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Demographic Changes in the Northern Territory Following Cyclone Tracy (1974/5)

KEY FINDINGS

- Cyclone Tracy and World War Two are events associated with the only two dramatic annual declines in the Northern Territory's population since the 1930s;
- The immediate response to Cyclone Tracy has been well documented, but there has been little analysis of the pattern of resettlement over the following years as the population returned to pre-Tracy size;
- Evidence suggests resettlement by more males than females, and by people aged 30-39 years at the expense of those aged 20-29 years and over 50 years;
- Resettlement coincided with a large increase in overseas immigration;
- Interstate migration out of the Territory around the time was largely to Queensland and South Australia, with movement in from New South Wales and South Australia;
- Indigenous populations seem to have been affected, but there are few details available;
- This research provides some insights into what might happen when another cyclone hits Darwin and raises important social and economic policy considerations.

RESEARCH AIM

To explore evidence of changes in the demography of the Northern Territory after Cyclone Tracy (December, 1974).

This research brief draws on data from the Census of Population and Housing (1971 – 2006) and other data provided by the Australian Bureau of Statistics. The study is part of a program of demographic research funded in part by the Northern Territory Treasury and the Australian Research Council.

The research has been conducted by **Associate Professor Dean Carson.**

Background

Cyclone Tracy, which struck Darwin in Christmas Eve, 1974, was one of only two events since the mid 1930s (the other being World War Two) which can be associated with a decline in the population of the Northern Territory (see Figure 1). Throughout the mid and late 1930s, population grew each year except in 1942 (when the bombing of Darwin occurred and 1974 when Cyclone Tracy struck. In both cases, the population decreased by 15%. Prior to 1933, the population was extremely volatile as a consequence of a low population size (under 5000 people).

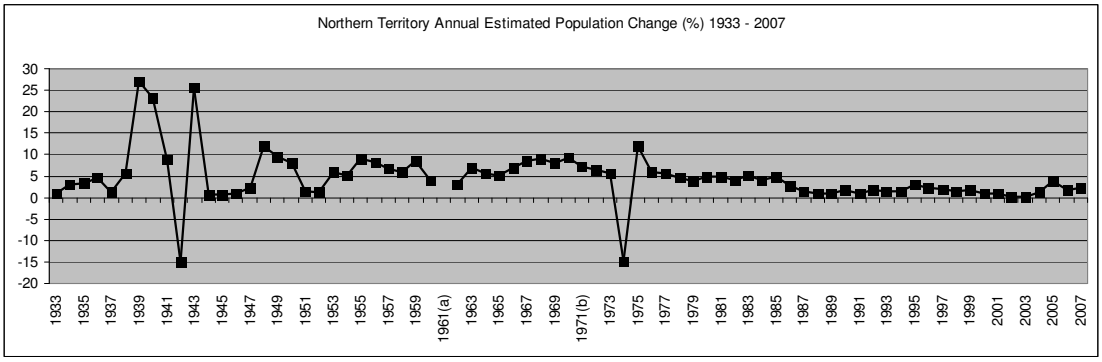

Figure 1. Annual Rate of Population Change in the Northern Territory, 1933 – 2007. Source: Various data collections compiled by the Australian Bureau of Statistics.

In the immediate aftermath of the cyclone, the Australian Bureau of Statistics (1975) produced estimates of the population of Darwin, showing an overall decrease from about 48 000 people in June 1974 to 12 000 in January 1975 and 22 000 in February 1975. These estimates included very high numbers of 'visitors' (people intending to stay less than twelve months), with the 'resident' population estimated at just 3 500 in January and 5 400 in February.

This research brief documents what is known about the changes in the demographic characteristics of Darwin and the Northern Territory following Cyclone Tracy. It is less concerned with the statistics about the immediate population consequences, and more about the characteristics of re-settlement and the extent to which the re-settling population was different from the population prior to the cyclone. This research has been conducted as background to a proposed project to model the demographic impacts of a cyclone hitting Darwin in the current era.

Methods

The Australian Bureau of Statistics has recently made available a range of historical demographic data (http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3105.0.65.0012006?OpenDocument) compiled from various sources and dating back to European settlement in the late eighteenth century. Data for the Northern Territory are largely available from 1911, when the Northern Territory separated from South Australia. The key data in this brief includes occasional population estimates (including for the Indigenous population) and Census data. Prior to 1961, Census were held on an irregular basis, but have been held every five years since 1961. Data quality, enumeration procedures, and data availability differs greatly between Census, particularly those

prior to 1981. Two issues are of particular concern for this brief. Indigenous people were first enumerated in the Census in 1971, and great care is required in interpreting data about this population, particularly in the first few Census in which they were included. Second, the 1976 Census data was compiled using a 50% sample because of the expense of processing all completed forms. The weighting of the sample data to the enumerated population of around 13.5 million is likely to result in substantial error, particularly as regards 'outlier' events.

