



COMMONWEALTH GRANTS COMMISSION

DISCUSSION PAPER CGC 2002/10

POPULATION ISSUES

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INTRODUCTION

1. This paper provides staff views on a number of population related issues raised by the States as part of the 2004 Review. They cover what the Commission should do, if anything, about the impact on State grant shares or assessments of:

- (i) the over or under-estimation of State estimated resident populations in the intercensal period;
- (ii) the possible under-enumeration of the Indigenous population in the 2001 Census;
- (iii) a possible discrepancy between the self-identified Census count of Indigenous people in Tasmania and real service delivery requirements;
- (iv) *gross* population movements within/between States rather than *net* population movements; and
- (v) transient population movements (Indigenous people, tourists, itinerant/fly-in/fly-out workers, refugees).

2. Where relevant, the paper presents ABS comments on these matters, received as a result of the Commission's request for information. Attachment A provides the views of the ABS in more detail.

3. The paper is written against the background that the Commission is a user of statistics produced by independent expert bodies, such as the ABS. It does not usually consider it appropriate to make adjustments to published statistics unless there is clear and unambiguous evidence that equalisation is served by so doing.

RESIDENT POPULATIONS

4. During its Workplace Discussions in August 2001, the Northern Territory claimed that the under-estimation of its population had a direct and quantifiable effect on the Territory's fiscal position. It claimed that an under-estimation of its population in intercensal years had cost it in excess of \$125 million in general revenue grants in the period 1981 to 1996. In its submission, the Territory suggested that the Commission address the fiscal implications of intercensal under-enumeration by a modification to the Debt Charges assessment.

5. The issues are:

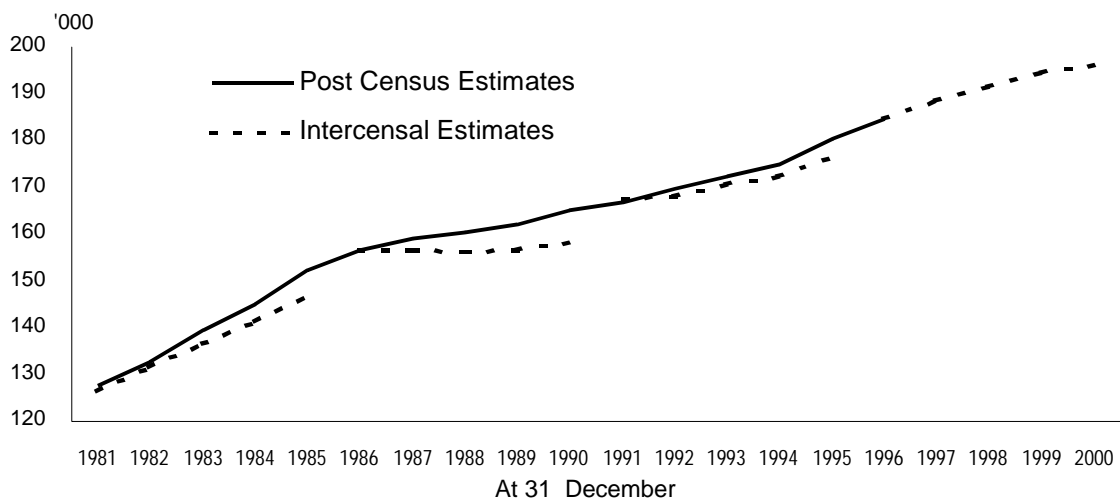
- (i) Has the Northern Territory's population been under-estimated in the intercensal years? In particular what has happened between 1996 and 2001? What of other States' populations?

- (ii) Should adjustments be made to the assessments for the extent to which the States have been over or under equalised in the past because of any inaccuracies in State resident population estimates?
- (iii) Should adjustments to resident population estimates — both totals and disaggregations — be made to data used in the 2004 Review to adjust for likely under or over estimates in the future?

The Facts

6. The Northern Territory presented evidence to show that ABS preliminary intercensal population estimates for the Territory had been substantially revised upwards after the last three Censuses. Figure 1 illustrates the claim. The Northern Territory said that its population was underestimated by 4.1 per cent between 1981 and 1986, 4.1 per cent between 1986 and 1991 and 2.3 per cent between 1991 and 1996, after substantial revision to the interstate migration model each time.

Figure 1 ESTIMATED RESIDENT POPULATION OF THE TERRITORY — COMPARISON OF PRELIMINARY AND FINAL ESTIMATES



Source: ABS Catalogue No. 3101.0, Australian Demographic Statistics, (various editions).

7. The ABS made no comments on the Northern Territory’s claim that its Estimated Resident Population (ERP) had been underestimated in the past. It noted in its comments on the Northern Territory submission that Final 2001 Census based population estimates for 30 June 2001, and thus December 2001, were not expected to be available until late March 2003. Estimates available at present were preliminary and subject to revision. It said that the preliminary ERP for the Northern Territory, based on the 2001 Census, showed an intercensal discrepancy of 1.2 per cent. That is, the preliminary ERP for the Northern Territory based on the 2001 Census was 1.2 per cent higher than the ERP based on the 1996 Census updated for births, deaths and migration over the period 1996-

2001 (see Table 1). This figure compared with an intercensal discrepancy of 2.9 per cent observed from 1996 Census (the Northern Territory reported 2.3 per cent).

Table 1 PRELIMINARY INTERCENSAL DISCREPANCY FOR THE PERIOD 1996-2001

Intercensal Discrepancy ^(a)	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Persons ('000)	-76.8	6.3	-7.3	3.6	-12.5	-2.7	-7.5	-2.4	-98.6
Percent (%)	-1.2	0.1	-0.2	0.2	-0.8	-0.6	-2.4	-1.2	-0.5

(a) A negative sign indicates that the ERP based on the 2001 Census is higher than the one based on 1996 Census updated for births, deaths and migration over the period; that is, the ERP in the intercensal years has been underestimated.

Source: ABS Correspondence 12 September 2002.

8. According to the Northern Territory, the past under-estimation between Censuses has been the result of inaccurate estimates of intercensal interstate population movements. Medicare 'change of address' data are used for this purpose and they are said to perform badly for the Territory because:

- (i) its gross interstate migration flows are large compared with those of other States (8 to 10 per cent per of its population changes each year compared with less than 2 per cent for the other States, excluding the ACT); and
- (ii) much of its in-migration is of young healthy 20 to 29 year olds who tend not to access Medicare and much of its out-migration is of families who do.

