Indigenous data from the ABS Labour Force Survey: What can they tell us?

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Abbreviations and acronyms

ABS	Australian Bureau of Statistics
AGPS	Australian Government Publishing Service
ANU	The Australian National University
ATSIC	Aboriginal and Torres Strait Islander Commission
CAEPR	Centre for Aboriginal Economic Policy Research
CAR	Council for Aboriginal reconciliation
CD	Collection District
CDEP	Community Development Employment Projects
CES	Commonwealth Employment Service
CGC	Commonwealth Grants Commission
DEWRSB	Department of Employment, Workplace Relations and Small Business
DFACS	Department of Family and Community Services
IEP	Indigenous Employment Policy
ISS	Indigenous Social Survey
LFS	Labour Force Survey
NATSIS	National Aboriginal and Torres Strait Islander Survey
NHS	National Health Survey
NSA	Newstart Allowance
RSE	Relative Standard Error
SE	Standard Error
SIF	Special Indigenous Form
SLA	Statistical Local Area
SRS	Simple Random Sampling
YA(o)	Youth Allowance (other)

Summary

Research issues

The Australian Bureau of Statistics (ABS) has recently published annual estimates of Indigenous labour force status for the period 1994–2000 based on the Labour Force Survey (LFS). Considerable interest surrounds these for two reasons:

- as annual estimates, they offer the possibility of establishing trends in labour force status that are closely aligned—at least more so than are census data—with identifiable policy shifts and macroeconomic shocks;
- the time series charted from the sequence of survey results is suggestive, at least at face value, of a sizeable decline in the Indigenous unemployment rate since the mid 1990s, and a current upward trend in employment levels.

This paper critically evaluates these estimates with a view to assessing their utility for policy evaluation. The estimates are first examined in the context of previous attempts to benchmark the position of Indigenous people in relation to the labour market. The LFS methodology is then evaluated (to the extent that it bears on the interpretation of results), and finally the standard errors associated with annual movement in the estimates are calculated. Along the way a series of policy questions are addressed:

- do these apparently positive results suggest that improvement in the position of Indigenous people in the labour market is at long last emerging;
- do they reflect success of the Indigenous Employment Policy (IEP);
- do they result from macroeconomic or microeconomic change?

Findings

The LFS experimental estimates are of limited value for policy analysis. At best, they merely confirm existing understandings of recent labour force trends. At worst, they are unreliable due to high standard errors. In particular, movements of annual rates are statistically insignificant in all but the last two years, thus preventing the establishment of long-term trends.

The key finding of significant decline in unemployment rates since 1998 resonates with an analysis of trends in Community Development Employment Projects (CDEP) scheme employment and with the fact that purely administrative changes to the scheme are likely to have raised overall employment levels over the same period. The prospect that recent decline in Indigenous unemployment has formed part of the general labour market trend appears unlikely. Also, the implementation of IEP would seem to have occurred too recently to have had any bearing on this result.

The proposal by the ABS to augment the Indigenous sample in the LFS by providing annualised estimates is an innovative option, but may not be as

straightforward as first appears. Such a procedure would require complex transformations of LFS data, probably involving out-of-sample estimates of the transition between, and duration of, respective labour force states. These are likely to effect the reliability of the final estimates.

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Introduction

Since 1971, the main vehicle for establishing a measure of the labour force status of Indigenous Australians has been the five-yearly Census of Population and Housing.[1] For the total population, these quinquennial statistics are complemented by inter-censal estimates of labour force status derived from the Australian Bureau of Statistics (ABS) Labour Force Survey (LFS). First instituted on a quarterly basis in 1964, the LFS became a monthly survey in 1978. This long-standing commitment to data gathering reflects the importance of employment, unemployment, and labour force participation rates as key national indicators of social and economic wellbeing.

Of course, to the extent that Indigenous people have formed part of the sample for the LFS and have participated in the process, they have always been included in the ensuing statistical profile. However, it was not until 1994, in the March survey round, that a question was added to enable the separate identification of Indigenous people within the sample (Barnes 1996: 19). This practice has subsequently been repeated annually in each February survey. Thus, for one month in each of the past six years, the ABS has gathered statistics that provide for the calculation of Indigenous labour force status, although they have only recently released these data as official, albeit experimental, estimates (ABS 2000a).

Reasons for prior reluctance to publish these annual survey results appear to have been linked to issues of poor data quality. In effect, the collection of data to 2000 was regarded by the ABS as an 'experiment' to examine whether reliable national estimates of Indigenous labour force status could be made on an annual basis (ABS 1999: 16). The experience gained by the ABS through the initial application of Indigenous identifiers in social surveys (such as the LFS) led to a period of reflection regarding their utility. This was because the small size of the Indigenous sample in many surveys, as well as the manner of sample selection, was found to lead to data of poor quality and possibly to misleading Indigenous statistics. Caution in their formal release as ABS-endorsed statistics was therefore required (Barnes 1996: 17). Certainly, the initial results of data collection for the LFS in remote areas were deemed by the ABS to be of poor or uncertain quality (ABS 1998b: para. 21). Of course, the size of any Indigenous sample could be enhanced to increase the precision of statistics, a practice which was followed in the 1995 National Health Survey (NHS), but the added expense has been an issue. The ABS has regarded sample enhancement as viable only if the resulting statistics can fully justify the additional expense and analytical complexity (Barnes 1996: 17).

Whatever reticence there may have been concerning the release of Indigenous data from the LFS, it is clear that with the official publication of the 'experimental

estimates' this no longer exists. To be fair, the ABS is at pains to highlight statistical and data quality issues in regard to the published estimates, appealing frequently for caution in their interpretation (ABS 2000a). One question addressed in this paper is whether these appeals for caution go far enough.

Cautionary clauses aside, from the perspective of policy evaluation considerable interest surrounds these latest available official measures of Indigenous economic status. For one thing, as annual estimates, they offer the possibility of establishing trends in labour force status that are more aligned—at least more so than are census data—with identifiable policy shifts and macroeconomic shocks. For another, the time series charted from the sequence of survey results is suggestive, at least at face value, of a sizeable decline in the Indigenous unemployment rate since the mid 1990s, and a current upward trend in employment levels.

These apparently positive results are potentially significant indications for policy and raise a number of pertinent questions. Do they suggest, perhaps, that improvement is at long last emerging; do they possibly reflect the success of the Indigenous Employment Policy (IEP)? Are they a consequence of macroeconomic, or of microeconomic change? Previous CAEPR research has found little if any link between macroeconomic change and Indigenous labour force status (Altman & Daly 1993)—do the results of the LFS suggest otherwise?

It appears that policy-makers are already responding to this new source of data. For example, in its final submission to the Commonwealth Grants Commission's (CGC) Indigenous Funding Inquiry, the Department of Employment, Workplace Relations and Small Business (DEWRSB) proposes that key indicators of Indigenous labour force status should be calculated at national, State and regional levels using data from the LFS (CGC 2000: 9). This same submission also implies that previous estimates of labour force status based on projections from the 1996 Census, such as those generated by Taylor and Hunter (1998), should be superseded by the 'current' estimates provided by the LFS (CGC 2000: 10). Such a statement affords a degree of legitimacy to the LFS estimates that requires testing.