The initial specifications for this brief included analysis of the following demographic characteristics of both Darwin and the Northern Territory as a whole –

- Population size;
- Age and sex distribution;
- Components of population change (natural increase, overseas migration, interstate migration);
- Sources and destinations for interstate migration; and
- Indigenous population (age and sex).

The intention was to map changes through three Census periods – 1971, 1976 and 1981. Limitations in the availability and quality of data (particularly the availability of data about Indigenous people) mean that the intention was not realised. Instead, the results piece together a variety of evidence about demographic changes following Cyclone Tracy.

Results

Figure 1 has already shown the substantial decrease in population size for the Northern Territory between 1973/4 and 1974/5. The population decreased by about 15 000, from about 105 000 people in June 1974 to about 90 000 in June 1975. The population of Darwin went from an estimated 46 700 to 25 700 in the same period (and included Cyclone Tracy evacuees who stated they were away from Darwin for less than six months). This means, of course, that the population of the Northern Territory outside of Darwin increased by about 10 000 people in the same period. The decrease in the Northern Territory and Darwin populations, and the increase in the non-Darwin population observed in 1974/5 were compensated for very quickly. By 1976/7, the Darwin and Northern Territory populations were back to 1973/4 levels. Interchange of population between Darwin and the rest of the Northern Territory is explored further in the results for interstate migration.

The age and sex distribution of the Northern Territory population was markedly different in 1973 to what it was in 2007. The sex ratio was 120.5 men per 100 women in 1973, compared to 108.0 in 2007. The trend of lowering of the sex ratio commenced well before 1973. As with population size, however 1975 represented a departure from the trend. The sex ratio climbed to 129.1, which was the highest since 1960. The sex ratio returned to its 1973 level in 1977, and has steadily decreased since.

In 1973, two thirds of the population was aged under 30 years (compared with less than half in 2007). In 1975, the summary age statistics were very similar to 1973 (65% aged under 30 years, mean age of 24.3 years), but there were some changes in the distribution among specific age groups. There was a decrease of almost 2% in the proportion of the population aged 20 – 29 years, with the compensating increase

in those aged 5 – 14 years and 30 – 39 years. Population decreases could largely be attributed to decrease in the number of females aged 0-4 years (10% decrease between 1973 and 1975) and females aged 20-29 years (10%). Decreases of this magnitude also occurred for females aged above 45 years. There was a similar decrease for males aged 20-29 years, but not in the other age groups below age 65 years. Increases and decreases in the male population were around two or three percent for each five year age group. Figure 2 displays age sex pyramids for the Northern Territory for 1973 and 1975. Close examination reveals the decreasing proportion of females in most age groups, and the decline in all people aged in their twenties.

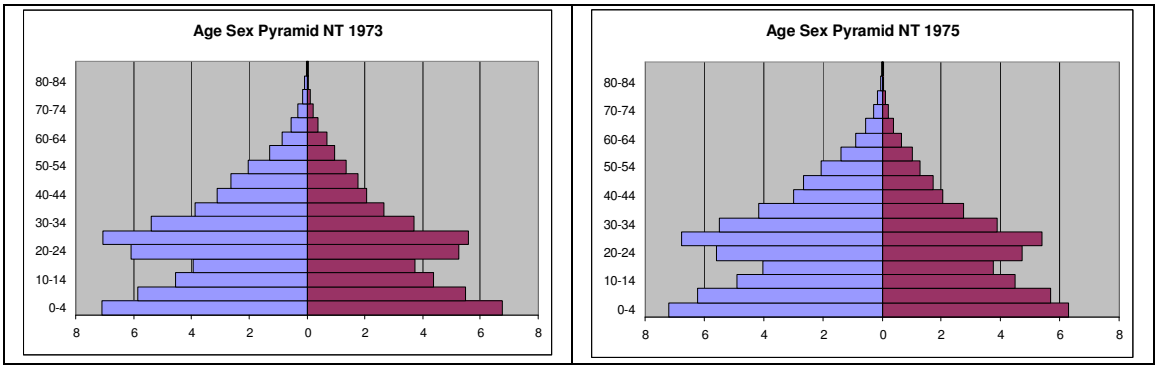

Figure 2: Age and sex pyramids for the Northern Territory, 1973 and 1975
Source: Various data collections compiled by the Australian Bureau of Statistics.

Data were not readily available for age and sex of the total population of Darwin in 1973 and 1975, but data from the 1976 Census (for ten year age groups), shows very high age specific sex ratios in each age group, including ratios over 1.45 for people aged older than 45 years. No data were available for comparison from the 1971 Census.