9. The ABS responded that the discrepancy was due to accumulated errors in all components of population change — births and deaths, overseas and interstate migration, and changes in the Census coverage. It reported that births and deaths were relatively accurate but there have been problems with the estimation of Net Overseas Migration because:

- (i) when the 1996 Census based ERP for 30 June 2001 was released (December 2001), little or no overseas migration data had been provided to ABS since July 2000, when the data collection system at DIMIA was replaced. Delays in the implementation of the new system have meant that for 8 out of the past 20 quarters, the ABS has had to estimate net overseas migration based on partial data, or none at all; and
- (ii) unauthorised arrivals are not included in the intercensal estimates because they do not complete a passenger card on arrival (however, they are counted in the Census), but unauthorised arrivals subsequently deported complete an outgoing passenger card upon departure.

10. The ABS has recognised that there are deficiencies in Medicare data and has calibrated the model it uses for estimating interstate migration for these. The model makes adjustments to Medicare movements data where empirical evidence from the Census shows that the Medicare data underestimates movements by particular population groups. For example, in the model:

Expansion factors are applied to the Medicare movements data for age groups where there is not a close connection. These include male arrivals to NT between 16 to 29 years of age and female arrivals aged between 18 to 24 years. There are also expansion factors applied to departures from NT for males (16 to 29 years of age) and females (18 and 24 years of age) not mentioned in paragraph 2.8 [of the Northern Territory submission].

11. The ABS also adjusts for defence personnel movements. It is proposing a further review of the model in 2003.

12. The ABS reported that improving Census coverage over time, particularly in remote areas, was almost certainly contributing significantly to a reduction in the Northern Territory's intercensal discrepancy.

Staff Views

13. There is no doubt that the Northern Territory's ERP has been substantially underestimated in the past. However, the results of the last Census suggest that this is a diminishing problem. The extent of over or under-estimation is small for all States and, in numerical terms, probably only important for the Northern Territory and New South Wales.

14. Most of the under-enumeration in New South Wales (see Table 1) was probably due to the problems in estimating overseas migration. Forty three per cent of permanent and long term arrivals and up to 50 per cent of unauthorised arrivals settle there. However, until the ABS obtains complete data on net overseas migration, it will not be able to determine with any certainty the actual source of the discrepancies, or make adjustments for them.

15. The final estimates which will be available in March 2003 may remove all cause for concern.

What Should the Commission Do?

16. There are two issues relating to resident population data:

- (i) should some adjustment be made for past inaccuracies which have led to over or under-equalisation of States; and
- (ii) should some adjustment be made for any present level of inaccuracy in data to be used for the 2004 Review?

17. *Dealing with past inaccuracies.* The Northern Territory argued that an adjustment to the Debt Charges assessment should be made to address the effect of past and future population estimation errors. It argued that the natural response for a State to take when population is under-estimated, and hence fiscal capacities are under-equalised, is to increase debt by the same amount in an attempt to provide an average level of services. Conversely, States that experience over-estimation of their population are over-equalised and their need to accumulate debt is reduced.

18. The Northern Territory proposed that, using the current Debt Charges framework, an additional amount of borrowing should be added or subtracted. This would require:

- (i) a determination of the period of time over which population estimation errors were to be corrected (say 1981 to 1986, 1986 to 1991, 1991 to 1996 and 1996 to 2001);
- (ii) a calculation of the impact of population errors on the distribution of general revenue grants in each year for each jurisdiction; and
- (iii) the cumulative amount for each jurisdiction being expressed in per capita terms and added to the per capita standardised net borrowings.

This would have the effect of increasing or decreasing each jurisdiction's need to borrow for standardised capital outlays and actual under or over-equalisation caused by population errors. This would flow through the assessment to the final disability factor.

19. The Commission does not usually make retrospective allowances for past inaccuracies — 'by-gones are by-gones'. As a result, staff are not inclined to support an adjustment to the Debt Charges assessment.

20. *Dealing with under-estimates in the 2004 Review.* Staff are reluctant to recommend adjustments to the resident population estimates — both totals and disaggregations — to be used in the 2004 Review. This is because the ABS 'has yet to see any credible verifiable evidence of deficiencies in population estimation' for any State and the adjustments are likely to be small and impossible to make with certainty.

21. For most States, the estimated resident populations appear accurate. Even for the Northern Territory, it appears that the ABS has been able to re-calibrate its models to produce better estimates of ERP between the 1996 and 2001 Censuses. Nonetheless, for the Northern Territory and New South Wales, there is an observable under-estimation. For New South Wales, it is possible this will be resolved when the DIMIA data become available from 2003. This may also be the case for the Northern Territory. Following the release of the final estimates, Commission staff will check the size of the problem. Hopefully, it will be possible to use the ERP estimates with confidence in the 2004 Review.

22. On a practical note, there does not appear to be any reliable way of adjusting State ERPs. Staff are not inclined to recommend any adjustment.

INDIGENOUS UNDER-ESTIMATES

23. During its Workplace Discussions in August 2001, the Northern Territory claimed that the undercounting of its remote Indigenous population had cost it in excess of \$50 million in untied funding over a five year period. In its submission, the Territory suggested that the Commission make adjustments to remote Indigenous population estimates to ensure equalisation is achieved.

24. The issues are:

- (i) Were remote Indigenous populations undercounted in the 2001 Census?
- (ii) Should the Commission make adjustments to remote Indigenous population data to be used in its calculations for the 2004 Review?

The Facts

25. The Northern Territory reported its concern that its remote Indigenous population was under-enumerated. This was because, while Census enumeration of the Territory's Indigenous population was improving, it remained difficult to accurately count and estimate Indigenous populations in remote communities.

26. The ABS adjusts the raw Census count of the Territory's Indigenous population using a Post Enumeration Survey undertaken across non-remote areas of Australia shortly after the Census. After the 1996 Census, the Indigenous net undercount rate for Australia (estimated at 7.1 per cent) was applied to adjust the Census count upward (by around 3 000 extra people) to derive experimental estimates.

27. However, this non-remote based adjustment assumed that the Territory's Indigenous net undercount was the same as the national net undercount, despite the large proportion of remote Indigenous people in the Territory. Consequently, according to the Northern Territory, the true net undercount of the remote Indigenous population in the Territory was more likely to lie well above the assumed 7 per cent, probably in the range of 12 per cent to 14 per cent (an extra 1 200 to 1 800 people).

