

WESTERN AUSTRALIAN SEPTEMBER 2009 SUBMISSION

POPULATION ESTIMATES

Key Points

- The ABS 2006 Census final experimental estimates of indigenous populations are considered to understate Western Australia's share of the indigenous population.
 - The ABS estimates of standard error and bias for its final experimental estimates of State indigenous populations are not considered reliable – they are a product of the assumptions used in the mathematical model.
- Western Australia considers that, as a key user of indigenous population statistics, the Grants Commission should consult on this matter with the ABS and other relevant experts, and form a judgement (on the use of alternative estimates) after considering all the evidence.
- Where 2006 Census data is used at a small area level, the Commission should apply the final estimates of SLA-level undercount-adjusted indigenous and non-indigenous populations published by the ABS.
 - While these estimates do not reflect the true level of undercounting, they do recognise regional undercounting variation to some extent, and are therefore better than using a common Statewide undercounting adjustment.

ABS EXPERIMENTAL INDIGENOUS POPULATION ESTIMATES

Western Australia has raised concerns with the Commission on a number of occasions about the ABS final experimental estimates of State indigenous populations. These occasions include:

- January 2009 comments on 2009 Update issues;
- February 2009 "Overview" submission for the 2010 Review; and
- July 2009 discussions in Western Australia with Grants Commission senior staff.

We have also followed up on the suggestion by the Secretary to the Grants Commission that we raise directly with the ABS the possibility of re-estimating the State indigenous populations for equalisation purposes (see attached correspondence). While a formal response has not yet been received, we understand that the ABS is unlikely to agree to this.

While we accept that the ABS is aiming for major improvements in the 2011 Census, we are concerned that Western Australia's grant share will be significantly understated in the meantime, due to the decline in Western Australia's share of the estimated indigenous population from 14.4% at the 2001 Census to 13.7% at the 2006 Census.

As noted in our January 2009 submission, school enrolments data suggests that the ABS has underestimated Western Australia's indigenous population relative to other States, as shown in Table 1.

Table1: Indigenous Enrolments (2006) vs ERP (30 June 2006)

	Enrol- ments	ERP	Diff. person	Diff. %	Enrol- ments	ERP	Diff. person	Diff. %
Age	6-9	6-9	6-9	6-9	10-14	10-14	10-14	10-14
NSW	14,491	15,494	-1,003	-6.5	18,065	19,885	-1,820	-9.2
Vic	2,863	3,381	-518	-15.3	3,489	4,150	-661	-15.9
Qld	14,362	15,036	-674	-4.5	17,523	18,621	-1,098	-5.9
SA	2,802	2,794	8	0.3	3,308	3,426	-118	-3.4
WA	7,977	7,184	793	11.0	9,226	8,539	687	8.0
Tas	1,683	1,766	-83	-4.7	2,244	2,387	-143	-6.0
NT	5,205	6,015	-810	-13.5	6,052	7,139	-1,087	-15.2
ACT	395	419	-24	-5.8	468	523	-55	-10.5
Total	49,778	52,090	-2,312	-4.4	60,375	64,670	-4,295	-6.6

Source: Indigenous ERP from ABS 3101.0, June 2008. As only five year age groups were published, the 6-9 age group has been estimated as 80% of the 5-9 age group. Age 5 was excluded due to only partial enrolment of age 5's across the States. Enrolment data was provided by the ABS on request.

We understand that the ABS faced significant difficulties with the 2006 Census in remote areas of Western Australia, including difficulties in recruiting Census collectors in the booming economic conditions that prevailed at the time.

We are also concerned at the methodology used by the ABS to form its State-by-State estimates of indigenous undercount rates from the 2006 Census. This methodology is detailed in the recently released ABS paper *Population Estimates: Concepts, Sources and Methods* (ABS 3228.0.55.001, published 12 June 2009), Appendix 2: Empirical Bayes Estimation of Indigenous Undercount.

In particular, feature A2.2 and paragraph A2.6 indicate that the "true" undercount adjustment T_r for each region "r" was assumed to be distributed as a normal random variable with the same mean T and same variance A.

This assumption is very strong. It means, as we understand it, that there is no *a priori* expectation that any region will have any worse undercount than any other region. This assumption is quite implausible for Western Australia, given the difficulties with the 2006 Census in this State, and the difficulty of counting the many small remote indigenous communities in the State.

The implausibility of the ABS assumption is also reflected in the undercount rates derived by the ABS, shown in Table 2. These rates are not at all random, as would be expected from the ABS assumption. Instead, the undercount rates match very well with *a priori* expectations (reflecting the remoteness and size of indigenous communities) that the undercount rates would be greatest in Western Australia and Northern Territory, followed by Queensland, with lower rates in other States and Territories.

Table 2: 2006 Census Indigenous Undercount Rates

New South Wales	8.6%
Victoria	9.4%
Queensland	11.6%
Western Australia	16.6%
South Australia	8.6%
Tasmania	8.8%
ACT	8.9%
Northern Territory	16.0%

Source: ABS 3238.0.55.001 – Experimental Estimates of Aboriginal and Torres Strait Islander Australians, Technical Note, August 2008.

Using its assumption, the ABS was able to “draw strength” from the national undercount to “improve” its estimates of undercount in each State, compared to just using undercount data for each State (this is the gist of what the ABS has said in presentations and meetings).

- In practice, as we understand it, this assumption has led to a significant downward adjustment in Western Australia’s share of the indigenous population.

The ABS considers that a major advantage of its approach is the ability to substantially reduce the standard errors of the State undercounts, compared to just using data for each State.

- For example, in Western Australia’s case, the “State only” standard error for the undercount is 8.8 percentage points, reduced to 4.2 percentage points by drawing strength from the national undercount (see feature A2.20 in the ABS paper). After allowing for the “mean square bias” in its methodology, the ABS derives an adjusted error estimate of 5.1 percentage points for Western Australia, still well below the “State only” estimate of 8.8 percentage points.

However, these reduced estimates of error are crucially dependent on the ABS's assumption of no expectation that any region will have any worse undercount than any other region. To the extent that this assumption does not hold, the ABS error estimates also do not hold.

What can be done

Western Australia considers that, as a key user of indigenous population statistics, the Grants Commission should consult on this matter with the ABS and other relevant experts, and form a judgement after considering all the evidence.

Options might include:

- averaging the State indigenous population shares derived from the 2001 and 2006 Censuses;
- using an average of the ABS undercount estimates and "State only" undercount estimates;
- recalculating the ABS estimates with a modified *a priori* assumption that recognises the expected higher undercount rates in some regions of Australia; or
- using Government administrative data to inform the estimates.

ADJUSTING SMALL AREA CENSUS DATA FOR UNDERCOUNTING

The Grants Commission is making much use of small area Census data in its assessments.

We ask that the Commission make the best possible adjustments for population undercounts at the small area level. Using, for example, a common Statewide undercount adjustment would not recognise regional undercounting variation.

The ABS website provides final estimates of SLA-level undercount-adjusted indigenous and non-indigenous populations as at 30 June 2006 (see ABS 3238.0.55.001). The ABS 3238.0.55.001 Technical Note states (in paragraph 22) that:

In producing estimates of the Indigenous and non-Indigenous populations of Statistical Local Areas (SLAs), PES estimates produced by the Empirical Bayes method for each state/territory were used as upper level constraints on the SLA-level Indigenous populations as at census night. State/territory net undercount was distributed pro-rata to individual SLAs, having regard to capital city/balance of state undercount for the total population according to their demographic characteristics such as age and sex.