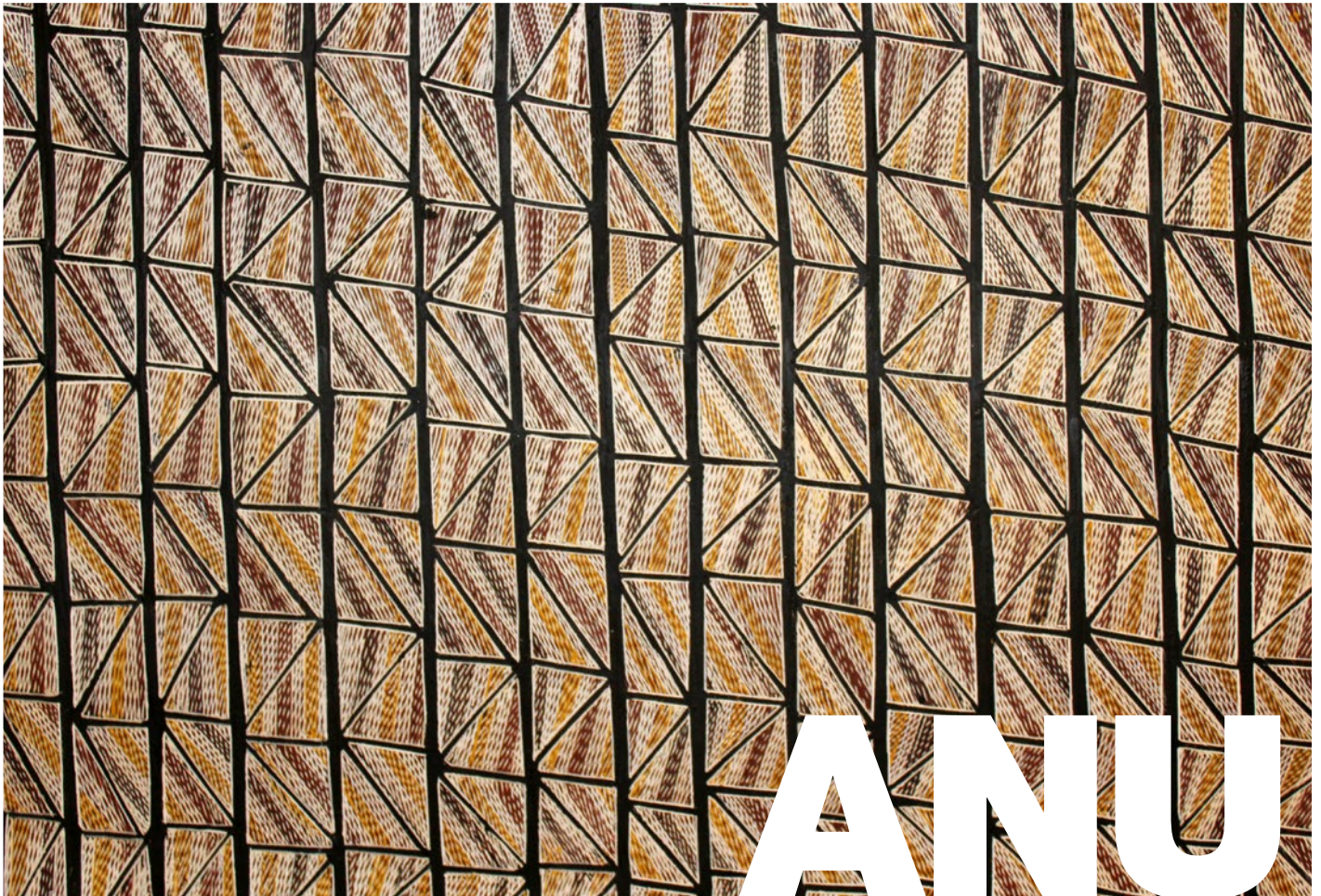




Australian
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INCOME, POVERTY AND INEQUALITY
F MARKHAM AND N BIDDLE

2016 CENSUS PAPER 2

Centre for
Aboriginal Economic
Policy Research
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Sciences**

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January 2018



Income, poverty and inequality

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Abstract

This paper uses data from the 2006, 2011 and 2016 censuses to analyse the distribution of income within the Indigenous population, and between the Indigenous and non-Indigenous populations. Particular attention is given to geographic variation in Indigenous income, poverty and inequality.

The findings of this paper show a growing divergence between the incomes of Indigenous people in urban areas and remote areas. Although Indigenous incomes are growing steadily in urban areas, where median disposable equivalised household income rose by \$57 per week in real terms between 2011 and 2016, median disposable equivalised household income in very remote areas fell by \$12 per week over the same period. Indigenous cash poverty rates in very remote areas rose from 46.9% in 2011 to 53.4% in 2016. During this period, poverty rates in urban areas continued to fall, reaching 24.4% in 2016. Finally, changes in the difference in the incomes of Indigenous and non-Indigenous Australians followed a similar pattern, with income gaps shrinking in urban areas while growing rapidly in very remote areas.

Although the increased incomes in urban and regional areas – where the majority of the Indigenous population lives – should be welcomed, this paper highlights a great divergence in the material circumstances of the Indigenous population across Australia. Urgent policy action is required to ameliorate the growing prevalence of poverty among Indigenous people in very remote Australia.

Keywords: income, poverty, income inequality, remoteness, spatial inequality

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Acronyms

ABS	Australian Bureau of Statistics
ANU	The Australian National University
CAEPR	Centre for Aboriginal Economic Policy Research
CDEP	Community Development Employment Projects
CPI	consumer price index
HILDA	Household, Income and Labour Dynamics in Australia
NATSISS	National Aboriginal and Torres Strait Islander Social Survey
OECD	Organisation for Economic Co-operation and Development

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Introduction

Given Australia's colonial history, it is unsurprising but nevertheless concerning that the incomes of Aboriginal and Torres Strait Islander people, measured in terms of the receipt of money, have historically been lower than those of the non-Indigenous population. The impacts of violence, dispossession and other forms of colonial domination on Indigenous economies are undeniable (Walter 2007, Hunter 2014). Indigenous people were systematically and violently deprived of access to economic resources, especially land, a process that continued until well into the second half of the 20th century (Altman & Markham 2015). And though Aboriginal and Torres Strait Islander people engaged with the settler-colonial economy in many diverse ways (Keen 2010, Fijn et al. 2012, Altman & Biddle 2014), underpayment or theft of wages was systematic in many parts of the country until the 1950s and 1960s (Gunstone 2012, Kidd 2012, Skyring 2012). This colonial legacy endures into the present. As Walter (2007:81) argues, 'Aboriginal people, families, households and communities do not just happen to be poor. Just like socioeconomic advantage, socioeconomic deprivation accrues and accumulates across and into the life and related health chances of individuals, families and communities'.

At the beginning of the era of formal equality, after the passage of the 1967 referendum and the Racial Discrimination Act of 1975, Indigenous incomes remained low. Surveying evidence from a range of sources from the first half of the 1970s, Altman and Nieuwenhuysen (1979:165) suggested that the per capita disposable income of Aboriginal people in major cities was between 33% and 43% of that of non-Indigenous Australians. In remote areas, estimates of Aboriginal incomes were lower, with the median estimate suggesting that the incomes of Aboriginal people in remote Australia were 19% of the non-Indigenous median income (estimates ranged from 7% to 35%) (Altman & Nieuwenhuysen 1979:48). During the intervening years, the incomes of Aboriginal and Torres Strait Islander people have grown, but only slightly faster than those of non-Indigenous Australians. Altman and Biddle (2014) report that, by the time of the 2011 Census, the median personal incomes of Aboriginal and Torres Strait Islander people were just 62% of that of non-Indigenous Australians. As Walter and Andersen (2013:91) note, a relative lack of income represents 'more than just contemporary socioeconomic position ...' but also an index of '... exclusion from a relative share of Australian society's resources and opportunities'.

Income is an important social indicator, most obviously because all people in Australia – including remote-living Indigenous people – rely on the purchase of commodities to live. Consequently, income is a basic requirement for living. This is especially the case for Aboriginal and Torres Strait Islander people, with low-income Indigenous households spending a greater proportion of their incomes on basic life necessities than comparable non-Indigenous households (Hunter 2012). If households are to avoid poverty, then – by definition – sufficient incomes are required.

Perhaps the most objective index of the importance of income to Indigenous life chances is in the realm of health. Indigenous Australians with higher incomes experience better health on average than lower-income Indigenous people, after accounting for other predictors of health (e.g. Shepherd et al. 2011). Indeed, correlational evidence from survey analysis suggests that the improved health of Indigenous people who are in employment derives not from the intrinsic qualities of work itself but from the income gained from employment (Booth & Carroll 2008).

For some remote-living people, livelihoods may include a higher noncash component than for the non-Indigenous population. Altman's 'hybrid economy' model (2001) highlights the importance of customary economic activity in constituting Indigenous livelihoods in remote Australia, in addition to income received from work or through government transfer. Customary activities include nonmarket activities such as hunting, fishing and gathering food (which may substitute for commoditised food), and market activities such as a commercial art production or the provision of paid environmental services. Participation in commodity-substituting activities may reduce the importance of cash income for providing basic material necessities, but the extent to which this is the case should not be overstated. For example, survey research in Fitzroy Crossing, Nauiyu Nambiyu and Kowanyama in 2009 estimated that the replacement value of customary, collected food ranged from around \$18 per household per week in Fitzroy Crossing to around \$50 per household per week in Kowanyama (Jackson et al. 2014). Measured in terms of replacement value, customary activities provided between 13% and 23% of the food consumed in these communities. Complicating the effect of complementing cash income with customary activities are the expenses incurred in customary food provisioning. Food harvesting, for example, often requires that sufficient cash income is available to purchase and maintain equipment such as vehicles. Furthermore, this limited contribution should be understood in the context of food prices in stores, which

are significantly higher in remote Indigenous communities than in more accessible areas (Ferguson et al. 2016). Clearly, although customary activities are widespread in remote Australia (Altman et al. 2012), the limited ability of contemporary customary activity to deliver basic necessities means that monetary income remains vitally important to assembling adequate livelihoods for Aboriginal and Torres Strait Islander people, even where access to customary resources is available.

This Census Paper uses income data from the 2016 Census to analyse the income distribution in Australia both within the Indigenous population and between the Indigenous and non-Indigenous populations, comparing results with those from the 2006 and 2011 censuses. In particular, it seeks to analyse changes in incomes across the income spectrum for Indigenous people, rather than just focusing on population averages. Furthermore, the paper examines regional variations in income to convey stark geographical differences in Indigenous outcomes. Finally, the paper places the incomes of the Indigenous population in the context of income inequality in Australia, examining both inequalities of income between the Indigenous and non-Indigenous populations and the contribution of this inequality to total income inequality in Australia.

A note on data and methods

This paper reports on Indigenous and non-Indigenous incomes in the 2016 Census data, comparing incomes in 2016 with those in the censuses of 2011 and 2006. In the 2016 Census, 649 200 people identified as being of Aboriginal or Torres Strait Islander origin (Markham & Biddle 2017). This is, according to the best available estimates, a substantial undercount of Indigenous Australians, with preliminary population estimates indicating that the Indigenous population on 30 June 2016 was 798 400. Because of our reliance on census data, we report on the income data of the 649 200 Indigenous people identified in the census rather than the full population. Unless stated otherwise, we have excluded from our analysis those who did not state their Indigenous status. Furthermore, around 10.0% of Indigenous census respondents and 3.5% of non-Indigenous census respondents did not report their personal income. Once aggregated to the household, 14.4% of Indigenous people were present in a dwelling on census night where at least one person did not state their income on the census, with the equivalent figure for non-Indigenous people being 9.4%. All people who did not state their income, or who were present in a dwelling where any household member failed to report their

income, were excluded from the household analyses. Therefore, most of the data presented in this Census Paper report on the 521 300 Indigenous people for whom household income data are available. Previous research from the 2016 Census has indicated that imputed census records – the most frequent form of missing data – are most likely to be located in areas with relatively high poverty rates (Markham & Biddle 2017), with 3.7% of records missing in low-poverty areas compared with 5.4% in poorer areas. This suggests that our analysis may overestimate the incomes of Indigenous people, and, in particular, may underestimate the magnitude of the difference between the incomes of Indigenous and non-Indigenous Australians.

Our analysis of income data in the census is limited by how the data are collected and made available. To measure the incomes of individuals, the 2016 Census form asked of all persons aged 15 or older, ‘What is the total of all income the person usually receives?’ (italics in original) and instructs respondents not to deduct ‘tax, superannuation contributions, amounts salary sacrificed, or any other automatic deductions’. Furthermore, respondents are instructed to include income from:

- wages and salaries, including
 - regular overtime
 - commissions and bonuses
- government pensions and allowances, including
 - Age Pension
 - Family Tax Benefit
 - Parenting Payment
 - Disability Support Pension
 - Newstart Allowance
 - youth and student allowances
 - Carer Allowance
 - any other government pension/allowance
- profit or loss from
 - unincorporated business/farm (e.g. sole traders, partnerships)
 - rental properties
- other income, such as
 - income from superannuation
 - private pensions
 - child support
 - interest
 - dividends on shares
 - workers compensation
 - any other income.

While the wording of this question has changed slightly from questions used in the 2011 Census (Biddle 2013a), the changes are unlikely to substantially affect the results. This question has the drawback that it reports gross

income (i.e. taxable income) rather than disposable income (i.e. income after taxation); the latter is a better measure of the economic resources available to individuals and households.

Respondents are asked to report their gross income level by marking a box indicating 1 of 15 income groups, rather than reporting income as a number. No information regarding the source of income (e.g. wages and salaries, social security payments, business income) is recorded. While this method of data collection has the advantage of simplicity, it has several shortcomings for policy analysis. First, because of the categorical nature of the data, we have no information from the census on the distribution of income within income groups. This makes it difficult to estimate conventional summary statistics directly from the census data. Second, comparison of grouped income data over time is especially difficult because of changes in the number of income groups reported in the census and the boundaries between them, especially once inflation is accounted for. Third, insufficient information is available to calculate disposable income (i.e. income remaining after deduction of taxes) directly, although disposable income is often of more policy relevance than gross income.

To ameliorate these shortcomings, we augmented the census data on income with data from the Household, Income and Labour Dynamics in Australia (HILDA) panel survey, which surveys the same 17 000 Australians each year about a range of issues, including their incomes. Specifically, following Biddle and Montaigne (2017), we estimated income percentiles within each census income group, using HILDA data for the total Australian population. These HILDA-derived within-group income distributions were applied to aggregate census counts describing between-group income distributions to simulate the total income distribution from each census income table. Furthermore, because HILDA includes data on both gross and disposable incomes, we use HILDA to convert between gross income groups reported in the census and disposable income distributions. To facilitate the calculation of the Theil index, all persons reporting nil or negative incomes were assigned an income of one dollar. Inflation factors of 1.10 and 1.27 were used to adjust 2011 and 2006 incomes, respectively. The gross income groups provided by the 2006, 2011 and 2016 censuses, and the median and mean disposable incomes within these brackets are listed in Tables 1 and 2.¹ Unless otherwise specified, all data presented in this paper are derived from the synthetic estimates produced by combining custom census cross-tabulations extracted through TableBuilder with estimates of the within-income-group distributions of income derived from HILDA.

While our approach provides a great deal of flexibility in dealing with census income data, it introduces a range of assumptions. First, it assumes that the income distribution within income groups is the same for both Indigenous and non-Indigenous people. Second, it assumes that the income distribution within income groups is constant across the country. Third, it assumes that, within income groups, the relationship between gross and disposable income is the same for Indigenous and non-Indigenous people. These assumptions are relatively strong. However, because the census income groups are relatively small, most of the difference in incomes arises from differences in the distribution across groups rather than within them. Consequently, the magnitudes of the biases caused by this approximation are likely to be small. This is especially true for the bottom end of the distribution, although the distribution within income groups is more assumption dependent for the top-coded income bracket. Consequently, in this paper we emphasise distributional measures of income (e.g. medians, and percentile measures) rather than means and totals. Similar assumptions also apply to alternative methods that are frequently used, such as converting categorical income groups to continuous measures at the midpoint of these groups, or assuming that incomes are distributed evenly within brackets. The HILDA-based approach allows us to simulate continuous disposable income distributions from census data that are comparable over time.

While some sensitivity analysis is possible, the impact of differing sets of assumptions on results is not strictly testable without access to adequate Indigenous income data. These are currently unavailable. Even the National Aboriginal and Torres Strait Islander Social Survey (NATSISS) and the Indigenous health surveys, which provide the best survey data about Indigenous incomes, do not collect sufficient data to estimate disposable incomes. Improvements to the NATSISS income data collection are needed to ameliorate this problem, although data linkage of census, taxation and social security may offer an alternative avenue to access rich Indigenous income data. Given the relative lack of detailed Indigenous income data, this paper proceeds based on a set of reasonable assumptions. However, the collection of detailed Indigenous income data should be a priority for statistical agencies.

To compare incomes over time, we converted all measures of income to 2016 dollars, using the national consumer price index (CPI) to adjust for inflation. All amounts reported in dollars in this Census Paper are expressed in terms of 2016 dollars, unless otherwise stated.

TABLE 1. Average disposable weekly personal incomes within census gross income groups, 2006, 2011 and 2016

2016 (HILDA wave 15)			2011 (HILDA wave 11)			2006 (HILDA wave 6)		
Gross income range in census (2016\$)	Disposable income (2016\$)		Gross income range in census (2011\$)	Disposable income (2016\$)		Gross income range in census (2006\$)	Disposable income (2016\$)	
	Mean	Median		Mean	Median		Mean	Median
0 or less	0	0	0 or less	0	0	0 or less	0	0
1–149	69	68	1–199	108	110	1–149	96	97
150–299	232	233	200–299	280	280	150–249	266	266
300–399	350	350	300–399	387	386	250–399	395	388
400–499	448	445	400–599	537	532	400–599	582	579
500–649	560	553	600–799	723	722	600–799	753	753
650–799	684	681	800–999	879	876	800–999	924	921
800–999	808	804	1000–1249	1047	1036	1000–1299	1146	1136
1000–1249	959	951	1250–1499	1237	1221	1300–1599	1392	1384
1250–1499	1130	1116	1500–1999	1502	1479	1600–1999	1650	1632
1500–1749	1296	1277	2000 or more	2582	2178	2000 or more	2753	2264
1750–1999	1468	1449						
2000–2999	1799	1752						
3000 or more	3249	2716						

Note: Gross income ranges are expressed in uninflated dollars from the census year, while disposable income medians and means are expressed in 2016 dollars. In 2016 dollars, the 2011 census ranges are \$0 or less, \$1–219, \$220–329, \$330–439, \$440–659, \$660–879, \$880–1099, \$1100–1374, \$1375–1649, \$1650–2199 and \$2200 or more. In 2016 dollars, the 2006 census ranges are \$0 or less, \$1–189, \$191–316, \$318–507, \$508–761, \$762–1015, \$1016–1269, \$1270–1650, \$1651–2031, \$2032–2539 and \$2540 or more.