Accordingly, this paper aims to evaluate the estimates of Indigenous labour force status with a view to establishing just how cautious the analyst should be in their interpretation, thereby assessing their utility for policy evaluation. The first step in this exercise is to examine the estimates in the context of previous attempts to benchmark the position of Indigenous people in relation to the labour market. The next is to evaluate the LFS methodology (to the extent that it bears on the interpretation of results). This evaluation is followed by the calculation of standard errors associated with annual movement in the estimates. The calculation of standard errors is particularly relevant in assessing the integrity of any trend analysis. The paper ends by considering the likely effects of shifting policy and macroeconomic influences on Indigenous labour force status, and concludes with a brief comment on possible future directions.

History of official measures

The lack of regular and accurate labour force data with which to monitor the capacity of Indigenous Australians to share in employment opportunities has been a long-standing and recurring concern of Indigenous Affairs policy-makers (Altman 1992: 2–4). Lack of timeliness in the availability of information on the Indigenous population has been noted in a number of major reviews of Indigenous economic status including the Miller Review of Aboriginal employment and training programs (Commonwealth of Australia 1985), the *Royal Commission into Aboriginal Deaths in Custody* (Commonwealth of Australia 1991a), the Academy of Social Sciences workshop on Aboriginal employment equity (Altman 1991: 168–9), and the Council for Aboriginal Reconciliation (CAR) workshop on benchmarking service delivery for Indigenous Australians (CAR/CAEPR 1997).

Indeed, it was the general dearth of information with which to inform the Royal Commission into Aboriginal Deaths in Custody that caused the Commissioner to recommend a special national survey of the Indigenous population (Commonwealth of Australia 1991b: 62). This recommendation was implemented as the 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS) which included questions to elicit labour force status. Results from this survey were released in 1995, thus providing the first inter-censal estimates of Indigenous labour force characteristics. Coincidentally, in 1993, the ABS made a decision to include a question on Indigenous identity in the March 1994 LFS. Indigenous identity was also sought in the 1995 NHS which included the standard labour force status question.

Thus, there are now four ABS collections from which national statistics on Indigenous labour force status may be derived and charted—the census, the NATSIS, the NHS and the LFS. Obviously, the greatest precision is associated with data from the census, representing as it does a full enumeration of the Indigenous population (at least as self-identified at each census), and thereby yielding actual counts of employment and unemployment. Estimates from the three sample survey sources are less precise, with the least precision attached to LFS data, primarily because of its relatively small sample size. The LFS Indigenous sample is, on average, 1,100, compared to the NATSIS sample of 15,700. The NHS included a supplementary sample of around 1,000 Indigenous respondents, boosting its sample to approximately 2,000 (ABS 1999: 45). It should also be noted that, unlike the NATSIS, and to some extent the NHS, LFS data are not strictly speaking drawn from a sample of the Indigenous population.[2] Rather they derive from a national sample of the Australian population and refer to those individuals from within that sample who identified as Indigenous at each annual survey round.

Although the statistics available from the four collections are based on the same underlying standard International Labour Organisation (ILO) definitions and concepts, there are differences in methodologies and definitions that affect the comparability of data (ABS 2000a: 2).[3] For example, the NATSIS included a specific question about employment in the Community Development Employment

Projects (CDEP) scheme, and while the census does not do this, it does require interviewers using Special Indigenous Census Forms to probe for such employment. In contrast, the LFS questionnaire does not inquire about CDEP employment but does include other questions designed to uncover possible forms of employment if the respondent's response to the standard employment question regarding whether they 'had a job last week' is negative. As such, the LFS methodology may be more likely to record a marginally employed person (for example a full-time student with casual work) as 'employed'. At the same time, it may be less likely to pick up CDEP employment, certainly in the years before 1998 when such employment was more loosely defined by Indigenous organisations and less regulated by government.

Table 1. Indigenous labour force status, 1971–2000

		Employment/ population ratio	Unemployment rates	Participation rates
Census	1971	41.4	9.3	45.6
	1976	40.7	17.8	49.5
	1981	35.7	24.6	47.3
	1986	31.3	35.3	48.3
	1991	37.1	30.8	51.4
	1996	40.1	22.7	50.3
NATSIS	1994	35.9	38.2	58.0
NHS[a]	1995	47.8	20.6	60.3
LFS	1994	38.3	27.8	53.1
	1995	44.7	20.9	56.5
	1996	42.5	22.9	55.2
	1997	38.9	23.3	50.7
	1998	39.1	25.0	52.2
	1999	39.8	21.9	50.9
	2000	43.6	17.6	52.9

Note: a. The 1995 NHS data refers only to the 15 to 64 year-olds and is not strictly comparable to the other statistics in this table which refer to the population aged 15 years or more. This is reflected in the relatively high participation rate. Nevertheless, NHS data is broadly consistent with the LFS results.

Sources: ABS 1995, 1998a, 2000a; Daly 1995. The 1995 NHS estimates are based on unpublished data.

As far as unemployment is concerned, the bias is clearer. The NATSIS methodology is most likely to classify individuals as unemployed, because NATSIS respondents were asked specifically about registration with the Commonwealth

Employment Service (CES—now called Employment National, part of Job Network), and were prompted with the statement that such registration constitutes an active step towards finding work (ABS/CAEPR 1996). In turn, while the census form does not include a question on CES (Job Network) registration, it does specify that such registration constitutes active job-seeking. The LFS, on the other hand, makes no reference to CES or Job Network registration. As a consequence of such systematic bias, it has been estimated that only 73 per cent of those classified as unemployed in the NATSIS would have been classified as unemployed using the strict LFS methodology. The other 27 per cent who were classified as unemployed in the NATSIS, rather than as not in the labour force, were so classified because they answered 'yes' to the question on CES registration (Hunter 1996).

Despite these problems, Table 1 reveals an employment/population ratio which is remarkably consistent across all four collections. All fall within a range of about 7 percentage points around 40 per cent of Indigenous adults, for the period between 1971 and 2000 (excluding 1986). Thus, using Census and NATSIS data as benchmarks, the LFS estimates appear to be in line with expectations, although they exhibit considerable year-to-year fluctuation, and the most recent results suggest a substantial improvement in the employment ratio.

As for unemployment rates among Indigenous people, census data are suggestive of an increase in the rate between 1971 and 1986 followed by a subsequent steady decline to 1996. This fall in unemployment rates appears—from the LFS results—to have continued, especially considering the 1999 and 2000 survey results. In these estimates of unemployment, the effect of the different NATSIS methodology is clearly evident. It is also apparent in the NATSIS labour force participation rate which is notably above other levels. Overall, the participation rate appears to have risen and then stabilised at just over the 50 per cent mark.[4]

At face value, then, the LFS estimates look reasonable when benchmarked against other collections, and are thus suggestive of continuing positive trends in Indigenous labour force status as indicated by a rising employment rate and declining unemployment rate. How reliable is this estimation?

