way to assess on-time vaccination (as children due for the relevant vaccines in 2023 were included in the analysis) and differs to how timeliness of vaccination has been calculated in previous reports prior to the 2022 report, where the denominator was the number of Medicare-registered children in the relevant cohort who had ever received the vaccine of interest and required assessment of timeliness at up to 3 years after doses were due, to allow time for very late vaccinations to be included in the analysis.

To capture other aspects of timeliness, fully vaccinated coverage was also assessed at 3 months after last vaccine dose due – that is, earlier than the standard assessment milestones, at 9, 15, 21 and 51 months of age – by Indigenous status, PHN and jurisdiction. The definitions of fully vaccinated coverage used are provided in Table A2 in the Appendix.

Remoteness status

Areas of residence of children were defined as ‘Major cities’, ‘Inner regional’, ‘Outer regional’, ‘Remote’ and ‘Very remote’ using the Accessibility/Remoteness Index of Australia (ARIA++).[50] ARIA++ is a continuous varying index with values ranging from 0 (high accessibility) to 15 (high remoteness) and is based on road distance measurements from over 12,000 populated localities to the nearest service centres in five categories based on population size. For analysis in this report, we combined the two ‘Regional’ categories (‘Inner regional’ and ‘Outer regional’) into one category and the two ‘Remote’ categories (‘Remote’ and ‘Very remote’) into one category. ARIA++ Accessibility/Remoteness categories were assigned to each child using their recorded postcode of residence on the AIR.

Socio-economic status

Vaccination coverage and timeliness were assessed by area level socio-economic status using the Australian Bureau of Statistics Socio-Economic Indexes for Areas (SEIFA) Index of Economic Resources.[51] The SEIFA index category was assigned for each individual using their recorded postcode of residence on the AIR. For this analysis, we compared vaccination coverage for children living in postcodes classified as being in the top quintile of all postcodes with regard to economic resources with vaccination coverage for children living in postcodes classified as being in the bottom quintile of postcodes with regard to economic resources.

Small area analysis

SA3

Analysis of coverage was undertaken at the small area level using the Australian Bureau of Statistics-defined SA3,[52] which was chosen because each SA3 is small enough to show differences within jurisdictions but not so small as to render maps unreadable. For reasons of both confidentiality and precision of coverage estimates, SA3s with denominators of less than 26 children were not included in any small area coverage analysis. Maps were created using version 15 of the MapInfo mapping software[53] and the Australian Bureau of Statistics Census Boundary Information. As postcode is the only geographical data field available on the AIR, the Australian Bureau of Statistics Postcode to SA3 Concordance 2021 file was used to match residential postcodes on AIR to SA3s.[54]

PHN

Analysis of coverage was also undertaken at the Primary Health Network (PHN) level. PHNs are organisations that work to improve coordination of healthcare in their area. There are 31 PHNs in Australia.

Vaccination coverage – adolescents

The WHO recommends assessing HPV vaccination coverage by 15 years of age for the purpose of comparison internationally and over time. In the cohorts of Medicare-registered adolescents turning 15 years of age during 2023 or 2022 (i.e. cohorts born in 2008 or 2007, respectively), the proportion who had received at least one dose of HPV vaccine after their 9th birthday (as HPV vaccine is registered from 9 years of age) but before their 15th birthday was calculated. Analysis of HPV vaccination coverage by 15 years of age was undertaken by year, gender, Indigenous status, jurisdiction, and socio-economic status and remoteness category of area of residence. It should be

noted that adolescent coverage estimates in this report may differ slightly from estimates published elsewhere that are calculated using rolling annualised quarterly coverage data.

Vaccination coverage of individual adolescent vaccines – namely, at least one dose of HPV vaccine given at ≥9 years of age, a dose of diphtheria-tetanus-pertussis vaccine (recorded on the AIR as either dTpa or DTPa) given at ≥10 years of age and a dose of meningococcal ACWY vaccine given at ≥10 years of age – were also calculated using single year-wide birth cohorts of Medicare-registered individuals, with reference to the age the cohorts were turning in 2023. These vaccines are predominantly given under the NIP as part of the state/territory school-based vaccination programs – HPV and dTpa vaccines are provided to students in Year 7 (typically around the age of 12–13 years) and meningococcal ACWY vaccine is provided to students in Year 10 (typically around the age of 15–16 years). However, adolescents who miss or opt out of receiving these vaccines at school can be vaccinated by other providers, with dTpa and meningococcal vaccine funded up to 19 years of age and HPV vaccine funded up to 25 years of age. Coverage was therefore assessed in single year-wide cohorts turning 13–25 years of age (for HPV vaccine), 13–19 years of age (for adolescent dose of diphtheria-tetanus-pertussis vaccine) and 15–19 years of age (for adolescent dose of meningococcal ACWY vaccine). Analysis was undertaken by gender (HPV vaccine only), birth cohort/age, Indigenous status and jurisdiction.

To assess full coverage of the adolescent vaccinations funded under the NIP, two adolescent composite measures of vaccination coverage were calculated, as previously recommended.[17] One composite measure – receipt of both an HPV vaccine dose and an adolescent dose of diphtheria-tetanus-pertussis vaccine by 31 December of the relevant year – was assessed in the cohort of Medicare-registered adolescents turning 15 years of age in 2023 or 2022. Another composite measure – receipt of an HPV vaccine dose and adolescent doses of diphtheria-tetanus-pertussis and meningococcal ACWY vaccine by 31 December of the relevant year – was assessed in the cohort of Medicare-registered adolescents turning 18 years of age in 2023 or 2022. Analysis of both adolescent composite measures was undertaken by Indigenous status and jurisdiction.

Influenza vaccination coverage for adolescents aged 10 to <20 years was calculated using the number of Medicare-registered adolescents 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. 2023 or 2022) as the numerator and the total number of adolescents registered on the AIR in each relevant age group as the denominator. Vaccination numerators were based on age at vaccination, and age group denominators were based on age at 30 June in the year of interest. Analysis was undertaken by age group, Indigenous status, jurisdiction and year.

Vaccination coverage – adults

Adult zoster vaccination coverage was calculated using the cohort method for Medicare-registered adults turning 71 years of age during 2023, 2022, 2021, 2020 or 2019 (i.e. cohorts born in 1952, 1951, 1950, 1949 or 1948, respectively) and for a broader range of age cohorts among adults turning 50−70 years and ≥72 years of age in 2023. The proportion of these cohorts that had received either one dose of Zostavax vaccine or two doses of Shingrix vaccine (given at least 4 weeks apart) by 31 December of the relevant year was calculated. Analysis was undertaken by Indigenous status, cohort/single year of age, age at vaccination and jurisdiction. Zoster vaccination coverage was also calculated for the entire cohort of adults turning ≥70 years of age in 2023 by Indigenous status.

Adult 13vPCV vaccination coverage was calculated using the cohort method for Medicare-registered adults turning 71 years of age during 2023, 2022, 2021 or 2020 (i.e. cohorts born in 1952, 1951, 1950 or 1949, respectively) and for a broader range of age cohorts among adults turning 50−70 years and ≥72 years of age in 2023. The proportion of these cohorts that had received an adult dose of 13vPCV by 31 December of the relevant year was calculated. Analysis for each year was undertaken by Indigenous status, cohort/single year of age, age at vaccination and jurisdiction. Adult 13vPCV vaccination coverage was also calculated for the entire cohort of adults turning ≥70 years of age in 2023 by Indigenous status and for the entire cohort of Indigenous adults turning ≥50 years of age in 2023.