This Census Paper mostly reports on equivalised household incomes. Because the census personal income questions solicit responses within income ranges (rather than as a continuous measure), total household incomes are calculated by the Australian Bureau of Statistics (ABS) by assigning median values to each income range using data from the Survey of Income and Housing. These median values are then summed across all members of the household.

Equivalisation is a further adjustment that is made to household income data to enable the comparison of households of different sizes and compositions, accounting for the lower cost of living for children compared with adults and the economies of scale that accrue to people living in large households. Equivalised household income is calculated by dividing total household income by an equivalence factor. The ABS uses the modified Organisation for Economic Co-operation and Development (OECD) equivalence scale to undertake equivalisation, and that is the method that we follow. This equivalence factor is constructed by allocating points to each person in a household (1 point to the first adult, 0.5 points to each additional person who is 15 years and over, and 0.3 to each child under

the age of 15) and then summing the equivalence points of all household members. While this equivalence factor may not be ideal for Indigenous households (Hunter et al. 2004), we adopt it because it is the method used by the ABS to produce grouped equivalised household incomes. Because equivalisation assigns income to children (as household members), all reports of average equivalised household incomes include the incomes assigned to children.

Throughout, data are presented disaggregated into three geographical levels: national, remoteness areas and Indigenous regions. Indigenous regions are based on former Aboriginal and Torres Strait Islander Commission regions, and are intended to represent something of the regional diversity among the Aboriginal and Torres Strait Islander populations.² After excluding external territories and nongeographic regions, there are 37 Indigenous regions in Australia. Remoteness areas are a standard Australian geographic classification that range from 'major cities', through 'inner and outer regional' Australia to 'remote' and 'very remote' areas. Remoteness areas are classified based on the accessibility of cities and towns of a range of sizes by road. Comparisons by remoteness area are made using the 2011 boundaries

TABLE 2. Average disposable weekly equivalised household incomes within census gross income groups, 2006, 2011 and 2016

2016 (HILDA wave 15)			2011 (HILDA wave 11)			2006 (HILDA wave 6)		
Gross equivalised income range in census (2016\$)	Equivalised disposable income (2016\$)		Gross equivalised income range in census (2011\$)	Equivalised disposable income (2016\$)		Gross equivalised income range in census (2006\$)	Equivalised disposable income (2016\$)	
	Mean	Median		Mean	Median		Mean	Median
0 or less	0	0	0 or less	0	\$0	0 or less	\$0	\$0
1–149	84	93	1–199	139	152	1–149	123	144
150–299	242	246	200–299	284	285	150–249	274	280
300–399	358	360	300–399	391	393	250–399	400	395
400–499	449	446	400–599	535	531	400–599	578	574
500–649	562	558	600–799	708	703	600–799	750	749
650–799	674	671	800–999	872	868	800–999	922	916
800–999	800	800	1000–1249	1044	1037	1000–1299	1142	1132
1000–1249	952	944	1250–1499	1245	1237	1300–1599	1393	1391
1250–1499	1127	1114	1500–1999	1525	1508	1600–1999	1671	1659
1500–1749	1300	1287	2000 or more	2386	2069	2000 or more	2555	2173
1750–1999	1482	1465						
2000–2499	1716	1697						
2500–2999	2036	2011						
3000 or more	3077	2687						

Note: Gross income ranges are expressed in uninflated dollars from the census year, while disposable income medians and means are expressed in 2016 dollars. In 2016 dollars, the 2011 census ranges are \$0 or less, \$1–219, \$220–329, \$330–439, \$440–659, \$660–879, \$880–1099, \$1100–1374, \$1375–1649, \$1650–2199 and \$2200 or more. In 2016 dollars, the 2006 census ranges are \$0 or less, \$1–189, \$191–316, \$318–507, \$508–761, \$762–1015, \$1016–1269, \$1270–1650, \$1651–2031, \$2032–2539 and \$2540 or more.

and concordances that translate 2006 and 2016 geographies into 2011 geographies.

This Census Paper frequently compares incomes in 2006, 2011 and 2016. Yet the Indigenous population has grown substantially over that period – at a much greater rate than can be accounted for by excess births over deaths (Markham & Biddle 2017). This unexplained component of population growth results either from changes in the methods by which the ABS enumerates the Indigenous population in the census or from the changing propensity of Indigenous people to identify as Indigenous. Because those who identified as Indigenous for the first time in the 2016 Census may have higher average incomes than those who have consistently identified as Indigenous, estimates of income change should be interpreted cautiously. No attempt to adjust for identification or enumeration change is made in this paper.

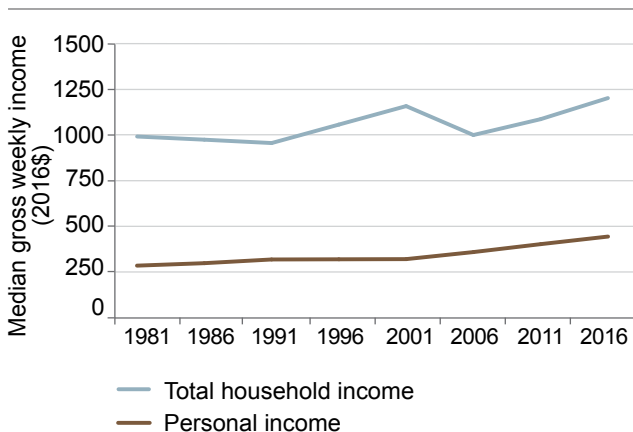
Changing Indigenous incomes

Incomes for Aboriginal and Torres Strait Islander people increased substantially between 2011 and 2016. Median income is the income of the individual in the very middle of the distribution, with half of the population having an income above that person, and half of the population having an income below. After adjusting for inflation, the median weekly disposable personal income of Indigenous Australians was \$438 in 2016, up from \$400 in 2011 and \$341 in 2006. This constitutes a compound annual growth of 1.8% per year between 2011 and 2016, a deceleration in income growth from the 3.2% per year during the period 2006 to 2011. Median equivalised disposable household income grew at a similar rate to median personal income, reaching \$557 in 2016, up from \$512 in 2011 and \$437 in 2006.

Data availability precludes putting these increases in Indigenous disposable incomes in historical context.

However, comparable data on gross weekly personal incomes and gross weekly total household incomes (not equivalised) are available from all censuses since 1981 (Altman et al. 2009), providing a consistent 35-year time series. Fig. 1 and Table 3 show that, while Indigenous personal income growth between 2011 and 2016 slowed slightly from its peak between 2006 and 2011, Indigenous incomes have grown much more rapidly since 2011 than they did during the 1980s and 1990s. The strong income growth between 2001 and 2011 reflects strong income growth in the national economy during this period. Historical trends in gross total household income are more difficult to interpret because of changes in household composition, with the mean size of Indigenous households consistently falling since the 1980s and the proportion of the Indigenous population that is younger than 15 falling. Notwithstanding these caveats, the growth in median gross total household income between 2011 and 2016 is the fastest recorded over the 35-year period for which comparable data are available.

FIG. 1. Gross, inflation-adjusted median personal and household incomes for Aboriginal and Torres Strait Islander people, 1981–2016



Sources: 1981–2001 from Altman et al. (2009); 2006–2016 from the Census of Population and Housing (2006, 2011, 2016)

Changes in income within the Indigenous population

Incomes are very unevenly distributed across the life course and between men and women. This is true for both Indigenous and non-Indigenous Australians (Biddle 2013a). Fig. 2 shows how median disposable personal income has changed for Indigenous men and women of different ages. Median personal income for Indigenous men increased from \$341 in 2006 to \$411 in 2011 and \$453 in 2016, while median personal income for Indigenous women increased from \$340 in 2006 to \$395 in 2011 and \$431 in 2016. The difference between the median personal incomes of Indigenous men and women increased over this period: median incomes started from a similar point in 2006, but the median income of Indigenous women grew less rapidly than that of Indigenous men, falling 5% behind the median income of Indigenous men by 2016.

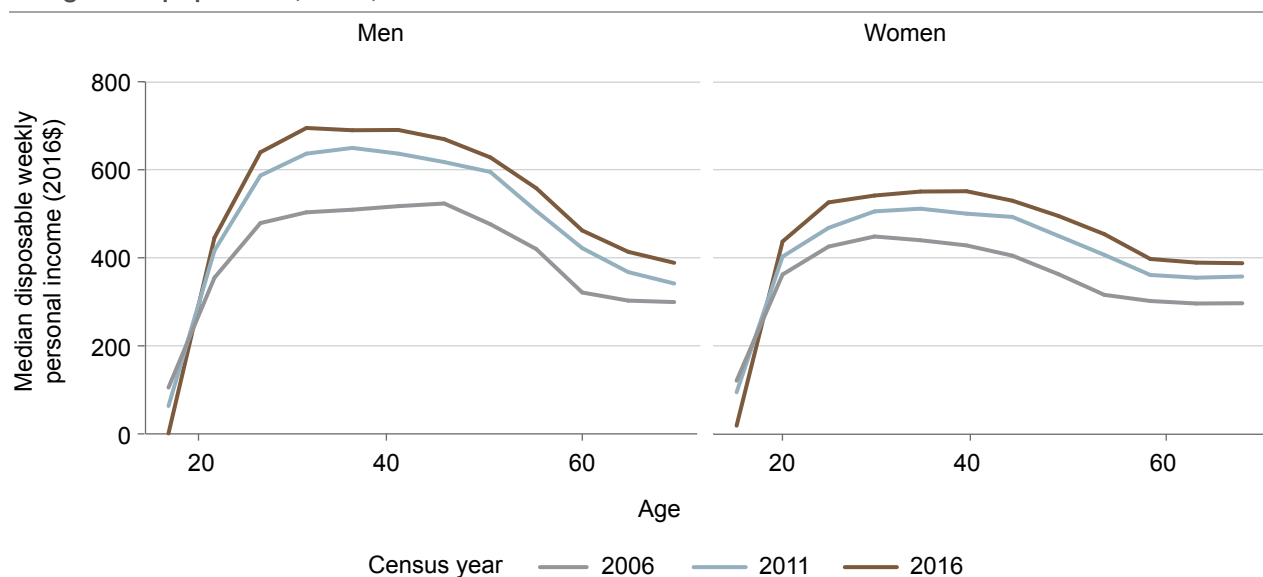
Median incomes increased across the age distribution for both men and women between 2011 and 2016, and 2006 and 2011, with two notable exceptions. Between 2011 and 2016, the real median income of Indigenous men and women aged 15–19 fell by \$62 and \$76, respectively. This decrease in income is likely to be at least partly a result of increased educational attainment among Indigenous youth and the related opportunity cost of studying, and changes to the indexation rate of the types of income support payments usually received by youth and young adults. Both topics will be discussed at greater depth in future CAEPR research. Increases in incomes for Indigenous people were greatest in relative terms among those of pension age. Specifically, between 2011 and 2016, the median disposable personal incomes of those aged 65–69 years increased by 12.5% for men and 10.0% for women, with similar increases for those in older age brackets. This increase in median incomes substantially outstripped the real increases in the standard rate of the

TABLE 3. Compound annual growth of gross, inflation-adjusted median personal and household incomes for Aboriginal and Torres Strait Islander people, 1981–2016

	1981–91	1991–96	1996–2001	2001–06	2006–11	2011–16
Annual growth in gross median weekly personal income	1.19%	0.07%	0.09%	2.42%	2.44%	2.06%
Annual growth in gross median weekly household income	-0.35%	1.88% ^a		-2.83%	1.64%	1.99%

^a Data are unavailable for median total household income in 1996, so this figure represents compound annual growth from 1991 to 2001. Sources: 1981–2001 from Altman et al. (2009); 2006–2016 from the Census of Population and Housing (2006, 2011, 2016). Because no data on total household income are available for 1996, a single compound annual growth rate has been calculated for the decade 1991–2001.

FIG. 2. Median disposable weekly personal income, adjusted for inflation, by age and sex for the Indigenous population, 2006, 2011 and 2016



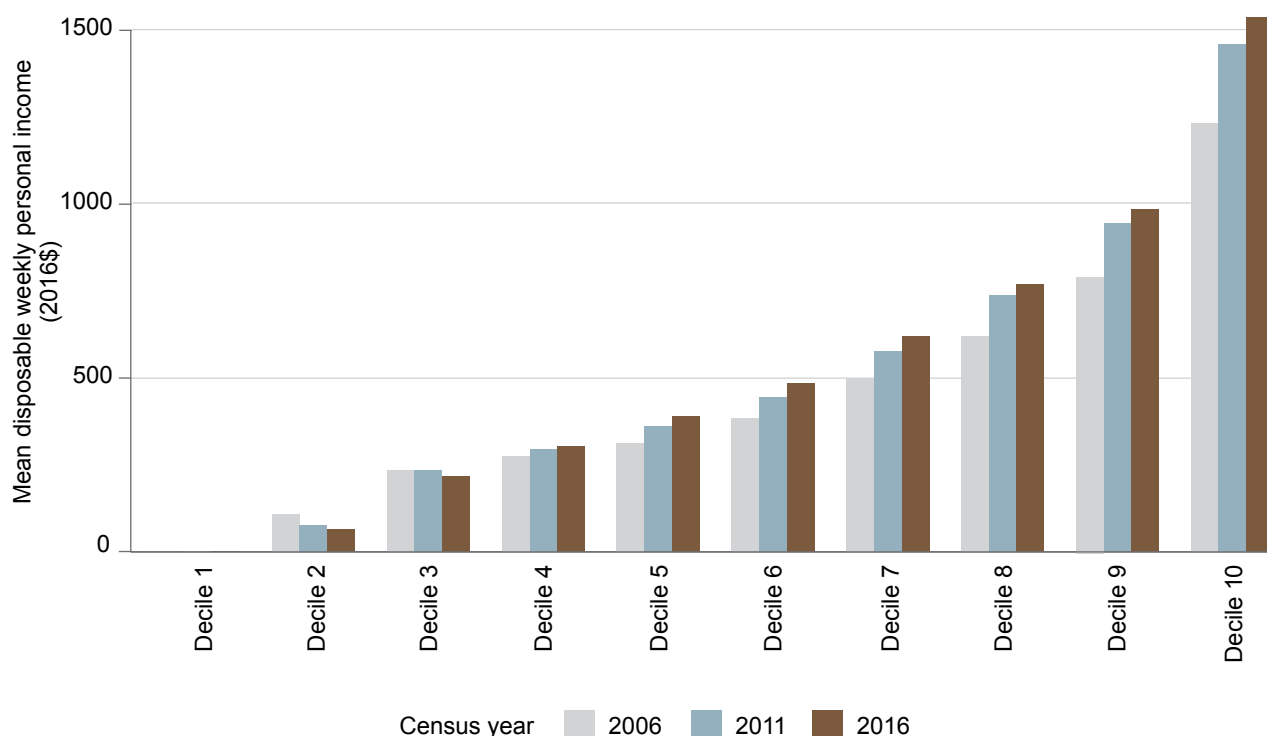
Age Pension, which rose by 5.8% over the same period (DSS 2017), indicating a decreased reliance on the Age Pension among Indigenous people aged 65 or older.

To complement the examination of changing Indigenous incomes across the life course, it is also useful to look at these changes across the income distribution. This enables an examination of how incomes have changed for relatively well-off and less well-off Indigenous people. Fig. 3 shows the mean disposable personal income for Indigenous people aged 15 or older, broken down by income decile, in 2006, 2011 and 2016. Each decile represents 10% of the Indigenous population in that year's census. There are several features of Fig. 3 that are worthy of discussion.

First, 10% of the Indigenous population receives no income at all. It is important to establish whether these individuals are undertaking nonmarket activities such as studying or child rearing, or whether people earning no income have dropped out of both the labour force and the income support system. Table 4 shows further information about the size and characteristics of the Indigenous population who do not earn an income. This group is growing, comprising 8.8% of the Indigenous population in 2006, 9.6% in 2011 and 11.8% in 2016. The majority of this group are students, while others are caring for children. It is the increase in the proportion of Indigenous people who are studying and not earning an income that explains most of the growth in the zero-income population over the past decade.

However, there is also a small but growing group of the Indigenous population (3.0% of those aged 15 or older in 2016, up from 2.7% in 2006 and 2.8% in 2011) who report not receiving an income from any source, and who do not report a 'core activity need for assistance', who are of working age, not studying, not caring for children and not living in an institutional setting. While the receipt of no personal income may be a choice for some who are supported by other family members, Table 4 suggests that most Indigenous people who have no personal income are living in low-income households, with a median disposable equivalised household income of \$408 per week. Further research is urgently required to understand why a growing number of Indigenous people with limited financial means do not receive an income from employment or the social security system.