Table 1 shows the components of population change in the Northern Territory between June 1974 and June 1975. The total population declined in that period by just over 10 000 people (10%). Almost all of this decline could be attributed to interstate migration, which reduced the 1974 population by 12%. There was also a small outflow of overseas migrants. In contrast, natural increase was about 2%. There were quality issues with some of these component estimates, but the broad picture is likely to be relevant.

Table 1: Components of Population Change, Northern Territory. June 1974 – June 1975.

Component	**N**
Births	2527
Deaths	570
Natural increase	1957
Permanent and long-term arrivals	1619
Permanent and long-term departures	1741
Category jumping(b)	. .
Net overseas migration	-122
Interstate arrivals	16600
Interstate departures	28800
Net interstate migration	-12200
Estimated resident population	92869
Population change	-10055

In the two years prior to Cyclone Tracy, the major components of population change (which was growth for both years) were natural increase (accounting for around 45-50% of growth) and interstate migration (around 45%). Overseas migration had a negligible effect. In the two years following Cyclone Tracy, interstate migration accounted for two thirds of population increase, with the remainder being natural increase. By the end of the decade, the contribution of natural increase returned to around 50 or 55%, but interstate migration dropped to a 15-20% contribution, and overseas migration began its dramatic rise – from 0.3% in 1976 to 23% in 1978. Overseas migration decreased again in the early 1980s, but the 1978 pattern closely resembles that from 2007 – 56% of growth attributable to natural increase, 17% to interstate migration and 27% to overseas migration. According to the 1976 Census, almost one third of all interstate migrants to the Northern Territory were aged 25-34 years. Migrants out of the Northern Territory were also more likely to be in this age group. Comparable data are not available for overseas migrants, but again this is a pattern that has persisted through the 2007 estimates.

Many evacuees from Darwin in December 1974 and January 1975 were required to complete a survey indicating where they were moving to (their first destination). Some evacuees who left in private vehicles did not complete the survey, however, of those that did, 29% were planning to move to New South Wales, 25% to South Australia and 19% to Queensland. This data compares with data from the 1976 Census, which asked respondents where they had been living five years previously (1971). People who had been living in Darwin in 1971 had moved to Adelaide (14% of all movers), regional Queensland (13%) and Brisbane (12%).

It has been estimated that about 60% of the Darwin population who left after Cyclone Tracy did not return. Many of the immigrants from other States and Territories reported in the 1976 Census were therefore not people who had been in Darwin in 1974. Data were limited to people who changed address at any time between 1971

and 1976, but the major sources of immigrants were Sydney (14%), Adelaide (13%), Melbourne (12%) and regional Queensland (10%).

Only 3% of evacuees said that their first destination would be elsewhere in the Northern Territory. However, the 1976 Census showed that 10% of all people who had left Darwin between 1971 and 1976 moved to elsewhere in the Northern Territory. One quarter of all people who left the remainder of the Territory moved to Darwin in the same time period. While these data provide some evidence of people's behaviour, it should be remembered that interstate migration data recorded in the Census provides a partial picture only (one change of residence in a five year period), and the timing of the collections (one within weeks of the cyclone, and one eighteen months later) makes analysis even more problematic.

Hardly any data were available about the Indigenous population of Darwin and the Northern Territory and how they may have responded to Cyclone Tracy. Estimates of the size of the Indigenous population of the Northern Territory have been made at various times since 1901. Data quality is notoriously poor, with estimation techniques and the definition of populations changing over time. Notwithstanding this, Figure 3 implies steady rates of growth (15-20%) from about the late 1940s (post World War Two), with the major exceptions being in 1971 and 1976, where growth rates were less than five percent. The 1971 figure may represent an adjustment as Census counts became available for the first time, and the 1976 figure may have some relationship to Cyclone Tracy. The figure is included here largely for comparison with Figure 1.