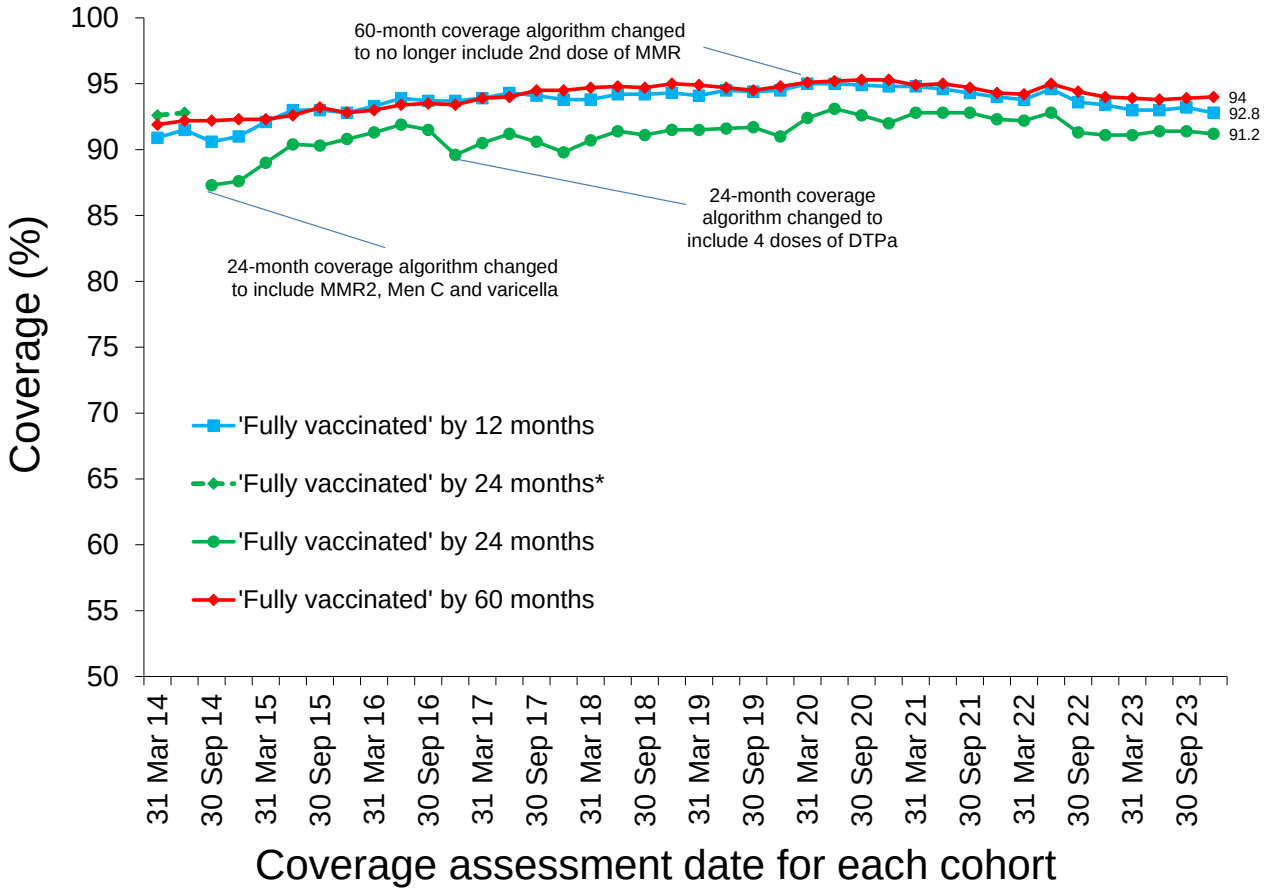
Influenza vaccination coverage for adults aged 20 to <50 years, 50 to <65 years and ≥65 years was calculated using the number of Medicare-registered adults in the relevant age group with at least one dose of influenza vaccine recorded on the AIR in the calendar year of interest (i.e. 2023 or 2022) as the numerator and the total number of adults registered on the AIR in each relevant age group as the denominator. Vaccination numerators were based on age at vaccination and age group denominators based on age at 30 June in the year of interest). Analysis was undertaken by age group, Indigenous status, jurisdiction and year.

An adult composite measure of vaccination coverage, as previously recommended,[17] – receipt of a dose of influenza vaccine in the calendar year of interest and a dose of 13vPCV by 31 December of the relevant year – was assessed in the cohort of Medicare-registered adults turning 71 years of age in 2023, 2022 or 2021 by Indigenous status and jurisdiction.

COVID-19 vaccination data are not included in this report but are available elsewhere.[55]

Additional data

Figure A1. Trends in fully vaccinated coverage by quarter, Australia, 2014–2023



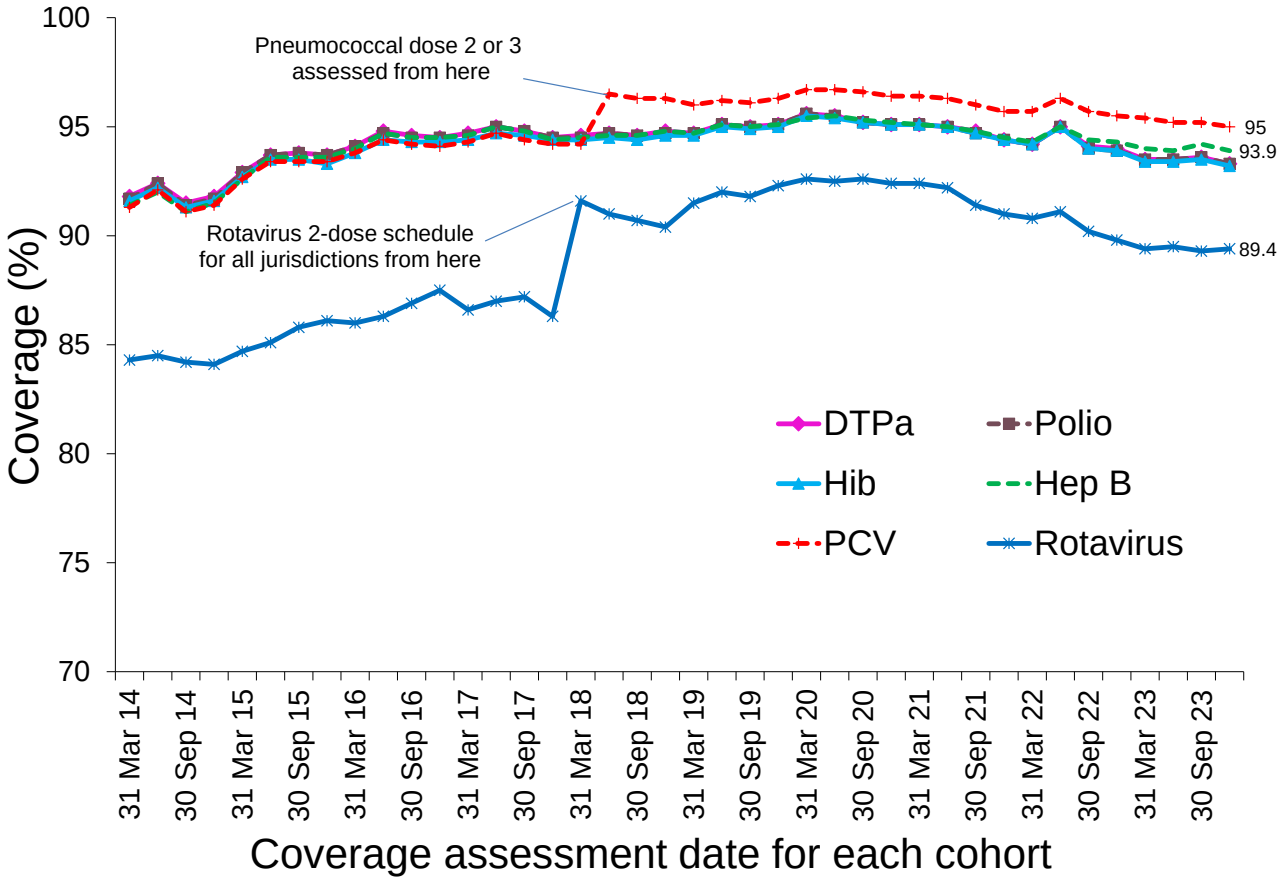
Note: By three-month birth cohorts born between 1 January 2009 and 31 December 2022. Coverage assessment date was 12, 24 or 60 months after the last birthdate of each cohort. Vaccination coverage estimates are calculated by quarter and may differ slightly from estimates published elsewhere using rolling annualised data

* Coverage algorithm before 1 July 2014

MMR2 = Second dose of MMR vaccine; MenC = meningococcal C-containing; DTPa = diphtheria-tetanus-pertussis

Source: Australian Immunisation Register

Figure A2. Trends in vaccination coverage at 12 months of age, by vaccine/antigen* and quarter, Australia, 2014–2023



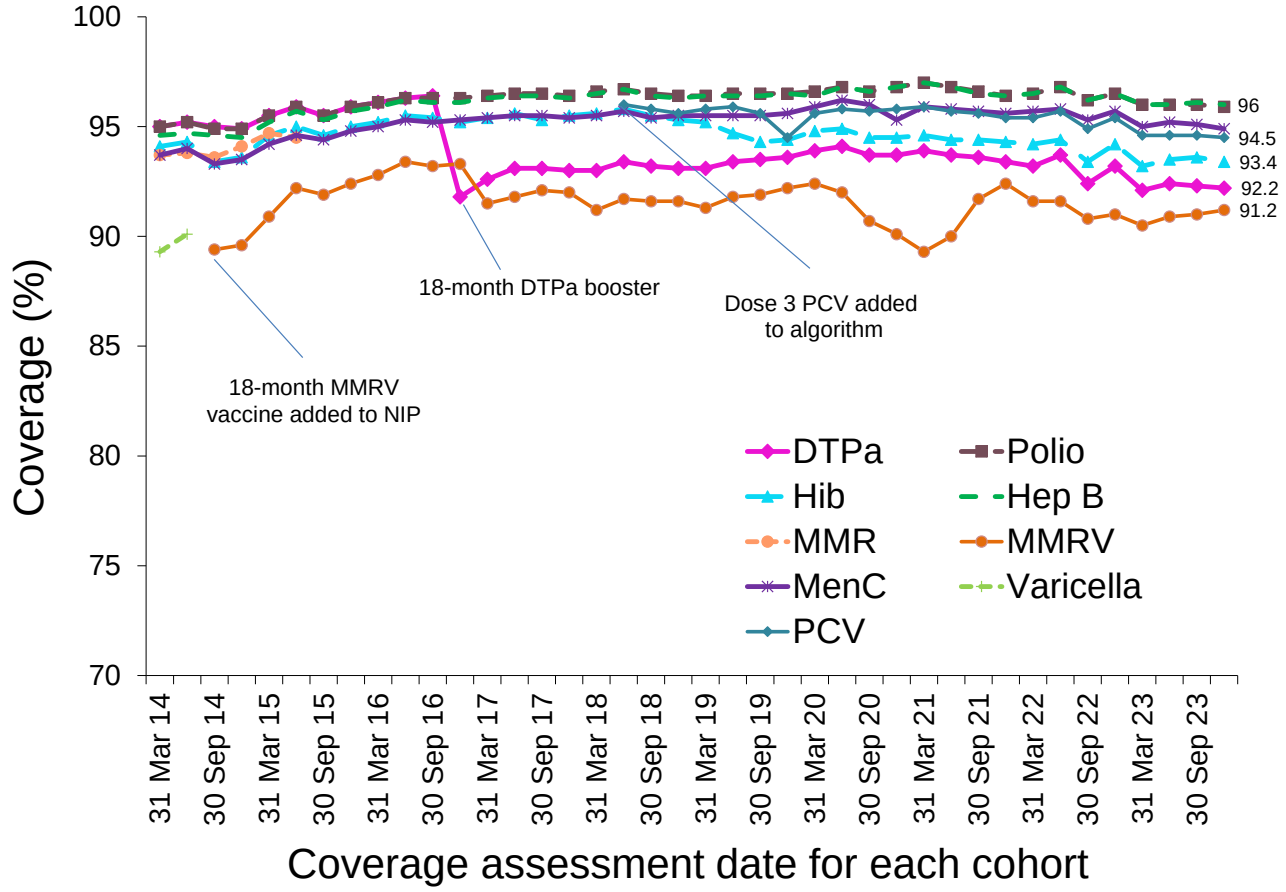
Note: By three-month birth cohorts born between 1 January 2013 and 31 December 2022. Coverage assessment date was 12 months after the last birth date of each cohort. Vaccination coverage estimates are calculated by quarter and may differ slightly from estimates published elsewhere using rolling annualised data