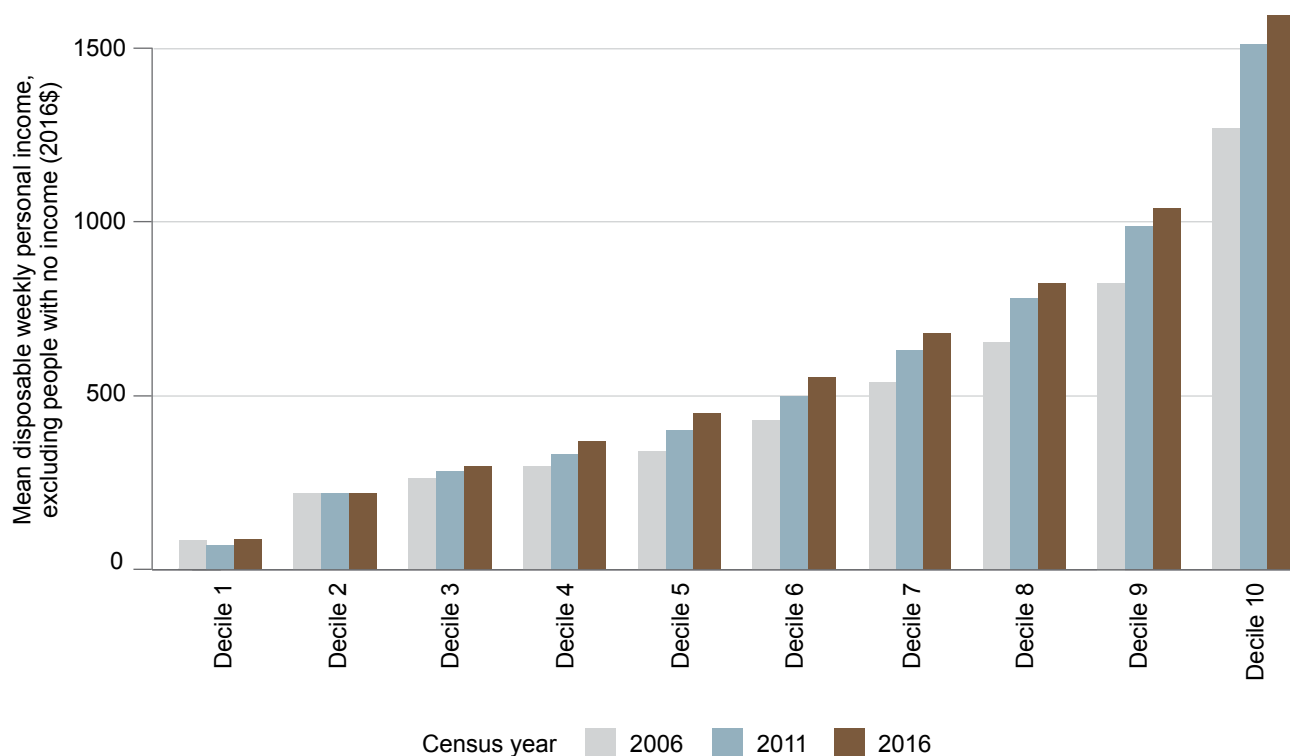
The second notable feature of changes in Indigenous personal incomes shown in Fig. 3 is that the mean income of those in the second and third deciles decreased between 2011 and 2016. Much of this decrease may be accounted for by the increased proportion of the population receiving zero income, which pushes those receiving meagre incomes further up the decile distribution. Consequently, Fig. 4 repeats the calculations presented in Fig. 3 but excludes those earning zero incomes, giving a clearer picture of changes in incomes among those receiving some personal income. After excluding those with zero income, the personal incomes of the bottom 20% of the distribution have effectively stagnated since 2006.

FIG. 3. Mean disposable weekly personal income, adjusted for inflation, for the Indigenous population, by Indigenous income decile, 2006, 2011 and 2016**TABLE 4.** Selected characteristics of the Indigenous population aged 15 or older who report not receiving a personal income

	Persons (exc. not stated)			Percentage of population			Median disposable weekly equivalised household income
	2006	2011	2016	2006	2011	2016	2016
Receiving personal income	214 852	269 240	324 779	91.2	90.4	88.2	\$618
Not receiving an income, and ...							
Studying	10 390	14 735	23 918	4.4	4.9	6.5	\$480
Caring for children (and not studying)	3 105	4 427	6 187	1.3	1.5	1.7	\$475
Pension age (not studying or caring for children)	238	400	911	0.1	0.1	0.2	\$139
Core need for assistance (and not studying, not caring for children, not pension aged)	302	494	968	0.1	0.2	0.3	\$272
None of the above but living in a nonprivate dwelling	178	273	268	0.1	0.1	0.1	–
None of the above	6 416	8 255	11 090	2.7	2.8	3.0	\$408

Source: Customised calculations from TableBuilder. Those living in nonprivate dwellings are excluded from calculations of equivalised household income throughout. Missing data were removed listwise, meaning that if data were not reported in a census record for any of the variables in this table then the record was ignored in this analysis.

FIG. 4. Mean disposable weekly personal income, adjusted for inflation, for the Indigenous population, excluding those earning zero or negative income, by Indigenous income decile, 2006, 2011 and 2016



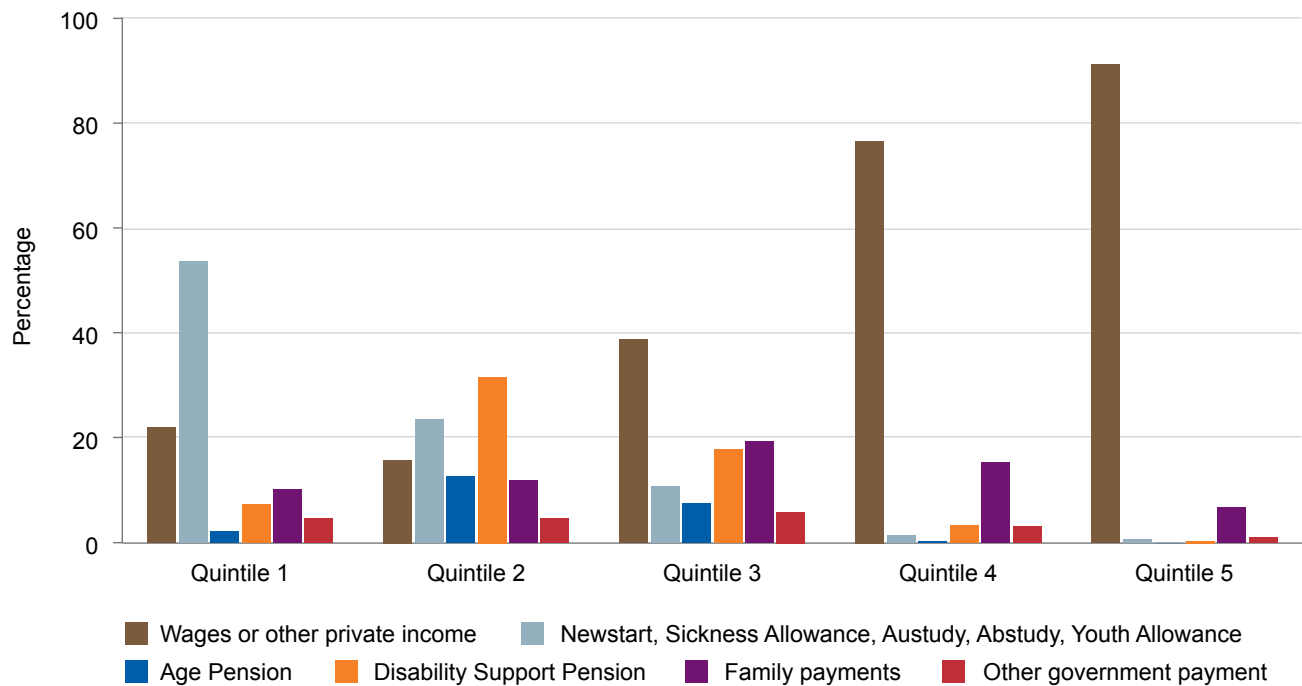
The third feature of changing Indigenous incomes is that personal incomes are growing among the remaining 70% of the adult population, but growing most rapidly for those at the top of the income distribution. Real weekly disposable incomes increased by around \$75 per week for the top 10% of Indigenous adults, compared with \$32 per week for those in decile 5. Income growth at the top of the distribution adds further weight to discussions surrounding the possible emergence of an Indigenous middle class (Lahn 2013, Langton 2013, Grant 2016). Finally, while sustained growth across much of the income distribution is encouraging, it is clear that Indigenous incomes grew more between 2006 and 2011 than between 2011 and 2016, particularly for the 30% of Indigenous adults with the highest incomes.

A partial explanation for the stagnation of Indigenous incomes at the bottom of the distribution at a time of growing incomes at the top can be derived from Fig. 5. Fig. 5 shows that, according to responses to the 2014–15 NATSISS, most of the Indigenous population in the bottom 20% of personal incomes rely on social security payments such as Newstart, Abstudy and Youth Allowance as their main source of income. These payments increase in accordance with the CPI and therefore remain constant in real terms, unlike the Age Pension, which is benchmarked against average earnings. In the middle of the income spectrum, Indigenous people received their income from a mixture of sources, including wages and private income, the

Age Pension, the Disability Support Pension and various family payments. In the top Indigenous personal income quintile, more than 90% of people receive most of their income from wages, businesses or other sources of private income. The differences in growth between CPI-indexed payments, earnings-benchmarked payments and wages or other private income go some way towards explaining the divergent income trajectories at the top and bottom of the Indigenous personal income distribution.

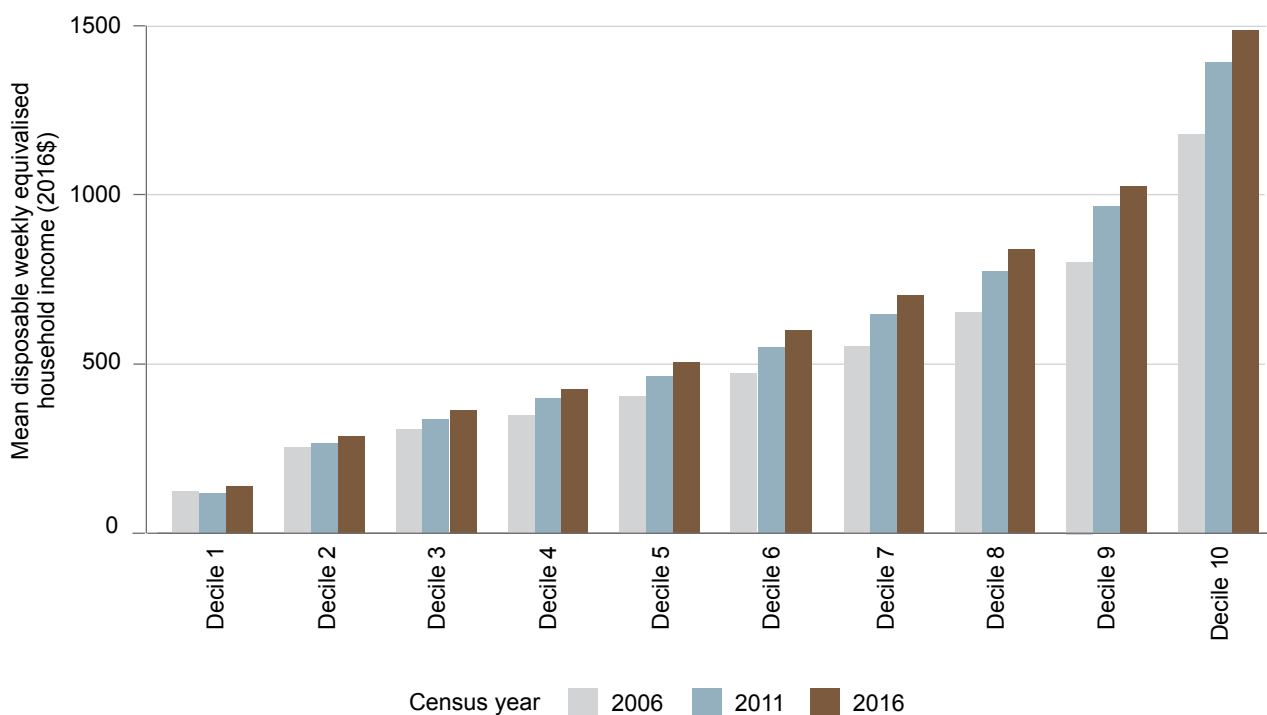
These features of the income distribution are repeated when the distribution of incomes is viewed in terms of equivalised household incomes rather than personal incomes, although the equivalised household income distribution tends to be smoother and more equal than the personal income distribution because of the assumption within the equivalisation adjustment that incomes are shared equally within households. Fig. 6 shows that equivalised household incomes grew between 2011 and 2016 across the income distribution, including among the lowest-income households. However, this growth was again very unevenly distributed, with incomes in absolute terms growing most at the top of the distribution. While growth at the bottom of the household income distribution is encouraging, the equivalised household incomes of the poorest 10% of Indigenous families remain alarmingly low, at just \$140 per week in 2016.

FIG. 5. Main source of personal income reported by Indigenous people, excluding those with zero personal income, by quintile of gross personal income for the Indigenous population



Source: Estimates derived from NATSISS 2014–2015

FIG. 6. Mean disposable weekly equivalised household income, adjusted for inflation, for the Indigenous population, by Indigenous income decile, 2006, 2011 and 2016



Geographical variations in Indigenous incomes

Indigenous incomes and income growth are highly geographically uneven. Fig. 7 shows the median equivalised household incomes of Indigenous people by remoteness area in 2006, 2011 and 2016. A familiar geographic gradient emerges from this analysis (Biddle 2013b), indicating that, for Indigenous Australians, median incomes are highest in major cities at \$647 per week in 2016, and decline dramatically as remoteness increases, falling to just \$389 per week in very remote areas.

Intercensal changes to median incomes follow a similar pattern. While the median income in major cities increased by \$57 per week between 2011 and 2016, incomes in outer regional areas, the midpoint of the remoteness gradient, increased by just \$32 per week. In remote areas, median incomes stagnated, increasing by just \$7 per week, whereas, in very remote areas, the median income fell by \$12 per week. The decrease in real equivalised household incomes in very remote parts of the country is especially concerning because incomes were already lowest in these regions.

Table 5 examines the income distribution by remoteness in more detail, reporting on mean income within income

brackets as well as at the 10th, 20th, 50th (median), 80th and 90th percentiles. Several notable features emerge from these data. The first is that the drop in median household incomes in very remote parts of Australia between 2011 and 2016 is not matched at other parts of the income distribution. Income stagnation at the 20th percentile suggests that household incomes have declined for a broad swathe of the Indigenous population in very remote areas, especially in the middle and lower half of the income distribution where incomes are already low.

Second, Table 5 shows that household incomes in very remote areas started to fall between 2006 and 2011, but these declines may have escaped notice (e.g. Biddle 2013) because they occurred only within particular parts of the income distribution. Specifically, equivalised incomes for households at the 10th and 20th percentiles fell by \$20 and \$6, respectively, between, 2006 and 2011 (in 2016 dollars). Put simply, incomes have been declining among low-income households in very remote Australia since before the 2011 Census, and have continued to do so.

Third, the pattern of incomes falling as remoteness increases does not hold at all points of the distribution. Specifically, the equivalised household income of the top 20% of Indigenous people in remote areas is higher than

FIG. 7. Median disposable weekly equivalised household income, adjusted for inflation, for the Indigenous population, by remoteness, 2006, 2011 and 2016