28. Furthermore, the Northern Territory reported, anecdotal evidence suggested that some young Indigenous males in the Territory, and in particular those from more remote and traditional communities, actively avoided being counted on any lists, Census or otherwise. This was supported by Territory Government data collections on Indigenous community populations which show a number of irregularities when compared to 1996 Census data.

29. The 2001 Census introduced measures as part of a 2001 Indigenous Enumeration Strategy that were expected to improve the Indigenous data. A comprehensive report on data quality will not be available until June 2003. However, the post-enumeration survey coverage still did not extend to 'sparsely settled areas' and the Indigenous net

undercount of about 6.5 per cent was applied to all geographic areas in deriving Indigenous population estimates. 'No separate undercount rate is derived for sparsely settled areas.'¹.

30. The ABS advised that it had seen no evidence of the claims made by the Northern Territory that the remote Indigenous net undercount was higher than the 7 per cent used in 1996, and was in the range 12 to 14 per cent. The ABS had concerns about the conceptual basis on which the higher estimate was obtained, as well as its statistical validity and the research approach used to obtain it.

31. Remote communities were enumerated in both the 1996 Census and the 2001 Census using an Indigenous Enumeration Strategy which was, amongst other things, based on ensuring co-operation from the communities involved by working with liaison officers from Indigenous communities. The ABS expects that while there are ongoing enumeration issues in some individual remote communities, the overall net under-enumeration rate for the communities where the Indigenous Enumeration Strategy was adopted should be the same as, or lower than, the net under-enumeration rate observed for the broader Indigenous population.

32. With regard to the use of administrative lists as the key source for determining net undercount, the ABS has strong reservations about both the reliability and the conceptual basis of such data to measure net undercount on a Usual Residence basis.

33. The ABS reported that demographic analyses suggested that the under-enumeration adjustments it had made were reasonable. In addition, the ABS advised that an improved method of estimating the net undercount was used for the 2001 Census. The ABS noted that:

Whilst the PES sample size does not permit direct estimates of Indigenous undercount by State, the calculation and application of net undercount measurements was done concurrently; that is, differential net undercount of the Indigenous population is included in the total net undercount for the Northern Territory, and implicitly reflects different patterns of age-sex and Indigenous characteristics present in the Northern Territory.

Staff View

34. If its remote Indigenous population is under-estimated, staff think that the Northern Territory has a justifiable concern because its population, relativities and grant share would also be understated. The question is whether the ABS post-enumeration survey and adjustment methods or administrative data give a more reliable picture of remote Indigenous populations. On the surface, neither seems completely reliable.

¹ ABS, Population Distribution, Aboriginal and Torres Strait Islander Australians, 4705.0, 2001.

What Should the Commission Do?

35. The Northern Territory argued that the problem of under-estimation of the remote area Indigenous population in the Territory, and most likely in other jurisdictions with remote populations, would have sufficient impact on the equalisation process to warrant further investigation by the Commission. It proposed that the Commission adjust Indigenous population estimates by a factor to ensure that remote Indigenous populations were appropriately reflected in the equalisation process.

36. The ABS Census post-enumeration survey still does not cover remote areas. However, the ABS does not accept that remote Indigenous people are undercounted more than non-remote Indigenous people and certainly not to the extent suggested by the Northern Territory. Commission staff accept that an error in the remote Indigenous population experimental estimates is unlikely to be statistically significant for ABS purposes. However, for equalisation purposes, once cost weights are applied to this group, the error could become material. For this reason, we are inclined to ask the Northern Territory to substantiate its view that the net undercount of remote Indigenous people in the Northern Territory could be twice the figure recognised nationally. If it can do so, then we would need to have discussions with the ABS on how best to adjust for this. If making an adjustment is practical, we would be inclined to recommend to the Commission that an adjustment be made to Northern Territory, and other remote Indigenous populations, in the Indigenous population estimates to be used in calculations for the 2004 Review.

TASMANIA INDIGENOUS COUNT

37. During the Commission's Indigenous Funding Inquiry, we were told that the 1996 Census count of Indigenous people in Tasmania was 14 to 16 thousand compared with a 'true' figure, which reflected service delivery needs, of six to eight thousand. The Commission was also told there was pressure from the Indigenous community for the Tasmanian Government to adopt a three tier definition of Indigeneity for service delivery purposes, rather than self-identification. The Tasmanian Government allows the Indigenous community itself to define who is an eligible person for Land Rights purposes but many government services rely on self identification – health services for example. This is despite the fact that Indigenous controlled health services in Tasmania strictly apply the three tier definition. Similarly, families with non-indigenous members can occupy Indigenous housing but non-Indigenous members of families are excluded from receiving services from Indigenous controlled health services.

38. There has also been considerable dissent in Tasmania, reported recently in the press, over who should be considered an Indigenous person.

39. Staff are concerned that using Census based counts of Indigenous persons in Tasmania is overstating its level of need. Assessments are generally approached on an assumption that the Census count provides an indication of States' relative levels of demand for services by Indigenous people. If the level of demand in Tasmania is substantially lower than the Census count, some adjustment for this may be necessary. Staff seek further

information on the three tiered identification system used by Indigenous health services, as well as any other comments States have.

GROSS AND NET POPULATION MOVEMENTS

State Views

40. The Northern Territory, in discussing interstate mobility, claimed that the ABS net migration data showed that it had a much higher level of gross population movement than other jurisdictions. It also argued that using net data resulted in an underestimate of the costs it faced because the net data did not adequately capture the large interstate flows which impact on demand for services and administrative scale costs.

Staff Views

41. It is true that the Northern Territory and the ACT have much higher gross population movements than the other States.

42. It is also true that most of the data available on population capture the net result of population movements rather than gross movements. For example, leaving aside births and deaths, a district with an equal number of persons moving in and out will show no net change in its population irrespective of the number of persons who moved. However, at least for some areas of functional activity, such as orientating new students in schools, a measure of gross movements may be more appropriate in reflecting cost impacts on budgets than a measure of net population change.

43. The Commission's current assessment methods use the net impact of population migration. Staff seek State views on whether the difference in budgetary impact between using gross population movements and net population change is material; and if so, how it should be measured.