* Third dose of DTPa vaccine, polio vaccine and hepatitis B vaccine, second or third dose of 13vPCV and Hib vaccines and second dose of rotavirus vaccine (vaccines included in the 12-month definition of fully vaccinated coverage + rotavirus vaccine)

DTPa = diphtheria-tetanus-pertussis; Hib = *Haemophilus influenzae* type b; Hep B = hepatitis B; 13vPCV = pneumococcal conjugate vaccine

Source: Australian Immunisation Register

Figure A3. Trends in vaccination coverage at 24 months of age by vaccine/antigen* and quarter, Australia, 2014–2023



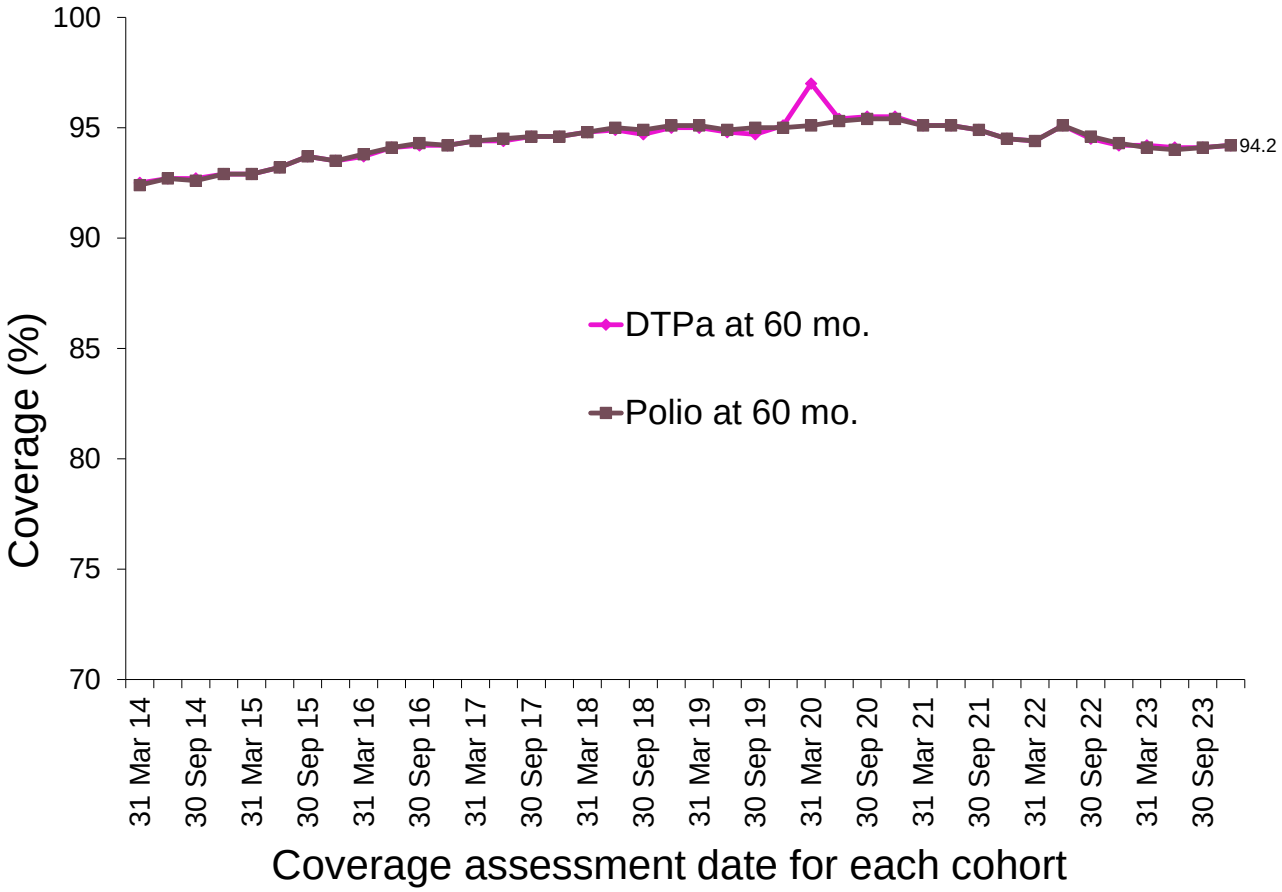
Note: By three-month birth cohorts born between 1 January 2012 and 31 December 2021. Coverage assessment date was 24 months after the last birth date of each cohort. Vaccination coverage estimates are calculated by quarter and may differ slightly from estimates published elsewhere using rolling annualised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

* Fourth dose of DTPa, third dose of polio, third or fourth dose of Hib, third dose of hepatitis B, second dose of MMR, dose 2 of MMRV, first dose of MenC, one dose of varicella and third or fourth dose of 13vPCV (vaccines included in the 24-month definition of fully vaccinated coverage)

DTPa = diphtheria-tetanus-pertussis; Hib = *Haemophilus influenzae* type b; Hep B = hepatitis B; MMR = measles-mumps-rubella; MenC = meningococcal C-containing; MMRV = measles-mumps-rubella-varicella; 13vPCV = pneumococcal conjugate vaccine

Source: Australian Immunisation Register

Figure A4. Trends in vaccination coverage at 60 months of age by vaccine/antigen* and quarter, Australia, 2014–2023



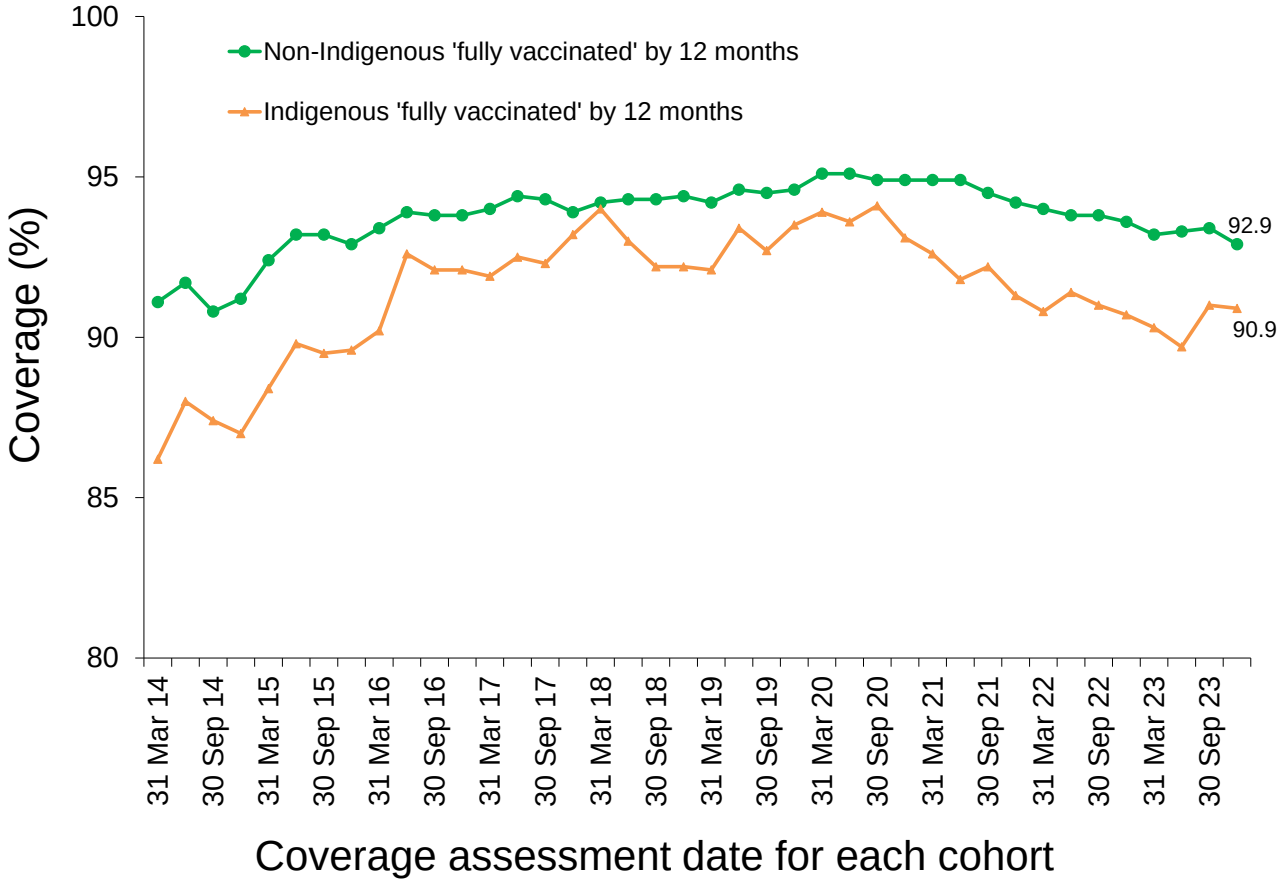
Note: By three-month birth cohorts born between 1 January 2009 and 31 December 2018. Coverage assessment date was 60 months after the last birth date of each cohort. Vaccination coverage estimates are calculated by quarter and may differ slightly from estimates published elsewhere using rolling annualised data