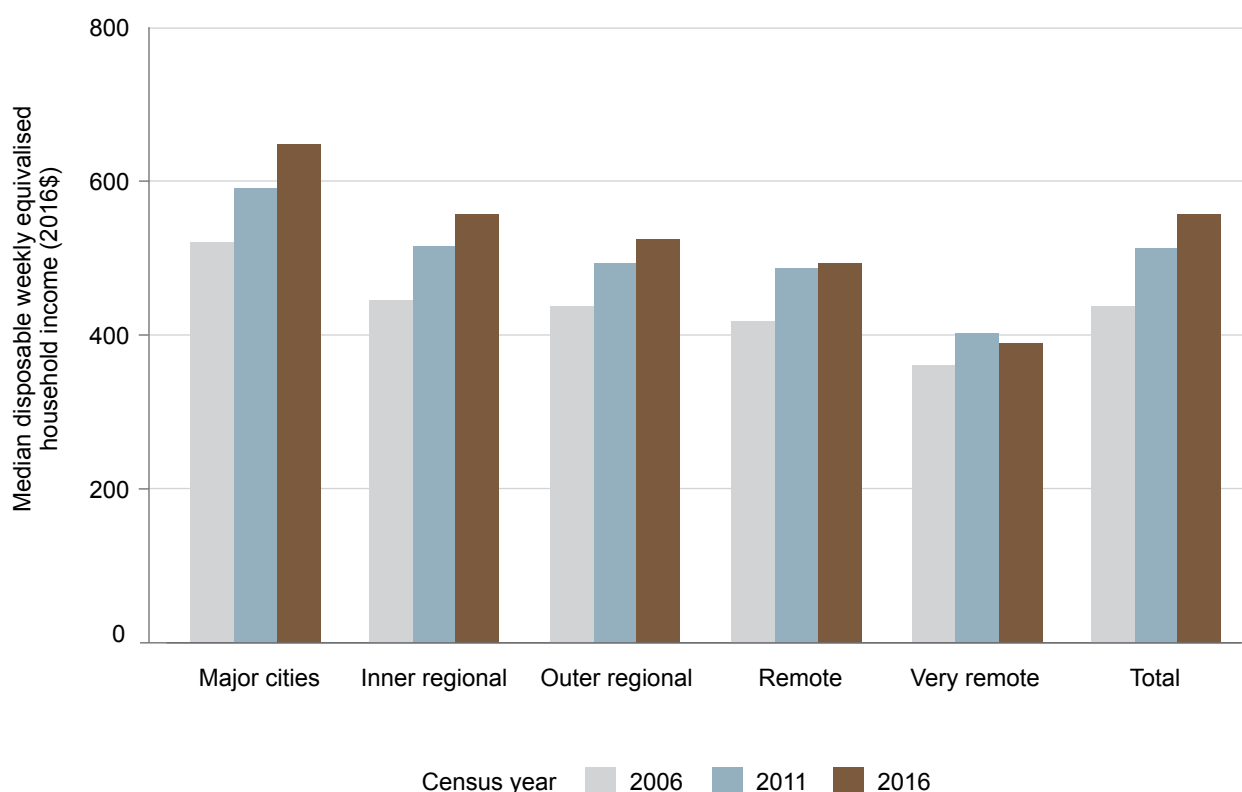


TABLE 5. Disposable incomes for Indigenous Australians, by remoteness

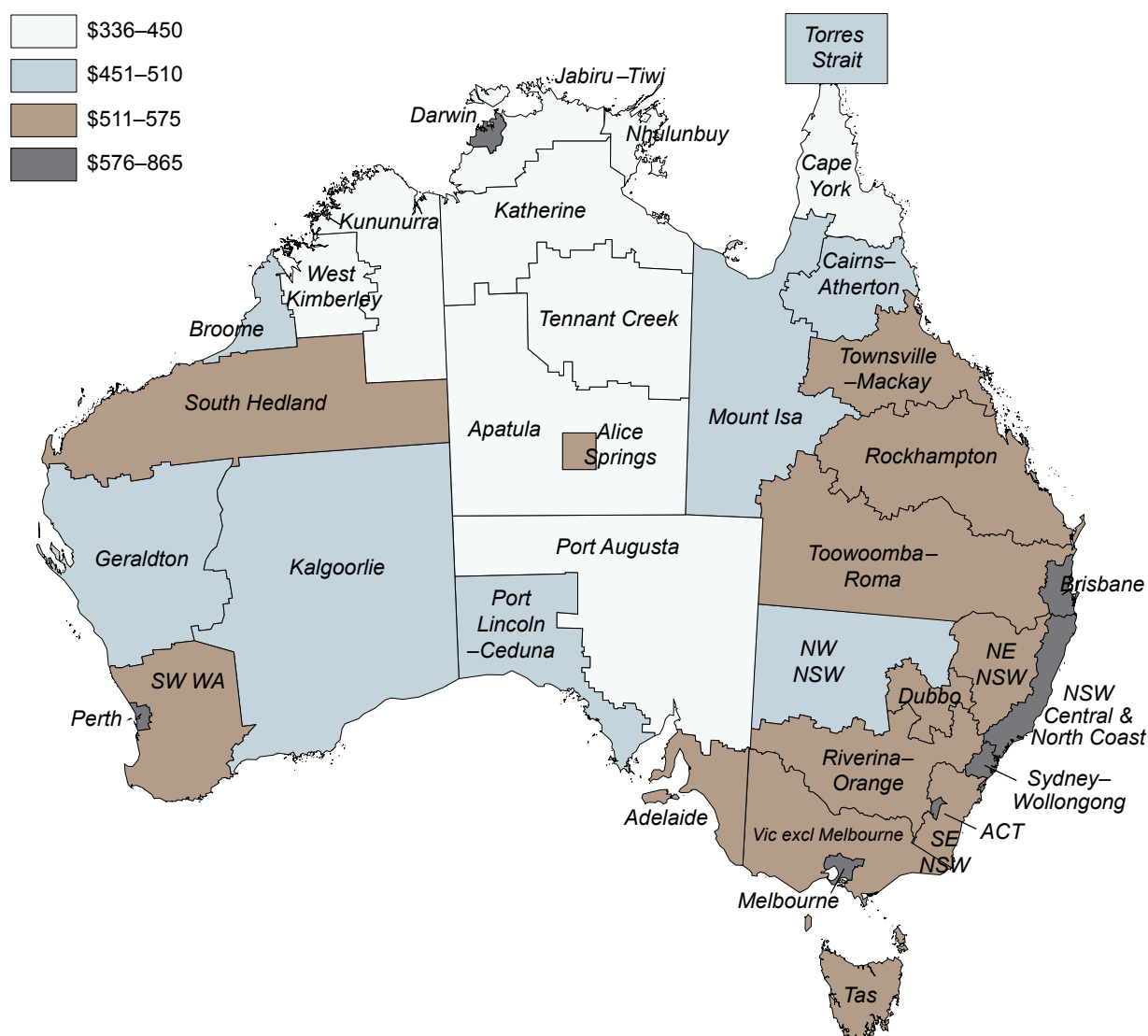
Income type	Year	Mean	Major cities (\$)	Inner regional (\$)	Outer regional (\$)	Remote (\$)	Very remote (\$)	Australia (total) (\$)	
Equivalised household income	2016	Mean	738	638	622	632	467	655	
		10%	273	258	243	214	196	246	
		20%	374	348	325	290	259	333	
		50%	647	557	525	493	389	557	
		80%	1040	884	870	921	613	924	
		90%	1310	1108	1110	1226	824	1184	
	2011	Mean	688	596	579	610	457	607	
		10%	253	245	222	207	178	226	
		20%	338	316	299	288	257	305	
		50%	591	516	493	486	401	512	
		80%	983	836	820	879	606	866	
		90%	1237	1058	1047	1174	774	1108	
	2006	Mean	597	516	510	509	402	523	
		10%	239	229	214	199	198	217	
		20%	309	293	290	273	263	290	
		50%	519	445	437	418	359	437	
		80%	835	709	703	706	503	727	
		90%	1071	887	887	925	631	927	
	Personal income	2016	Mean	613	545	541	555	432	558
			10%	0	0	0	0	14	0
			20%	175	174	179	166	165	173
50%			499	450	434	396	292	437	
80%			955	834	833	872	622	866	
90%			1254	1098	1114	1224	937	1164	
2011		Mean	590	521	518	551	423	533	
		10%	–	3	–	4	13	3	
		20%	190	179	192	197	143	177	
		50%	461	412	401	380	304	400	
		80%	927	803	803	850	620	828	
		90%	1204	1056	1059	1195	882	1105	
2006		Mean	526	461	456	457	350	462	
		10%	12	15	15	31	27	15	
		20%	201	195	203	212	207	203	
		50%	430	362	354	320	285	341	
		80%	809	702	691	670	461	703	
		90%	1065	915	903	935	651	942	

Notes: Personal incomes are only reported for those aged 15 or older. 10%, 20%, 50%, 80% and 90% indicate the incomes at those points on the income distribution. All incomes are expressed in 2016 dollars, adjusted using the consumer price index.

that of the top 20% in inner regional and outer regional areas. Although this cohort is not visible when median incomes are examined alone, this suggests that there are opportunities for substantial incomes and income growth for a not insignificant minority of Indigenous people living in remote (but not very remote) areas.

These trends can be examined with more geographic specificity when households are aggregated to the regional level rather than the remoteness classification (Fig. 8). The Australian Capital Territory (ACT) has the highest median equivalised household income for Indigenous people at \$862 per week, with Darwin

FIG. 8. Median disposable weekly equivalised household income, by Indigenous region, for the Indigenous population, 2016



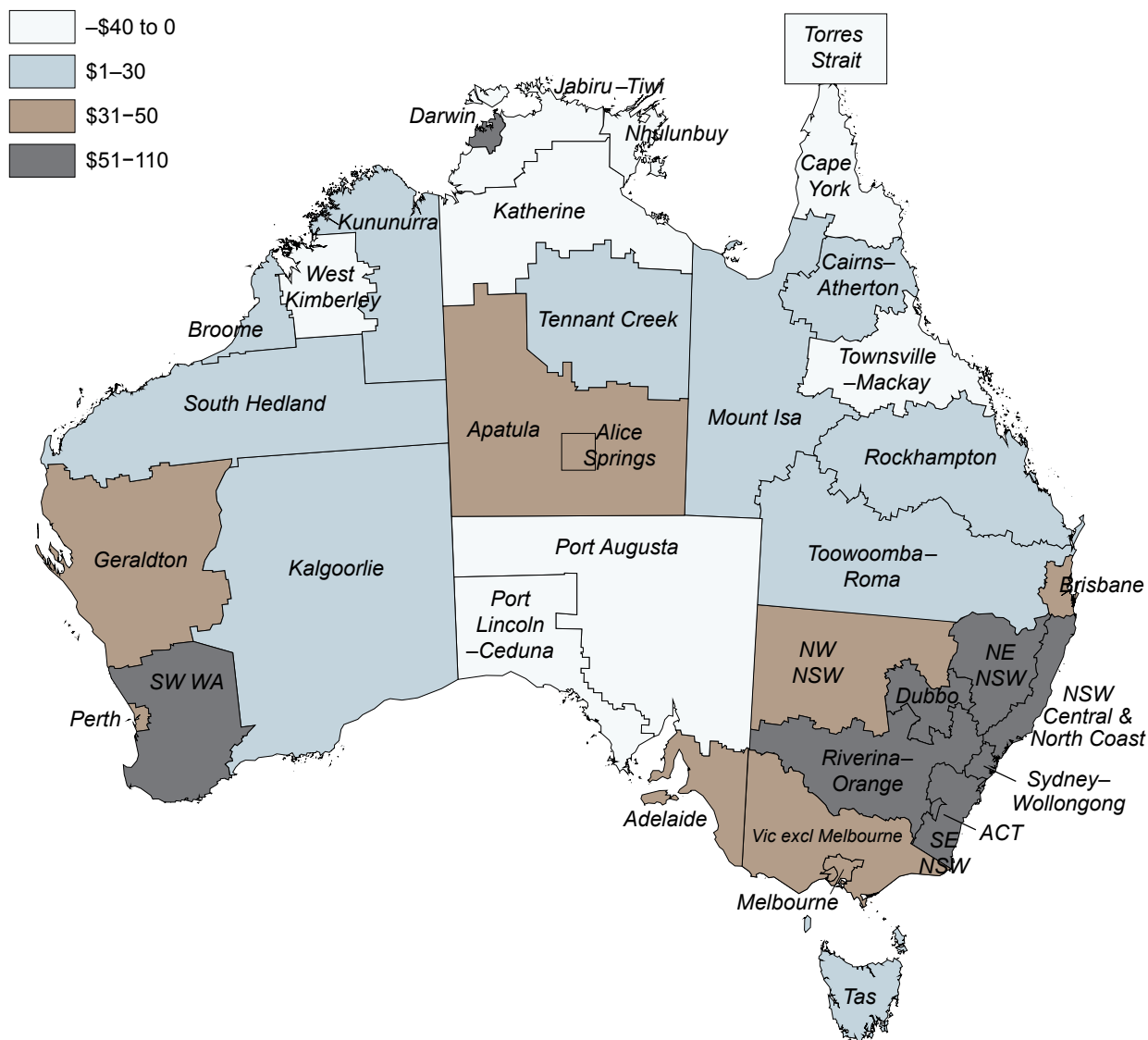
(\$782), Sydney-Wollongong (\$689), Melbourne (\$685) and Brisbane (\$635) having the next highest incomes. The poorest regions are in the Northern Territory and Western Australia, with low median incomes reported in Jabiru-Tiwi (\$337), Nhulunbuy (\$350), Apatula (\$373), Katherine (\$379) and West Kimberley (\$388).

Although these extremes in regional incomes largely follow the remoteness gradient, some regions are exceptions to the general pattern of Indigenous incomes declining as remoteness increases. Among Indigenous regions that are predominantly in very remote parts of the country, South Hedland is exceptional. The median disposable equivalised household income for Indigenous residents of South Hedland was \$618 per week, compared with the median in very remote Australia of \$389 per week. Indeed, despite its remoteness and because of mining industry engagement, the median income of Indigenous people in South Hedland is the

sixth highest of the 37 regions in the country. At the other end of the remoteness spectrum, the median disposable equivalised household income of Indigenous people in Adelaide was relatively low, just \$543 per week, compared with the median of \$647 per week across all major cities.

Changes in regional median incomes are less clearly patterned by remoteness (see Fig. 9). The largest increases in median incomes were concentrated in New South Wales and major cities, with the largest increases occurring in the regions of Darwin (\$108), Sydney-Wollongong (\$82), NSW Central and North Coast (\$63), South-Eastern NSW (\$61) and Dubbo (\$59). Falls in median income mostly occurred in parts of remote and very remote Northern Territory and Queensland, and were largest in Nhulunbuy (-\$39), Jabiru-Tiwi (-\$39), Townsville-Mackay (-\$32), Cape York (-\$17) and Katherine (-\$16).

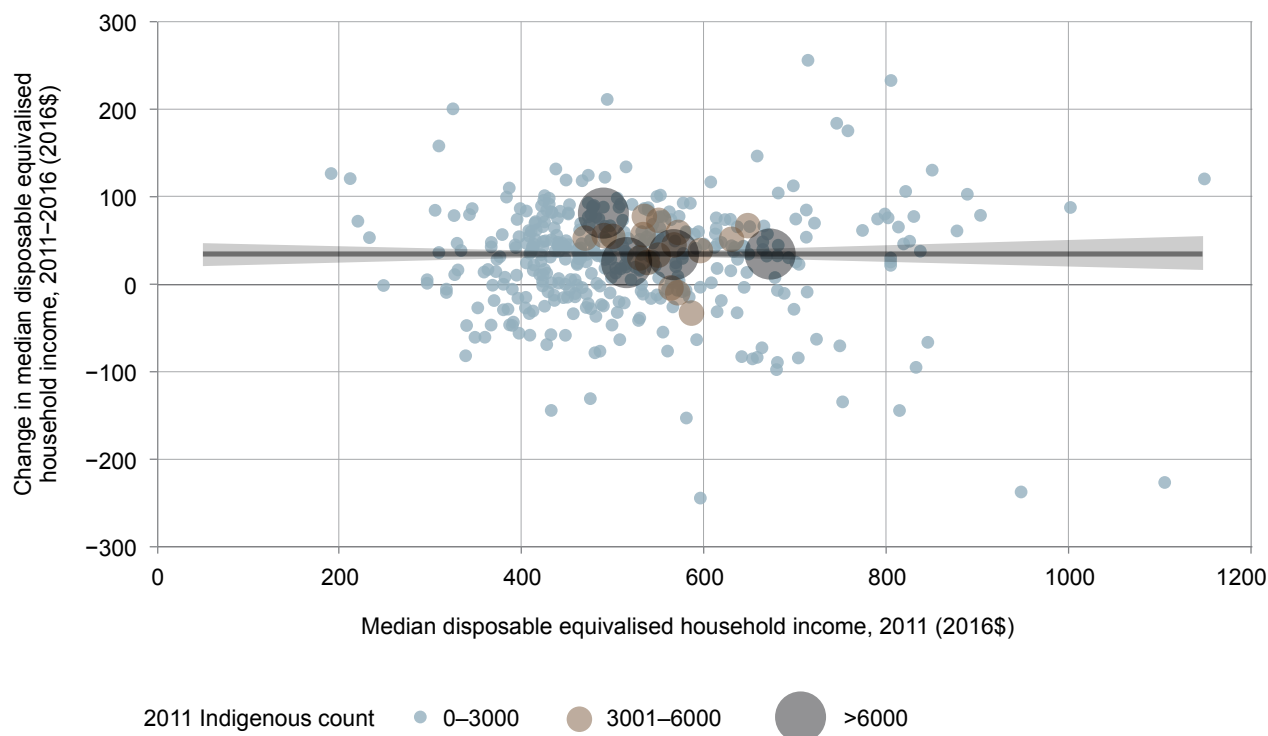
FIG. 9. Change in median disposable weekly equivalised household income, adjusted for inflation, for the Indigenous population, by Indigenous region, 2011–16



It is not immediately clear from income data alone what is driving these regional differences in income change. However, several commentators have identified that the transition from the Community Development Employment Projects (CDEP) to the Community Development Programme in remote areas may have reduced the incomes of those reliant on the social security system in remote parts of the country (Jordan 2016, Altman 2017). Other factors that may have contributed to growing regional divergences in incomes include regional differences in changes to labour market demand, changes in the propensity of people to identify as Indigenous, particularly in relatively prosperous regions in New South Wales and Queensland (Markham & Biddle 2017), and possibly selective out-migration from remote areas by those with higher levels of education (although evidence from 2006 suggests that this may not be the case; see Biddle 2010). The trends in income when

aggregated by broad remoteness area are indicative of a ‘great divergence’, in which high-income residents of cities are becoming relatively better off while the incomes of low-income residents of remote and in particular very remote regions fall or stagnate. However, when examined using a more disaggregated geography (i.e. at the regional level), the picture becomes more complex, with regional disparities in income trends apparent within remoteness categories. Further, when analysed at the subregional level, there is no apparent relationship between median income in 2011 and income growth to 2016. As Fig. 10 shows, for Indigenous areas, there is no discernible relationship between 2011 median income and growth in median income between 2011 and 2016. In other words, when geographically disaggregated into 404 Indigenous areas, incomes in 2011 did not predict income growth over the subsequent five years.

FIG. 10. Relationship between median disposable equivalised household, adjusted for inflation, for Indigenous areas in 2011 and the change in income between 2011 and 2016, Indigenous population only



Note: The relationships are consistent when change in incomes is measured in terms of percentage change rather than absolute dollars.

Poverty

Even though changes in income on average or at different points on the distribution are a useful measure of economic prosperity, the calculation of poverty rates provides an alternative lens through which to view the same data. Whereas the previous analysis has focused on changes to Indigenous income across the income spectrum, here we focus specifically on poverty, defined in terms of low incomes. 'Poverty' of course is a multivalent term, whose meanings may encompass material need, economic circumstances or social relationships (Hunter 2012). Here we adopt a purely income-focused approach to poverty, as is conventional in the literature. However, it is important to note that this definition of poverty may not accord neatly with that used by Indigenous people themselves. For example, in her analysis of 60 semistructured interviews with Aboriginal people residing in western Sydney, New South Wales, and Shepparton, Victoria, Lahn (2012:299,302) found that 'to be poor in Aboriginal terms is to have no familial networks to call upon, especially when in need of food or shelter ... [and that] Aboriginal family networks constitute a critical resource that assist people in guaranteeing basic material needs'. Furthermore, survey analysis has established that the absence of cash poverty in

Aboriginal and Torres Strait Islander households does not imply the absence of disadvantage, with Hunter (1999) pointing out that overcrowding and incarceration were both at high levels for Indigenous people living above the poverty line.