Reliability of the estimates

As with the results of all sample surveys, estimates from the LFS cannot be accepted simply at face value. They require validation in the context of both sampling and non-sampling errors. The first of these categories of error provides measures of variability in the estimates that occurs by chance because a sample, rather than the entire population, is surveyed. As already noted, the Indigenous LFS estimates are not drawn from a sampling frame that is designed to be representative of the Indigenous population and this adds complexity to the assessment of reliability. For example, although the six-year average Indigenous sample size of 1,066 represents a sampling fraction of the Indigenous population which is roughly equivalent to that set by the LFS for the sample of the total

Australian adult population (0.5%), the Indigenous sample size has varied each year, ranging from a low of 964 in 1998 to a high of 1,189 in 1997. Within this, the annual sample from sparsely settled areas has fluctuated even more—from a high of 354 in 1994 to a low of 153 in 1998 (Table 2).[5] With such small numbers and high annual variability, it is likely that the published ABS estimates will be highly variable at sub-national level.

Table 2. Indigenous sample size and distribution: LFS, 1994–2000

Survey year	Sparsely settled sample size	Total Indigenous sample size	Sparsely settled share (%)
1994	354	1151	30.7
1995	218	994	21.9
1996	317	1157	27.4
1997	301	1189	25.3
1998	153	964	15.6
1999	201	1001	20.1
2000	235	1006	23.3

Sources: ABS 1995, 1998a, 2000a; Daly 1995.

Geographic distribution of the sample

A potential source of sampling error derives from the fact that the LFS sample is a multi-stage area sample of private dwellings designed to produce reliable estimates of labour force characteristics of the total population in each State and Territory. Another aim of area (in effect collection district or CD) sampling is to spatially restrict the sampling frame in order to minimise survey costs.

In sparsely settled areas, CDs are often synonymous with communities, and because of the great distances that exist between communities, the sample becomes geographically clustered with the result that Indigenous respondents in such areas are drawn from a relatively small number of localities. This has implications for the reliability of the sample in remote areas, in particular because high variability can exist between communities in terms of available employment opportunities, especially via the CDEP scheme (Altman & Daly 1992; Altman, Gray & Sanders 2001; Altman & Hunter 1996). Furthermore, the multi-stage nature of the sample means that annual Indigenous data are drawn each time from a different set of communities, thus adding to variability in the annual movement of the estimates. This point is illustrated by 1996 Census data from two adjacent Aboriginal communities in the Northern Territory. While Barunga had an unemployment rate of 46 per cent and no CDEP scheme, the neighbouring community of Wugularr, which has a CDEP scheme, reported no unemployment.[6] Unfortunately, it is not possible to say which types of community (CDEP or non-CDEP) are included in the sample each year as the ABS does not provide such information.

The need to provide reliable estimates for States and Territories in a federal system necessarily means that States with low population densities are relatively over-sampled in the LFS (ABS 1997; ABS 2000b: 9). For example, in 2000, the estimated Indigenous population aged 15 years and over in sparsely settled areas was 46,100, or 18 per cent of the total (ABS 2000a: 8). However, in the same year, 23 per cent of the Indigenous sample was from such areas. Assuming that the Indigenous population resident in sparsely settled areas has been stable at around 18 per cent of the total population since 1994, then this over-sampling has been fairly consistent, except in 1998 (see Table 2). As a consequence, labour force estimates derived from the survey may disproportionately reflect the characteristics of sparsely settled areas in the sample.

The ABS's weighting procedure (based on census counts) attempts to adjust for the probability of being sampled in a particular area, thus reducing the scope for bias. However, one important example of where the weighting procedure might still produce 'biased' results would be if the LFS happened to over-sample particular sorts of areas, such as those with CDEP communities. That is, the failure to take into account available information about location of CDEP schemes may lead to predictable biases in the point estimates of employment and unemployment (and possibly even labour force participation). Over time this problem would manifest itself as volatility in the estimates of labour force status as the sample switched between communities with and without CDEP schemes. This volatility would depend on how many and which communities are being sampled rather than on the number of respondents.

The drop in the LFS Indigenous sample size between 1994 and 1995 and then again between 1997 and 1998 followed an overall reduction in the LFS sample in line with sample re-design subsequent to the 1991 and 1996 Censuses (ABS 2000b). Oddly enough, given that these sample re-designs generated higher sampling fractions for jurisdictions with sparsely settled areas, it also resulted in a substantial reduction in the Indigenous sample in such areas. This suggests that the drop in numbers in 1995 and 1998 may also reflect simple variation in the number of Indigenous people identified as such in the LFS sample. The multi-stage nature of the sample, where annual Indigenous data are drawn each time from a different set of communities, adds to variability in the annual movement of the estimates. This variation in the proportion in sparsely settled areas is of particular concern because it implies that the LFS estimates will be unreliable. That is, the reliability of Indigenous estimates may be a problem where they are based on a small amount of information, or where that information is not representative of Indigenous people in the area being examined.

Thus, there are two main concerns about the geographic distribution of the sample, both associated with the sampling method in sparsely settled areas: the first is the variations that are likely to occur between surveys in the number of eligible Indigenous people identified in these areas and its effect on the sample estimates; and the second is the potential bias arising from the selection of

communities which do not accurately represent the variations in employment opportunities caused by the patchy distribution of the CDEP scheme in sparsely populated areas.

Sample timing

Since 1995, the data on Indigenous labour force status has been drawn from the February LFS. February is a highly transitional month in labour market terms and therefore one of the most unstable months of the year to collect information on job seekers. Large numbers of youth, in particular, are about to alter their labour force status by entering the higher education sector, and this presents a severe problem for the interpretation of results. This is confirmed by seasonally unadjusted monthly LFS data and Centrelink data on unemployment among both Indigenous and non-Indigenous populations, which indicate that unemployment is much higher in February compared to March. Centrelink data show that many ex-students claim unemployment benefits before returning to education.

Another timing-related issue is that while the estimates are currently based on one month's sample only, from 2002 it is proposed that they be based on 12 months of sample, thus producing 'annualised' estimates (ABS 2000a: 2). The ABS calculates that this strategy will effectively increase the Indigenous sample size by 50 per cent with a corresponding reduction in standard errors of around 30 to 40 per cent. This enhancement of reliability of Indigenous labour force data may only be apparent; the methodology raises further questions about how monthly data are combined over time to measure unemployment and employment at a particular point in time. Given that monthly data include different people in the various months, it is not clear how the methodology for combining the data will address issues about the duration of employment and unemployment for various respondents.[7] If people move in and out of employment, then this will also have to be taken into account. That is, in order to produce annualised estimates, one has to make crucial assumptions about the ongoing labour force status of respondents who are no longer in the sample.

The problems for combining monthly LFS data over the year are highlighted by two stylised facts of the Indigenous labour market. First, seasonal effects that dominate in certain regions (e.g. the 'wet' in Northern Australia) may distort Indigenous estimates, especially if the sample in sparsely settled areas is not drawn from a representative sample of regions. That is, if regions are not representative of variable labour market conditions across Australia, then duration data are likely to be unreliable and hence distort the resulting annualised estimates of Indigenous labour force status. A second stylised fact is the disproportionate concentration of Indigenous workers in casual jobs (Hunter & Hawke 2001). Consequently, many Indigenous people will either move frequently between jobs or between the various labour force states and hence affect the resulting estimates from the augmented LFS sample.