* Fourth or fifth dose of DTPa and fourth dose of polio, second dose of MMR (included in fully vaccinated algorithm until June 2017)

DTPa = Diphtheria-tetanus-pertussis; MMR = Measles-mumps-rubella (vaccines included in the 60-month definition of fully vaccinated coverage)

Source: Australian Immunisation Register

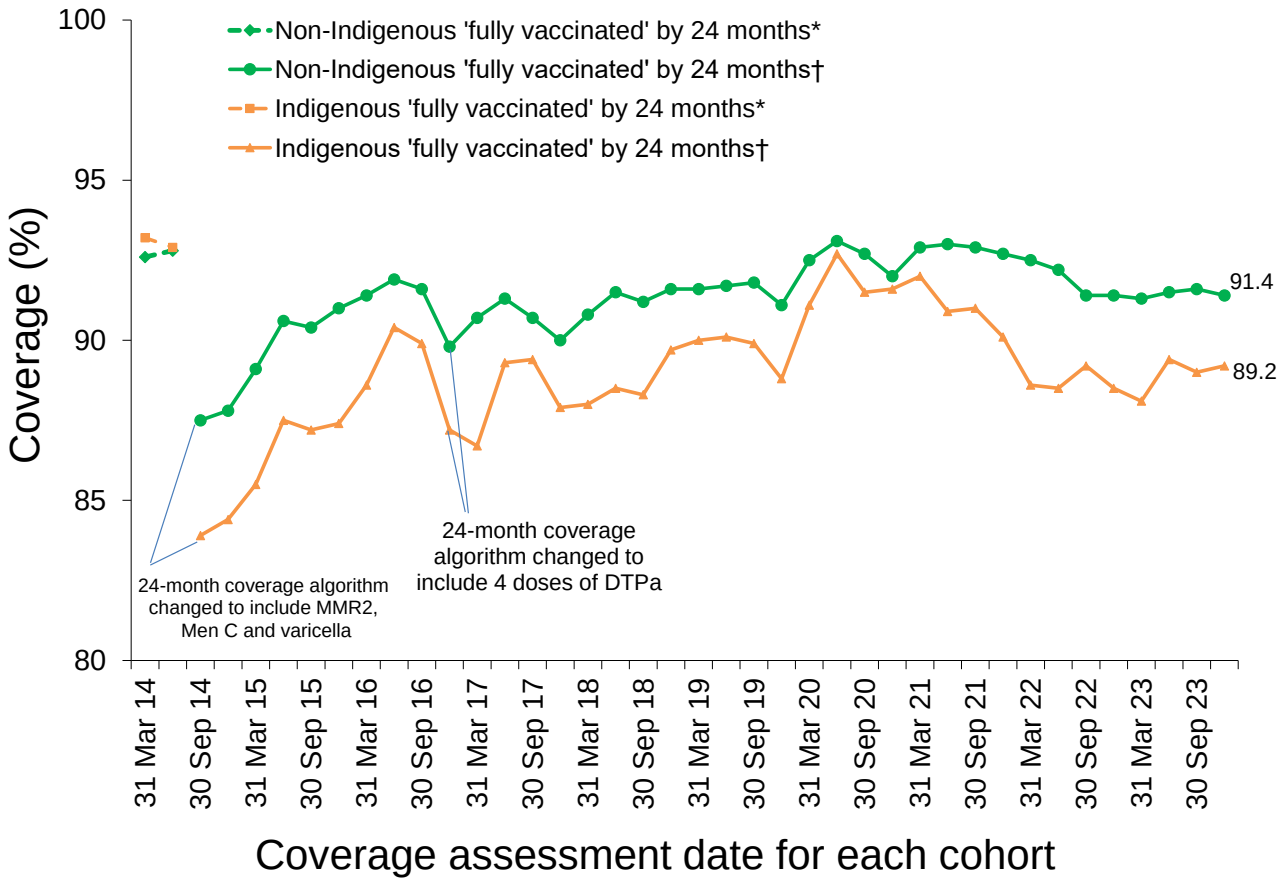
Figure A5. Trends in fully vaccinated coverage at 12 months of age by Indigenous status and quarter, Australia, 2014–2023



Note: Vaccination coverage estimates are calculated using three-month-wide birth cohorts by quarter and may differ slightly from estimates published elsewhere using rolling annualised data

Source: Australian Immunisation Register

Figure A6. Trends in fully vaccinated coverage at 24 months of age by Indigenous status and quarter, Australia, 2014–2023



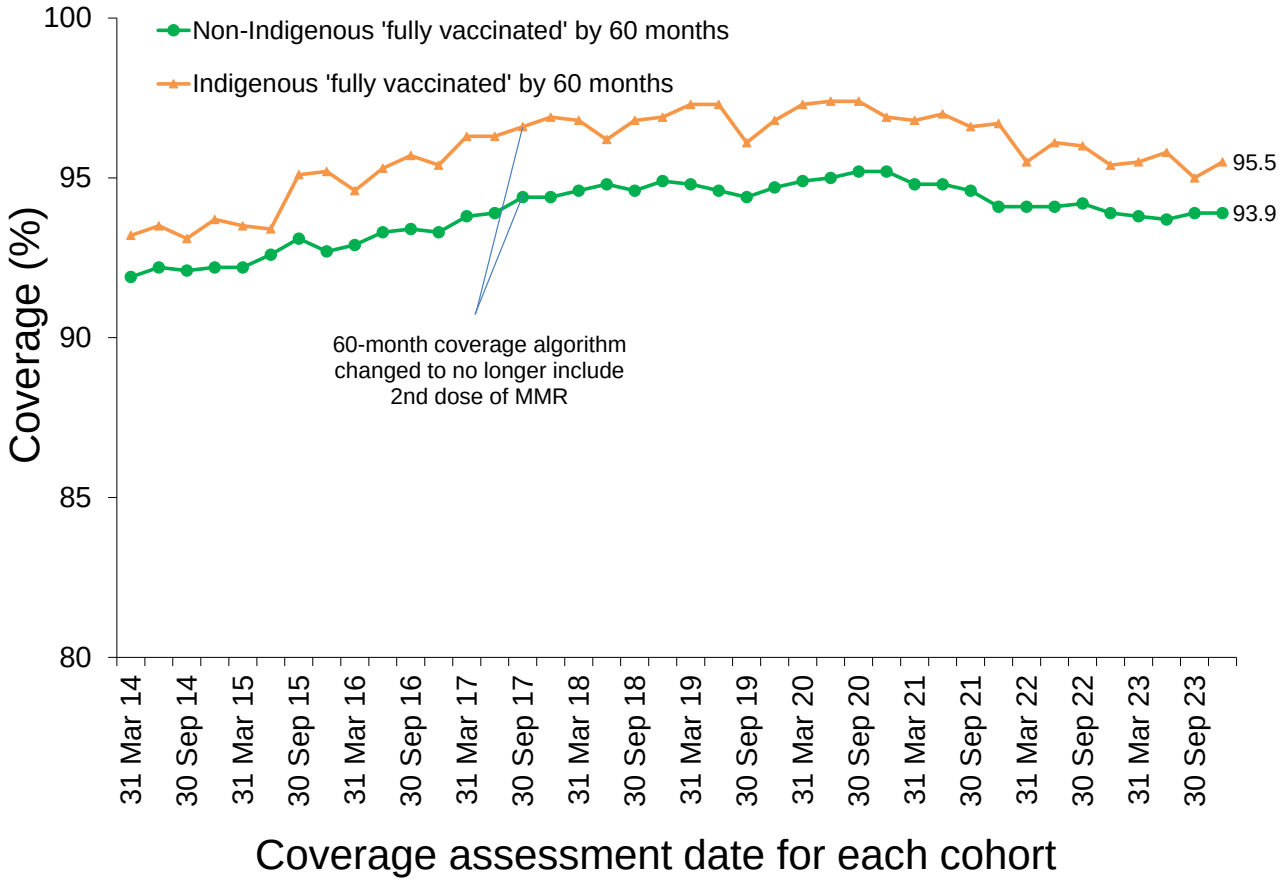
Note: Vaccination coverage estimates are calculated using three-month-wide birth cohorts by quarter and may differ slightly from estimates published elsewhere using rolling annualised data