Poverty rates for Indigenous Australians have been regularly estimated for several decades after the Henderson Poverty Inquiry of 1975 (e.g. Ross & Mikalaukus 1996, Altman & Hunter 1997, Hunter 2012). These studies have tended to take national definitions of poverty – in particular, the location of the 'poverty line', the income threshold below which poverty is defined – and apply them to the Indigenous population. Four main issues have been identified in the estimation of Indigenous poverty using this type of approach. First, Indigenous (and indeed non-Indigenous) incomes may be supplemented by noncash incomes (Altman 2007) – consequently, the term poverty in this paper is taken to mean 'cash poverty' rather than income or 'livelihood' poverty. Second, there are distinctive differences in family size and resource sharing within Indigenous households that may make standard adjustments for household size such as the modified OECD equivalence scale inaccurate (Hunter et al. 2004). Third, national poverty rates do not account for spatial variation in the cost of

basic necessities such as housing and food (Altman & Hunter 1997), which may influence Indigenous poverty rates given that Indigenous people are more likely to live in remote parts of Australia (Markham & Biddle 2017). Finally, there remains a question about the degree to which economic indicators such as income and poverty should be applied to some Indigenous Australians who may place a lower priority on material circumstances alone (Altman 2000) and for whom income has a more contingent association with wellbeing (Biddle 2015). Such an observation does not imply that poverty is a choice for Indigenous Australians, however. Rather, it is reflection of how the historical and ongoing consequences of colonialism have circumscribed the access of Indigenous people to economic, social and political resources (Walter 2007).

Notwithstanding these caveats, poverty estimates remain a key policy-relevant metric for understanding the prevalence of Indigenous households living in conditions of material deprivation (Walter 2007). Although technical issues regarding equivalence scales and spatial variations in consumption costs should be considered when interpreting poverty rates (Hunter 2012), especially when comparing Indigenous poverty rates with non-Indigenous poverty rates, such issues become less confounding when comparing trends in consistently measured poverty rates in the same location over time. Furthermore, census-based indicators of poverty remain the only consistent measures available that can be tracked over time and disaggregated to local levels of geography across Australia.

Here we estimate poverty rates for Indigenous individuals, based on the disposable equivalised household income of the household in which they live. The modified OECD equivalence scale employed in recent censuses is adopted. We employ the conventional relative poverty line of 50% of the median national equivalised household income, meaning that the Indigenous poverty rate is a measure of the economic situation of Indigenous Australians relative to the entire population of the country. The adoption of this conventional definition is helpful in allowing comparison with other estimates of Indigenous poverty. On this measure, the poverty line was \$404 per week in 2016, \$389 per week in 2011 and \$344 per week in 2006 (all measured in 2016 dollars), a growth that reflects the increase in median household incomes nationally. A weekly disposable equivalised household

income poverty line of \$404 per week in 2016 is similar to the Henderson Poverty Line for the same period (\$417 per week for single persons, remembering that the modified OECD equivalisation scale expresses incomes in terms of the income of a single person living alone).

Poverty rates among the Indigenous population are displayed in Fig. 11, disaggregated by remoteness and census year. Fig. 11 shows that Indigenous poverty rates in Australia have declined slowly over the past decade, falling from 33.9% in 2006 to 32.7% in 2011 and 31.4% in 2016. However, changes in the poverty rate have been greater in some areas than others. While Indigenous poverty rates declined most over the past decade in major cities and inner regional areas (down 3.4% in both areas), poverty rates effectively stagnated in outer regional areas (down 0.4%), and rose in remote and very remote areas (up 1.2% and 7.6%, respectively).

The increased prevalence of remote Indigenous poverty is very concerning. It concurs with the pattern described in Table 5 of stagnating or falling incomes in very remote areas in the context of rising national median incomes. Finally, it is important to note the clear remoteness gradient in Indigenous poverty rates, which increase substantially as remoteness increases, ranging from 24.4% in major cities in 2016 to 53.4% in very remote areas. Clearly, Indigenous poverty exhibits a great of spatial variation in terms of its prevalence and trends.

Although poverty rates give an indication of the prevalence of poverty, they shed little light on its intensity. This is unfortunate because an income that is 10% below the poverty line is qualitatively different from one that is 50% below the poverty line. The 'poverty gap', or mean income of those below the poverty line as a percentage of the poverty line, is often used to measure the intensity of poverty (Hunter et al. 2004). Fig. 12 shows differences in the poverty gap by remoteness and census year. It is notable that the intensity of poverty increased between 2006 and 2011 in all remoteness areas, but decreased from 2011 to 2016. Also of note is that poverty gaps are relatively consistent across the country, ranging in 2016 from 68.0% in inner regional areas to 65.0% in remote areas. It is likely that variation in the ability of those in poverty to fulfil their basic needs will be determined more by geographic differences in prices of items such as housing than by spatial variation in the incomes of those living in poverty.

FIG. 11. Indigenous poverty rates, by remoteness, using the ‘50% of median disposable equivalised household income’ poverty line, 2006, 2011 and 2016

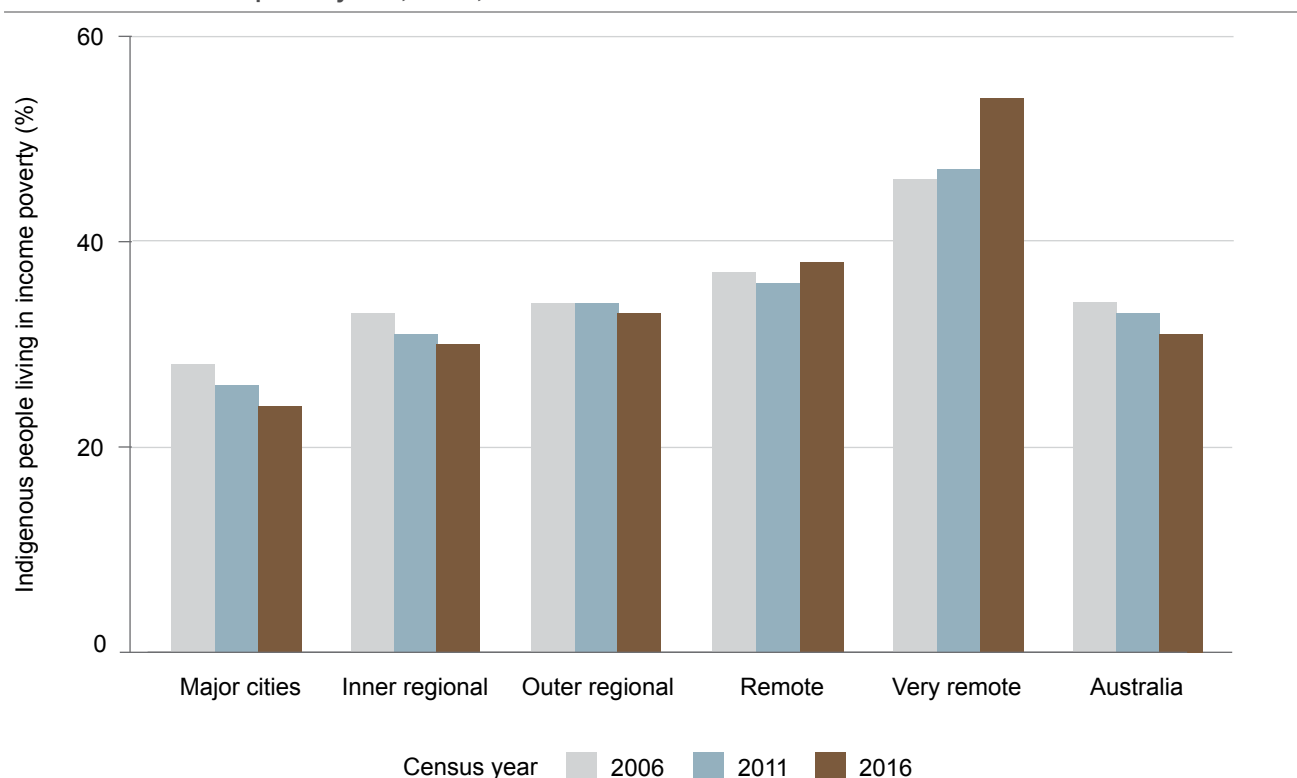


FIG. 12. Poverty gaps for Indigenous poverty, by remoteness, using the ‘50% of median disposable equivalised household income’ poverty line, 2006, 2011 and 2016



Note: Poverty gaps were defined as the ratios of the mean incomes of those living below the poverty line to the poverty line.

It is evident from Fig. 13 that poverty is even more spatially concentrated when poverty rates are examined at the regional level. As the figure shows, Indigenous poverty rates were highest in regions in very remote parts of the country, at 69.3% in Nhulunbuy, 67.7% in Jabiru–Tiwi, 60.8% in Apatula, 57.4% in Katherine and 55.3% in West Kimberley. Indigenous poverty rates were lowest in highly urbanised regions, especially the ACT (18.9%),

Melbourne (21.3%), Darwin (22.4%), Sydney–Wollongong (22.7%) and Brisbane (22.7%). More evidence of regional divergence emerges when investigating change in poverty rates between 2011 and 2016 (Fig. 14). Poverty rates increased dramatically in several remote regions, especially in the Northern Territory and the Kimberley, while the largest declines in poverty rates occurred in regional New South Wales.

FIG. 13. Indigenous poverty rates by Indigenous region, measured in terms of disposable equivalised household income, 2016

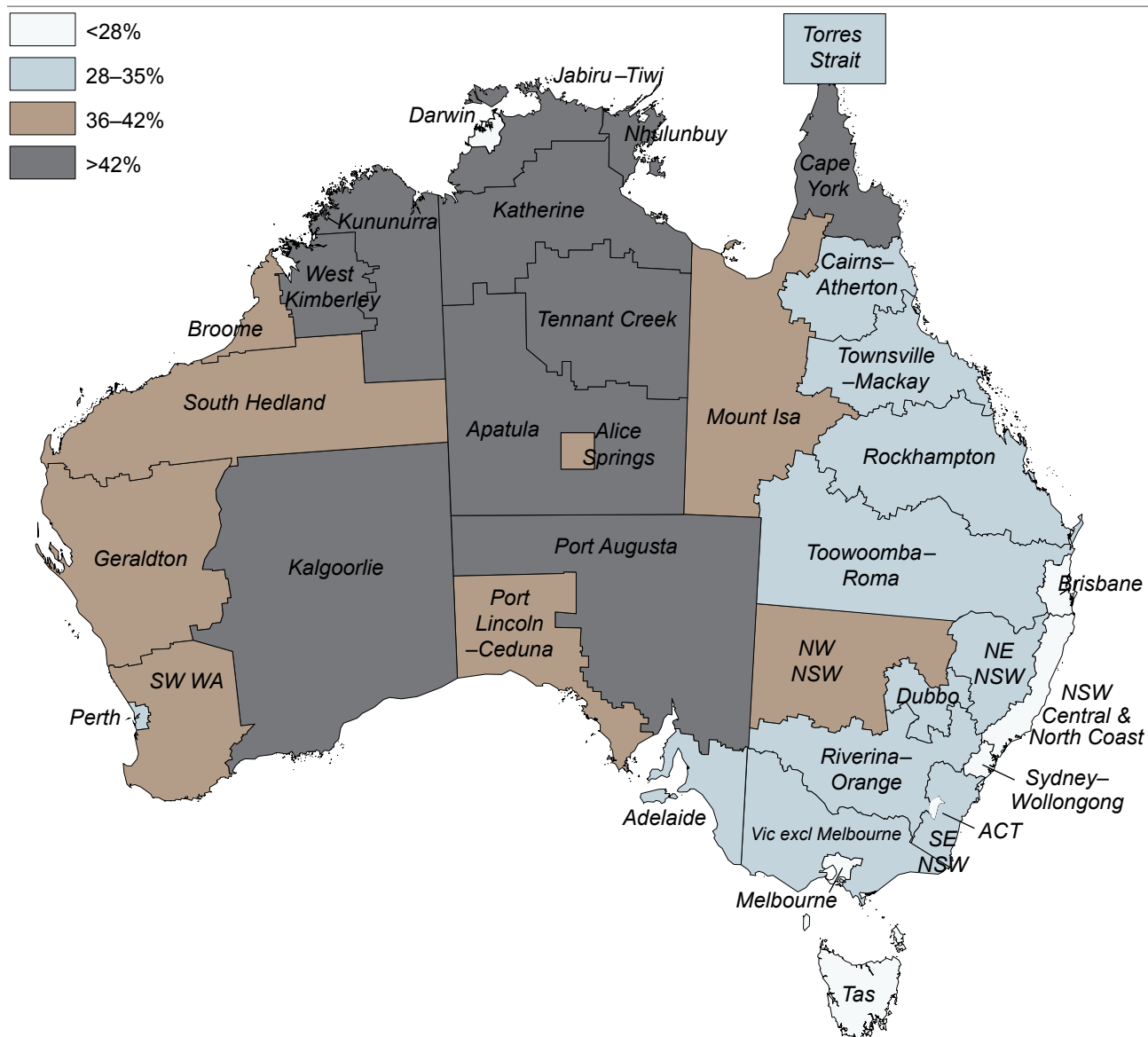
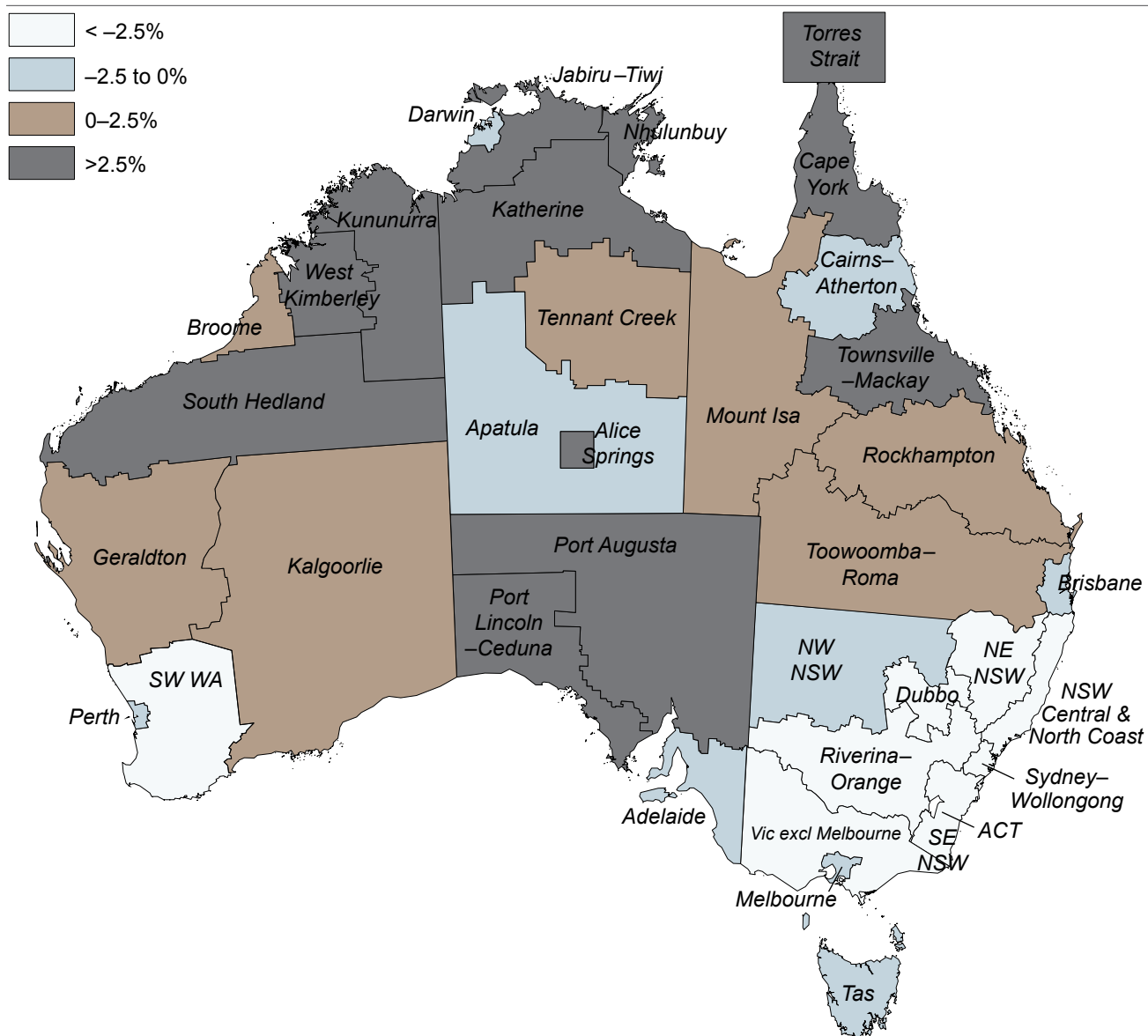


FIG. 14. Change in Indigenous poverty rates, by Indigenous region, 2011–16



Income inequality

In recent years, income inequality has re-emerged as an important global public policy issue. Several reasons for this concern may be identified. First, income inequality leads to a range of negative social outcomes. A wide variety of social outcomes – including life expectancy and physical health, educational performance, incarceration, social cohesion, and mental health and wellbeing – are negatively correlated with income inequality (Wilkinson & Pickett 2009), with the weight of evidence suggesting that the relationship is causal (Dabla-Norris et al. 2015, Pickett & Wilkinson 2015). Second, social mobility, equality of opportunity and other related measures of social justice also decline in the presence of increased income inequality (Reeves 2017). Third, recent research has shown that income inequality has generally trended upwards within advanced economies since the 1980s, both internationally (Piketty 2014) and within Australia (Atkinson & Leigh 2007, Wilkins 2014). Indeed, income inequality in Australia has continued to increase somewhat over the past decade, although the nature of that increase depends on the data series used (Burkhauser et al. 2016).

This section of the paper presents data analysis on income inequality as it relates to the Indigenous population of Australia. It approaches the intersection of income inequality and Indigenous status from three distinct perspectives. First, it examines the inequality between Indigenous and non-Indigenous incomes, and looks to see how these inequalities have changed over time and in different parts of the country. Second, it compares income inequality within the Indigenous and non-Indigenous populations. Third, the differences in incomes between Indigenous and non-Indigenous people are placed in the context of overall income inequality in the total Australian population, to understand the contribution that Indigenous/non-Indigenous differences make to national inequality statistics.