Even if the ABS collects the necessary duration and transition data from the relevant LFS supplements, several questions remain about the validity of using such information for Indigenous respondents. Duration data are likely to be unreliable in the small Indigenous sample and may vary substantially between areas. The use of the non-Indigenous data is likely to be unsatisfactory because Indigenous and other Australians operate in different segments of the labour market (Hunter & Gray 1998; Taylor & Hunter 1997, 1998). The accuracy of the necessary assumptions is debatable and the assumptions may themselves add to the variability of the annualised estimates. That is, the standard errors of the proposed annualised estimates should not just be based on the augmented sample size. They need to take into account the fact that these crucial assumptions are themselves based on estimates which may, or may not, be representative of all Indigenous respondents.

Non-sampling errors

Non-sampling errors mainly relate to the incorrect or inaccurate reporting of information that inevitably occurs as a consequence of the interaction between respondents and interviewers administering household survey questionnaires. In surveying Indigenous households, ABS experience has highlighted the significance of non-sampling error for this population, especially in sparsely settled areas (ABS 1999). One aspect of this, that has particular relevance to the LFS results, is the difficulty of applying mainstream notions of work and unemployment in a cross-cultural setting. From the standpoint of the Indigenous domain, official indicators have been described as ethnocentric and consequently low in content validity, definitionally ambiguous and conceptually inadequate (Smith 1995).

A related issue is the varying degree to which participants in the CDEP scheme may consider themselves employed according to the LFS definition. Following a review of the CDEP scheme in 1997 (Spicer 1997), a series of administrative reforms were implemented that placed emphasis on the scheme as an employment program, the aim of which was to equip participants for mainstream work. Part of this reform involved the movement of non-working participants off the scheme and into the ambit of the social security system, and their replacement by working participants (Sanders 2001). Prior to this, participation in the scheme did not necessarily equate with employment according to LFS criteria and in analysing 1996 Census data an estimate that 40 per cent of scheme participants were not employed has been applied (Taylor & Bell 1998: 44–5). According to the Aboriginal and Torres Strait Islander Commission (ATSIC), which administers the scheme, participation is now synonymous with paid employment and, in theory at least, all registered participants would now be likely to be classified by the LFS as employed. Assuming this to be the case, the effect of administrative reforms nationally has been to raise estimated levels of Indigenous employment through the CDEP scheme from around 21,000 in 1998 to 31,000 in 1999 (Table 3).

Table 3. Comparative CDEP estimates, 1994–2000

	CDEP employed	CDEP participants	
	Taylor & Hunter 2001 (30 June)	ABS 2000a (30 June)	ATSIC (1 Feb)[a]
1994	na	24,100	22,178
1995	na	27,000	24,107
1996	18,656	28,400	26,217
1997	19,974	30,000	26,442
1998	21,228	30,300	30,007
1999	31,650	31,900	30,738
2000	32,220	30,600	31,050

Note: a. ATSIC figures for 1991–99 are from CDEP Finance spreadsheets, and show actual CDEP participation for February in each year. The figure for 2000 is from CDEPManager, and shows actual participation at 1 February 2000.

Sources: Taylor and Hunter 2001; Table 4.1 in ABS 2000a; and ATSIC administrative data.

As background to assist in the interpretation of its Indigenous LFS estimates, the ABS reports the number of CDEP scheme participants each year from 1994 to 2000 as at June 30 (ABS 2000a: 13). These are shown in Table 3 alongside estimates of the number of CDEP participants who would be classified as employed according to ABS definitions (Taylor & Hunter 2001). Administrative data on CDEP is also reported for 1 February each year to maximise comparability with the labour force estimates in ABS (2000a). Given that the ATSIC data and Table 4.1 in ABS (2000a) are from the same administrative source, it is not surprising that there is little difference in their participant numbers. However, compared to the adjusted estimates of those who might be classified as employed as a consequence of their participation in the scheme, the focus on participant numbers alone produces a misleading impression, suggesting low growth in employment due to CDEP in recent years.[8]

Another potential source of non-sampling error arises from the increased use of telephone interviews since August 1996, especially in non-remote areas (ABS 1997). The first LFS interview is face-to-face, and the second is now by telephone if this is acceptable to the respondent. While data on the availability of telephones in Indigenous communities is scarce, case studies suggest that very few households in country towns have access to a telephone in their own home (Finlayson, Daly & Smith 2000), while in remote discrete Indigenous communities access to telephones is largely through community or Indigenous organisations (Musharbash 2000). These regional and inter-temporal differences in methodology, combined with differential access to telephones, may mean that non-sampling error distorts the relative labour force status, both over time and between areas. Since future LFS data will be consistently based on a largely telephone methodology, this problem will be largely confined to geographic comparisons where there are substantial differences in access to telephones.

The existence of non-sampling errors means that the ABS's reported standard errors will, at best, overstate the reliability of the estimates. At worst they could induce a bias in the estimates of employment, unemployment, and labour force participation. Consequently, it is necessary to benchmark the ABS (2000a) estimates against other estimates. The following section focuses on the reliability of LFS estimates of Indigenous unemployment in order to assess the overall quality of the data. The discussion then moves to consider what the experimental estimates tell us about Indigenous LFS in capital cities, sparsely settled areas, and the balance of State areas.

Confidence intervals for changes in Indigenous unemployment rates

The standard errors reported in ABS (2000a) are for the level (number) in each labour force status for the Indigenous and non-Indigenous populations. Since most policy analysts are interested in the variability of unemployment rates, employment/population ratios, and participation rates these standard errors have to be manipulated to obtain appropriate measures of reliability. Appendix A documents this manipulation and provides the methodology for calculating standard errors of the difference or change between two rates.

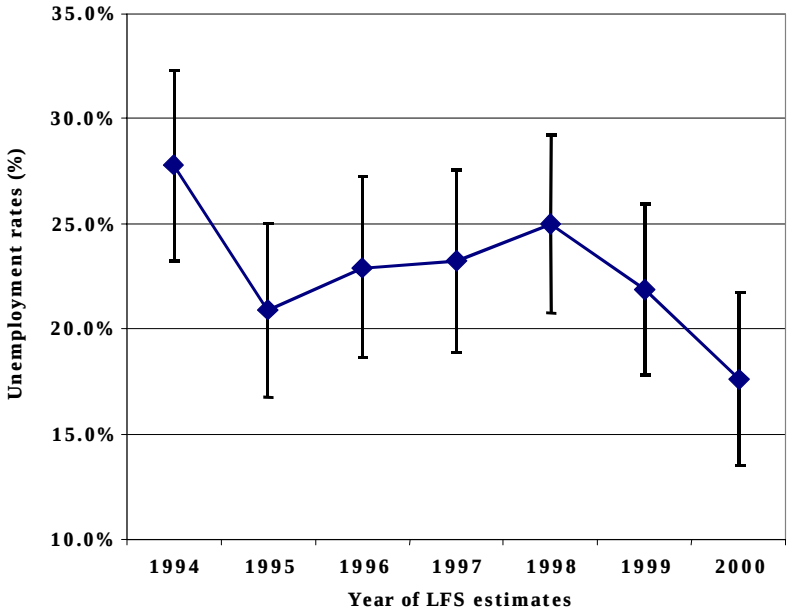
Using these standard errors it is possible to calculate the 95 per cent confidence intervals for annual movements in unemployment rates (Fig. 1). That is, if an unemployment rate in an adjacent year is outside a confidence interval, then we can be 95 per cent confident that there was a significant change in the unemployment rate.

