Tetanus, pertussis, and diphtheria vaccination coverage in older adults, Australia, 2023: analysis of Australian Immunisation Register data

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Tetanus is an acute and sometimes fatal disease caused by *Clostridium tetani*, spores of which are found in soil. The bacterium can grow anaerobically in soil-contaminated wounds, producing a neurotoxin that causes muscle rigidity and painful spasms.[1] Between 2000 and 2013, the Australian Immunisation Handbook (AIH) recommended a single booster dose of diphtheria–tetanus toxoid-containing vaccine (dT) at 50 years of age if a person had not received the vaccine during the preceding ten years, rather than a dT booster dose every ten years, as previously recommended.[2] Since 2013, it is recommended that the booster be administered as a diphtheria–tetanus–pertussis (dTpa) combination vaccine, and that a second dTpa booster dose at 65 years of age or older be provided if the person has not received the vaccine during the preceding ten years.[1-3] The aim is primarily to protect against pertussis, which can cause severe morbidity and mortality in older adults.[1,3,4]

The tetanus hospitalisation rate in Australia for people aged 65 years or older declined from 0.24 in 2003–2012 to 0.10 cases per 100 000 population per year in 2013–2019.[5] However, deaths from tetanus are still reported. All eleven tetanus-related deaths during 2003–2019 were of people aged 75 years or older; none of those with known vaccination status had received a tetanus-containing vaccine in line with AIH recommendations for adults.[5] The tetanus-related death of a New South Wales woman in her eighties in April 2023, the result of a minor gardening wound, attracted media attention and led to calls for more widespread vaccination.[6] While the Australian Immunisation Register (AIR) has recorded adult vaccinations since 1 October 2016, the uptake of tetanus, diphtheria, and pertussis vaccines by Australian adults is unknown.

We therefore assessed tetanus, pertussis, and diphtheria vaccination coverage among Medicare-registered older adults in Australia by age group (50–64, 65–74, 75–84, 85 or more years), as recorded by the AIR to 2 February 2024. In line with AIH recommendations, people aged 50 years or older were deemed up to date for tetanus and diphtheria vaccination if they had received a tetanus or diphtheria-containing vaccine after the age of 40 years, and up to date for pertussis vaccination if they had received a pertussis-containing vaccine after the age of 40 years (for those aged 50–64 years) or 55 years (for those aged 65 years or older). We calculated the proportion of adults up to date for tetanus, pertussis, and diphtheria vaccination from the number vaccinated to 31 December 2023 and the total number of people in the relevant age group, based on their age at 31 December 2023. Our analysis of de-identified administrative data (routine reporting data, approved by the Australian Department of Health and Aged Care) was exempted from formal ethics approval by the human research ethics committee of the Sydney Children's Hospitals Network.

About one-third of adults aged 50 years or older were up to date for tetanus (3 135 660, 30.2%) and diphtheria vaccination (3 124 894, 30.1%); about one-fifth (2 153 032, 20.8%) were up to date for pertussis vaccination. Of those up to date for tetanus vaccination, 2 090 300 people had received dTpa (66.7%), 1 033 150 had received dT (32.9%), and 12 210 had received monovalent tetanus toxoid vaccine (0.4%; unavailable in Australia since 2006[2]). Of those up to date for one or more of the three vaccinations, administration prior to October 2016 was recorded for 216 699 older adults (7%). The proportions up to date for tetanus and diphtheria vaccinations were similar across age groups (28–33%), but the proportion up to date for pertussis vaccination declined from 23.9% at 65–74 years to 13.5% for people aged 85 years or older (Box).

Our findings indicated that tetanus, pertussis, and diphtheria-containing vaccine coverage among older Australians is suboptimal, particularly with respect to dTpa uptake, which suggests that compliance with AIH recommendations for protection against pertussis is poorer than for tetanus and diphtheria vaccination. However, we have probably underestimated vaccination coverage, as the AIR expanded to include adult vaccinations only in 2016, and the reporting of adult tetanus, diphtheria, and

Numbers of adults aged 50 years or older who were up-to-date for tetanus, pertussis, and diphtheria vaccination, Australia, 2023, by age group*

	Age group (years)					
Vaccination	50–64	65–74	75–84	85 or older	50 or older	65 or older
Medicare-registered adults	5 282 953	2 758 338	1 694 345	640 090	10 375 726	5 092 773
Tetanus	1 540 895 (29.2%)	906 629 (32.9%)	511 210 (30.2%)	176 926 (27.6%)	3 135 660 (30.2%)	1 594 765 (31.3%)
Pertussis	1 105 402 (20.9%)	659 490 (23.9%)	301 724 (17.8%)	86 416 (13.5%)	2 153 032 (20.8%)	1 047 630 (20.6%)
Diphtheria	1 536 450 (29.1%)	903 747 (32.8%)	508 753 (30.0%)	175 944 (27.5%)	3 124 894 (30.1%)	1 588 444 (31.2%)

* Source: Australian Immunisation Register, 2 February 2024. ◆

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pertussis vaccinations is not mandatory. Under-reporting of adult vaccinations to the AIR during the first two years after the expansion of the AIR has been reported.[7] Adult vaccinations can be retrospectively reported to AIR, but this is uncommon. As tetanus, pertussis, and diphtheria-containing vaccines are not funded by the National Immunisation Program for older adults, lower awareness and vaccine cost may influence their uptake. Further, AIH recommendations are complex and can be misinterpreted; for example, it is reported anecdotally that some vaccination providers incorrectly believe that routine tetanus boosters every ten years are still recommended, although additional doses may be required if a tetanus-prone wound is sustained.[1]

We strongly encourage vaccination providers to review the vaccination status of older people and to offer booster dTpa vaccines when appropriate to optimise protection against tetanus, pertussis, and diphtheria. AIH recommendations should be clear and communicated effectively to providers and the public. Options for reducing out-of-pocket expenses for people, including adding adult dTpa vaccinations to the National Immunisation Program, should be explored, and the completeness of the reporting of adult vaccinations to AIR evaluated.

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