* Coverage algorithm before 1 July 2014

† Coverage algorithm from 1 July 2014

Source: Australian Immunisation Register

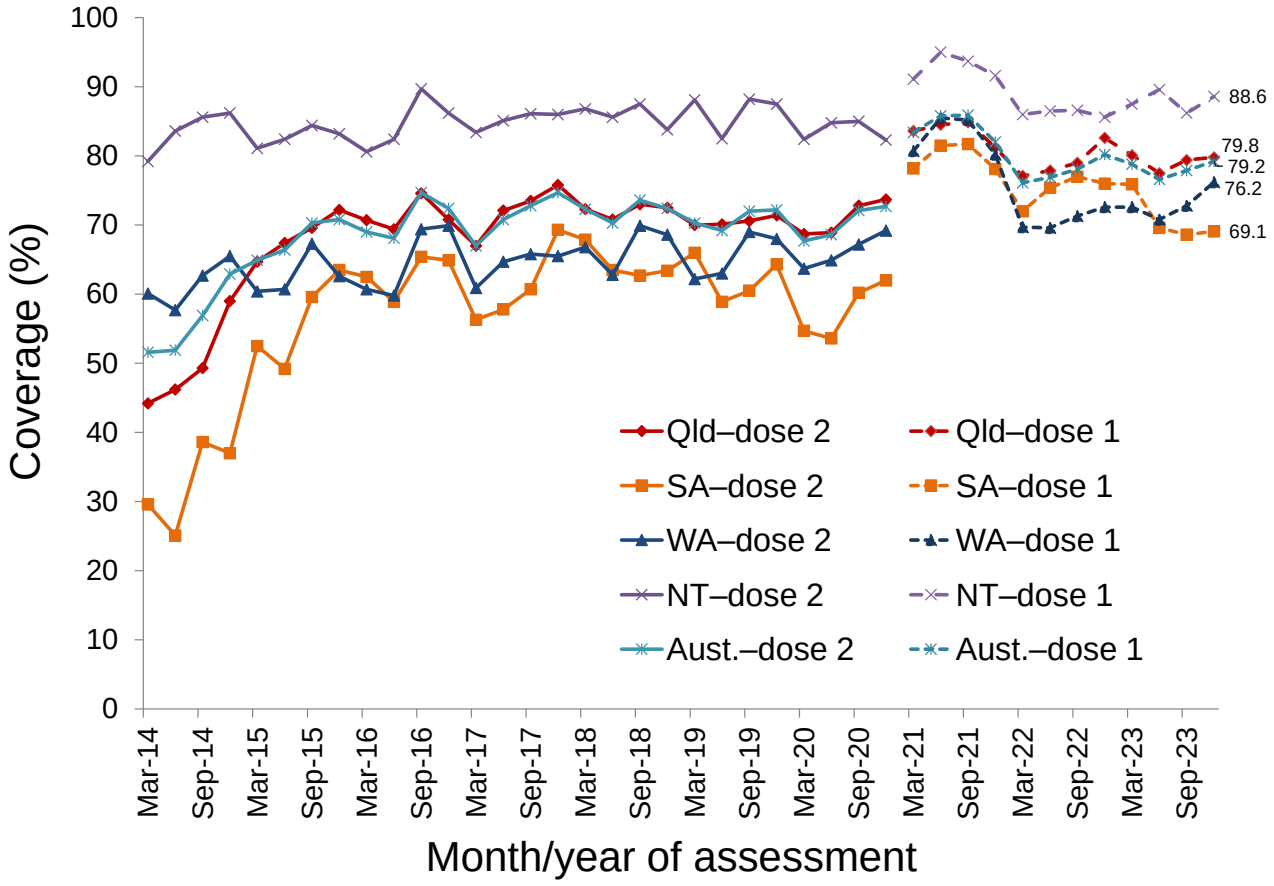
Figure A7. Trends in fully vaccinated coverage at 60 months of age by Indigenous status and quarter, Australia, 2014–2023



Note: Vaccination coverage estimates are calculated using three-month-wide birth cohorts by quarter and may differ slightly from estimates published elsewhere using rolling annualised data

Source: Australian Immunisation Register

Figure A8. Trends in coverage for hepatitis A vaccine* by 30 months of age for Indigenous children by jurisdiction, Australia†, 2014–2023



Note: Vaccination coverage estimates are calculated using three-month-wide birth cohorts by quarter

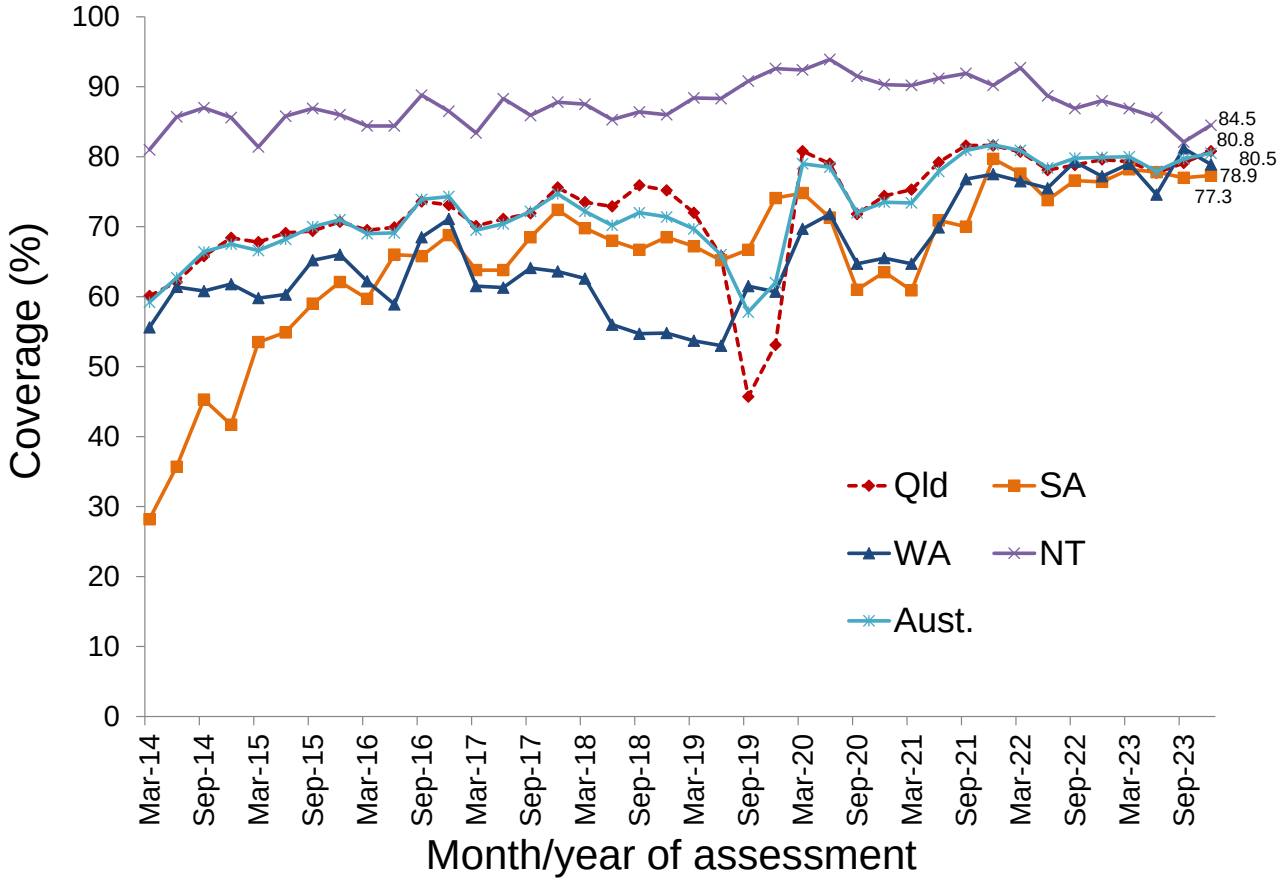
* 18-month dose assessed: scheduled ages for hepatitis A vaccination changed from 12 to 18 months (dose 1) and from 18 months to 4 years (dose 2) from July 2020

† NT, Qld, SA and WA only

Aust. = Australia

Source: Australian Immunisation Register

Figure A9. Trends in coverage for pneumococcal* vaccine for Indigenous children by jurisdiction†, Australia, 2014–2023



Note: Vaccination coverage estimates calculated using three-month-wide birth cohorts by quarter

* 12-month booster dose (4th dose) assessed at 30 months of age in all four jurisdictions