Income inequality between Indigenous and non-Indigenous Australians

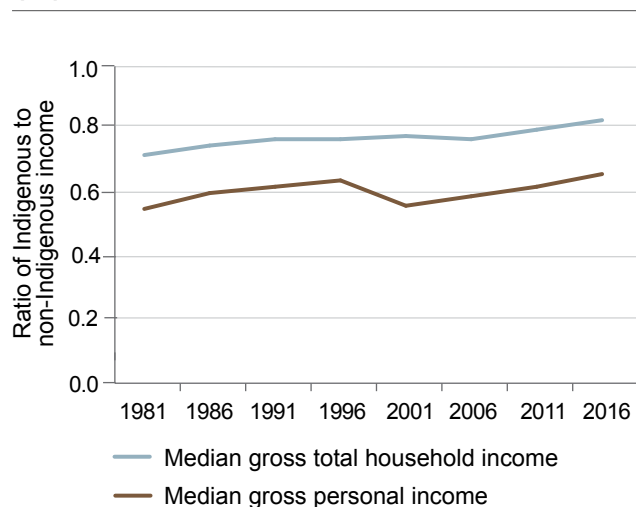
Differences in the incomes of Indigenous and non-Indigenous Australians have been the subject of much scholarship (e.g. Altman and Biddle 2014, Biddle 2013a). Such research has found that not only are Indigenous incomes lower than those of non-Indigenous Australians but that, with the exception of Indigenous females with a university degree, 'for almost every demographic, geographic, education and employment combination, Indigenous Australians have a lower average income than their non-Indigenous counterparts' (Biddle 2013a:14).

Nevertheless, such research has shown a gradual convergence of Indigenous and non-Indigenous incomes, although this process will take many decades to reach parity at the current rates of change.

The 2016 Census data continue this trend of gradually closing income gaps. Fig. 15 shows the ratio of the median incomes of the Indigenous and non-Indigenous populations over 35 years. In this figure, a value of 1.0 would mean perfect equality of median incomes, and a value of 0.5 would mean that the median income of Indigenous Australians was half the median income of non-Indigenous Australians. The latest census data show the median gross personal income ratio rising to 0.66 in 2016 from 0.62 in 2011. This is the highest income ratio since the census began collecting reliable income data in 1981, eclipsing the previous peak of 0.64 in 1996. Nevertheless, the gap between Indigenous and non-Indigenous personal incomes is closing only gradually. If the 2011–16 rate of convergence were to continue, Indigenous median personal incomes would equal those of the non-Indigenous population in approximately 2060. This observation should not be understood as a prediction, but is rather an indication of the relatively slow progress that was made between 2011 and 2016 towards equalising Indigenous and non-Indigenous incomes.

The ratios of Indigenous to non-Indigenous total gross household incomes show similar trends, increasing to the highest recorded ratio of 0.83. However, caution needs to be used when analysing the difference between the total (unequalised) household incomes of Indigenous and non-Indigenous Australians. 'Indigenous households', defined here as those households with at least one Indigenous person in residence, tend to be larger (with a mean of 3.2 residents in 2016) than other households (with a mean of 2.6 residents). This means that, on average, Indigenous households need a larger income than non-Indigenous households to enjoy the same standard of living. Despite this limitation, total household income is a useful measure for considering change over time, since it can be calculated for every census since 1981. Together, the trends in personal and total household income median ratios in Fig. 15 indicate large and enduring differences in median incomes, differences that are gradually decreasing in magnitude.

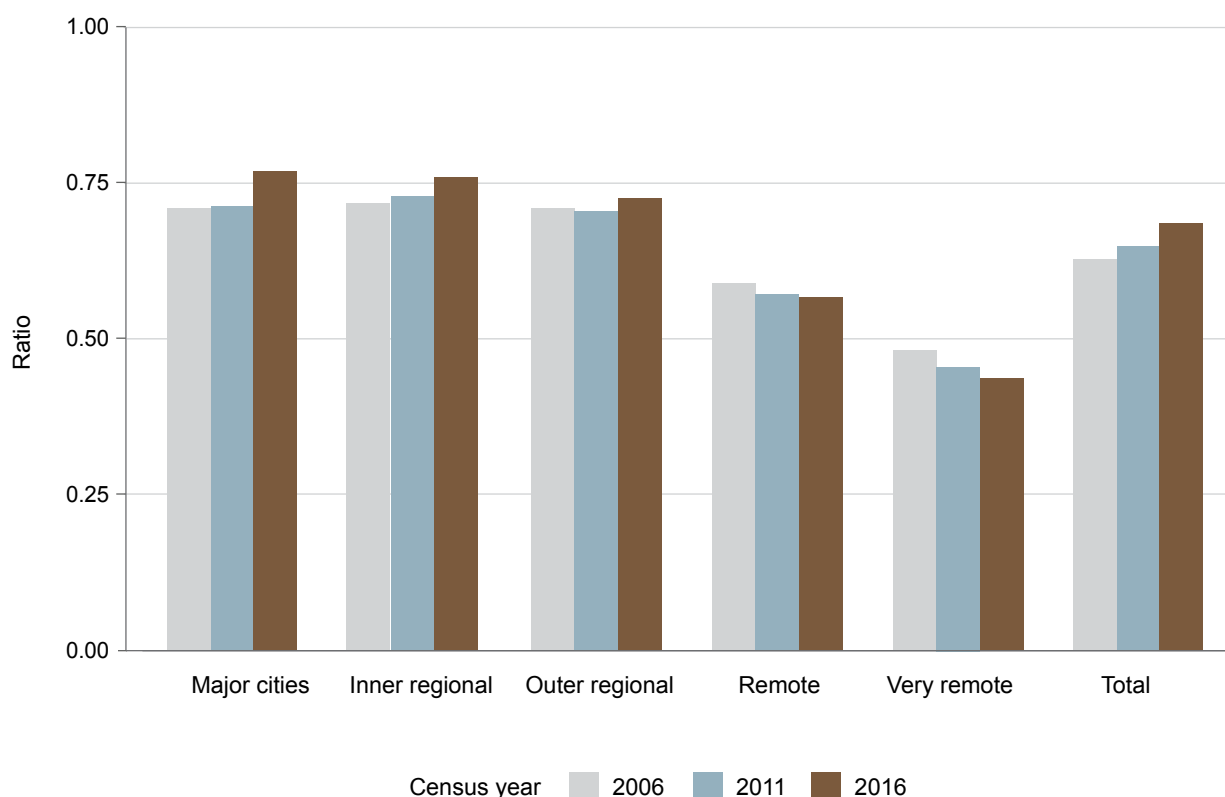
FIG. 15. Ratio of median gross income in the Indigenous population to the non-Indigenous population



Sources: 1981–2001 from Altman et al. (2009); 2006–2016 from the Census of Population and Housing (2006, 2011, 2016)

Using the synthesised census and HILDA data, we can investigate the trends in median ratio for Indigenous and non-Indigenous incomes since 2006 with more geographic specificity. Fig. 16, which examines the ratios of median disposable equivalised household incomes of the Indigenous population to those of the non-Indigenous population, shows a similar pattern of slow convergence at the national level, with ratios rising from 0.63 in 2006 and 0.65 in 2011 before reaching 0.69 in 2016. This national picture of converging Indigenous and non-Indigenous median incomes obscures variation at different levels of the remoteness structure. First, the ratio of Indigenous to non-Indigenous median incomes is highest in major cities and inner regional areas (0.77 in 2016), while it is lower in outer regional areas (0.73) and much lower in remote (0.57) and very remote (0.44) areas. Furthermore, although the ratio of median incomes is increasing in urban and regional areas, Indigenous median incomes are decreasing relative to non-Indigenous median incomes in remote and especially very remote areas.

FIG. 16. Ratio of median disposable equivalised household incomes of the Indigenous population to the non-Indigenous population, by remoteness, 2016

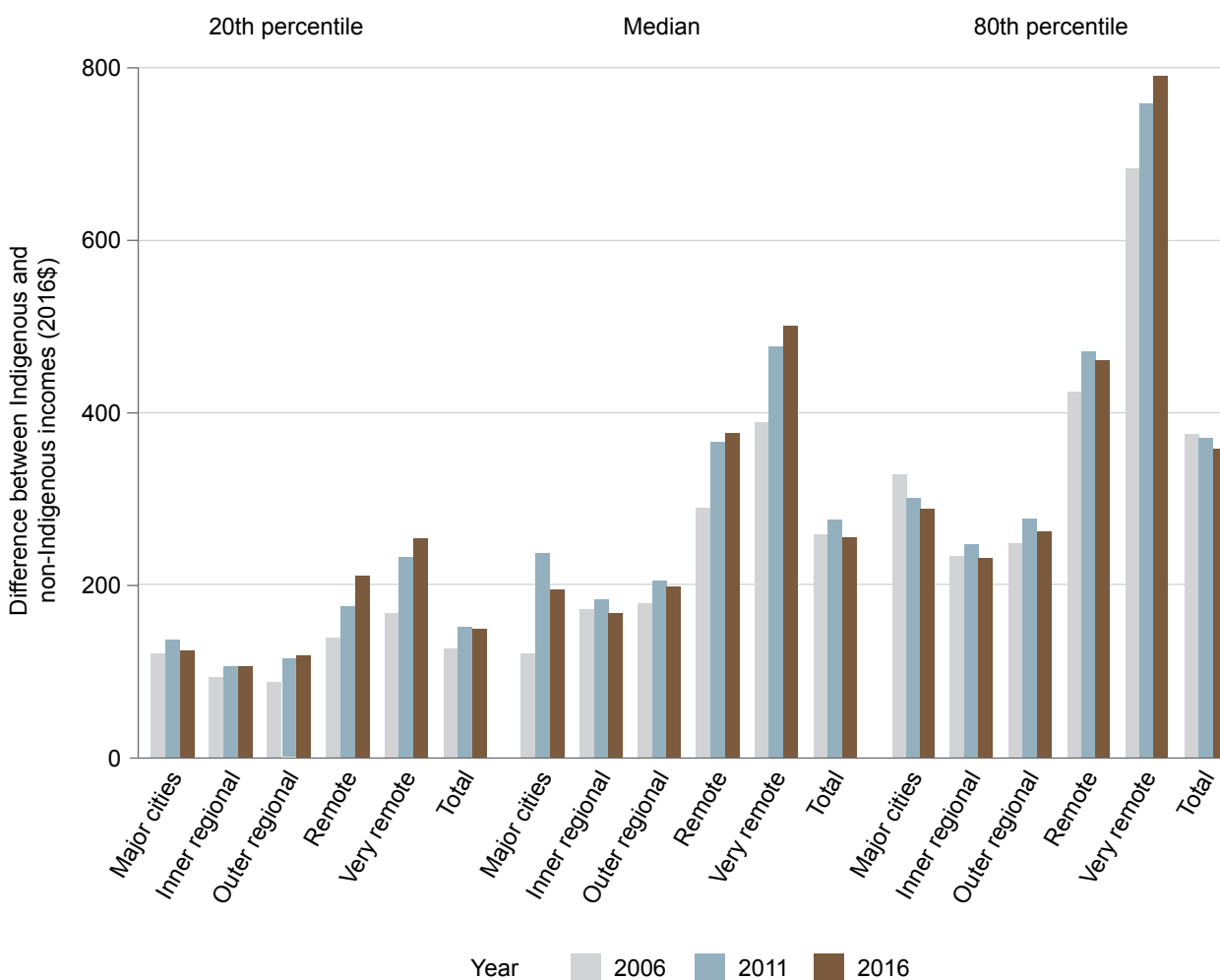


Corresponding results are found across the income distribution, and are especially clear when the difference between Indigenous and non-Indigenous incomes is viewed in absolute rather than relative terms. Fig. 17 compares Indigenous and non-Indigenous disposable equivalised household weekly incomes at the 20th, 50th (median) and 80th percentiles in terms of the absolute difference in weekly income. Differences between Indigenous and non-Indigenous incomes are greatest at the 80th percentile, where, when averaged nationally, the median Indigenous income is \$358 per week less than the median non-Indigenous income. The national average gap between Indigenous and non-Indigenous incomes has decreased at the 80th percentile, down from \$378 in 2006 and \$371 in 2011. At the median, the gap between Indigenous and non-Indigenous incomes is smaller and has declined slightly over the past decade, falling from \$260 in 2006 to \$256 in 2016. At the 20th percentile, however,

gaps between Indigenous and non-Indigenous incomes are widening, rising from \$127 in 2006 to \$150 in 2016.

When examined across the remoteness spectrum, several key features are clear. First, the gap between Indigenous and non-Indigenous incomes is largest in very remote areas. The income gap in very remote areas is high across the income distribution; at the 80th percentile, non-Indigenous people received \$791 per week more than Indigenous people in 2016, growing substantially from \$683 in 2006. Second, although income gaps closed at the 80th percentile in all areas between 2011 and 2016, at the 20th percentile, income gaps only closed in major cities between 2011 and 2016. At the median, income gaps widened in remote and very remote areas between 2011 and 2016, but narrowed in urban and regional areas.

FIG. 17. Difference between Indigenous and non-Indigenous weekly disposable equivalised household incomes, adjusted for inflation, by remoteness, at three points in the income distribution, 2006, 2011 and 2016



In short, the trends documented in Fig. 17 show income gaps narrowing in urban areas but widening in remoter areas, and narrowing at the top end of the income distribution but widening at the bottom end of the distribution. The growing differences between Indigenous and non-Indigenous incomes in remote areas correspond with the growing regional divergences between urban and remote areas within the Indigenous population described earlier in this paper. Clearly, the growing regional divergences within the Indigenous population differ in several important ways from the income trajectories of the non-Indigenous population.

These data allow us to tentatively address the question of whether the income stagnation among the lowest-income 20% of the Indigenous population is similar or different to that of the lowest-income 20% of the non-Indigenous population. When aggregated nationally, the absolute difference in incomes between low-income Indigenous and non-Indigenous people has remained constant between 2011 and 2016. This might suggest that income dynamics are constant between the low-income Indigenous and non-Indigenous populations. However, the magnitude of that gap (around \$150 dollars per week) is very significant, given that mean income for the lowest-income 20% of the Indigenous population was just \$213 per week in 2016 (see Fig. 6). This considerable difference in magnitude of incomes of the lowest-income 20% of the Indigenous and non-Indigenous populations suggests that these populations are receiving incomes from different sources. It is likely that some factors that contribute to income stagnation among the lowest-income 20% of the Indigenous population are shared with those of the lowest-income 20% of the non-Indigenous population, while other contributors are distinctive to the social circumstances of Indigenous Australians

At the regional level, a more complex picture emerges. As Fig. 18 shows, the relative gap in median incomes between Indigenous and non-Indigenous populations is greatest in very remote regions of the Northern Territory and the Kimberley, specifically Nhulunbuy (median income ratio of 0.29), Jabiru–Tiwi (0.32), Kununurra (0.35), West Kimberley (0.36) and Apatula (0.37). The median incomes of Indigenous people are closest to those of non-Indigenous people in Melbourne (0.83), Tasmania (0.81), NSW Central and North Coast (0.80), the ACT (0.80) and Sydney–Wollongong (0.78). Although Fig. 16 and Fig. 17 show that income gaps are widening in very remote areas, a regional analysis shows that this trend is not uniform within very remote areas. In particular, Fig. 19 shows that the income gaps in Apatula, South Hedland, Kalgoorlie and Tennant Creek are all closing. Income gaps are also closing relatively quickly in some regions where income gaps are already relatively small. For example, the median income ratio in Sydney–Wollongong increased by 0.07 between 2011 and 2016. If this rate of convergence continued, median incomes in this region would reach parity by 2032, followed by the ACT and Melbourne in 2034. In summary, the income gaps between Indigenous and non-Indigenous Australians are extremely uneven in magnitude across the country. While income gaps in some regions are steadily widening, others are closing relatively rapidly, providing more evidence of diverging regional trajectories.

