



Regional Implementation Committee

The RIC Report

Change in wellbeing indicators of Pilbara Aboriginal people: 2001 – 2016

A report to the Regional Implementation Committee (RIC) by John Taylor

The confronting information in this report calls for a collaborative effort to improve the prospects for Pilbara Aboriginal people. An approach where Pilbara Aboriginal people are empowered to be front and centre to the solution. The RIC invites Government, service providers and other Aboriginal agencies to work together to deliver better outcomes.

September 2018



Preface

By The Honourable Fred Chaney AO

Former Federal politician, Indigenous policy influencer, served on the National Native Title Tribunal (1994-2007), former Co-Chair Reconciliation Australia (2000-2005), Vice-President The Graham 'Polly' Farmer Foundation (1995-current).

The importance and significance of the RIC is self evident. It could and should enable the issues identified in the RIC report to be dealt with more effectively in future than they have been in the past. But will the opportunity be taken up by governments and industry or will it be another wasted opportunity?

Nothing is more vital to meeting the challenges in education employment and health identified in the RIC report than the involvement of the Aboriginal people of the Pilbara themselves. RIC Report author, Emeritus Professor John Taylor with his usual thoroughness identifies the failure of a rising tide of wealth creation to raise all boats. But what is to be done?

Success in education, employment and health are intensely personal and individual. But they all involve opportunity and an enabling environment. Each child is educated in a family, a classroom and a school. All of these are important. Each employee is an individual with a relationship with an employer. Both are important. The health of an individual depends on diet, habits, and the availability of health care when needed. All are important. Individuals alone cannot succeed but success requires the engagement of individuals as well as governments and their agencies.

In each area of concern there are multiple actors and what is needed is for all those actors to be engaged with a sense of shared purpose. The RIC brings together eight Traditional Owner groups and the possibility of Aboriginal shared purpose and engagement to improve education employment and health. As well it makes possible the harnessing of the strengths of Aboriginal society and culture, sharing and reciprocity, to use group resources to tackle areas of continuing social deficits that have deep historical roots.

The RIC report is relevant to all Aboriginal individuals and organisations in the Pilbara. If they are to be front and centre in changing what is unacceptable the RIC needs to continue to work with other TOs and organisations of like mind to lead change. Collaboration will add great strength to all. You are the permanent population of the Pilbara. If you can work together the circumstances Taylor describes can be transformed for the better.

Governments and companies should at least be sheepish and more properly ashamed that in an area of immense wealth production, vital to Western Australia and Australia, so much disadvantage persists. Recent initiatives by resource companies to find ways to work in the Pilbara within a more collective framework demonstrate both goodwill and a realisation that unilateral episodic interventions do not achieve the wider changes needed.

The RIC Report's introduction suggests that courage will be the maker of us all. Courageous leadership from the RIC on the Aboriginal side will not suffice unless there is equally courageous leadership from government and industry. What is required is a stable long term framework for cooperation between the Aboriginal people and organisations in the Pilbara that ensures each element plays its part in achieving shared objectives.

History suggests that governments have not been consistent in working with communities and industry to achieve change over the long term. The RIC presents an opportunity to alter that. Everyone should be able

to agree that changes to the social and economic statistics in the Pilbara are needed. Everyone should be able to agree that community governments and industry have key roles to play. Everyone should be able to agree that change will not be overnight and requires long term commitment. This is an opportunity to be grasped now.

There is a real choice, a real dilemma, facing the community with respect to closing the employment gap. Taylor identifies the increase in high incomes for a minority of the population. This is related to the resource curse and it has a disabling element. Do people want to have the lower paid jobs that provide the bulk of employment opportunities in Australia?

The big and fastest growing employment numbers in Australia are outside the mining sector, in services such as education health and welfare. These services are needed in the Pilbara and could provide significant employment provided educational standards are lifted and, most important, people want to do those jobs that do not pay as well as jobs in mining. Education and training, government services including policing and prisons, retail, environmental services, age and disability services, and health care and social assistance are where the bulk of jobs are. Is there an appetite for getting Pilbara Aboriginal people into these jobs? This is a tough question for the RIC and all Aboriginal individuals and groups in the Pilbara.



Introduction

Written by a Pilbara Traditional Owner, on behalf of the RIC

Looking at the past

It is arid, hot, isolated and tough to live in. Nevertheless, for 50 years, the Pilbara and its iron ore, gas and salt deposits have contributed richly to the wealth of Western Australia and the Australian nation. Yet many of the Aboriginal people of the Pilbara have experienced very little benefit from the abundance extracted from our homelands and waters. Many of us live in disadvantaged and impoverished circumstances.

This has not always been so.

For more than 60,000 years, we, the Traditional Owners of the Pilbara, have conducted our lives through a cultural belief system that values equality and responsibility for each other and the natural environment and all living things above all else. Our heritage is held beyond time itself, recorded in our languages, our Law, our songs and stories of the world in its infancy, and carried out by more than 2,000 generations who with all living beings are the heartbeat of this land that sustains life and balance.

We are one

With this RIC Report, we, eight Traditional Owner Groups of the Pilbara - Banjima, Karlka Nyiyaparli, Kuruma Marthudunera, Ngarlawangga, Ngarluma, Puutu Kunti Kurrama, Pinikura, Yinhawangka and Yindjibarndi - are one voice as we speak from many different language groups of the Pilbara. Aboriginal people of the Pilbara can be defined by many different considerations and we acknowledge that we cannot speak for every member of the Pilbara Aboriginal population. However, while each nation is unique, we remain equal to one another in our origins of life and country.

What matters most is that we are all accountable to each other and to the future generations. Our relationships with one another are firmly based on our cultural principles of reciprocity that unequivocally determine who we are, our obligations to our country, and our ongoing accountability to our land and to each other. Caring for one another and our country are values that maintain our cultures and relationships and make us feel worthy as individuals. It is in honouring this collective commitment to each other that we choose to confront our current inequities.

Confirming what we already know

For the past 100 years, Pilbara Aboriginal families have been seriously affected by dispossession from their homelands, by poverty, unemployment, poor quality housing, ill-conceived policies, discrimination and sub-standard services that have resulted in ill-health, low educational attainments, substance abuse, and other negative social impacts. It is not difficult to draw the conclusion that despite multiple government and service organisation interventions over the past 50 years, there have been very few continuing or long-term positive improvements to the opportunities, experiences, and life outcomes of our Pilbara Aboriginal citizens.



The RIC Report focuses specifically on how life has changed for Aboriginal people in the Pilbara since 2001. It details many things that we already knew about life for Aboriginal people in the Pilbara, but needed data to prove: Income inequality is widening; more investment in education and training is required; a heavily distorted housing market is causing unsanitary overcrowding in Aboriginal dwellings; the life expectancy rate of Aboriginal people is still far lower than other population groups and the leading causes of mortality in Aboriginal adults are 'lifestyle' diseases that can be screened for and potentially avoided. These are just some of the key points from the RIC Report which demonstrate in stark data detail how poorly many Aboriginal people in the Pilbara are currently living.

This is us today

We acknowledge that some of us have received advantages through our mining Indigenous Land Use Agreements (ILUAs) that mean we are better equipped, financially and structurally, to engage with government and deploy resources to our benefit. But, ultimately, our social structure is kept alive by our obligations to one another and our collective socio-cultural ecology. If we over-reach, if we focus on ourselves, if we do not share knowledge and opportunities and maintain balanced relationships, the cultural consequences of decoupling from the shared goals can isolate front-runners from our essential cultural fabric and frameworks. Trust and commitment will be central to raising the life outcomes for all Pilbara Traditional Owner Group partners.

Similarly, our proposal to work alongside one another on behalf of all Pilbara Aboriginal people can only occur in accordance with Pilbara Aboriginal communal ownership values; that we will ensure that we do not betray the laws of Aboriginal democracy under which no individual can exploit the land or the rights of others, and no man or woman shall profit from the country unless we all profit.

We acknowledge our collective relationships with Rio Tinto that enabled us to commission and use this RIC Report to benefit our people far beyond the remit of our individual ILUAs. We are grateful for the undeniable commitment that Rio Tinto has shown to walk alongside us as we forge our own path to social and economic prosperity.

Mutual responsibility and mutual respect – working together

Our vision is to create change by exploring new ideas, new teachings and different ways of thinking. We want to motivate this and future generations to become more involved with government directly and indirectly, enabling shared financial and social responsibilities, an active focus on commerce, the provision of locally determined businesses, services and training, and opportunities to participate in capital ventures.

We are optimistic that our vision for the Pilbara will also reap considerable benefit for the government and tax payer by broadly encompassing all manner of social obligations with shared responsibility. We are optimistic that by listening and learning from each other's experiences, we will overcome difficult social issues condescendingly described as Aboriginal dependency, "hand to mouth" welfare and a waste of taxpayers' money.

We will create opportunities, through diversity, positive partnerships and diplomacy, for Pilbara Aboriginal communities to prosper and thrive. We will work together, respecting our own innate knowledge to help develop better health, education and employment outcomes, essential skills and businesses.



This is where we will be tomorrow

The roadmap of prosperity has reached a fork in the road. We can no longer continue to have our knowledge, strengths and experience ignored. Accordingly, eight Pilbara Traditional Owner groups are standing in unity together to assist the government and other partner stakeholders to create the change that will better the lives of Aboriginal peoples in the Pilbara.

Our future as Aboriginal people living vibrantly on our own land depends upon extending the knowledge and understandings of every politician, business leader and private citizen in our State. As representatives of many of the Pilbara Aboriginal nations, we seek acknowledgement and support from every Aboriginal person who shares in our birthright of this land. We want to sing from the song page of shared prosperity.

The eight Traditional Owner groups of the Pilbara Banjima, Karlka Nyiyaparli, Kuruma Marthudunera, Ngarlawangga, Ngarluma, Puutu Kunti Kurrama, Pinikura, Yinhawangka and Yindjibarndi are proud to be working alongside each other in presenting this RIC Report and putting forward our concerns, suggestions and demands to the Western Australian Government and other stakeholder partners in the hope and expectation that courage will be the maker of us all.

Change in wellbeing indicators of Pilbara Aboriginal people: 2001-2016

A Report to the Regional Implementation Committee

by

John Taylor

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He is also an Emeritus Professor at the Australian National University.*

September 2018

Acknowledgements

Many individuals and agencies contributed to the information presented in this report, either by way of data input or by assisting with interpretation and insights. First of all I would like to acknowledge the Traditional Owners of the Pilbara represented on the Pilbara Regional Implementation Committee at whose request this update to the Taylor and Scambary (2005) report has been constructed. These included Maitland Parker, Kelly Parker, Jason Masters, Gloria Lockyer, Albert Pianta, Lloyd Hubert, Floyd Churnside, Morgan Lockyer, Keith Hall, Frances Bung, Mitchell Drage, John Ashburton, Rodney (Ali) Parker, Sally-Anne Johnson, Stanley Warrie, and Middleton Cheedy. I am also grateful to Janet Reark, Joshua Nisbet, Linda Dawson, Gavin Martin, Rheannan Burke, Cassy Howard and Neesha Sen (Rio Tinto Iron Ore); Chris Dorrian (WA Department of Premier and Cabinet); Tom Mulholland (WA Department of Planning, Lands and Heritage); Peter Lonsdale, Ellen Quigley and Craig Newton (WA Department of Communities); Bruce Miller, Mark Stringer and Steve Cashion (WA Police Force); Mark Bloomfield and Haregu Abaye (WA Department of Training and Workforce Development); Gavin Morris and Don Pollock (WA Department of Education); Peter Somerford and Mimi Liu (WA Department of Health); Jennifer Endersbee (WA Department of Justice); Jen Mackay Commonwealth Department of Social Services); Francis Markham (Australian National University); Yvette Manalos and Sharon Reynolds (Woodside Energy); and Amanda Wheeler and Tahnee Davies (Forum for Directors of Indigenous Organisations).

Executive summary

In 2017, Aboriginal Traditional Owner members of the Pilbara Regional Implementation Committee (RIC) endorsed a committee proposal to analyse change in baseline Aboriginal social indicators for the Pilbara that were established in the early 2000s prior to the mining boom (Taylor and Scambary 2005). The purpose was to bring an essential quantum to their discussions of future needs and priorities for the Pilbara Aboriginal community. What is provided is a unique and detailed information resource that empowers the RIC in its strategic thinking and representation to Rio Tinto, government and others as it seeks to advance social and economic development for Pilbara Aboriginal people. As anticipated in the baseline study a good deal has changed for Aboriginal people as a consequence of unprecedented levels of economic activity in the region due mostly to massive investments in the mineral resources sector. This economic shock has occurred in waves through construction, production and wind-down/transition phases and it should be noted that impacts are still underway.

The basic message from the baseline study was that little had been achieved up to 2001 in terms of enhancing Aboriginal socioeconomic status over decades of mining activity in the Pilbara. This can no longer be claimed, at least not at a whole-of-population level. What we see instead, is a very mixed set of outcomes whereby some individuals, families and communities have clearly benefited while for others little has changed, indeed, relatively-speaking, they are now invariably worse off. If pressed to allocate an approximate ratio to this observation, the general impression would be that a third of people are now economically better off and two-thirds are not. The difference between the two is determined largely by employment, especially in mining.

Against a background of accelerated growth in the Aboriginal resident population there has been absolute improvement – more people employed, more on higher incomes, additional housing, increased school retention, fewer avoidable deaths etc., but what matters more is the volume of improvement relative to population (need). Here, change is often mixed with either slight or substantial improvement in the employment rate (depending on definition), more people on higher incomes but poverty rates increasing, no change in low school attendance rates but some positive shift in literacy and numeracy outcomes, less apparent housing need overall but continued high occupancy rates in many locations, significant decline in mortality and morbidity rates for some conditions but not most, lower arrest rates for males but not for females and so on. Even in instances where improvement exists, sizeable gaps in outcomes between Aboriginal and other Pilbara residents often remain. More importantly, gaps have widened within the Aboriginal population, especially in regard to income and opportunity.

Of particular note is that Pilbara Aboriginal people have embraced the increased opportunity for employment in mining to an extent that they are now overly-dependant on this single industry even more so than others in the region. This comes at a time when there is downward pressure on labour supply due to automation in mining and it places a premium on finding ways and means of retaining existing workers at the same time as diversifying opportunity. The focus for this is on those aged under 35 years who are at the vanguard of an emerging population bulge that will see the working-age group dominate for some years to come. This demographic shift presents a business case for increased and urgent investment in human capital.

The report is structured into thematic sections that present detailed statistical data from census and administrative sources on change in population, labour force, income,

education and training, housing and infrastructure, health status, and crime and justice. It should be said that the types of data available are provided by the state and are not necessarily designed with Aboriginal issues and interests in mind and they do not cover the full range of what might be measured in any assessment of Aboriginal wellbeing. However, to the extent that improvement in these areas does form part of the RIC's calculus of Aboriginal wellbeing it is legitimate and beneficial to examine key measures. The implications for the RIC of trends observed are presented in a full summary section at the end of the report.

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Abbreviations and acronyms

ABS	Australian Bureau of Statistics
AIGC	Australian Indigenous Geographic Classification
AIHW	Australian Institute of Health and Welfare
ALRC	Australian Law Reform Commission
ANZSIC	Australian and New Zealand Standard Industrial Classification
ANZSOC	Australian and New Zealand Standard Offence Classification
ANZSCO	Australian and New Zealand Standard Occupational Classification
ASMR	Age-Standardised Mortality rate
ASR	Age-Standardised Rate
AQF	Australian Qualifications Framework
ASCO	Australian Standard Classification of Occupations
ATAR	Australian Tertiary Admission Rank
ATAS	Aboriginal Training and Support program
ATSIC	Aboriginal and Torres Strait Islander Commission
CBO	Community Based Order
CDP	Community Development Program
CDEP	Community Development Employment Projects scheme
CHINS	Community Housing and Infrastructure Needs Survey
COAG	Council of Australian Governments
CPI	Consumer Price Index
DOH	Department of Health
EHNS	Environmental Health Needs Survey
ERP	Estimated Resident Population
FIFO	Fly-in/Fly-out
FMG	Fortescue Metals Group
ICD	International Classification of Diseases
IL	Indigenous Location
LGA	Local Government Area
MLCR	Module Load Completion Rate
NAPLAN	National Assessment Program – Literacy and Numeracy
NGO	Non-Government Organisation
NMS	National Minimum Standards
OECD	Organisation for Economic Cooperation and Development
PAP	Pilbara Aboriginal People
RAESP	Remote Area Essential Services Program
RIC	Regional Implementation Committee
RTIO	Rio Tinto Iron Ore
TAFE	Technical and Further Education
TO	Traditional Owner
VET	Vocational Education and Training

WA Western Australia

WACE Western Australian Certificate of Education

1. Regional profiling

Part of the rationale for a baseline study of social and economic conditions for Aboriginal people in the Pilbara in the early 2000s (Taylor and Scambary 2005) was a recognition that the region was about to experience potentially the largest escalation in mining activity and associated economic stimulus in Australian history. Against a background of negotiations for regional agreements between resource companies and Traditional Owners, the scale of proposed new mineral output, of infrastructure development, of labour demand and regional multipliers were seen as having potentially major impacts on social and economic outcomes for Aboriginal people. The expectation and desire was that these outcomes would be favourable from the perspective of Pilbara Traditional Owners and Aboriginal residents more generally. Ultimately, the aim was to assist in the planning and subsequent monitoring of both company and Aboriginal stakeholder initiatives aimed at meeting particular goals in regard to Aboriginal participation in the regional economy. The means to this was to provide an initial set of high-level social indicators that could be used in negotiations and in goal-setting and that could then, at some future date, be revisited in order to measure what progress had been made.

While therefore implicitly tied to the monitoring of regional agreements and their effectiveness in improving Aboriginal lives, there is no sense in which the present exercise provides a direct means to achieving this. For one thing, the impacts of agreements can only be established internally within the confines of each set of negotiated arrangements and stated objectives, and with reference only to those directly implicated. What this report provides instead is set of high-level public-access indicators that summarise region-wide outcomes. Furthermore, there are many mining agreements across the Pilbara and each may have quite different objectives and aspirations, although it is fair to say that they share in common the advancement of Aboriginal wellbeing. In this regard, it should be noted that the data presented here on Aboriginal people in the Pilbara all arise as by-products of national or state-controlled statistical collections (mostly census and administrative). These types of data are not designed with specific Aboriginal interests and issues in mind and they most certainly do not cover the full range of what might be measured in any assessment of Aboriginal wellbeing (see, for example, Yu and Yap 2016). In short, they are not developed from what has been referred to as an 'Indigenous standpoint', in fact very few statistical data around the world are (Walter and Andersen 2013). However, to the extent that improvements in regional employment outcomes, business development, incomes, education, housing, health and justice do form part of a general calculation of wellbeing (namely, the sorts of indicators detailed in the initial baseline study) it is legitimate to recalibrate these as a contribution to rapid appraisal of impacts.

Such a task is well-suited to support the future-thinking philosophy underpinning the Pilbara Regional Framework Agreement. This agreement was established between Rio Tinto and Pilbara Traditional Owners who have opted-in to the Regional Framework Deed (RFD). In order to give impetus to this deed, a Regional Implementation Committee (RIC) was established as a forum to operate as the primary interface between the Traditional Owner (TO) Opt-In Groups and Rio Tinto. The primary purpose of the RIC is to provide TO Opt-In Groups with the opportunity to influence Rio Tinto's behaviour and decisions on a regional basis. In doing so, the RIC is responsible for monitoring and reviewing the performance of Rio Tinto and the TO Opt-In Groups under a set of Regional Standards. These standards are designed to

improve the wellbeing of Aboriginal people throughout the Pilbara in relation to many of the indicators mentioned above, as well as to others that are more culturally-based but out of scope for the present analysis. To assist in performing these duties, in 2017 Traditional Owner members of the RIC endorsed a proposal to analyse change in the baseline social indicators set out by Taylor and Scambary (2005) as a means of bringing essential quantum to elements of their discussion around future needs and priorities. Hence the present report.

The purpose, then, is to update as far as possible the original data in Taylor and Scambary (2005). This is not as straightforward as it may seem for a variety of reasons. To begin with, two broad sources of statistical data are available – census and administrative data - and some of the categories produced by these have changed since the early 2000s. As the emphasis here is on developing robust time series to identify change it is essential that data sets are consistent over time and this is not always achievable. Secondly, some data in the original analysis were presented for geographic sub-sets of the Pilbara (such as local government areas) and while this may or may not still be possible, depending on which data are involved, the fact is a focus on any geography lower than the Pilbara region as a whole greatly complicates the task of both compiling a time series and interpreting the results. For the most part, therefore, this report is concerned with data at the whole of region-level defined as the Pilbara SA3 using the 2011 Australian Geographic Standard Classification.

A further point to note is that in Taylor and Scambary (2005) census data are reported for the Indigenous population of the Pilbara based on place of enumeration counts. There are two issues here. First, the current report uses place of usual residence counts from the census and this now includes data from the 2001 census where appropriate. As a consequence, 2001 census figures may at times differ slightly from the original report. All subsequent census data were extracted from the Australian Bureau of Statistics' (ABS) TableBuilder, a web-based platform that allows the extraction of confidentialised census cross-tabulations. Second, use of the label 'Indigenous' in the first report was statistically correct as this is the official umbrella term used by the ABS when referring collectively to Aboriginal and/or Torres Strait Islander people. It is noted, however, that the preference among Traditional Owners in the Pilbara is to use the term 'Aboriginal' in statistical reporting and this is the practice now adopted. However, it should also be noted that all data reported in respect of this category still refer to the Indigenous population of the Pilbara for two reasons.

First of all, official estimates of population constructed by the ABS and the Western Australian government refer only to Aboriginal and Torres Strait Islander populations together as 'Indigenous' and there is no way to adjust these. Second, this is also true of administrative data provided by the Western Australian (WA) government and the Commonwealth. A further issue regarding identity in statistics should be noted. As with the initial report, it remains the case that no comprehensive statistics of the type presented in this report are available for Traditional Owner groups in the Pilbara, indeed this is so across the whole of Australia. Recent discussion has emerged internationally around the theme of indigenous data sovereignty that would give rise to such recognition and champion local control over data (Kukutai and Taylor 2016) but in Australia different Aboriginal peoples remain invisible statistically even though they have a growing need for dedicated information as incorporated groups. In light of sentiments regarding local representation and participation in decision-making that arose from the First Nations Regional Dialogues on constitutional recognition

(<https://www.referendumcouncil.org.au/dialogues>), it is worth reflecting on the fact that the Australian census allows for self-identified ancestry as Bulgarian or Yemeni, but not as Banjima or Yamatji! The present report, as was the initial one, remains constrained by this.

Finally, some comment should be made about methodology. It is fast becoming a well-known, but unfortunate, fact that the five-yearly census fails to count all Aboriginal people, not to a small degree, but substantially. At the 2016 census, it is estimated (by the ABS) that as much as 24% of the Aboriginal population of Western Australia was not counted (ABS 2017). Furthermore, when it comes to the Pilbara, the number of people who completed a census form in 2016 but did not answer the question on Aboriginal and/or Torres Strait Islander identity was equivalent in size to those who identified as Aboriginal and/or Torres Strait Islander. This all leaves a good deal of post-census adjustment to be done in order to estimate what the 'true' size and composition of the population might be.

What this means, then, is that raw census counts of variables such as employment numbers or persons per dwelling cannot be utilized alone – they need to be adjusted for undercount. To this end, the method used here is to regard the census count as a large sample survey from which essential rates of events (such as the employment rate) can be calculated. To establish true levels (such as numbers actually employed) these rates must then be applied to appropriate estimated cohorts of population. The sources used for this where required throughout the report are the 2016 estimated resident population figures produced by the ABS (ABS 2018a). Further errors of omission involving non-response to census questions occur across all census variables and some of these can be substantial for Aboriginal respondents (e.g. level of qualification had a 13.5% non response rate and personal income was 12.1%) but there is no way to adjust for these other than omitting non-response from the calculation of rates. There are issues too with the completeness of administrative data in so far as they depend on consistent self-identification of individuals across very wide-ranging administrative settings, something that is far from certain.

Putting all of this together, it is clear that official data, especially from the five-yearly census, provide only an indication of what Aboriginal social indicators and their levels might be, albeit based on a fairly consistent set of definitions and administrative processes and a reasonably large sample of the likely true population. All of the data presented in this report, and in the original report, indeed in any report, are only approximations to the real people on the ground. Nonetheless, they remain the best available statistical product from a variety of administrative interactions between individuals and the State. Any improvement in local data quality, content and focus awaits a shift towards greater Aboriginal ownership and control of data design and gathering processes (Kukutai and Taylor 2016).

2. Population change

The impact of mining investment and associated economic activity in the Pilbara over the past 15 years is most clearly manifest in substantial increases in both resident and temporary Aboriginal and non-Aboriginal populations. In discussing and measuring change in these populations it is necessary to be clear about definitions as a range of counts and estimates are available. For example, each census produces a *de facto* count of people who are present in the region on census night. Then, there is a *de jure* count of people across Australia who indicate the Pilbara as their usual place of residence on census night regardless of where they are actually counted. Finally, the ABS publishes post-census estimates of Aboriginal and non-Aboriginal resident populations of the Pilbara in recognition of the fact that errors occur in each census enumeration. It should also be noted that the WA Department of Health (DOH) develops its own set of estimates of the Aboriginal and non-Aboriginal populations of the Pilbara by using ABS post-censal calculations as the base and updating these each subsequent year using regional births and deaths (but not migration) data. In the present assessment of population change, and throughout the report, each of these measures will be examined and applied as appropriate, although analyses of change in key indicators are invariably based on population data representing those who indicate the Pilbara as their usual place of residence.

A key measure, then, is the five-yearly census count of usual residents. This is shown for each of the past four censuses in Table 2.1. Overall, the count of Pilbara usual residents increased by as much as 60% from 37,135 in 2001 to almost 60,000 in 2016. Percentage increases in the Aboriginal and non-Aboriginal components of this population were also substantial at 49% and 48% respectively. The balance of this population increase was comprised of individuals who did not respond to the question on Indigenous status on the census form – this number also increased from 2,812 in 2001 to 8,794 in 2016. As a consequence of this latter category (and other factors of census error), it has never been possible to fully establish the ‘true’ size of the Aboriginal population of the Pilbara (or anywhere in Australia for that matter). However, if we discount these non-responses, we can say that Aboriginal people comprised an estimated 16.2% of the usual resident count of the Pilbara in 2001 and that by 2016 this had increased only slightly to 16.4%.

Table 2.1 Aboriginal and non-Aboriginal usual resident counts, Pilbara region 2001-2016

Year	Aboriginal	Non-Aboriginal	Not stated	Total
2001	5,579	28,744	2,812	37,135
2006	5,632	28,533	6,836	41,001
2011	7,212	41,633	11,051	59,896
2016	8,308	42,451	8,786	59,545

Source: ABS Census of Population and Housing 2001, 2006, 2011 and 2016

As mentioned, the ABS does adjust census counts using estimates of the impact of census error such as net undercount of the population and non-response to the question on Aboriginal and Torres Strait Islander status. Sometime (usually two years) after each census it releases small area Estimated Resident Population (ERP) figures for Indigenous and non-Indigenous populations and it has done this for Pilbara Local Government Areas since 1986, although figures for 1981 were also produced internally. Since 2006, estimates by age breakdown have only been available for the South

Hedland Indigenous Region (this area includes the Pilbara plus Exmouth and so covers a slightly wider area). However, this only creates a very small addition to the Aboriginal population estimates and so these data provide the best available measure of changing age distributions in the Pilbara. They are used in this report to adjust census counts as appropriate through to 2016.

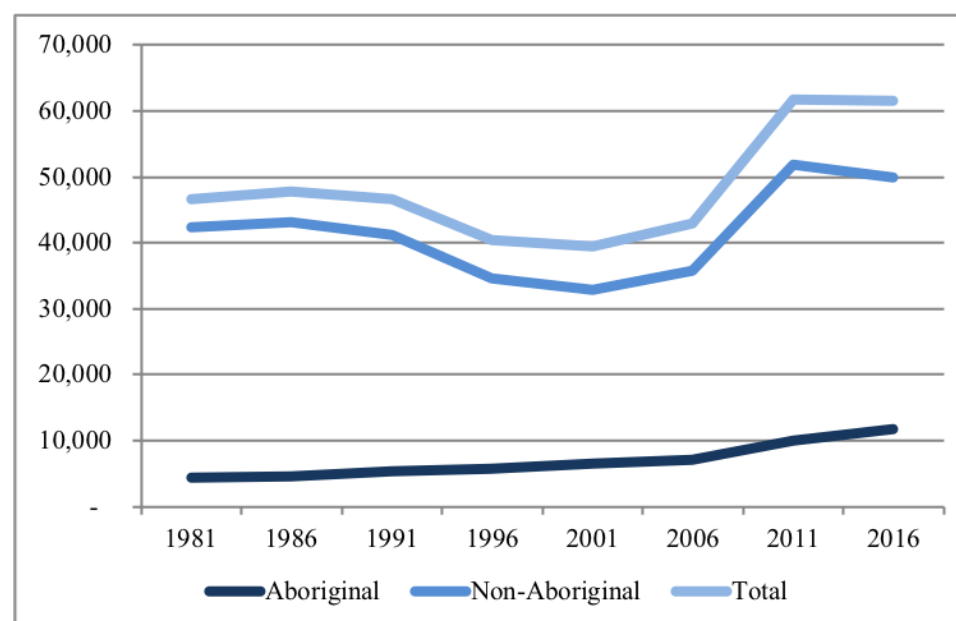
Figure 2.1 and Table 2.2 show how these resident population estimates have changed over the 30-year period to 2016. After a period of relative stability in the 1980s, the 1990s witnessed a decline in numbers of non-Aboriginal residents and a steady but slow rise in Aboriginal numbers. Since 2001, however, and especially since 2006, the number of non-Aboriginal residents increased dramatically reaching almost 52,000 in 2011 while an upswing in Aboriginal population was also evident with an estimate in the same year of almost 10,000. Since then non-Aboriginal numbers have declined while the Aboriginal population has continued to rise sharply reaching almost 12,000 by 2016 (Figure 2.2). Overall, the population of the Pilbara was essentially unchanged in 2016 compared to 2011. Also shown in Table 2.2 is the Aboriginal share of the Pilbara population. This has steadily increased since 1981 and now sits at almost one-fifth (19%).

Table 2.2 Aboriginal, non-Aboriginal and total Estimated Resident Populations: Pilbara region 1981 to 2016

	Aboriginal	Non-Aboriginal	Total	Aboriginal % of total
1981	4,336	42,294	46,630	9.3
1986	4,582	43,147	47,729	9.6
1991	5,400	41,150	46,550	11.6
1996	5,721	34,705	40,426	14.2
2001	6,514	32,947	39,461	16.5
2006	7,141	35,759	42,900	16.6
2011	9,926	51,851	61,777	16.1
2016	11,716	49,823	61,539	19.0

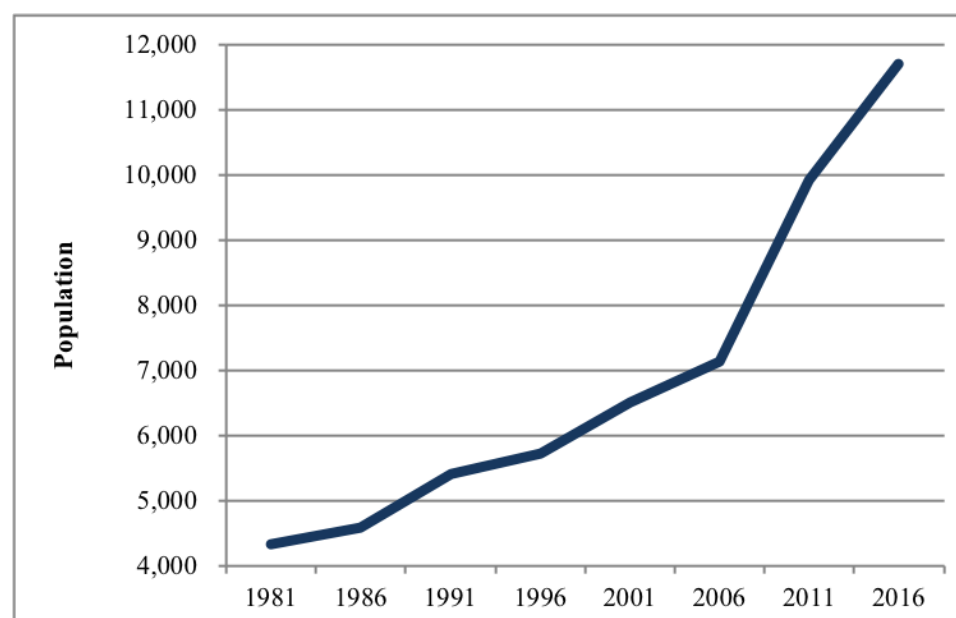
Source: Taylor and Scambary 2005; ABS Catalogue nos. 3230.0, 3231.0, 32380.0, 3238.0.55.001, 3238.0.55.00

Figure 2.1 Aboriginal, non-Aboriginal and total Estimated Resident Populations: Pilbara region 1981 to 2016



Source: ABS Catalogue nos. 3230.0, 3231.0, 3238.0.55.001, 3238.0.55.002

Figure 2.2 Aboriginal resident population estimates: Pilbara region 1981 to 2016



Source: Taylor and Scambray 2005; ABS Catalogue nos. 3230.0, 3231.0, 3238.0.55.001, 3238.0.55.002

While these ABS estimates are the official figures for the Aboriginal population of the Pilbara they raise a number of concerns about the capacity of the Bureau of Statistics (or any other agency of government for that matter) to adequately enumerate Aboriginal residents of the Pilbara. This problem is indicated by the widening gap over time between the numbers counted at each census and the adjustments made to those counts to produce estimates of the population. Table 2.3 and Figure 2.3 show the proportional and numeric size of this growing gap in the Pilbara since 2001. In 2001, the estimated Aboriginal population was almost 17% higher than the population counted on census night. At the time, this seemed a substantial adjustment to make as it meant that a

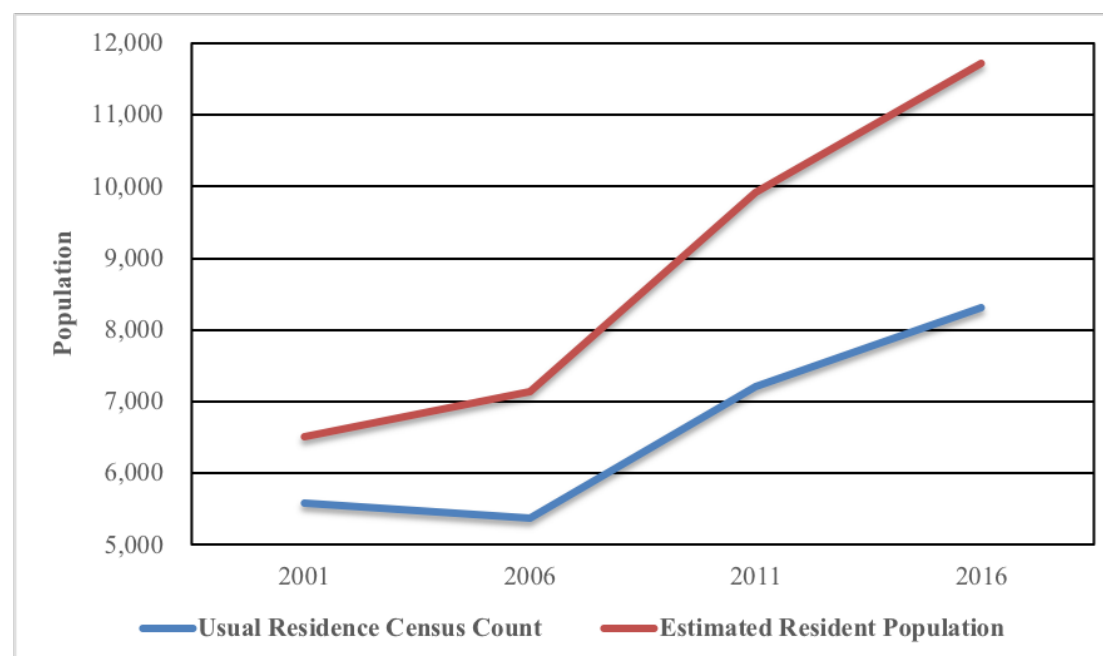
sizeable proportion of the population had not been counted in the census. The surprise, then, is to find that this proportion has risen steadily since that time despite the fact that the ABS has committed more and more resources to remote area enumeration. By 2016, the estimated Aboriginal population of the Pilbara was fully 41% higher than the census count! How does one interpret any demographic and social and economic data drawn from barely half of the population other than to regard these as the product of a sample survey rather than a census, albeit one in which any selection bias (short of age and sex) is unknown? Likewise, estimates from sample surveys are typically accompanied by standard errors in order to judge their utility but such measures of confidence are not provided for the Pilbara population estimates. As if these analytical and policy dilemmas were not enough, there are others too.

Table 2.3 Difference between Aboriginal usual residence census counts and Aboriginal estimated resident populations: Pilbara region, 2001-2016

	Usual residence census count	Estimated resident population	Difference	% Difference
2001	5,579	6,514	935	16.8
2006	5,373	7,141	1,768	32.9
2011	7,207	9,926	2,719	37.7
2016	8,314	11,716	3,402	40.9

Source: ABS Census of Population and Housing 2001, 2006, 2011 and 2016, ABS Catalogue no. 3238.0.55.001

Figure 2.3 Aboriginal census counts and estimated resident populations: Pilbara region 2001-2016



Source: ABS Census of Population and Housing 2001, 2006, 2011 and 2016, ABS Catalogue no. 3238.0.55.001

Partly because the ABS only develops estimates of Indigenous and non-Indigenous populations every five years and then makes these available for regions only two years

after each census, the WA Department of Health (DOH) has taken to creating its own annual regional estimates of these populations in order to have regular and more up-to-date metrics. Currently (2016), the DOH estimates point to a total resident population in the Pilbara of over 66,000 with the Aboriginal portion of this at 10,600 (Table 2.4). Clearly, these estimates are at odds with official ABS estimates – DOH figures have the Aboriginal population barely rising since 2011 while ABS figures show a sharp increase; DOH figures show a slight rise in non-Indigenous population (to 55,829) while ABS estimates indicate a noticeable decline (to 52,527). Also, using DOH figures, the Aboriginal share of the Pilbara population in 2016 was 16.0% whereas using ABS estimates it was 18.4%.

The reason for these discrepancies is no doubt to be found in the different methodologies applied with the ABS figures heavily influenced by estimates of census undercount and the DOH figures based solely on annual data on births and deaths. Nonetheless, the ABS estimates are the ones applied in Commonwealth Grants Commission assessments and they exist as the ‘official’ population data. As such, they are the preferred data for the current analysis. Having said that, there is clearly an unresolved public policy issue if two such separate estimates on regional population exist – which one to use and why? To answer this, some benchmarking against administrative data sets can be conducted but even here there is no guarantee that these refer to the same populations.

Table 2.4 Western Australia Department of Health estimates of Aboriginal and non-Aboriginal populations: Pilbara region 2011-2016

Year	Aboriginal	Non-Aboriginal	Total
2011	9,926	51,851	61,777
2012	10,052	54,112	64,164
2013	10,161	56,033	66,194
2014	10,331	55,973	66,304
2015	10,459	55,400	65,859
2016	10,594*	55,829	66,423

Source: WA Department of Health

* 2016 estimate based on a calculation by the Aboriginal Policy Unit of the WA Department of Premier and Cabinet

Inter-regional migration

The census question on usual place of residence 5 years ago provides for the calculation and analysis of movement in and out of the Pilbara between each census as well as the degree to which people remain resident within the Pilbara. Table 2.5 shows the proportions that remained as Pilbara residents between each census period. This shows clearly that Aboriginal residents are consistently more stable in their residence although the proportion remaining within the Pilbara has reduced over time. More noticeable is the fact that less than half of the non-Aboriginal population remained in the Pilbara between 2011 and 2016. Accordingly, more than half of the non-Aboriginal population in 2016 (53%) were new migrants from elsewhere (this is net of those aged 0-4 years in 2016 as well as those who did not state their usual place of residence 5 years ago). Clearly, population turnover in the region, especially for the non-Aboriginal population, is very high.

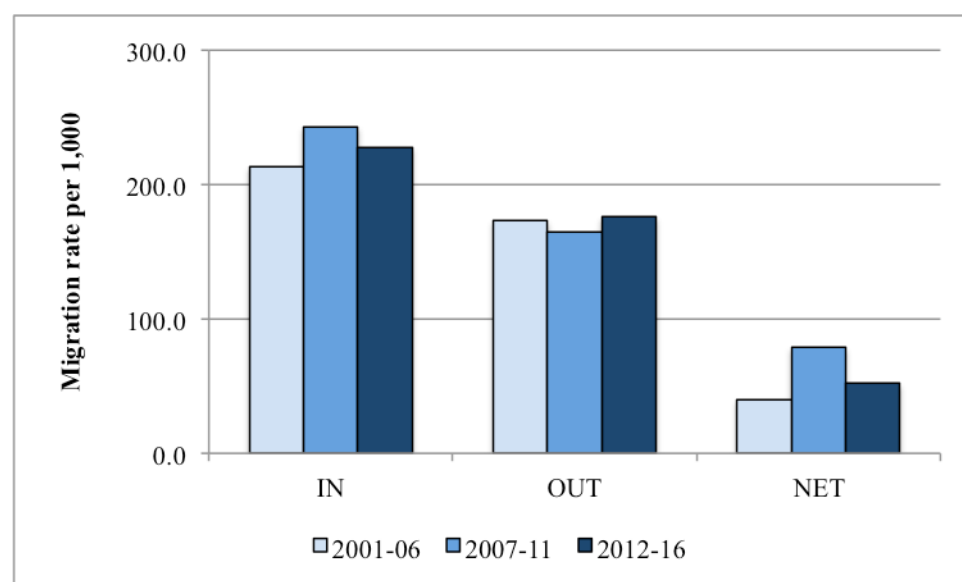
Table 2.5 Proportions of Aboriginal and non-Aboriginal populations remaining resident in the Pilbara region between census counts: 2001-2016

	2001-06	2006-11	2011-16
Aboriginal	84.1	82.5	77.2
Non-Aboriginal	50.4	52.0	46.8

Source: ABS Census of Population and Housing 2006, 2011 and 2106

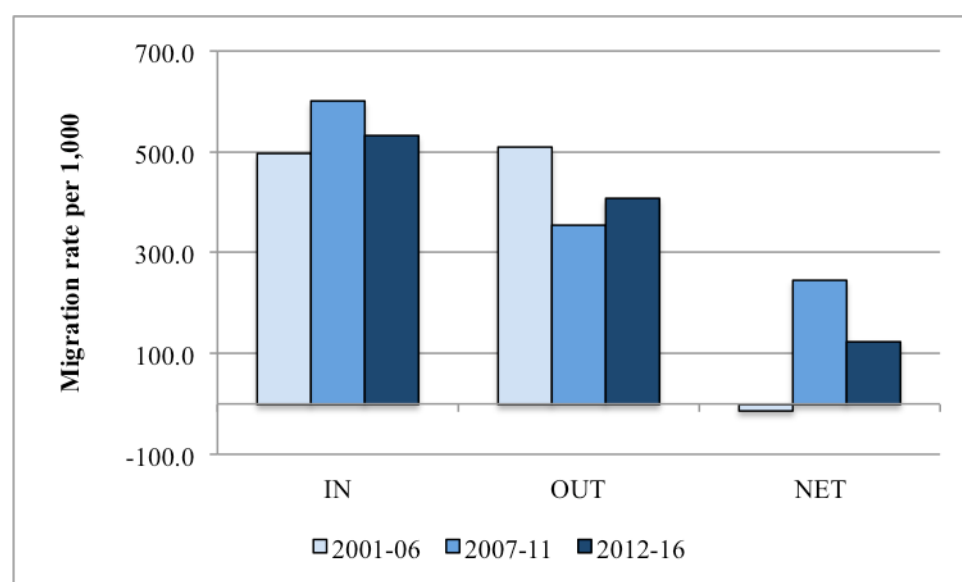
Figures 2.4 and 2.5 show the changes to in- and out-movement rates as well as net rates between 2001 and 2016. The results confirm the characterisation of the Pilbara as a high population growth/high population turnover region with large movements in and out. Of particular interest is the net balance of these movements as these have been positive throughout the period, although non-Aboriginal net migration was slightly negative between 2001 and 2006. The point to note for understanding recent population change and likely shifts in population levels is that net migration peaked for both Aboriginal and non-Aboriginal populations between 2006 and 2011 and while it has fallen back since then, over the period 2011 to 2016 it has remained notably positive. While the impact of the mining boom is most evident in the rise in net migration during 2006-2011, the region does appear to have retained its attraction as a destination despite some falling away in economic activity. Interestingly, this observation tends to support the idea embodied in the DOH population estimates that numbers increased in recent years and then held steady.

Figure 2.4 Aboriginal migration rates: Pilbara region, 2001-2016



Source: ABS Tablebuilder Pro 2006, 2011 and 2016

Figure 2.5 Non-Aboriginal migration rates : Pilbara region, 2001-2016

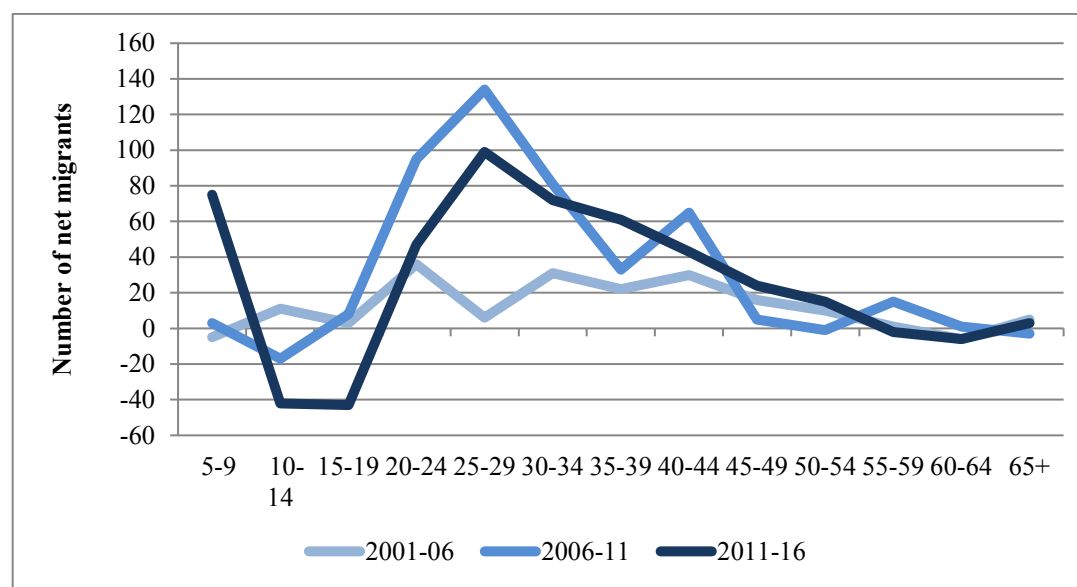


Source: ABS Tablebuilder Pro 2006, 2011 and 2016

The age pattern of this net migration is shown in Figures 2.6 and 2.7 and interesting similarities and differences emerge between Aboriginal and non-Aboriginal populations. Leaving aside the obvious difference in the size of net flows, both populations show net gains concentrated in the prime working age group of 20-39 years no doubt associated with employment. Also of note are net losses among teenagers suggestive of out-migration for schooling. However, some evidence of recent Aboriginal family migration is suggested by net gains in 2011-2016 among Aboriginal children of primary-age and sustained higher gains among those in parental ages of 30-40 years. At the other end of the age distribution net migration has been consistently low (Aboriginal) or negative (non-Aboriginal) beyond 55 years of age. The other common feature is a correlation between net flows and business cycles with the rise

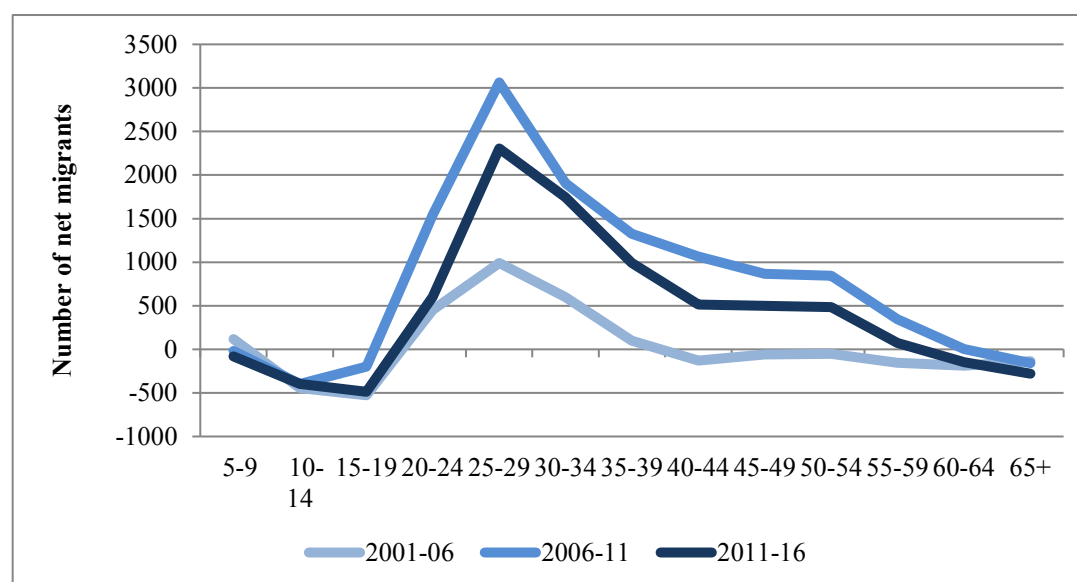
and fall in net gains between 2001 and 2016 following the tempo of economic activity. As a broad generalisation, over the 15-year period these patterns are suggestive of the movement into the Pilbara of mostly single persons of prime working age as well as some Aboriginal families. They also point to movement out of the Pilbara for high school as well as movement out for retirement in later years especially among the non-Aboriginal population.