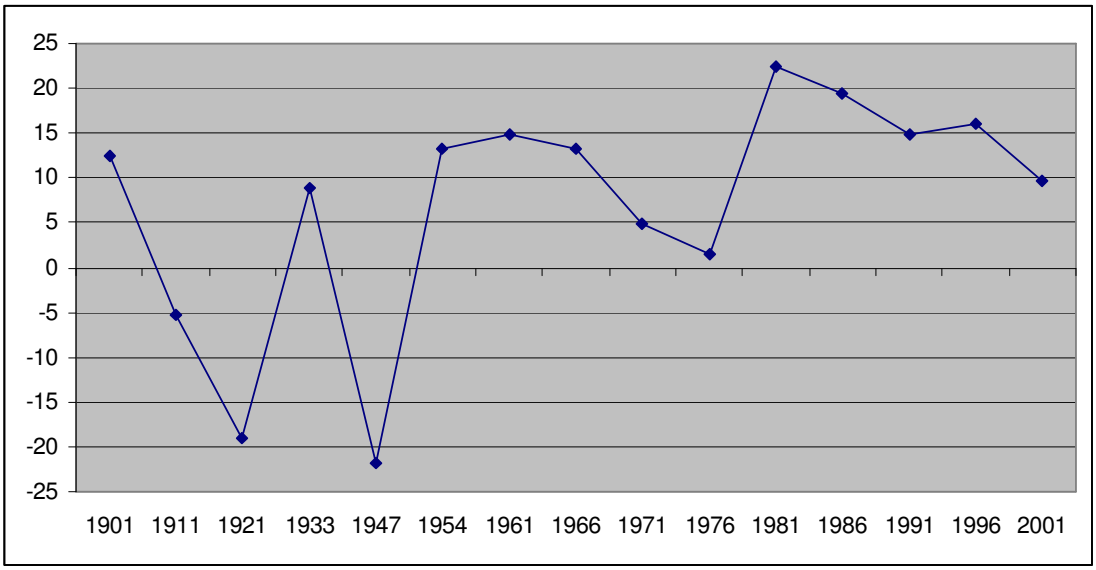

Figure 3: Estimated change in Indigenous population of the Northern Territory between selected periods 1901-2001.

Discussion

The demographic impacts of Cyclone Tracy remain unclear. There is broad agreement on the immediate impacts in terms of evacuation resulting in largely permanent out-migration. The available data goes some way to describing how the population resettled, particularly during the period 1976-7 when the population size of

both Darwin and the Northern Territory recovered to pre-cyclone levels. Some of the changes we observed between 1973 and 1976 are more readily attributable to Cyclone Tracy than others. For example, what was effectively the replacement of a cohort of 20-29 year olds with 30-39 year olds seems probably cyclone related, while the rapid increase in overseas migration two or three years later may more likely be due to changes in national population policy and immigration legislation. Teasing effects apart in this way, however, is not straightforward and a number of issues occur –

- While the immediate in-migration of 30-39 year olds may be explained by workforce replacement post Cyclone Tracy, the growth in the population aged 5-14 years is more difficult to explain. It may be that mid-level bureaucrats recruited to help rebuild Darwin's services brought with them their young families, but the male bias in immigration is difficult to account for under this assumption;
- The changes in contribution of various population growth components in the immediate post-cyclone period does suggest a major effort to re-stock the Northern Territory from whichever sources were available (interstate and overseas). The coincidence of this event with changes in national policy may have been fortuitous in terms of opening up overseas immigration, but it has certainly contributed to a changed cultural profile of Darwin since the late 1970s;
- The migration relationships with specific places around Australia are of some interest. If evacuees reported accurately, there was a large group who moved to New South Wales at least temporarily, but the 1976 Census did not show a high proportion of longer term moves between Darwin and New South Wales. In contrast, the large group of evacuees moving to Queensland is matched with a large group of residential moves there between 1971 and 1976. It could be that those who moved to New South Wales moved back or moved on again in a short period of time;
- The immediate increase and subsequent rapid decrease in the population of the rest of the Northern Territory (i.e. outside of Darwin) is not adequately explained by the evacuee or 1976 Census data. Relatively few people claimed to move from Darwin to somewhere else in the Northern Territory. The shift in population balance back in favour of Darwin may be somewhat better explained by the high rates of migration from the rest of the Territory to the capital recorded in the 1976 Census. The evidence suggests that movement (temporary or longer term) to other places in the Northern Territory following Cyclone Tracy was uncommon. The loss of Darwin population more equated to a loss of Northern Territory population. Resettlement may have come from those who did relocate in the Territory, but otherwise largely from new migrants;
- The currently available data say very little about the response of the Indigenous population of Darwin or the Northern Territory to Cyclone Tracy. If the slowing in population growth observed in Figure 3 can be supported, then there is some evidence that population movements for Indigenous people may also have been out of the Territory rather than resettling within the Territory. Whether these interstate or overseas moves were temporary or longer lasting is not clear, although a very sharp rise in population between 1976 and 1981 is somewhat suggestive of return migration.

The Northern Territory and Darwin have volatile population structures most of the time. Shocks like Cyclone Tracy (and World War Two) increase volatility for a short period of time and may cause the path of demographic development to alter somewhat in the longer term. If Cyclone Tracy is to serve as a preview of what may happen when the next cyclone strikes Darwin, then substantial effort is required to address the data quality and availability issues revealed in this brief. It is likely, however, that the growth paths of Darwin and the Territory and the national and global conditions which influence them, are substantially different now to the mid 1970s. Modelling of demographic impacts were an event to occur in the near future needs to consider both impacts of past events (in Darwin and similar places around the World) and account for changed conditions.