As noted above, it is difficult to compare the 1994 estimate to other unemployment rates given that it was based on the March, rather than the February, round of the LFS. If one ignores the 1994 estimate, the only statistically significant change in unemployment rates was for the 1999–2000 period. That is, Indigenous unemployment between 1995 and 1999 was about 22 per cent plus or minus about 4 percentage points. The lowest overall unemployment rate recorded was 17.6 per cent in February 2000. In effect, this means that no statistical significance can be attributed to any of the estimated changes in unemployment rates for most of the period for which Indigenous data are available from the LFS.

Benchmarking Indigenous unemployment rates

Another means of testing the reliability of the Indigenous estimates is to compare them to the number of unemployed registered at Centrelink offices. Table 4 facilitates this comparison by indicating the number of Centrelink clients who identified as Indigenous in February of 1999 and 2000 and who, as a result of their receipt of Newstart Allowance (NSA) and certain Youth Allowances (YA), could be expected to declare as unemployed in the LFS.

Fig. 1. Reliability of LFS estimates of Indigenous unemployment



Source: ABS 2000a and authors' calculations in Appendix A.

Table 4. Comparative levels of Indigenous unemployment

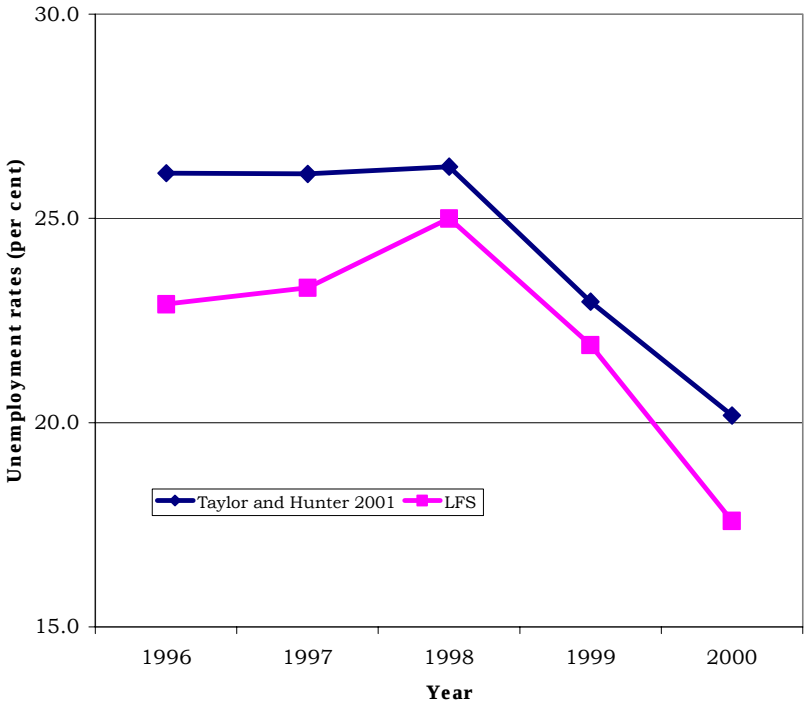
	NSA/YA(o)[a]	ABS 2000a	Taylor & Hunter 2001
Feb-99	30,186	27,700	
Jun-99	29,106		30,200
Feb-00	31,866	23,700	
Jun-00	31,095		27,200

Notes: a. The populations include customers who received Newstart Allowance (NSA) or Youth Allowance (other), YA(o). Customers on YA(o) are those who are unemployed and receiving YA (not full-time students on YA). The population for June 2000 excludes NSA/YA(o) customers who participate in CDEP programs. The populations are fortnightly populations produced for each of the periods. The quality of the data used to derive the Indigenous Indicator depends largely on the data that the customers provide (through self-identification). Furthermore, prior to September 2000 customers on income support payments were not required to provide information on their Indigenous identification. Seasonal effects are usually prevalent from December to February in both Department of Family and Community Services (DFACS) and ABS data (original series). DFACS recommends that care should be taken when analysing the trends in the above populations.

Sources: Centrelink's Newstart SuperStar database; ABS 2000a; Taylor and Hunter 2001.

Against the Centrelink data, LFS estimates are lower—by about 2,500 in 1999 and by about 8,000 in 2000. The obvious conclusion is that the ABS definition of unemployment is more restrictive than that used in the Centrelink administrative rules for unemployment entitlements, which allow eligible job seekers also to acquire some paid employment. However, since the activity test requires recipients to actively seek jobs in the previous two weeks (as per ABS criteria), the Centrelink figures do at least provide a nominal count of the likely upper bound of Indigenous people who might be classified as unemployed by ABS criteria. Given that the only other estimates of Indigenous unemployment for this period (Taylor & Hunter 2001) are close to the Centrelink figures for June 1999 and between the LFS and Centrelink levels in June 2000, the LFS estimates appear to occupy the lower bounds of likely levels. To the extent that these sets of unemployment figures bear any relationship to each other, it is interesting to note that the substantial drop in the LFS estimates between 1999 and 2000 does not appear to be reflected in a similar decline in the Centrelink figures. It does, however, match the decline in unemployment levels simulated by Taylor and Hunter (2001), who provide the only other available set of annual inter-censal estimates (Fig. 2).

Fig. 2. Benchmarking LFS estimates of Indigenous unemployment rates



Although the LFS estimates are unreliable, the simulated unemployment rates are always within the 95 per cent confidence intervals presented in Fig. 1. Clearly, the LFS estimates are consistent with the hypothesis advanced in Taylor and Hunter (2001) that administrative changes in the CDEP scheme are the major factor behind recent changes in Indigenous labour force status.

The Taylor and Hunter simulation uses census data to control for demographic changes (i.e. the large numbers of Indigenous youth entering the labour market), makes adjustments to account for recent CDEP scheme reforms and holds employment growth at the 1991–96 rate. Therefore, despite the difference in timing of the ABS and the Taylor and Hunter estimates (in February and June respectively), the LFS results are explicable by recent changes in the labour market and CDEP policy. There is no need to resort to explanations that rely on the effect of active labour market policy or some form of trickle down of macroeconomic growth. Indeed, it could be argued that the IEP was implemented too recently to have had any impact as yet on unemployment rates. Equally, it has been shown empirically that Indigenous labour force status bears little relation to macroeconomic change (Altman & Daly 1993).