Figure 2.6 Aboriginal net migration by age: Pilbara region, 2001-06 to 2011-16



Source: ABS Tablebuilder Pro 2006, 2011 and 2016

Figure 2.7 Non-Aboriginal net migration by age: Pilbara region, 2001-06 to 2011-16



Source: ABS Tablebuilder Pro 2006, 2011 and 2016

Temporary populations

Whatever the best estimates of the resident population might be, it is true that the population actually present in the Pilbara at any given time is invariably much higher

than this since the population present includes usual residents plus individuals whose usual residence is elsewhere but who find themselves in the Pilbara on a temporary basis as workers, as accompanying family members or as visitors. At census time this population is counted according to their place of enumeration. In 2016, this overall number amounted to 84,808 (Table 2.6).

As indicated, by comparison with Table 2.1, this place of enumeration count was substantially higher than the number who nominated the Pilbara as their place of usual residence. This was notably the case among those identifying as non-Aboriginal. Also noticeable in the place of enumeration count is much higher non-response to the census question on Aboriginal status, especially in recent census years, making a determination of the 'true' number of Aboriginal people in the Pilbara at any given time all the more difficult. Nonetheless, if we discount these non-responses, the Aboriginal share of the census population present in the Pilbara at census time appears to have dropped from 14.6% in 2001 to 13.0% in 2016 which would seem to tally with the known influx of large numbers of non-Aboriginal temporary workers over this period. This issue is explored further in the section on labour force change.

Table 2.6 Aboriginal and non-Aboriginal Place of Enumeration counts: Pilbara region, 2001 to 2016

Year	Aboriginal	Non-Aboriginal	Not stated	Total
2001	5,736	33,622	3,053	42,411
2006	5,686	35,690	9,665	51,041
2011	7,511	55,469	16,886	79,866
2016	8,957	60,148	15,703	84,808

Source: ABS Census of Population and Housing 2001, 2006, 2011 and 2016

Population distribution

Despite substantial population growth since 2001, the distribution of population within the Pilbara has altered far less. Notwithstanding unprecedented expansion of employment opportunities and regional investment in capital works, housing construction and service provision, the geographic foundations for this were already largely in place by 2001. Essentially, the settlement structure of the Pilbara remains underpinned by a series of inland mines linked by rail to coastal bulk-handling and shipping operations. Around this a number of coastal service/residential towns have emerged while remaining settlement is comprised mostly of inland mining towns, widely dispersed Aboriginal communities and pastoral properties. Most population growth has grafted on to this existing pattern although some variation in the rate of growth is evident by Local Government Area and individual location. If we look at Local Government Areas first, Tables 2.7 and 2.8 show the absolute and percentage change in usual resident counts between 2006 and 2016 (2001 usual resident counts are not available as ABS standard output). While Karratha and Port Hedland shires remain the most populous, accounting for 60% of the total regional population in 2016, this share was down from 69% in 2006 due to the relatively high growth in numbers in Ashburton shire followed by East Pilbara. Most Aboriginal usual residents are also still found in Karratha and Port Hedland but this proportion has remained more or less unchanged at 63%.

Table 2.7 Aboriginal and non-Aboriginal usual residence counts: Pilbara Shires, 2006 and 2016

	Aboriginal		Non-Aboriginal		Total*	
	2006	2016	2006	2016	2006	2016
Ashburton	585	1,023	4,866	9,841	6,078	13,026
East Pilbara	1,429	2,073	4,109	6,513	6,544	10,591
Karratha	1,831	2,801	12,489	16,154	16,423	21,473
Pt. Hedland	1,786	2,411	7,072	9,944	11,599	14,469
Total	5,631	8,313	28,536	42,451	40,644	59,555

Source: ABS Census of Population and Housing 2016

* includes Indigenous status not stated

Table 2.8 Percentage change in Aboriginal and non-Aboriginal usual residence counts: Pilbara Shires, 2006-2016

Local Govt. Area	Aboriginal	Non-Aboriginal	Total*
Ashburton	74.9	102.2	114.3
East Pilbara	44.9	58.5	61.8
Karratha	53.0	29.3	30.7
Port Hedland	35.2	40.6	24.7
Total	47.6	48.8	46.5

Source: ABS Census of Population and Housing 2006 and 2016

* includes Indigenous status not stated

As for individual localities within the Pilbara, Table 2.9 shows the rank order of Aboriginal usual residence counts in 2016 using the ABS' 'Indigenous Location' (IL) classification together with equivalent non-Aboriginal counts. Also provided are the 2006 census counts of Aboriginal population in order to provide some basis for assessing change over time (2001 usual residence counts are not available for these detailed geographies).

Clearly, there has been some shift in distribution towards larger urban centres with South Hedland and Karratha accounting for 42% of Aboriginal Pilbara residents in 2016 compared to 34% in 2006. There has also been growth in inland towns such as Newman, Tom Price and Paraburdoo. Elsewhere, population change has been more modest with actual reductions in the census count at Port Hedland and Roebourne. While some remote communities also recorded a reduction in their population count (Parnngurr and Injudunna), for the most part these settlements recorded little change. The apparent substantial growth in Cheeditha-Mingullatharndo simply reflects a census boundary change so the actual change at Cheeditha is unknown using census data. Overall, there appears to have been a growing concentration of Aboriginal residence in larger more urbanised locations no doubt as people have followed or been directed by the availability of housing, services and jobs.

Table 2.9 Rank order of Aboriginal Usual Residence counts by Indigenous Location (ILO): Pilbara region, 2006 and 2016

Indigenous Location	Aboriginal 2006	Aboriginal 2016	Non- Aboriginal 2016	Not stated 2016	Total 2016
South Hedland	1,193*	1,904 (+)	6,115	1,447	9,471
Karratha	742	1,600 (+)	12,454	1,767	15,828
Newman	284	589 (+)	3,268	717	4,567
Exmouth/Ashburton - surrounds	258	541 (+)	8,582	1,940	11,057
Cheeditha – Mingullatharndo	59	416 (+)	842	51	1,312
East Pilbara – surrounds	270	385 (+)	3,030	1,225	4,642
Roebourne	526	357 (-)	119	35	511
Jigalong	254	308 (+)	16	18	333
Wickham	288	298 (+)	1,023	252	1,572
Port Hedland exc. Tjalka Boorda	309*	253 (-)	3,547	550	4,348
Tom Price	158	240 (+)	2,024	224	2,490
Onslow	192	181 (-)	569	97	848
Kiwirrkurra	131	154 (+)	10	0	164
Punmu	69	138 (+)	5	0	145
Port Hedland – surrounds	71	131 (+)	276	112	509
Paraburdoo	82	124 (+)	1,090	144	1,359
Parnngurr	170	122 (-)	14	15	153
Mugarinya (Yandeyarra)	101	118 (+)	11	3	126
Nullagine	108	103 (-)	73	15	194
Marble Bar - Mirtunkarra	66	101 (+)	82	18	200
Warralong	96	100 (+)	7	3	113
Kunawarritji	84	74 (-)	6	3	83
Injudunna	149	74 (-)	26	16	117
Dampier	28	52 (+)	1,693	390	2,139
Tjalka Boorda	76	10 (-)	0	3	14

Source: ABS Census of Population and Housing 2016

(+) = increase in population count; (-) = decrease in population count

* State suburb in ASGC

While Table 2.9 provides a more detailed sense of the geography of population change, what it does not reveal is the extent of this in the smaller Aboriginal communities and town-based reserves across the Pilbara. The Indigenous Location geography from the ABS' Australian Indigenous Geographic Classification (AIGC) has been used in Table 2.9 because it represents the lowest available unit within census geography that is specifically intended to identify Aboriginal communities. Despite this, many communities are invisible using these data – they are subsumed under the 'Exmouth/Ashburton – surrounds', 'Port Hedland – surrounds', 'East Pilbara – surrounds', and 'Dampier' Indigenous Locations. In 2016, these areas collectively accounted for 13% of the Pilbara Aboriginal population, up from 11% in 2006.

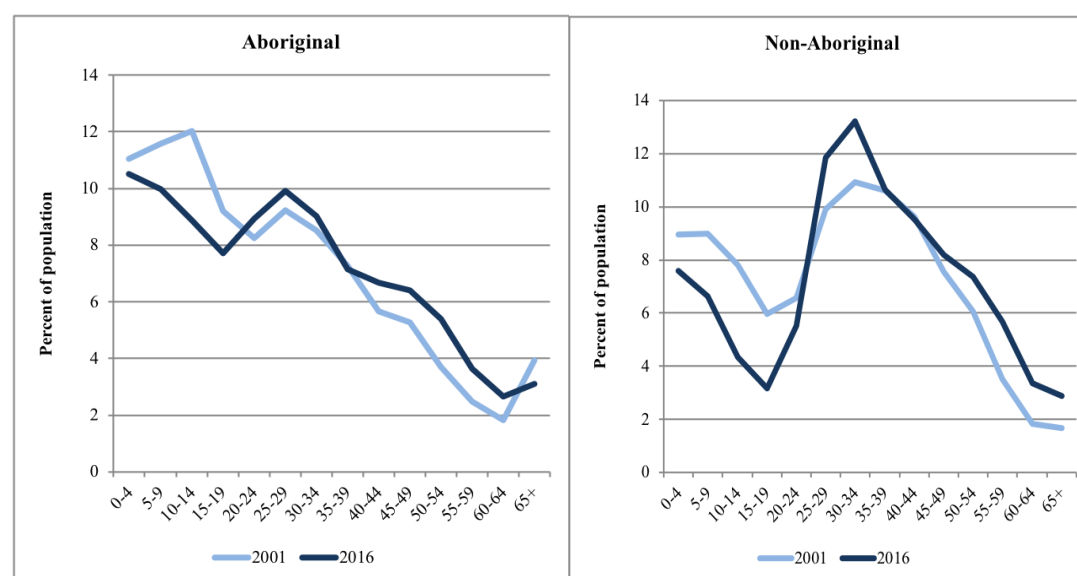
In 2001, a total of 30 discrete Aboriginal communities were reported across the Pilbara by the ABS' Community Housing and Infrastructure Needs Survey (CHINS) but only 10 of these are identified by the IL geography reported in Table 2.9 while three more have emerged since. Unfortunately, the CHINS was abandoned after the 2006 Census following the demise of the Aboriginal and Torres Strait Islander Commission (ATSIC) and so the data in Table 2.9 are now the best remaining data source on community population change. Precisely what has occurred in the 20+ communities that are not listed in Table 2.9 is a moot point and one that is of interest in the context of the regional services reform process since the so-called 'Road Map' for reform uses a population minimum of 50 persons as one of its criteria for investing in services and capital works.

Advice from the Department of Communities is that they generally have an underreporting of population through their head tenant rent collection model and due to the transient nature of many tenants. Furthermore, they tend to rely on the census for population data and, in any event, they no longer have service responsibilities for the majority of communities. As a consequence, despite considerable growth in the Aboriginal population of the Pilbara since the Taylor and Scamby report (2005), and despite heightened policy interest in their circumstances, we now have less overall data and less reliable data on numbers and distribution than we did in the past.

Age composition

A key component of demography that has major implications for development planning is age structure. This is also a component that can radically change over time as a consequence of age-selective net migration as well as variable mortality and fertility. Figure 2.8 reveals changes in the age distribution of Aboriginal and non-Aboriginal estimated resident populations of the Pilbara between 2011 and 2016.

Figure 2.8 Age distribution of Aboriginal and non-Aboriginal estimated resident populations: Pilbara region* 2011 and 2016



Sources: ABS 2003, 2018a

*South Hedland Indigenous Region

The Aboriginal population shows clear signs of ageing with a much flatter curve in 2016 due to reductions in the percentage of the population in age groups under 19 years and increases in age groups above 40 years. A similar pattern of ageing is evident for the non-Aboriginal population although here the change is more emphatic with a marked reduction in the proportion of the population aged 0-19 years and increases in population share most noticeable among those aged 25-34 years and to a lesser extent among older age groups beyond 40 years. The overall shift in the age structure of the non-Aboriginal population underscores the role played by net inward migration especially in working-age groups. While some of this same influence is evident for the Aboriginal population it has clearly been less prominent. Of particular interest is change in the proportion of the population of working-age as opposed to those of young and

old age. As this proportion increases there is greater potential for an economic dividend, as we shall discuss.

One consequence of these changes in age structure is a shift in the Aboriginal population share of each age group resident in the Pilbara. Table 2.10 shows these shifts for males and females in 2001 and 2016. Differential changes in Aboriginal and non-Aboriginal age structure meant that by 2016 Aboriginal males and females comprised a notably higher share of the infant, school-age and young working-age populations aged 0-24 years than they did in 2001. This was also the case for working-age Aboriginal males except among 25-34 year-olds. Aboriginal females increased their share of every age group up to 60 plus. In 2001, fully one quarter of males in the Pilbara aged over 65 years were Aboriginal, by 2015 this had reduced to just 13%. Likewise with females – Aboriginal women constituted a sizeable share of the aged population 60 years and above in 2001 but this share was much reduced by 2016. The lower increase in representation of Aboriginal males in the population overall compared to that of Aboriginal females is a measure of the predominance of non-Aboriginal males among workers migrating to the Pilbara since 2001.

Table 2.10 Aboriginal male and female percentage shares of resident population by five-year age groups: Pilbara region 2001 and 2016

Age group	Males		Females	
	2001	2016	2001	2016
0-4	19.1	23.6 ↑	20.1	23.9 ↑
5-9	20.3	25.2 ↑	20.3	25.2 ↑
10-14	23.5	31.1 ↑	23.1	31.8 ↑
15-19	22.3	35.1 ↑	24.7	35.6 ↑
20-24	18.6	26.6 ↑	21.4	26.8 ↑
25-29	15.5	14.8	15.6	17.4 ↑
30-34	12.7	11.6	14.1	15.9 ↑
35-39	11.1	11.4 ↑	12.9	16.1 ↑
40-44	9.0	12.3 ↑	12.3	16.2 ↑
45-49	10.0	12.0 ↑	15.2	20.2 ↑
50-54	8.6	10.6 ↑	14.0	20.3 ↑
55-59	10.2	9.9	15.7	17.5 ↑
60-64	9.9	11.6 ↑	27.1	21.0
65+	25.0	13.3	39.8	28.5
Total	15.2	16.2 ↑	18.1	21.5 ↑

Based on ABS 2003 and 2018a

↑ *Aboriginal share of age group increased*

As for age groups that typically form the target of policy intervention, changes here are shown in Table 2.11. Selection of these groupings is dictated somewhat by the availability of population estimates at five-year intervals only. Thus, the infant years leading up to compulsory schooling are identifiable as 0-4 years, but for the years of compulsory schooling we are forced to use 5-14 years, whereas compulsory schooling in Western Australia now extends to 17 years. Thereafter, we can identify the approximate transition years from school to work as ages 15-24 years, while the prime working-age group is identified here as ages 25-54. Typically in the Australian workforce, and in International Labour Organisation convention, working-age extends to 64 years with those over 65 years representing the aged and pensionable. However, health conditions associated with ageing often affect Aboriginal people earlier than other Australians. Consequently, the Commonwealth provides access to aged care services at 50 years of age for Aboriginal people in comparison to 65 years for the

broadier population. Nonetheless, many Aboriginal people over the age of 50 years are actively engaged in employment in the Pilbara and so some concession is made for this with the lower limit for the 'aged' population in Table 2.10 set at 55 years.

The first observation is that the size of all age groups has increased substantially since 2001. However, the greatest numeric and proportional growth has occurred among those of prime working-age between 25 and 54 years, while the aged population over 55 years has more than doubled in size. By comparison, growth of the school-age group has been relatively minor. As noted, this partly reflects the impact of migration to and from the Pilbara which resulted in substantial net migration gains in the working-age groups and net losses in young age groups over each census period (Figure 2.6). This lower growth of school age numbers may also, in part, reflect school-age children conducting their studies away from the Pilbara, especially in Perth and surrounds. For children away at boarding institutions on census night it is ABS practice to assign usual residence status to the location of the institution and not to the home base. The other feature, of course, is the large proportional increase in the population aged over 55 years which a burgeoning working-age group can only serve to further augment over time, unless there is a rise in net out-migration among the elderly in future years. From the evidence of the past three census rounds (Figure 2.6) such retirement migration is plausible for non-Aboriginal residents but not for Aboriginal residents.

Table 2.11 Change in the Pilbara* Aboriginal resident population by policy-relevant age groups: 2001-2016

Age group	2001	2016	Change (n)	Change (%)
0-4	720	1,239	519	72.1
5-14	1,538	2,223	685	44.5
15-24	1,137	1,967	830	73.0
25-54	2,582	5,261	2,679	103.7
55+	537	1,110	573	106.7
Total	6,514	11,800	5,286	81.1

Source: ABS 2003, 2018a

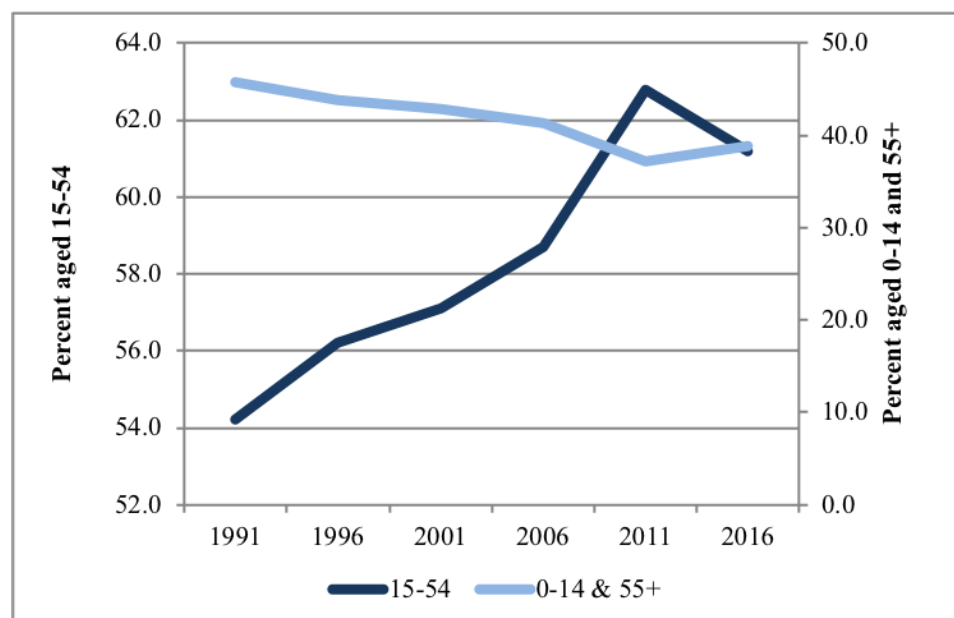
*2016 data based on South Hedland Indigenous Region

Demographic dividend

This structural 'ageing' of the population has very strategic social and economic planning implications for the RIC since it signals the presence of potential 'demographic dividend'. This notion of demographic dividend refers to that period in the middle of the transition of a population from being predominantly 'young' to being predominantly 'old', when the bulk of the population is found in the key workforce age groups between 15 and 54 years (usually 15-64 years but we use 15-54 here for reasons already explained). During this period, employment, earnings and investment levels are potentially maximised and economic dependency ratios are potentially minimised. The term 'potentially' is critical here since these outcomes do not occur of their own accord – they require deliberate foresight, strategic planning and investment. Australia as a whole has exited this phase of transition having commenced its progression in the 1960s with positive economic impacts due to high rates of education and labour force participation that accompanied the bulge in working-age population (Jackson and Felmingham 2004). While calculations of demographic dividend are typically applied at national levels and for whole populations, the logic can still apply at the regional

level and for sub-populations. Consequently, a key measure to establish is the trend in the working-age proportion of the Pilbara Aboriginal population. This is shown in Figure 2.9 since 1991 with the corresponding proportion in the dependent ages of 0-14 and 55+ included on a secondary axis for comparative purposes.

Figure 2.9 Demographic dividend: proportion of Aboriginal population aged 15-54 in the Pilbara region, 1991-2016



Source: ABS 2003, 2018a

With 20 years-worth of data to hand, we can now see that the Aboriginal population of the Pilbara may have already passed through the phase of potential demographic dividend with the share of the population in the prime working-age group that had increased steadily for much of this period now showing signs of waning. Ultimately, expansion of the working-age group does have a limit and this may well have been reached as the relative size of the young and aged population (mostly the latter) has recently increased. Whether or not policy-makers in Western Australia have been aware of this opportunity presented by Aboriginal demographic change is unclear. Certainly the issue has been tabled in the Indigenous policy literature (Jackson 2008, 2016; Biddle and Taylor 2012: 581-3) but the key government documents that examine the economic implications of demographic change (successive Federal Treasury *Intergenerational Reports*) have not even mentioned Aboriginal people, let alone related issues of demographic dividend, as they have been focused solely on impacts for the whole population and therefore more concerned with issues to do with funding retirement and aged care. That is not to say that efforts to maximise Aboriginal employment and workforce readiness have not been made. Rather, it is to point out that scrutiny of these efforts and their effectiveness becomes much more of an imperative and part of a business case for investment in human capital when framed within the notion of a demographic dividend. If anything, the likelihood that the related phase of demographic transition may now have been completed simply makes scrutiny of this 'lost' opportunity all the more urgent.

Population projections

There are no formally accepted rules or procedures for demographic projection. Rather, there exists a large body of professional literature which is concerned with the computation of future populations and which collectively contains a set of guidelines that are generally accepted as representing good projection practice. Among these is the well-established principle that the accuracy of projections diminishes with time. It is also well established that projections for large populations are more reliable than those for small populations. With these understandings in mind it is wise to consider any projections as mere forecasts of what outcomes might prevail if the assumptions governing the computation of future numbers were to persist. The simple fact is that projections of Aboriginal populations in Australia have tended to be less than accurate. For example, we now know that the projection of Aboriginal population in the Pilbara to 2016 based on known parameters in 2001 (Taylor and Scambary 2005) was short by almost 20%. To some degree, though, this misses the point. The real importance of projections is not so much their ability to accurately predict, it is rather that they focus the policy-mind on possible future scenarios and bring an empirical quantum to discussion of future needs.

The most accurate and useful projections for these purposes are those that account for the effect of changes in population age structure and the manner in which these changes interact with other demographic processes. Accordingly, the cohort component method, as it is called, is the most commonly used form of population projection. It examines separately the three components of population change—mortality (survival), fertility, and net migration. Rates for these components of change are applied to each cohort of a base population, resulting in a set of projections over a specified time period. The process is iterative over the projection period. This is the method used by the ABS in preparing its current round of official projections for the Aboriginal population of the Pilbara to 2026 using the 2011 ERP as the base (ABS 2014). It should be noted that these are the only official projections currently available.

Table 2.12 provides these ABS projections of the Aboriginal population for the South Hedland Indigenous Region to 2026 according to the social policy age categories discussed above. Series B projections are presented which means that the assumptions driving the projections include a decline in Aboriginal female fertility rate of 0.5% per annum, an increase in Aboriginal male paternity rate of 1.0% per annum, a rise in life expectancy at birth of 0.2 years per year for males and 0.15 years per year for females, and constant inter-regional net migration rates as observed at the 2011 Census. Given the likely slow-down in population growth between 2011 and 2016 indicated in Table 2.3 and the ABS' own annual estimates of population since 2011, the most problematic of these assumptions is the latter one regarding constant net migration rates. Even if this were to hold, it is likely that the projections in Table 2.12 represent some sort of upper limit on likely outcomes. Nonetheless, they do provide some basis for contemplating the future size and composition of the population.

Table 2.12 ABS Series B projections of Aboriginal resident population in the South Hedland Indigenous Region 2011-2026 by select policy age groups

Age group	2011	2026	Change (n)	Change (%)
0-4	966	1,596	630	65.2
5-14	1,977	2,437	460	23.3
15-24	2,006	2,009	3	0.5
25-54	4,281	7,680	3,399	79.4
55+	784	1,488	704	89.8
Total	10,014	15,210	5,196	51.9

Source ABS 2014.

With this upper-limit proviso in mind, the scenario is for continued high population growth with a 50% increase in overall numbers by 2026. The greatest proportional increase is in the oldest age group with the prime working-age group of 25-54 not far behind. Overall, those in this prime working-age group will account for two-thirds of the projected population increase. One notable feature is the relative lack of growth in the 15-24 age group. This is especially so among 15-19 year-olds and it likely reflects the relatively small younger age cohorts from 2011 working their way through the population, combined with net migration loss.

3. Aboriginal participation in the regional labour market

A key finding from the previous report on Aboriginal participation in the Pilbara labour market (Taylor and Scambary 2005) was that despite substantial growth in economic activity and employment opportunity in the region since the 1960s the overall employment rate for Aboriginal residents had risen only slightly from 38% of all adults in 1971 to just 42% by 2001. Furthermore, such employment growth as had occurred among Aboriginal people was due largely to an expansion of the Community Development Employment Projects (CDEP) scheme meaning that much of the opportunity presented by mainstream employment had largely bypassed the Aboriginal population. Since that time, the CDEP scheme has been disbanded and the Pilbara region has experienced further and unprecedented economic expansion. The question now arises as to whether Aboriginal people have been able to benefit from this more recent period of economic growth by improving their employment status.

Given the nature of the regional economy and its substantial reliance on non-resident workers, we have to be clear about which workforce population is being referred to in any analysis. Aside from resident workers there are many who are in the region on a temporary basis. This latter group includes many Fly-in/Fly-out (FIFO) workers with a residential base outside of the Pilbara as well as others who acquire short-term contract work or who service the region intermittently from elsewhere. Included, as well, are 457 visa holders whose residence is ostensibly overseas but who may well regard themselves as aspirant Australian residents. While such temporary workers experience high turnover, as a group they comprise an ever-present structural component of the regional labour market. Any discussion of workforce levels and composition must therefore, where appropriate, include such elements.

While this seems straightforward, accurate data on this mobile workforce is difficult to compile as it would ideally require the bringing together of disparate company and administrative records. As an alternative, census output since 2001 has included a 'Place of Work' variable which can be used to identify those whose place of work on census night was in the Pilbara but whose usual residence was elsewhere in Australia. However, this also reveals that some residents of the Pilbara do not work in the Pilbara. Thus, an accurate portrayal of the Pilbara labour market becomes an exercise in stock and flow accounting and Table 3.1 provides the beginning of such an analysis.

Table 3.1 Census counts of Aboriginal and non-Aboriginal workers employed in the Pilbara by usual place of residence 2011 and 2016

Usual place of residence	Place of work Pilbara 2011		Place of work Pilbara 2016	
	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal
Pilbara	1,774 (73%)	25,500 (58%)	2,269 (66%)	26,631 (47%)
Elsewhere	657 (27%)	18,111 (42%)	1,184 (34%)	29,490 (53%)
Total	2,431 (100%)	43,611 (100%)	3,453 (100%)	56,121 (100%)

Source: ABS Census of Population and Housing 2011 and 2016

This shows the usual residence of workers who were counted as being employed in the Pilbara on census night in 2011 and 2016 (equivalent data for 2006 are not available via Tablebuilder Pro). It reveals that in 2016 a total of 3,453 Aboriginal people had jobs in the Pilbara. However, only two-thirds of these (66%) were residents of the Pilbara, the remaining one-third were usual residents of somewhere else. Most of those from

outside the Pilbara came from Perth and the south west of WA (74%), a further 12% came from the rest of WA and 14% came from other States in Australia. These 1,184 workers are, by definition, in the Pilbara on a temporary basis and no doubt constitute much of the Aboriginal FIFO workforce. The point of interest in Table 3.1 is that the proportion of such workers in the Aboriginal workforce increased from 27% in 2011 to 34% in 2016. If we look at the non-Aboriginal figures we can see that the proportions of temporary workers are even higher and even formed the majority in 2016 (53% - up from 42% in 2011). While equivalent data were not available for the earlier analysis of the Pilbara labour market (Taylor and Scambary 2005: 28) the overall size of the total temporary workforce for 2001 was estimated to be just 2,500 or 11% of the total, with virtually all of these being non-Aboriginal. This underlines the scale and speed with which temporary workers have been introduced into the Pilbara in recent times.

However, as the purpose of the present analysis is to meet the information needs of the RIC, the main interest is in labour market outcomes for usual residents of the Pilbara. In 2016, a total of 2,512 Aboriginal Pilbara residents were counted as employed compared to 29,106 non-Aboriginal residents. Not all of these found jobs in the Pilbara, although the majority did as we have seen. In 2016, 243 Aboriginal residents of the Pilbara (9.7%) found work elsewhere in Australia compared to 2,475 (8.5%) of non-Aboriginal residents. Regardless of the location of their employment, these more mobile Pilbara residents are still included in the analysis of Pilbara outcomes.

Just as an aside, one unknown quantum in adequately profiling the regional labour market is the presence of temporary workers from overseas via the 457 visa program. The census provides no direct measure of such workers nor, indeed, any assessment of whether they are counted and included in employment figures even though they are meant to be if temporarily resident at census time. However, as this issue is exclusive to the non-Aboriginal workforce it is left in the too-hard basket and out of scope.

In Taylor and Scambary (2005) it was observed that a structural gap between Aboriginal and non-Aboriginal employment rates, together with a low rate of Aboriginal labour force participation, had significant consequences for Aboriginal economic status. Given that context, it was asked whether the targets set by Pilbara Iron and other companies for recruiting Aboriginal labour had the capacity to lead to an improvement in the regional economic status of Aboriginal people. The essential background to considering this question was, and is, one of projected growth in the Aboriginal working-age population set against likely future employment demand and labour supply. To explore this using current parameters we begin by estimating current levels of labour force status.

Regional labour force status: rates and levels

Table 3.2 shows labour force status rates for Aboriginal residents of the Pilbara and it indicates how these have changed since 2001. Rather than establish conventional rates of unemployment and labour force participation, customised measures are presented as proportions of the 15+ population for ease of interpretation. Thus, we have:

- An employment to population ratio representing the percentage of persons aged 15 years and over who indicated in the census that they were in employment during the week prior to enumeration;
- An unemployment to population ratio indicating those who were not in employment

but had actively looked for work during the four weeks prior to enumeration as a percentage of those aged 15 years and over;

- A labour force non-participation to population ratio representing persons who were neither employed or unemployed (ie. not in the labour force) as a percentage of those aged 15 years and over:

While these measures are strictly speaking percentage ratios of the adult population, from here on we shall use the term 'rates' as this is more colloquial. Based on these rates, Table 3.2 also shows estimates of the numbers of people employed, unemployed and not in the labour force in each census year since the raw census figures are invariably undercounts. To derive these estimates, the census-based rates in each year are applied to ABS ERPs for the adult population of the Pilbara.

Table 3.2 Labour force status rates and estimated levels for Aboriginal residents of the Pilbara region 2001-2016

	2001	2006	2011	2016
Census-based rates				
Employed	42.5 (30.2)	44.3 (34.6)	49.3 (46.3)	45.6
Unemployed	8.0	8.8	8.0	10.3
NILF	49.5	46.9	42.7	44.1
Estimated levels				
Employed	1,808 (1,285)	2,220 (1,735)	3,483 (3,273)	3,802
Unemployed	339	441	566	859
NILF	2,108	2,352	3,019	3,677

*Source: Census rates from ABS Census of Population and Housing 2001, 2006, 2011 and 2016
Employment rates and levels net of CDEP in 2001 and 2006, and net of CDP in 2011 are shown in parentheses*

Adult denominator populations based on ABS ERPs

NILF = Not in the Labour Force

Excludes labour force status not stated

The key trends to note are a steady rise in the Aboriginal employment rate, especially between 2001 and 2011, and a notable fall in 2016 almost back to the 2006 level. It should be noted, however, that the rates for 2001 and 2006 are derived by counting CDEP participants as employed, while in 2011 CDP participants were also counted by the census as employed. If we exclude CDEP and CDP participants from these respective employment counts we derive the rates shown in parentheses in Table 3.2. It reveals what has been mostly been referred to as 'non-CDEP employment' (Gray et al. 2013) but here we shall call 'mainstream employment' to reflect the nature of the regional labour market more generally. This produces a quite different trend whereby the rate of mainstream employment rose steadily from 30% in 2001 to 46% in 2011 and essentially stabilised at that level in 2016. Both males and females have shared in this adjusted employment growth with the mainstream rate for males rate increasing from 31.7% to 52.1% and for females from 25.5% to 38.2%.

Of course, if CDEP/CDP participants are discounted as employed they must be allocated to another labour force status, either unemployed or not in the labour force. However, there is no firm basis for choosing either of these options except for some notional link between CDEP/CDP and Newstart Allowance. Consequently, rates and levels of unemployment and not in the labour force are reported net of CDEP/CDP. These indicate a slight rise in the proportion of Aboriginal adults recorded by the census as unemployed while the proportion not participating in the labour force has generally fallen from almost 50% in 2001 to 44% in 2016.

As for estimated levels, the number in employment based on official census rates has continued to rise since 2001, albeit at a slower rate since 2011, and it now stands at 3,802 – an increase of 110%. However, if reference is made just to mainstream employment then this has risen from 1,285 in 2001 to 3,802 – an increase of 196%. Unemployed numbers have also risen (discounting CDEP) with 10% of all Aboriginal adults now unemployed. In terms of the official unemployment rate measure (unemployed as percentage of the labour force) the rate has gone up from 15.8% in 2001 to 18.4% in 2016 (once again discounting CDEP).

While this regional unemployment rate undoubtedly appears high, what is interesting about the 2016 estimated level of 859 is its lack of comparability to the number of Aboriginal Pilbara residents registered with Centrelink for Newstart and Youth Allowances which stood at 1,214 at the time of the last census. Similar discrepancy was noted in a comparison of 2001 census data with 2005 Centrelink data (Taylor and Scambary 2005: 29) and in both instances this gap emerged even after upwardly adjusting the census count. This suggests that the ‘real’ unemployment rate in both census years could have been higher still and it places a question mark over the accuracy of census responses. In effect, if 2016 Centrelink data on Newstart and Youth Allowance recipients were used instead of census data then an estimated 16.1% of those aged 15 years and over would have been unemployed instead of the 10.3% rate shown in Table 3.2. A similar adjustment to 2006 census data produces an equivalent unemployment percentage of 16.3% suggesting that the unemployment rate may have remained stable over the past 10 years at this higher adjusted level compared to the rise shown in Table 3.2. However, given the rise in both employment and unemployment rates shown in Table 3.2 the drop in the proportion of those not in the labour force is to be expected even though the school leaving-age in Western Australia was raised from 15 to 17 years in the interim. Obviously, these non-participation rates would be lower again if the Centrelink-based adjustments to unemployment were applied.

Over the same period, the non-Aboriginal employment rate has remained consistently high at 80% in 2001 and 86% in 2016. Accordingly, the unemployment rate has remained low falling from 3% to 2.7% while the proportion of adults not in the labour force fell from 17% to just 11% (Table 3.3). Thus, despite evident gains in Aboriginal employment levels, the gap between Aboriginal and non-Aboriginal residents in terms of the official employment rate has remained relatively unchanged and substantial with the Aboriginal rate still around half of the non-Aboriginal rate (Table 3.4). Once again, though, if CDEP is discounted then the ratio of Aboriginal to non-Aboriginal employment rates has been steadily closing since 2001. Conversely, Aboriginal unemployment and non-participation rates (unadjusted) have remained considerably higher than non-Aboriginal rates ranging consistently between 3 and 5 times higher.

Table 3.3 Labour force status rates for non-Aboriginal residents of the Pilbara region: 2001-2016.

	2001	2006	2011	2016
Employment	80.0	83.6	88.6	86.1
Unemployment	3.0	1.6	1.4	2.7
NILF	17.0	14.8	10.0	11.1

Source: ABS Census of Population and Housing 2001, 2006, 2011 and 2016

NILF = Not in the Labour Force

Table 3.4 Rate ratios of Aboriginal to non-Aboriginal labour force status rates: Pilbara region, 2001-2016.

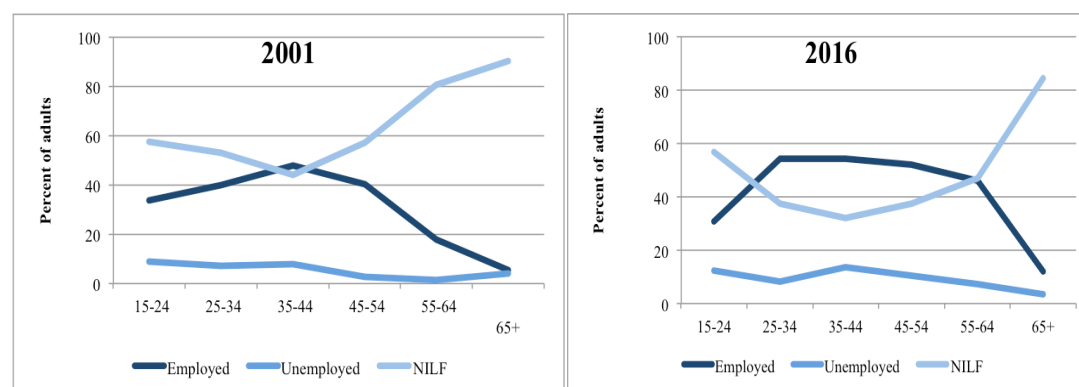
	2001	2006	2011	2016
Employment	0.53 (0.37)	0.53 (0.41)	0.56 (0.52)	0.53
Unemployment	2.7	5.5	5.7	3.8
NILF	2.9	3.2	4.3	4.0

NILF = Not in the Labour Force

Employment ratios net of CDEP in 2001 and 2006, and net of CDP in 2011 are shown in parentheses

Aggregate labour force status rates based on the entire adult population can mask considerable variation by age. In 2001, for example, Aboriginal employment rates were shown to peak in the age group 35-44, but either side of that the tendency was for the majority of adults to be outside of the labour force (Figure 3.1). However, by 2016, a notable shift in this pattern had emerged whereby the majority of Aboriginal adults between the ages of 25-64 were in the labour force and most of these were employed (Figure 3.1). This is despite the demise of the CDEP scheme in the meantime.

Figure 3.1 Aboriginal labour force status by age: Pilbara region, 2001 and 2016



Source: ABS Census of Population and Housing 2001 and 2016

NILF = Not in the Labour Force

The actual shift in the proportional distribution of labour force status rates is shown in Table 3.5. In terms of increase in the proportion of adults employed, the most significant change has been among those aged 25-34 and 55-64. While shifts into the labour force have occurred across all ages, the biggest change is evident among older adults aged 45-64 years.

Table 3.5 Change in Aboriginal labour force status percentage distributions by age group: Pilbara region, 2001-2016

Age group	Employed	Unemployed	NILF
15-24	-2.8	3.6	-0.7
25-34	14.4	1.3	-15.7
35-44	6.3	5.6	-12.0
45-54	11.9	7.8	-19.7
55-64	28.1	5.7	-33.8
65+	6.4	-0.6	-5.8

Source: ABS Census of Population and Housing 2001 and 2016

NILF = Not in the Labour Force

Dependency ratios

Data on labour force status can be combined with age structure to produce a range of age and economic dependency ratios. These ratios provide a crude but effective summary of the numbers of working-age and economically-active members of a population relative to those who may largely depend on them for resources. These are shown in Table 3.6 for the Aboriginal resident population of the Pilbara in 2001 and 2016. Equivalent figures are provided for non-Aboriginal residents in 2016 for the purpose of benchmarking regional conditions.

The childhood dependency ratio is the simplest of these measures. It expresses the number of children in the population (aged 0–14 years) as a ratio of adults (15+ years). A ratio of 1.0 would indicate that the size of the two age groups is the same and that there is one child per adult. A figure greater than 1.0 indicates more than one child to each adult; less than 1.0 indicates less than one child to each adult. In 2001, the childhood dependency ratio was 0.53 and this fell to 0.41 by 2016 reflecting the relative decline in the number of children in the population due mostly to the relatively high in-migration of adults. By contrast, the childhood dependency ratio for non-Aboriginal Pilbara residents at 0.1 is extremely low emphasising the very different compositions of the regional sub-populations.

Table 3.6 Dependency ratios for the Aboriginal and non-Aboriginal resident populations of the Pilbara region: 2001 and 2016

Ratio	Aboriginal		Non-Aboriginal
	2001	2016	2016
Childhood dependency	0.53	0.41	0.10
Childhood burden	1.25	0.91	0.12
Dependency ratio	2.03	1.53	0.25
Economic burden	2.60	2.10	0.28

Source: ABS Census of Population and Housing 2001 and 2016

Of course, childhood dependency provides a very limited measure of economic dependency. More refined measures attempt to incorporate some indication of the ability of working-age adults to support others. The childhood burden, for example, is defined as the ratio of the number of children to the number of employed persons. Once again, a figure of 1.0 indicates parity. In 2001, there were 1.25 Aboriginal children to each person employed; by 2016 this had fallen considerably to 0.91. Once again, this is notably higher than the non-Aboriginal ratio as the latter incorporates the low non-Aboriginal childhood dependency ratio plus the fact that most non-Aboriginal resident adults are in employment. A further measure is provided by the dependency ratio which

represents the ratio of children and economically inactive adults to adults in the labour force (those employed plus those unemployed). This produces an average of 1.53 Aboriginal dependents per economically active person in 2016 and once again represents a reduction in economic dependency compared to 2001.

Finally, the economic burden is a ratio of the number of children and economically inactive persons (including here those unemployed) to employed persons. This has declined since 2001 and it shows that for each employed Aboriginal person in 2016 there were 2.0 others who are not employed and who, notionally at least, may be part-dependent on each employed person for income. This remains a notably higher ratio of economic burden than that recorded for non-Aboriginal residents of the Pilbara and it underlines the additional financial pressures on Aboriginal households in such a high cost region as the Pilbara.

From a regional planning perspective, then, the youthful age profile of the Aboriginal population remains a key demographic feature when set against the relatively poor labour force status of Aboriginal adults. Having said that, a clear reduction in economic burden is evident over the past 15 years. In 2001, the economic burden was alleviated somewhat by substantial participation in the CDEP scheme. Without this in place at that time there would have been an average of four dependents to each person in employment. Using this figure as the baseline, and recognising the subsequent demise of CDEP, we can say that the economic burden has been halved since 2001. This is a significant outcome in terms of demographic dividend as it shows that the relative expansion of working-age numbers combined with growth in mainstream employment has had a positive economic effect.

Industry sector

Major transformation of the Aboriginal workforce in the Pilbara has occurred since 2001 in the manner of its employment by industry sector. Simply put, there has been a structural reduction in dependence on government-sponsored employment and a concomitant rise in private sector employment. From a situation 15 years ago when employment was equally divided between government and non-government sectors, the private sector now accounts for over 90% of Aboriginal people in employment, an outcome that is shared with non-Aboriginal residents. This shift is shown in Table 3.7. In 2001, the census industry sector variable included a coding for CDEP workers. In the 2006 census, this was deleted and presumably (because it is ultimately not known) those coded as employed in CDEP in 2001 disappeared into the census classification for private sector employment in 2006 and 2011 (even though they were still funded by government) and by 2016 were no longer classified as employed. This should be considered when interpreting Table 3.7 since government sector employment in all three categories has fallen away steadily since 2001 in direct proportion to the rapid rise in private sector employment. This fall in government employment has been most evident in the State and local government sectors.

Table 3.7 Percentage distribution of Aboriginal employment by industry sector: Pilbara region, 2001-2016

Sector	2001	2006	2011	2016
Federal government	2.7	0.9	1.0	1.1
State government	13.2	13.9	7.9	6.1
Local government	3.7	7.6	2.9	1.4
Private sector	49.8	77.6	88.2	91.4
CDEP(b)	30.6	0.0	0.0	0.0
Total employed	100.0	100.0	100.0	100.0

Source: ABS Census of Population and Housing 2001, 2006, 2011 and 2016

As for the actual numbers employed in each sector, Table 3.8 provides estimates based on the rates shown in Table 3.7 as applied to estimated adult populations from the ABS for each census year between 2001 and 2016. These show the magnitude of the drop in State and local government employment especially since 2006 – a loss of 193 jobs representing a decline of 40%. By contrast, private sector employment doubled over the same period to reach an estimate of 3,475 in 2016. This relative and absolute increase in private sector employment has also impacted on the number of Aboriginal people in full-time work over 35 hours per week. Full-time employment for Aboriginal workers in 2001 stood at 50% and by 2016 it had increased to 70%. While full-time employment increased in all sectors the sheer weight of employment growth in the private sector means that almost the entire rise in full-time employment (147% since 2001) was due to expansion in this sector alone.

Table 3.8 Estimated levels of Aboriginal employment by industry sector: Pilbara region, 2001-2016

Sector	2001	2006	2011	2016
Federal government	48	19	32	42
State government	239	309	247	232
Local government	67	169	91	53
Private sector	900	1,722	2,760	3,475
CDEP(b)	553	n/a	n/a	n/a
Total employed	1,808	2,220	3,130	3,802

n/a = not applicable

Based on ABS ERPs

Aboriginal sector

This census classification of employment by industry sector into three categories of government employment and the private sector masks a very important component of the Aboriginal labour market in the Pilbara (and elsewhere) that is constituted by Aboriginal incorporated organisations and Aboriginal-owned businesses. While a plethora of such institutions exist, and while they employ many Aboriginal people, precise knowledge of their economic impact is not known since they are not identified in official statistical collections such as the census. Aside from masking the scale and range of associated economic activity, a further reason why this is an unfortunate omission is because such bodies provide a cultural labour market niche for many Aboriginal workers and they invariably apply affirmative action employment and training policies. They also often emerge out of mining agreement processes and so their contribution to regional economic outcomes constitutes one element in assessing the efficacy of those arrangements.

Taylor and Scambary (2005) listed a total of 71 Aboriginal organisations in the Pilbara in 2004 while a number of prominent Aboriginal-owned businesses also existed. Currently, as many as 88 Pilbara-based organisations are registered with the Commonwealth Office of the Registrar of Indigenous Corporations (ORIC) alone (Table 3.9) and it is more than likely that the number of Aboriginal businesses has expanded since 2004 while pre-existing ones have extended their activities. A total of 47 Pilbara-based companies are presently listed in the Aboriginal Business Directory of Western Australia ranging from large to small. Added to this, there is a burgeoning number of Aboriginal ranger programs and numbers are likely to expand with renewed support for on-country land management activities from both Federal and State governments as well as private sector interests and NGOs.

Table 3.9 Pilbara-based Indigenous organisations registered with ORIC and select Aboriginal businesses and ranger programs, 2016.

ORIC Registered
Ashburton Aboriginal Corporation
Bornor Gundi Gurrama Aboriginal Corporation
Bully Aboriginal Corporation
Cheeditha Group Aboriginal Corporation
Descendants of Traditional Custodians For Murujuga Munda Aboriginal Corporation (for Research & Development)
Djibbinj Aboriginal Corporation
Gobawarra Minduarra Yinhawanga Group Aboriginal Corporation
Gnarlamumu Aboriginal Corporation
Goondee Aboriginal Corporation
Gurumali Wartu Aboriginal Corporation
Gumula Aboriginal Corporation
Hedland Aboriginal Church Aboriginal Corporation
Innawonga Aboriginal Corporation
Irrawarra Wanti Aboriginal Corporation
Jajee-warda Aboriginal Corporation
Jinapi Aboriginal Corporation
Jinparinya Aboriginal Corporation
Jirda-winy-bangu Aboriginal Corporation
Juluwarlu Group Aboriginal Corporation
Jundaru Aboriginal Corporation
Kapu Wanparijalu Aboriginal Corporation
Karlka Niyiparli Aboriginal Corporation
Karntimarta Aboriginal Corporation
Kubalana Aboriginal Corporation
Kunawarritji (Aboriginal Corporation)
Kurlarnunya Mumpulunya Aboriginal Corporation
Kuruma Marthudenera Aboriginal Corporation RNTBC
Kuyk Kirim Torres Strait Islander Corporation: Perth Circle of Elders
Marapikurrinya Aboriginal Corporation
Marta Marta Aboriginal Corporation
Martu Idja Niyiparli Aboriginal Corporation
Mawarnkarra Health Service Aboriginal Corporation
Milykujurna Old Generation Warnman Community Aboriginal Corporation
Milyuranpa Banjyma Aboriginal Corporation
Minadhu Aboriginal Corporation
Mura Mabai Ghauw Buai Torres Strait Islander Corporation
Murambarinya Aboriginal Corporation
Murujuga Aboriginal Corporation
Ngaarda Media Aboriginal Corporation
Ngama Ngamarda Jajee Warda Aboriginal Corporation
Ngarliyarndu Bindirri Aboriginal Corporation

Ngarluma Aboriginal Corporation RNTBC
Ngarluma Ngurra
Ngudarra Banyjima Bardulanha Windel Block Aboriginal Corporation
Ngurawaana Group (Aboriginal Corporation)
Nguru Aboriginal Corporation
Njamal Aboriginal Corporation
Niyiyamarri Pukurl Nyangumarta Aboriginal Corporation
Nyuntiguninya Family Aboriginal Corporation
Oondumarra Ngarluma Aboriginal Corporation
Palyku Claimants Aboriginal Corporation
Pananykarra Aboriginal Corporation
Partany Aboriginal Corporation
Pilbara Aboriginal Corporation of Traditional Owners
Pilbara Aboriginal Corporations and Enterprises Inc.
Pilbara Aboriginal Land Council (Aboriginal Corporation)
Pilbara Indigenous Womens Aboriginal Corporation
Pilbara Arts, Crafts and Designs Aboriginal Corporation
Pilbara Meta Maya Regional Aboriginal Corporation
Pilyaku Aboriginal Corporation
Pinthurrinya Mallina Aboriginal Corporation
Pirpirn-nha Aboriginal Corporation
Pitjikala Aboriginal Corporation
Pontroy Aboriginal Corporation
Port Hedland Regional Aboriginal Corporation
Putungaja Aboriginal Corporation
Puutu Kunti Kurrama Development Aboriginal Corporation
Rawa Community School Aboriginal Corporation
Robinson Family Aboriginal Corporation
Roebourne Art Group Aboriginal Corporation
Tjalka Boorda Aboriginal Corporation
Wakuthuni Aboriginal Corporation
Wamarranya Aboriginal Corporation
Wangka Maya Pilbara Aboriginal Language Centre (Aboriginal Corporation)
Warrie Group and Family Indigenous Corporation
West Ngarluma Ngurin Aboriginal Corporation
Western Desert Lands Aboriginal Corporation
Weymul Aboriginal Corporation
Wirraka Maya Health Service Aboriginal Corporation
Wirrilimarra Bantikura Banyjima Aboriginal Corporation
Yaburara and Coastal Mardudhunera Aboriginal Corporation
Yamatji Marlpa AC
Yinhawangka AC
Yarnagu Gumalardi Aboriginal Corporation
Yindjibarndi Aboriginal Corporation RNTBC
Yindjibarndi Native Title Aboriginal Corporation
Yindjibarndi Ngurra Aboriginal Corporation RNTBC
Youngaleena Bunjima Aboriginal Corporation

Select Aboriginal businesses

Pindari
Ngaarda Civil and Mining
Gumula Enterprises
Jarrubardi Total Waste Management
Greentree Bithuwarnda
Civil Road and Rail (SX5) Pty Ltd
Brida Pty Ltd
Binbirri Contracting Pty Ltd
Allround Plumbing Services Pty Ltd
Yurra Pty Ltd
IBN Corporation

Select Aboriginal Ranger Programs

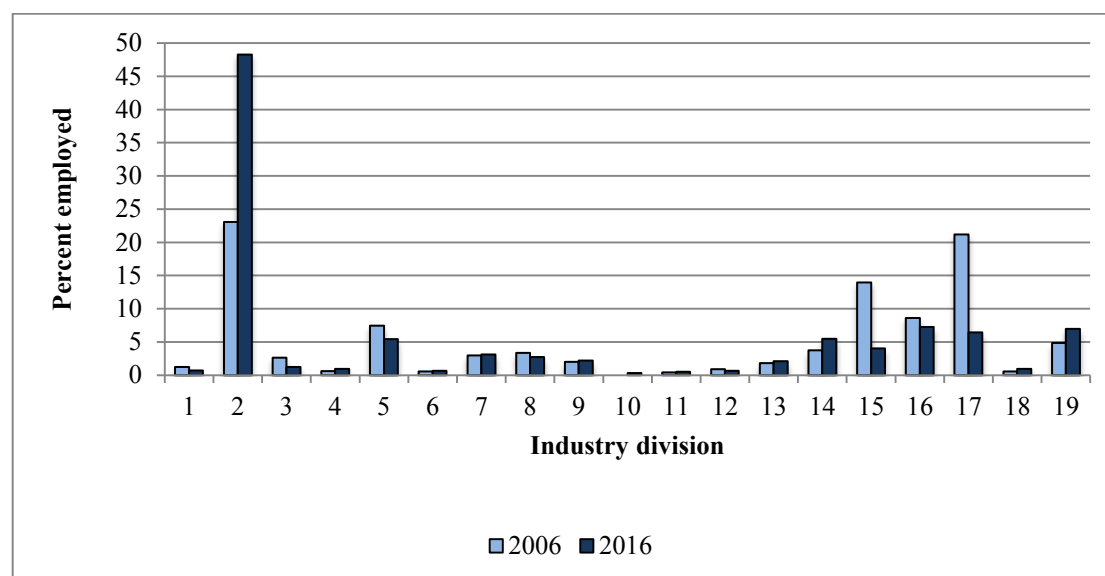
Kanyirniinpu Jukurrpa
Gumula Ranger Team
Niyiyaparli Ranger Program
Ngurrawaana Rangers
Yaburara and Coastal Mardudhunera Rangers
YMAC Rangers
Murujuga Land and Sea Unit
Budadee Foundation
Nyangumartu Warrarn Rangers

From the figures on industry sector provided in Table 3.8 it is almost certain that Aboriginal employment in these organisations and enterprises would exceed that in the entire government sector and account for a reasonable slice of employment that is classified as private sector. The problem is, no consolidated source of data exists with which to profile, analyse and monitor this uniquely Aboriginal contribution to the regional economy. Given the undoubted importance of this sector for strategic planning by the RIC there is an urgent need to audit all Aboriginal businesses, organisations and ranger programs across the Pilbara in order to make them more statistically visible and to establish their impact on Aboriginal employment and wellbeing. The data in Table 3.9 represent a minimum number of entities and a first task would be to compile a fully comprehensive list. There is also a case to be made to the ABS for the creation of a separate 'Aboriginal sector' category in census statistics.