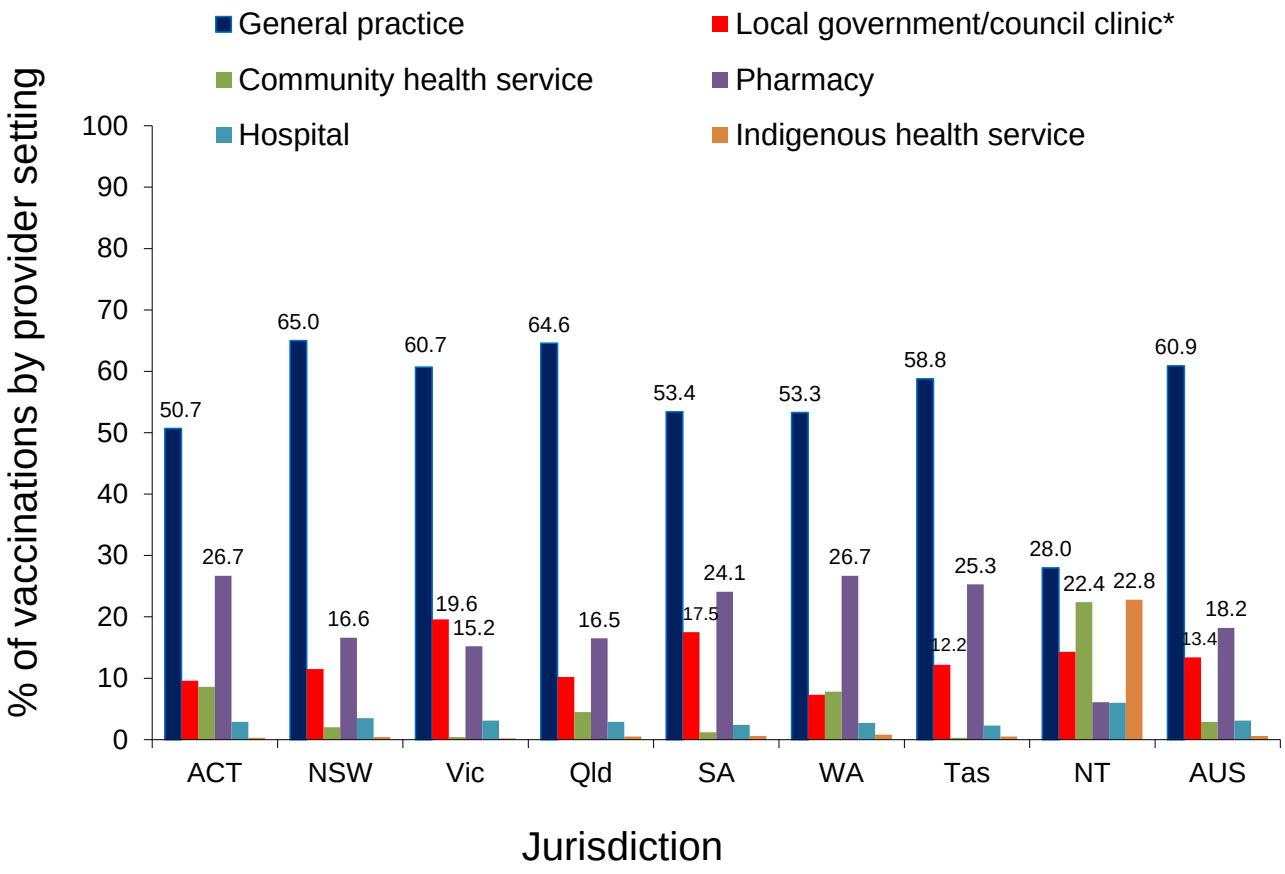
† NT, Qld, SA and WA only

13vPCV = 13-valent pneumococcal conjugate vaccine

Aust. = Australia

Source: Australian Immunisation Register

Figure A10. Proportion of all vaccinations given to people of all ages by provider setting and jurisdiction, Australia, 2023



* Includes Public Health Units and State Health

Note: Includes all vaccine encounters administered in 2023 and reported to the AIR (i.e. both NIP and non-NIP vaccines) for all Medicare- registered people of all ages

Source: Australian Immunisation Register data as at 4 February 2024

Table A3. Fully vaccinated coverage assessed at standard age milestones (12, 24 and 60 months) and earlier (9, 15, 21, 51 months) milestones*, all children, by PHN and jurisdiction, 2023

	Age milestone						
Jurisdiction and PHN	**9mo†**	**12mo†**	**15mo‡**	**21mo‡**	**24mo‡**	**51mo§**	**60mo§**
Australian Capital Territory	**94.6**	**96.1**	**93.8**	**92.1**	**94.1**	**90.0**	**95.1**
Australian Capital Territory	94.6	96.1	93.8	92.1	94.1	90.0	95.1
New South Wales	**89.7**	**93.0**	**89.2**	**87.3**	**90.9**	**86.0**	**93.4**
Central and Eastern Sydney	90.4	93.2	89.0	86.9	90.1	84.0	91.4
Hunter New England and Central Coast	91.2	94.1	91.1	89.3	92.9	88.1	94.9
Murrumbidgee	90.0	93.1	91.1	89.0	92.2	88.9	95.3
Nepean Blue Mountains	90.4	93.6	89.7	88.0	91.6	87.0	95.0
North Coast	83.8	87.3	83.7	81.8	86.0	80.2	88.4
Northern Sydney	92.5	94.7	90.5	89.2	91.8	85.9	92.8
South Eastern NSW	91.8	94.6	90.7	89.1	92.3	87.7	94.8
South Western Sydney	87.3	91.6	87.7	85.8	89.9	85.6	93.7
Western NSW	91.5	94.9	91.4	89.2	93.4	88.6	96.0
Western Sydney	88.3	92.3	88.1	86.2	90.2	86.3	94.0
Victoria	**89.1**	**93.4**	**89.2**	**87.7**	**91.3**	**86.9**	**94.2**
Eastern Melbourne	89.8	93.9	89.9	88.3	91.9	87.1	94.5
Gippsland	87.6	91.8	88.6	86.6	90.7	87.8	94.6
Murray	89.6	93.9	90.5	88.9	92.6	86.8	94.8
North Western Melbourne	88.2	93.0	88.0	86.5	90.2	86.5	93.9
South Eastern Melbourne	88.8	93.2	88.9	87.5	91.1	86.5	93.8
Western Victoria	90.5	94.4	90.9	89.6	92.8	88.4	95.3
Queensland	**87.8**	**92.0**	**87.8**	**85.9**	**90.2**	**83.7**	**92.0**
Brisbane North	90.8	94.4	89.8	88.1	92.0	86.1	93.4
Brisbane South	89.1	92.9	88.6	87.0	90.9	84.3	92.2
Central Queensland, Wide Bay, Sunshine Coast	85.1	89.3	85.5	83.5	87.9	81.4	90.1
Darling Downs and West Moreton	88.7	92.8	88.4	86.7	90.9	85.2	93.0
Gold Coast	84.2	88.5	84.6	83.0	87.6	80.7	89.6
Northern Queensland	87.1	92.4	88.7	85.7	90.9	84.1	93.3
Western Queensland	84.0	90.9	85.7	82.1	88.9	76.7	92.1
South Australia	**89.2**	**93.0**	**89.8**	**87.7**	**91.5**	**87.1**	**94.6**
Adelaide	89.8	93.4	90.1	88.1	91.9	87.4	94.7
Country SA	86.8	91.7	88.4	85.6	89.8	85.2	94.2

	Age milestone						
Jurisdiction and PHN	**9mo†**	**12mo†**	**15mo‡**	**21mo‡**	**24mo‡**	**51mo§**	**60mo§**
Western Australia	**86.4**	**91.5**	**87.3**	**84.3**	**89.3**	**82.2**	**92.3**
Country WA	82.0	88.8	84.1	79.6	86.4	78.0	91.1
Perth North	88.1	92.6	88.3	85.5	90.0	82.8	92.3
Perth South	87.1	91.8	87.9	85.5	90.2	83.7	92.7
Tasmania	**90.1**	**94.1**	**90.5**	**88.0**	**92.2**	**85.6**	**93.9**
Tasmania	90.1	94.1	90.5	88.0	92.2	85.6	93.9
Northern Territory	**85.3**	**91.6**	**84.9**	**81.6**	**88.1**	**77.2**	**90.9**
Northern Territory	85.3	91.6	84.9	81.6	88.1	77.2	90.9
AUSTRALIA	**88.8**	**92.8**	**88.8**	**86.8**	**90.8**	**85.4**	**93.3**

* Coverage algorithm used for 9-, 21- and 51-month milestones same as for 12-,24- and 60-month milestones, respectively; algorithm used for 15 months same as for 24 months but excludes doses due at 18 months. For further detail on algorithms, refer to Table A2 in the Appendix

† Cohort born 1 January 2022–31 December 2022

‡ Cohort born 1 January 2021–31 December 2021

§ Cohort born 1 January 2018–31 December 2018

Table A4. Fully vaccinated coverage assessed at standard age milestones (12, 24 and 60 months) and earlier (9, 15, 21, 51 months) milestones*, Indigenous children, by PHN and jurisdiction, 2023