FIG. 18. Ratio of median disposable equivalised household income of Indigenous people to that of non-Indigenous people, by Indigenous region, 2016

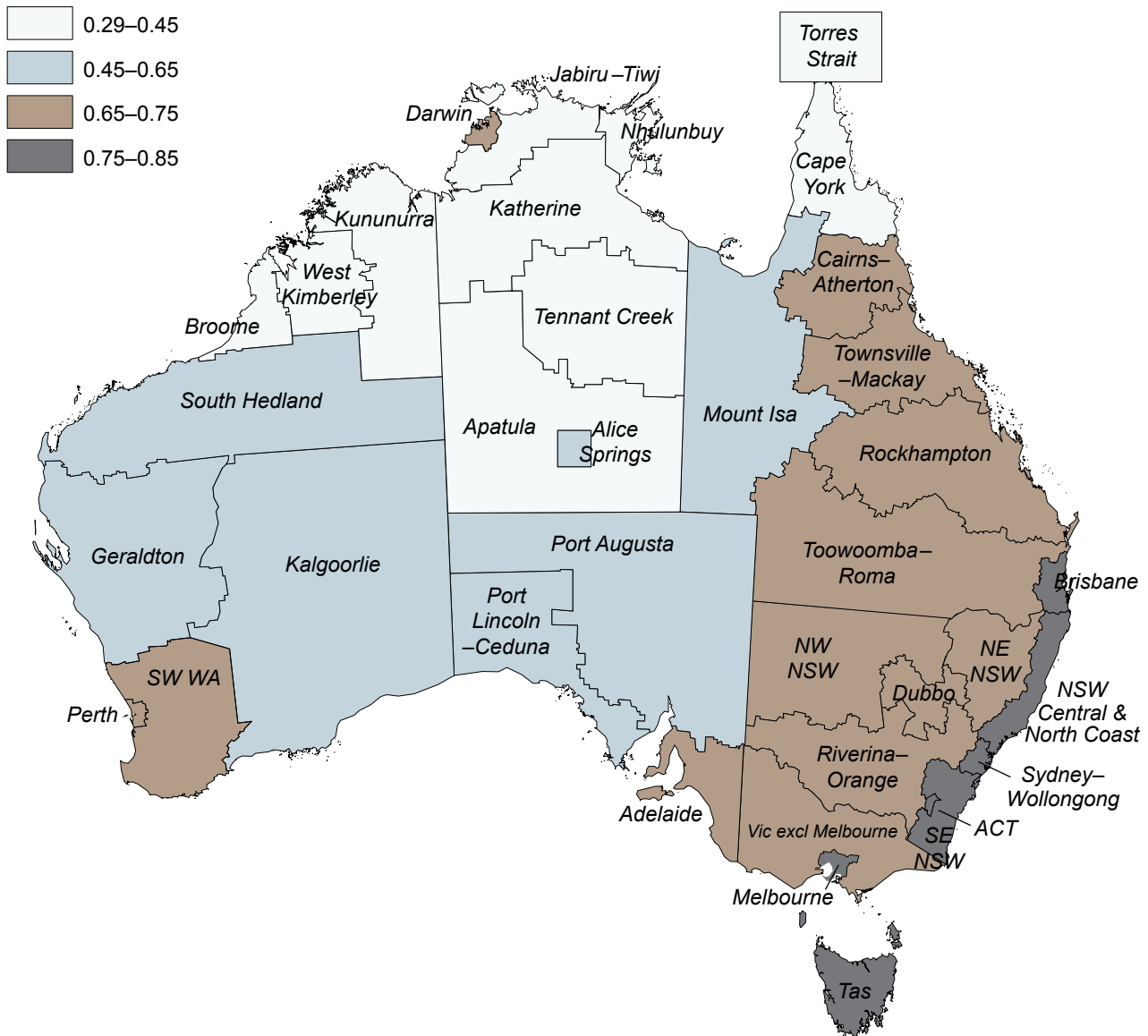
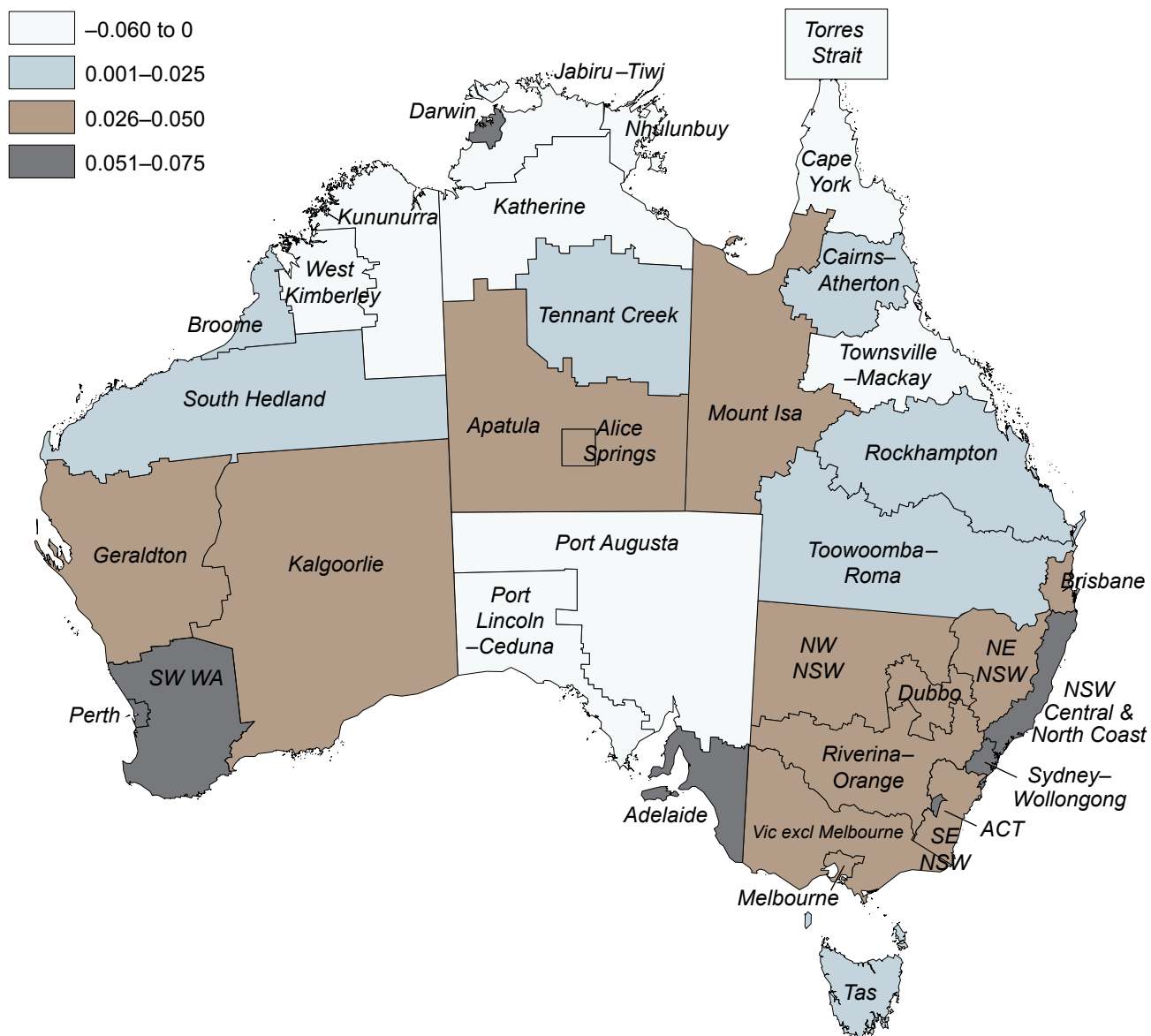


FIG. 19. Change in ratio of median disposable equivalised household income of Indigenous people to that of non-Indigenous people, by Indigenous region, 2011–16



Income inequality within the Indigenous and non-Indigenous populations

The previous section focused on income inequalities between the Indigenous and non-Indigenous populations. This section compares income inequalities within these groups. Rather than measuring inequalities at selected points of the income distribution, this section estimates the Theil index (T) to measure inequalities across the entire distribution simultaneously. The Theil index measures the distance between perfect equality, in which every person has the same income, and perfect inequality, where all income is received by a single person. Perfect equality would be indicated by a Theil index of 0.0, with higher numbers indicating greater inequality, and the Theil index for perfect inequality equal to the natural logarithm of the population. Although the maximum value for the Theil index depends on the population size, two populations of different sizes will have the same Theil index if the distribution of income throughout the population is the same in relative terms.

Although the units of Theil's index can be difficult to interpret, it has several advantages for measuring income inequality over other measures used in the literature (Bourguignon 1979, Shorrocks 2013). First, it is a relative measure of inequality (or income homogeneity), meaning that richer areas are not considered more unequal unless the distribution of income within them is more unequal. Second, as mentioned, the Theil index between areas with different populations can be meaningfully compared. Third, the Theil index can be additively decomposed by region or population subgroup. This means that total income inequality in a country can be partitioned into several divisions by demography and/or geography that together sum to the countrywide total.

Following Biddle and Montaigne (2017), we take advantage of the decomposability of the Theil index to deal with the grouped nature of census income data. Specifically, we used HILDA data to estimate income inequality within each census income bracket, rather than if there is no inequality within income brackets. We then estimate inequality between income brackets. A series of models are built that further decompose income inequality by Indigenous status and region. Although we do not present the equations used to calculate the Theil index for reasons of brevity, our multilevel decomposition adopts the methods described by Akita (2003). Because the Theil index requires the calculation of logarithms, all those who report nil or negative incomes are assigned an income of one dollar.

Table 6 presents estimates of inequality in disposable equivalised household incomes within the Indigenous, non-Indigenous and total populations in 2006, 2011 and 2016. Income inequality is greater in the Indigenous population than in the non-Indigenous population at all three censuses. This is the first time this has been demonstrated consistently at the national level (as far as the authors are aware). It is important to remember that this estimate measures cash income only. It does not measure inequality of wealth. Nor does it consider income sharing and reciprocity that operate within the Indigenous population (and, to a lesser degree, the non-Indigenous population) after income is received (e.g. Schwab 1995). For example, Altman (1987) found that around 15% of cash incomes was informally redistributed after receipt by residents of the Momega outstation in Arnhem Land. However, this study shows that high levels of informal or kin-based sharing (Altman 2011) and other forms of reciprocity (Schwab 1995) should not be confused with an equal distribution of income from wages and the social security system at the population level.

Table 6 also shows a substantial increase in income inequality between 2006 and 2011, followed by a flattening or small reduction in inequality between 2011 and 2016 (using the Theil index). The increase in income inequality between 2006 and 2011 is likely to be a result of the strong growth in wages during this period, which for the Indigenous population tended to be more concentrated at the top part of the income distribution, rather than transfer payments that are concentrated at the bottom part of the distribution. As Fig. 6 shows, disposable equivalised household incomes increased substantially for the Indigenous population during this period, but increases were largest at the top of the income distribution while incomes at the bottom of the distribution stagnated. Between 2011 and 2016, however, increases in income were more consistent across the income distribution, resulting in the stable Theil indices in Table 6.

TABLE 6. Income inequality within the Indigenous, non-Indigenous and total populations, using the Theil index to measure inequalities in disposable equivalised household income, 2006–16

Theil's T	2006	2011	2016
Indigenous	0.181	0.202	0.198
Non-Indigenous	0.172	0.180	0.180
Total (inc. not stated)	0.174	0.182	0.182

Geographic variations in inequality within the Indigenous and non-Indigenous populations are explored in Fig. 20. Different spatial distributions of inequality are evident for the Indigenous and non-Indigenous populations. Income inequality for Indigenous people is highest in remote areas by a substantial margin. Specifically, the Theil index for the Indigenous population in remote areas was 0.24 in 2016, while the Theil index in major cities was much lower at 0.18. Indigenous incomes in very remote areas were more equal than in remote areas, with a Theil index of 0.19 in 2016. The trends in Indigenous income inequality also differ substantially along the remoteness gradient. Income inequality grew rapidly among the Indigenous populations in remote and very remote areas between 2006 and 2016, with their Theil indices increasing by 0.04 and 0.06, respectively. Income inequality in inner regional and outer regional areas grew less rapidly, however, with Theil indices increasing by 0.01 and 0.02, respectively, while the Theil index of major cities was flat over this period. Put simply, Fig. 20 shows that Indigenous income inequality is highest in remote areas, grew most rapidly in very remote areas, and was stable in major cities.

The spatial patterns in the levels and trends in non-Indigenous income inequality are quite different. In particular, non-Indigenous income inequality varies less by remoteness. Non-Indigenous incomes were most equally distributed in 2016 in inner regional ($T = 0.16$) and outer regional ($T = 0.17$) areas, although other areas had only marginally less equal income distributions ($T = 0.18$ in all cases). However, while non-Indigenous income inequalities increased between 2006 and 2011 in urban and regional areas, inequalities in remote areas were either stable or registered slight decreases.

These differences in levels of income inequality within the Indigenous population and non-Indigenous population across space are starker when viewed at the regional level (see Fig. 21 and Fig. 22). Income inequalities within the Indigenous population appear to be highest in Western Australian regions, with Theil indices in 2016 highest in the mining regions of South Hedland ($T = 0.28$), Geraldton ($T = 0.24$) and Mount Isa ($T = 0.24$), and the regional service centre of Alice Springs ($T = 0.24$). Such a finding is consistent with previous research showing that the 'minerals boom' since 2001 has led to increased inequality in mining areas (Hunter et al. 2014, Fleming & Measham 2015). No such simple spatial pattern was evident among regions with very low Indigenous income inequality, which included the remote regions Apatula ($T = 0.12$) and Torres Strait ($T = 0.16$), as well as urban areas such as Brisbane ($T = 0.16$) and NSW Central and North Coast ($T = 0.17$).

For the non-Indigenous population, regional income inequality is more clearly spatially patterned. Non-Indigenous income inequality is lowest in very remote areas, especially in the Northern Territory and northern Western Australia, including the mining region of South Hedland, where Indigenous income inequality is highest. Conversely, non-Indigenous income inequality is highest in major cities such as Sydney and Melbourne.

FIG. 20. Income inequality within the Indigenous and non-Indigenous populations

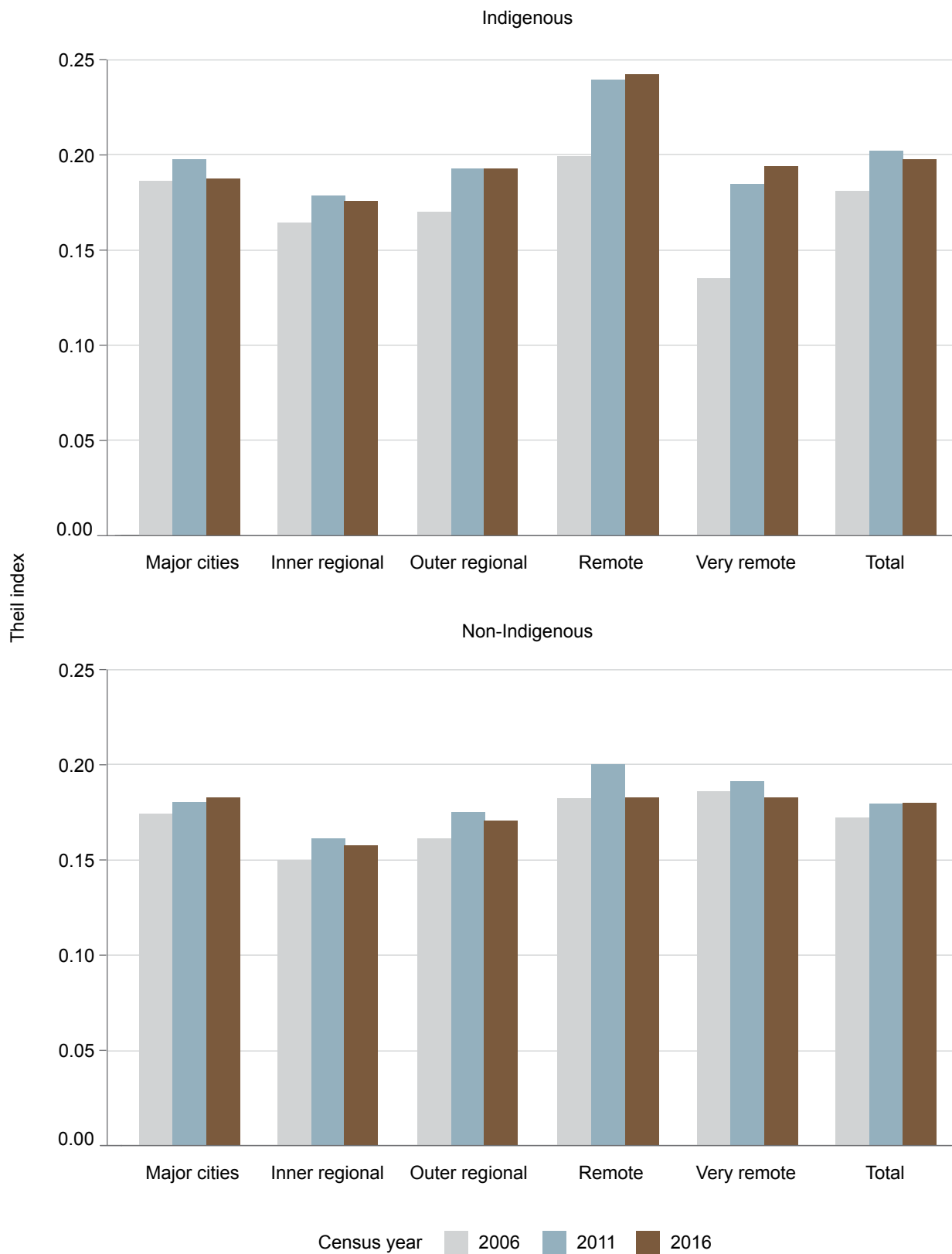


FIG. 21. Inequality in disposable equivalised household income within the Indigenous populations of Indigenous regions, 2016