Industry

Establishing precise measures of change in employment between 2001 and 2016 across all of the divisional categories of the Australian and New Zealand Standard Industrial Classification (ANZSIC) is rendered problematic by the major revision to ANZSIC conducted in 2006 along with subsequent amendments. Nonetheless, sufficient stability is retained to allow clear conclusions to be drawn. When compared to the distributions in 2001 (Taylor and Scambary 2005: 37) the change is striking. Figure 3.2 shows this change for all Aboriginal workers over the decade 2006-2016. A shift into the mining industry is overwhelming and reduced shares of employment in public administration and health care and social assistance jobs also stand out. The current distribution of Aboriginal employment by industry is compared to non-Aboriginal employment for males and then females in Figures 3.3 and 3.4.

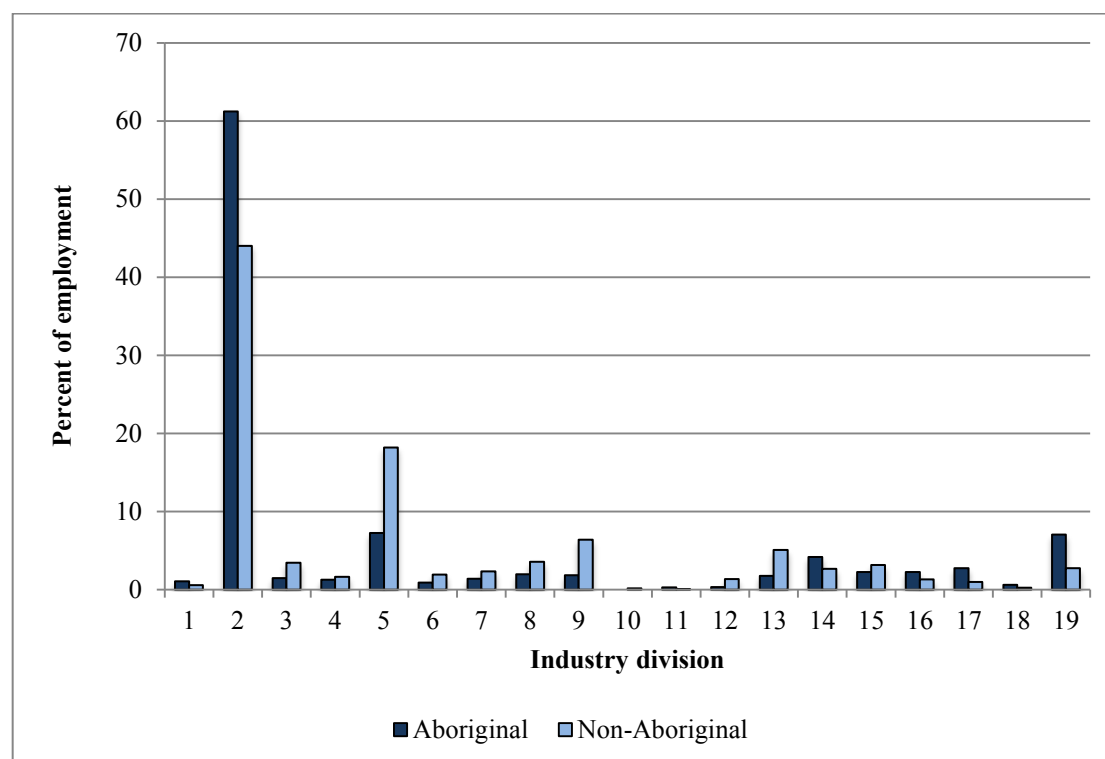
Figure 3.2 Distribution of Aboriginal employment by industry division: Pilbara region, 2006 and 2016



Source: ABS Census of Population and Housing 2016

Key: 1. Agriculture, Forestry and Fishing; 2. Mining; 3. Manufacturing; 4. Electricity, gas, water and waste; 5. Construction; 6. Wholesale Trade; 7. Retail Trade; 8. Accommodation and food services; 9. Transport postal and warehousing; 10. Information, media and telecommunications; 11. Financial and Insurance services; 12. Rental, Hiring and Real Estate Services; 13. Professional, Scientific and Technical Services; 14. Administrative and Support Services; 15. Public Administration and Safety; 16. Education and Training; 17. Health Care and Social Assistance; 18. Arts and Recreation Services; 19. Other Services

Figure 3.3 Distribution of Aboriginal and non-Aboriginal male employment by industry division: Pilbara region, 2006 and 2016



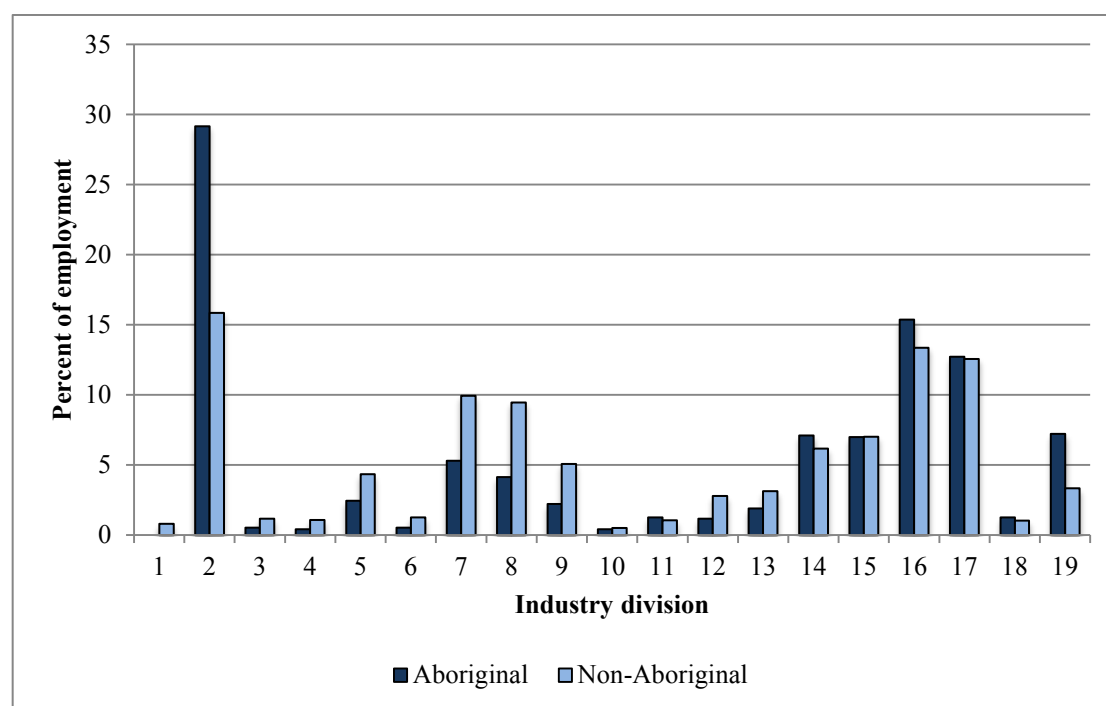
Source: ABS Census of Population and Housing 2016

Key: 1. Agriculture, Forestry and Fishing; 2. Mining; 3. Manufacturing; 4. Electricity, gas, water and waste; 5. Construction; 6. Wholesale Trade; 7. Retail Trade; 8. Accommodation and food services; 9.

Transport postal and warehousing; 10. Information, media and telecommunications; 11. Financial and Insurance services; 12. Rental, Hiring and Real Estate Services; 13. Professional, Scientific and Technical Services; 14. Administrative and Support Services; 15. Public Administration and Safety; 16. Education and Training; 17. Health Care and Social Assistance. 18. Arts and Recreation Services; 19. Other Services

Employment among resident Aboriginal males has become much more concentrated in the mining industry over the past 15 years. Almost two-thirds (61%) are now employed in the mining industry compared to just over 20% in 2001 (Taylor and Scambary 2005: 37). To some degree, this concentration partly reflects the demise of employment in the CDEP scheme which accounted for almost 30% of Aboriginal male employment in 2001 and was mostly classified as work in government administration at the time. However, it primarily reflects a real rise in local mining employment to the relative exclusion of employment growth in other industries.

Figure 3.4 Distribution of Aboriginal and non-Aboriginal female employment by industry division: Pilbara region, 2016



Source: ABS Census of Population and Housing 2016

Key: 1. Agriculture, Forestry and Fishing; 2. Mining; 3. Manufacturing; 4. Electricity, gas, water and waste; 5. Construction; 6. Wholesale Trade; 7. Retail Trade; 8. Accommodation and food services; 9. Transport postal and warehousing; 10. Information, media and telecommunications; 11. Financial and Insurance services; 12. Rental, Hiring and Real Estate Services; 13. Professional, Scientific and Technical Services; 14. Administrative and Support Services; 15. Public Administration and Safety; 16. Education and Training; 17. Health Care and Social Assistance. 18. Arts and Recreation Services; 19. Other Services

An equally clear shift in employment towards the mining industry is evident among resident Aboriginal females with almost one-third of those in employment now engaged by the mining industry compared to less than 5% in 2001 (Figure 3.4). In contrast to Aboriginal male workers, however, Aboriginal females continue to be employed across a wider range of industries especially in retail, administrative services, public administration, education and health care.

As for comparison with non-Aboriginal workers, Table 3.10 reveals that the share of Aboriginal male employment in the mining industry is now 17 percentage points higher than the equivalent share among resident non-Aboriginal males (61% employed in mining compared to 44%). Back in 2001, this situation was reversed with local non-Aboriginal males far more likely than their Aboriginal counterparts to be concentrated in mining employment. A similar picture emerges among females. Leaving aside the actual numbers involved, mining can now be said to epitomise the employment profile for Aboriginal residents of the Pilbara far more so than it does for non-Aboriginal residents. In the meantime, one industry of note where Aboriginal male workers are now far less likely to be found compared to their non-Aboriginal counterparts is construction (-11 percentage points difference) while Aboriginal females are now relatively less likely than before to be in retail and accommodation industries.

Table 3.10 Percentage point differences in the distribution of Aboriginal compared to non-Aboriginal male and female employment by industry division: Pilbara region, 2016

Industry	Males	Females
Agriculture, Forestry and Fishing	0.5	-0.8
Mining	17.2	13.3
Manufacturing	-2.0	-0.6
Electricity, Gas, Water and Waste Services	-0.4	-0.7
Construction	-10.9	-1.9
Wholesale Trade	-1.0	-0.7
Retail Trade	-0.9	-4.7
Accommodation and Food Services	-1.6	-5.3
Transport, Postal and Warehousing	-4.6	-2.8
Information Media and Telecommunications	-0.2	-0.1
Financial and Insurance Services	0.2	0.2
Rental, Hiring and Real Estate Services	-1.0	-1.6
Professional, Scientific and Technical Services	-3.3	-1.2
Administrative and Support Services	1.5	0.9
Public Administration and Safety	-0.9	0.0
Education and Training	0.9	2.0
Health Care and Social Assistance	1.8	0.1
Arts and Recreation Services	0.4	0.2
Other Services	4.3	3.8

Obviously, the prospect that Aboriginal and non-Aboriginal workers would be distributed in equal proportion across each of the industry categories is minimal and some variation as shown in Table 3.10 is to be expected. Precise difference in these employment profiles can be calculated using an index of dissimilarity. In short, if the resident Aboriginal workforce were to participate in 2016 in the industry mix of the regional labour market in the same fashion as local non-Aboriginal workers then, according to the index of dissimilarity, 23% of them would need to change their industry of employment. This compares to 38% in 2001 (Taylor and Scambary 2005: 38) and it signals a notable reduction in labour market segregation.

Other calculations of this index also show a reduction in labour market segregation. Table 3.11 reveals that both Aboriginal males and females were much closer in 2016 to the employment distribution of their non-Aboriginal counterparts than they were in 2001. In 2001, for example, almost 40% of Aboriginal males would need to have changed their industry of employment in order to have had an industry profile of employment equivalent to their non-Aboriginal counterparts. By 2016 this proportion was down to less than 20%. A similar reduction in the gap by industry of employment

was observed among female workers. The key structural difference is now less and less between Aboriginal and non-Aboriginal workers but persistently between Aboriginal male and female workers as indicated by the lack of change in the final index in Table 3.11.

Table 3.11 Indices of Dissimilarity for industry divisions: Pilbara region, 2001 and 2016

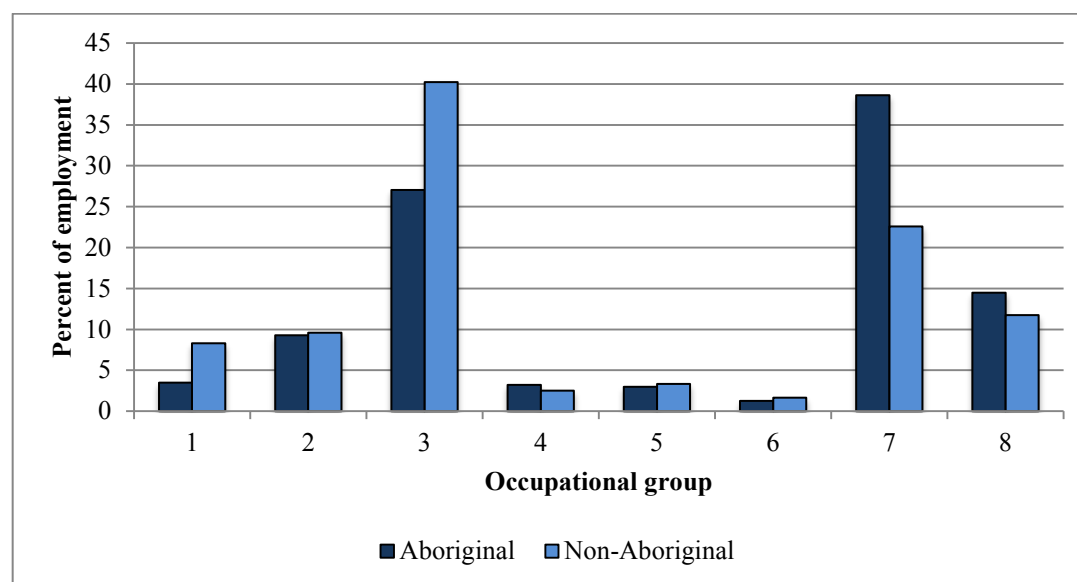
Comparison	2001	2016
Aboriginal males/non-Aboriginal males	39.5	18.2
Aboriginal females/non-Aboriginal females	34.9	20.6
Aboriginal males/Aboriginal females	42.3	40.2

Occupation

For the 2006 Census, the Australian and New Zealand Standard Classification of Occupations (ANZSCO) First Edition replaced the Australian Standard Classification of Occupations (ASCO) Second Edition (which was applied in the 2001 Census) with subsequent revisions before the 2011 and 2016 censuses. One major change was a shift from 9 occupational major groups to 8 major groups involving a reshuffling of occupations between groups as well as some re-labelling of group content. While concordances do exist, it is a complex and time-consuming process to match directly the output from the 2001 Census with that from 2016. Given the fairly undifferentiated nature of the Pilbara labour market it is also probably unnecessary as comparison with the distributions in 2001 (Taylor and Scambary 2005: 39) is easily established via cross-reference.

Figures 3.5 and 3.6 show the distribution of Aboriginal and non-Aboriginal male and female workers respectively by major occupational group in the Pilbara in 2016. While there are some similarities with 2001 a good deal has also changed. The biggest change since 2001 has been a large reduction in the over-representation of Aboriginal workers as labourers. For males, this category has fallen from over 40% of the workforce to less than 15%, and among females it has dropped from 27% to 12% both more or less in line with non-Aboriginal workers. A key reason for this, of course, is the demise of CDEP employment but it also reflects growth of employment in other, more skilled, occupational groups. For example, the proportion of Aboriginal males in technical and trades jobs has increased from just under 20% to 27% and those employed as machinery operators and drivers have increased from 24% to almost 40%.

Figure 3.5 Distribution of Aboriginal and non-Aboriginal male employment by major occupational group: Pilbara region, 2016

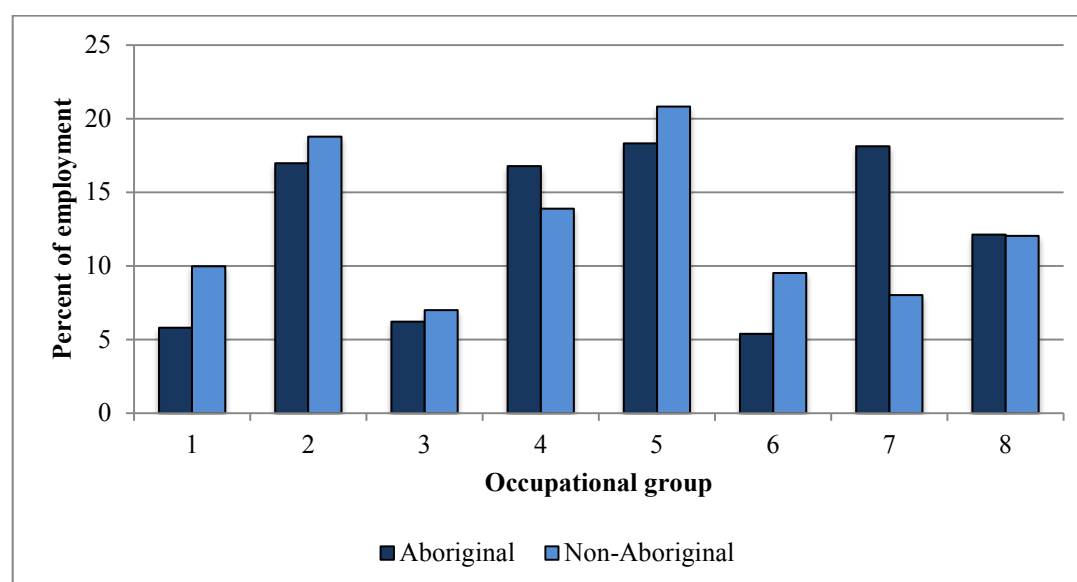


Source: ABS Census of Population and Housing 2016

Key: 1. Managers; 2. Professionals; 3. Technicians and Trades Workers; 4. Community and Personal Service Workers; 5. Clerical and Administrative Workers; 6. Sales Workers; 7. Machinery Operators and Drivers; 8. Labourers

By contrast, female workers have remained more widely distributed across occupational groups though with some clear changes in occupational status. The most obvious one is the reduction in Aboriginal female employment as labourers and the almost equivalent rise in their employment as machinery operators and drivers. Aboriginal females have also remained firmly in administrative, clerical and community service jobs.

Figure 3.6 Distribution of Aboriginal and non-Aboriginal female employment by major occupational group: Pilbara region, 2016



Source: ABS Census of Population and Housing 2016

Key: 1. Managers; 2. Professionals; 3. Technicians and Trades Workers; 4. Community and Personal Service Workers; 5. Clerical and Administrative Workers; 6. Sales Workers; 7. Machinery Operators and Drivers; 8. Labourers

and Drivers; 8. Labourers

As with the industry data, these shifts in employment by occupation have led to a closing of the gap in occupational distribution between the Aboriginal and non-Aboriginal workforces. Table 3.12 shows that Aboriginal male workers are now very similar in overall occupational group distribution to their non-Aboriginal counterparts with the main difference remaining in their respective shares of trades and machinery operator jobs. As for females, the gap between these was always smaller anyway but it has reduced even further. Once again, the main structural break in terms of occupation remains the one between Aboriginal males and females.

Table 3.12 Indices of Dissimilarity for occupational groups: Pilbara region, 2001 and 2016.

Comparison	2001	2016
Aboriginal males/non-Aboriginal males	33.7	13.2
Aboriginal females/non-Aboriginal females	23.8	19.3
Aboriginal males/Aboriginal females	48.5	43.4

The data in Figs. 3.2 through to 3.6 reveal only the broad outlines of the regional labour market. Each of these classifications can be disaggregated into more detailed descriptions of industry and occupation in a way that highlights the particular jobs that Aboriginal workers congregate in. For example, census output for the ANZSIC can be broken down into 721 individual industry classes, while the ANZSCO can be disaggregated to 478 occupational units. When examined at this level of detail the distribution of employment in the Pilbara, for both Aboriginal and non-Aboriginal workers, emerges as even more concentrated into relatively few individual industries and occupations.

Table 3.13 shows the top 20 industry classes (based on census counts of numbers employed) listed in rank order for both sets of workers. As a measure of employment concentration, these top 20 out of 721 industries in 2016 accounted for almost 70% of all Aboriginal employment up from 64% in 2001 (out of 635 industries) indicating an increased concentration of employment in a few industries. Categories marked in bold indicate those that are common to the Aboriginal and non-Aboriginal workforces; all others are unique to one list or the other. Thus, half of the top 20 employing industries are common to both Aboriginal and non-Aboriginal workers and, not surprisingly, many of these (such as iron ore mining, supermarkets, primary education, and hospitals) are major regional employers. The major focus on employment in iron ore mining as opposed to other resource industries appears borne out by company data – for example, Rio Tinto alone reported a total of 366 Aboriginal employees who were Pilbara residents in 2016. While Aboriginal workers tend to be concentrated in the leading regional industries, there are notable exceptions. For example, Aboriginal people are relatively absent from certain components of mining and trade-based industries (such as gold mining and electrical services) as well as from key elements of the tourism sector such as accommodation. By contrast, they are more likely to be found in particular service industries such as employment placement and recruitment and adult, community and other education.

Table 3.13 Rank order of top 20 industries of employment: Aboriginal and non-Aboriginal workers usually resident in the Pilbara region, 2016

Aboriginal		Non-Aboriginal	
Iron Ore Mining	912	Iron Ore Mining	7279
Other Interest Group Services nec	134	Other Heavy and Civil Engineering Construction	1319
Primary Education	54	Engineering Design and Engineering Consulting Services	780
Oil and Gas Extraction	51	Primary Education	732
Other Non-Metallic Mineral Mining and Quarrying	50	Oil and Gas Extraction	698
Building and Other Industrial Cleaning Services	41	Road Freight Transport	625
Other Heavy and Civil Engineering Construction	39	Catering Services	541
Supermarket and Grocery Stores	37	Other Non-Metallic Mineral Mining and Quarrying	536
Local Government Administration	36	Local Government Administration	495
Labour Supply Services	31	Supermarket and Grocery Stores	490
Catering Services	30	Building and Other Industrial Cleaning Services	461
Secondary Education	27	Hospitals (except Psychiatric Hospitals)	433
Combined Primary and Secondary Education	27	Construction, nfd	431
Mining, nfd	26	Accommodation	399
Road Freight Transport	26	Labour Supply Services	345
Adult, Community and Other Education nec	26	Secondary Education	339
Hospitals (except Psychiatric Hospitals)	26	Electrical Services	320
Metal Ore Mining, nfd	24	Other Mining Support Services	312
Other Social Assistance Services	23	Gold Ore Mining	279
Employment Placement and Recruitment Services	22	Other Construction Services nec	257
Top 20 % of workforce 2016	69.7	Top 20 % of workforce 2016	61.1
Top 20 % of workforce 2001	64.5	Top 20 % of workforce 2001	48.7

Source: ABS Census of Population and Housing 2016

Shared categories in bold

Table 3.14 Rank order of top 20 occupations of employment: Aboriginal and non-Aboriginal workers usually resident in the Pilbara region, 2016

Aboriginal		Non-Aboriginal	
Drillers, Miners and Shot Firers	321	Metal Fitters and Machinists	2031
Metal Fitters and Machinists	157	Drillers, Miners and Shot Firers	1796
Truck Drivers	140	Electricians	1406
Environmental Scientists	84	Other Building and Engineering Technicians	922
Education Aides	70	Truck Drivers	909
General Clerks	60	Structural Steel and Welding Trades Workers	872
Other Stationary Plant Operators	59	Sales Assistants (General)	611
Train and Tram Drivers	55	Structural Steel Construction Workers	596
Electricians	43	General Clerks	547
Welfare Support Workers	43	Commercial Cleaners	432
Structural Steel and Welding Trades Workers	42	Primary School Teachers	382

Commercial Cleaners	42	Motor Mechanics	378
Other Building and Engineering Technicians	41	Production Managers	348
Sales Assistants (General)	41	Other Stationary Plant Operators	326
Other Miscellaneous Labourers	38	Storepersons	320
Gardeners	35	Other Miscellaneous Labourers	302
Cleaners and Laundry Workers, nfd	34	Retail Managers	293
Earthmoving Plant Operators	33	Contract, Program and Project Administrators	283
Receptionists	29	Architectural, Building and Surveying Technicians	267
Human Resource Professionals	27	Education Aides	255
Top 20 % of workforce 2016	58.2	Top 20 % of workforce 2016	46.4
Top 20% of workforce 2001	55.0	Top 20% of workforce 2001	40.3

Source: ABS Census of Population and Housing 2016

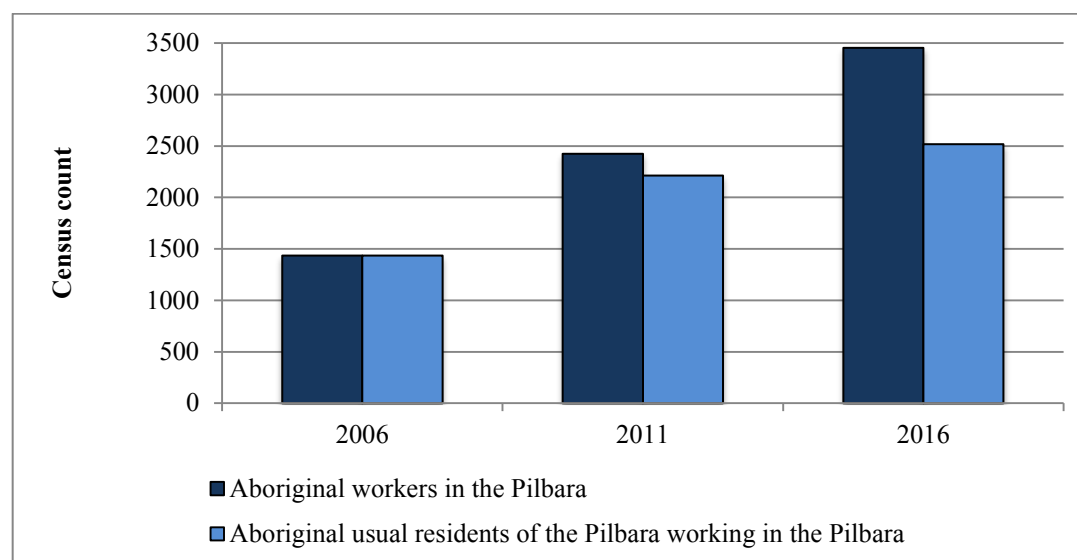
Shared categories in bold

Given the focus on employment in iron ore mining it is not surprising to see that most Aboriginal workers are employed as drillers, miners and shot firers followed by metal fitters, machinists and truck drivers. While this clearly reflects recent success in boosting mining employment these include precisely the sorts of jobs that are likely to be shed in the face of increased automation in the mineral production process.

Non-resident workforce

As was shown in Table 3.1, as much as two-thirds of non-Aboriginal workers and one-third of Aboriginal workers who were counted as being employed in the Pilbara in 2016 were non-residents of the Pilbara. This importation of Aboriginal labour has gathered pace since 2006 when local labour demand was met solely by resident workers (Figure 3.7). For the most part, these non-resident workers operate in the Pilbara out of a home base located elsewhere in Australia, mostly in Perth and South West WA, and it is assumed that they are predominantly FIFO. Given the interest expressed in mining agreements to ensure that benefits from mining flow predominantly to Traditional Owner signatories, including benefits from mining employment, it is worth considering some of the characteristics of this non-resident workforce in terms of who they are and what jobs they occupy.

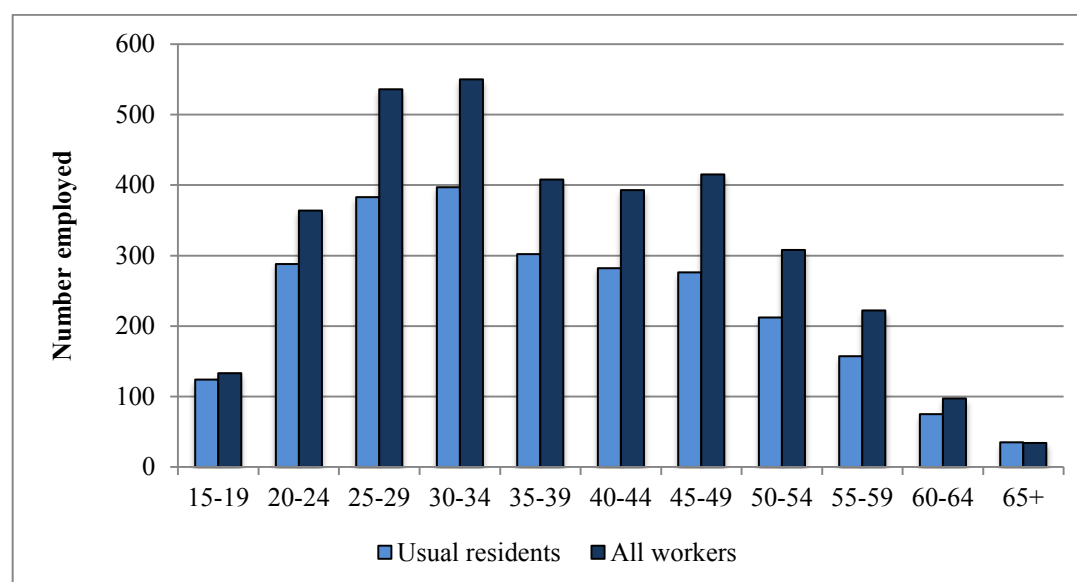
Figure 3.7 Census counts of all Aboriginal workers and Aboriginal usual resident workers in the Pilbara region: 2016



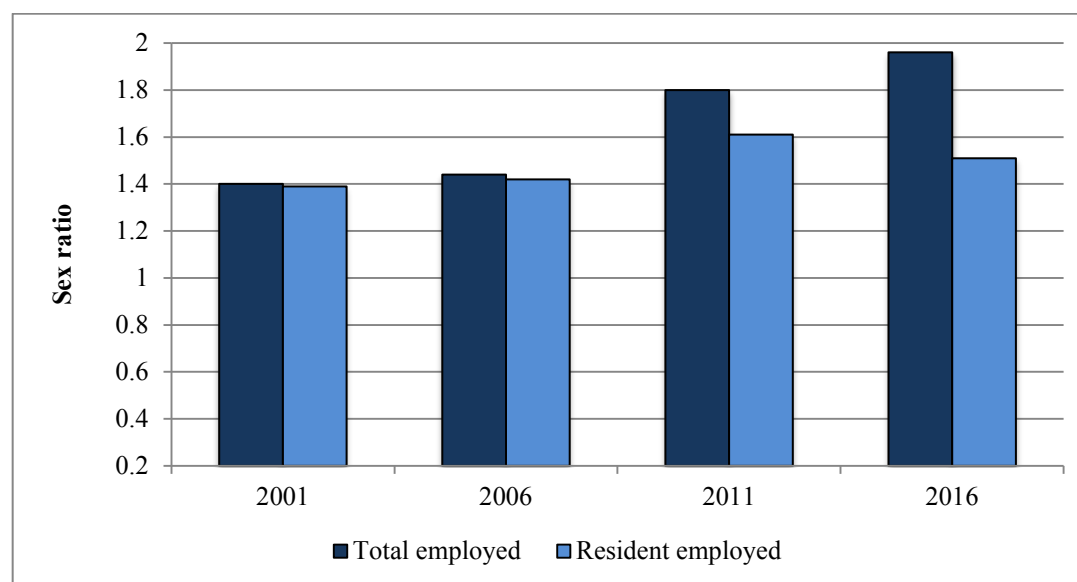
Source: ABS Census of Population and Housing 2006, 2011 and 2016

From Figure 3.8 we can see that non-resident workers have an almost identical age profile to that of resident workers rising to a peak in the age bracket 25-34 and falling away more or less steadily after that with very few over the age of 65 years. If we introduce gender as a consideration Figure 3.9 shows that males have always been prominent in the Aboriginal workforce, whether resident or not, and while this remained stable and equivalent in 2001 and 2006 for resident and all workers at around 1.4 males per females, the ratio of males to females increased in 2011 for both groups and then continued to rise for all workers in 2016 but fell back among resident workers. There is thus an increasing differentiation between resident and non-resident workers with the latter being increasingly male.

Figure 3.8 Distribution of Aboriginal resident workers and all Aboriginal workers in the Pilbara region by age, 2016



Source: ABS Census of Population and Housing 2016

Figure 3.9 Sex ratios of Aboriginal resident and Aboriginal total workforce: Pilbara region, 2001-2016

Source: ABS Census of Population and Housing 2001, 2006, 2011 and 2016

As for the sorts of jobs occupied by non-resident workers, Table 3.15 shows the leading industries of employment in 2016. Both non-Aboriginal and Aboriginal non-resident workers are heavily concentrated in iron ore mining and, indeed, in mining and allied industries generally. Overall, a total of 1,420 Aboriginal workers were recorded by the census as employed in iron ore mining in the Pilbara in 2016 but 508 of these were FIFO workers. The few exceptions to this non-resident focus on mining industries included catering, construction and accommodation but even these are likely to be associated with mining in some way. Non-Aboriginal workers also feature as education aides. The general picture is one of excessive concentration in just a few industries with the top 20 industries out of a possible 721 accounting for as much as 92% of non-resident Aboriginal workers and 84% of their non-Aboriginal counterparts. These proportions are much lower (though still high) among resident workers (70% and 61% respectively).

Table 3.15 Census counts of non-resident Aboriginal and non-Aboriginal workers in the Pilbara region in 2016 by rank order of top 20 industries of employment

Aboriginal		Non-Aboriginal	
Iron Ore Mining	508	Iron Ore Mining	10,063
Other Heavy and Civil Engineering Construction	55	Other Heavy and Civil Engineering Construction	2,611
Oil and Gas Extraction	52	Oil and Gas Extraction	1,904
Catering Services	42	Engineering Design and Engineering Consulting Services	1,169
Gold Ore Mining	35	Gold Ore Mining	990
Engineering Design and Engineering Consulting Services	23	Catering Services	684
Mining, nfd	21	Construction, nfd	678
Labour Supply Services	21	Non-Residential Building Construction	445
Construction, nfd	13	Road Freight Transport	422
Road and Bridge Construction	13	Other Mining Support Services	419
Metal Ore Mining, nfd	11	Electrical Services	378

Heavy and Civil Engineering Construction, nfd	11	Labour Supply Services	328
Road Freight Transport	11	Other Construction Services nec	257
Gas Supply	10	Mining, nfd	255
Coal Mining	9	Building and Other Industrial Cleaning Services	252
Painting and Decorating Services	8	Copper Ore Mining	219
Industrial Gas Manufacturing	7	Site Preparation Services	202
Accommodation	7	Gas Supply	172
Management Advice and Related Consulting Services	7	Coal Mining	168
Human Resource Professionals	27	Education Aides	255
% of non-resident workforce 2016	91.9%	% of non-resident workforce 2016	84.4%

Source: ABS Census of Population and Housing 2016

Shared categories in bold

Interestingly, far less concentration is evident with regard to occupations with 60% of Aboriginal non-resident workers and 53% of non-Aboriginal workers engaged in the top 20 occupations (Table 3.16). These proportions are more or less equivalent to those of resident workers (Table 3.14). The general picture, then, is of a few industries drawing temporary labour into the Pilbara to fill positions across a wide range of occupations. To some extent, these latter seem to be in more specialist jobs such as registered nurses, chefs and plumbers compared to the leading occupations among resident workers. Having said that, many job categories are also the same such as motor mechanics, truck drivers and, of course, drillers, miners and shot firers.

Table 3.16 Census counts of non-resident Aboriginal and non-Aboriginal workers in the Pilbara region in 2016 by rank order of top 20 occupations of employment

Aboriginal		Non-Aboriginal	
Drillers, Miners and Shot Firers	63	Drillers, Miners and Shot Firers	1,920
Truck Drivers	47	Metal Fitters and Machinists	1,690
Education Aides	37	Electricians	1,359
Structural Steel and Welding Trades Workers	28	Structural Steel and Welding Trades Workers	1,117
Electricians	28	Structural Steel Construction Workers	876
Commercial Cleaners	25	Truck Drivers	851
Structural Steel Construction Workers	23	Other Building and Engineering Technicians	773
Livestock Farm Workers	23	Architectural, Building and Surveying Technicians	374
Registered Nurses	21	Chemical, Gas, Petroleum and Power Generation Plant Operators	328
Welfare Support Workers	20	Sales Assistants (General)	315
Kitchenhands	15	Other Miscellaneous Labourers	306
Plumbers	14	Production Managers	301
Motor Mechanics	12	Commercial Cleaners	295
Other Stationary Plant Operators	12	Storepersons	279
Other Miscellaneous Labourers	12	Other Stationary Plant Operators	275
Chefs	11	Motor Mechanics	260
Metal Fitters and Machinists	10	Occupational and Environmental Health Professionals	250
Carpenters and Joiners	10	Earthmoving Plant Operators	237
Machine Operators, nfd	10	Registered Nurses	233
Industrial Spraypainters	10	Chefs	224
% of non-resident workforce 2016	59.9%	% of non-resident workforce 2016	53.0%

Source: ABS Census of Population and Housing 2016; Shared categories in bold

Mining employment

Clearly, census counts from the past few enumerations indicate that mining, and especially iron ore mining, is the leading industry of employment for both Aboriginal and non-Aboriginal workers in the Pilbara, whether they are residents or not. While data have been presented to this effect, these fall short of providing a precise metric and profile of mining employment for all the reasons of census undercount already mentioned. A comparison of census and company figures on employment in iron ore mining provides a case in point.

The 2016 census counted a total of 912 Aboriginal usual residents of the Pilbara in iron ore mining representing 39% of all Aboriginal residents in employment. If we adjust for undercount using the 2016 ERP we can derive an estimate of the 1,483 Aboriginal residents in iron ore mining. As for the total number of Aboriginal workers in iron ore mining in the Pilbara, including non-residents, this is recorded by the census as 1,420. While this figure cannot be adjusted because it includes non-residents, company figures on numbers employed suggest that it should be more in the region of 2,500. For example, data from Rio Tinto Iron Ore (RTIO) show a total of 366 resident Aboriginal workers in 2016 at around the time of the census representing 42% of its then total Pilbara-based Aboriginal workforce of 864. Access to equivalent data from other major companies involved in iron ore mining notably BHP Billiton Iron Ore (BHP) and Fortescue Metals Group (FMG) was out of scope for the present analysis. However, available public information (admittedly limited) points to around 1,100 Aboriginal employees at FMG either as direct employees or working with on-site contractors in the third quarter of 2016 (<http://www.fmgl.com.au/in-the-news/media-releases/2016/11/09/fortescue-agm-highlights-company-performance-andcommitment-to-diversity>). Also, at the end of July 2015 there were 654 Aboriginal workers reported in BHP Pilbara operations (<https://www.bhp.com/community/case-studies/changing-lives>) a figure that probably indicates those directly employed by BHP. No doubt these figures include both resident and FIFO workers but to what extent is unknown. Even with these rough figures to hand, it is clear from company records that the combined Aboriginal workforce in iron ore mining (both resident and FIFO) is likely to be considerably higher than that counted by the census. Unfortunately, without access to detailed data from all company operators it is not possible to be more precise.

If we focus on data from RTIO as a case-study, we can see that there were 135 Aboriginal employees at Pilbara-based worksites in 2004 (Taylor and Scambary 2005: 47). By December 2016, this number had risen to 864 representing an increase of 540%. However, the total RTIO workforce also grew substantially over this same period from 3,531 in 2004 to around 12,500 in 2016. Nonetheless, the Aboriginal share of this total workforce doubled over the same period from 3.8% in to 7.2%. Of course, this global figure includes a variety of Aboriginal workers including those who are Pilbara residents and FIFO and whether these are from a Traditional Owner group or not. For example, regarding the latter, 16.4% of the Pilbara-based workforce identified as Banjima, Eastern Guruma, Kuruma Marthudunera, Ngarluma, Nyiyaparli, Yindjibarndi, Yinhawangka, Ngarlawangga and Puutu Kunti Kurrama and Pinikura. The remainder simply indicated Aboriginal descent. It is not clear whether any of those identifying simply as 'Aboriginal descent' would be from any of the Traditional Owner groups listed so all we can say is that the minimum number of the latter employed in Pilbara

Iron operations in 2016 amounted to 148.

Such detail is of particular interest in the context of Agreements where the pressing question is whether growth in Aboriginal employment is contributing to the achievement of negotiated company targets. RTIO has three employment targets for different Aboriginal population groupings. First of all, there is a national target for Rio Tinto Australia of 8% of total employment as set out in its Reconciliation Action Plan. Second, there is a target for Pilbara Aboriginal People (PAP) that refers to all Aboriginal people who live in the Pilbara and all members of Traditional Owner groups that have signed the Regional Framework Deed, regardless of where they live. This target is set against RTIO residential roles and is linked to census data so it moves every 5 years. In 2017, the target was set at 12.2% and as of January 2018 it shifted to 15.7%. Finally, there is a target for Traditional Owners that refers to all people who identify as members of a group that RTIO has an Agreement with. There is no formal RTIO target for this category but the residential target is used as a proxy measure with individual targets for FIFO sites introduced in 2017. Of particular interest in terms of the focus in this report on outcomes for Pilbara residents including Traditional Owners is the outcome for the PAP grouping. As of March 2018, 13.1% of RTIO's Pilbara residential workforce was drawn from this category and the expectation is that this will rise to 13.5% by the end of 2018.

Table 3.17 provides a breakdown of these three employee groupings according to whether individuals are resident in the Pilbara or operate as FIFO workers. This shows that most Aboriginal employees (58%) are FIFO workers from outside of the Pilbara although 9% of these indicate that they are Pilbara Traditional Owners.

Table 3.17 Number of Aboriginal RTIO employees according to employment target category, 2016

Category	Aboriginal	PAP	Traditional Owner
Pilbara resident	366	332	96
Pilbara FIFO	498	45	45
Perth	40	3	3
Total	904	380	144

Source: Rio Tinto Iron Ore, Perth

Table 3.18 also shows the distribution of Pilbara-based Aboriginal employees and relief contractors by major RTIO worksite in 2004 and 2016. The first thing to note is that employment numbers distinguish between employees and relief contractors. The latter are small in number and have barely increased since 2004. These are essentially replacement staff positions that can be filled by another employee or a relief contractor. Often relief contractors are converted to an employee after a period of time. They may be used in situations where they are backfilling for someone on maternity leave for example. Employees and relief contractors are both counted in the employment headcount unlike workers that are subcontracted as these perform roles that would not otherwise be performed by an employee and the roles are usually short term by nature.

Table 3.18 Distribution of Aboriginal employees and relief contractors by Rio Tinto Iron Ore major worksites, 2004* and 2016

Worksite	Employee 2016	Relief contractor 2016	Total 2016
Brockman	142 (0)	4	146

Cape Lambert	102 (18)	1	103
Dampier	118 (35)	2	120
Hope Downs	92	8	100
Marandoo	40 (6)	3	43
Pannawonica	53 (1)	1	54
Paraburdoo	62 (6)	6	68
Perth	40 (1)	0	40
Tom Price	106 (28)	1	107
West Angelas	70 (7)	6	76
Yandicoogina	41 (5)	4	45
Total Pilbara	827	36	862
Total Rio Tinto Iron Ore	866 (107)	36 (24)	902

Source: Rio Tinto Iron Ore, Perth

* 2004 figures in parentheses

The vast majority of Aboriginal workers are direct employees at each worksite. The mine with the largest Aboriginal workforce in 2016 was Brockman which is interesting as it recorded no Aboriginal workers in 2004. This is followed by Tom Price and Hope Downs as well as the port facilities at Dampier and Cape Lambert. Clearly, all worksites have considerably increased their Aboriginal workforces since 2004, although Hope Downs was only opened in 2007. Overall, Aboriginal employment in these major worksites has risen from 135 in 2004 to 902 in 2016. As for the Aboriginal share of employment at each site, this is shown in Table 3.19. Overall, the share of employment at worksites in the Pilbara has doubled since 2004 from 3.8% to 8.6% with a slightly lower increase at RTIO worksites more generally. This increase has occurred at all worksites with Brockman, Pannawonica and Paraburdoo standing out as having the largest increase. The two port facilities at Cape Lambert and Dampier record the highest proportions of Aboriginal workers.

Table 3.19 Distribution of Aboriginal employees and relief contractors by Rio Tinto Iron Ore major worksites, 2004 and 2016

Worksite	Total workforce 2016	Aboriginal %	
		2004	2016
Brockman	1,817	0.0	8.0
Cape Lambert	949	5.3	10.8
Dampier	1,171	4.9	10.2
Hope Downs	1,056	n/a	9.5
Marandoo	595	5.0	7.2
Pannawonica	591	0.4	9.1
Paraburdoo	855	1.3	7.9
Perth	1,645	0.0	2.4
Tom Price	1,266	4.1	8.4
West Angelas	1,016	2.7	7.5
Yandicoogina	641	3.1	7.0
Total Pilbara	9,965	3.8	8.6

Source: Rio Tinto Iron Ore, Perth

While census data shown in Tables 3.14 and 3.16 indicate that most of these workers would be engaged as shot firers and drillers, RTIO data on worksite role types provide a further dimension on occupations (Table 3.20). These show that almost two-thirds (60%) of Aboriginal workers are plant operators followed by those in trade positions (13%). This is broadly consistent with the census data on leading occupations shown in Tables 3.14 and 3.16. Beyond this around 11% of employees were in technical,

professional and supervisory roles and some 5% were apprentices. No Aboriginal people were engaged in graduate or managerial positions.

Table 3.20 Distribution of Aboriginal workers by role type at Rio Tinto Iron Ore worksites, 2016

Role type	Number	Percent
Plant operator	540	59.7
Trade	115	12.7
Team member	73	8.1
Apprentice	44	4.9
Technical	37	4.1
Administration	30	3.3
Professional	26	2.9
Supervisor	24	2.7
Superintendent	8	0.9
Specialist	6	0.7
Principal	1	0.1
Graduate	0	0.0
Manager	0	0.0
Total	904	100.0

Source: Rio Tinto Iron Ore, Perth

Aside from these direct employee and relief contractor positions companies also contribute to Aboriginal mining employment via preferential contracting of Aboriginal businesses or by stipulating Aboriginal labour quotas from other businesses who operate both on and off mine sites. Defining the precise cut-off between the mining industry and allied activities and who exactly is working for whom in the Pilbara has always been very difficult and this has become even more so with the emergence of multiple Aboriginal-owned businesses and joint ventures providing a variety of support and operational services to resource companies. The point has already been made that this constitutes a sizeable but mostly unquantified Aboriginal sector of the regional economy and a separate study is required to establish its contours, content and impact.