44. Staff think this issue is best dealt with on a category-by-category basis.

TRANSIENT POPULATION MOVEMENTS

State Views

45. Queensland and the Northern Territory raised concerns about the impact of transient population movements in their jurisdictions on service delivery costs.

46. Queensland claimed that temporary mobility of its population was substantial and was of rising importance throughout Australia. It said that the reasons for

this mobility were not well understood, nor well recognised, but whatever the cause, there was a substantial population redistribution towards Queensland. While temporary movers contribute to local economies through their demands for goods and services, they also place demands on the local infrastructure, services and facilities. For some regions, particularly holiday areas, the impacts of these temporary population movements are more significant than permanent inflows — and services, such as water and sewerage, have to meet peak demands.

47. The Northern Territory said that Indigenous people were inherently highly mobile. While some Indigenous movement is predictable, such as that due to seasonal influences, other movement is not. This high mobility and unpredictability has a significant impact on the demand for and nature of services, such as teacher time spent in orientating new students and providing accommodation.

Staff View

48. Transient population movements cover both interstate and intrastate movements and include persons who have not changed their permanent address (or do not have a permanent address) such as: travellers, tourists, visitors and itinerant workers. It also includes Indigenous persons, especially in remote areas, who move around frequently, on a seasonal basis or otherwise. The impact of transient populations on State budgets is all about gross population movements and has little to do with net population changes.

49. The Commission's current methods of assessment do not take account of transient population movements.

50. There are few data available on transient population movements. One way to measure transient population movement would be to compare Census population counts on a place of enumeration basis with a place of residency basis. The differences can be assumed to be the number of transients at Census date. If the Census were undertaken in January instead of August, it would give a much different result. For example, the Northern Territory experiences a major inflow of tourists mid-year and a significant outflow of residents in the Christmas/New Year period.

51. Transient populations appear to fall into a number of groups that are likely to have different impacts on States' services — tourists, seasonal workers, unemployed persons and Indigenous persons in remote areas.

52. This gives rise to several issues.

- (i) What are the relative proportions of each group?
- (ii) What impacts do they have on particular services?
- (iii) Are the impacts of transient population movements on State expenses material?

- (iv) If the net impacts on State expenses are material, can we use Census data on place of enumeration as an indicator of where the impact of such population movements on a service is material?

53. The impact of foreign tourists on hospital costs was raised by New South Wales. We are not sure why this has not been raised as a wider issue, but think it should be approached on a net flow rather than an inflow basis. Materiality and data availability might dictate the assessments in which this issue needs to be considered further.

54. Unless State responses to the above questions indicate that the differential impacts of transient population movements on State budgets are significant, where they are significant and how they can be measured, staff are inclined to recommend to the Commission that it not introduce methods to take account of transient population movements in its assessments.

55. As with gross population movements, it is considered that this issue is best dealt with on a category by category basis.

SUMMARY

56. Staff are inclined to recommend to the Commission that:

- (i) no adjustment be made to data or assessment methods in relation to the over or under-estimation of resident populations in the 2004 Review:
- for past inaccuracies, because the Commission's usual approach is not to correct for past errors; and
 - for present inaccuracies, because their extent is small and no appropriate way of making adjustments is available;
- (ii) adjustments should be made to remote area Indigenous population estimates if the Northern Territory can substantiate the extent of the claimed under-enumeration of its remote Indigenous population. This would be done with advice from the ABS on how any such adjustments might be made.

57. Staff seek State views on the disputed Indigenous count for service delivery purposes in Tasmania and further information on the three tier identification approach to service delivery used by Tasmanian Indigenous health organisations.

58. Staff acknowledge that the assessments do not take into account many of the population movements identified by States. However, we are not certain how material they are or of how they could be taken into account. Evidence of the impacts on particular services and how they might be taken into account would be helpful.

ATTACHMENT A

CGC REQUEST

File Ref: 2002/0162

**The Australian Statistician
Locked Bag 10
BELCONNEN ACT 2616**

Attention: Paul Williams
Branch Head, Census, Demography and Geography
By email: paul.williams@abs.gov.au

POPULATION DATA

The Commission is currently reviewing the methods used to assess the funding requirements of all States and Territories — the so-called 2004 Review of State Per Capita Relativities. As part of that review, I need your comments on the accuracy of ABS population data. As you may know, we use resident population data in all our calculations and indigenous populations data in a number of functional assessments. They are very important drivers of the distribution of GST funds.

I understand that the Northern Territory has discussed a number of issues about the compilation of population data for the Territory directly with your office over recent years, as a result of which there have been changes made to ABS procedures. Nevertheless, it remains dissatisfied with the population data in two respects — it believes that the Territory's populations between Censuses are underestimated, and that its indigenous population is undercounted because of the use of national-based adjustments for undercounting in non-remote areas.

The Northern Territory Treasury has asked the Commission to change its methods for calculating per capita relativities to adjust for the alleged population undercounts. I have attached a copy of a section of its submission to us for your information and comment.

We understand that other States have raised with the Commonwealth Treasury a somewhat similar issue relating to the underestimation of their populations in the intercensal period. They have sought an adjustment to the financial assistance they received from the Commonwealth over that period.

Any comments you have on these two issues would be appreciated. I would also appreciate any assistance you might be able to provide, even on an informal basis, on how the

Commission might adjust resident population and Aboriginal experimental population estimates to compensate for these matters of concern. We understand that the extent of underestimation is unlikely to be significant in statistical terms, but for our calculations, it is important.

The Commission is to meet with Treasury officers from all States and Territories in either late October or November to discuss this issue. To prepare the Commission for those discussions, it would be most beneficial if your views on the issues raised by the Northern Territory could be received by 6 September 2002. ABS would be welcome to participate in the discussions of population data with the Treasury officials. We will advise you of the date when it has been set.

The Commission's work on population data is being managed by Catherine Hull who can be contacted on 6229 8813 or e-mail at catherine.hull@cgc.gov.au should you wish to do so.