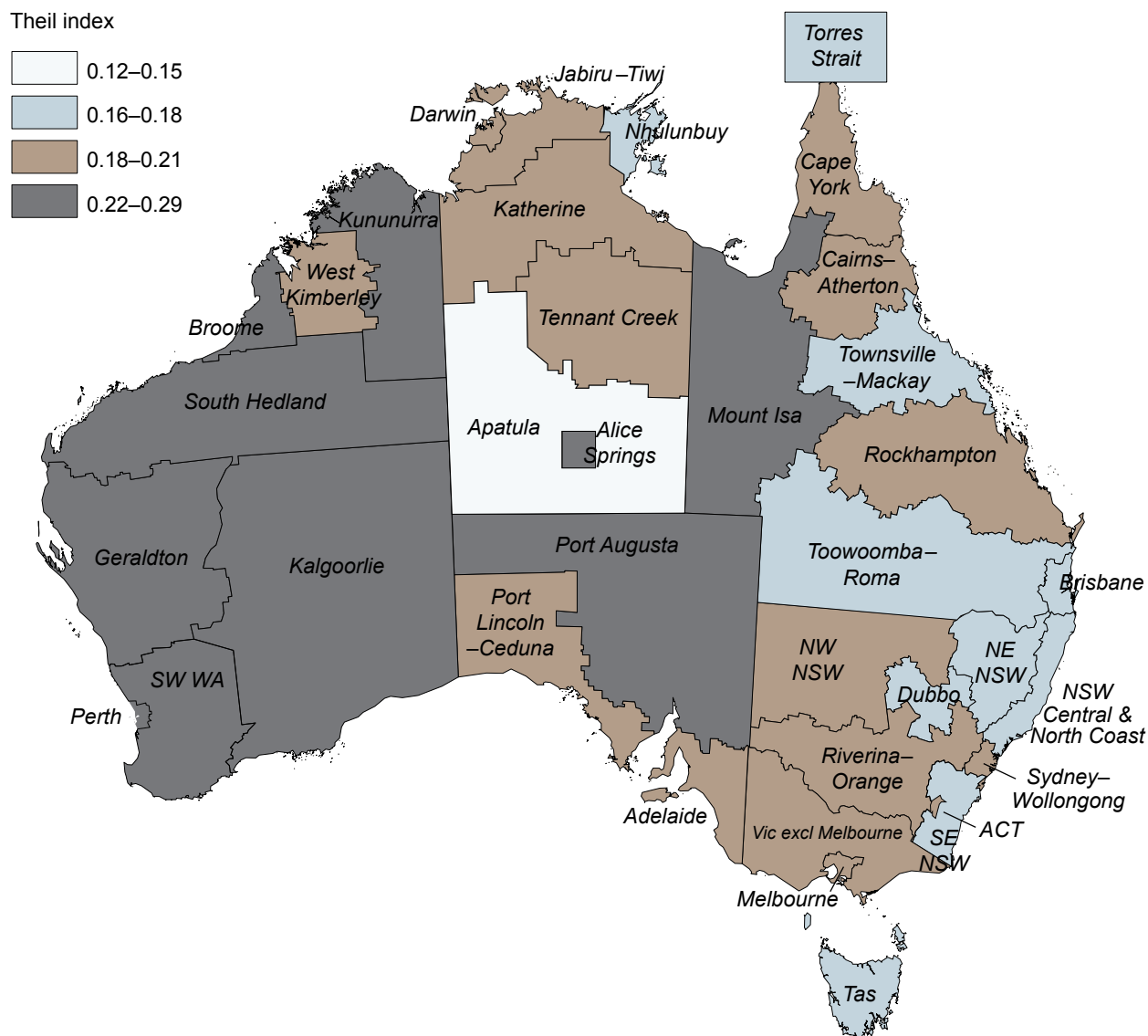
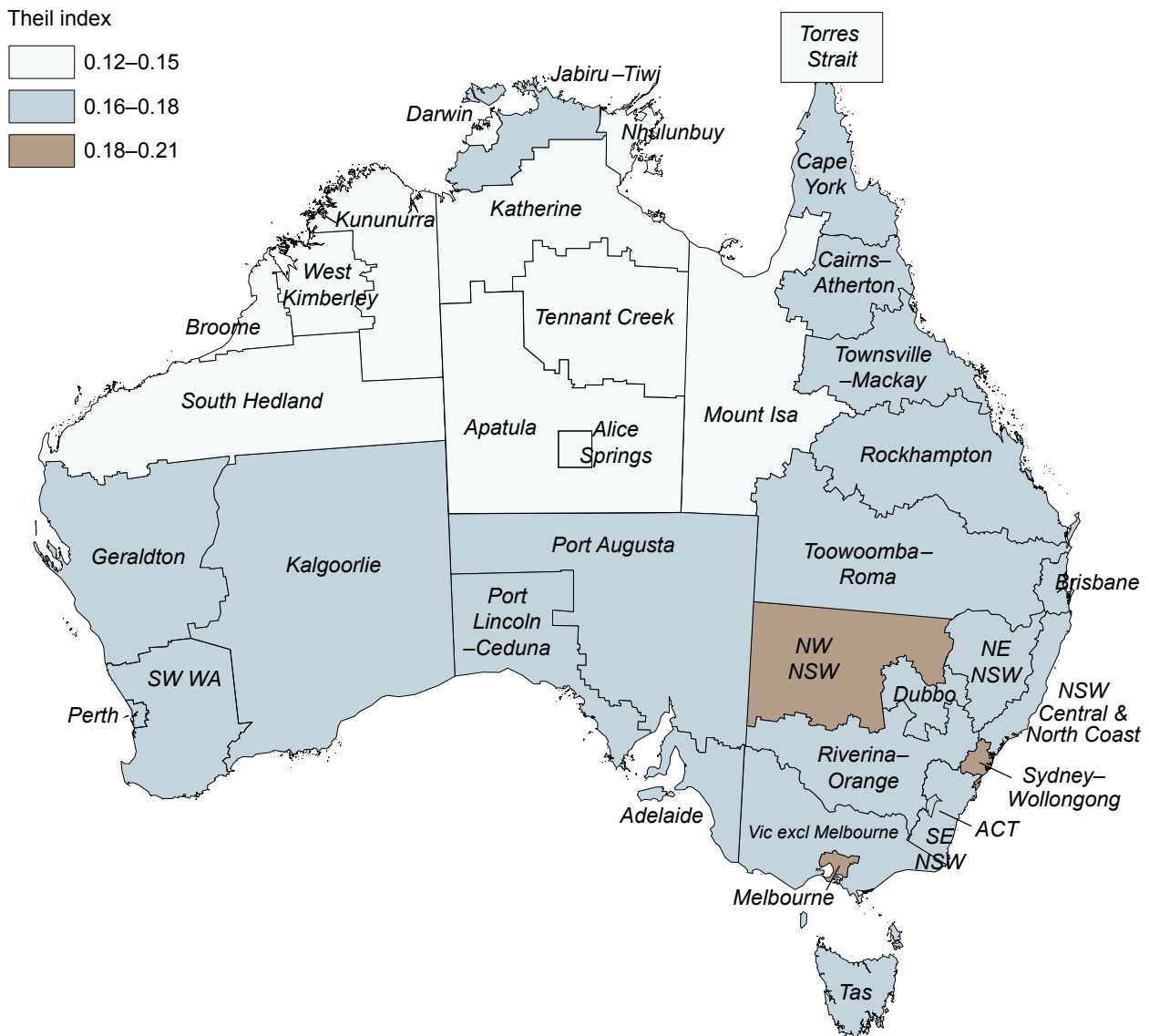


FIG. 22. Inequality in disposable equivalised household income within the non-Indigenous populations of Indigenous regions, 2016



Indigenous status in the context of national income inequality

Given the increasing interest in inequality within the total Australian population (for a recent review, see Biddle & Montaigne 2017), and the well-documented gap between Indigenous and non-Indigenous incomes (Altman & Biddle 2014), it is surprising that no study to date has investigated the contribution of inequalities between the Indigenous and non-Indigenous populations to total income inequality in Australia. This section quantifies the contribution of inequality of income between Indigenous and non-Indigenous people to total income inequality in Australia by decomposing the Theil index. Table 7 reports the results of three decompositions of total disposable equivalised household income inequality in 2016 in Australia. Decomposition 1 disaggregates total income

inequality into inequality within income brackets and inequality between income brackets. It shows that most of total income inequality is accounted for by inequality between income brackets (94.4%) rather than within income brackets (5.6%). Decomposition 2 disaggregates income inequality further, identifying the contribution of inequalities between the Indigenous and non-Indigenous populations to total inequality. This component of inequality is relatively small, at just 0.7% of total inequality. Finally, decomposition 3 further disaggregates Indigenous and non-Indigenous income inequalities by Indigenous region. Although this decomposition contributes a somewhat greater proportion of total inequality (2.6%), inequality between income brackets still contributes the vast majority of total inequality (91.1%).

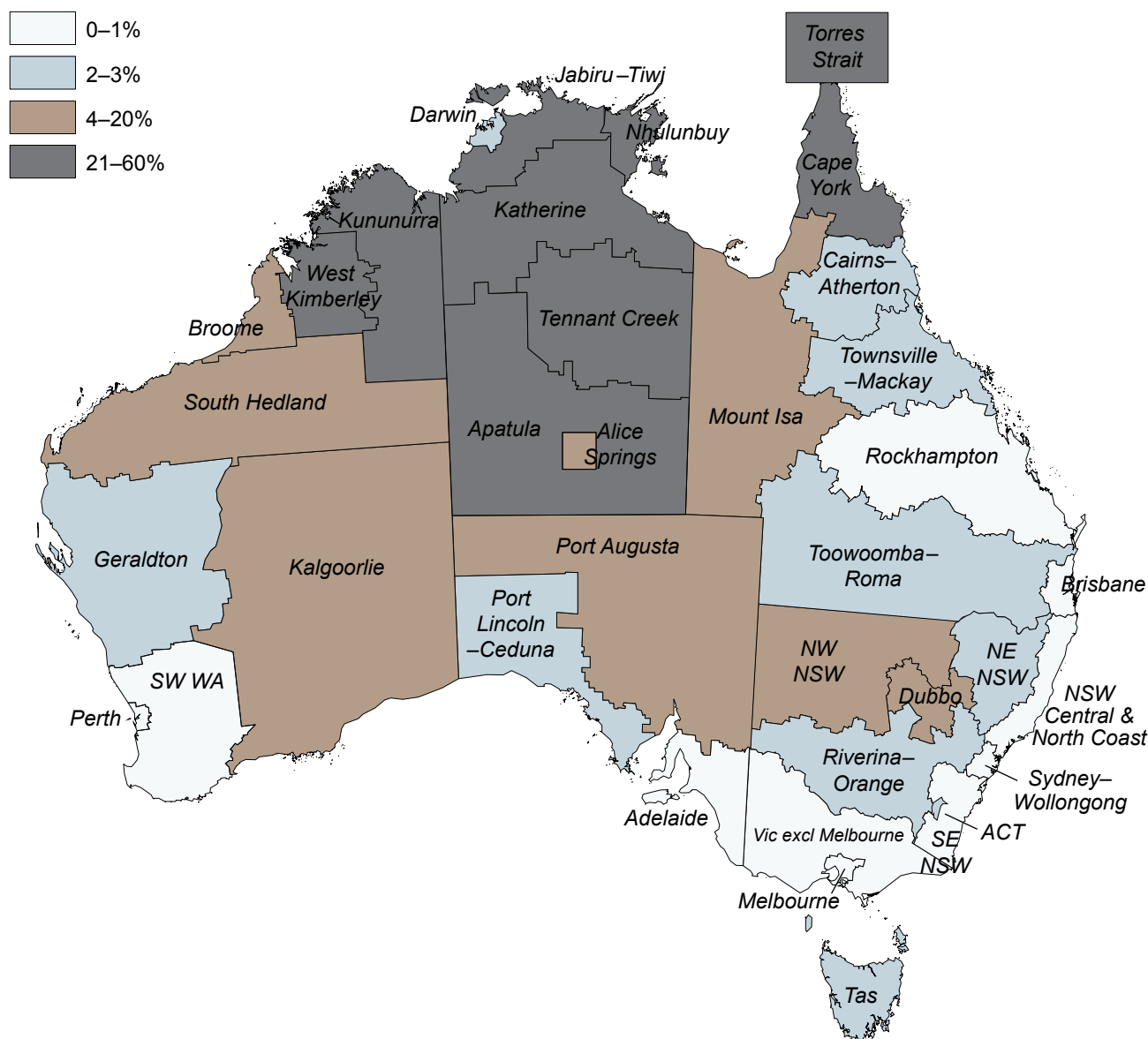
TABLE 7. Three decompositions of total disposable equivalised household income inequality in Australia, 2016

Type of inequality	Decomposition		
	1: All people by income bracket	2: Indigenous status by income bracket	3: Region of residence by Indigenous status by income bracket
	Theil's <i>T</i> (% total)	Theil's <i>T</i> (% total)	Theil's <i>T</i> (% total)
Inequality within income brackets	0.010 (5.6%)	0.010 (5.6%)	0.010 (5.6%)
Inequality between income brackets	0.172 (94.4%)	0.170 (93.6%)	0.166 (91.1%)
Inequality between Indigenous and non-Indigenous people	–	0.001 (0.7%)	0.001 (0.6%)
Regional inequality	–	–	0.005 (2.6%)
Total inequality	0.182 (100%)	0.182 (100%)	0.182 (100%)

Inequality between the Indigenous and non-Indigenous populations explains only a small proportion of the total income inequality within Australia, but this does vary substantially between regions (see Fig. 23). In some regions, Indigenous/non-Indigenous inequality contributes a substantial proportion of inequality – for example, Nhulunbuy (56.7%), Apatula (47.1%), Jabiru–Tiwi (43.7%), West Kimberley (39.8%) and Kununurra (34.6%). In other regions, such as Melbourne, Sydney–Wollongong, Canberra, Adelaide and Victoria excluding Melbourne, the contribution is negligible (<0.4%). This reflects the differences in income levels between the Indigenous and non-Indigenous populations of different

regions, but probably even more so differences in the proportion of each region's population that is Indigenous. Regions where inequality between Indigenous and non-Indigenous incomes contributes a substantial proportion of inequality tend to have both large differences between Indigenous and non-Indigenous incomes and a high proportion of the population that is Indigenous, while the converse is true for regions where Indigenous inequality's contribution to total inequality is negligible.

FIG. 23. Contribution of Indigenous and non-Indigenous inequality to total income inequality within a region, 2016



Discussion and concluding remarks

This Census Paper has examined the distribution of income within the Indigenous population, and income inequalities between the Indigenous and non-Indigenous populations. It has particularly emphasised differences in the changes in Indigenous incomes across the income distribution and spatial unevenness in Indigenous incomes. Several key findings have emerged from the analyses presented in this paper.

First, when analysed in aggregate, Indigenous incomes are not only growing but are growing faster than non-Indigenous incomes. This continues the post-1996

trend of gradually closing gaps between Indigenous and non-Indigenous incomes. The improving economic status of the Indigenous population – when measured in terms of average cash income – should be welcomed.

This improvement in average outcome obscures a concerning deterioration of incomes in some geographic areas. Median incomes in remote areas were flat between 2011 and 2016, while median incomes in very remote areas fell by more than \$10 per week in real terms. This reduction in the median income of the Indigenous population in very remote Australia is particularly concerning given that the median Indigenous income in this area was only \$400 per week in 2011. That is, income is falling from a very low base.

For the first time that we are aware of, more than half of the Indigenous population in very remote Australia was in income poverty, with rates in most very remote regions well above 50% in 2016. Indigenous incomes in very remote areas fell further behind non-Indigenous incomes, with the median Indigenous income in these areas averaging just 44% of the median non-Indigenous income. The structural causes of this increase in poverty require urgent action.

Although the impoverishment of Indigenous people in very remote areas is a serious cause for concern, Indigenous incomes have risen substantially in major cities, where 37% of the Indigenous population lives. Median Indigenous incomes in major cities reached \$647 per week in 2016, compared with just \$389 per week in very remote areas. Indigenous poverty rates have fallen to 24.4% in major cities, a prevalence of poverty that, although still concerning, is considerably lower than that for Indigenous people in other parts of the country. Indeed, the median Indigenous income in major cities is gradually approaching the median non-Indigenous income. If current rates of convergence continue, equality will be reached in these areas before the year 2040.

Remoteness areas between the major cities and very remote areas tend to show outcomes somewhere between these two extremes. In general, in inner regional and outer regional areas, Indigenous incomes are growing, Indigenous poverty is falling, and Indigenous and non-Indigenous incomes are slowly converging. In remote areas, Indigenous incomes grew marginally in the middle and bottom of the income distribution but grew considerably at the top of the distribution, resulting in increased levels of income inequality within the Indigenous population. Taken as a whole, these results suggest a geographic bifurcation in Indigenous economic outcomes. Rather than witnessing a 'great convergence' (Baldwin 2016) in Indigenous incomes across the country, there appears to be a 'great divergence', with incomes growing in major cities while very remote areas fall further behind.

This paper has not sought to explain the causes of diverging regional incomes, and an explanation will rely on labour market data, which were not available at the time of writing. However, what is clear is that the difference in Indigenous incomes between the bottom and the top of the income distribution is growing. This is not surprising given that data from NATSISS show that those in the bottom 20% of the Indigenous income distribution rely heavily on social security payments that are indexed to inflation rather than wages. Given that

employment rates in remote areas were relatively low in 2011 (Gray et al. 2013), stagnating or falling Indigenous incomes are likely to be a function of weak labour market outcomes for the Indigenous population. Other factors that are likely to have contributed to diverging Indigenous incomes include the abolition of CDEP (Jordan 2016) in remote areas, the increased propensity of Indigenous people aged over 15 to study full-time and the transition of several large mining projects from the labour-intensive construction phase to less labour-intensive operation phase (Ryser et al. 2016).

Nuancing this geographic story of diverging outcomes along the remoteness gradient is a more complex regional patterning of Indigenous incomes. There are considerable differences in Indigenous incomes, poverty rates, and inequalities between Indigenous and non-Indigenous Australians between regional areas, even for regions with the same level of remoteness. Although there are simple explanations for the exceptional trajectories of some regions – such as South Hedland, the epicentre of the impacts of the mining boom (Hunter et al. 2014) – the reasons for the total pattern of incomes between Indigenous regions is not immediately apparent. Despite the apparent contingency in the regional patterning of outcomes, certain regions, particularly those in Arnhem Land and the Kimberley, clearly have low incomes and low income growth, when measured across a range of metrics. For example, Jabiru–Tiwi has among the lowest median incomes of any region, and reported falling incomes and rising poverty rates between 2011 and 2016, and increasing inequality between Indigenous and non-Indigenous populations. On the other hand, other regions showed consistently positive outcomes and trajectories, particularly regions in New South Wales and other highly urbanised regions on the eastern seaboard.

These results should be interpreted with an appropriate degree of caution. In particular, we have insufficient data at this time to adjust our results for identification change, which appears to have had the greatest incidence in those regions registering the considerable increases in incomes (Markham & Biddle 2017). Consequently, some of the positive findings of this paper and the associated geographic divergence may have resulted from a change in the group of people who identify as Indigenous rather than from the increasing incomes of those who identified as Indigenous in 2011. Analysis of the extent to which identification change has confounded our findings will need to be conducted after the release of the 2016 Australian Census Longitudinal Dataset. Furthermore, the results presented in this paper are to some degree reliant on the assumptions made to estimate within-income-group income distributions and to estimate disposable

incomes on the basis of gross incomes. High-quality Indigenous-specific survey data that disaggregate incomes by source continue to be needed to confirm these results with a greater degree of certainty.

One final finding of note relates to income inequality within the Indigenous and non-Indigenous populations. This paper is the first of which the authors are aware to observe that incomes are distributed less equally among the Indigenous population than among the non-Indigenous population. While further rounds of informal redistribution of Indigenous incomes are likely to occur beyond that recorded by a census (Schwab 1995, Altman 2011), this finding underscores the diversity of outcomes within the Indigenous population. This Census Paper has reported both a cash impoverishment of Indigenous people in remote regions and at the bottom end of the income distribution, and the continued growth of Indigenous incomes in urban areas. There is an urgent, clear policy imperative to ameliorate the former while promoting the latter.

Notes

1. Although our analysis is based on estimated percentiles within each bracket, percentile estimates consist of too much data to reproduce in Tables 1 and 2.
2. Refer to the Australian Statistical Geography Standard (www.abs.gov.au/websitedbs/D3310114.nsf/home/Australian+Statistical+Geography+Standard+%28ASGS%29) for details of this classification

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