	Age milestone						
Jurisdiction and PHN	**9mo†**	**12mo†**	**15mo‡**	**21mo‡**	**24mo‡**	**51mo§**	**60mo§**
Australian Capital Territory	**86.3**	**91.6**	**90.0**	**87.4**	**92.6**	**87.7**	**96.1**
Australian Capital Territory	86.3	91.6	90.0	87.4	92.6	87.7	96.1
New South Wales	**86.1**	**92.0**	**87.4**	**84.5**	**90.6**	**86.3**	**96.2**
Central and Eastern Sydney	87.2	93.2	80.8	81.1	87.0	81.3	93.8
Hunter New England and Central Coast	87.6	92.4	89.0	85.4	91.6	87.1	96.5
Murrumbidgee	83.7	92.3	90.3	87.1	92.3	90.9	97.6
Nepean Blue Mountains	88.1	93.1	88.4	86.5	90.5	87.9	96.9
North Coast	84.5	90.2	85.6	83.1	89.0	84.2	93.8
Northern Sydney	86.4	93.2	83.9	82.1	88.4	89.9	97.5
South Eastern NSW	84.8	90.5	88.9	84.3	91.5	85.3	96.1
South Western Sydney	84.8	91.1	85.2	83.3	89.2	83.9	95.6
Western NSW	86.7	93.1	87.8	83.4	90.5	85.9	97.3
Western Sydney	83.6	91.0	84.6	83.4	89.2	85.9	96.2
Victoria	**84.9**	**91.8**	**84.9**	**83.2**	**88.5**	**83.8**	**95.1**
Eastern Melbourne	84.6	90.7	79.2	80.4	85.0	83.2	94.6
Gippsland	79.7	88.1	84.1	81.9	89.1	81.3	92.7
Murray	82.4	90.0	87.1	83.3	88.9	81.4	95.1
North Western Melbourne	87.8	93.3	85.0	82.8	87.4	85.0	96.5
South Eastern Melbourne	85.8	93.3	83.9	82.5	88.8	90.7	96.7
Western Victoria	86.4	93.6	86.3	87.1	90.7	83.3	94.6
Queensland	**79.5**	**89.3**	**83.7**	**80.5**	**88.3**	**81.3**	**94.8**
Brisbane North	81.8	91.0	83.5	81.6	88.8	84.6	96.7
Brisbane South	78.9	88.6	83.9	82.3	88.0	82.4	93.5
Central Queensland, Wide Bay, Sunshine Coast	82.2	89.8	83.3	81.5	87.6	80.6	94.1
Darling Downs and West Moreton	81.9	89.9	84.8	83.2	90.2	84.7	95.1
Gold Coast	79.8	85.1	86.9	83.8	90.3	84.6	93.5
Northern Queensland	76.7	88.9	83.7	78.0	88.3	79.9	95.5
Western Queensland	75.7	88.3	78.5	73.8	83.8	72.4	93.3
South Australia	**79.1**	**88.2**	**84.1**	**79.4**	**86.9**	**81.8**	**95.5**
Adelaide	79.3	88.4	85.4	80.7	87.3	82.7	95.0
Country SA	75.0	87.2	79.4	73.3	83.2	76.4	95.4

	Age milestone						
Jurisdiction and PHN	**9mo†**	**12mo†**	**15mo‡**	**21mo‡**	**24mo‡**	**51mo§**	**60mo§**
Western Australia	**68.2**	**83.5**	**75.5**	**68.3**	**80.1**	**72.1**	**93.9**
Country WA	67.1	83.4	72.2	65.1	78.1	69.8	93.8
Perth North	69.6	83.7	76.2	69.4	81.3	71.8	92.6
Perth South	70.6	83.7	80.3	72.3	82.2	76.1	94.6
Tasmania	**87.6**	**94.6**	**88.2**	**87.1**	**92.2**	**86.5**	**96.0**
Tasmania	87.6	94.6	88.2	87.1	92.2	86.5	96.0
Northern Territory	**74.4**	**87.3**	**76.9**	**71.0**	**82.4**	**70.9**	**92.0**
Northern Territory	74.4	87.3	76.9	71.0	82.4	70.9	92.0
AUSTRALIA	**80.8**	**89.7**	**83.9**	**80.2**	**87.8**	**81.4**	**95.0**

* Coverage algorithm used for 9-, 21- and 51-month milestones same as for 12-, 24- and 60-month milestones, respectively; algorithm used for 15 months same as for 24 months but excludes doses due at 18 months. For further detail on algorithms, refer to Table A2 in the Appendix

† Cohort born 1 January 2021–31 December 2022

‡ Cohort born 1 January 2020–31 December 2021

§ Cohort born 1 January 2017–31 December 2018

ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

PHN = Primary Health Network

Table A5. Coverage* of at least one dose of HPV vaccine in females by birth cohort/age,† Indigenous status and jurisdiction, 2023

	All							
Birth cohort (age turning in 2023)	**ACT**	**NSW**	**Vic**	**Qld**	**SA**	**WA**	**Tas**	**NT**
2010 cohort (13yo)	84.0	75.3	76.3	71.2	72.5	73.0	74.4	63.9
2009 cohort (14yo)	86.9	81.4	81.9	77.0	77.9	79.3	77.8	73.1
2008 cohort (15yo)	90.9	86.4	85.7	82.1	83.8	83.0	84.4	79.5
2007 cohort (16yo)	90.9	87.4	87.6	83.3	86.1	85.4	85.9	84.2
2006 cohort (17yo)	91.5	88.7	88.8	84.4	87.6	85.5	89.5	89.6
2005 cohort (18yo)	91.3	88.8	89.6	85.5	88.5	86.6	90.8	89.7
2004 cohort (19yo)	90.7	88.6	89.4	85.6	88.6	85.9	90.5	91.3
2003 cohort (20yo)	89.7	88.4	88.9	85.1	88.7	86.7	89.9	91.0
2002 cohort (21yo)	88.9	87.2	88.3	85.2	88.2	85.9	89.0	91.8
2001 cohort (22yo)	87.5	84.7	85.4	83.7	87.4	84.7	87.2	90.6
2000 cohort (23yo)	83.1	81.8	82.0	81.0	83.8	80.3	82.9	86.7
1999 cohort (24yo)	80.9	77.7	79.4	77.8	82.8	78.4	78.8	82.4
1998 cohort (25yo)	76.9	71.6	76.0	74.6	78.9	75.5	74.8	78.6
	Indigenous							
Birth cohort (age turning in 2023)	**ACT**	**NSW**	**Vic**	**Qld**	**SA**	**WA**	**Tas**	**NT**
2010 cohort (13yo)	75.0	63.6	63.0	59.3	50.8	57.1	70.7	55.0
2009 cohort (14yo)	83.3	79.1	75.2	70.2	59.4	71.9	75.1	69.0
2008 cohort (15yo)	91.7	87.3	81.6	81.0	68.7	80.1	82.2	75.5
2007 cohort (16yo)	90.4	89.4	85.1	83.0	79.0	85.9	86.2	84.1
2006 cohort (17yo)	91.4	92.9	89.9	87.5	81.2	87.1	91.4	92.7
2005 cohort (18yo)	88.9	92.9	88.9	89.0	83.5	86.8	89.9	93.9
2004 cohort (19yo)	91.6	92.7	91.5	89.9	82.9	88.6	90.9	95.5
2003 cohort (20yo)	90.1	92.8	90.7	89.9	91.3	90.1	91.6	94.6
2002 cohort (21yo)	89.2	89.6	88.8	88.9	87.7	87.5	87.3	95.6
2001 cohort (22yo)	93.2	85.8	87.6	86.4	80.6	86.9	88.5	94.3
2000 cohort (23yo)	85.3	85.4	82.1	81.8	74.8	82.6	81.3	93.6
1999 cohort (24yo)	85.7	79.0	80.8	77.4	80.9	79.7	80.2	89.0
1998 cohort (25yo)	82.7	73.8	77.1	72.9	71.6	82.2	78.3	87.8

*Coverage calculated using the number of Medicare-registered females in each year-wide cohort with an AIR record of having received at least one dose of HPV vaccine by 31 December 2023 as the numerator and the total number of Medicare-registered females in the relevant age cohort as the denominator, expressed as a percentage

† Birth/age cohort based on age turning in 2023

Note: Coverage data for the cohort of 15-year-olds presented in this table include HPV doses given before and after their 15th birthday. Data may therefore differ slightly from data presented in Table 2, where coverage only includes doses given before the 15th birthday (in line with WHO recommendations for international reporting).

Source: Australian Immunisation Register data as at 4 February 2024

Table A6. Coverage* of at least one dose of HPV vaccine in males by birth cohort/age,† Indigenous status and jurisdiction, 2023

	All							
Birth cohort (age turning in 2023)	**ACT**	**NSW**	**Vic**	**Qld**	**SA**	**WA**	**Tas**	**NT**
2010 cohort (13yo)	83.4	70.7	72.1	66.8	69.3	69.9	69.9	57.7
2009 cohort (14yo)	86.5	76.5	79.0	74.0	72.9	77.8	73.7	63.9
2008 cohort (15yo)	88.5	83.1	84.0	79.5	81.1	82.5	81.5	74.5
2007 cohort (16yo)	88.7	85.0	85.3	81.5	84.3	84.0	81.7	81.2
2006 cohort (17yo)	90.0	86.3	87.3	82.9	85.7	85.0	85.5	82.9
2005 cohort (18yo)	88.8	87.1	87.5	83.8	87.2	85.4	87.6	87.2
2004 cohort (19yo)	89.6	85.9	87.1	83.0	86.2	85.2	88.5	89.1
2003 cohort (20yo)	88.4	85.3	86.7	82.0	86.4	84.3	88.0	88.3
2002 cohort (21yo)	88.0	83.8	85.6	81.3	85.5	83.3	85.9	88.1
2001 cohort (22yo)	81.8	79.1	81.7	79.3	83.9	81.7	80.9	85.4
2000 cohort (23yo)	77.8	72.8	76.9	74.9	79.2	73.6	75.7	81.3
1999 cohort (24yo)	75.2	69.0	73.6	69.1	75.5	65.8	72.6	73.1
1998 cohort (25yo)	59.1	49.7	60.8	63.9	53.2	62.8	63.9	57.5
	Indigenous							
Birth cohort (age turning in 2023)	**ACT**	**NSW**	**Vic**	**Qld**	**SA**	**WA**	**Tas**	**NT**
2010 cohort (13yo)	75.8	57.8	57.8	53.3	42.7	51.9	64.7	47.0
2009 cohort (14yo)	80.5	68.2	69.4	63.3	47.8	68.2	68.7	54.6
2008 cohort (15yo)	75.3	81.3	77.0	75.9	60.5	74.9	83.7	69.1
2007 cohort (16yo)	83.1	84.4	83.0	80.1	69.1	81.9	82.7	80.1
2006 cohort (17yo)	84.6	87.9	84.9	81.3	76.7	81.9	85.2	83.7
2005 cohort (18yo)	80.3	88.4	84.3	86.0	80.6	82.5	87.1	88.8
2004 cohort (19yo)	87.9	86.4	89.5	86.9	79.0	84.4	87.7	93.0
2003 cohort (20yo)	86.3	87.8	87.3	84.7	80.9	84.9	84.4	91.9
2002 cohort (21yo)	80.3	83.8	86.2	82.4	80.5	85.0	82.8	92.4
2001 cohort (22yo)	80.3	77.2	80.1	77.7	78.4	79.5	79.3	91.4
2000 cohort (23yo)	67.7	69.0	70.6	73.8	70.5	68.1	74.5	86.5
1999 cohort (24yo)	66.7	60.0	63.7	62.8	59.5	55.3	66.9	74.6
1998 cohort (25yo)	43.5	47.3	53.9	53.1	46.3	44.6	55.4	58.3