(signed)

Bob Searle
Secretary

19 August 2002

POPULATION UNDERESTIMATION

KEY POINTS

- From 1981 to 1996 the ABS consistently and significantly underestimated the Territory population.
- It is expected that underestimation has continued in the latest intercensal period to 2001.
- In addition, inadequate Census Post Enumeration Survey processes mean that the Census undercounts a significant number of remote Indigenous Territorians.
- It is estimated that intercensal underestimation has cost the Territory some \$125M in general revenue grants in the period 1981 to 1996.
- It is estimated that undercounting of the remote Indigenous population costs in excess of \$50M in a five year period.
- The Territory suggests that the fiscal implications of intercensal underestimation could be addressed by a modification to the Debt Charges assessment.
- The Territory suggests that the Commission consider making adjustments to remote Indigenous population estimates to ensure that equalisation is achieved.

During the Territory's Workplace Discussions in August 2001, the Territory outlined a problem that it faces concerning the underestimation of the Territory population. This underestimation has a direct and quantifiable effect on the Territory's fiscal position, which it seeks to address as part of the 2004 Review. The Territory's concerns are outlined below, followed by a suggested approach to address the impact of this problem.

BACKGROUND

2.1 Between each Census, the Australian Bureau of Statistics (ABS) generates relatively accurate estimates of births, deaths and net overseas migration for each jurisdiction. However, due to difficulties in estimating the number of people who change residency from one jurisdiction to another, the ABS is not able to precisely estimate intercensal interstate flows.

2.2 The ABS model for estimating interstate migration flows is a nation-wide model which identifies when and where people move, based on Medicare 'change of address' forms. While this zero-sum model balances at a national level and works well for most large jurisdictions, it performs poorly in the estimation of movements to and from the Territory.

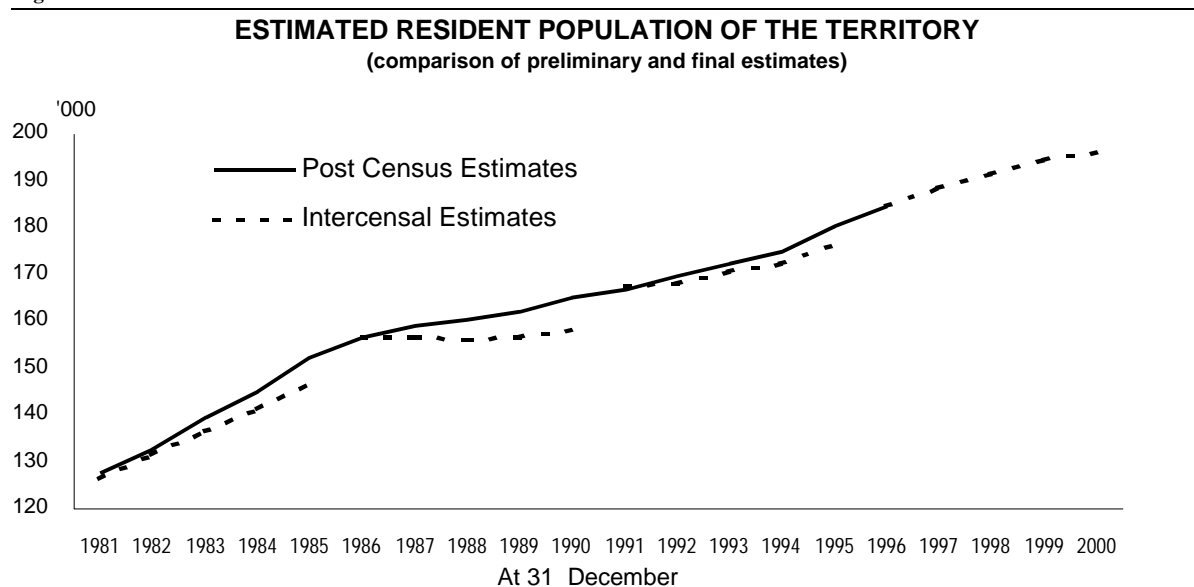
By way of example, the preliminary intercensal population estimates for the Territory have been subject to substantial upwards revision upon release of the last three reported Census collections in 1986, 1991 and 1996.

2.3 At the end of the 1981 to 1986 intercensal period, more accurate 1986 Census data showed that the ABS had underestimated the population of the Territory by 4.1 per cent. After the release of the 1991 Census results, this underestimation was shown to have recurred, with Census data showing that the Territory's population over 1986 to 1991 had been significantly underestimated, again by 4.1 per cent. This was despite refinements to the Medicare model.

2.4 Following the 1991 Census, the ABS again revised the interstate migration model. However, as in previous periods, this was insufficient to eliminate the continued underestimation of the Territory population, with 1996 Census results showing an underestimation of 2.3 per cent. This compared to revisions ranging from -0.5 per cent to +0.5 per cent for the other jurisdictions.

2.5 Figure 2.1 shows the ABS preliminary intercensal estimates, and the consequent upward revisions made by the ABS once more accurate Census data were acquired.

Figure 2.1



Source: ABS Catalogue No. 3101.0, Australian Demographic Statistics, (various editions).

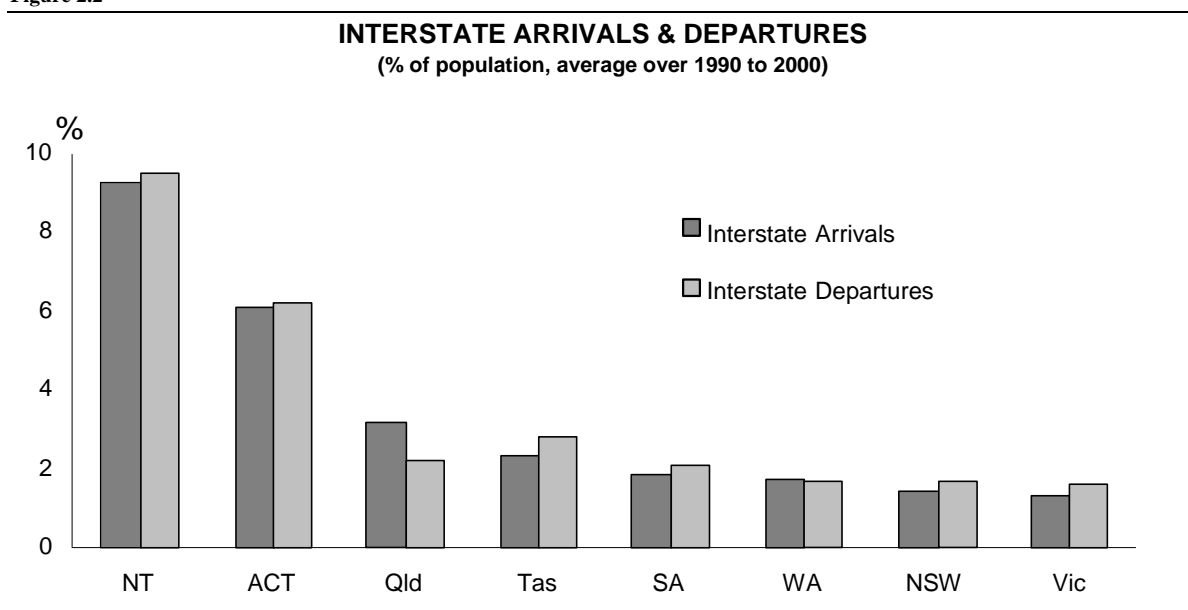
Final estimates for 1996 onwards to be released after the 2001 Census.

