# Current issues in immunisation

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# National immunisation coverage - interpreting the first three quarterly reports from the ACIR

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The methodology for calculating immunisation coverage from information in the Australian Childhood Immunisation Register (ACIR) has recently been described in *Communicable Diseases Intelligence,*[1] and the third quarterly report of national immunisation coverage appears in this issue (page 122). The purpose of this report is to outline some of the limitations of these data and to emphasise the important messages from them.

**Immunisation coverage estimates from the ACIR compared with the ABS**

The Australian Bureau of Statistics (ABS) immunisation survey[2] measured immunisation coverage by a very different method to the ACIR.[1] The ABS survey was conducted by face-to-face interview of a random sample of Australian households, representative of the resident population. Although immunisation status was measured by parental report, which tends to overestimate immunisation,[3] parents of 61% of children referred to immunisation records.[2] By contrast, the ACIR measures coverage from information submitted by providers; the greatest problem with this method is failure to report.

Table 1 compares the third quarterly coverage estimates from the ACIR for completion of the immunisation schedule at 12 months of age, with the estimates from the 1995 ABS survey for children of the same age. In most States, the ABS estimate of Diptheria-Tetanus-Pertussis (DTP) and Oral Polio (OPV) coverage was substantially higher than the ACIR's, and it is likely that the true coverage lies somewhere between these figures. A notable exception was Queensland, where DTP coverage on the ACIR was 2% higher than estimated by the ABS. As Queensland's reporting system (VIVAS) is linked to vaccine supply, encounters are more likely to be reported to the ACIR from providers using VIVAS than from providers using the standard encounter form.[4] It is likely that the ACIR coverage estimates for Queensland are closer to true coverage in that State than those for other jurisdictions.

Estimates of Hib coverage from the ACIR are 10% higher than the ABS estimates. This reflects the marked improvement in immunisation coverage between the ABS survey in 1995 (which took place less than two years after Hib was introduced into the schedule) and the period covered by the third quarterly report. It also confirms that the ACIR is able to detect large changes in immunisation coverage, such as occur with the introduction of new vaccines into the childhood schedule.

The Northern Territory is the only jurisdiction where Hib coverage, as measured by the ACIR, substantially exceeds that of DTP. There are a number of possible factors contributing to this. Firstly, the Northern Territory uses the PRP-OMP conjugate Hib vaccine, which requires only 2 doses for the primary course for all children. This may lead to both a truly higher completion rate and a spurious increase, as it is known that third dose vaccinations are less frequently reported to the ACIR.[4] Secondly, Hib immunisation has been more actively promoted in the Northern Territory than in other jurisdictions.

**Evidence for under-reporting to the ACIR**

In 1996, a consultancy group (Human Capital Alliance) conducted an evaluation of the ACIR.[4] This included cross-checking of parent-held immunisation records amongst a sample of children recorded by the ACIR as being at least 30 days overdue in September 1996.[3] This comparison showed that 27% of third dose DTP encounters were discrepant due to missing data on the ACIR,[4] confirming underestimation of coverage, but not quantifying it.

The degree by which coverage is underestimated is likely to vary by State or Territory and by the pattern of immunisation provision. Published data are available from two jurisdictions with a high proportion of providers in the public sector - the Northern Territory and Victoria. In the Northern Territory, a recent audit of immunisation coverage registers found that second dose Hib and third dose DTP coverage were 94% and 89% respectively,[5] compared with ACIR estimates of 59% and 67%. Reasons for underestimation in the Northern Territory include:

- limited use of Medicare numbers as the unique identifier in Northern Territory data, which makes matching of vaccination encounters to Medicare data problematic;
- delays in data transmission that have resulted in the exclusion of a significant proportion of Northern Territory data from the quarterly ACIR reports; and until recently,

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- reluctance by some health services to participate in the ACIR.

In Victoria, a pilot study of home immunisation, conducted in November 1996 in economically disadvantaged local government areas in Melbourne, estimated that 93% of children were up to date with immunisation at 9 or 16 months of age, compared with 84% recorded by the ACIR.[6] The degree of under reporting may be greater in States with a higher proportion of general practitioner immunisation, such as New South Wales and Western Australia, and lower in areas with centralised reporting to the ACIR, such as Queensland and the Australian Capital Territory. An independent evaluation of children recorded as being overdue by the ACIR in New South Wales, based on Public Health Units, was completed in 1997. This study should provide insights into ACIR reporting in a large area with predominantly general practitioner based immunisation delivery. A similar evaluation is also planned for Western Australia in 1998.

**Future developments and conclusions**

Current ACIR estimates of immunisation coverage in Australia for the vaccines scheduled in the first 12 months of life are minimum estimates or a worst case scenario. The ACIR underestimates immunisation coverage because of under reporting of vaccination encounters. Delays in reporting encounters, data transfer, and data entry are less influential causes of underestimation, because the method used to calculate national immunisation coverage allows at least 6 months after the recommended age of vaccination for reports to be entered into the ACIR.[1] Between the first and third quarterly cohorts, there has been a small but definite increase nationally from 75 - 77% in the proportion of children fully immunised with a primary course of DTP, Hib, and OPV vaccines. While there may have been a real improvement in immunisation coverage, it is likely that this largely represents improved reporting to the ACIR.

The introduction of additional financial incentives for general practitioner immunisation can be expected to further improve the accuracy of the ACIR estimates of coverage, and its usefulness for monitoring Australia's progress towards national immunisation targets. Despite its limitations, ACIR data are providing valuable insights into the patterns of immunisation in Australia and with improving participation, ACIR's value as a planning tool will be further enhanced.

**Table 1. Percentage of children fully immunised, by State and Territory and assessment method, assessed at 1 year of age**

| | Vaccine | | | | | |
|---|---|---|---|---|---|---|
| | DTP | | OPV | | Hib | |
| State | ACIR[1] (%) | ABS[2] (%) | ACIR (%) | ABS (%) | ACIR (%) | ABS (%) |
| Australian Capital Territory | 83 | 87 | 82 | 87 | 81 | 69 |
| New South Wales | 78 | 87 | 77 | 88 | 77 | 63 |
| Northern Territory | 59 | 85 | 59 | 70 | 67 | 70 |
| Queensland | 81 | 79 | 82 | 83 | 82 | 52 |
| South Australia | 81 | 86 | 81 | 85 | 81 | 57 |
| Tasmania | 81 | 87 | 82 | 91 | 81 | 63 |
| Victoria | 82 | 90 | 82 | 88 | 82 | 66 |
| Western Australia | 72 | 87 | 72 | 84 | 72 | 71 |
| Australia | 79 | 86 | 79 | 86 | 79 | 62 |

1. Australian Childhood Immunisation Register: assessment date 30/9/97 for cohort of children born between 1/7/96-30/9/96.
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