A further means to enhancing Aboriginal employment is through Rio Tinto's Aboriginal Training and Support (ATAS) program. This identifies employment opportunities through a structured pre-employment pathway for Traditional Owners. The program provides fixed-term contracts for local Aboriginal people at Pilbara-based operations and it is designed to build potential employee capacity, skills and industry experience with the opportunity to transition to full-time employment. Eligibility includes being 18 years and over, being a Traditional Owner of the land on which Rio Tinto operates in the Pilbara, being fit for work, holding a current C class manual drivers licence, residing locally in the Pilbara or at one of RTIO's FIFO source communities for the duration of the program, possessing strong communication skills and the ability to work as part of a diverse team, and being self-motivated with a high regard for safety. Whether the Traditional Owner requirement is fully applied is not clear as only 54% of current participants specify a particular Traditional Owner group with the remainder identifying in ATAS records as 'Aboriginal' only.

The program commenced in 1992 under the auspices of the Aboriginal Training and Liaison Unit (ATAL) and between 1992 and 2004 a total of 131 trainees passed through the program with just under 10% withdrawing before completion (Taylor and Scambary 2005: 46). Data from ATAS for the period 2011-2016 indicate a total of 179 participants over that period with an average of 30 participants a year and numbers growing in recent

years (Table 3.21).

Table 3.21 ATAS participant numbers and outcomes, 2011-2016

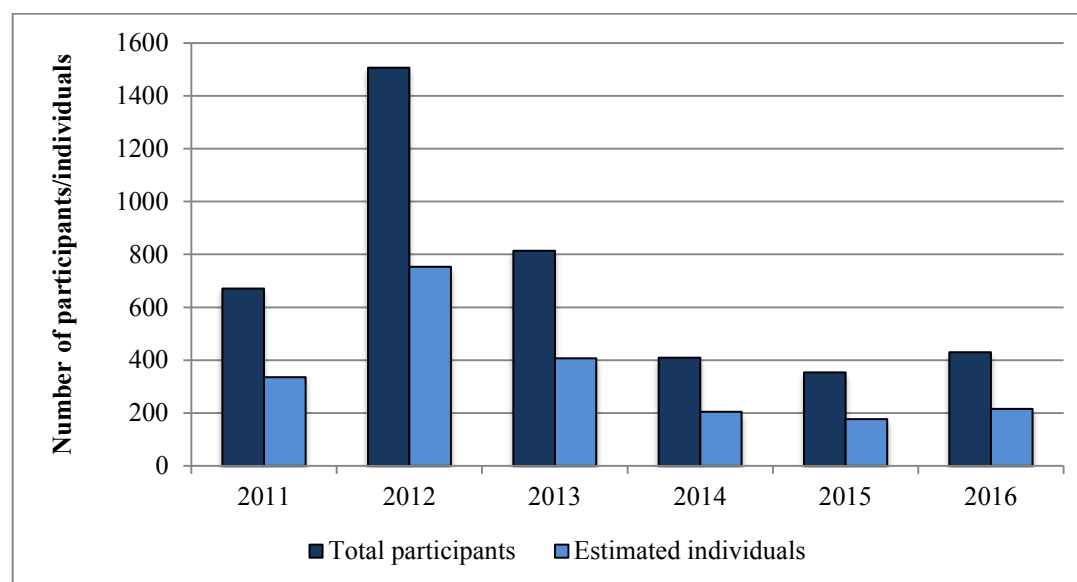
	2011	2012	2013	2014	2015	2016
Employee initiated termination	7	4	9	4	8	11
External FTE conversion	4	4	1	3	9	1
RTIO Apprenticeship conversion	0	0	0	1	4	2
RTIO FTE conversion	4	9	15	4	13	14
RTIO initiated termination	3	8	10	4	14	1
RTIO conversion	0	0	0	0	0	1
Total	18	25	35	16	48	37

Source: Rio Tinto Iron Ore, Perth

A further source of employment that is contingent on mining activity arises from the requirement for RTIO to meet its obligations for the identification, protection, and management of Aboriginal heritage sites. Accordingly, the RTIO heritage program works closely with Traditional Owners to effectively manage activities around heritage sites. Both the nature and scale of these activities varies over time and space as does the number of Traditional Owners employed. Some idea of the scale of activity is provided by Figure 3.10 which shows the total number of Traditional Owner participant positions in survey activities each year between 2011 and 2016 together with a crude estimate of the actual number of unique individuals involved in occupying those positions each year (this estimate is based on RTIO unit-record data from 2016 which showed that the ratio of individuals to positions was 0.5 – this was then applied to all years).

What this clearly shows is the rise and fall of heritage survey work as the requirements for site clearance has shifted according to the business cycle of mining. A further breakdown would reveal that participation has also varied over time between different Traditional Owner groups as different parcels of country become subject to clearance requirements. In the peak year of 2012 it is possible that up to 800 individuals were engaged in at least some heritage work with this number now falling back to around 200. The spike in 2012 coincided with the Koodaideri mine development and Cape Lambert port and rail expansions. Once these projects were complete there was a sharp drop off in heritage survey activity as the chart shows. What this points to is that short-term employment opportunities on country, when they are available, prove to be popular as they allow people to drop in and out of participation to attend to other matters. What it also suggests, however, is that opportunities for this kind of engagement may have commenced a medium-term decline as the need for such clearance work recedes. In some ways, this may be an ominous precursor to possible outcomes more generally in the mining industry – people respond to the opportunities for work as they emerge only to find that demand for their particular skill-set subsequently declines.

Figure 3.10 Counts of Traditional Owner participants and estimates of distinct persons engaged for Rio Tinto Pilbara heritage survey work, 2011-2016.



Source: RTIO, Perth

The challenge of meeting targets

It is clear that the expansion of mining activity since the early 2000s has provided a major boost to Aboriginal employment in the Pilbara, although care is required to distinguish resident from FIFO components of this. Such achievement represents a positive step towards meeting the medium to long-term goal that was set by the original Central Negotiating Committee to ‘elevate Aboriginal people (of the Pilbara) to be on a par with the rest of Australia’ (across key social indicators). This goal (among others) laid the foundation for the Regional Framework Deed that includes a set of seven regional standards to achieve in areas of interest to the RIC including in regard to employment and training. As we have seen, this employment focus is now manifest in negotiated targets established around the concept of representation in the RTIO workforce based on share of regional population. But what of the original regional ambition to ‘be on a par with the rest of Australia’? What targets would this entail and what would they imply in terms of job requirements over the medium-term?

The basic dynamics involved here include existing Pilbara Aboriginal and total Australian employment rates along with some measure of the future size of the Pilbara Aboriginal population of working-age (ie. potential job-seekers). We have already seen how these dynamics work over time since the notable expansion of the Aboriginal workforce in the Pilbara since 2001 has led to only a slight increase in the employment rate (if we include CDEP). This is because employment growth overall has barely outpaced population growth. A much more positive trend is evident if CDEP is excluded from employment but even here recent jobs growth has more or less stalled and the employment rate remains well below the regional average. Simply put, while more Aboriginal people are in work than ever before, there are also more Aboriginal people of working-age than ever before. One consequence is a continuing substantial gap in regional employment rates with double the number of Aboriginal people required in employment in 2016 to achieve the same employment rate as non-Aboriginal residents. In the meantime, the Aboriginal population of working-age is projected to continue to grow and so the numbers required to reach parity in rates will also continue

to expand over time. According to the ABS projections there will be an additional 4,106 working-age Aboriginal residents of the Pilbara by 2026 from a base in 2011 of 7,071 (ABS 2014). As is often noted in the context of Aboriginal development, there is a sense here of constant catch-up with no end in sight.

With regard to the prospect of employment growth keeping pace with this future expansion in population numbers, from a mining industry perspective the prognosis is for a reduced but more technically-skilled workforce that is able to operate in a more automated work environment. In effect, the skill-set required for mining employment is likely to shift in emphasis with a need for more employees trained at higher levels in science, technology, engineering and mathematics (STEM) and fewer with lower level qualifications for occupations such as drilling and haulage as these are expected to be overtaken by more remote operations and machine automation. All of this points to a workforce that is unlikely to be adequately equipped for mining employment without completion of a substantial grounding in tertiary-level post-school education and training. Likewise, the mining jobs of the future may become better suited to younger trained members of the workforce with the newest skills.

On this basis we can argue that a more realistic working-age range for contemplating and setting targets for employment outcomes is likely to be the age group 25-54 rather than the whole adult population aged 15 years and over. With these sorts of dynamics unfolding in the industry where most Aboriginal people are employed, what, then, is the scale of the challenge ahead if the Aboriginal population in this age range is to approach parity with the rest of the population in terms of employment outcomes? To answer this we can use the population projections in Table 2.11 against a set of differing expectations regarding employment rates.

Overall, using ABS projections from 2011, the Aboriginal population of the Pilbara aged 25-54 years is expected to rise to 7,680 by 2026 (Table 2.12). Using ABS estimates, the equivalent population is currently (in 2016) around 5,261. This means there will be around 2,500 additional people of prime working-age over the next 10 years. How many jobs will they require in order to achieve selected employment objectives? As we have seen, one such strategic (20-30 year) objective identified by the RIC is to elevate Aboriginal people to be on a par with the rest of Australia. We can model this outcome in employment terms and see what it means for additional jobs required but only to 2026 (Table 3.22).

As a rough guide, to avoid any slipping behind in the current regional Aboriginal employment rate, the minimum task is to retain the 2,714 in this age group who are presently in work and then to add an additional 1,250 jobs over the next 10 years. Every additional job beyond this represents a step towards some form of parity. If, the parity sought is with all Australians then a half-way point towards this objective by 2026 would require a doubling of the current employment level. If parity were sought with other Pilbara residents this would require a tripling of the current level. As to where these additional individuals might come from and what they might need in order to successfully secure employment, one might only look at the 1,000 or so students currently in or just out of the high school system and what their requirements might be for joining the workforce. Of additional interest would be the situation facing those of younger working age who are either unemployed or unattached to the labour force. In effect, an urgent audit of capacity to engage is required of the younger Aboriginal age groups.

Table 3.22 Estimates of future Aboriginal employment requirements in the Pilbara region to meet select employment rate outcomes by 2026

Employment rate in 2016	Estimate of base employment in 2016*	Total jobs required for parity by 2026	Extra jobs required by 2026
51.6 ^a	2,714	3,963	1,249
63.7 ^b	2,714	4,892	2,178
88.9 ^c	2,714	6,827	4,113

* Estimate of Aboriginal employed aged 25-54 using ABS ERP and census rates

a. 2016 employment rate for Aboriginal Pilbara residents aged 25-54

b. Half way to all Australians aged 25-54

c. Non-Aboriginal Pilbara residents aged 25-54

Judging by the experience of Aboriginal employment gains since 2001, the mining industry will inevitably be at the forefront of efforts to achieve such regional targets. As we have seen, just about all of the growth in Aboriginal employment since 2001 has been in the private sector and the bulk of this has been in the mining industry or in activities associated with the mining industry. To that extent, Aboriginal jobs in the Pilbara are now overly-tied to the fortunes of that industry, either through direct or indirect employment, to a degree that is unprecedented. This leaves them highly vulnerable to change and negative impacts. As far as mining jobs for Pilbara residents and Traditional Owners are concerned, there is clearly some slack in the labour market in so far as non-residents have occupied an increasing number and proportion of Pilbara-based positions. This may provide a case for some form of regionally-based labour market-testing to favour local job-seekers in much the same way as happens with international labour. At the same time, the downward pressure on labour demand in the mining industry due to occupational restructuring might actually present opportunity for local businesses such as in maintenance work, but the main message from these trends is a pressing need for the RIC to search for and develop alternatives to mining employment.

4. Income status

Income data collected by the census refer to the total of all income (gross income) 'usually received'. Options are provided on the census form to interpret this as amounts 'per week' or 'per year'. Gross income is the sum of income received from all sources before any deductions such as income tax, Medicare levy or salary sacrificed amounts are extracted. In theory it is meant to include wages, salaries, business income, rents received, royalties, dividends, interest, income from superannuation, child support, worker's compensation and government pensions and allowances. In practice, there is a tendency for incomes to be understated in the census although the distribution of income for the population as a whole is largely consistent with that obtained from ABS income surveys (ABS 2016: 201 Census Dictionary cat no. 2901.0).

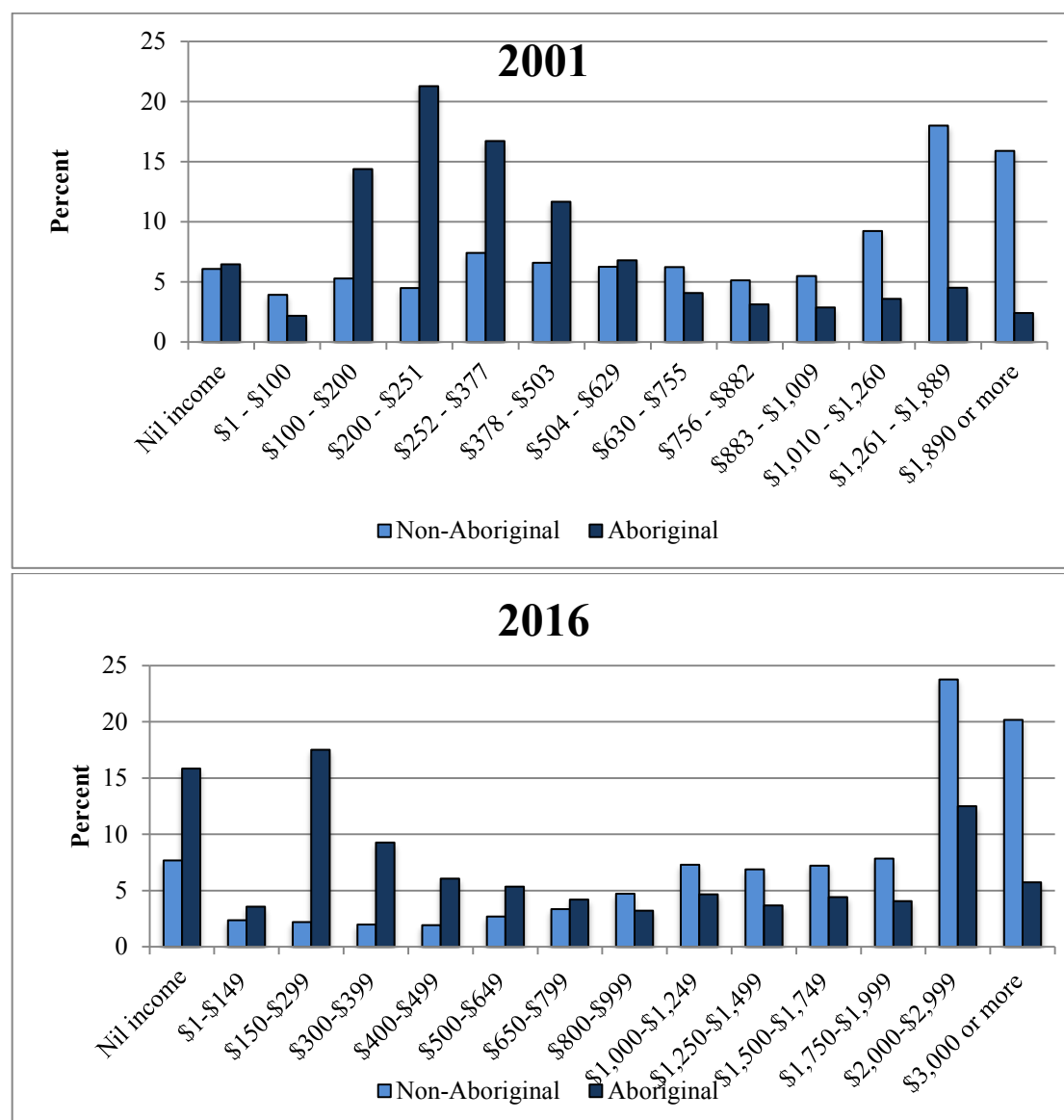
Accurate data on income levels, and employment and non-employment sources of income, are notoriously difficult to obtain due to a variety of conceptual problems. For one thing, reference to 'usual income' over the two available time periods of annual or weekly assumes a consistent flow of income to individuals and households whereas this is often intermittent. What might constitute 'usual weekly' income in many Aboriginal households is difficult to determine to say nothing about the problem of constructing such households using census data (Morphy 2016: 109). On the credit side, there is the likelihood of intermittent employment and windfall gains from sources such as cash loans and royalty payments. This sort of income combines with debits for example, due to loss of employment or welfare payments to create a highly complex picture even over a short space of time and one that census methods of data gathering are not equipped to capture. Nonetheless, the census remains the only comprehensive source of income data that allows for separate measurement of personal and household Aboriginal income using a consistent methodology.

It should be noted that the census reports income in categories, with the highest category left open-ended. Consequently, actual incomes have to be derived. In estimating total and mean incomes, the mid-point for each income category is used on the assumption that individuals are evenly distributed around this mid-point. The open-ended highest category is problematic, but it is arbitrarily assumed that the average income received by individuals in this category is one-and-a-half times the lower limit of the category (Treadgold 1988) and this is applied here.

Income distribution

Fig. 4.1 shows the distribution of personal weekly incomes for Aboriginal and non-Aboriginal residents of the Pilbara in 2001 and 2016 with the 2001 distribution adjusted for inflation and expressed in \$2016 for direct comparison. In both years, there are two very different sets of outcomes with Aboriginal incomes clustered around the lower end of each distribution and non-Aboriginal incomes clustered around the high end. In 2016, median personal income for Aboriginal adults was \$463 per week while for non-Aboriginal adults it was \$1,744 per week. The other point to note is considerable growth in the proportion of Aboriginal incomes at the upper end of the distribution. In 2001, only 10% of Aboriginal weekly incomes were over the equivalent of \$1,000 whereas in 2016 the figure was 35%. Conversely, as much as 72% of Aboriginal weekly incomes were less than \$500 in 2001 compared to 52% in 2016. This 2016 figure would have been lower still if the proportion of individuals with no income had not risen from 6% in 2001 to 16% in 2016.

Figure 4.1 Distribution of Aboriginal and non-Aboriginal weekly personal income (\$): Pilbara region, 2001 and 2016



Source: ABS Census of Population and Housing 2016; Taylor and Scambary 2005

One suggestion for this rise in the proportion with no income is the increase in school leaving age to 17 years. However, more than half (55%) of those with no income were neither employed nor in education or training. What is not clear is whether these individuals have dropped out of the income support system as well, which would seem to be implied. The possibility that this may reflect substantial compliance breaching off the Community Development Program involving no pay penalties cannot be discounted (Fowkes and Sanders 2016) although regional data on this are difficult to access as the Senate committee investigating this matter itself recently discovered (Commonwealth of Australia 2017: 110). Some sense of the possible impacts of breaching in the Pilbara is provided by the range of evidence presented to this committee including correspondence tabled by the CEO of Kanyirninpa Jukurrpa at Newman (Commonwealth of Australia 2017: Appendix 1).

Together with persistent concentration in the lowest income categories, this growth in

Aboriginal residents who are not receiving an income from employment or social security is one reason why the Aboriginal income distribution appears more stretched in 2016 than it was in 2001. The allied reason is the increasing share of Aboriginal adults with incomes at the upper end of the distribution. In 2016, this was particularly so in income brackets of over \$2,000 per week and it lends support to the idea of an emergent Aboriginal middle-class not least in mining regions such as the Pilbara (Langton 2013). By contrast, non-Aboriginal incomes are now even more heavily concentrated towards the upper end of the distribution. The two distributions cross over at more or less the same income level in 2016 as they did in 2001 (expressed in \$2016) with Aboriginal shares highest in all income categories below \$650-799 in 2016 and non-Aboriginal shares higher in all categories above this.

The net effect of these shifts in income distribution is summarised as changes in median income in Tables 4.1 and 4.2. These are adjusted for inflation and based on \$2016 using the ABS' CPI Inflation Calculator. On this basis, in 2001, Aboriginal median weekly income was \$294. By 2006, it had risen only slightly to \$310 but by 2016 it had increased substantially to \$463. Table 4.1 shows the changes in median incomes in real dollars between 2006 and 2016. As might be expected, non-Aboriginal incomes grew substantially in real terms from a median of \$1,217 in 2006 to \$1,774 in 2016 – an increase of 46%. While Aboriginal real incomes also increased at a similar rate (49%) in relative terms they remained unchanged and low at just 26% of the non-Aboriginal median (Table 4.2). Also shown in Tables 4.1 and 4.2 is considerable variation in outcomes across the various Pilbara shires. Most notable of all is a dramatic increase in Aboriginal median income in Ashburton shire with this rising from 26% of the non-Aboriginal median in 2006 to almost half by 2016. Elsewhere, income gains have been more modest and the ratios of medians have remained much the same in real terms at around one-third the non-Aboriginal median in Karratha and Port Hedland and at a very low 18% in East Pilbara.

Table 4.1 Aboriginal and non-Aboriginal median weekly personal incomes (\$) by Pilbara shire, 2006* and 2016.

	Aboriginal		Non-Aboriginal	
	2006*	2016	2006*	2016
Ashburton	384	1,139	1,462	2,453
Karratha	382	426	1,213	1,468
Port Hedland	419	478	1,196	1,501
East Pilbara	267	370	1,515	2,017
Total	310	463	1,217	1,774

Source: ABS Census of Population and Housing 2006 and 2016

*2006 census data converted to \$2016 using the ABS' CPI Inflation Calculator (ABS Cat. no. 6401.0)

Table 4.2 Ratios of Aboriginal to non-Aboriginal median personal incomes (\$) by Pilbara shire 2006 and 2016.

	2006	2016
Ashburton	0.26	0.46
Karratha	0.31	0.29
Port Hedland	0.35	0.32
East Pilbara	0.18	0.18
Total	0.25	0.26

Based on data in Table 4.1.

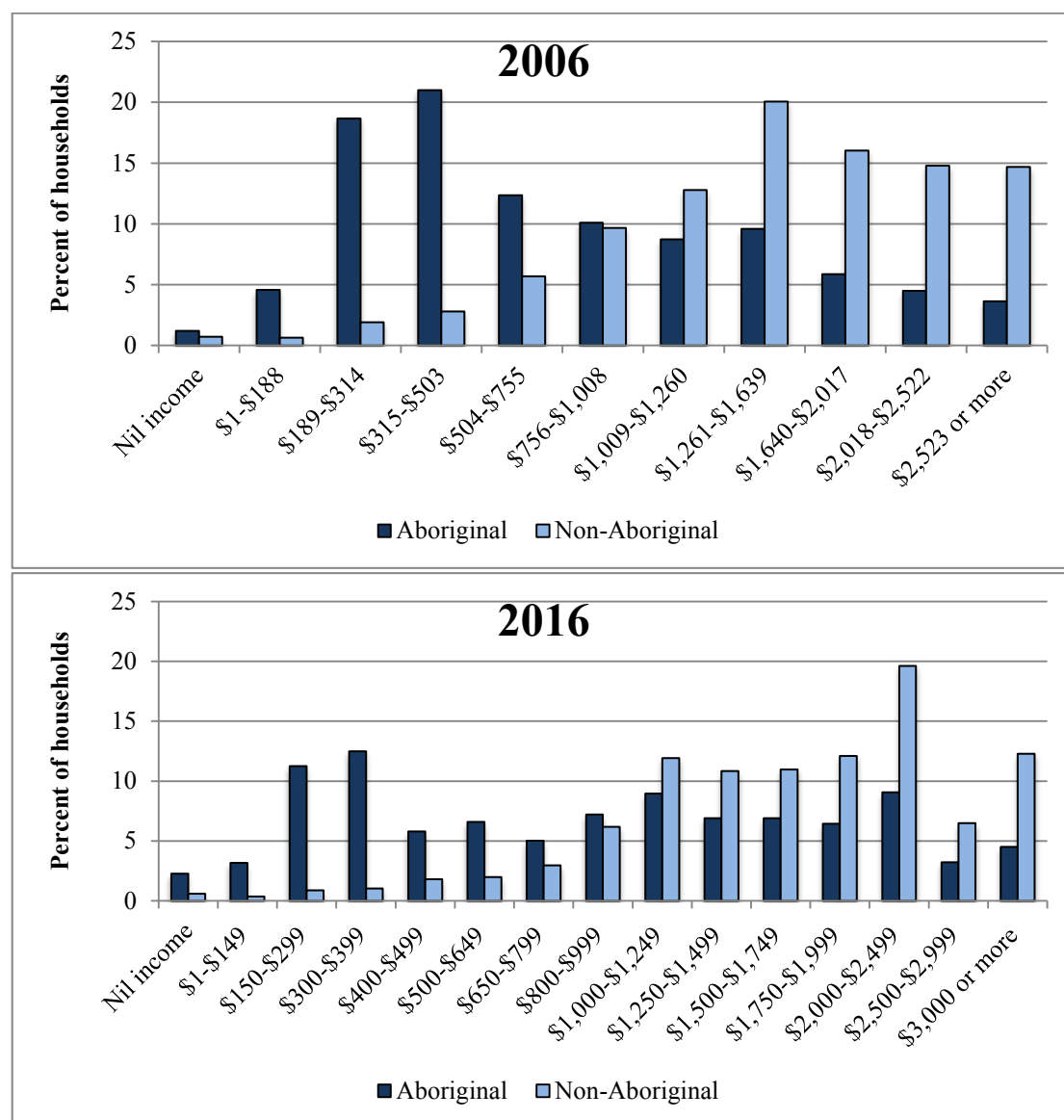
One important measure that is often based on median income is the proportion of people on incomes below the poverty line. If we use those Aboriginal people in the Pilbara with personal incomes less than 50% of the national median (\$662 per week) as the benchmark we can say that in 2016 as much as 58% of individuals were below the poverty line. While this represents a substantial proportion what is more telling is that it is up from 47% in 2001.

Household income

Of course, individual personal incomes are invariably shared, usually with other family members as part of a household. The collective income of household members is therefore an important a measure of access to financial resources. This is reported by the census as household income. While gross household income distributions were presented in Taylor and Scambary (2005: 65), in order to examine change in these over time and between populations we need to know whether any shift is due to actual changes in income levels or simply to changes in household size and composition. To do this, the ABS reports household income using an equivalence scale that places households on an equal footing independent of size and composition. Equivalised household income is therefore total household income adjusted to facilitate comparison of income levels between households of differing size and composition. It enables comparison over time.

Figure 4.2 shows equivalised weekly incomes for Aboriginal and non-Aboriginal households in the Pilbara in 2006 and 2016 with income categories for 2006 adjusted for inflation and reported in 2016 dollars. What this reveals is a substantial positive shift in Aboriginal household incomes. In 2006, 45% of Aboriginal household incomes were less than \$500 per week compared to 34% in 2016. By contrast, in 2001, 32% of household incomes were above \$1,000 per week compared to 45% in 2016. The proportion in the middle of the distribution between \$500-\$1,000 remained roughly unchanged at 22% and 18% respectively. Despite this shift, the 2016 Census still reports almost 20% of Aboriginal households (17%) with an effective equivalised income of less than \$300 per week. This compares to just 2% of non-Aboriginal households. Overall, however, the gap between Aboriginal and non-Aboriginal household incomes has been closing with the ratio of medians between the two rising from 0.38 in 2006 to 0.51 in 2016 (Table 4.3).

Figure 4.2 Distribution of Aboriginal and non-Aboriginal gross weekly equivalised household income (\$) adjusted for inflation*: Pilbara region, 2006 and 2016



Source: ABS Census of Population and Housing 2006 and 2016

* 2006 income categories adjusted for inflation using \$2016

Table 4.3 Median Aboriginal and non-Aboriginal gross weekly equivalised household incomes (\$) : Pilbara region, 2006* and 2016.

	Aboriginal		Non-Aboriginal	
	2006*	2016	2006*	2016
Median	474	894	1,236	1,768
Ratio Aboriginal/non-Aboriginal	0.38	0.51		

Source: ABS Census of Population and Housing 2006 and 2016

*2006 census data converted to \$2016 using the ABS' CPI Inflation Calculator (ABS Cat. no. 6401.0)

One important measure of economic status that is often based on median household income is the proportion of people on incomes below the poverty line. Poverty measures are generally based on a percentage of the median income of the population as a whole and a commonly used measure is to identify people living in poverty as those

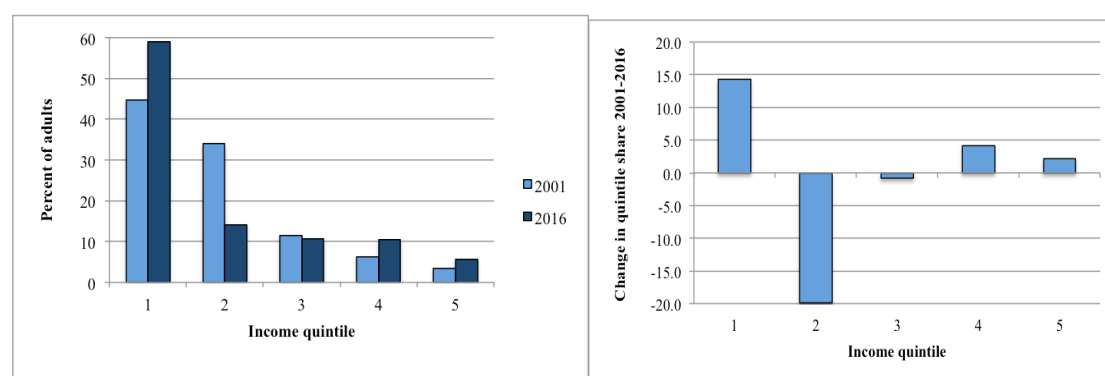
in households with a disposable income below 50% of the median income for all households. This is the method applied by Markham and Biddle (2018) in their analysis of Indigenous income and poverty in Australia and it means that their rate is a measure of the economic situation of Indigenous Australians relative to the entire population of the country. The Markham and Biddle analysis reveals that the Aboriginal poverty rate in the Pilbara in 2016 was high at 35.2% (though not the highest in the country), but more to the point it had increased by almost one-fifth from 29.4% in 2011 (Markham and Biddle 2018: 18-19; Francis Markham pers. com.). This increase in the Pilbara Aboriginal poverty rate was the 7th highest in the country out of 37 Indigenous Regions – a remarkably negative outcome for a region of such sustained economic growth.

Relative change in Aboriginal income distributions

The distribution of individuals or households by income quintiles over time can be also used as a summary measure of relative change. Here the incomes of non-Aboriginal individuals and households in the Pilbara are ranked in ascending order (from lowest to highest income) and then divided into five equal groups (five quintiles) each comprising 20 per cent of the population. The proportions of incomes among Aboriginal individuals and households in each of these same quintiles are then calculated. If income distributions were similar across the Aboriginal and non-Aboriginal populations, there would be about 20 per cent of Aboriginal adults and households in each quintile.

With regard to personal income, we can see from Figure 4.3 that parity in income distribution is far from the case both in 2001 and in 2016. Instead of recording 20% percent of Aboriginal adults in the first (low income) quintile, 44% of Aboriginal incomes fell into this category in 2001 while in 2016 this had risen to almost 60%. Conversely, the share of Aboriginal incomes the 4th and 5th quintiles both increased.

Figure 4.3 Aboriginal personal income distribution by quintiles and change in quintile shares: Pilbara region, 2001 and 2016



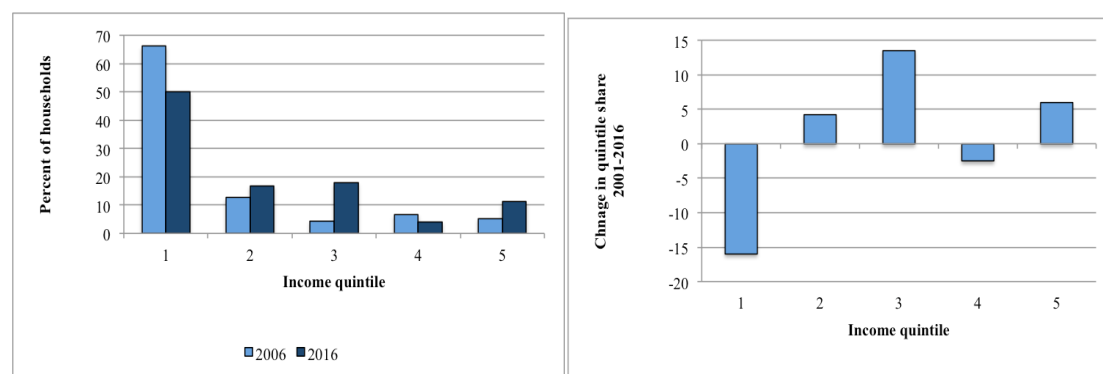
Source: ABS Census of Population and Housing 2001 and 2016

This shift in relative Aboriginal income distribution is clearly illustrated in the second panel in Figure 4.3 that shows the net change in quintile shares. The most obvious feature is a large drop in the proportion of individuals with incomes in the second lowest quintile but only because many of these had, by 2016, fallen into the lowest income quintile partly reflecting an increase in persons with nil income. At the other extreme increased shares are apparent in the highest two quintiles. What this illustrates is a growing gap within the Aboriginal population between a large group (60% of adults) who are now even more entrenched at the bottom of the personal income distribution and a smaller group (16%) who appear to have been sharing in the high income rewards

that have been on offer in the region over the 15 year period. As noted before, little net change is apparent in the middle of the income distribution.

A somewhat different story emerges from the analysis of change in equivalised household incomes (Figure 4.4). Here there has been a general improvement in Aboriginal income with a shift away from the lowest quintile towards the middle of the income distribution. There has also been a notable gain in the highest income quintile.

Figure 4.4 Aboriginal equivalised household income distribution by quintiles and change in quintile shares: Pilbara region, 2006 and 2016

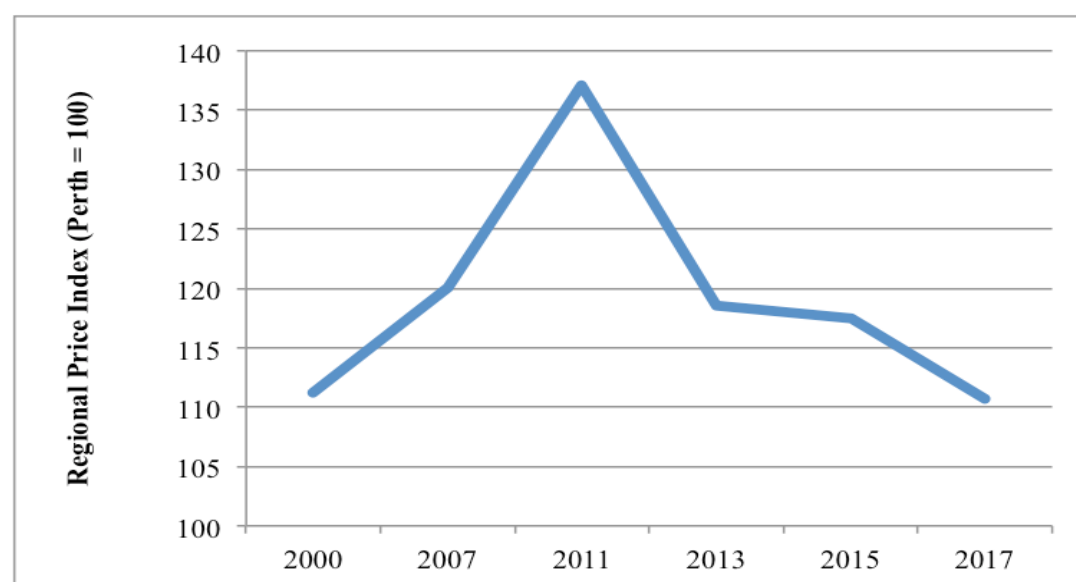


Source: ABS Census of Population and Housing 2001 and 2016

Taken together, these relative changes in income point to growing inequality in the personal incomes of Aboriginal people as those without jobs and dependent solely on income support are left behind financially compared to those in employment with often high paying jobs. At the same time, there appears to have been some amelioration of this in the context of household incomes no doubt due to a mix of improved family support payments and wages growth. According to Markham and Biddle (2018: 27) income inequalities within the Aboriginal population are highest in Western Australian regions, and highest of all in the Pilbara. They report that this finding is consistent with previous research showing that the ‘minerals boom’ since 2001 has led to increased income inequality generally in mining areas (Hunter et al. 2014; Fleming & Measham 2015). Clearly, the difference in Aboriginal personal incomes in the Pilbara between the bottom and the top of the income distribution is growing. As Markham and Biddle (2018: 33) point out, this is not surprising given that data from the National Aboriginal and Torres Strait Islander Social Survey 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 to wages.

The significance of this growing income disparity is best considered in the context of cost of living in the Pilbara and the degree to which this has been inflated by the mining boom. Figure 4.5 shows the Regional Price Index for a basket of goods in the Pilbara from 2000 to 2017. The Regional Price Index is a survey-based measure developed by the Western Australia Department of Primary Industries and Regional Development to compare the price of a unique basket of 500 goods and services in regional locations with its equivalent in Perth. Items in the basket are derived from the ABS’ Consumer Price Index and include food, alcohol and tobacco, clothing, housing, household equipment and operation, health, transport and recreation and education. Perth prices in the index equal 100.

Figure 4.5 Regional Price Index: Pilbara region, 2000-2017



Source: Western Australia Department of Primary Industries and Regional Development, Regional Prices Index 2000, 2007, 2011 2013, 2015 and 2017

Since the year 2000, the Pilbara region has often recorded the highest prices for goods and services in Western Australia, sometimes falling behind parts of the Kimberley, but only on occasion. Certainly, during the mining boom, this dubious distinction was unparalleled as shown by the peak in the Regional Price Index in Figure 4.5. At the middle of the boom in 2011, overall prices in the Pilbara were fully 37% higher than in Perth having risen from 10% higher in 2000. The combined price index has now fallen back to the 2000 level but prices for such items as food, health care and housing remain 17-20% higher. Even those in waged employment would no doubt have struggled to cope with cost of living pressures throughout this period, whereas people on low wages and/or income support payments would clearly have been pushed further into poverty.

Employment and non-employment income

The other reason for growing inequality in Aboriginal incomes is the industry structure of Aboriginal employment growth with most of this arising from employment in the high-wage mining industry. Table 4.4 shows Aboriginal average annual gross incomes in the Pilbara by labour force status in 2001 and 2016 with 2001 figures adjusted for inflation. As we can see, real incomes from employment more than doubled over the 15-year period whereas non-employment incomes stagnated – in effect, they simply kept pace with inflation as they are designed to do.

Table 4.4 Average annual Aboriginal gross personal income (\$) by labour force status: Pilbara, 2001* and 2016

	Employed	Unemployed	NILF	Total
2016	92,747	16,074	15,147	52,907
2001*	42,570	15,544	15,799	28,132

Source: ABS Census of Population and Housing 2001 and 2016

*2001 census data adjusted for inflation to \$2016 using the ABS' CPI Inflation Calculator (ABS Cat. no. 6401.0)

Non-Aboriginal incomes from employment also increased in real terms (Table 4.5) but not to the same extent as Aboriginal incomes because mining employment already formed a sizeable share of employment in 2001 and other jobs were also concentrated in higher status occupations (Taylor and Scambary 2005: 36-42).

Table 4.5 Average annual non-Aboriginal gross personal income (\$) by labour force status: Pilbara region, 2001* and 2016

	Employed	Unemployed	NILF	Total
2016	119,966	30,314	17,422	106,558
2001*	80,879	30,230	21,644	69,746

Source: ABS Census of Population and Housing 2001 and 2016

*2001 census data converted to \$2016 using the ABS' CPI Inflation Calculator (ABS Cat. no. 6401.0)

The consequence of this substantial rise in real income for Aboriginal workers has been a marked 'closing of the gap' between them and the incomes of other resident workers (Table 4.6). The fact that income from non-employment sources is steadily higher among non-Aboriginal residents who are unemployed or not in the labour force is interesting as it suggests that they have greater access to other income sources beyond those provided by welfare payments. Aboriginal people, by contrast, seem not to emulate this as their non-employment incomes are consistently around the level pegged by income support.

Table 4.6 Ratio of Aboriginal to non-Aboriginal annual gross personal income (\$) by labour force status: Pilbara region, 2001* and 2016

	Employed	Unemployed	NILF	Total
2016	0.77	0.53	0.70	0.50
2001*	0.63	0.53	0.80	0.42

*2001 census data converted to \$2016 using the ABS' CPI Inflation Calculator (ABS Cat. no. 6401.0)

As for total amounts of income generated by employment, Table 4.7 shows this for Aboriginal and non-Aboriginal workers in 2001 and 2016. Once again, 2001 figures are adjusted for inflation. It should be noted that it is not possible to weight these figures using ABS population estimates as their distribution by income is unknown. As such, the data presented here are inevitably minimum amounts based on census counts of labour force status. According to these data, in 2001, Aboriginal workers in the Pilbara earned an estimated gross income of \$85m. By 2016, in real terms, this amount had risen to \$227m representing an increase of 167%. As a consequence, the share of regional Aboriginal income that derived from employment (including CDEP in 2001) rose from 72% to 85%. In terms of the impact on Aboriginal income distribution, it is worth recalling that this contribution to regional income was generated by just 45.6% of the adult population.

Table 4.7 Estimated Aboriginal and non-Aboriginal annual gross personal income (\$) adjusted for inflation) by labour force status: Pilbara region, 2001* and 2016

	Aboriginal		Non-Aboriginal	
	2001*	2016	2001*	2016
Employed	61,508,341	227,043,700	1.51 billion	3.44 billion
Unemployed	3,352,355	8,776,300	14,209,053	27,160,900
NILF	20,481,203	31,051,800	85,535,334	61,951,500
Total	85,341,900	266,227,000	1.61 billion	3.53 billion
Employment %	72.0	85.3	94.0	97.5

Source: ABS Census of Population and Housing 2001 and 2016

**2001 census data converted to \$2016 using the ABS' CPI Inflation Calculator (ABS Cat. no. 6401.0)*

One feature of the growth in gross income is its underlying reliance on wages from employment in the mining sector. As we have seen, in 2001, 21% of Aboriginal males were employed in mining and just 4% of Aboriginal females. By 2016, these proportions had risen to 61% and 28%. At the same time, salaries available from mining employment increased as did the occupational status of Aboriginal workers in the industry. All told, this has led to a dramatic increase in the contribution of mining to the regional employment income of Aboriginal workers. Of the \$227m gross income earned by Aboriginal workers in 2016, as much as \$141m (62%) of this derived from mining employment. Of this amount, \$30m (21%) was earned by female workers. Using 2016 census data, Aboriginal male mine workers earned on average \$131,000 per annum and female workers \$108,000 per annum. In 2006, using figures adjusted for inflation, the equivalent average earnings were \$112,000 for males and \$86,000 for females.

Income support

So far, the headline income indicators have focused on persons in employment. As such, they reflect the incomes, and to some extent the circumstances, of individuals at the top end of the income distribution. However, as noted, this refers to less than half of the adult Aboriginal population. The majority of Aboriginal adults in the Pilbara are not in this position of earning large amounts – they never were and this remains the case. For those who are either unemployed or not in the labour force average earnings are stuck at just 16% of the level of those in employment. As Markham and Biddle (2018: 33) point out, individuals in the bottom 20% of the national Indigenous income distribution rely heavily on social security payments.

Table 4.8. shows the distribution of these payments for Aboriginal and non-Aboriginal residents of the Pilbara in March 2005 and in 2016 at around the time of the census. First of all, the fact that payments to Aboriginal people exceed those for non-Aboriginal people (except for the age pension) is a measure of low relative economic status for a population that accounts for only around 16% of the regional adult population. It is also worth noting that the Aboriginal share of most payments made in the Pilbara has increased since 2005 (Table 4.9). The other outstanding feature is a substantial rise in Newstart payments, although the proportion of the population aged 22-64 in receipt of Newstart payments has remained unchanged since 2005 at 18%. As noted earlier, the numbers on Newstart together with Youth Allowance are far greater than the number recorded as unemployed by the census, even when the latter is adjusted for undercount. One reason for the rise since 2005 is the administrative transfer of individuals who would have been on CDEP in 2005 but were shifted to Job Search activities by 2016. As suggested earlier, it may be that these 2016 numbers were actually higher than shown here given the likelihood of compliance breaching off the Community Development Program involving no pay penalties (Commonwealth of Australia 2017). Other observations include the fact that Aboriginal disability payments have remained stable at around 500, despite population growth, while ABSTUDY payments appear to have fallen quite markedly, although on advice from the Department of Social Services care should be taken in drawing any conclusion here since the ABSTUDY figures may not be comparable over time due to possible different data sources and extraction rules.

**Table 4.8 Aboriginal and non-Aboriginal Centrelink customers by payment type:
Pilbara residents 2005⁽¹⁾ and 2016⁽²⁾**

Payment Type	Aboriginal		Non-Aboriginal	
	2005	2016	2005	2016
ABSTUDY (Living Allowance) ³	156	39	n/a	n/a
Newstart Allowance	670	1,092	344	407
Parenting Payment Partnered	217	171	134	38
Parenting Payment Single	742	517	414	156
Youth Allowance (other)	129	122	90	33
Youth Allowance (student)	<5	<5	<5	<5
Age Pension	214	232	731	394
Carer Allowance	<5	156	26	212
Carer Payment	<5	105	<5	35
Disability Support Pension	510	502	444	183
Rent Assistance*	Nd.	188	Nd.	380

Source: Commonwealth Department of Social Services, Canberra

1. As at fortnight ending March 31, 2005

2. As at fortnight ending 30 September, 2016

3. ABSTUDY data may not be directly comparable over time due to differing data sources/extraction rules.

Nd. No data

*Figures reflect the number of income units receiving Rent Assistance. An income unit comprises a single person (with or without dependent children) or a couple (with or without dependent children). Single social security recipients living together in the same household are regarded as separate income units.

Note: these data refer to recipients who are determined to be current (ie. entitled to be paid) on the Centrelink payment system. Aboriginal recipients include only those who have voluntarily identified as Aboriginal. These data may therefore represent an undercount of Aboriginal recipients and an overcount of non-Aboriginal recipients.

Some of these payments are not mutually exclusive, i.e. Rent Assistance and Carer Allowance can be received in conjunction with other payment types. Some of the payment data in the attached is only available quarterly, so we have provided data closest to August 2016

To the extent that income support payments from Centrelink provide some measure of financial need or hardship within the community it is instructive to establish whether the extent of such hardship across the Aboriginal resident population of the Pilbara has been reduced since 2005. We have already seen that as far as Newstart payments are concerned the extent of income support is roughly unchanged at around 16% of the adult population. As for disability support, there is some indication that the rate may have declined – in 2005 there were 510 disability support payments and 502 in 2016. However, the adult population increased over the intervening years so the rate of disability payment declined from 10.2% to 6.7%. Likewise with parenting support payments – in 2005 there were 217 Parenting Partnered payments and this number fell to 171 in 2016 representing a drop from 40% of partnered parents to just 17%. As for parenting support for single parents, the 2006 census data on Aboriginal single parents appears to be unusually low (at 297) compared to the number of parenting single payments (742) and so calculation of a rate is uncertain but likely to be in the region of 100%. If that is so, then the rate of 84% in 2016 would likely represent a decline even though the rate is still very high.

Table 4.9 Aboriginal percentage of Centrelink customers by payment type, Pilbara residents 2005⁽¹⁾ and 2016⁽²⁾

Payment Type	Aboriginal % of total payments	
	2005	2016
Newstart Allowance	66.1	72.8
Parenting Payment Partnered	61.8	81.8
Parenting Payment Single	64.2	76.8
Youth Allowance (other)	58.9	78.7
Age Pension	32.5	37.1
Disability Support Pension	53.5	73.3
Rent Assistance	Nd.	33.1

Source: Commonwealth Department of Social Services, Canberra

1. As at fortnight ending March 31, 2005

2. As at fortnight ending 30 September, 2016

Nd. No data

Note: these data refer to recipients who are determined to be current (ie. entitled to be paid) on the Centrelink payment system. Aboriginal recipients include only those who have voluntarily identified as Aboriginal. These data may therefore represent an undercount of Aboriginal recipients and an overcount of non-Aboriginal recipients

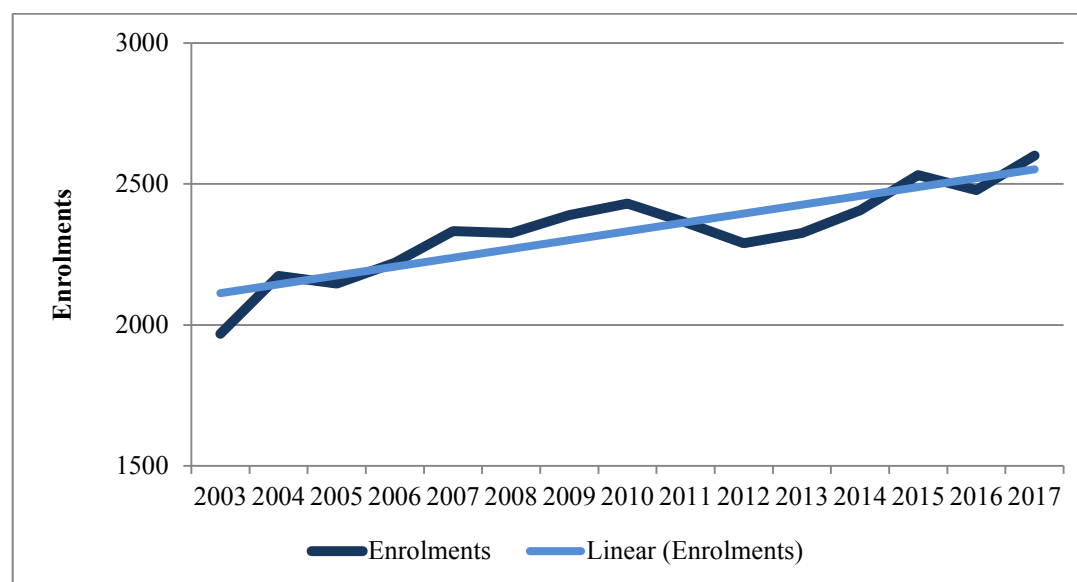
5. Education and training

From the viewpoint of engagement with the mining sector, and with the labour market more generally, outcomes from education are measured in terms of participation rates, grade progression, competency in numeracy and literacy skills, and (for the Vocational Education and Training (VET) sector) course completion rates. As mentioned in the previous chapter, mine sites (and workplaces in general) are consistently upgrading and changing their occupational skill requirements and the achievement of adequate and appropriate accreditation (WACE and/or tertiary qualification) is fast becoming a prerequisite for entry into on-going employment.