2.6 Despite some method changes, this pattern of underestimation is likely to have continued in the recently concluded 1996 to 2001 intercensal period, with the ABS tracking interstate migration in a manner similar to that used in previous intercensal periods. While the ABS has incorporated a more realistic adjustment for defence personnel not reliant on

Medicare, it has not addressed the basic issue of a Medicare-based model not being able to accurately track Territory interstate migration flows.

2.7 A primary difficulty for the Territory relates to its large gross interstate migration flows. A high level of population transience relative to other jurisdictions means that, in a typical year, around 8 to 10 per cent of the total population of the Territory has changed. These large gross flows, as shown in Figure 2.2, result in estimates of net interstate migration to the Territory which are both volatile and prone to inaccuracy. This is not a major problem for other jurisdictions, which typically have much smaller gross flows.

Figure 2.2



Source: ABS Catalogue No. 3101.0, *Australian Demographic Statistics*, (various editions).

2.8 Another problem with the Medicare model relates to the lower propensity of people who move to the Territory to register a change of address with Medicare, compared to those who move out. A study of 1991 and 1996 Census data shows that the majority of interstate migrants to the Territory over the 1991 to 1996 intercensal period were aged 20 to 29. This age group is typically healthy, with a correspondingly lower propensity to access medical services through Medicare (making it less likely they would change their registered address for Medicare purposes while in the Territory).

2.9 The same study showed that most migrants leaving the Territory were outside this age group, and typically comprise family groups. Such family groups have a relatively higher probability of changing their Medicare address details once they have moved to another State.

Indigenous Census Counts

2.10 Another major issue of underestimation concerns the Territory's Indigenous Census counts. While Census enumeration of the Territory's Indigenous population is thought to be

improving, it remains difficult to accurately measure Indigenous populations in remote communities.

2.11 The ABS carries out a Post Enumeration Survey across non-remote areas of Australia shortly after the Census. This is then used to determine the Census undercounts, in recognition of the fact that Census counts completely miss some people. The Indigenous undercount rate for Australia for the 1996 Census (estimated at 7.1 per cent) was applied to adjust upward the raw Census count of the Territory's Indigenous population (by around 3 000 extra people).

2.12 However, this non-remote based adjustment assumed that the Territory's Indigenous undercount was the same as nationally, despite the large proportion of remote Indigenous people in the Territory. Consequently, the true undercount of the remote Indigenous population in the Territory is more likely to lie above the assumed 7 per cent, probably in the range of 12 per cent to 14 per cent (an extra 1 200 to 1 800 people).

2.13 Furthermore, anecdotal evidence suggests that some young Indigenous males in the Territory, and in particular those from more remote and traditional communities, actively avoid being counted on any lists, Census or otherwise. This is backed up by Territory Government data collections on Indigenous community populations, which show a number of irregularities when compared to 1996 Census data.

Fiscal Consequences

2.14 The fiscal consequences of such intercensal underestimations are significant for the Territory, as the preliminary population estimates are used as the basis for distributing the Commonwealth's general revenue assistance payments between jurisdictions. Between 1981 and 1996 it is estimated that the Territory missed out on some \$125M (nominal) in grants as a direct result of this underestimation. While an improvement was achieved in the 1991 to 1996 intercensal period, the error remained unacceptably high, with an estimated \$43M in funding lost in that period alone.

2.15 The approach used to calculate these outcomes is relatively simple. For each year the 'correct' population estimates for each jurisdiction is applied to the relativities prepared by the Commission to produce an adjusted general revenue grant. The difference between the adjusted grant and the actual grant is the amount that each jurisdiction is under or over equalised. A more complex approach of adjusting each category and factor assessment where population estimates are used has not been considered due to the excessive complications that would arise. In addition, this would be inconsistent with the concept of not retrospectively adjusting assessments.

2.16 The Territory's fiscal losses arising from the Indigenous undercount are also significant, and are additional to the fiscal losses generated by intercensal underestimation. For every 1 000 remote Indigenous persons missed in the Census process, the Territory loses in excess of \$50M in funding from the Commonwealth over the following five years.

2.17 The Territory has made many approaches to the ABS to seek improvements to its model for estimating interstate migration. As previously indicated, the ABS introduced a modification in the mid-1990s to more accurately estimate movements of defence personnel because the Medicare method was clearly inappropriate for this group of interstate migrants not reliant on Medicare. Beyond that modification, the ABS's ability to further reduce errors appears to be extremely limited.

Method Changes

2.18 The only effective way to address the effect of past and future population estimation errors is therefore via a modification to the Commission's method.

2.19 The Territory has considered the nature of past and potential future errors in population estimates in the context of the Commission's methods and concluded that the appropriate category to modify is Debt Charges.

2.20 When the Commission calculates relativities it seeks to equalise the financial capacities of States in an environment where data are both correct and unbiased. It is clear that in the case of population estimates, which are the single most important source of data, significant errors are a regular phenomenon, particularly for the Territory. A natural response for a State to take when population is underestimated, and hence fiscal capacities are underequalised, is to increase debt by the same amount in an attempt to provide an average level of services. Conversely, States that experience overestimation of their population are over-equalised and their need to accumulate debt is reduced.

2.21 Using the current Debt Charges assessment as a guide, it would appear to be a relatively simple task to add in a module which takes into account the impact on debt levels of the over or underestimation of the population of each State.

2.22 The first step would be to determine a period of time over which population estimation errors are considered. The Territory has only examined the three intercensal periods since Self-Government for which data are available (1981 to 1986, 1986 to 1991 and 1991 to 1996). Data for the 1996 to 2001 period will be available in June.