Indigenous labour force status across areas

The focus in the previous section was on unemployment rates; however, it is also possible to use the LFS to describe trends in employment/population ratios and participation rates. Furthermore, all three measures of labour force status can be examined separately for the three types of geographic areas used by the ABS (2000a). This geographic breakdown is important because of concern about the reliability of LFS estimates for sparsely settled areas. Table 5 presents these labour force status indicators, while Table 6 reports the annual movements in these indicators and the statistical significance of any changes (see Appendix A for the methodology for calculating the test statistic).

Employment ratios were reasonably stable in non-remote areas but were highly volatile in sparsely settled areas, where they fluctuated between 50.1 per cent and 26.5 per cent. For example, capital cities had employment ratios hovering around the 45 per cent mark, while the ratio was reasonably stable at around 40 per cent in the balance of State areas. There has been only a slight increase in overall Indigenous employment since 1999. Since employment did not improve substantially in capital cities and declined in sparsely settled areas, the increase can only be driven by changes in the balance of State areas, which includes regional and rural areas. Since many Indigenous communities in such areas are covered by the CDEP scheme, this observation is consistent with Taylor and Hunter's hypothesis reported above.

Unemployment rates in capital cities and balance of State areas declined from a high base in a similar manner to that for the overall distribution (Figs 1 and 2). Much of the decline in unemployment rates appears to be generated outside capital cities, especially in the 1994 to 1995 period.

Table 5. Indigenous labour force status by area, 1994–2000

	1994	1995	1996	1997	1998	1999	2000
	Employment/population ratios						
Capital city	48.2	46.5	42.8	38.4	45.0	46.4	48.2
Sparsely settled	29.1	50.1	47.3	40.9	28.0	34.8	26.5
Balance of State	35.8	41.7	40.7	38.5	39.6	37.6	46.9
Total Indigenous	38.3	44.7	42.5	38.9	39.2	39.8	43.6
	Unemployment rates						
Capital city	24.7	22.5	21.3	25.2	26.3	19.8	16.6
Sparsely settled	4.8	5.1	4.3	11.6	10.9	0.0	9.6
Balance of State	34.6	25.1	29.5	25.8	26.9	28.5	19.6
Total Indigenous	27.8	20.9	22.9	23.3	25.0	21.9	17.6
	Labour force participation rates						
Capital city	63.9	60.0	54.4	51.3	61.0	57.8	57.8
Sparsely settled	30.6	52.8	49.4	46.3	31.4	34.8	29.3
Balance of State	54.7	55.7	57.7	51.9	54.1	52.6	58.3
Total Indigenous	53.1	56.5	55.2	50.7	52.2	50.9	52.9

Source: ABS 2000a.

In contrast, unemployment rates in sparsely settled areas are very low and appear 'random'. They can be explained by the widespread nature of CDEP scheme in remote Australia. However, the fact that the unemployment rate jumps up, and then down by 10 percentage points each year between 1998 and 2000 is particularly revealing of underlying problems with the measurement of LFS in such areas. Since employment demand is likely to be very weak in such areas, the fall of the unemployment rate to zero in 1999 means that the sample was probably drawn exclusively from CDEP communities in that year. That is, the clustered nature of the sample is likely to have generated particularly unreliable estimates, and some of their variability will not be picked up by the standard error provided by the ABS. In addition, the small sample of unemployed respondents in such areas, combined with widespread uncertainty among remote Indigenous people as to what constitutes being unemployed (i.e. non-sampling errors), makes the unemployment rates particularly unreliable.

The LFS estimates of labour force participation are reasonably similar in capital cities and the balance of State. However, participation in sparsely settled areas in February 2000 appears remarkably low—approximately half that in capital cities (29.3% compared to 57.8%). In contrast to this, Altman and Gray (2000: 7) derive an Indigenous participation rate of 58.3 for areas where Special Indigenous Forms (SIFs) were deployed in the 1996 Census (an area roughly equivalent to the sparsely settled areas). This large disparity between the census-based participation rates and the LFS estimates after 1998 (or indeed the 1994 rates)

raises further doubt about the accuracy of the latter, at least in sparsely settled areas. While it is not possible to discount the possibility that labour force participation in such areas fell by almost one-half between 1995 and 2000 (or rose by a similar amount between 1994 and 1995), it seems highly unlikely that this pattern was generated from a random sample, especially in the absence of a plausible hypothesis to explain large changes in both employment and participation in remote areas. For example, it is possible to discount the role of CDEP reforms in depressing the 1994 participation rates because these did not take effect till 1998. In any case, the internal expansion of the CDEP scheme would have a tendency to simultaneously increase employment and reduce labour force participation (i.e. if non-working participants leave the labour force).

Table 6 provides data on the geography of annual changes in labour force status and indicates whether a change was statistically significant. For example, overall Indigenous employment/population ratios increased significantly in 1994–95 and 1999–2000, and fell significantly in 1996–97. Interestingly, none of these significant changes coincided with the only significant change in employment in capital cities (1997–98). In contrast, the balance of State areas registered significant increases in employment in the same years that overall Indigenous employment was buoyant. As expected, the changes in sparsely settled areas appear random, with equal numbers of significant increases and decreases in employment, and with the employment ratio in 2000 being roughly equal to that in 1994. It appears that the significance of these statistics is driven by the artificially low standard errors that fail to take account of the effect of 'clustering' and non-sampling errors.

There are no significant changes in Indigenous unemployment rates in capital cities. All the significant changes in unemployment rates have been generated in the balance of State areas, for which the significant changes in unemployment coincide with those in the overall Indigenous unemployment rates. As indicated above the changes in unemployment in sparsely settled areas appears to be generated by the nature of the LFS Indigenous sample.

The annual movement in participation rates is roughly similar to that for employment ratios. One difference is that the significant increase in participation between 1994–95 is driven solely by the large apparent increase in participation in sparsely settled areas. Given the doubt that surrounds these estimates it would be unwise to overestimate their contribution to the overall picture. If one ignores the results for sparsely settled areas, one other difference was that an insignificant fall in participation in balance of State areas in 1996–97 translated into a significant decline in overall Indigenous participation. Also, the significant fall in participation in capital cities in 1995–96 is hidden in the annual changes in overall participation by the countervailing, but insignificant, increase in participation in the balance of State areas. While the inclusion of sparsely settled areas in the overall sample may hide important information on labour force trends, the changes in non-remote participation rates are very small in magnitude and appear to balance out in the medium term.

Table 6. Significance of annual changes in Indigenous labour force status by area, 1994–2000

	Period over which change in labour force status is measured					
	1994–1995	1995–1996	1996–1997	1997–1998	1998–1999	1999–2000
	Employment/population ratios					
Capital city	-1.7	-3.7	-4.4	6.6*	1.4	1.9
Sparsely settled	21.0*	-2.9	-6.4	-12.9*	6.8*	-8.3*
Balance of State	6.0*	-1.1	-2.1	1.0	-2.0	9.3*
Total Indigenous	6.4*	-2.2	-3.6*	0.2	0.6	3.8*
	Unemployment rates					
Capital city	-2.2	-1.2	3.9	1.1	-6.5	-3.2
Sparsely settled	0.2	-0.7	7.3*	-0.7	-10.9*	9.6*
Balance of State	-9.5*	4.4	-3.7	1.1	1.6	-8.8*
Total Indigenous	-6.9*	2.0	0.3	1.8	-3.1	-4.3*
	Labour force participation rates					
Capital city	-3.9	-5.6*	-3.1	9.7*	-3.2	0.0
Sparsely settled	22.2*	-3.4	-3.1	-14.9*	3.4	-5.5
Balance of State	1.0	2.0	-5.8*	2.2	-1.6	5.7*
Total Indigenous	3.4*	-1.3	-4.4*	1.5	-1.3	2.0

Note: An asterisk denotes that a change in labour force status was significant at the 95% level. Test statistics are calculated using formula in Appendix A.
Source: ABS 2000a.