Participation in schooling

Figure 5.1 shows the number of Aboriginal enrolments in primary and secondary public schools in the Pilbara between 2003 and 2017. It should be noted that these account for the majority of Aboriginal school enrolments since combined enrolments in Catholic and other independent schools is relatively minor at just 3%. While there has been a steady rise in enrolments over this period (no doubt partly due to the raising of school-leaving age to 17 years), there appears to have been a dip between 2010 and 2014 and a subsequent rise again to the present level (2017) of 2,600. Reasons for this apparent dip in enrolments are unclear and all the more intriguing as they appear at a time when the Aboriginal population was growing rapidly due to in-migration. One possibility, suggested by the age-distribution of net migration in Figure 2.2, is that people moving to the region (who were mostly from Perth and the south-west) left school-age children behind. Another is the possibility of an increase in the number of school-age children from the Pilbara who were attending school elsewhere such as Perth. If this were so, they would be statistically lost to the Pilbara usual resident count given census counting rules. This latter group is difficult to quantify but could form a significant component of the stock of Pilbara school students. One useful task for the RIC would therefore be to elicit assistance from the Western Australia Department of Education to shed more light on this matter.

Figure 5.1 Aboriginal enrolments in primary and secondary public schools: Pilbara region, 2003-2017



Source: Government of Western Australia Department of Education

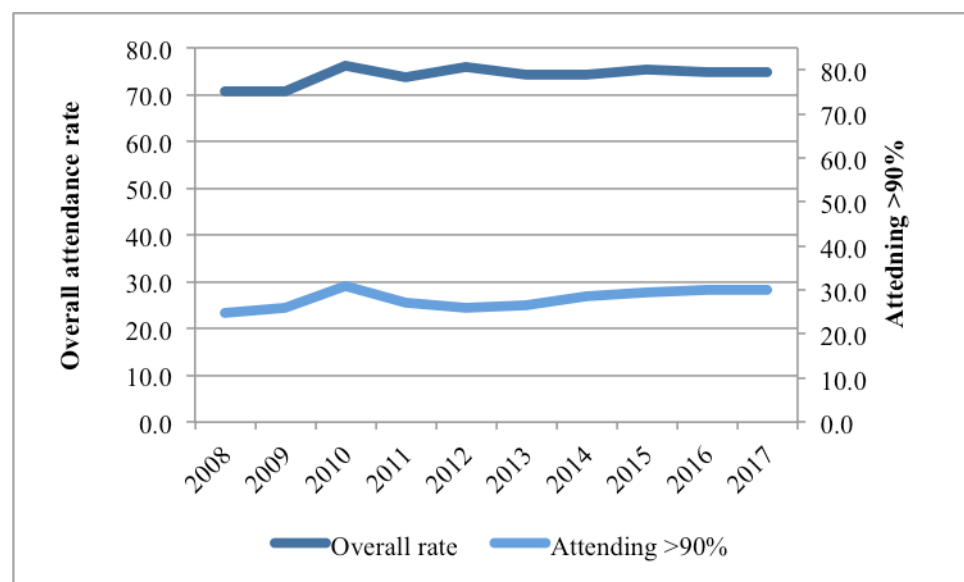
Since 2008 in Western Australia, school attendance or approved home schooling has been compulsory from the beginning of the year in which a child will turn 5 years and 6 months, until the end of the year in which the child reaches 17 years and 6 months, or until the student reaches the age of 18, whichever happens first. There are two main options available for students who wish to leave school earlier. The first is an exemption which is available for students from Year 10 or who will reach the age of 15 years and 6 months or more in the year for which an exemption is sought. This provides for an alternative to full-time schooling, usually a combination of education, training or employment such as an apprenticeship. The other is a 'notice of arrangement' which more or less amounts to the same thing but applies to Years 11 and 12.

With these directives in place it is not surprising to find that the number of Aboriginal children currently enrolled in schools is very close to the estimated numbers in the school age range of 5-17 in 2016 (2,770) suggesting almost universal enrolment. The same cannot be said, however, of the more important statistics regarding attendance. Two measures are routinely gathered for each school - the student attendance rate (defined as the number of actual full-time equivalent student-days attended by full-time students expressed as a percentage of the total number of possible student-days attended over the period), and the student attendance level (defined as the proportion of full-time students whose attendance rate is equal to or greater than 90%). Both of these measures refer to attendance during semester 1 of each school year and reliable time series data are available from the WA Department of Education for the period 2008-2017.

Of those Aboriginal children enrolled each year in Pilbara primary schools since 2008, the attendance rate has ranged between 70 and 76% (Figure 5.2). More crucially, though, the attendance level at more than 90% of available school days has been consistently much lower ranging from 25% to 31%. Currently, since 2014, it appears to be steady at around 30%. By way of comparison, the non-Aboriginal attendance rate has typically been around 91% and the attendance level around 70%. The situation at secondary level is worse than this – overall attendance rates have hovered around 60% and attendance levels have ranged between 14 and 22%

This means that as much as 70% of Aboriginal students who are currently (2016) enrolled in Pilbara primary schools are not in attendance for the minimum time stipulated by COAG via the Australian Curriculum Assessment and Reporting Authority (ACARA) as required to maximise the benefits from schooling (Hancock et al. 2013: 251). The equivalent figure for secondary schools was 77%. In semester 1 of 2016, the WA Department of Education indicated that only a total of 472 Aboriginal children in primary schools and 225 in secondary schools were in attendance for more than 90% of the time out of a total enrolment of 2,601.

Figure 5.2 Aboriginal attendance rates in public primary schools: Pilbara 2008-2017

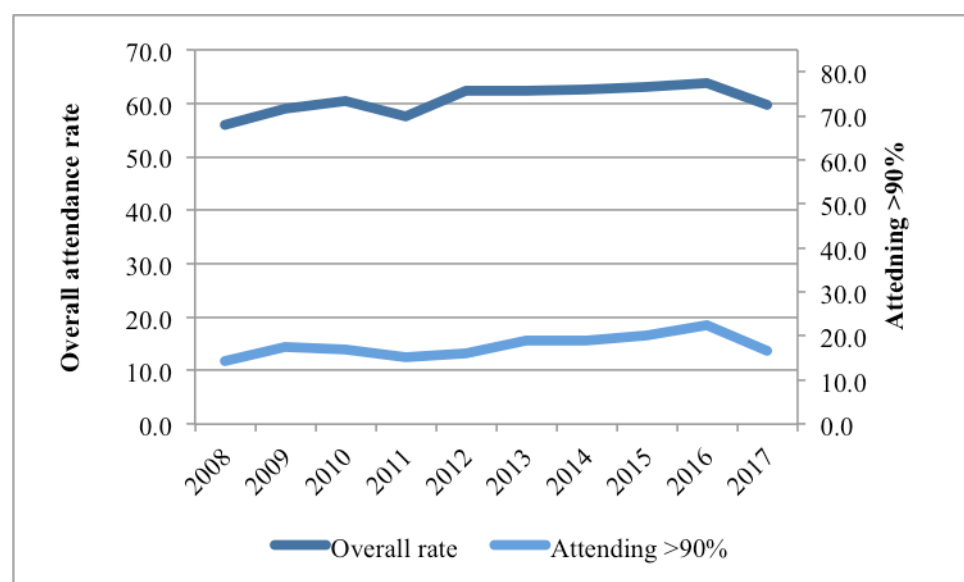


Source: WA Department of Education

Notes:

1. Figures may not include all schools as the School Information System was phased in over time to all schools
2. Attendance for 2008-12 includes only those students enrolled at the end of Semester 1 and does not include former students of participation NOA
3. From 2013, students enrolled for any length of time during Semester 1 are included in the totals and all figures exclude participation NOA. This change was made as part of a national agreement with ACARA for consistent reporting across jurisdictions
4. In 2013 PPR became compulsory in Western Australia, therefore Primary = PPR-Y07, previously it was Y01-Y07
5. In 2015 Y07 was transitioned to Secondary in Western Australia, therefore from 2015 Primary = PPR-Y06 and Secondary = Y07-Y12. Prior to 2015, Secondary = Y08-Y12

Figure 5.3 Aboriginal attendance rates in public secondary schools: Pilbara 2008-2017



Source: WA Department of Education

Notes:

1. Figures may not include all schools as the School Information System was phased in over time to all schools
2. Attendance for 2008-12 includes only those students enrolled at the end of Semester 1 and does not include former students of participation NOA
3. From 2013, students enrolled for any length of time during Semester 1 are included in the totals and all figures exclude participation NOA. This change was made as part of a national agreement with ACARA for consistent reporting across jurisdictions
4. In 2013 PPR became compulsory in Western Australia, therefore Primary = PPR-Y07, previously it was Y01-Y07
5. In 2015 Y07 was transitioned to Secondary in Western Australia, therefore from 2015 Primary = PPR-Y06 and Secondary = Y07-Y12. Prior to 2015, Secondary = Y08-Y12

A total of 37 schools are located in the Pilbara region and these are administered by three different education sectors – government, catholic and Aboriginal independent. Collectively, they incorporate 22 primary schools, one District High school (K-12), four senior high schools, one college, seven Aboriginal community schools, one education support centre and Port Hedland School of the Air. An almost complete list for 2016 is provided in Table 5.1 using data from the *myschool* website. Aboriginal enrolments and attendance figures are provided for each school in 2016 and these are compared to the data provided for 2005 in Taylor and Scambray (2005: 78).

Table 5.1 Aboriginal enrolments and attendance: Pilbara schools, 2005 and 2016

School	Aboriginal enrolments 2005 ^a	Aboriginal enrolments 2016	Aboriginal % of total enrolments 2016	No. Aboriginal students attending >90%*
Baler Primary	147	193	34	54
Baynton West Primary	n/a	100	15	17
Cassia Primary	87	167	37	52
Cassia Education Support Centre	n/d	17	85	6
Dampier Primary	5	11	5	n/d
Hedland Senior High	206	283	35	51
Jigalong Remote Community School	83	65	100	2
Karratha Primary	63	87	29	30
Karratha Senior High	111	278	29	39
Kiwirrkura Remote Community School	n/d	n/d	100	n/d
Marble Bar Primary	57	22	61	5
Millars Well Primary	25	46	16	13
Newman Primary	40	60	26	16
Newman Senior High	37	89	30	12
North Tom Price Primary	34	50	20	11
Nullagine Primary	48	31	100	17
Onslow Primary	79	40	37	3
Pannawonica Primary	6	22	17	10
Paraburdoo Primary	15	40	17	8
Parnngurr Community School	n/d	33	94	0
Peg's Creek Primary	47	61	26	10
Port Hedland Primary	38	52	11	14
Port Hedland School of the Air	7	8	22	n/d
Rawa Community School (via Newman)	n/d	53	100	n/d
Rawa Community School (Kunawarritji)	n/d	n/d	n/d	n/d
Roebourne District High	253	173	94	16
South Hedland Primary	248	145	73	28
South Newman Primary	83	103	24	29
St. Cecilia's Primary	n/d	27	15	11
St Luke's College	n/d	31	8	12
St. Paul's Primary	n/d	22	6	8
Strelley Community School	n/d	n/d	n/d	n/d
Tambrey Primary	63	156	30	41
Tom Price Primary	52	43	17	6
Tom Price Senior High	33	54	19	12
Wickham Primary	71	72	26	18
Yandeyarra Remote Community School	58	32	100	3
Total Pilbara	1,996	2,666	28.8	554

Source: <https://www.myschool.edu.au/>

a. From Taylor and Scambary 2005:78

* Student attendance as at Term 3, 2016

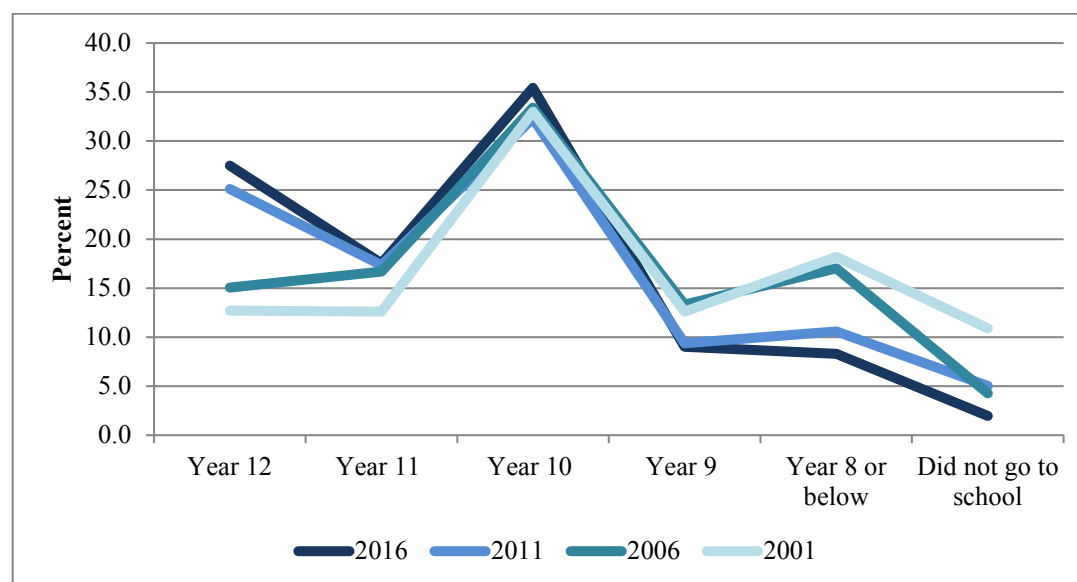
The first point to note is that Aboriginal enrolments have increased by 29% since 2005 and this is in line with the approximate growth in the school age population. The second, related, observation is that enrolments in 2016 appear to be almost universal since the total enrolment of 2,666 is reasonably close to the 2016 ABS estimate of 2,770 for the Aboriginal school-age population (5-17 years). Thus, unlike in some parts of remote Australia, the issue in the Pilbara is not so much ensuring that Aboriginal children are enrolled in school, rather it is the more common problem of ensuring that they attend school on a regular basis once enrolled.

To consider this, the final column in Table 5.1 shows the number of students who attend each school on more than 90% of available school days. In the third term of 2016 (the date closest to the census), 554 students or 21% of those enrolled were in this category. Conversely, 79% were attending less than 90% of the time (these figures differ from the region-wide data from the Department of Education as they refer to a different school term). With regard to progression through the school system and on to further education and employment this cohort of 554 would therefore appear to present the best prospect for success according to the assessments made by Hancock et al. (2013). While their numbers are distributed across the school system, particular concentrations appear at Baler, Cassia and South Hedland Primary schools along with Hedland Senior High in South Hedland, at Karratha Primary and Senior High schools in Karratha, and at South Newman Primary in Newman.

The other feature of Table 5.1 is the variable degree to which schools in the Pilbara are comprised of Aboriginal enrolments. Some schools, such as Jigalong, Kiwirrkura, Nullagine, Parnngurr, Rawa, Strelley, and Yandeyarra are essentially Aboriginal schools. Elsewhere, schools like South Hedland Primary, Marble Bar Primary and Roebourne District High are majority Aboriginal schools, while many others have an Aboriginal share of enrolments around the regional average of 29% and a few, such as Dampier Primary, Port Hedland Primary and the catholic schools have relatively few Aboriginal enrolments. Finally, since 2005, there seems to have been some relocation in the balance of Aboriginal enrolments between schools – an example of this is the 42% reduction in enrolments at South Hedland Primary alongside the 54% increase in enrolments at Baler and Cassia Primary schools also in South Hedland.

As far as the outcomes from schooling are concerned a standard census measure that refers to all adults in a population is the highest level of schooling completed (Figure 5.4). This statistic summarises a wide range of schooling experiences and it essentially reflects a mix of current and historic schooling achievements, requirements and practices. Among Aboriginal adults in the Pilbara we see a gradual decline over time in those with no schooling and a steady rise in school completions through to Year 12. However, the peak year for having left school among all current adults in the region remains Year 10.

Figure 5.4 Highest level of schooling completed: Aboriginal adults in the Pilbara region, 2001-2106

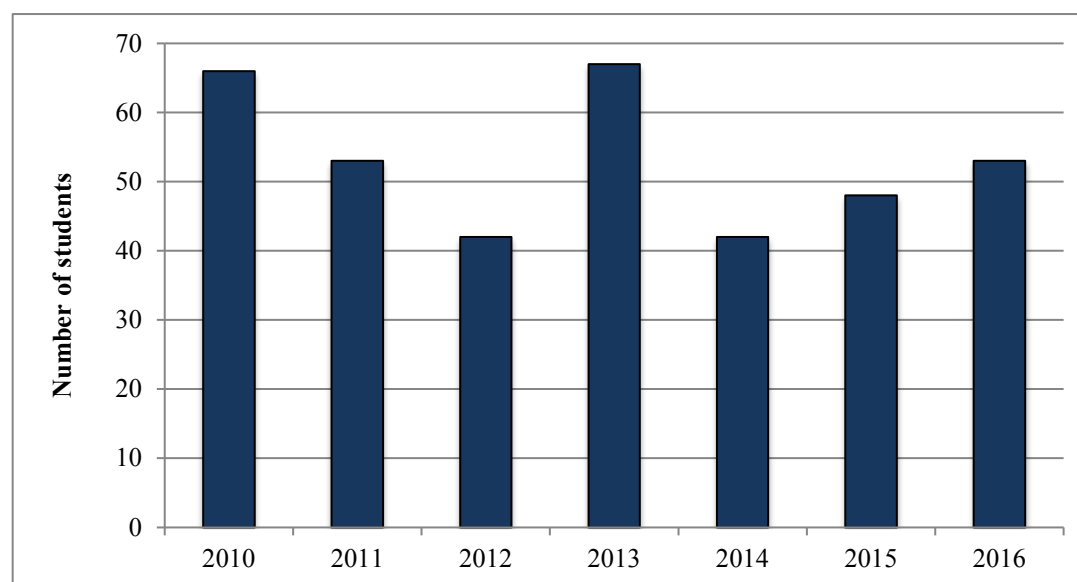


Source: ABS Census of Population and Housing 2001, 2006, 2011 and 2016

There is a strong age-related distribution in these data and the more immediate impact of education performance is best enabled by focusing on the age group that is immediately out of compulsory schooling (20-24 years). Using successive recent cohorts we see that the proportion in this age group with Year 12 completion has risen from 23% in 2006, to 27% in 2011 and 38% in 2016 in line with the trend more generally following the raising of compulsory school leaving age. Despite this, the Aboriginal rate of Year 12 completion among 20-24 year-olds in the Pilbara remains substantially behind the equivalent figure of 65% for non-Aboriginal residents.

Actual Year 12 Aboriginal enrolments in public schools in the Pilbara are shown in Figure 5.5 for the period 2010-2016 using data supplied by the WA Department of Education. As shown, numbers have fluctuated somewhat with an annual average of 53. Unfortunately, single year estimates of Aboriginal population do not exist but using the ABS five-year age group estimates as a guide, there could be around 182 Aboriginal youth aged 17 years. This would suggest that only around 30% of the eligible age group are enrolled in Year 12 although it is not known how many students from the Pilbara undertake Year 12 studies elsewhere and there is a need for improved tracking and reporting of Pilbara students throughout the education system. Other data from the WA Department of Education would seem to support this level of Year 12 engagement as an annual average of 87 Aboriginal students in Years 11 and 12 over the past three years have acquired a Notice of Arrangement to leave school and engage either in a full-time course at TAFE or with a private RTO, in a traineeship or apprenticeship, in full-time employment or in part-time employment and/or part-time training.

Figure 5.5 Aboriginal Year 12 enrolments: Pilbara public schools 2010-2106



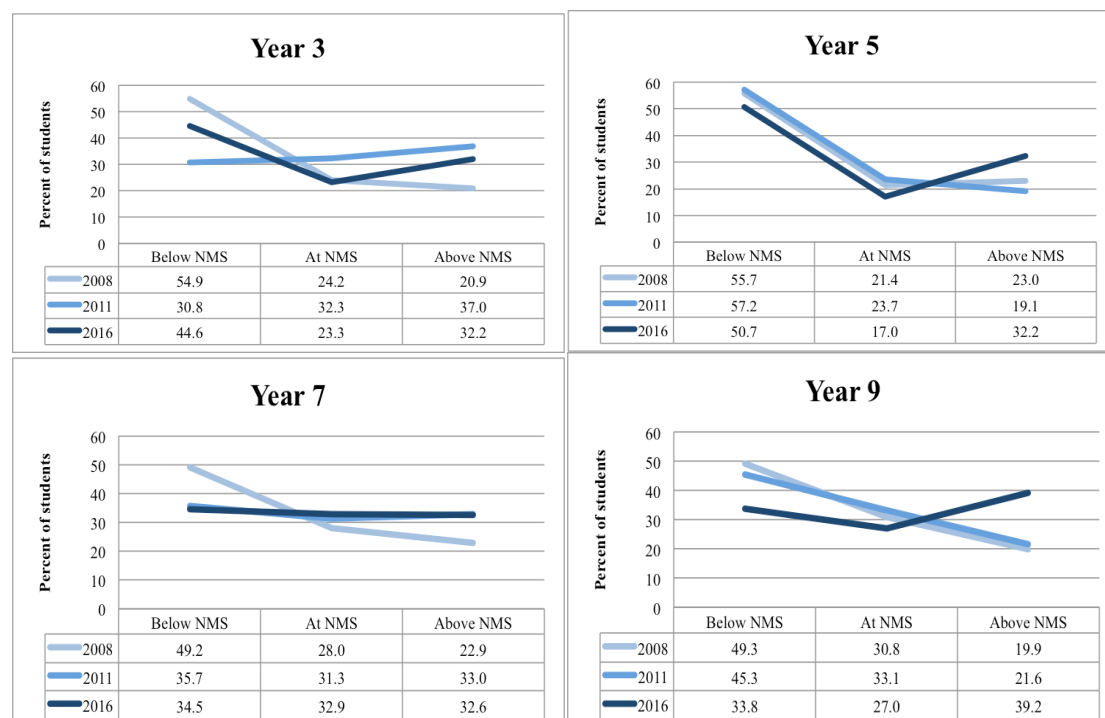
Source: Government of Western Australia Department of Education

Outcomes

Aside from receipt of the Year 12 Western Australian Certificate of Education (WACE) alongside its associated Vocational Education and Training (VET) and Australian Tertiary Admission Rank (ATAR) qualifications, educational outcomes from the school system are measured by the National Assessment Program – Literacy and Numeracy (NAPLAN) administered by the Australian Curriculum Assessment and Reporting Authority (ACARA).

Prior to the first NAPLAN tests in 2008, each state and territory managed its own literacy and numeracy testing. In Taylor and Scambary (2005: 86) reading skill results for Aboriginal and total students at school-years 3, 5 and 7 in 2004 were made available by the then WA Department of Education and Training. However, these did not identify results for the Pilbara region as a separate category. Instead, results for the Pilbara had to be assumed as being similar to those reported for the whole of ‘remote’ and ‘very remote’ parts of the state. With NAPLAN testing we now have detailed results for the Pilbara region for the period 2008-2016, including for Year 9. Accordingly, the proportions of Aboriginal students below, at, and above NAPLAN National Minimum Standards (NMS) for reading are shown in Figure 5.6 and for numeracy in Figure 5.7. To interpret these charts it is worth noting that success at each year level would be indicated by a curve that increases from left to right. Progress over time at each year level is indicated if the curve for each successive survey year is steeper from left to right. Horizontal curves indicate no change.

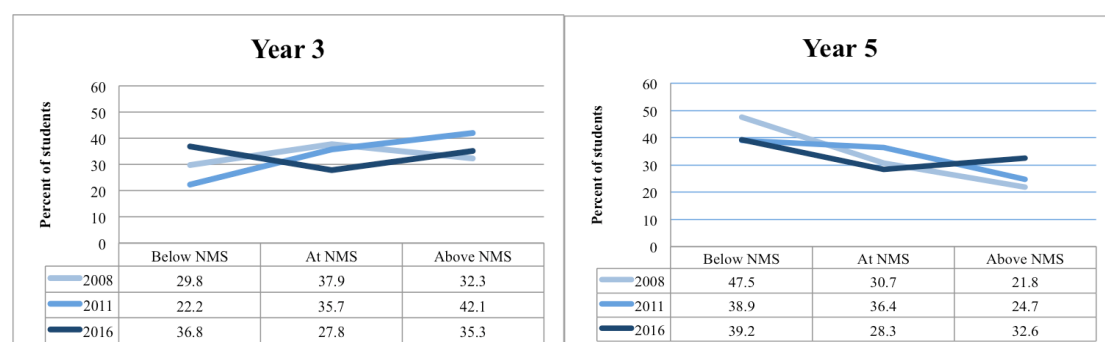
Figure 5.6 Proportion of Aboriginal students below, at, and above NAPLAN National Minimum Standards (NMS) for reading by school year: Pilbara, 2008, 2011 and 2016

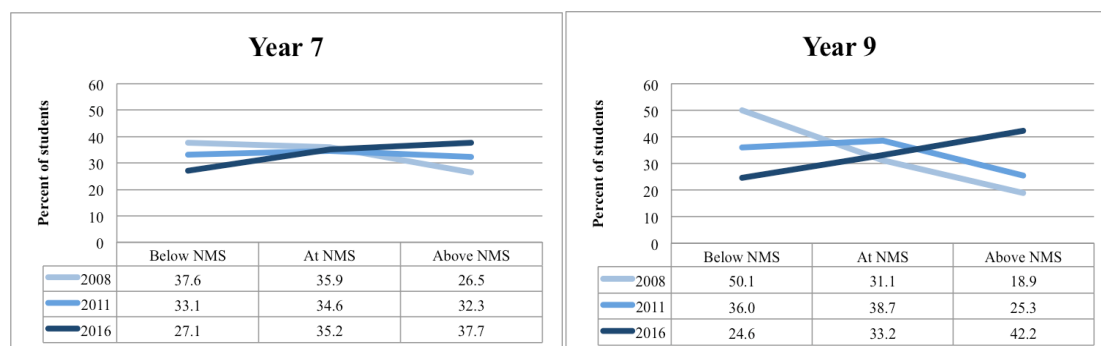


Source: WA Department of Education

Looking at the curves for reading (Figure 5.6), there are some signs of improvement since 2008 although the proportions below NMS have remained stubbornly high. Year 7 results have shifted in the right direction but appears to have stalled, while the Year 9 trend is encouraging since the rate of achievement above NMS has doubled and that below NMS has almost halved. As for numeracy (Figure 5.7), Year 3 results are promising, Year 5 are not, but results for Year 7, and especially Year 9, display exactly the sort of turnaround in the composition of outcomes that schools are aiming to achieve.

Figure 5.7 Proportion of Aboriginal students below, at, and above NAPLAN National Minimum Standards (NMS) for numeracy by school year: Pilbara, 2008, 2011 and 2016





Source: WA Department of Education

Of course, these results refer only to students in four out of 12 school grades. In terms of overall enrolments in 2016, those in Years 3, 5, 7 and 9 accounted for only 30% of the total. To that extent, it could be argued that results among these NAPLAN cohorts, spread as they are across the school age distribution, provide a reasonably good representative sample of the likely performance of the entire Aboriginal school population in relation to similar testing were it available to each school year. On this basis, we can use these NAPLAN results to establish a crude estimate of the overall number of Aboriginal students in the system who are likely to be capable of achieving at or above National Minimum Standards. This is done by calculating a collective set of outcome rates for 2016 from those in the NAPLAN school years and then applying these to the whole school population. In 2016, the number of Aboriginal students estimated in this way to be capable of achieving at or above National Minimum Standards for numeracy was 1,207, or 46% of the enrolled student population; for reading it was 1,087 or 42%. A breakdown of these estimates is provided in Table 5.2.

Table 5.2 Crude estimates of total Aboriginal students likely to participate in NAPLAN and achieve below, at and above National Minimum Standards (NMS) in numeracy and reading: Pilbara region, 2016

	Numeracy	Reading
Above NMS	655	633
At NMS	551	458
Below NMS	592	786
Total participating in NAPLAN	1,796	1,877
Total not participating	802	724
Total enrolments	2,601	2,601

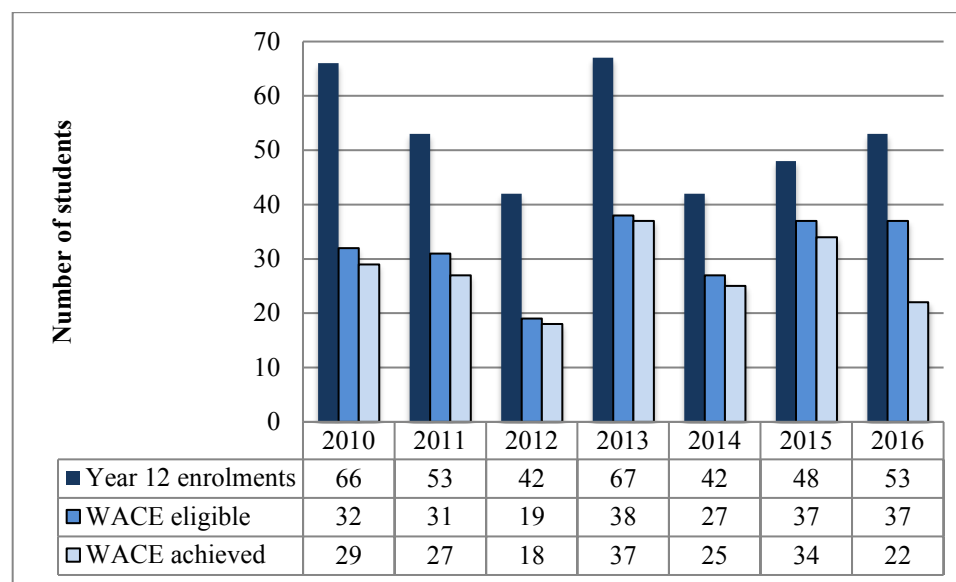
Source: own calculations based on data from the WA Department of Education

This reveals that an estimated 655 Aboriginal students enrolled in 2016 might have been capable of achieving above NMS in numeracy and 633 in reading. While no direct association can be established, it is interesting to note that these figures are remarkably similar to the figure of 697 Aboriginal students recorded as attending school for more than 90% of the time in semester 1 of 2016. Of course, on the reverse-side of these estimates are the 1,394 and 1,514 students who achieve either below NMS or do not participate in NAPLAN testing for numeracy and reading respectively.

As for Year 12 outcomes, the Western Australian Certificate of Education (WACE) is awarded to senior secondary school students who satisfy its requirements. It is a senior secondary certificate recognised nationally in the Australian Qualifications Framework (AQF). Generally, students will complete two years of senior secondary study to achieve the WACE although the School Curriculum and Standards Authority allows students to meet the WACE requirements over a lifetime. The WACE is recognised by

universities, industry and other training providers. Achievement of a WACE signifies that a student successfully met the breadth and depth standard, the achievement standard and the literacy and numeracy standard in their senior secondary schooling. Figure 5.8 shows the number of Aboriginal students in Pilbara schools enrolled in Year 12 and achieving WACE for each year between 2010 and 2016.

Figure 5.8 Aboriginal Year 12 enrolments and WACE outcomes: Pilbara schools 2010-2016

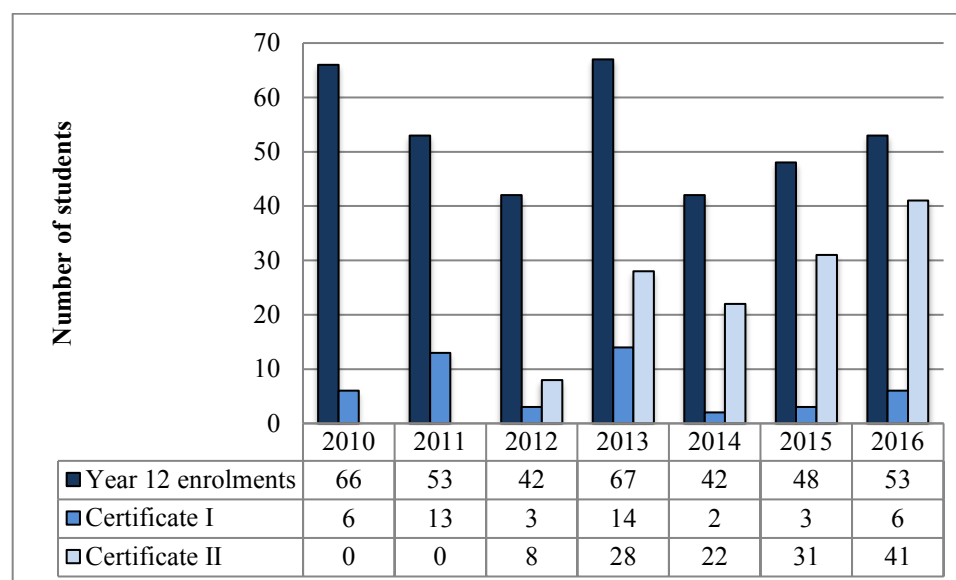


Source: WA Department of Education

What we see over this period is a variable level of Year 12 enrolments with an annual average of 53. If anything, enrolments have declined in more recent years. What we also see is a consistent pattern whereby the number of students eligible for WACE graduation is on average around 60% of enrolments, and then actual achievement of WACE is on average around 87% of eligibility. Given the scale of job needs that were shown in Table 3.20, just to maintain the Aboriginal employment rate at its current relatively low level (to say nothing about actually improving this) the annual number of Aboriginal school leavers with requisite qualifications appears woefully inadequate. Having said that, what is not known from available data and what needs to be investigated and established, is the number of Pilbara students who enrol for Year 12 and complete their WACE at schools outside of the Pilbara.

Some Year 12 students also undertake vocational studies as part of their WACE requirements at Certificate I and II levels. Figure 5.9 shows how this tendency has increased in recent years especially at Certificate II level. Others can opt to leave school before Year 12 via a Notice of Arrangement to leave school and engage either in a full-time course at TAFE or with a private RTO, in a traineeship or apprenticeship, in full-time employment or in part-time employment and/or part-time training all of which can lead to alternate qualifications. The proportion of Aboriginal students taking this option has varied considerably over the period in question ranging from 33% in 2012 just 13% in 2016.

Figure 5.9 Aboriginal Year 12 enrolments and Certificate I and II attainment: Pilbara schools 2010-2016



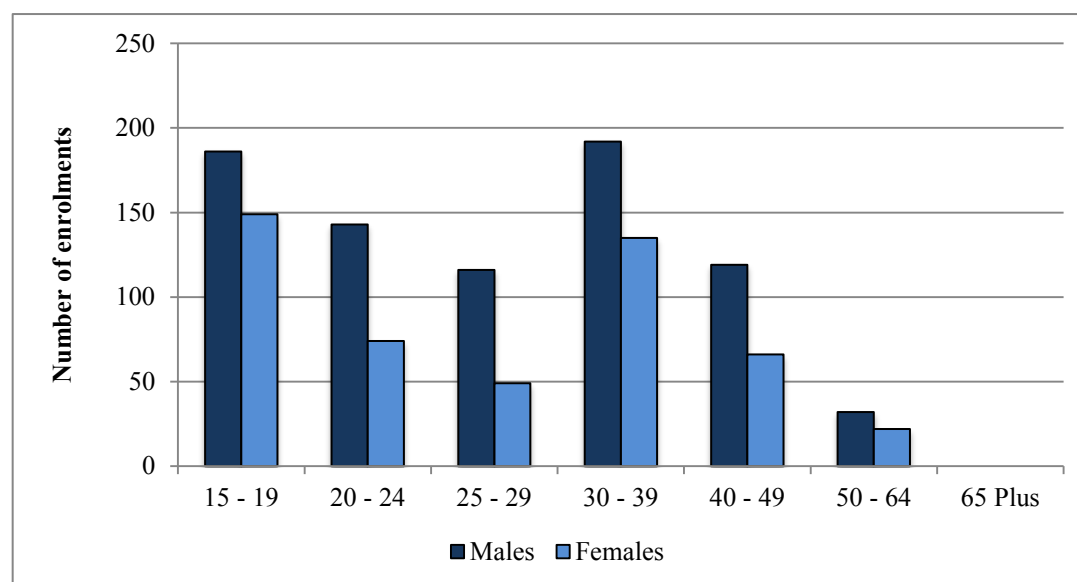
Source: WA Department of Education

Participation in vocational education and training (VET)

Post-secondary education and training leading to the acquisition of formal workplace qualifications is available in the Pilbara from a variety of public and private providers including TAFE campuses at Karratha, Roebourne, Newman, South Hedland and Tom Price as well as VET in schools. Given these various training delivery locations, plus the possibility of Pilbara residents enrolling in VET courses outside of the Pilbara and the fact that students can enrol in more than one course in more than one location, it is difficult to establish a fully reliable time series of participation. Having said that, we do know that the number of Aboriginal VET clients with a usual residence address in the Pilbara was 884 in 2016 and that this was a reduction from 1,131 in 2006. As a proportion of all Pilbara residents in VET, Aboriginal clients comprised 28% in 2016 – similar to the figure of 31% in 2006 and much higher than the Aboriginal share of the adult resident population (13.6%).

As individuals can (and do) enrol in more than one course, enrolments are higher than client numbers – approximately 50% higher. From Figure 5.10 we can see that the number of Aboriginal enrolments varies by age and sex – course enrolments are highest among males and they peak among those in the 15-19 and 30-39 age groups and taper off from each of these points at subsequent ages.

Figure 5.10 Aboriginal VET course enrolments by age and sex, Pilbara residents 2016



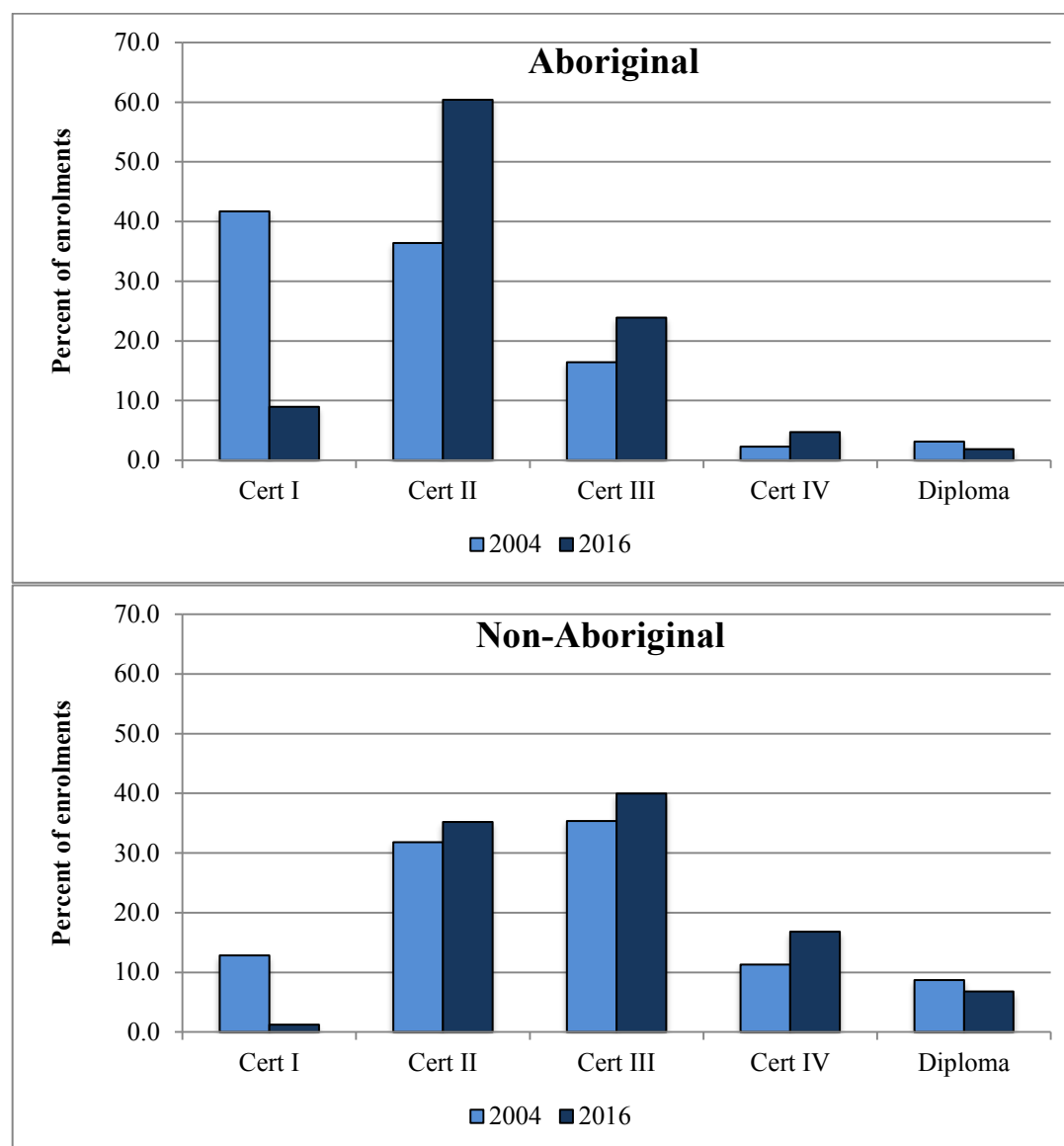
Source: WA Department of Training and Workforce Development

Note:

Enrolments are based on a combination of course identifier, student identifier, training type and training delivery location. They include TAFE – all VET, ACE and higher education enrolments, publicly funded and fee for service; VET enrolments of the Western Australian Academy of Performing Arts; VET enrolments of the Broome campus of Notre Dame University; Department funded VET contracted to private (and other) providers; VET prison training reported by the WA Department of Corrective Services; VET in school enrolments reported by the Schools Curriculum Standards Authority

There are eight levels of qualification in the VET system all linked to the Australian Qualifications Framework (AQF). In general terms, Certificates I and II offer skills and knowledge to get individuals started in an entry-level job. Certificates III and IV and Diploma levels are for more specialised jobs such as those in trades or technology areas, and Advanced Diploma to Graduate Diploma levels offer a more complex and higher level of skills and knowledge. There were virtually no Advanced or Graduate Diploma level enrolments in the Pilbara and so this category is left out of the analysis. Figure 5.11 shows the distribution of Aboriginal and non-Aboriginal course enrolments in Pilbara VET by these course levels in 2004 and 2016. In all cases there has been a shift towards more advanced courses most notably as a consequence of a universal decline in enrolments in Certificate I courses. Most of this shift among Aboriginal enrolments seems to have been into Certificate II courses while a greater proportion of Aboriginal enrolments are now in Certificate III and IV courses, the same is true of non-Aboriginal enrolments and so the gap in terms of level of course enrolments has remained the same. In effect, Aboriginal people are raising their VET level skills in an environment where skill levels are rising more generally.

Figure 5.11 Aboriginal and non-Aboriginal course enrolments in VET courses by course level, Pilbara residents 2004 and 2016



Source: Taylor and Scambary (2005: 87); WA Department of Training and Workforce Development

For the record, the 2016 census output introduced a new composite variable (EETP – Engagement in Employment, Education and Training). This item classifies individuals according to their participation in work and/or study and it applies to all persons aged 15 years and over (Table 5.3). Not surprisingly, the proportion of Aboriginal adults not engaged in employment, education and training (44.7%) is more or less equivalent to the proportion shown as not in the labour force in 2016 in Table 3.2 (44.1%). The main refinement is a breakdown between degrees of engagement with 40% of adults classified as fully engaged (ie. engaged in full-time work or study) and 15% only partially engaged. Of considerable interest, however, is an age breakdown since it is to be hoped that younger adults are more likely to be engaged in employment, education and training than older adults if improvements in labour force participation and employment are to continue. However, if we look at this for those aged under 35 years it is surprising to find that fully 41% are not engaged in any of these activities – only 44% are fully engaged and 15% partially engaged. This is a sizeable level of non-

participation in the very cohort that might hopefully contribute to a demographic dividend and the reasons for this require urgent inquiry and remedy.

Table 5.3 Aboriginal and non-Aboriginal engagement in Employment, Education and Training: Pilbara residents, 2016.

	Aboriginal	Non-Aboriginal
Fully engaged	39.8	71.9
Partially engaged	9.9	11.0
At least partially engaged	5.5	6.2
Not Engaged	44.7	10.9
Total	100.0	100.0

Source: ABS Census of Population and Housing 2016

VET Outcomes

To measure performance in the VET sector, the WA Department of Training and Workforce Development has identified a number of key performance measures related to efficiency, effectiveness and quality. In relation to the effectiveness of the training system, the key indicator is the rate of successful completion of modules – the components from which courses are constructed. Table 5.4 shows the distribution of module outcomes for Aboriginal males and females in 2004 and 2016. Categories 1-3 in this Table represent successful outcomes. In 2004, males successfully completed 71% of modules and females completed 63%. Both of these rates had increased by 2016 to 84% and 82% respectively which brought the rate of Aboriginal completions close to that recorded for non-Aboriginal students. Among Aboriginal students with unsuccessful outcomes, ‘failure to achieve competency’ has dramatically fallen as a reason and the main reason now for failure is ‘module withdrawal/discontinuation’.

Table 5.4 Aboriginal male and female VET module outcomes: Pilbara residents 2004 and 2016

	Males				Females			
	2004		2016		2004		2016	
Outcome	No.	%	No.	%	No.	%	No.	%
1	2,908	62.0	2,470	79.7	1,576	55.3	2,252	78.4
2	3	0.1	36	1.2	16	0.6	69	2.4
3	403	8.6	95	3.1	192	6.7	34	1.2
4	655	14.0	69	2.2	482	16.9	36	1.3
5	718	15.3	429	13.8	583	20.5	481	16.7
Total	4,687	100.0	3,099	100.0	2,849	100.0	2,872	100.0

Source: Taylor and Scambary (2005: 89); WA Department of Training and Workforce Development
1. Competency Achieved/Pass; 2. Recognition of Prior Learning; 3. Non-Assessable Enrolment - Satisfactorily Completed; 4. Competency Not Achieved/Fail; 5. Withdrawn/discontinued
Categories 1-3 represent successful outcomes
Excludes those enrolled in modules who are continuing studies into the next collection period and Indigenous status not stated.

The module load completion rate (MLCR) provides another measure of performance. This represents the sum of student curriculum hours for successfully completed modules expressed as a proportion of the total student curriculum hours across all module enrolments. In 2004, this rate was only 58% for Aboriginal module enrolments – less than two-thirds of the level reported for non-Aboriginal students in the Pilbara (Table 5.5). By 2016, however, the rate for Aboriginal students had greatly improved to be more or less equivalent to the non-Aboriginal rate. Just by way of benchmarking,

it is worth noting that both of these 2016 rates were higher than their counterpart rates in Western Australia as a whole in 2015 (76.8% for Aboriginal students and 84.6% for non-Aboriginal students) (Government of Western Australia 2017 – Map 12).

Table 5.5 Aboriginal and non-Aboriginal Module Load Completion Rates: Pilbara residents 2004 and 2016.

	2004	2016
Aboriginal	58.0	82.3
Non-Aboriginal	82.9	89.3

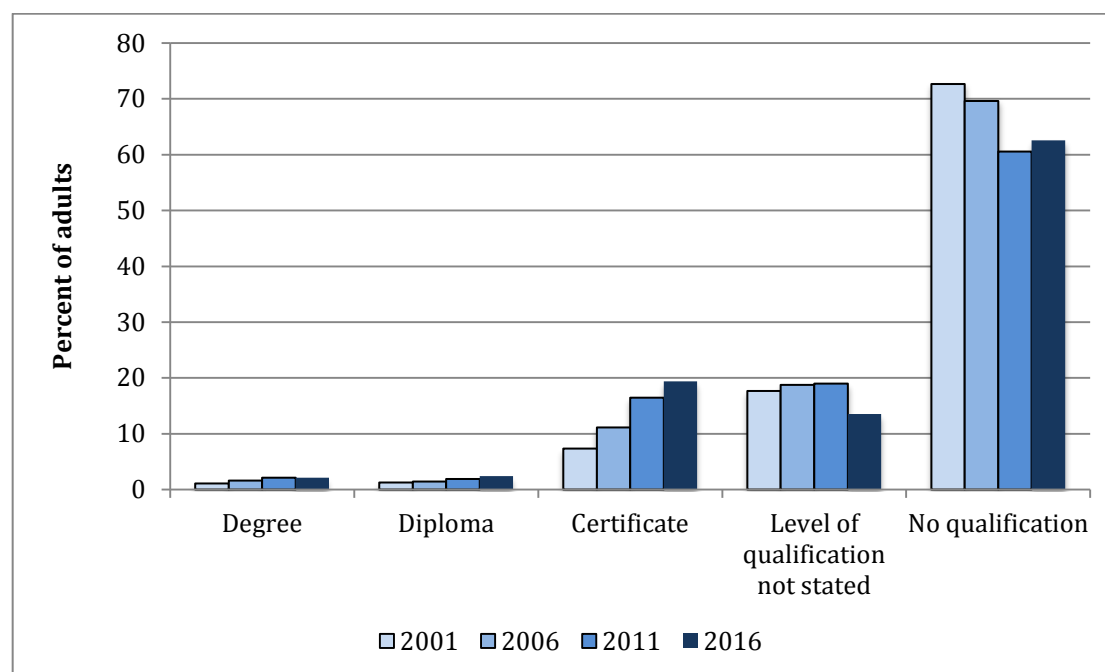
Source: Government of WA Department of Training and Workforce Development

Qualifications

A key human capital requirement in the regional labour market, and one that is likely to assume greater prominence with occupational restructuring in the mining industry, is the acquisition of formal tertiary-level qualifications. While program data can reveal course enrolments and achievements each year, it remains the case that the five-yearly census provides the only comprehensive set of data that reveals the levels of qualification for the population as a whole.