2.23 The impact of population errors on the distribution of general revenue grants in each year for each jurisdiction would then be calculated. The cumulative amount for each jurisdiction would then be expressed in per capita terms and added to the per capita standardised net borrowings. This would have the effect of increasing or decreasing each jurisdiction's need to borrow for standardised capital outlays and actual under or over equalisation caused by population errors. This would then flow through the assessment to the final disability factor.

2.24 Method changes associated with the underenumeration of the Territory's Indigenous population are potentially more complex. With intercensal discrepancies, these errors are acknowledged by the ABS and are indisputable. Indigenous underenumeration, on the other

hand, is an issue that is not clearly acknowledged by the ABS. The Territory considers that the problem of underestimation of the remote area Indigenous population in the Territory, and most likely in other jurisdictions with remote populations, would have sufficient impact on the equalisation process to warrant further investigation by the Commission. If the Commission is sufficiently concerned, it should adjust Indigenous population estimates by an appropriate factor to ensure that remote Indigenous populations are appropriately reflected in the equalisation process.

CONCLUSION

The Territory has proposed an adjustment to the Debt Charges assessment to take into account the impact on debt levels of population over or underestimation. The Territory considers that such an adjustment should be implemented irrespective of the outcome of the 2001 Census, including the possibility that the Census indicates that the Territory's population has not been underestimated over the past five years. The Territory has also highlighted a problem associated with underenumeration of remote Indigenous populations and proposed appropriate adjustments to these estimates to ensure that equalisation is achieved.

ABS RESPONSE

---Original Message-----

From: Paul Williams [mailto:paul.williams@abs.gov.au]

Sent: Thursday, 12 September 2002 2:21 PM

To: Linda Pure

Cc: Patrick Corr; Matthew Berger

Subject: Re: FW: Population Enumeration - Commonwealth Grants Commission

Linda

Please find below advice on NT submission.

We are happy to meet to discuss these issues at any time

Accuracy of population data between Censuses

The 30 June 2001 population estimates based on 2001 Census data are currently preliminary estimates, and are subject to revision. This means that the 31 December 2001 population estimates used by the Statistician for this year's population determination are also preliminary. Final 2001 Census based population estimates for 30 June 2001 are not expected to be available until late March 2003.

The preliminary Estimated Resident Population (ERP) for the Northern Territory, based on the 2001 Census, shows a preliminary intercensal discrepancy, of 1.2%. That is, the preliminary ERP for the Northern Territory based on the 2001 Census was 1.2% higher than the ERP based on the 1996 Census updated for births, deaths and migration over the period 1996-2001. This figure compares with an intercensal discrepancy of 2.9% observed from 1996 Census.

Table 1 : Preliminary intercensal discrepancy for the period 1996-2001

State	Intercensal Discrepancy	
	Persons ('000)	Percent (%)
New South Wales	-76.8	-1.2
Victoria	6.3	0.1
Queensland	-7.3	-0.2
South Australia	-12.5	-0.8
Western Australia	3.6	0.2
Tasmania	-2.7	-0.6
Northern Territory	-2.4	-1.2
Australian Capital Territory	-7.5	-2.4
Australia (a)	-98.6	-0.5

(a) Australia includes Other Territories

The report from the NT Treasury assigns the cause for Census preliminary intercensal discrepancy to an unsatisfactory internal migration component. The ABS feels that this judgment is both premature and erroneous. Firstly, intercensal discrepancy is, by definition, the accumulated errors in all components of population change. More specifically, the discrepancy observed is due to

possible errors in birth and death data as measured by registration data, possible errors in net overseas migration as measured by passenger card data from DIMIA, and possible errors in measurement of interstate migration through a model which uses Medicare data. Further, changes in coverage of the Census, including an improvement in coverage, also contributes to intercensal discrepancy.

Births and Deaths

With regards to the specific claims by the NT Treasury, they note, in paragraph 2.1 that "ABS generates relatively accurate estimates of births, deaths and net overseas migration". This quote is a reasonable statement for births and deaths based on data provided by the NT Government Registrar of Births, Deaths and Marriages. However, we would like to advise that the birth and death data used to compile December quarter population are, in part, on a preliminary "when registered" basis rather than an occurrence basis as used to revise population data for the previous financial year in September quarter each year. This means that in 2001 all of September and December quarter birth and death data will be on a preliminary registration basis for the December quarter population estimates. Birth and death data registered in any period will not necessarily be the same as events that occurred in that period due to lags that occur between the date of occurrence and the date of registration. These registration lags affect births more than deaths but the affect is reduced somewhat by the fact that late registrations are likely to be present in registrations in any given period as well as events that occurred in that period.

Net Overseas Migration

The estimation of Net Overseas Migration however, currently has more issues. When the 1996 Census based ERP for 30 June 2001 was released (December 2001), little or no overseas migration data had been provided to ABS since July 2000, when the data collection system at DIMIA was replaced. Delays in the implementation of these changes has meant that for 8 out of the past 20 quarters, the ABS has had to estimate net overseas migration based on partial data or none at all. The September quarter 2001 is the first of these quarters for which actual data has been provided, which indicates an underestimation at the National level of 5,000 for one quarter. Migration data for all the missing quarters will not be available until the end of 2002. Having overseas movement data for the entire period will also allow calculation of category jumpers where travellers change from short-term movements to long-term/permanent movements or vice versa, another important component of population estimates, missing since July 2000 for the preliminary Census 2001 based estimates.

There are other issues which affect the accuracy of migration data. Unauthorised arrivals to Australia have not been included in intercensal estimates as they do not complete passenger cards on arrival, but they were counted in the Census. Unauthorised arrivals subsequently deported complete an outgoing passenger card upon departure. Together these may have contributed about 12,500 to the preliminary increased discrepancy.

Census improvements

Improving Census coverage over time, particularly in remote areas is almost certainly contributing significantly to NT's intercensal discrepancy. ABS introduced Special Remote Area Forms in the 1986 Census and replaced these with Special Indigenous Forms since 1996. Data on these forms were collected by experienced interviewers and included questions relating to State or Territory of usual residence. For the 2001 Census, continued high effort was made in counting these remote Indigenous populations that have historically proved difficult to enumerate. Further improved strategies were applied to count groups such as the absolute homeless. It is expected that the 2001 Census achieved better coverage of these groups than did the 1996 Census, and hence contribute to an increased discrepancy (ie, the ABS counted more people in 2001 than in 1996). While this would provide some answer to the Northern Territory population intercensal discrepancy, it also would preclude the possibility of a larger undercount of the Indigenous population in the Northern Territory.