Policy and methodological implications

Publication by the ABS of annual estimates of Indigenous labour force status from the LFS represents an important development in the routine monitoring of Indigenous economic status. As they stand, however, the estimates are of limited value for policy analysis. At best, they merely confirm existing understandings of recent labour force trends. At worst, they are unreliable due to high standard errors. In particular, movements of annual rates are statistically insignificant in all but the last two years, thus preventing the establishment of long-term trends. As in other ABS surveys, these results partly reflect sampling problems in sparsely settled areas, but even in capital cities few annual estimates are statistically significant, and this applies particularly to the estimates of unemployment.

The inclusion of remote areas in estimates of overall Indigenous labour force status may conceal significant trends in employment and participation rates and generate trends where probably none exist. Clearly, then, policy makers should give most weight to the more reliable LFS estimates for non-remote Australia. This is not a particularly radical suggestion; similar concerns about the 1995 NHS data quality for Indigenous respondents in remote areas meant that such areas were excluded from public release data (Gray 1997). Assessment of NHS data quality only had to contend with the problems of non-sampling error in remote Indigenous communities, and not with additional issues arising from the CDEP scheme or the use of a sample unstratified by Indigenous status. There are thus additional arguments for treating the LFS sparsely settled data with extreme caution.

While there are obvious limitations to the LFS estimates of Indigenous labour force status, the survey currently provides the only realistic mechanism for accurate inter-censal estimation. However, another avenue for securing accurate, representative measures of Indigenous labour force status between censuses is the forthcoming Indigenous Social Survey (ISS). The ISS Indigenous sample will be much larger than that of the LFS, and more attention will be paid to Indigenous-specific issues which will minimise non-sampling errors. It may therefore be prudent to give more weight in future to the ISS estimates, especially when assessing labour force status in remote Australia.

The key finding of significant decline in unemployment rates since 1998 resonates with an analysis of trends in increasing CDEP scheme employment and with the fact that purely administrative changes to the scheme are likely to have raised overall employment levels over the same period (Taylor & Hunter 2001). In other words, it is very unlikely that the recent decline in Indigenous unemployment has formed part of the general labour market trend, and this lack of association has been demonstrated before (Altman & Daly 1993). Also, the implementation of IEP would seem to have occurred too recently to have had any bearing on this result. While some program elements of the IEP commenced in July 1999, many of the programs were introduced progressively through the second half of 1999 and the first few months of 2000.

Far from superseding previous estimates of labour force status based on projections from the 1996 Census (Taylor & Hunter 1998), as suggested by DEWRSB (CGC 2000: 10), these new estimates tend to support one plank of the census-based projections. Notwithstanding the unreliability of many of these estimates, there is useful information in the overall lack of significant change that they indicate. For example, the relative stability of non-remote participation rates since the last census is consistent with the assumption in Taylor and Hunter (1998) of constant labour force participation rates among Indigenous people.

Technical issues such as the representativeness of the sample are important for interpreting the published ABS results. One means of ensuring that the sample is representative of the experience of Indigenous people is to augment the LFS with a stratified sample of the Indigenous population, as in the NHS. If the ABS were

to deem that the expenditure this entails is not warranted, then at the very least more detail on the geographic composition of the sample should be published. This would assist in understanding the process and effects of clustering in particular remote Indigenous communities. A nationally augmented sample might also open the possibility of increased use of Indigenous interviewers (Alphenaar, Majchrzak-Hamilton & Smith 1999), although this would not, in itself, guarantee that response rates and data quality would be acceptable. Hunter and Smith (2000) provide a detailed analysis of the advantages and disadvantages of using Indigenous interviews in a longitudinal context.[9]

The interpretation of estimates would also be further assisted if more detail were provided for the accurate calculation of standard errors of annual movements in labour force rates. For example, the standard errors for unemployment rates used in this paper are potentially inaccurate because no information was provided on the appropriate adjustment factors for the labour force (see Appendix A). While a conservative adjustment was used (that given for the unemployed population), this tends to overstate the variability of the labour force and hence understates the standard error on the unemployment rates.

The proposal to augment the Indigenous sample in the LFS by providing annualised estimates is an innovative option, but may not be as straightforward as it first appears. Such a procedure would require complex transformations of LFS data, probably involving out-of-sample estimates of the transition between and duration of respective labour force states, which are likely to effect the reliability of the final estimates. While numerical estimates of standard errors can be derived using 'bootstrap' or 'jackknife' techniques, the methodology employed needs to account properly for the complexity of the interim data transformations. Even if this were done, it is not guaranteed that annualised estimates would have lower standard errors than those based on one month's data from the LFS. However, it seems reasonable to assume that the larger effective sample would reduce standard errors somewhat. In any event, it would certainly enhance confidence in any analysis if the methodology used to construct such estimates were published and debated.

Appendix A. Calculating standard errors and testing hypothesis

ABS (2001) provides the appropriate statistical methodology to estimate the standard error (SE or se) of the changes in labour force status (e.g. the annual movement in unemployment rates). This appendix outlines the methods set out in that paper and describes the construction of the test-statistic used to test the significance of annual movements in labour force status.

Standard errors for changes in labour forces status

This section provides a methodology of how to calculate standard errors for a difference in two random variables. From basic statistical theory, the variance (Var) of a difference is:

$$\text{Var}(x-y) = \text{Var}(x) + \text{Var}(y) - 2\text{Cov}(x,y) \quad \text{(A1)}$$

Ignoring the co-variance (Cov) term, or rather assuming it is positive and bounding it below by 0, yields formula (A2):

$$\text{se}(x - y) = \sqrt{se(x)^2 + se(y)^2} \quad \text{(A2)}$$

While this formula is theoretically valid under simple random sampling (SRS) only (i.e. assuming independence), it is widely used in publications based on complex household sample designs, such as the LFS. To test its validity under these circumstances a quick empirical study was undertaken using Indigenous data from the 1994 Australian Housing Survey (see ABS 2001 for details).

An alternative, more conservative approach, is to bound the co-variance using a Cauchy-Schwarz inequality (i.e. $\text{Cov}(x,y) =< \text{se}(x)\text{se}(y)$), which leads to the formula:

$$\text{se}(x-y) =< \text{se}(x) + \text{se}(y) \quad \text{(A3)}$$

Equation A2 worked quite well in ABS (2001), while equation A3 was found to overestimate standard errors, but not drastically. While the co-variance cannot always be neglected, the ABS study provides no evidence against the use of equation A2 in surveys with Indigenous components. Also, equation A3 may not be a good alternative as, being an upper bound, it will always overestimate the true variation. Given the ABS's previous experience, the confidence intervals and inferences in this paper use the formula in equation A2.