As far as adults in the Pilbara are concerned, the census gathers information on those who hold a ‘non-school qualification’ although among Aboriginal census respondents this variable has consistently suffered from high non-response rates. In 2016, a total of 24,830 adults in the Pilbara were counted as having a non-school qualification. Of these, 8.7% (2,155) were Aboriginal representing only a slight rise from 8.5% in 2001. However, among Aboriginal adults, the proportion with a qualification (net of non-response) rose steadily from 27% in 2001, to 30% in 2006 and 39% in 2011, but then fell back to 37% in 2016. If this 2016 rate is applied to the ABS estimate of the adult Aboriginal population of the same year we can estimate that a total of 3,085 Aboriginal adults had a non-school qualification.

Figure 5.12 Distribution of Aboriginal adults by level of non-school qualifications: Pilbara region, 2001-2016



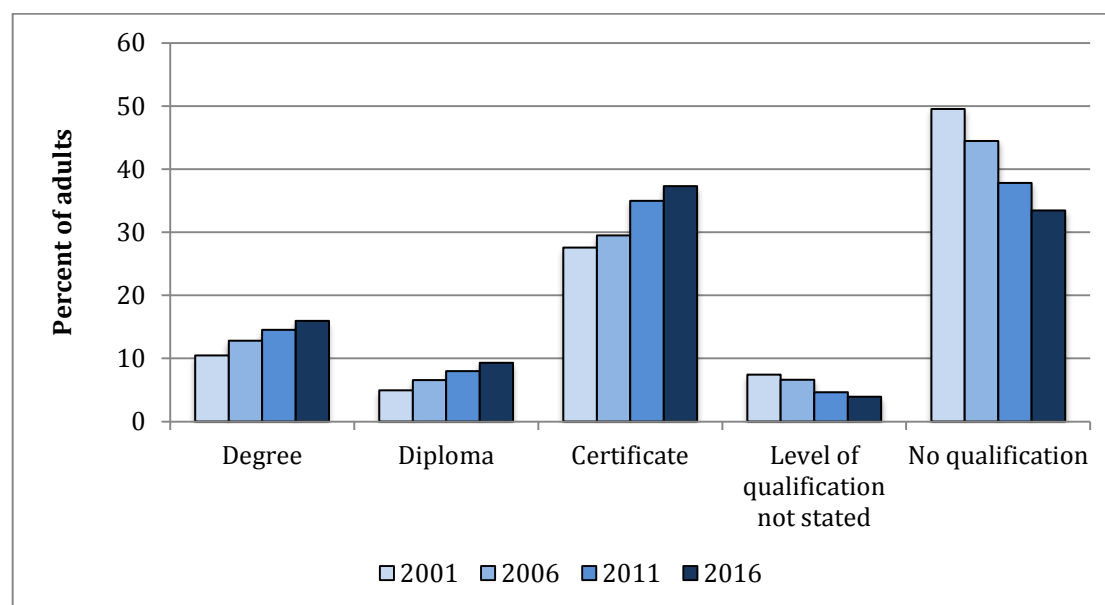
Source: ABS Census of Population and Housing 2001, 2006, 2011 and 2016

Note: Degree includes Postgraduate, Graduate Diploma/Graduate Certificate and Bachelor Degree; Diploma includes Advanced Diploma/Diploma; Certificate includes Certificate levels I, II, III and IV.

Figure 5.12 illustrates these changes and shows that previous steady growth in the proportion of Aboriginal adults with a non-school qualification appears to be currently stalled although the level of non-response compromises any firm conclusion. As far as we can tell, as much as 62% of adults remain without a qualification, a proportion which is much higher than the 34% of non-Aboriginal residents as shown in Figure 5.12.

As for the level of qualifications held, confidence in the Aboriginal results is once again undermined by consistently high non-response rates. However, on the assumption that this non-response is distributed in equal proportion across the different qualification levels we can conclude that the growth in Aboriginal adults with qualifications since 2001 has occurred mostly at the Certificate level. Of particular note is the fact that the number of Aboriginal adults who indicated in the census that they had a Certificate III or IV increased between 2006 and 2016 by almost 200% from 289 to 856. As a consequence, 62% of adults who indicated that they had a qualification in 2016 had a Certificate III or IV, a figure that was up from 52% in 2006. Similar growth in Certificate level qualifications has occurred among non-Aboriginal residents with their combined proportion with diplomas and degrees now around 25% (Figure 5.13). This latter level is much higher than the figure of 4% among Aboriginal residents and it underlines the degree of competition faced by Aboriginal residents in the Pilbara labour market. In short, while qualification levels have improved since 2001 among Aboriginal Pilbara residents, they remain notably behind the rest of the population. Perhaps of greater interest, in terms of potential labour market engagement, is the fact that this gap has widened since 2011.

Figure 5.13 Distribution of non-Aboriginal adults by level of non-school qualifications: Pilbara region, 2001-2016

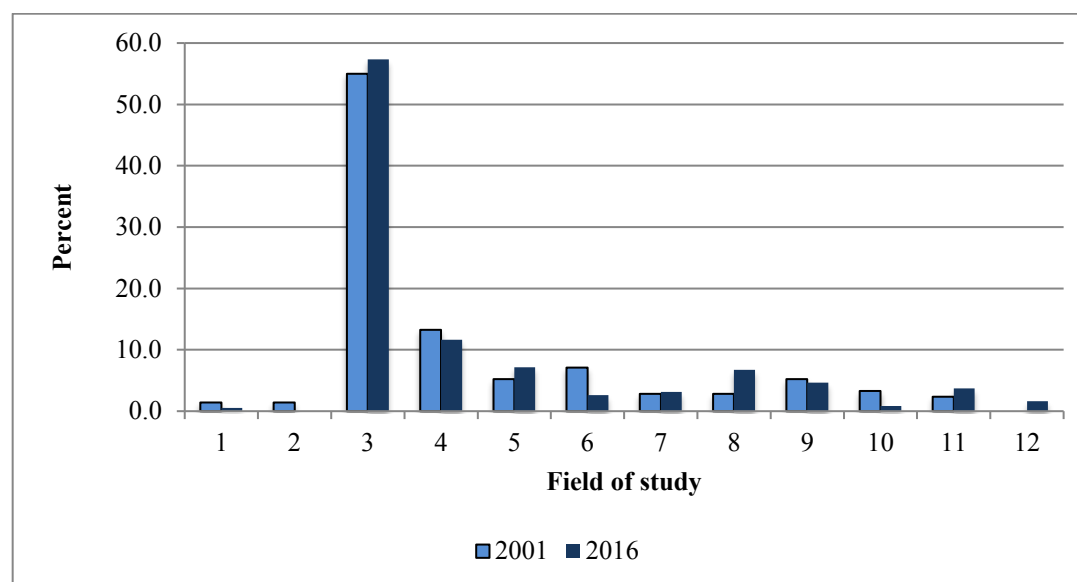


Source: ABS Census of Population and Housing 2001, 2006, 2011 and 2016

Note: Degree includes Postgraduate, Graduate Diploma/Graduate Certificate and Bachelor Degree; Diploma includes Advanced Diploma/Diploma; Certificate includes Certificate levels I, II, III and IV.

As for the field of study for Aboriginal adults with qualifications, patterns here are remarkably stable over time especially among males (Figure 5.14). In 2001, 55% of qualifications were in 'engineering and related technologies' and this remained almost the same in 2016 (58%). The next highest proportion was in 'architecture and building' with proportions again more or less stable at around 12%. Beyond that, there was a decline in the proportion of qualifications in 'health' and a rise in 'management and commerce'. Females display a quite different profile to this with most having qualifications in 'management and commerce' followed by 'society and culture' (Figure 5.15). Of more interest here, though, is the notable decline in the proportion of females with qualifications in 'health' from 22% to just 12%. While the number of Aboriginal females with a health qualification actually increased by 83% between 2001 and 2016, there is now a greater proportional spread across areas such as 'engineering and related technologies', 'society & culture', and 'food, hospitality and personal services'.

Figure 5.14 Non-school qualifications by field of study: Aboriginal male residents of the Pilbara 2001 and 2016

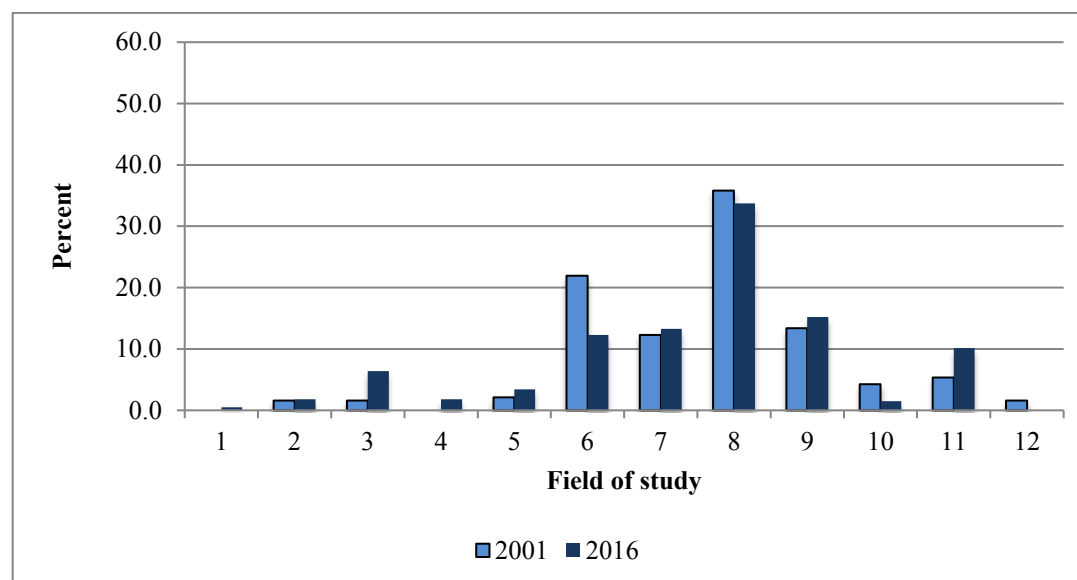


Source: ABS Census of Population and Housing 2001, 2006, 2011 and 2016

1. Natural and Physical Sciences; 2. Information Technology; 3. Engineering and Related Technologies; 4. Architecture and Building; 5. Agriculture, Environmental and Related Studies; 6. Health; 7. Education; 8. Management and Commerce; 9. Society and Culture; 10. Creative Arts; 11. Food, Hospitality and Personal Services; 12. Mixed Field Programs

Excludes non-school qualification not stated and field of study inadequately described

Figure 5.15 Non-school qualifications by field of study: Aboriginal female residents of the Pilbara 2001 and 2016



Source: ABS Census of Population and Housing 2001, 2006, 2011 and 2016

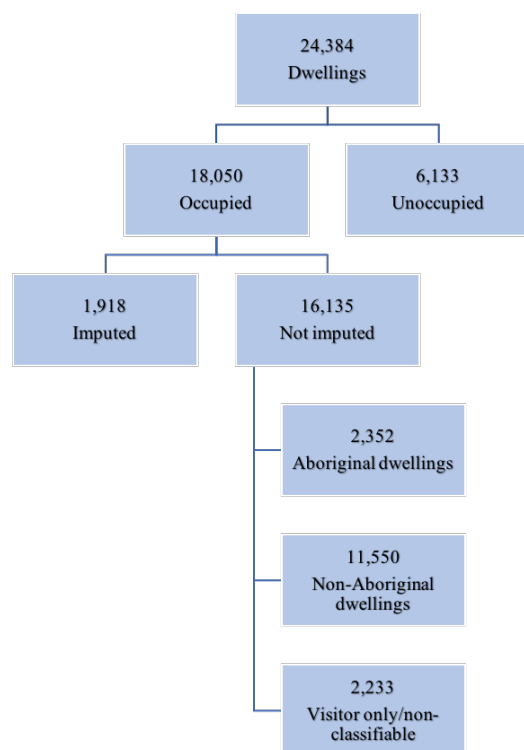
1. Natural and Physical Sciences; 2. Information Technology; 3. Engineering and Related Technologies; 4. Architecture and Building; 5. Agriculture, Environmental and Related Studies; 6. Health; 7. Education; 8. Management and Commerce; 9. Society and Culture; 10. Creative Arts; 11. Food, Hospitality and Personal Services; 12. Mixed Field Programs

Excludes non-school qualification not stated and field of study inadequately described

6. Housing and infrastructure

In 2016, a total of 24,384 private dwelling structures were recorded in the Pilbara (Figure 6.1). This is more than double the figure of 10,962 recorded in 2001. Of those identified in 2016, as many as 6,133 (25.2%) were declared unoccupied at the time of the census. It should be noted that this figure does not include FIFO camps as these were classified in the census as non-private dwellings under 'staff quarters' of which 125 were recorded. Among the 18,050 private dwellings recorded as occupied, no census form was returned from 1,918 of these. In these instances the number of residents was imputed but not their Indigenous status. This leaves a total of 16,135 dwellings whose occupants were not imputed. Of these, 15% were occupied by an Indigenous household. This is defined as any household where at least one usual resident was identified as being of Aboriginal and/or Torres Strait Islander origin. Most of the remaining dwellings (72%) were occupied by non-Aboriginal households, while the balance (13%) were visitor only households or unclassifiable.

Figure 6.1 Private dwellings by dwelling type and Aboriginal household indicator: Pilbara, 2016



Source: ABS Census of Population and Housing 2016

At each census there has always been a relatively large number of private dwellings recorded as unoccupied in the Pilbara. In 2006, the proportion was 15%, in 2011 it was 14%, but in 2016 it rose to fully 25% of all dwellings, the vast majority of which were separate houses. Unfortunately, the census does not indicate (in fact, has no way of knowing) the reason why they are unoccupied – whether this is because of the temporary absence of occupants or because they have no occupants at all. However, the fact that so many structures were recorded as unoccupied in 2016 is most likely a reflection of downturn in the business cycle and, given the low rate of home ownership, these are most likely to have been private rental dwellings that agents were unable to lease.

In Table 6.1 we can see the 2,300 or so Aboriginal dwellings in 2016 according to the structure of dwelling. Compared to 2001, this represents an increase of just over 1,000 Aboriginal households, or 75%, with the vast majority of these households in separate dwellings. Table 6.1 also shows occupancy rates for different dwelling structures with population adjusted for undercount using ABS estimates. These remained essentially unchanged in separate houses at 5.4/5.3 persons per house while average numbers in townhouses increased from 3.3 to 3.6 persons. According to these census data, improvised dwellings had all but disappeared by 2016.

Table 6.1 Structure of dwellings with Aboriginal households: Pilbara, 2001 and 2016

Structure of dwelling	2001			2016		
	No. of dwellings	Persons ^a	Occupancy rate	No. of dwellings	Persons ^a	Occupancy rate
Separate house	1,007	5,426	5.4	1,971	10,425	5.3
Townhouse/apartment	257	853	3.3	356	1,278	3.6
Improvised dwelling	56	114	2.0	16	13	0.8
Total	1,343	6,516	4.9	2,343*	11,716	5.0

Source: ABS Census of Population and Housing 2016

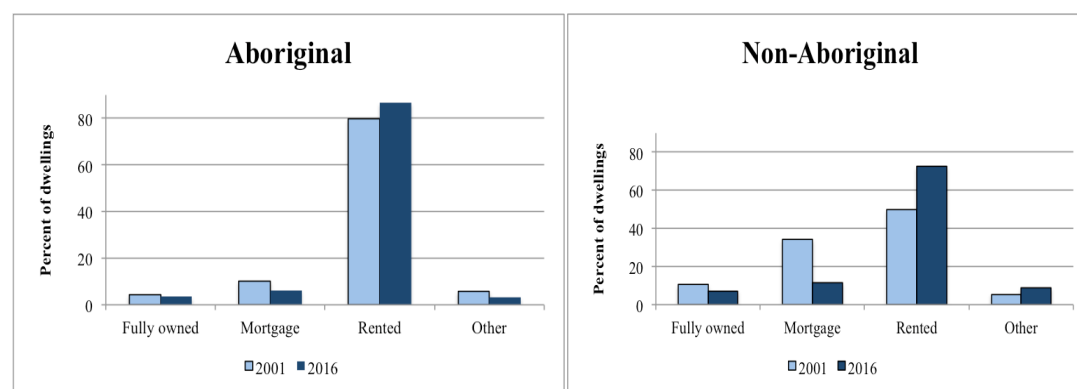
* Excludes structure of dwelling not stated

a. Based on ABS ERP

Housing tenure

The Pilbara region remains unusual within Australia for having such a high proportion of its private dwellings as government or company-owned rental properties with a corresponding low level of home ownership. Australia as a whole has one of the highest home ownership rates among OECD countries at 67% in 2016. In Western Australia as a whole it is slightly lower at 65.5%. By contrast, in the Pilbara in 2016, it was just 21.4%. However, what is more striking is the fact that the home ownership rate in the Pilbara in 2001 was 43%. Furthermore, the absolute number of dwellings either owned outright or being purchased has fallen from 5,382 in 2001 to just 3,272 in 2016. Accordingly, the number of rental dwellings has risen from 6,370 in 2001 to 10,681 in 2016. This constitutes a remarkable shift in the regional composition of housing tenure that is likely to be unique in Australia and linked directly to economic vagaries brought about by the mining boom (Haslam McKenzie et al. 2009). Figure 6.2 summarises the shifts that have occurred in housing tenure for those dwellings identified as occupied by Aboriginal and non-Aboriginal households between 2001 and 2016 amidst the very substantial growth in private dwellings that accompanied the mining boom.

Figure 6.2 Distribution of Aboriginal and non-Aboriginal dwellings by tenure type: Pilbara region, 2001 and 2016

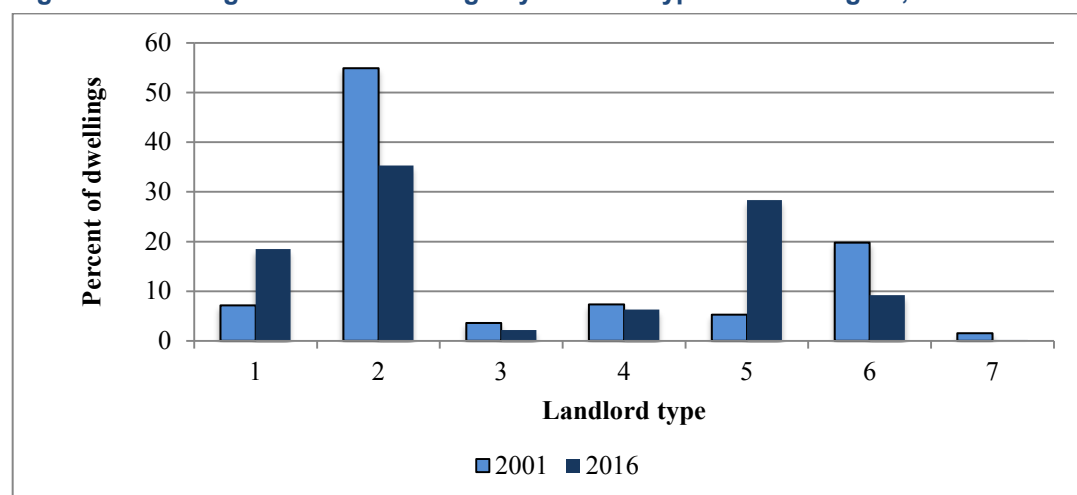


Source: ABS Census of Population and Housing 2001 and 2016

As far as the tenure of Aboriginal dwellings is concerned very little has changed. In 2001, Aboriginal households were overwhelmingly in rental accommodation and this remains the case, in fact slightly more so. As a consequence, the very low rates of home ownership recorded in 2001 are now even lower although the actual number of privately-owned Aboriginal dwellings increased slightly from 181 to 219. This pattern of change by tenure is repeated among non-Aboriginal dwellings although the trend here is more exaggerated. In effect, there has been a substantial structural shift out of home ownership and into rental housing with the absolute number of privately-owned non-Aboriginal dwellings declining by half from 4,207 in 2001 to just 2,104 in 2016.

Further structural change has occurred among rental dwellings. Aboriginal households are now far less likely to be in State and community rental housing than they were in 2001 and far more likely to be in non-government employer or private rental housing (Figure 6.3). Similar shifts into private and non-government employer rental housing have also occurred among non-Aboriginal households, although this has involved a reduction in the share of households in government employer rental properties (Figure 6.4).

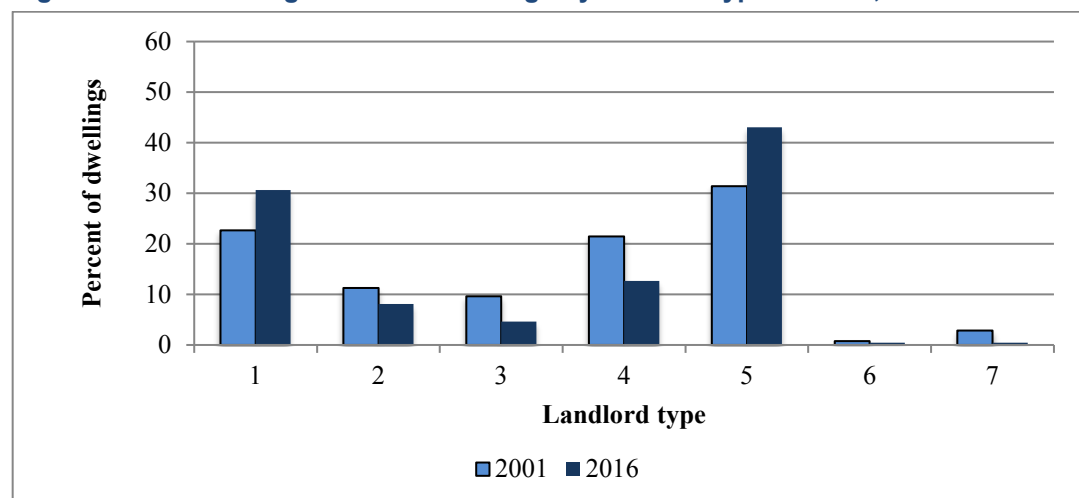
Figure 6.3 Aboriginal rental dwellings by landlord type: Pilbara region, 2001 and 2016



Source: ABS Census of Population and Housing 2016

Legend: 1. Real estate agent; 2. State housing authority; 3. Private landlord; 4. Government employer; 5. Other employer; 6. Housing co-operative/community; 7. Other landlord

Figure 6.4 Non-Aboriginal rental dwellings by landlord type: Pilbara, 2001 and 2016



Source: ABS Census of Population and Housing 2016

Legend: 1. Real estate agent; 2. State housing authority; 3. Private landlord; 4. Government employer; 5. Other employer; 6. Housing co-operative/community; 7. Other landlord

Table 6.2 provides a geographic breakdown of Aboriginal housing tenure across the Pilbara using Indigenous Locations. Clearly, private rental dwellings are restricted to the main towns of South Hedland and Karratha with a few also in Newman and Port Hedland. State housing rentals are also predominantly in these larger centres but are widespread across larger remote communities as well. The situation generally in remote communities appears mixed with some having only community rental dwellings (Punmu, Parnngurr and Kunawarritji) and others having a mix of community and State rental (Mugarinya). Other rental housing is predominantly non-government employer housing and this is found exclusively in main urban centres and mining towns such as Tom Price, Newman and Paraburdoo.

Table 6.2 Distribution of Aboriginal dwellings by tenure type: Indigenous Locations in the Pilbara, 2016

Indigenous Location	Real estate agent	State housing authority	Community rental	Other rental	Owned/ mortgaged
South Hedland	128	211	3	181	69
Karratha	144	176	3	124	58
Newman	38	19	0	93	20
Exmouth/Ashburton Surrounds	8	7	43	44	11
Cheeditha – Mingullatharndo	0	14	22	30	0
East Pilbara – Surrounds	0	0	6	0	0
Roebourne	13	53	3	3	10
Jigalong	0	50	0	0	0
Wickham	10	29	0	59	7
Port Hedland exc. Tjalka Boorda	16	32	0	44	24
Tom Price	9	8	0	55	6
Onslow	5	19	11	11	7
Kiwirrkurra	0	20	0	0	0
Punmu	0	0	23	3	0
Port Hedland – Surrounds	0	15	3	0	6
Paraburdoo	0	3	0	38	0
Parnngurr	0	0	23	0	0
Mugarinya (Yandeyarra)	0	9	9	0	0
Nullagine	0	0	10	0	0

Marble Bar - Mirtunkarra	0	17	0	5	3
Warralong	0	10	0	0	0
Kunawarritji	0	0	15	0	0
Injudunna	9	8	0	0	0
Dampier	3	0	0	4	6
Tjalka Boorda	0	0	0	0	0

Source: ABS Census of Population and Housing 2016

Some uncertainty surrounds these data as they conflict at times with equivalent data provided by the WA Department of Communities, although it should be noted that the data provided by the Department of Communities refer to 2018. Table 6.3 shows the distribution of state-managed dwellings across remote and town-based communities as provided by the Department of Communities. If we compare these data with those in Table 6.2 we can see immediately that Cheeditha is absent from the list even though the census indicates a total of 14 state housing authority dwellings in that location. Elsewhere, we can see that Mugarinya (Yandeyarra) has 33 state housing authority dwellings whereas the census indicates only 9; by contrast, the census reports a total of 17 such dwellings at Mirtunkarra but the Department of Communities indicates only 9. While reasons for such discrepancies are not clear, what is clear is that no single comprehensive and authoritative data set of Aboriginal housing currently exists for Aboriginal communities in the Pilbara and therefore no clear comprehensive measure of housing need is available.

Table 6.3 Pilbara Aboriginal communities with housing managed by the Department of Communities, 2018

Name of community	Number of dwellings managed by the Department of Communities
Bindi Bindi	24
Innawonga	7
Jigalong	56
Jinparinya	9
Marta Marta	2
Mirtunkarra	9
Yandeyarra	33
Jundaru	4
Punju Njamal	5
Parnpajinya	11
Wakathuni	29
Warralong	11
Youngaleena	7

Source: WA Department of Communities

Housing adequacy

Measures of housing adequacy tend to comprise some form of occupancy calculation mainly using census data. To add a further dimension, administrative data were requested from the Department of Communities on unmet demand for social housing but these were not forthcoming. For the Pilbara, we are therefore left with the ABS' census-based measure that uses the Canadian National Occupancy Standard. This is a measure of housing utilisation based on a comparison of the number of bedrooms in a dwelling with a series of household demographics such as the number of usual residents, their relationship to each other, their age and sex. This measure aims to identify whether a dwelling is 'under' or 'over-utilised'. Using this standard the ABS produced a new

housing variable for the 2016 census output called 'housing suitability'. This showed that out of 2,114 Aboriginal households across the Pilbara for which data on housing need was available, only 16% required extra bedrooms while 54% had 'spare' bedroom capacity. The remaining 32% were in dwellings with adequate bedroom capacity. According to this measure, the proportion of Aboriginal dwellings that are overcrowded fell between 2006 and 2016 from 21% to 16%, although the absolute number actually increased from 312 to 332 (Table 6.4). However, it should be pointed out that these calculations are based on usual resident counts only and they cannot be adjusted using post-census estimates of resident population because these are not compatible with household demographics. To that extent, they are inevitably underestimates of need in each census year though to what degree is unknown.

Table 6.4 Overcrowded Aboriginal dwellings: Pilbara region, 2006, 2011 and 2016

	2006	2011	2016
Overcrowded dwellings	312	352	332
% of all dwellings	21.4	19.0	15.7

Source: Biddle 2008, 2012; ABS Census of Population and Housing 2016

Not surprisingly, all but 20 of the Aboriginal households in overcrowded dwellings in 2016 were in rented accommodation. Table 6.5 shows the distribution of these rentals by landlord type. Almost two-thirds of overcrowded dwellings were in public sector housing rented from the housing division of the WA Department of Communities. The other major grouping was community rental which accounted for 25% of overcrowded dwellings, although it is not clear just how this census category is manifest in actual rental options in Pilbara communities especially in regard to Aboriginal Lands Trust properties.

Table 6.5 Overcrowded Aboriginal dwellings by landlord type and bedroom requirements: Pilbara region, 2016

Extra bedrooms required	Real estate agent	State housing authority	Employer-government	Employer - other	Housing cooperative/ community	Total*
Four or more	0	18	0	0	12	30
Three	3	22	0	0	9	34
Two	5	45	0	0	22	72
One	10	93	4	16	30	153
Total	18	178	4	16	73	289
% of dwellings	6.2	62.0	1.4	5.5	25.2	100.0

Source: ABS Census of Population and Housing 2016

*Excludes mortgaged dwellings, other minor tenures, not stated, not applicable, and unable to determine

The ability to track change in key aspects of housing and infrastructure in town-based reserves and in remote communities of all sizes in the Pilbara is greatly hampered by the abandonment of two vital surveys of housing and infrastructure that were available in the early 2000s but have not been since 2006 and 2008 respectively – namely the ABS' Community Housing and Infrastructure Needs Survey (CHINS) and the Western Australian Government's Environmental Health Needs Survey (EHNS). In combination, these surveys provided comprehensive public access data on resident populations, occupancy rates, functionality of dwellings, community facilities and measures of mobility and of infrastructure needs for all discrete Aboriginal localities in the Pilbara. Today, 15 years on, equivalent data no longer exist, at least not in the public domain and not for all communities.

To compound this data deficiency, one of the enduring difficulties in examining change in the geography of Aboriginal housing need across the Pilbara is a mismatch that often exists between spatial units used for census data which are based on the ABS' Australian Indigenous Geographic Classification (AIGC), and those used by the various Western Australian government departments that have had responsibility for community housing (currently the Department of Communities). The latter agency identifies discrete community boundaries via land tenure arrangements and policy prescriptions regarding service delivery rather than by the requirements of statistical geography. On this basis it currently has responsibilities for managing essential services (power and water) and/or housing in 18 Aboriginal remote and town-based reserve communities. By contrast, the smallest unit in the AIGC (Indigenous Locations) includes 25 contiguous areas some of which are town-based reserves (such as Tjalka Boorda), some are town-based reserves incorporated within township areas (such as Mirtunkarra and Marble Bar), some of which are remote communities (such as Jigalong), others are urban centres (such as Karratha), and the balance refer to residual (often geographically large) areas which include a number of localities within the Department of Communities remit but which are not separately identified in the AIGC as an Indigenous Location (such as Wakathuni and Innawonga).

The consequence of all this is that census data and Department of Communities data invariably do not match up. Having said that, even where spatial units do match there can still be discrepancies - for example, the 2016 census recorded just 4 dwellings at Tjalka Boorda compared to the 26 recorded by the Department of Communities (<http://regionalservicesreform.wa.gov.au/pr/pilbara-aboriginal-town-based-reserves>). Despite these problems of compatibility, the residual advantage of census data is that they provide a comprehensive breakdown across the region of Aboriginal population and housing at least in respect of some settlement clusters as well as broader settlement areas constituted, as we have seen, as 'Indigenous Locations'. As such, they enable a comprehensive but crude calculation of occupancy rates (estimated persons per dwelling) across the Pilbara. Table 6.6 shows the distribution of these variables by Indigenous Location in 2016 listed in rank order according to occupancy rate.

Table 6.6 Aboriginal housing occupancy rates by Pilbara Indigenous location, 2016

Indigenous Location	Estimated population	Dwellings	Occupancy rate
E. Pilbara (surrounds)	487	13	37.5
Warralong	127	10	12.7 (7.1)
Punmu	175	19	9.2 (5.9)
Kiwirrkurra	195	24	8.1 (6.2)
Jigalong	390	50	7.8 (4.2)
Cheeditha-Mingullatharndo	527	71	7.4 (9.7)
Parnngurr	154	22	7.0 (4.3)
Nullagine	130	19	6.9
Port Hedland (surrounds)	166	25	6.6
Kunawarritji	94	15	6.2
Exmouth-Ashburton (surrounds)	685	125	5.5
Roebourne	448	96	4.7
Dampier	66	14	4.7
Mugarinya (Yandeyarra)	147	33	4.5 (6.8)
Marble Bar (Mirtunkarra)	128	30	4.3 (5.6)
Newman	746	173	4.3
Injudunna	94	23	4.1
Tom Price	304	82	3.7
South Hedland	2,410	659	3.7

Karratha	2,026	543	3.7
Onslow	229	62	3.7
Wickham	377	106	3.6
Paraburdoo	157	49	3.2
Tjalka Boorda	13	4	3.2 (2.2)
Port Hedland (ex. Tjalka Boorda)	320	114	2.8
Total	10,594	2,381	4.4

Source: ABS Census of Population and Housing 2016
2003 EHNS data shown in parenthesis where available

If we use the average occupancy rate for the region of 4.4 as a benchmark, we can identify locations that are higher and lower than this. Accordingly, all locations with above average occupancy appear to be remote communities such as Jigalong and Warralong, while most of those with below average occupancy are urban centres such as Karratha and South Hedland. Also shown (in parenthesis) are equivalent occupancy measures from the 2003 EHNS in the few places where such data are available. While comparison over time is therefore only partial, the tendency seems to be that occupancy rates have generally risen since the early 2000s (for example, from 7.1 to 12.7 at Warralong) with only Mugarinya and Mirtunkarra recording slight reduction.

Environmental health infrastructure

As mentioned earlier, the two main sources of data on remote community and town-based reserve housing in the Pilbara and associated environmental health infrastructure (CHINS and EHNS) have been defunct since 2006 and 2008 respectively. It is also the case that the policy and funding framework surrounding the provision of housing and municipal services to these communities has been considerably overhauled since the baseline report of Taylor and Scambary (2005) with a focus on consolidating resources in fewer, larger settlements under the regional services reform agenda (<https://regionalservicesreform.wa.gov.au/p/roadmap>) (see also Hunt 2018).

With regard to infrastructure data, the Department of Communities advises that they have not compiled, nor do they hold, refreshed data comprehensive enough to cover the whole of the Pilbara region. While they have now assumed responsibility for the management of municipal services from the Commonwealth this only includes 18 out of 33 communities and it essentially refers to the Remote Area Essential Services Program (RAESP) that provides a repair and maintenance service for power, water and wastewater systems to these select communities. In effect, it is not possible to measure change in the details or the range of environmental health infrastructure for Aboriginal communities in the Pilbara since the data required for such an exercise no longer exist. There is an urgent need to fill this data gap.

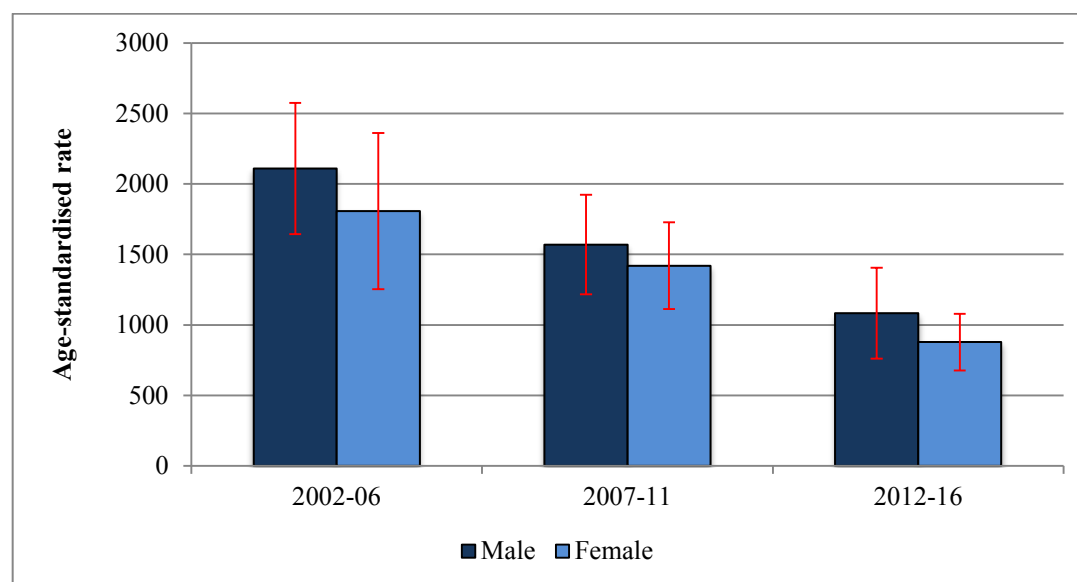
7. Health status and outcomes

Information on health status and outcomes is gathered as a matter of course in the day-to-day operation of the health care system in Western Australia. To develop a robust time-series of health indicators since 2001, data for usual residents of the Pilbara were compiled by the Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health for the periods 2002-06, 2007-11 and 2012-16. These data were drawn from hospital records and ABS vital registration records. In line with the original report (Taylor and Scambary 2005), analysis of health status is focused mostly on high-level Tier 1 type measures of health status and outcomes as per the Aboriginal and Torres Strait Islander Health Performance Framework (AIHW 2014). This includes the prevalence of health conditions (for example, circulatory disease, diabetes), human function (for example, disability), and mortality. Many elements of Tier 2 measures from the Health Performance Framework that focus on the determinants of health, particularly those concerned with socioeconomic status, are provided in the main body of this report. Tier 3 measures that focus on health system performance are not included.

Mortality

Between 2002 and 2016, the WA Department of Health reports a total of 1,478 deaths of Pilbara residents. Of these, 782 were Aboriginal residents or 53% of the total. This is despite the fact that Aboriginal people have comprised an average of only 16% of the population throughout this period. Presently, Aboriginal male deaths in the Pilbara outnumber non-Aboriginal male deaths by almost 4 to one, while Aboriginal female deaths outnumber non-Aboriginal female deaths by more than 5 to one. It is perhaps surprising, then, to report that Aboriginal age-standardised mortality rates (ASMRs) have improved significantly over the period 2002-6 to 2012-16 as shown in Figure 7.1. Overall, Aboriginal male mortality rates are consistently higher than female, and Aboriginal rates generally are much higher than non-Aboriginal rates. However, all rates have fallen over the period with the drop in both Aboriginal male and female rates between 2002-06 and 2012-16 considered significant at the 0.05 confidence level.

Figure 7.1 Aboriginal and male and female all causes age-standardised mortality rates: Pilbara region, 2002-2016



Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

Rates per 100,000 person years

Note: Statistically there is 95% confidence that the true rate (ASR) falls between lower and upper confidence interval values shown by the 'whiskers' in the chart. Two rates are considered significantly different (at the 0.05 level) if their confidence intervals do not overlap. Otherwise, if their confidence intervals overlap, the two rates are not significantly different.

Figure 7.2 Non-Aboriginal and male and female all causes age-standardised mortality rates: Pilbara region, 2002-2016



Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

Rates per 100,000 person years

Note: Statistically there is 95% confidence that the true rate (ASR) falls between lower and upper confidence interval values shown by the 'whiskers' in the chart. Two rates are considered significantly different (at the 0.05 level) if their confidence intervals do not overlap. Otherwise, if their confidence intervals overlap, the two rates are not significantly different.

Notwithstanding this reduction in Aboriginal ASMRs, non-Aboriginal rates have also fallen, though not significantly, as shown in Figure 7.2. As a consequence, while the gap between Aboriginal and non-Aboriginal mortality rates has narrowed for both males and females this gap is still considerable, especially among females. Table 7.1 shows the ratio of Aboriginal to non-Aboriginal ASMRs for each of the three census periods. While female ratios have been consistently highest this says as much about the relatively low and declining rates of mortality among non-Aboriginal females as it does about Aboriginal female mortality per se.

Table 7.1 Ratios of Aboriginal to non-Aboriginal Age-standardised mortality rates: Pilbara region, 2002-06, 2007-11 and 2012-16

	2002-06	2007-11	2012-16
Males	4.78	3.24	3.73
Females	6.27	6.41	5.38

Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

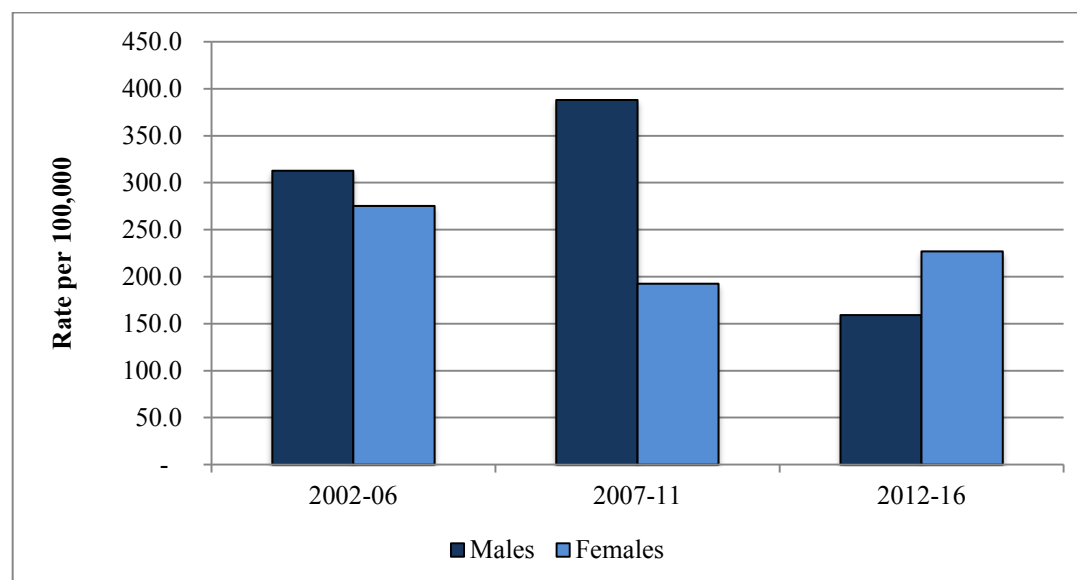
Of particular interest as a measure of development outcomes is the rate of childhood mortality (those aged 0-4 years). Halving the gap in child mortality rates between Aboriginal and non-Aboriginal children forms one of the key planks of the COAG Closing the Gap strategy – indeed, it is one of only two out of 7 headline indicators that appears to be on track towards achievement (Australian Government 2018). In situations of high mortality and relatively low life expectancy, as found among Aboriginal people in the Pilbara, a large proportion of deaths have typically occurred before the age of 5. Reducing this outcome has been a major goal of public health interventions.

Internationally, high child mortality levels have been associated with poverty, the availability, accessibility and quality of health services, environmental health risks including access to safe water and sanitation, and poor nutrition (United Nations Children's Fund 2017). As for aetiology, in Australia perinatal conditions have accounted for a large share of causes, along with 'sudden and ill-defined conditions' (such as Sudden Infant Death Syndrome), 'congenital malformation', and 'injury and poisoning' (Australian Government 2014). While many health interventions can have a long lead-time before measurable impacts are seen, a number of intermediate measures provide an important barometer of likely improvement in child and maternal health such as increases in the take up of antenatal care programs, reductions in the rate of maternal smoking during pregnancy, reductions in low birthweight babies, and increases in immunisation rates. While data on these are not provided here they typically form outcomes that arise from the many public health activities conducted by the State government and Aboriginal Medical Services in the Pilbara.

To this extent, it is encouraging to find that that Aboriginal child mortality rates in the Pilbara seem to have followed the national trend downwards as shown in Figure 7.3. There is some variation by gender but this is to be expected with small numbers. Perhaps of more interest is the fact that rates can vary substantially by reporting period with a considerable rise among males in the period 2007-11 and substantial drop in 2012-16. Such variation is repeated when considering rate ratios with non-Aboriginal child mortality (Figure 7.4). If we view the 2007-11 period as off-trend, the longer-term trajectory suggests that Aboriginal rates have remained mostly unchanged over the past 15 years at around 3-4 higher than non-Aboriginal rates which is consistent with the

overall ratio of 3.3 for Western Australia as a whole in 2016 (SCRGSP 2016: Table 4A.2.5).

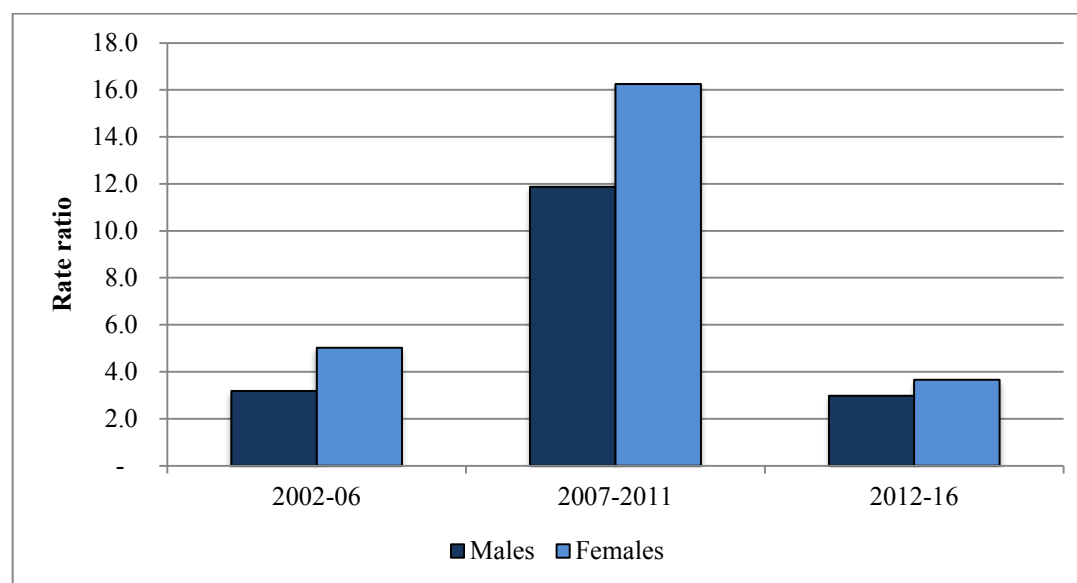
Figure 7.3 Aboriginal male and female child mortality rates: Pilbara region, 2002-2016



Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

Rates per 100,000 person years

Figure 7.4 Rate ratios of Aboriginal to non-Aboriginal child mortality rates: Pilbara region, 2002-2016

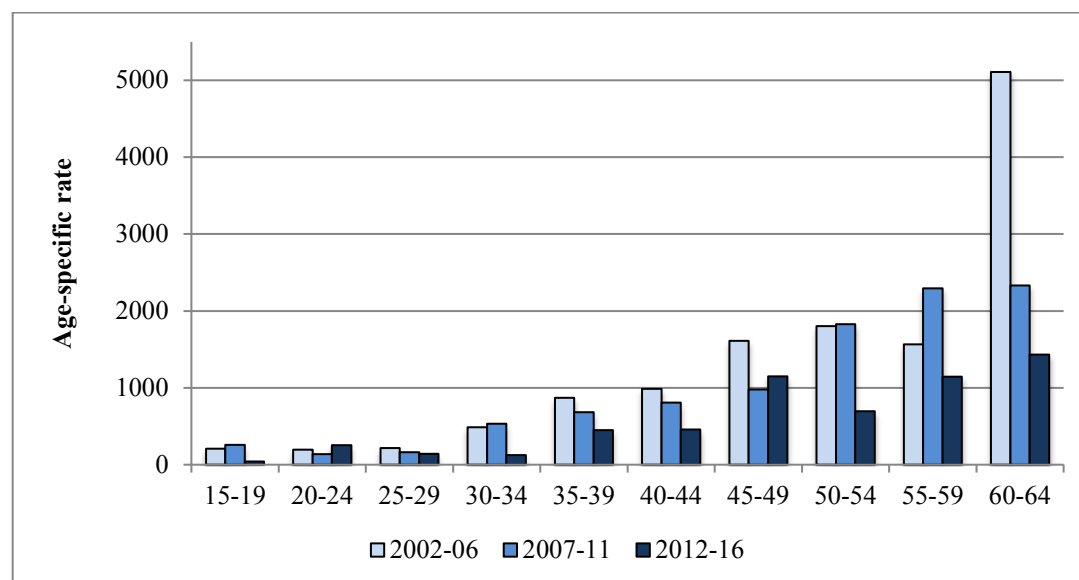


Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

Of particular interest from the perspective of economic participation is the rate of mortality across the life span. This is shown for Aboriginal males and then females in 7.5 and 7.6 with reference to the population aged 15-64. In 2002-06, signs of rising mortality commenced among males at age 30 and among females at age 25. Beyond these ages mortality rates increased steadily among males and reached a very high peak among those aged 60-64. For females, this rise in mortality occurred later at age 45 with a steady increase beyond that but to a much lower peak than for males at age 60-64.

However, since 2002-06, it appears that male and female fortunes have varied. Among males, age-specific rates have all fallen at all ages, especially among those aged 60-64. While female rates have also generally fallen, they have risen at some ages (15-19, 30-39 and 60-64). For the most part, however, Aboriginal mortality remains lower among females than males at almost all ages.

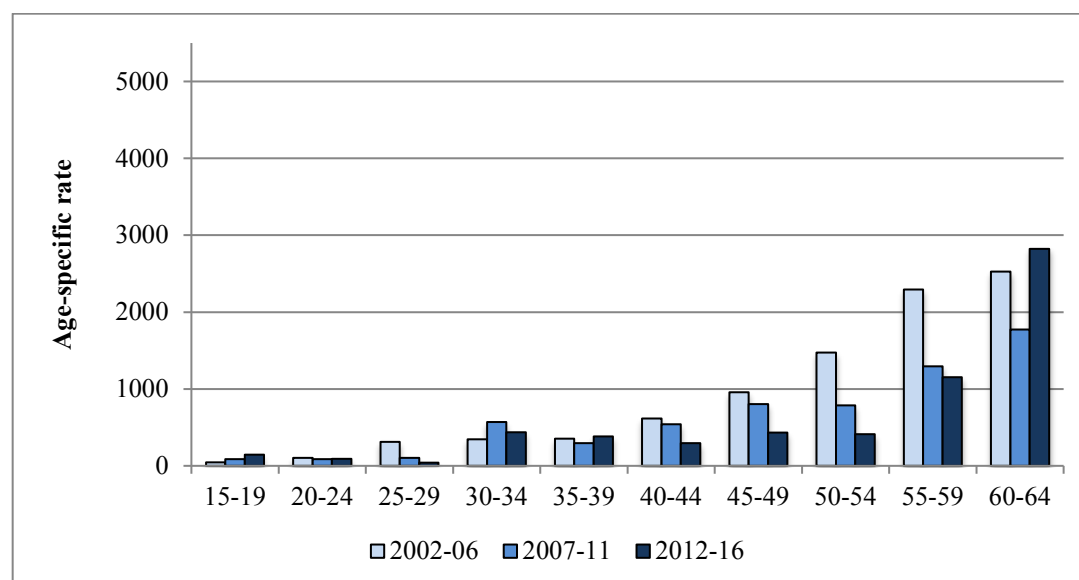
Figure 7.5 Aboriginal males 15-64 years all causes age-specific mortality rates: Pilbara region, 2002-2016



Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

Rates per 100,000 person years

Figure 7.6 Aboriginal females 15-64 years all causes age-specific mortality rates: Pilbara region, 2002-2016



Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

Rates per 100,000 person years

While all-cause Aboriginal mortality rates have fallen steadily since 2002-06, the leading causes of mortality observed over the period 2002-06 have remained the same and their decline has not been statistically significant even though the actual ASRs have reduced (Table 7.2). The main cause of death remains diseases of the circulatory system followed by endocrine, nutritional and metabolic diseases and neoplasms. In effect, Aboriginal mortality remains dominated by so-called 'lifestyle' diseases that, by definition, are potentially avoidable. With this in mind, Figure 7.7 shows the change in Aboriginal and non-Aboriginal potentially avoidable mortality rates for the period 2002-2106.