*Coverage calculated using the number of Medicare-registered males in each year-wide cohort with an AIR record of having received at least one dose of HPV vaccine by 31 December 2023 as the numerator and the total number of Medicare-registered males in the relevant age cohort as the denominator, expressed as a percentage

† Birth/age cohort based on age turning in 2023

Note: Coverage data for the cohort of 15-year-olds presented in this table include HPV doses given before and after their 15th birthday. Data may therefore differ slightly from data presented in Table 2, where coverage only includes doses given before the 15th birthday (in line with WHO recommendations for international reporting).

Source: Australian Immunisation Register data as at 4 February 2024

Table A7. Coverage* of a dose of diphtheria-tetanus-pertussis vaccine in adolescents by age,† Indigenous status and jurisdiction, 2023

	All							
Birth cohort (age turning in 2023)	**ACT**	**NSW**	**Vic**	**Qld**	**SA**	**WA**	**Tas**	**NT**
2010 cohort (13yo)	82.6	74.2	75.7	71.5	73.5	74.1	72.7	61.9
2009 cohort (14yo)	82.0	80.3	81.6	77.5	78.2	81.0	76.1	69.5
2008 cohort (15yo)	86.8	86.7	86.5	83.1	85.2	85.8	83.5	77.7
2007 cohort (16yo)	89.2	88.4	88.2	85.2	88.1	87.9	85.4	83.2
2006 cohort (17yo)	91.0	89.8	90.0	86.5	89.9	88.8	88.9	86.7
2005 cohort (18yo)	89.7	89.7	89.9	87.1	90.6	89.3	88.1	88.5
2004 cohort (19yo)	88.5	89.0	89.3	86.7	89.7	88.8	86.5	87.6
	Indigenous							
Birth cohort (age turning in 2023)	**ACT**	**NSW**	**Vic**	**Qld**	**SA**	**WA**	**Tas**	**NT**
2010 cohort (13yo)	73.7	61.5	61.0	57.4	48.7	56.0	70.4	52.1
2009 cohort (14yo)	70.1	74.6	72.7	67.9	55.4	71.0	71.5	62.6
2008 cohort (15yo)	76.6	85.8	79.4	79.8	65.7	79.1	81.6	72.3
2007 cohort (16yo)	85.3	88.2	84.7	83.7	76.6	84.8	86.1	81.1
2006 cohort (17yo)	84.5	91.8	88.8	86.4	81.4	86.3	91.1	87.6
2005 cohort (18yo)	78.2	90.7	88.1	87.8	85.1	86.6	87.7	88.9
2004 cohort (19yo)	84.7	89.1	88.6	90.0	82.1	87.4	86.7	89.3

* 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. ≥10 years of age) dose of diphtheria-tetanus-pertussis vaccine (recorded as either dTpa or DTPa) by 31 December 2023 as the numerator and the total number of Medicare-registered adolescents in the relevant age cohort as the denominator, expressed as a percentage

† Birth/age cohort based on age turning in 2023

Source: Australian Immunisation Register data as at 4 February 2024

Table A8. Coverage* of a dose of meningococcal ACWY vaccine in adolescents by age,† Indigenous status and jurisdiction, 2023

	All							
Birth cohort (age turning in 2023)	**ACT**	**NSW**	**Vic**	**Qld**	**SA**	**WA**	**Tas**	**NT**
2008 cohort (15yo)	22.1	19.8	16.1	28.7	24.9	33.2	49.6	51.6
2007 cohort (16yo)	77.9	65.1	68.0	63.1	72.4	66.4	84.3	74.2
2006 cohort (17yo)	82.5	70.5	74.9	69.4	77.5	74.2	85.4	81.1
2005 cohort (18yo)	85.4	76.0	78.4	75.2	82.7	79.0	86.4	81.8
2004 cohort (19yo)	87.2	79.4	79.2	77.0	82.4	81.1	86.4	81.8
	Indigenous							
Birth cohort (age turning in 2023)	**ACT**	**NSW**	**Vic**	**Qld**	**SA**	**WA**	**Tas**	**NT**
2008 cohort (15yo)	16.1	12.8	11.8	23.7	14.8	25.6	55.0	36.6
2007 cohort (16yo)	71.3	45.8	48.4	54.6	51.5	51.9	82.8	78.7
2006 cohort (17yo)	68.6	62.3	62.5	69.8	64.0	64.7	86.4	88.4
2005 cohort (18yo)	68.6	62.3	62.5	69.8	64.0	64.7	86.4	88.4
2004 cohort (19yo)	73.0	68.0	67.3	73.0	68.6	70.7	87.4	87.3

* 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. ≥10 years of age) dose of meningococcal ACWY vaccine by 31 December 2023 as the numerator and the total number of Medicare-registered adolescents in the relevant age cohort as the denominator, expressed as a percentage

† Birth/age cohort based on age turning in 2023

Source: Australian Immunisation Register data as at 4 February 2024

Table A9. Recorded coverage* of seasonal influenza vaccine by age group, jurisdiction and Indigenous status, 2022 and 2023, Australia

Age group	2022															
	Jurisdiction															
	ACT		NSW		Vic		Qld		SA		WA		Tas		NT	
	All	Indig-enous	All	Indig-enous	All	Indig-enous	All	Indig-enous	All	Indig-enous	All	Indig-enous	All	Indig-enous	All	Indig-enous
6mo-<5yrs	56.4	37.7	33.1	23.0	39.6	27.1	27.4	19.6	35.8	22.0	30.0	22.5	38.6	28.9	47.3	54.6
5-<10yrs	31.1	22.2	24.5	17.6	28.0	18.5	19.9	14.6	25.6	17.4	20.7	18.3	25.3	20.5	20.2	32.7
10-<20yrs	25.6	21.2	21.6	18.2	25.3	20.5	19.7	16.8	26.2	20.1	19.7	18.4	24.9	22.0	21.0	32.4
20-<50yrs	38.8	31.1	29.2	24.1	33.7	27.2	27.0	23.2	36.9	29.7	27.5	27.3	34.6	30.5	29.7	45.2
50-<65yrs	52.9	54.3	44.6	50.4	48.8	51.8	44.9	47.7	54.7	55.3	45.4	50.8	55.3	62.4	34.6	58.8
≥65yrs	72.4	74.3	67.5	73.4	71.3	74.1	69.4	68.2	76.7	72.7	70.3	65.4	76.5	82.1	43.3	59.7
	2023															
Age group	Jurisdiction															
	ACT		NSW		Vic		Qld		SA		WA		Tas		NT	
	All	Indig-enous†	All	Indig-enous	All	Indig-enous	All	Indig-enous	All	Indig-enous	All	Indig-enous	All	Indig-enous	All	Indig-enous
6mo-<5yrs	55.0	35.3	28.3	20.5	34.5	24.6	26.0	19.9	30.5	19.8	28.4	21.8	36.4	31.8	43.4	49.9
5-<10yrs	28.4	18.3	16.9	12.8	19.2	13.1	15.9	12.7	17.0	12.8	20.1	16.7	17.5	15.9	17.0	28.1
10-<20yrs	20.6	16.5	13.8	13.6	16.0	13.8	14.7	14.7	15.5	14.3	17.5	15.7	15.7	14.7	18.4	29.9
20-<50yrs	35.1	26.3	22.3	19.2	26.8	21.4	22.1	19.8	27.4	22.8	23.1	20.5	26.8	24.0	26.0	39.5
50-<65yrs	46.8	45.2	34.7	40.7	39.1	41.2	36.7	40.7	41.3	43.0	37.9	39.1	45.0	51.1	29.4	51.4
≥65yrs	68.2	70.2	61.5	66.3	65.2	66.8	64.8	63.9	69.4	64.5	65.4	58.5	71.4	76.9	38.5	53.4

* Coverage calculated by dividing the number of Medicare-registered people with at least one dose of influenza vaccine administered in the calendar year of interest by the total number of Medicare-registered people registered in each age group. Vaccination numerators based on age at vaccination and age group denominators based on age at 30 June in relevant year. Coverage data in this table may differ slightly from estimates published elsewhere due to differences in calculation methodologies and/or the AIR data being used in the calculation having been downloaded on different dates

ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

Source: Australian Immunisation Register data as at 2 April 2023 (for 2022 data) and 4 February 2024 (for 2023 data)

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