Interstate migration data

At the time of the production of 31 December 2001 ERP, the ABS did not have available either complete net overseas migration data at the National or State/Territory level, nor data from the 2001 Census on "Where did the person usually live one year ago?". In the absence of these data, the ABS cannot determine the final intercensal discrepancy at either the National or the State level, and further, we cannot determine if the discrepancy we are currently observing is due to problems with net overseas migration data, problems with net interstate migration data, problems with one of the other components, or some combination of all these factors. This type of conclusive analysis can only be undertaken once all the components are final. Because DIMIA have advised that the backlog of passenger card data will not be available until the end of 2002, at this stage it is expected that this analysis cannot be undertaken until early 2003.

The NT Treasury has frequently criticised the ABS use of Medicare to estimate net interstate migration. Concern has often been expressed that the many changes of addresses are not registered with Medicare. This is not consistent with the close relationship shown with previous population census data on interstate migration. Expansion factors are applied to the Medicare movements data for age groups where there is not a close connection. These include male arrivals to NT between 16 to 29 years of age and female arrivals aged between 18 to 24 years. There are also expansion factors applied to departures from NT for males (16 to 29 years of age) and females (18 and 24 years of age) not mentioned in paragraph 2.8. As part of every intercensal revision, net interstate migration data and the Medicare model are scheduled for review and if necessary revision following finalisation of all components of intercensal growth. This analysis will be undertaken in 2003. It is worthy of note that ABS lags the Medicare data used to determine internal migration by three months. This is because the data is provided when convenient to the user of Medicare services and research has shown that a lag occurs between the date of movement and date the change of address is reported to Medicare.

Estimation of the Indigenous Population

The NT Treasury is correct in its analysis that estimation of net undercount in the 1996 Census was done separately for the total population (within each State) and for the Indigenous population (nationally). However, they have made some errors on the details and the implication. Firstly, and most importantly, population estimation and the net undercount process never "adjust upward the Census count". The Census data itself is not revised by this process - but the derived population estimate does include a component that allows for net undercount. Secondly, whilst the population estimate of the Indigenous population uses counts of Indigenous persons from the Census, further information is applied, particularly concerning imputation of the "not stated" response to the Census question.

As described by the NT Treasury, for the 1996 process a 7.1% net undercount was applied independently to the total Indigenous Census count (after the counts were adjusted for "not stated" to the Indigenous question in the Census). For the 2001, however, an improved method has been used. Whilst the PES sample size does not permit direct estimates of Indigenous undercount by State, the calculation and application of net undercount measurements was done concurrently; that is, differential net undercount of the Indigenous population is included in the total net undercount for Northern Territory, and implicitly reflects different patterns of age-sex and Indigenous characteristics present in the NT.

Regarding exclusion of remote areas, the Post Enumeration Survey (PES), as is the case with many other surveys, excludes a small fraction of Australia's population. For the 2001 PES, it is estimated that under 4% of the total Australian population had no chance of inclusion in the PES - these persons excluded are those living in non-private dwellings such as hospitals and prisons, those living in Other Territories such as Christmas Island, or those living in areas classified as remote under the Monthly Population Survey sampling framework. For the Northern Territory, this exclusion is about 5% for Darwin Statistical Division, but for the remainder of the NT the exclusion is around 50,000 of the total 91,800 people (or 54% of persons living outside Darwin). For the Indigenous

population in NT, the PES excludes 8% of the Indigenous population of Darwin, and 82% of the Indigenous population of the Balance of the NT.

The ABS deals with these exclusions by explicitly assuming that net undercount rate of these persons is the same as those measured in the PES (that is, the same on an Age/Sex, Capital City/Balance of State, and Indigenous/Non-Indigenous basis)

Whilst these exclusions are substantial, the issue here is "did they have different undercount?". The NT Treasury claims that (for 1996) "the true undercount of the remote Indigenous population in the Territory is more likely to lie above the assumed 7 per cent, probably in the range of 12 per cent to 14 per cent". The ABS has seen no evidence of these claims. Further, the ABS adopts a special Indigenous Enumeration Strategy specifically designed to improve the coverage of the Census in the very communities the NT Treasury is saying were missed. The claim made, therefore, amounts to "for every Indigenous person missed from the Census according to the Post Enumeration Survey, two Indigenous people were missed in the areas which were excluded from the PES but had community liaison and special enumeration strategies".

ABS has scheduled a review of the PES methodology for 2006 to determine if it is possible to extend or replace the PES in remote Indigenous communities. Such a review may change future measurement of remote areas, particularly in the Northern Territory.

ABS advice on adjustments

The ABS feels that 2001 based ERP is an improvement over 1996 based ERP (particularly with regard to estimation of net undercount). Further, the ABS has yet to see any credible and verifiable evidence of deficiencies in population estimation (from NT Treasury nor any other party), either for the total population nor the Indigenous population. However, the ABS wishes to stress the caveat that the data available at present is only preliminary and is subject to revision in March 2003 which will utilise additional information and statistics as outlined above.

The population determination made by the Statistician is in accordance with paragraph 7.2(b) of A New Tax System (Commonwealth-State Financial Arrangements) Act 1999:

7 Determination of population of a State

(1) The estimated population of a State on 31 December in a GST year is the population of the State on that date as determined by the Australian Statistician after that date and before 10 June in the GST year.

(2) In making a determination under this section, the Australian Statistician must:

- (a) if practicable, consult with the official Statistician of each State concerned; and
- (b) have regard to the latest statistics in relation to population available to the Australian Statistician on the day on which the determination is made.

It is the ABS understanding that the population as determined by the Statistician is used in per capita funding for the States (and subsequently, for Local Governments). That is, the population estimate having "regard to the latest statistics" at time of determination is used for funding for an entire year. This remains so even when later data become available which provide a more precise estimate of the population.

Given that the ABS estimates improve as later data become available, would it be more appropriate to allow for adjustment to funding based on later revised population estimates. This would seem a mechanism which might satisfy NT (and other State) governments which point out changes to population estimates that are evident as later data become available.