Table 7.2 Leading causes* of Aboriginal mortality: Pilbara region region, 2002-2016

Leading cause in 2002-06	ASR 2002-06	ASR 2007-11	ASR 2012-16	Significant change at 0.05 level 2002/06- 2012/16
Diseases of the Circulatory System	444.6	398.6	237.8	No
Endocrine, Nutritional, Metabolic Diseases	269.5	206.9	141.0	No
Neoplasms	265.8	227.7	126.7	No
External Cause of morbidity & mortality	188.3	132.7	96.7	No
Diseases of the Respiratory System	179.5	Nil	Nil	Nil

Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

Rates per 100,000 person years

**Major category ICD-10-AM*

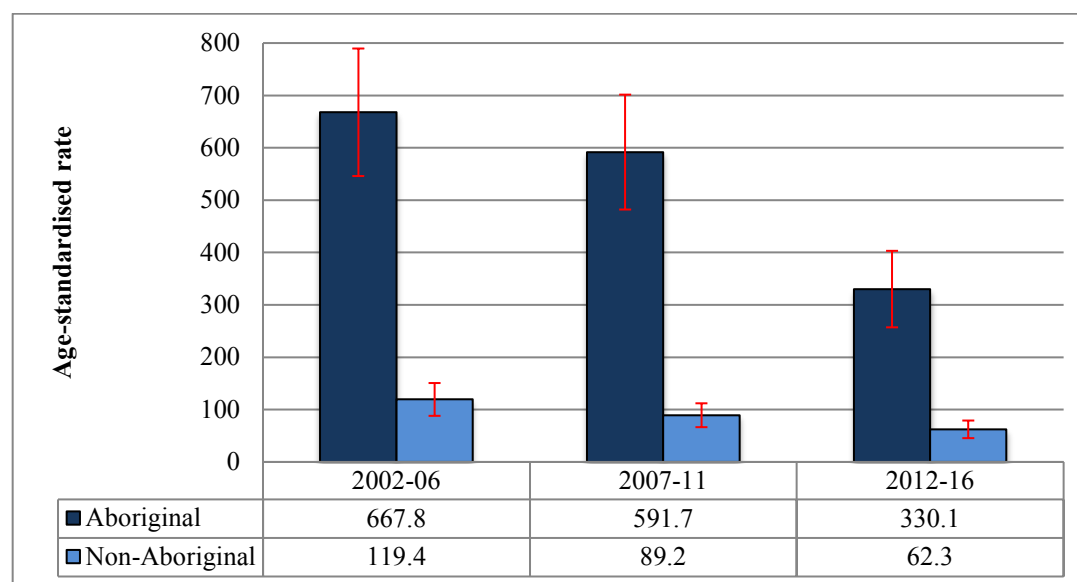
ASR = Age-standardised rate per 100,000

Nil = insufficient cases

Note: Statistically there is 95% confidence that the true rate (ASR) falls between lower and upper confidence interval values. Two rates are considered significantly different (at the 0.05 level) if their confidence intervals do not overlap. Otherwise, if their confidence intervals overlap, the two rates are not significantly different.

Potentially avoidable deaths are those that could be prevented with individualised care or through existing primary care or hospitalisation (Falster and Jorm 2017). They are amenable to screening and primary prevention, such as immunisation and lifestyle change, and to this degree they reflect the effectiveness of the current preventive health activities of the health sector including disease prevention and population health initiatives (ABS 2016). According to the ABS (2016) they may be influenced by a person's level of access to medical and other services which may, in-turn, be influenced by their place of usual residence. Accordingly, the ABS reports a strong correlation between the rate of potentially avoidable death rates across Australia and degree of remoteness (ABS 2016). Given that constituent parts of the Pilbara are classified as either remote or very remote it is to be expected that rates of potentially avoidable deaths would be relatively high. Against this expectation, the current rate in the Pilbara shown in Figure 7.7 (330 per 100,000) is found to be equivalent to the national rate (345 per 100,000) based on collective data from New South Wales, Queensland, South Australia, Western Australia and the Northern Territory (<https://www.pmc.gov.au/sites/default/files/publications/indigenous/hpf-2017/tier1/124.html>). Furthermore, this rate is now significantly lower in the Pilbara than it was in 2002-06.

Figure 7.7 Age-standardised Aboriginal and non-Aboriginal potentially avoidable mortality rates: Pilbara region, 2002-2106



Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

Rates per 100,000 person years

Note: Statistically there is 95% confidence that the true rate (ASR) falls between lower and upper confidence interval values shown by the 'whiskers' in the chart. Two rates are considered significantly different (at the 0.05 level) if their confidence intervals do not overlap. Otherwise, if their confidence intervals overlap, the two rates are not significantly different.

Morbidity

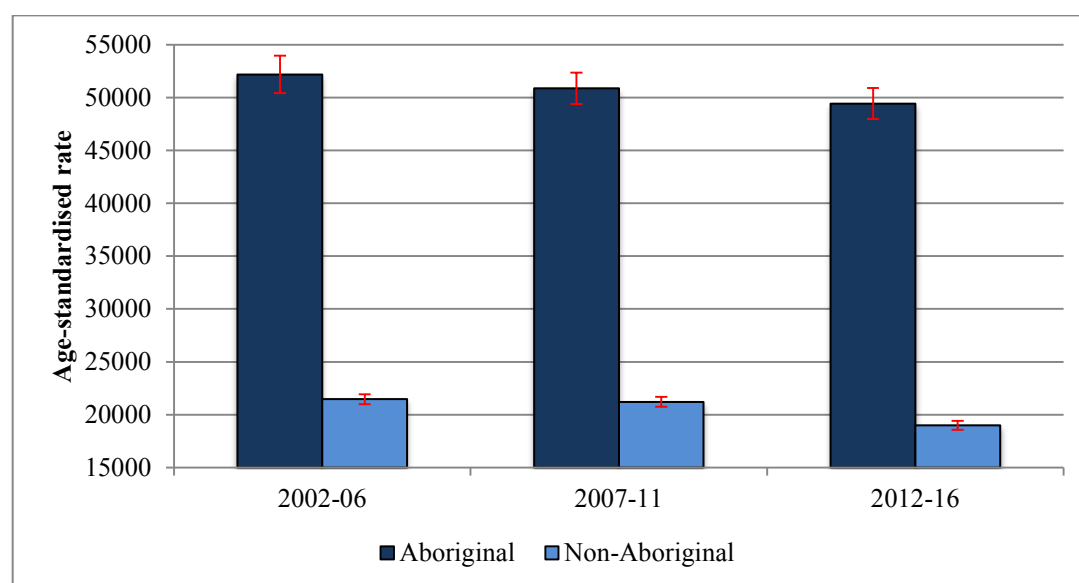
Hospital separations data from the Epidemiology Branch of the WA Department of Health provide the basis for developing profiles of morbidity for Aboriginal and non-Aboriginal residents of the Pilbara. The source of these data is the Western Australia Hospitals Morbidity Data System (HMDS). This records episodes of care within the hospital system. These commence with formal admission to hospital and end with a formal discharge (separation) from hospital. As such, the data used here to profile morbidity exclude patients attending outpatient or community health services. To that extent they do not provide a full measure of the burden of ill health in the region. Rather, they focus attention on health conditions that are serious enough to warrant admission to hospital. Another limitation is that they relate to episodes of hospitalisation rather than to individual patients. As such, they can include multiple admissions by a relatively small number of people with the notable example being for kidney dialysis. As a consequence, data are presented that both include and exclude episodes of care involving dialysis.

Over the period 2012-16, a total of 106,006 hospital separations were recorded for usual residents of the Pilbara. Of these, just over half (50.4%) were accounted for by Aboriginal residents even though Aboriginal people comprised just 16% of the population. This represents a rise in the Aboriginal share of separations from 45% during 2002-06. Kidney dialysis accounts for a large proportion of these Aboriginal separations – as much as 55% in 2012-16, up from 41% in 2002-06 and 45% in 2007-11. If we exclude these, the underlying level of hospitalisation amounted to 23,800 separations in 2012-16 up from 18,300 in 2002-06. However, as an age-standardised

rate, this translates into a slight reduction in Aboriginal hospitalisation for both males and females.

Notwithstanding this reduction, Aboriginal hospitalisation rates in the Pilbara remain far higher than non-Aboriginal rates (even excluding dialysis) as indeed they are across the country. Figures 7.8 and 7.9 show these relative rates for males and female respectively. Aside from the clear observation that Aboriginal rates are relatively very high, the main point to note is the lack of any statistically significant reduction since 2002-06 among Aboriginal males, while the Aboriginal female rate in 2012-16 was significantly lower than the rate in 2002-06. At the same time, female rates tend to be higher than male rates due largely to hospitalisation for childbirth. Any reductions in morbidity would no doubt reflect the impact of primary health initiatives aimed at lowering the incidence and prevalence of underlying conditions as well as any changes to social determinants of health outcomes such as employment, education and housing as documented here. To this extent, the decline in the Aboriginal female rate may provide some measure of success in these areas.

Figure 7.8 Age-standardised Aboriginal and Non-Aboriginal male hospitalisation rates (excluding dialysis): Pilbara region, 2002-2106

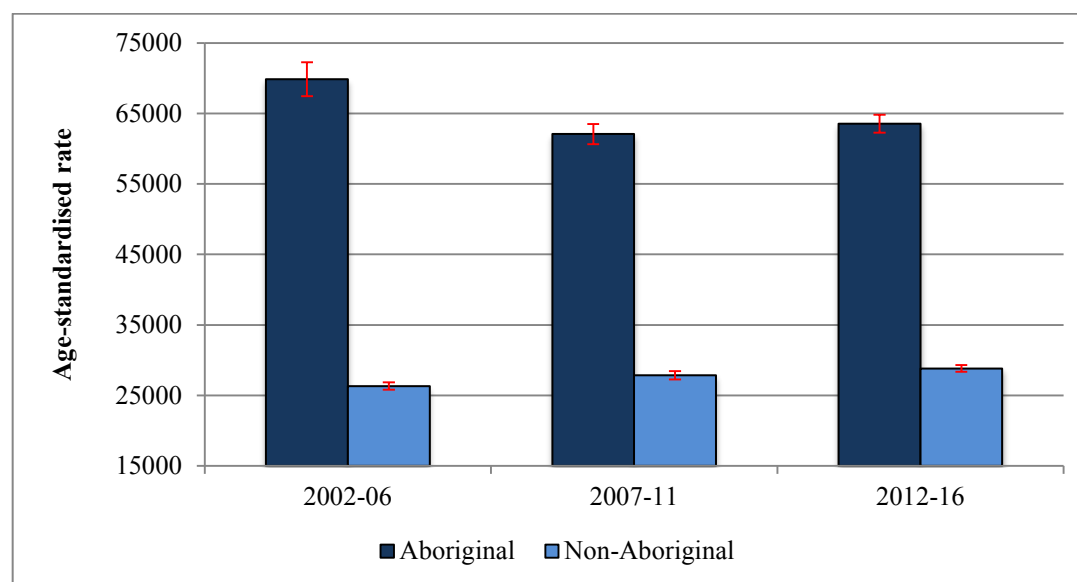


Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

Rates per 100,000 person years

Note: Statistically there is 95% confidence that the true rate (ASR) falls between lower and upper confidence interval values shown by the 'whiskers' in the chart. Two rates are considered significantly different (at the 0.05 level) if their confidence intervals do not overlap. Otherwise, if their confidence intervals overlap, the two rates are not significantly different.

Figure 7.9 Age-standardised Aboriginal and Non-Aboriginal female hospitalisation rates (excluding dialysis): Pilbara region, 2002-2106



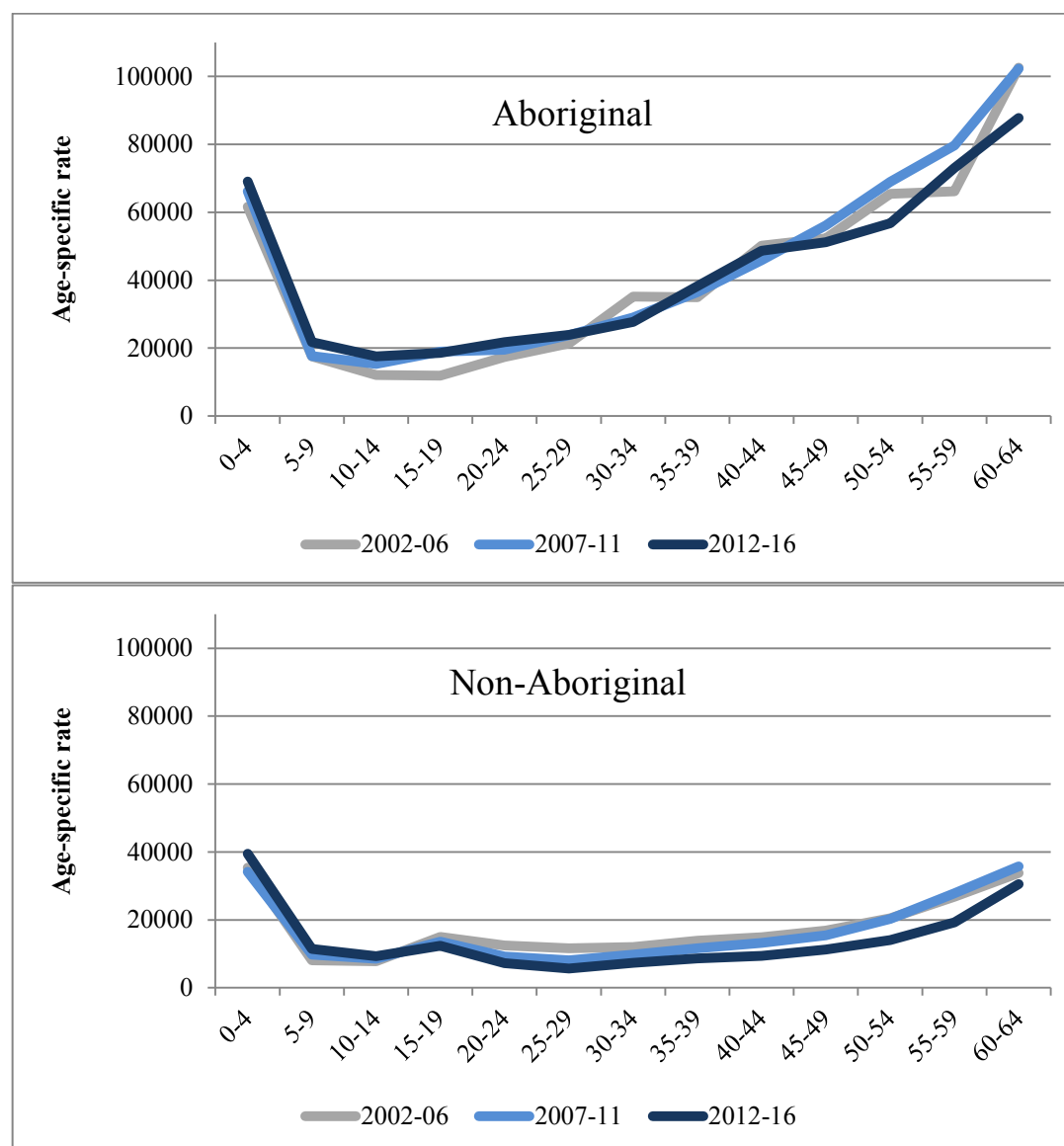
Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

Rates per 100,000 person years

Note: Statistically there is 95% confidence that the true rate (ASR) falls between lower and upper confidence interval values shown by the 'whiskers' in the chart. Two rates are considered significantly different (at the 0.05 level) if their confidence intervals do not overlap. Otherwise, if their confidence intervals overlap, the two rates are not significantly different.

As for age-specific rates of hospitalisation (Figure 7.10), these are typically high among infants and in Western Australia the most common reasons for hospitalisation among infants are infectious and parasitic diseases, accidental injuries and respiratory conditions (Commonwealth of Australia 2016: 6.33). Following a dip in school-age years, Aboriginal hospitalisation rates (excluding dialysis) accelerate from age 20 onwards and continue to rise steadily throughout adulthood. Comparison with non-Aboriginal rates shows clearly that Aboriginal rates are substantially higher at all ages. Episodes of hospital care therefore provide a common backdrop for Aboriginal residents of the Pilbara affecting them either directly or as carers of other family members. However, there does appear to have been some shift in the distribution of morbidity by age with an increase in rates among youth since 2002-06 and reduced rates at older ages from 40 to 64 years. A similar shift also appears in non-Aboriginal age-specific rates and so there has been no reduction in the gap in rates at older ages. Indeed, as the rate ratios in Figure 7.11 indicate, Aboriginal hospitalisation rates are now much higher than non-Aboriginal rates at all ages between 20 and 59 years than they were in 2002-06 or in 2007-11.

Figure 7.10 Age-specific Aboriginal and Non-Aboriginal hospitalisation rates (excluding dialysis): Pilbara region, 2002-2016

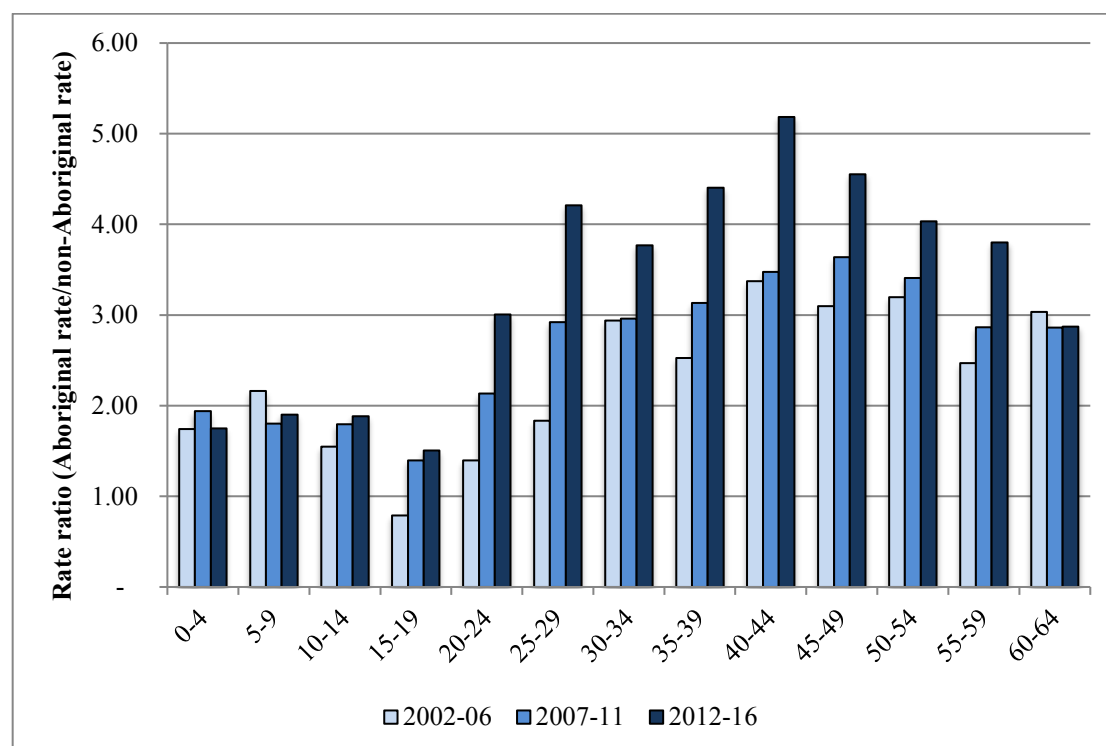


Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

Rates per 100,000 person years

Apart from the age group 0-9 years, and then again at age 60-64, at all other ages the gap between Aboriginal and non-Aboriginal rates has widened steadily and considerably. Among those aged 25-29, for example, the Aboriginal hospitalisation rate was just under twice as high as the non-Aboriginal rate in 2002-06 but in 2012-16 it was more than four times higher. In the age group 40-44, it was just over three times higher in 2002-06, now it is more than five times higher. Over the entire working-age range, Aboriginal hospitalisation rates are now more than three times higher than non-Aboriginal rates. This must have some impact on economic participation and productivity although to what extent cannot be measured here as separations data do not refer to unique persons.

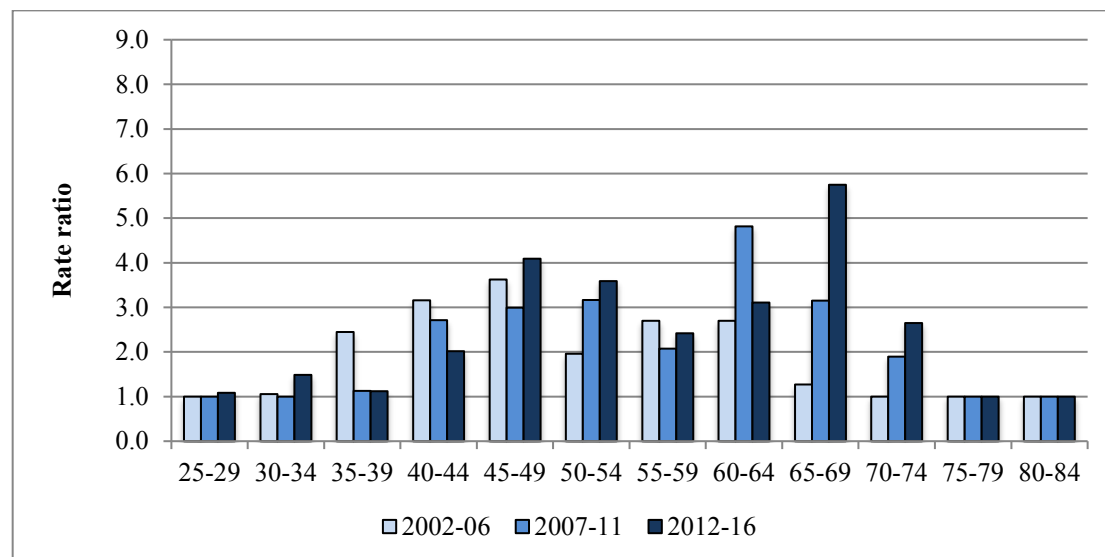
Figure 7.11 Rate ratios of Aboriginal to non-Aboriginal age-specific hospitalisation rates (excluding dialysis): Pilbara region, 2002-2016



Source: Epidemiology Branch of the Public and Aboriginal Health Division of the Western Australia Department of Health
Rates per 100,000 person years

So far, of course, we have excluded separations due to kidney dialysis for end-stage renal disease. The impact of adding these is shown in Figure 7.12 for Aboriginal males and Figure 7.13 for Aboriginal females. These show the rate ratios of hospitalisation rates including dialysis over those excluding dialysis. A ratio of 1.0 indicates parity and any result higher than one indicates that rates including dialysis are higher than those excluding dialysis. For example, among 65-69 year old males, the hospitalisation rate including dialysis was almost six times higher in 2012-16 than the rate excluding dialysis. What's more, this gap had increased substantially since 2002-06 when the rates were almost equivalent. If we look more closely at the trends in rate ratios by age group, we can see that at some younger ages (35-44) and late middle to old ages (55-64) the gap has narrowed indicating a decline in dialysis separations, whereas among those aged 45-54 and 65-74 at older ages the gap has increased indicating a rise. What this appears to suggest is successive waves of dialysis treatment progressing through the population on a cohort basis with the current population aged over 45 years displaying the legacy of earlier lifestyle disease and, probably, improved access to treatment. While the fall in ratios at ages 35-44 offers some hope that this progression may be moderated, it should be noted that Aboriginal hospital separations due to renal disease increased significantly from 201 per 100,000 in 2002-06 to 410 per 100,000 in 2012-16.

Figure 7.12 Rate ratios of age-specific Aboriginal male hospitalisation rates (including dialysis) to age-specific Aboriginal male hospitalisation rates (excluding dialysis): Pilbara region, 2002-2016

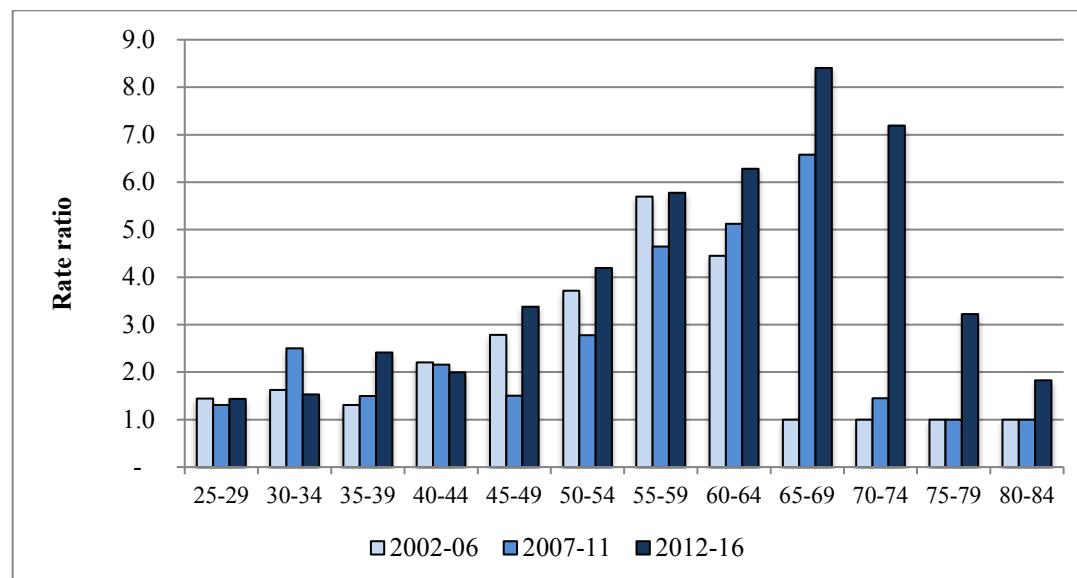


Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

Rates per 100,000 person years

This same pattern of rate ratios appears among female separations (Figure 7.13) with some signs of reduced dialysis at younger ages below 44 years. However, the wave of dialysis treatment is very prominent at older ages, especially for those over 65 years, and female rate ratios far exceed male ratios at all ages over 50. In 2012-16, there were 29,577 dialysis separations involving Aboriginal patients and as much as two-thirds of these (66%) were female – an increase from 55% in 2002-06. As mentioned, these figures refer to episodes of care, not individuals, but the number of individuals invested in each episode is no doubt much greater than the patients themselves as the latter require transport and family support during treatment. None of these wider population impacts are capable of estimation here.

Figure 7.13 Rate ratios of age-specific Aboriginal female hospitalisation rates (including dialysis) to age-specific Aboriginal female hospitalisation rates (excluding dialysis): Pilbara region, 2002-2016



Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health
Rates per 100,000 person years

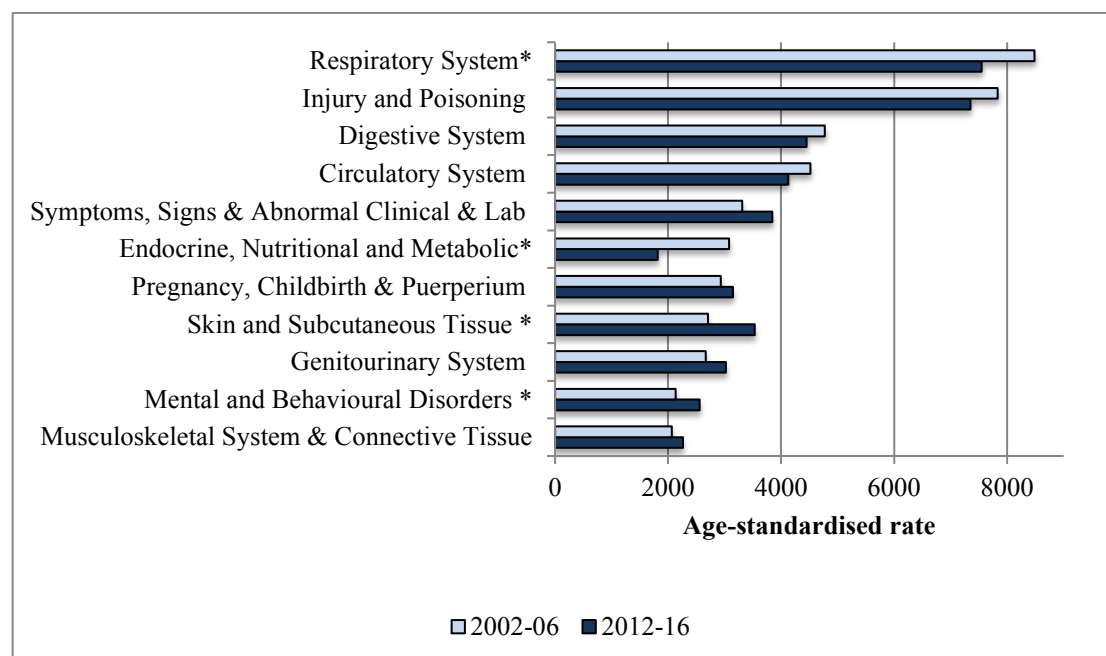
Causes of hospitalisation

In all three reporting periods, the most common reason for the hospitalisation of Aboriginal people from the Pilbara was 'Factors influencing health status and contact with health services' (mostly for care involving dialysis). As we have seen, this single cause accounted for more than half of all Aboriginal separations in 2012-16. If we put these to one side and focus on remaining causes we can examine these using the ICD-10-AM principal diagnosis classifications. ICD-10-AM is the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification. It is part of the international standard for defining and reporting diseases and health conditions. The classification is based around diagnostic categories and principal diagnoses are those considered to be chiefly responsible for an episode of patient care. Major diagnoses provide a high-level description of morbidity while minor diagnoses provide for more detailed analysis.

Figure 7.14 shows age-standardised Aboriginal hospitalisation rates by leading cause in 2002-06 and tracks how these had changed by 2012-16. The first point to note is that the leading causes identified in 2002-06 remained the same in 2012-16. Diseases of the respiratory system still dominate followed by injury and poisoning. Also of note is the fact that the top four leading causes, plus the endocrine, nutritional and metabolic disease category, all recorded a decrease in their ASR, while the bottom five leading causes all recorded an increase. The reduction in separations due to respiratory disease is significant at the 0.05 level and mostly reflects a decline in chronic obstructive pulmonary disease with rates in this also down significantly from an ASR of 2559.4 in 2002-06 to 1471.8 in 2012-16. The fall in ASR for endocrine, nutritional and metabolic disease was also significant due largely to a drop in the ASR for diabetes mellitus from 2257.4 in 2002-06 to 790.6 in 2012-16. As for increases in ASRs, the elevated rate for diseases of the skin and subcutaneous tissue was significant due to a rise in skin

infections as was the rise in mental and behavioural disorders due mostly to an increase in alcohol and drug disorders. All other changes in ASRs were not statistically significant.

Figure 7.14 Age-standardised Aboriginal hospitalisation rates by leading cause: Pilbara region, 2002-06 and 2012-16



Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

Rates per 100,000 person years

a. Principal diagnoses (major ICD-10-AM) listed by leading cause in 2002-06

* Significant change at the 0.05 level

Table 7.3 reveals the changes in the top 15 causes of hospitalisation according to the more detailed measure of ICD-10-AM (minor10). In effect, these are the more precise disease diagnoses underlying the trends shown in Figure 7.14. ASRs for almost two-thirds of the leading causes of hospitalisation (60%) increased since 2002-06 and five of these represented a significant increase – infections of the skin, health service encounters due to reproduction, symptom and signs involving circulatory and respiratory systems, alcohol and drug disorders and conditions originating in the perinatal period. By contrast, a significant reduction in the ASR was only recorded for one leading cause – chronic obstructive pulmonary disease (COPD), which includes chronic bronchitis, emphysema and bronchiectasis.

Table 7.3 ASRs of top 15 causes of hospitalisation* for Aboriginal Pilbara residents in 2002-06 and 2012-16

	ASR 2002-06	ASR 2012-16	Change in ASR	Significant at 0.05 level
Infections of the skin and subcutaneous tissue	2202.5	3000.4	↑	Yes
Injuries to head and neck	1890.3	1913.5	↑	No
Influenza and pneumonia	2792.6	2695.0	↓	No
Acute respiratory infections	1762.8	1948.9	↑	No
Injuries to upper limbs	1390.4	1480.5	↑	No
Injuries to lower limbs	2088.0	1858.8	↓	No
Persons encountering health services related to reproduction	724.6	952.9	↑	Yes
Disorders of gallbladder, biliary tract and pancreas	1487.4	1398.2	↓	No
Symptoms and signs involving the circulatory and respiratory systems	1138.8	1565.8	↑	Yes
Alcohol and drug disorders	883.6	1114.0	↑	Yes
Certain conditions originating in the perinatal period	579.0	731.0	↑	Yes
Other forms of heart disease	1537.2	1736.4	↑	No
Other conditions/indicators of pregnancy, childbirth and puerperium	751.7	714.3	↓	No
COPD (includes chronic bronchitis, emphysema and bronchiectasis)	2559.4	1471.8	↓	Yes
Symptoms and signs involving the digestive system and abdomen	939.7	902.5	↓	No

Source: Epidemiology Branch of the Public and Aboriginal Health Division of the WA Department of Health

Rates per 100,000 person years

* Principal diagnoses (minor ICD-10-AM) listed by leading cause 2012-16

↑ increase in ASR ↓ decrease in ASR

Note: Statistically there is 95% confidence that the true rate (ASR) falls between lower and upper confidence interval values. Two rates are considered significantly different (at the 0.05 level) if their confidence intervals do not overlap. Otherwise, if their confidence intervals overlap, the two rates are not significantly different.

Disability

Aside from the debilitating effects of chronic morbidity, one element of health status that can have a direct impact on the capacity of individuals to participate in economic activity is disability, defined as any continuing condition that restricts everyday activities. Such restriction can be due to an intellectual, cognitive, neurological, sensory or physical impairment or a combination of these; it may be permanent or episodic in nature and it can result in substantially reduced capacity of individuals for communication, social interaction, learning or mobility and a need for continuing support services.

Establishing a time series of Aboriginal Pilbara residents with a disability is difficult using public access data. The main consistent source is the five-yearly census that has included a question on disability since 2006. The census asks whether individuals need someone to help them with self-care activities, with body movement activities, and with communication activities. It then asks about the reasons for such needs such as short or long-term health conditions, disability or old age. From these answers it constructs a census output variable on core activity need for assistance that captures profound or

severe core activity limitation (and omits moderate and mild limitations) and which we can use here to construct profiles and estimates of such disability for Pilbara residents.

Unfortunately, this census variable has a fairly high non-response rate among Aboriginal respondents ranging between 6.5% and 10% over the past three censuses. If we add to this the consistently high non-response to the census question on Indigenous status we are clearly dealing with only a sample of the population. Nonetheless, as with other census variables, we have the basis for establishing rates of disability over time and we can use these to derive crude estimates of numbers. Table 7.4 shows these census-based rates of disability for Aboriginal and non-Aboriginal residents of the Pilbara in 2006, 2011 and 2016 along with estimated levels.

Table 7.4 Census rates and estimated levels of Aboriginal and non-Aboriginal persons with a core activity need for assistance: Pilbara region, 2006-2016

	2006	2011	2016
	Rates		
Aboriginal	4.7	3.9	3.9
Non-Aboriginal	0.9	0.8	1.0
	Estimated levels		
Aboriginal	303	391	456
Non-Aboriginal	338	412	525
Total	641	803	981
Aboriginal % of total	47.3	48.7	46.5

Source: ABS Census of Population and Housing 2006, 2011 and 2016

Estimates based on ABS ERPs

The rate of core activity need for assistance among Aboriginal people in the Pilbara is relatively low at 3.9% in 2016 although it was higher in 2006 at 4.7% – among Aboriginal people generally in Western Australia it was 5.3% in 2016 and in Australia as a whole it was 7.2%. Nonetheless, it is clearly higher than the figure of 1% recorded for non-Aboriginal Pilbara residents, although this non-Aboriginal rate is very low compared to the national overall rate of 5.5%. As a consequence, Aboriginal people have consistently accounted for almost half of those in the Pilbara with a disability despite comprising only 16% of the population.

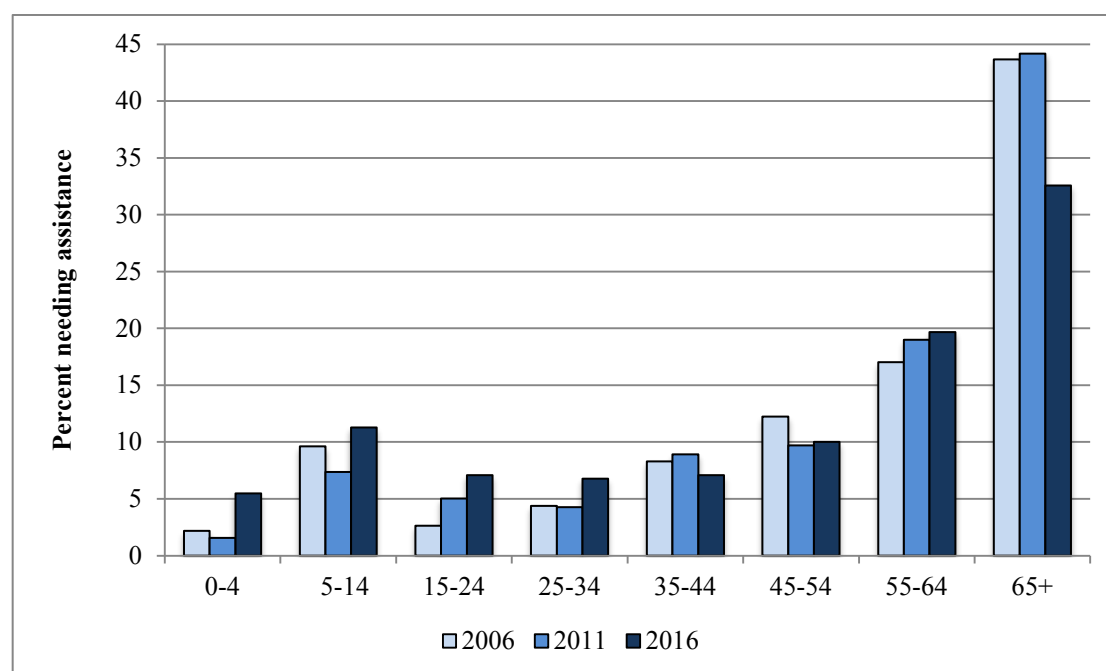
It is interesting to compare the 2016 estimate of 456 Aboriginal persons with a disability shown in Table 7.4 with the figure of 502 in receipt of a Disability Support Pension from Centrelink at around the same time as the 2016 census (Table 4.8) as the figure from administrative data does provide some useful validation of the estimated level. This is especially so considering census undercount and the fact that the administrative net around disability is likely to be more encompassing and include moderate and mild disabilities compared to the census question which is focused on the more severe end of the disability spectrum. The observation that the census-derived rate of disability has fallen since 2006 is also of interest as it matches findings from administrative data that show no change in the level of disability pension payments since 2005 (510 in 2005 and 502 in 2016) despite considerable population growth over that period. At the same time, it should be noted that the use of administrative data for benchmarking is always problematic due to the potential impact of changes to eligibility rules and administrative practice.

As expected, the prevalence of disability in the population increases with age. To a large extent in Australia disability has been characterised as a condition associated

mostly with old, or at least with increasing, age. Nationally, in 2016, 53% of all persons with a disability based on the census definition were over the age of 64 years. Among the Indigenous population, however, disability is far more evenly spread across the life span – in Australia as a whole only 19% of those over 64 years had a disability in 2016. This more widely distributed pattern of disability across the age distribution is also evident among Aboriginal residents of the Pilbara and it appears to have become increasingly so over the period since 2006.

Figure 7.15 shows the age distribution of Pilbara Aboriginal residents who had a core activity need for assistance at each census since 2006. While disability is concentrated among those of older age, especially over 55 years, there has been a substantial decline in the proportion at ages over 65 and a notable rise in the proportions recorded at younger ages below 35 years with the latter up from 19% in 2006 to fully 31% in 2016.

Figure 7.15 Age distribution of Aboriginal residents with a core activity need for assistance: Pilbara region, 2006-2016



Source: ABS Census of Population and Housing 2006, 2011 and 2016

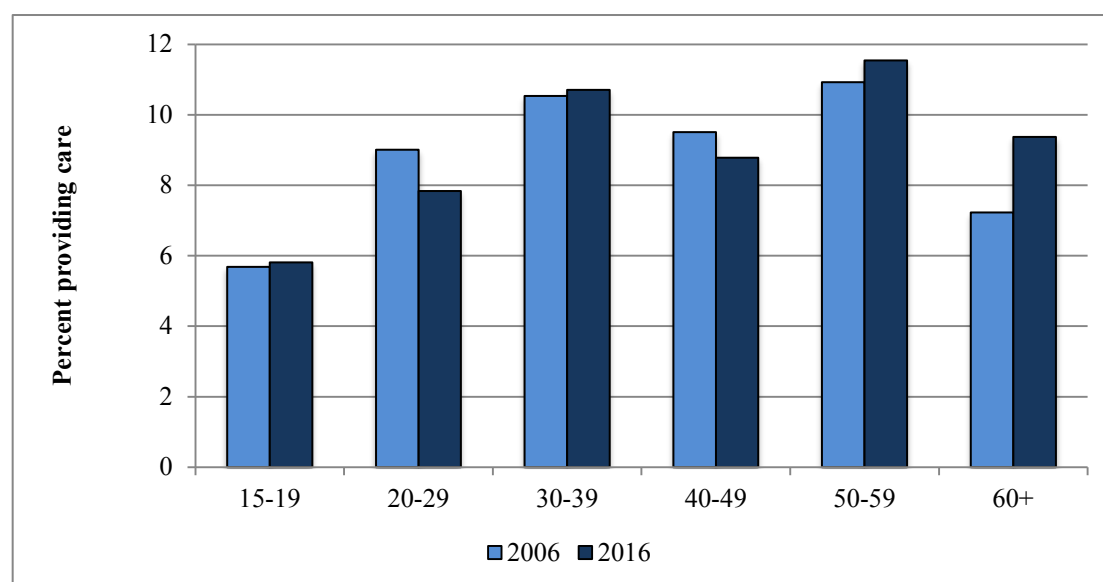
Estimates of numbers of persons with a profound or severe disability provide one measure of potential health impacts on regional economic participation. By definition, the census question on core activity need for assistance suggests that others are implicated as well by making time available to provide such assistance. Accordingly, the census also asks whether individuals spent time (over the previous two weeks) providing unpaid assistance to family members or others because of a disability, a long-term health condition, or problems related to old age. Unfortunately, no estimate of how much time spent in caring is acquired via this question, although the chronic nature of the health conditions referred to at least suggests that such care is ongoing. A good example here may be drawn from the data on dialysis separations. As mentioned, these figures refer to episodes of care, not to individuals, but, as already pointed out, the number of persons involved in each episode is no doubt much greater than the patients themselves as those in care require transport and family support during regular episodes of treatment. The census question on provision of care therefore provides some further

means of measuring potential health impacts on regional economic participation by identifying those in the population who may be time-restricted by caring for family members and others.

The most direct measure of this is provided by Centrelink records on clients in receipt of Carer payments as these provide financial support to people who are unable to work in substantial paid employment because they provide full time daily care to someone with a severe disability or medical condition, or to someone who is frail aged. In 2016, 105 Pilbara Aboriginal adults (just 1.5% of the total) received such payments (Table 4.8). By contrast, the 2016 census data indicate that 13% of Aboriginal adults provided some unpaid home-based care to family members or others because of a disability, long-term illness or problems related to old age. This translates into an estimate of 1,084 persons which suggests that those who directly forgo employment in order to provide care are a small sub-set of the total number providing care, but what it does not indicate is the extent to which caring overall restricts economic participation.

One clue is provided by data on the proportion of each age group involved in this care (Figure 7.16). This reveals that for those people providing care, the highest proportions are drawn from the prime working-age groups between 30 and 59 years, although there is some indication that the burden of care has shifted since 2006 more towards those in the oldest age groups aged over 50 years. Ironically, this shift might itself be one consequence of increased labour force participation observed among those of working-age – especially among women since most carers in the Pilbara have been women.

Figure 7.16 Aboriginal residents providing care, help or assistance to family members or others as a percent of age group: Pilbara region, 2006 and 2016



Source: ABS Census of Population and Housing 2006 and 2016

8. Crime and justice

Crime statistics in Western Australia are available from a variety of sources reflecting different stages of the public's interaction with the criminal justice system. The initiating factor, of course, is contact with the police either by way of reporting an offence, or as individuals are apprehended by arrest, summons or court warrant. Such actions yield a range of data concerning the nature of offences and offenders with separate reporting for juveniles (aged 10-17 years), and adults (18+). Individuals who are charged with an offence are further processed by the courts (a charge being an allegation laid by the police before the court or other prosecuting agency that a person has committed a criminal offence). Statistics relating to the activities of the Children's Court and Magistrates Court are provided by the WA Department of Justice. As for those charged who are found guilty of an offence, imprisonment data are available from the Department of Corrective Services while non-custodial sentencing data can be extracted from the records of the Department of Justice.

According to the Department of Justice, the capture and storage of data on Indigenous status that is provided to the courts by the WA Police Force has only recently been improved to a point where they feel confident in publicly releasing such data. Consequently, within the timeframe set out for the present exercise, it was not possible to acquire validated data for any period prior to 2012/13 and so the time series presented only covers individual years over the most recent reporting period of 2012/13 to 2016/17. This data quality issue is also recognised by the ABS who do not include data from Western Australia in national reporting of Indigenous crime and justice statistics (ABS 2017c, 2018b,c). Nonetheless, for the baseline report (Taylor and Scambary 2005) both police and courts data for Aboriginal people in the Pilbara were provided via the (now defunct) Crime Research Centre at the University of Western Australia, the WA Department of Justice and the WA Office of Crime Prevention.

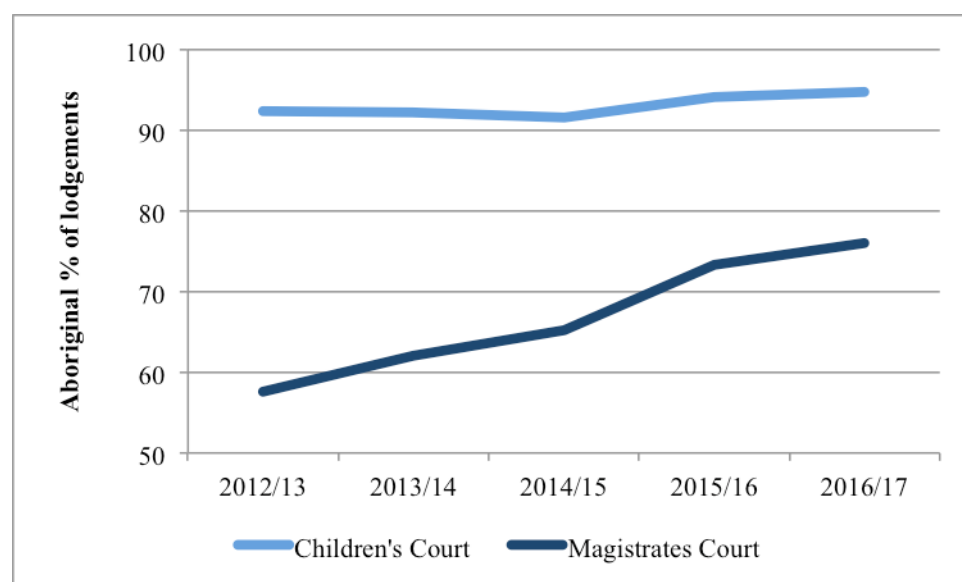
Using these latter data it was noted that interaction with the police and subsequently with the court system and various custodial institutions was a pervasive element of Aboriginal social and economic life in the Pilbara. From the latest data it is clear that this remains the case. At the apex of the criminal justice system are those received into custody or detention - in 2016/17 this amounted to almost 5% of the Pilbara Aboriginal population aged 18+. However, lower level interactions with the system via police and the courts are more prevalent and the effects are felt widely throughout families, households and communities. At the same time, the actual individuals involved represent a fairly well-defined sub-set of the population as whole – they are predominantly male, of young working-age and they show signs of early engagement with police and the courts as youth. The evidence from the Pilbara presented in Taylor and Scambary (2005) was suggestive of a progression into the criminal justice system, not necessarily recidivist, but nonetheless subject to life cycle influences and procedural tendencies of the criminal justice system. The same can be seen today.

Before proceeding with an analysis of recent trends, it is worthwhile prefacing this with brief mention of select findings and recommendations of the 2017 Australian Law Reform Commission's inquiry into the incarceration rate of Aboriginal and Torres Strait Islander peoples (ALRC 2017). An overarching point made by this inquiry reiterates one that has often been stated in regard to social determinants of incarceration that work against Aboriginal people. These include many of the indicators of disadvantage outlined in preceding sections of the present report. As for outcomes in

the criminal justice system, the point is also made that Aboriginal people continue to be heavily over-represented in the courts and prisons and that charges and convictions display distinct biases against Aboriginal people. All of these features are evident in data provided for the Pilbara by the Western Australia Police and Western Australia Department of Justice. Among the recommendations tabled by the ALRC report is one calling for criminal justice targets. The data presented here for the Pilbara provide a useful starting point for the RIC in thinking through what such targets might focus on.