Standard errors of a ratio

Given that employment/population ratios and unemployment and participation rates are all, in fact, ratios, standard errors have to take this into account. The ABS (2001) document several possible formulas to calculate the relative standard error (RSE or rse is a measure of variance which is not affected by the scale of a variable) of a ratio (where the numerator is estimated over a domain which is a subset of that of the demonimator), including:

$$\text{rse}(x/y) = \sqrt{rse(x)^2 - rse(y)^2} \quad \text{(A4)}$$

Again, this is only strictly valid under SRS. ABS's (2001) benchmarking of this method against approximations of more general formulas reveals that equation A4 gives 'good results', generally comparable with direct estimates of the true variation. They conclude that there is not 'sufficient evidence to warrant' not assuming SRS, especially since the alternative estimators generally over-estimate variance, sometimes quite drastically.

Hypothesis testing

Whether there are statistically significant differences in labour force status between years can be formally tested using the following:

$$test \quad statistic = \frac{Z_{t+1} - Z_t}{\sqrt{SE(Z_{t+1})^2 + SE(Z_t)^2}} \tag{A5}$$

where Z_{t+1} and Z_t are the unemployment rates (or employment/population ratios and participation rates) at year t+1 and t respectively and $SE(Z_{t+1})$ and $SE(Z_t)$ are the corresponding standard errors. As indicated above, the denominator is simply the standard error of the difference between two random variables from a simple random sample. In conventional hypothesis tests, the 95 per cent confidence interval of an estimate is the point estimate plus or minus 1.96 times the standard error. That is, the test statistic must be greater than 1.96 for there to be statistically significant differences in a variable.

An example: Calculating significance of changes in unemployment rates between 1999 and 2000

For reasons associated with space limitations, it is impractical to print the SE of each estimate in ABS (2000a). Instead, a table of SEs is provided to enable readers to determine the SE for an estimate according to the size of that estimate.

As an example calculation, the construction of the SE of the movement in unemployment rate between February 1999 and February 2000 is given for Indigenous Australians aged 15 years and over.

Table A1. Example of estimating significance

	1999	2000
Number of Unemployed Persons (denote X; from Table 3.2)	27,700	23,700
Unadjusted SEs using linear interpolation (from Table A3.3)	1,904	1,824
Adjusting for SE factor (1.05 from Table A7)	1,999	1,915
Number of Persons in the Labour Force (denote Y; from Table 3.2)	126,600	134,600
Unadjusted SEs using linear interpolation (from Table A3.3)	2,539	2,562
Adjusting for SE factor (1.05 from Table A7)	2,666	2,690
Unemployment Rate (denote Z; from Table 3.2)	21.9	17.6
RSE(X)=(SE(X)/X)*100	7.2	8.1
RSE(Y)=(SE(Y)/Y)*100	2.1	2.0
RSE(Z) = RSE(X/Y) = $\sqrt{(RSE(X)^2 - RSE(Y)^2)}$	6.9	7.8
SE(Z)=(RSE(Z)*Z)/100	1.5	1.4
Z_{2000}-Z_{1999}		-4.3
$SE(Z_{2000}\text{-}Z_{1999}) = \sqrt{(SE(Z_{2000})^2+SE(Z_{1999})^2)}$		2.1
T-statistic for hypothesis that UR is the same in 2000 and 1999		-2.05

Note: All references to table numbers in this table refer to the relevant table in ABS (2000a). No standard error adjustment factor was provided by the ABS for the labour force levels. Accordingly, a conservative adjustment factor was used by taking that indicated or the relevant unemployed population (i.e. *1.05).

The ABS advised that the standard error adjustment factor for annual movements in their Table A7 (2000a) could be used as an alternative rule of thumb for derived variables. If applied to the example in the above table, the appropriate factor of 1.38 times the standard error for the unemployment rates in 1999 and 2000 gives a standard error of 2.1 and 1.9 per cent, respectively. Note that the more conservative estimate (2.1%) equals the standard error derived using equation A4. The standard errors used in this paper were the most conservative of those derived using either equation A4 or the ABS's 'rule of thumb'. That is, where there was a conflict between the two methods for calculating the standard errors, the larger was used.

Therefore, using the above decision rule on the test statistic reported in Table A1, it is possible to reject the hypothesis that Indigenous unemployment rates are the same in both 2000 and 1999.

Notes

1. It is only since the 1967 Referendum that Indigenous Australians have been included in the five-yearly census. Up until that time Section 127 of the original Australian Constitution stated: 'In reckoning the numbers of the people of the Commonwealth, or of a State or other part of the Commonwealth, Indigenous natives shall not be counted.' Since the 1971 Census, Indigenous Australians have gradually been fully incorporated into successive censuses.
2. Only NATSIS totally controlled for Indigenous status when designing its sample. In the 1995 NHS, only the augmented portion of the sample was stratified by Indigenous status to ensure that the proportion of Indigenous respondents in an area reflects the population distribution from the previous census.
3. Factors contributing to differences in estimates include under-enumeration in the census for which labour force estimates have not been adjusted, the use in the LFS of population benchmarks derived from incomplete information about population change, the inclusion of members of the permanent Defence Forces in census estimates, the personal interview approach adopted in the survey as opposed to the self-enumeration of census schedules, the use of different questions to determine labour force characteristics and differing methods of adjustment for non-response to the survey or census.
4. The relatively low Indigenous participation rates recorded in the 1996 Census result from the ABS practice of treating those who did not state their labour force status as being outside the labour force and hence as not participating. If, as seems reasonable, some of the people who did not answer the question were either employed or unemployed, then the participation rate is understated. The 1996 Census estimate of participation rate increases to 52.7 per cent if the 'not stated' category is allocated proportionately across all labour force states—an increase of 2.4 percentage points. Note that the measured unemployment rate will not change with this proportional adjustment because the calculation in ABS (2000a) simply overstates the not-in-the-labour-force category. The LFS publications do not report a category for 'not stated' because respondents are always prompted for a response to this question.

5. Sparsely settled areas are defined as Statistical Local Areas (SLAs) with less than 0.057 dwellings per square kilometre.
6. Ironically, Barunga was the site of the nation's first CDEP scheme.
7. The LFS is a rolling sample that replaces one-eighth of the sample every month (ABS 1997). That is, after nine months all respondents will be different from those in the original sample.
8. While some confusion may remain among CDEP participants regarding their labour force status in the context of the LFS (Altman & Johnson 2000), and while the jump in employment numbers may not have been as abrupt as suggested by Taylor and Hunter (2001), it is likely that non-sampling error from this source will tend to decline in significance as participants are increasingly employed under 'no work, no pay' rules.
9. While the LFS is based a rotating panel, rather than a strictly longitudinal survey, it still attempts to collect information on respondents over time (over an 8-month period).

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