First of all, in case there is any doubt at all about the relevance of findings from the ALRC report to the situation in the Pilbara, Figure 8.1 shows the level of over-representation of Aboriginal children and adults in the Pilbara-based court system. Almost all criminal cases brought to the Children's Court in the Pilbara refer to Aboriginal defendants. While the Aboriginal share of Magistrates Court cases is lower this has been steadily rising and is now at almost 80%. To put these rates in perspective we should recall that Aboriginal people constitute only around 33% of children aged between 10 and 17 years in the Pilbara and approximately 15% of adults over 18 years. In 2016, at the time of the census, a total of 2,377 Aboriginal adults were held in custody in prisons in Western Australia accounting for fully 38% of the total prison population at that time (Government of Western Australia 2016). Those from the Pilbara accounted for 13% of these.

Figure 8.1 Criminal case lodgements against Aboriginal defendants as a percentage of all case lodgements in the Pilbara-based Children's Court and Magistrates Court, 2012/13-2016/17



Source: WA Department of Justice

Reported crime

In 2001, the most common crimes reported to police in the Pilbara were offences against property (notably burglary, property damage and theft) and offences against the person (particularly assault and sexual offences) (Taylor and Scambary 2005). This remains the case today. It was also the case in 2001 that Aboriginal people were by far the more likely victims of crime. Once again, this is still the outcome. Aside from these observations, levels and rates of reported crime in 2001 were found to vary quite considerably across the Pilbara between different shires and localities. To examine whether this has remained the case equivalent data are provided by the Business Intelligence and Analytics branch of the WA Police Force for the census years of 2006, 2011 and 2016. Before examining these data a couple of methodological shortcomings need to be considered.

First of all, the Aboriginal and non-Aboriginal population denominators used by the WA Police Force for calculating rates are unadjusted census counts of usual residents. As we have seen, census counts, especially Aboriginal census counts, fall well short of estimated resident population (ERP) numbers and so, ideally, the latter should be used in calculating rates. While Aboriginal and non-Aboriginal ERPs are available for this purpose at the local government area level for 2006 and 2011 they are not yet available for 2016, nor are they disaggregated by age which is a requirement for some of the data analysis. Consequently, for the sake of consistency, we are forced to use the rates provided by the WA Police. This means that the rates reported here for geographies lower than that of the Pilbara region as a whole are inevitably higher, and sometimes much higher, than if they were calculated using ERPs as the population base. However, at the sub-Pilbara level we are more interested in how rates vary geographically rather than in their actual levels and so this becomes less of a problem. A second issue relates to the comparison of levels and types of reported crime over time as these can be influenced by pro-active policing strategies to encourage the reporting of certain offences (such as domestic violence and sexual assault). Also, police may target certain offences from time to time (such as drug trafficking). While it may be theoretically possible to analyse the effect of such pro-active policing on reported crime this task lies beyond scope of the present exercise.

Table 8.1 shows the rate ratios of Aboriginal to non-Aboriginal reported offences for the period 2006-2016. This shows unequivocally that Aboriginal people are overwhelmingly the victims of crime, especially offences against the person with assault accounting for the bulk of these. Remarkably, in 2016, Aboriginal rates of offence against the person were almost 20 times higher than non-Aboriginal rates in East Pilbara and Port Hedland. In Ashburton and Karratha they were also substantially higher. In all four shires, but especially in Ashburton and East Pilbara, the gap in offence rates between Aboriginal and non-Aboriginal victims of crime has widened over time largely due to a rise in common assault. As for offences against property, once again Aboriginal people have been consistently more likely to be victims of crime mostly involving domestic burglary, stealing and property damage although Aboriginal rates for property offences have typically been much closer to non-Aboriginal rates. Having said that, gaps between these rates have also shown signs of widening in recent years with the Aboriginal rate now almost five times higher than the non-Aboriginal rate in Ashburton.

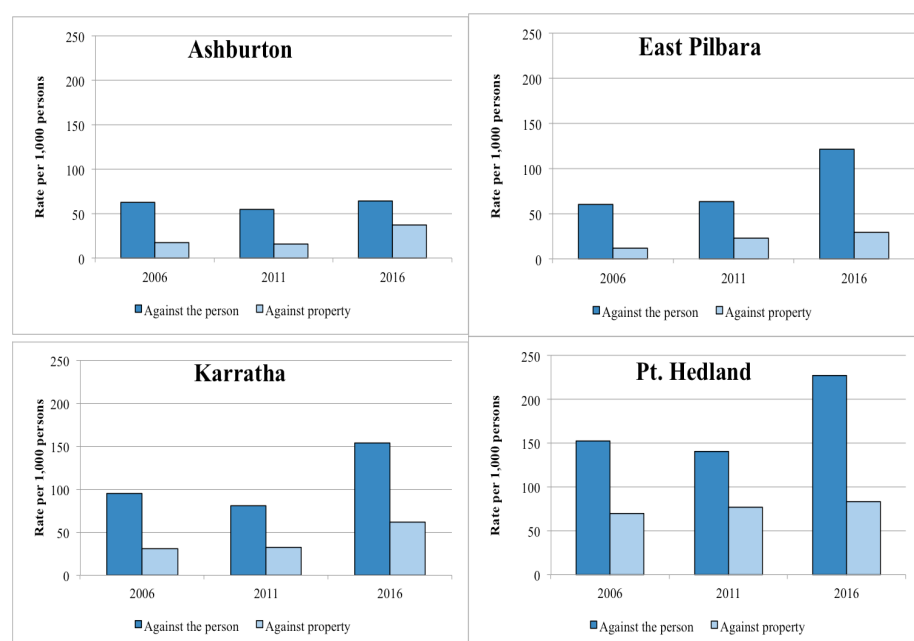
Table 8.1 Rate ratios of Aboriginal to non-Aboriginal offence rates against the person and property: Pilbara Local Government Areas, 2006-2016

	2006	2011	2016
Against the person			
Ashburton	9.4	9.7	14.6
East Pilbara	8.6	9.7	18.4
Karratha	13.8	10.9	14.0
Port Hedland	14.3	10.7	18.4
Against property			
Ashburton	1.9	1.1	4.6
East Pilbara	0.4	0.9	2.1
Karratha	1.6	1.2	2.1
Port Hedland	2.3	1.1	1.5

Source: WA Police Force

Note: as a consequence of the changes to WA Police crime recording and reporting practices, only offence data from 2008 has been verified in relation to the new Offence Hierarchy. As a consequence, data provided for 2006 may not reflect these crime recording and reporting changes and is subject to revision.

As Aboriginal people are the primary victims of crime, Figure 8.2 focuses on reported offences against Aboriginal persons and property and shows these for each Local Government Area in 2006, 2011 and 2016. Several features stand out. First of all, offences against the person are the most prevalent type of offence reported in all parts of the Pilbara. Second, offence rates of both types in Ashburton shire are considerably low compared to those recorded in other shires. Third, Port Hedland stands out as having by far the highest rates of reported offences, especially against the person but also of property offences. Finally, since 2011, there has been a noticeable increase in the rate of reported offences against the person in East Pilbara, Karratha and Port Hedland.

Figure 8.2 Offence rates* against Aboriginal persons and property: Pilbara Local Government Areas, 2006-2016

Source: WA Police Force

*Offences per 1,000 persons

Note: as a consequence of the changes to WA Police crime recording and reporting practices, only offence data from 2008 has been verified in relation to the new Offence Hierarchy. As a consequence, data provided for 2006 may not reflect these crime recording and reporting changes and is subject to revision.

The number of reported offences for a period (e.g. calendar year) comprises all offences reported during that period but may include offences committed during earlier periods.

Reported offences are selected offences reported to or becoming known to police, and resulting in the submission of an offence report in the Offence Information System (OIS) or Incident Management System (IMS). Offences against public order, such as disorderly conduct and offences against the Firearms Act, Liquor Licensing Act and a number of other offences against the statute laws of Western Australia and the Commonwealth are not recorded in these systems.

A finer-grained geographic breakdown of offence rate ratios is provided in Table 8.2 using select Pilbara localities. Not surprisingly, this shows a tendency for the levels and directions of change in rate ratios at any given locality to more or less match those of parent LGAs shown in Table 8.1. Against this general pattern, places that stand out include Wickham and Newman where rate ratios have been noticeably much higher than generally observed in their respective LGAs. By contrast, in Roebourne and Marble Bar it has been much lower (at least until recently in the latter case) though still positive. The recent dramatic rise in the ratio for Marble Bar demonstrates the sort of effect that a few incidents can have in areas with small populations – Wickham displays aspects of this as well. As for property offences, Roebourne stands out again this time for having consistently higher non-Aboriginal rates than Aboriginal, as does Onslow until recently. Interestingly, in 2001, non-Aboriginal people were the most likely to be victims of property offences in all localities in the Pilbara (Taylor and Scambray 2005: 134). This outcome is now the exception rather than the rule.

Table 8.2 Rate ratios of Aboriginal to non-Aboriginal offence rates against the person and property: select Pilbara localities, 2006-2016

	2006	2011	2016
	Against the person		
Onslow	10.3	5.3	11.5
Tom Price	6.6	7.4	11.3
Karratha	10.7	10.8	10.9
Roebourne	6.8	3.6	3.5
Wickham	27.8	15.1	18.2
Port Hedland	16.6	10.7	20.1
Marble Bar	3.3	1.2	21.1
Newman	14.6	13.1	22.0
	Against property		
Onslow	0.4	0.2	2.7
Tom Price	2.4	1.5	3.5
Karratha	2.7	1.6	2.2
Roebourne	0.4	0.3	0.5
Wickham	1.8	1.1	2.1
Port Hedland	2.7	1.1	1.7
Marble Bar	0.4	0.1	5.5
Newman	0.7	1.3	2.4

Source: WA Police Force

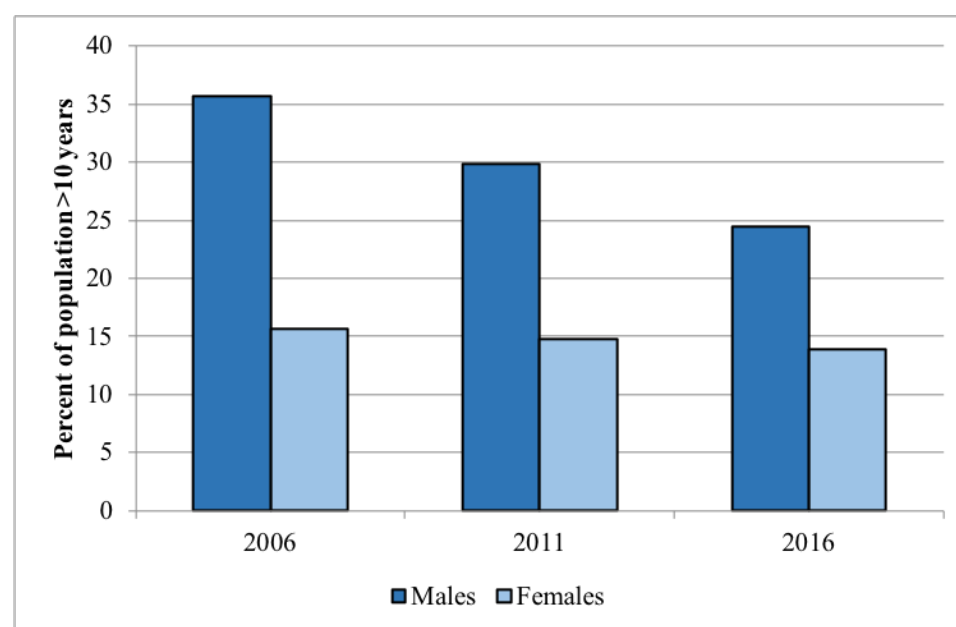
Note: as a consequence of the changes to WA Police crime recording and reporting practices, only offence data from 2008 has been verified in relation to the new Offence Hierarchy. As a consequence, data provided for 2006 may not reflect these crime recording and reporting changes and is subject to revision.

Offenders and the police

Contact between the police and offenders is recorded statistically as individuals are apprehended (either by arrest, summons or warrant) or are diverted (as juveniles) through the cautioning system and referred to a juvenile justice team. Criminal cases that arise out of such apprehensions are lodged in the Children's Court for juveniles and the Magistrates Court for adults along with prosecution and charge details. Upon arrest, or at the time of any charge, the police administer the standard Indigenous status question developed by the ABS. In instances where this yields no information Indigenous status may be assigned on the basis of an individual's 'ethnic appearance'. Given the subjective nature of this assessment WA Police advise that a person attributed to a particular group may not necessarily belong to that group. To date, this shortcoming has formed part of the caution applied to the use of WA crime statistics in national reporting on Indigenous status of offenders by the ABS and others (ABS 2018a). With this caveat in mind, data on unique individuals arrested, including their Indigenous status and other characteristics, are provided via the Western Australia Police Force Briefcase/Prosecutions system.

This shows that the vast majority of Aboriginal offenders in the Pilbara are male. In 2003, data provided by the WA Office of Crime Prevention indicated that males accounted for as much as 78% of unique Aboriginal offenders in that year (Taylor and Scambray 2005: 137). Subsequent data indicate that this proportion remains high but has steadily declined as more and more Aboriginal females have been arrested. In 2006, males accounted for 72% of all Aboriginal arrests, in 2011 the figure was 70% and in 2016 it was 66%. As for rates of arrest, Figure 8.3 shows that these have steadily declined for males since 2006 from 35% of all males aged over 10 years to 24% in 2016. Female rates, on the other hand, have declined only slightly and remain at around 15%. It should be noted that the rates shown in Figure 8.3 are more reliable methodologically than those used for offence rates in the preceding section. This is because they are derived using ABS ERP figures as the base population (aged 10+).

Figure 8.3 Aboriginal male and female arrest rates*: Pilbara region, 2006-2016



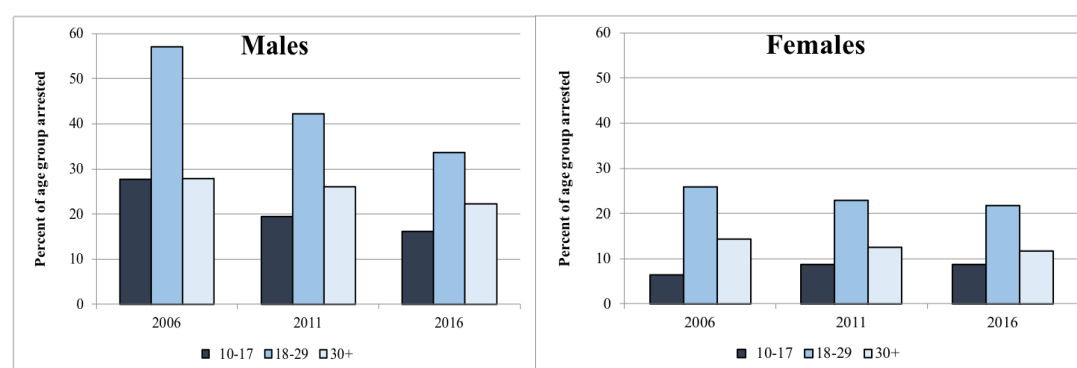
Source: Western Australian Police Force

*Unique persons arrested as a percent of ABS ERP populations aged 10+

Although arrest rates among males may have fallen since 2006 they do remain remarkably high accounting for fully one quarter of all males over 10 years of age in 2016. Aside from social impacts that may arise from encounters with the police, apprehensions also raise the probability of criminal prosecution and that, in turn, can affect employment prospects. Previous studies have indicated that having been arrested can reduce the probability of Aboriginal people being employed by between 10% and 20% for males and 7% and 17% for females (Borland and Hunter 2000; Hunter and Daly 2008). The rate of arrest is therefore a crucial labour supply-side indicator.

This is certainly the case when these rates are further disaggregated by age. Figure 8.4 shows Aboriginal male and female arrest rates for juveniles and for young adult and older adult age groups. First of all, we can see that these rates have fallen among males in each of the age groups whereas for females juvenile arrest has increased but remained steady among adults. The more interesting observation, however, is focussed on those aged 18-29 years – individuals who have just left schooling and are entering into crucial years of training and/or first employment. Here we see that almost 60% of males in 2006 had been arrested, and while this subsequently fell it still remains relatively high at 33%. Among females the rate has also steadily fallen over the past decade but at a much slower pace from 26% to 22%. In terms of the aspirations implied by the emerging prospect of demographic dividend, arrest levels at these magnitudes are of a matter of concern given their negative impact on employability. This finding presents the RIC with an urgent need to consider more closely the social and economic consequences of apprehensions by police to ensure that, where possible, any social and economic impacts are ameliorated. Justice reinvestment and diversion programs provide potential avenues here alongside the many other recommendations of the recent Australian Law Reform Commission inquiry into the incarceration rate of Aboriginal and Torres Strait Islander peoples (ALRC 2017).

Figure 8.4 Aboriginal male and female arrest rates by broad age group*: Pilbara region, 2006-2016



Source: WA Police Force

*Percent of ABS ERP populations aged 10-17, 18-29 and 30+

The actual number of unique Aboriginal persons arrested in the Pilbara rose steadily from 1,047 in 2003 (Taylor and Scambray 2005: 137) to 1,524 in 2006 and 1,831 in 2011. By 2016 this increase had leveled off at 1,826. As a cross-section, this means that in 2016 as much as 19.4% of the Pilbara Aboriginal population aged 10 years and over were arrested. Of course, from a labour market perspective, any evidence of prior arrest can serve as a hindrance to obtaining work and so the cumulative impact on the population of arrests over the years is likely to result in a higher proportion of persons implicated than the one-fifth figure above, although the true level is incalculable given

the absence of appropriate data. Not surprisingly, most of these arrests occur in the largest localities in the Pilbara with Port Hedland, Karratha and Newman standing out (Table 8.3). The latter two places are of interest as numbers arrested there increased considerably over the period 2011 to 2016 against the trend generally.

Table 8.3 Number of unique Aboriginal persons arrested in 2006, 2011 and 2016 by select Pilbara localities

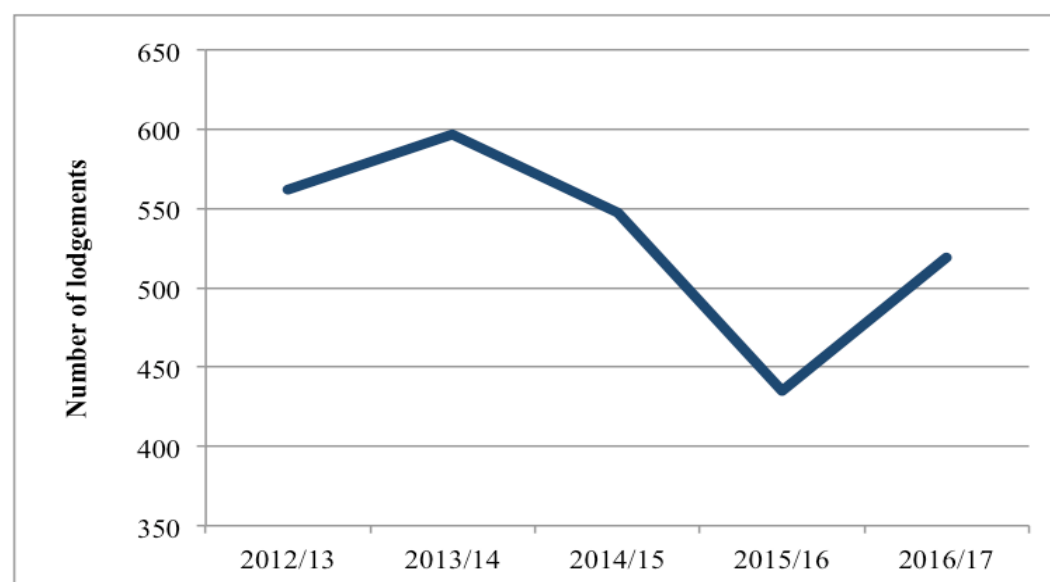
	2006	2011	2016
Onslow	77	50	55
Tom Price	43	41	22
Karratha	222	247	414
Roebourne	143	180	198
Wickham	54	59	77
Port Hedland	612	679	610
Marble Bar	39	17	21
Newman	282	184	378

Source: WA Police Force

Juvenile offenders and Children's Courts

One constraint placed on the court data presented here is that they rely mostly on information for defendants processed by the Pilbara-based courts and therefore do not necessarily refer to Pilbara usual residents, although this is more likely than not. Figure 8.5 shows the number of criminal cases lodged against Aboriginal defendants in Pilbara-based Children's Courts in each of the five-yearly reporting periods from 2012/13. Following an initial rise, the number of cases lodged declined by 27% only to rise again in 2016/17. However, the overall trend in cases brought is downwards with an annual average of 532 over the period.

Figure 8.5 Number of criminal cases against Aboriginal defendants lodged in Pilbara Children's Courts, 2012/13 to 2016/17

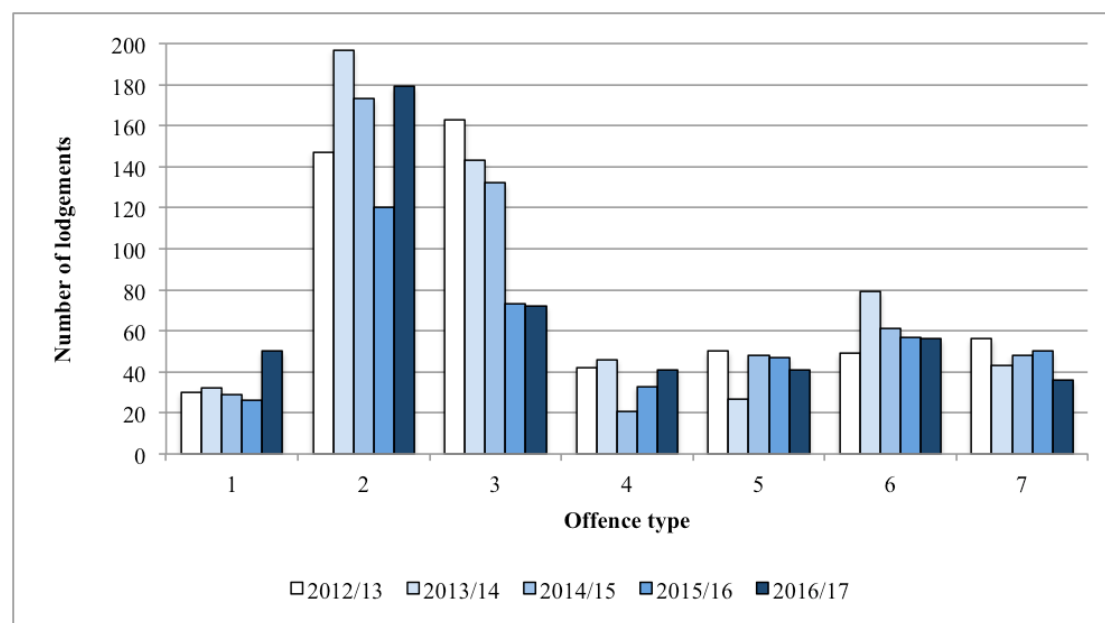


Source: WA Department of Justice

Figure 8.6 shows these criminal cases according to main offence type. A total of 16 offence type categories are identified in the Australian and New Zealand Standard Offence Classification (ANZSOC) but only 7 are shown here as they accounted for 95%

of all cases. By far the most prominent offence type, and consistently so, is unlawful entry with intent/burglary and break and enter. In 2012/13 this was matched by theft and related offences but cases brought to the court for this offence have steadily declined since then. Cases brought for other offence types are relatively few and show little sign of fluctuation in recent years.

Figure 8.6 Criminal cases against Aboriginal defendants lodged in Pilbara Children's Courts by main offence types*, 2012/13 to 2016/17

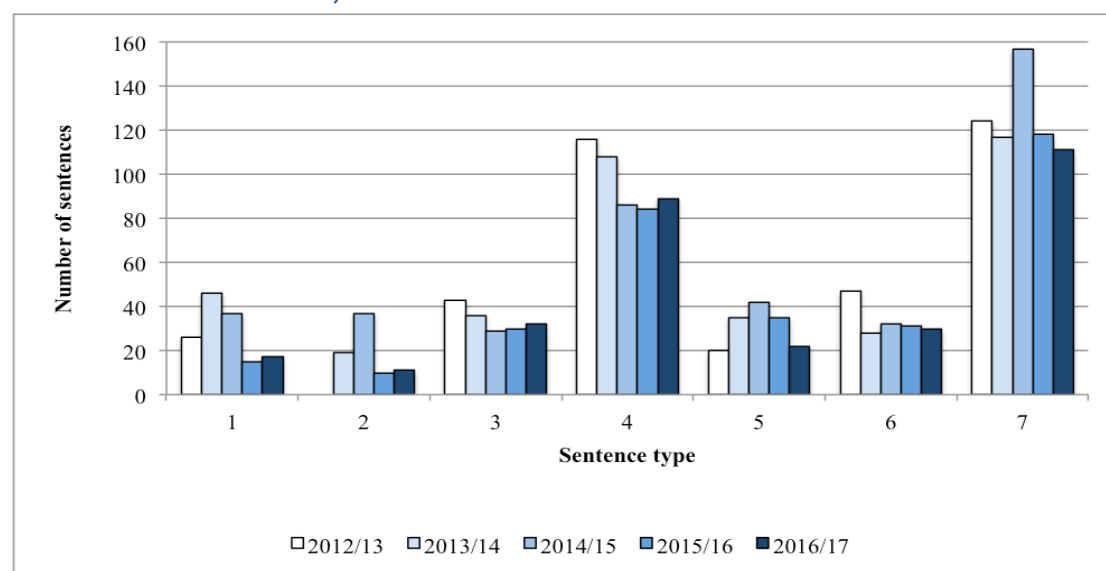


Source: WA Department of Justice

* A total of 16 offence type categories are listed in the ANZSOC but only 7 are shown here as these accounted for an average of 95% of case lodgements by offence type between 2012/13 and 2016/17
1. Acts Intended to Cause Injury; 2. Unlawful Entry With Intent/Burglary, Break and Enter; 3. Theft and Related Offences; 4. Property Damage and Environmental Pollution; 5. Public Order Offences; 6. Traffic and Vehicle Regulatory Offences; 7. Offences Against Justice Procedures, Government Security and Government Operations

As for sentences imposed (Figure 8.7), the single largest in each year between 2012/13 and 2016/17 accounting for around one-third of all court decisions in each year was 'no punishment'. The remaining two-thirds of sentences did involve a punishment and the most prominent of these has been a youth community-based order. By contrast, detentions have been relatively few, especially since 2015/16.

Figure 8.7 Sentences imposed on Aboriginal defendants by main sentence types: Pilbara Children's Courts, 2012/13 to 2016/17



Source: WA Department of Justice

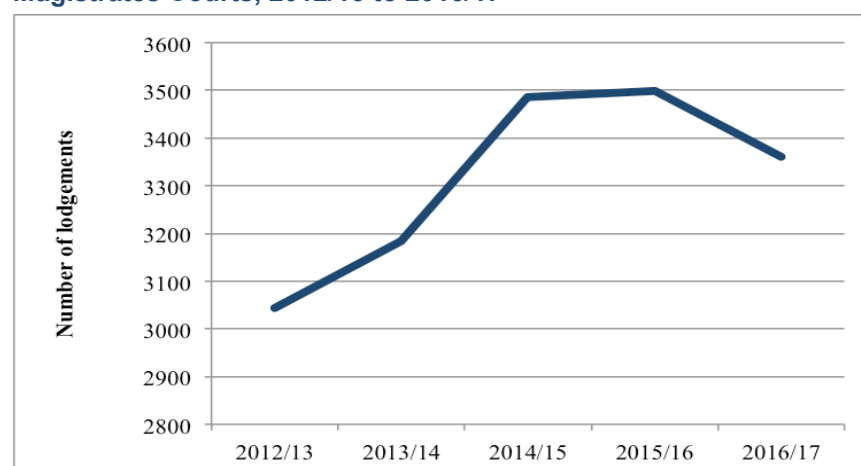
1. Detention; 2. Juvenile conditional release order; 3. Intensive youth supervision order; 4. Youth community based order; 5. Fine; 6. Juvenile good behaviour bond; 7. No punishment

A total of 12 sentence type categories are listed by the Children's Court but only 7 are shown here as these accounted for an average of 94% of case lodgements by sentence type between 2012/13 and 2016/17

Adult offenders and Magistrates Courts

The number of cases lodged against Aboriginal defendants in Pilbara-based Magistrates Courts increased by 10% over the five years between 2012/13 and 2016/17 from 3,043 to 3,360 (Figure 8.8). This rise was steady up to 2015/16 but appears to have abated in the most recent reporting period. The extent to which this indicates a rise in the actual number of defendants is not clear as multiple lodgements can occur for a single person. However, the rise and then levelling off that we have seen in individuals arrested over the same period would suggest some correspondence as does the trend in population growth shown in Figure 2.2. It seems likely that as the number of lodgements has steadily increased the (unknown) rate of lodgement has remained relatively stable.

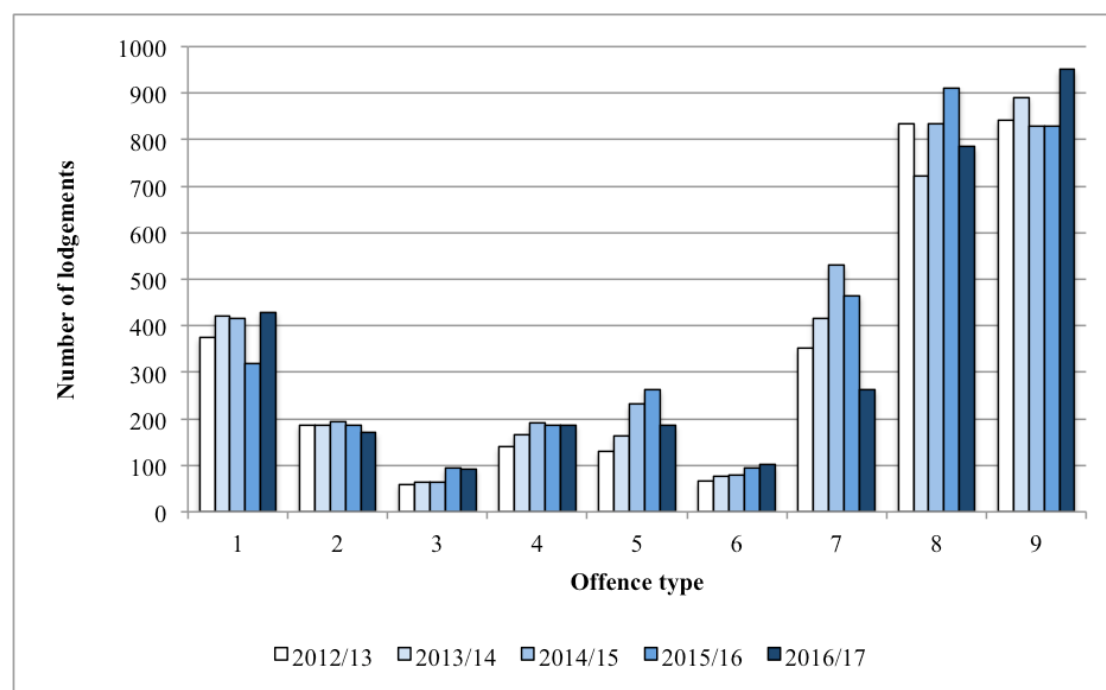
Figure 8.8 Number of criminal cases against Aboriginal defendants lodged in Pilbara Magistrates Courts, 2012/13 to 2016/17



Source: WA Department of Justice

Cases lodged in the Magistrates Court against Aboriginal defendants have been consistently concentrated in two categories of offence type - traffic and vehicle regulatory offences and offences against justice procedures, government security and government operations (Figure 8.9). In the first of these categories common misdemeanours arise in relation to driver licences, vehicle registration, vehicle roadworthiness and driving regulations. In the latter category, offences mostly refer to breaches of custodial orders, community-based orders and violence and non-violence orders. Lodgements for these latter offences are the most common and have increased over time. Cases involving acts intended to cause injury refer to a number of categories of assault and these have been lodged fairly consistently over time. All other lodgements by offence type have shown signs of increasing since 2012/13 with the notable exception of those related to public order offences that first of all increased and then, since 2015/16, recorded a substantial decrease.

Figure 8.9 Number of criminal cases against Aboriginal defendants lodged in Pilbara Magistrates Courts by main offence types, 2012/13 to 2016/17



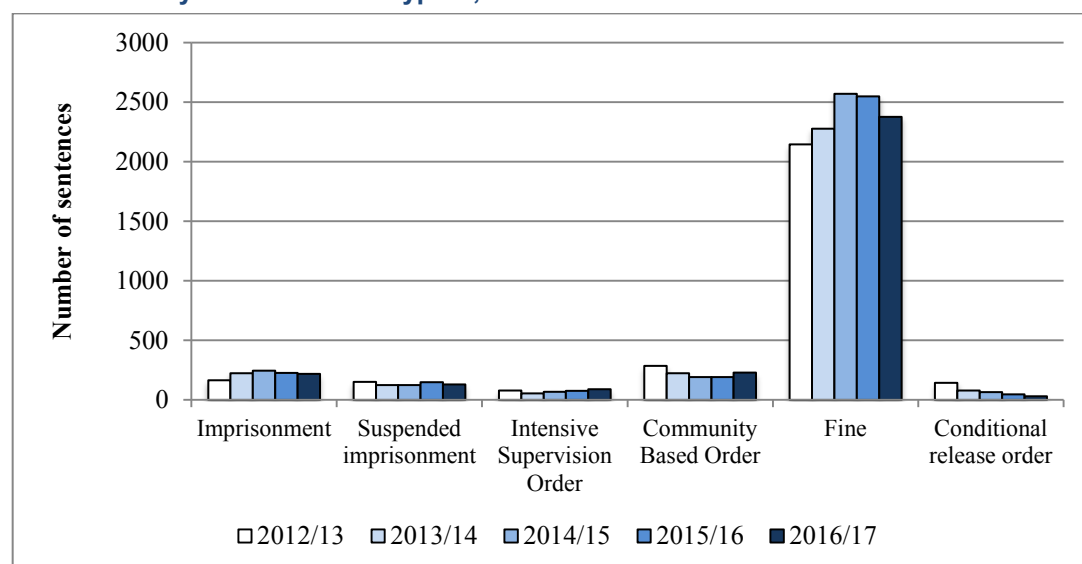
Source: WA Department of Justice

1. Acts Intended to Cause Injury; 2. Dangerous or Negligent Acts Endangering Persons; 3. Unlawful Entry With Intent/Burglary, Break and Enter; 4. Theft and Related Offences; 5. Illicit Drug Offences; 6. Property Damage and Environmental Pollution; 7. Public Order Offences; 8. Traffic and Vehicle Regulatory Offences; 9. Offences Against Justice Procedures, Government Security and Government Operations

Based on the Australian and New Zealand Standard Offence Classification (ANZSOC) Third Edition, 2011 (ABS 1234.0)

As for sentences imposed by the Magistrates Court in relation to these criminal cases these show a clear and consistent pattern (Figure 8.10). By far the most common form of sentencing, and one that has increased the most over time, is the issuance of a fine. Almost 2,500 fines were issued to Aboriginal defendants in the most recent reporting period of 2016/17, although data on the actual number of individuals receiving these is not provided. Most other sentences were evenly divided between imprisonment (suspended or actual) and Intensive Supervision Orders and Community Based Orders.

Figure 8.10 Number of sentences imposed by Pilbara Magistrates Courts on Aboriginal defendants by main sentence types*, 2012/13 to 2016/17.

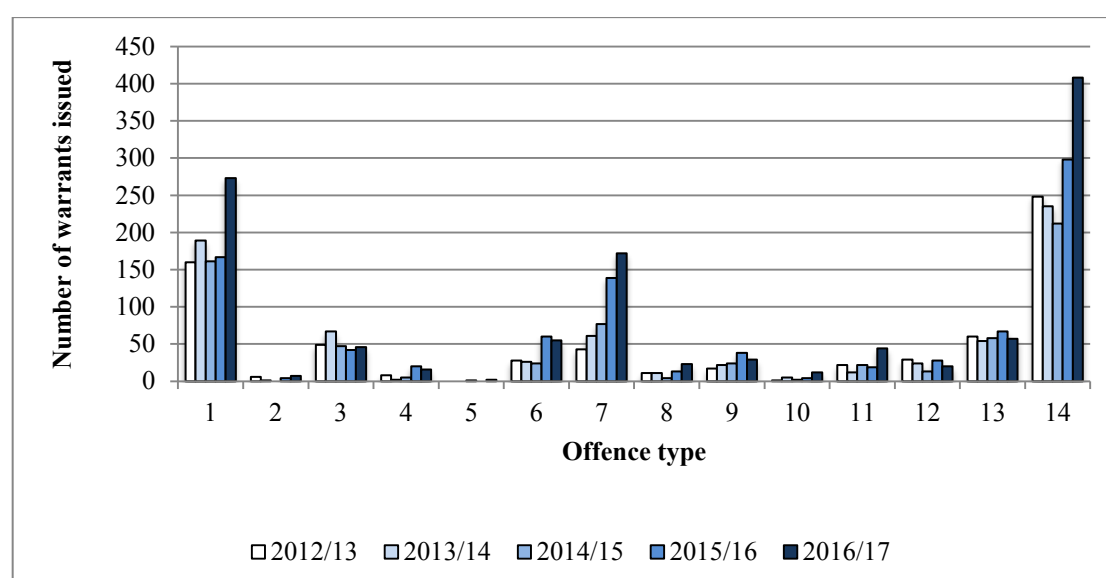


Source: WA Department of Justice

Figure shows sentences for the top 6 leading sentence types out of a list of 11 possible types

Failure to attend court when required to do so leads to the issuance of an arrest warrant by the court. This, in itself, brings a further charge of an offence against justice procedures although it is not clear how these synchronise in the data. The number of such warrants issued by the Magistrates Court against Aboriginal defendants increased considerably since 2012/13 by 71% from 682 to 1,164 in 2016/17 although, once again, it is important to note that multiple warrants can be issued for the same person. Ironically, the largest offence type among those failing to attend court referred to offences against justice procedures (Figure 8.11). Other clear peaks are noted for defendants with theft and related offences and those assault charges.

Figure 8.11 Arrest warrants issued by Pilbara Magistrates Courts against Aboriginal adults for failure to attend court when required to do so by offence type, 2012/13 to 2016/17



Source: WA Department of Justice

1. Acts Intended to Cause Injury; 2. Sexual Assault and Related Offences; 3. Dangerous or Negligent Acts Endangering Persons; 4. Abduction, Harassment and Other Offences Against the Person; 5. Robbery, Extortion and Related Offences; 6. Unlawful Entry With Intent/Burglary, Break and Enter; 7. Theft and Related Offences; 8. Fraud, Deception and Related Offences; 9. Illicit Drug Offences; 10. Prohibited and Regulated Weapons And Explosives Offences; 11. Property Damage and Environmental Pollution; 12. Public Order Offences; 13. Traffic and Vehicle Regulatory Offences; 14. Offences Against Justice Procedures, Government Security and Government Operations

Based on the Australian and New Zealand Standard Offence Classification (ANZSOC) Third Edition, 2011 (ABS 1234.0)

Corrective services

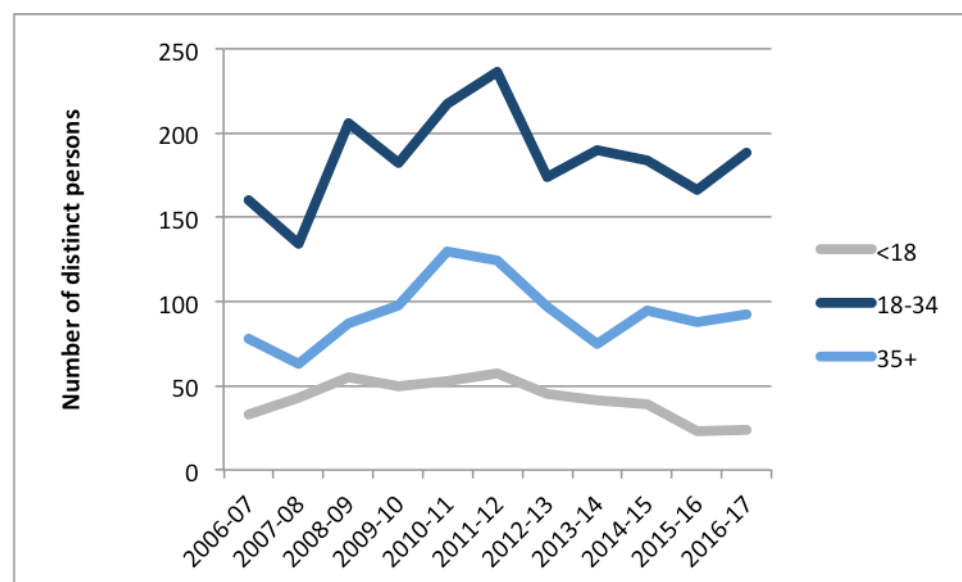
As noted, one of the drawbacks in these data on offences is a lack of information on the actual number of individuals involved and their characteristics. When it comes to sentencing, however, the WA Department of Corrective Services can provide data for distinct Aboriginal persons so long as such persons self-identify as Aboriginal when arrested.

Using these data we can see that a total of 333 distinct Aboriginal residents of the Pilbara aged 18 years and over commenced a period of custody in one of 15 adult prison facilities in Western Australia during the financial year 2016/17. Of these, the vast majority (84%) were male. Altogether, 6.5% of the estimated adult male population of the Pilbara was in custody but only 1.4% of the adult female population. In the same financial year a total of 31 Aboriginal youth from the Pilbara aged between 10 and 17 years commenced a sentence in a juvenile detention facility representing just 1.9% of the estimated Pilbara population in that age group. Once again, the majority (77%) were male. In addition to those in custody during 2016/17, a total of 396 Aboriginal adult residents were subject to a Community Based Order (CBO) of some form with the majority (75%) being male. As an overall rate per head of population, this represented 7.2% of adult males and 2.7% of adult females. As for juveniles, a total of 75 were subject to a Community Based Order representing 4.7% of the population aged between 10 and 17 years. Most of these (81%) were male.

Of more interest for the present report is the degree to which these levels have changed over the period of the mining boom as well as any variation by age group given the impact of incarceration and/or CBOs on labour force participation. Since males account for the vast majority of those implicated, this more detailed analysis is confined to them. Accordingly, Figure 8.12 shows the number of distinct Aboriginal male residents of the Pilbara in custody over the 10-year period from 2006/07 to 2016/17.

Clearly, the number of individual males in both adult and juvenile custody rose steadily to a peak around 2011/12 and then subsequently receded. Also of note is the fact that most adult males in custody are consistently in the younger adult age group of 18 to 34 years. In 2016/17, for example, two-thirds of those in custody (67%) were in this age group despite the fact that those aged 18-34 years accounted for only 48% of all adult males. To provide some sense of the population impact of this incarceration, we can calculate an average rate of custody over the 10-year period by expressing the average numbers in custody as a percentage of the mid-period population in each age group. This produces a rate of 5.6% for those aged 10-17 years, a rate of 11.7% for those aged 18-34 years, and a rate of 5.5% for those aged over 35 years.

Figure 8.12 Number of distinct Pilbara resident Aboriginal males in prison custody* by broad age group, 2006/07-2016/17

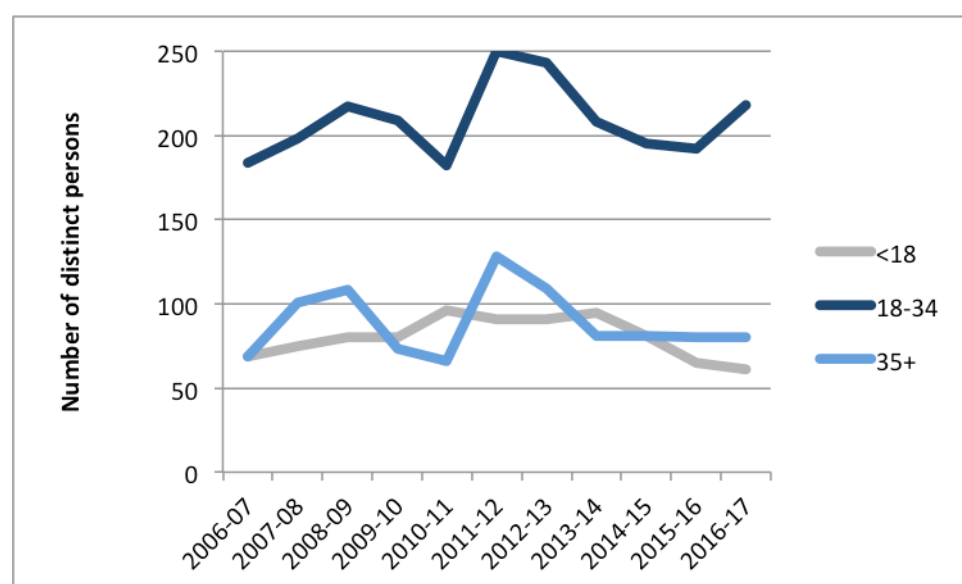


Source: WA Department of Justice

* Detained in any one of 15 public and private prisons in Western Australia managed by the Department of Corrective Services

Similar numbers and change in levels over time appear for those subject to Community Based Orders (Figure 8.13). Using the same method as above for calculating average rates, this means that an average of 10.7% of those aged 10 to 17 years were subject to a CBO over the period 2006/7 to 2016/17. The equivalent figure for those aged 18 to 34 years was 13.2 and for those aged over 35 years it was 5.3%.

Figure 8.13 Number of distinct Pilbara resident Aboriginal males subject to a Community Based Order* by broad age group, 2006/07-2016/17



Source: WA Department of Justice

* An order issued by a Court of Law, or other authority, for the management of an offender or person on bail in the community. For example: Bail Orders, Community Based Orders, Intensive Supervision Orders, Work and Development Orders and Early Release Orders (Parole)

While the data shown in Figures 8.12 and 8.13 refer to distinct individuals, the possibility of an individual commencing a period of custody as well as a CBO in the same year (and therefore appearing in both sets of data) cannot be discounted. Unfortunately, without a fairly intense process of data-matching it is not possible to detect any such overlap. At one extreme the data sets could, in theory, refer to the same individuals, though not exactly as there have been far more individuals on CBOs than in custody. At the other extreme they could refer to entirely different sets of individuals. The reality is likely to fall somewhere in-between with a tendency probably towards difference than similarity.

The issue at stake here is an attempt to estimate the proportion of the population that is likely to be either in custody or subject to a CBO at any given time. This is important to know as it presents a constraint on labour force participation and offers some measure of the degree to which interaction with the criminal justice system impacts on potential labour supply. In terms of the three age groups presented, the best that can be provided is a lower and an upper limit. For lower limits we can use the lowest figures of 5.6%, 131.7 and 5.3% shown above. For the upper limits we can simply sum the custody and CBO rates to reach 16.3% for those aged 10-17, 24.9% for those aged 18-34, and 10.8% for those aged 35 years and over. From the point of view of regional participation, the figure that stands out here is that of 24.9% as this suggests, in theory at least, that as much as one quarter of Aboriginal males aged between 18 and 34 years could have been either in custody or subject to a CBO (rather than potentially in work) at any one time over the decade of the mining boom. More likely it was less than this, but no less than 14%.

9. Key findings and issues for the Regional Implementation Committee

As anticipated in the baseline study of social and economic conditions in the Pilbara in the early 2000s (Taylor and Scambary 2005) a good deal has changed for Aboriginal people in the subsequent years as a consequence of unprecedented levels of economic activity in the region due mostly to massive investments in the mineral resources sector. This economic shock has occurred in waves through construction, production and wind-down/transition phases and as this study reports on selected impacts some 15 years on, it should be noted that impacts are still underway. Nonetheless, this is a critical juncture at which to take stock because technological transitions now commencing within the mining industry are set to greatly influence the nature of business operations in ways that are of critical interest to Aboriginal Traditional Owners as they contemplate opportunities and constraints for future economic participation.

The basic message from the baseline study (Taylor and Scambary 2005) was that little had been achieved in terms of enhancing Aboriginal socioeconomic status over decades of mining activity in the Pilbara up to the early 2000s. This can no longer be claimed, at least not at a whole-of-population level. What we see instead is a very mixed set of outcomes whereby some individuals, families and communities have clearly benefited while for others little has changed, indeed, relatively-speaking, they are now invariably worse off. If pressed to allocate an approximate ratio to this observation, the general impression would be that a third of people are now better off and two-thirds are not, at least as far as the aggregate selected indicators are concerned. The difference between the two is determined largely by employment, especially in mining. Outcomes across the range of indicators in terms of their juxtaposition with greatly enhanced wealth-generating activity bear all the hallmarks of the so-called resource curse, where poverty can be seen as a form of capacity deprivation for want of appropriate and sufficient investments in human capital (Langton 2010, 2012: 38-9).

Here it is important to recall the three dimensions of change that have been presented: absolute, proportional and relative. In many instances, there has been absolute improvement – more people employed, more on higher incomes, additional housing, increased school enrolment, fewer avoidable deaths etc., but what matters more is the volume of improvement relative to population (need). Here, change is often mixed with either slight or substantial improvement in the employment rate (depending on definition), more people on higher incomes but poverty rates increasing, no change in low school attendance rates but some positive shift in literacy and numeracy outcomes, less apparent housing need overall but continued high occupancy rates in many locations, significant shifts in mortality and morbidity rates for some conditions but not most, lower arrest rates for males but not for females and so on. Most telling of all, however, is that even in instances where improvement exists, the gaps between Aboriginal and other Pilbara residents have often failed to close or have widened. Furthermore, gaps within the Aboriginal population are widening too, especially in regard to income and opportunity.

In effect, a key finding overall is that trends over the past 15 years support the observation made by Langton (2010) in the middle of the mining boom:

“disparityis accelerating and it is driven by the mining boom. In Karratha, everyone who wants to work has a job. In Roebourne, few people have the skills and education to join the fast-paced industries transforming the area. It is not just Aboriginal people or the residents of Roebourne who are falling behind. Anyone who lives in a mining province but does not work for a mining company is disadvantaged in important ways: their income is much lower, yet they must pay the same exorbitant housing, food and services costs, thanks to the localized inflation brought about by the boom.”

The question posed at the time (Langton 2010) still seems worth addressing: “*are there any policies [in place] to counter the growing disparities in income, living conditions and opportunity in mining provinces?*” To assist the RIC and others who have an interest in answering this, the following explores the implications of key findings from each of the social indicator categories reviewed.

Population change

The most visible sign of change in the Pilbara has been the increase in both resident and temporary populations that accompanied the mining boom. While this much is unequivocal, the actual scale of population change is far less certain. Remarkably, the undercount of the Pilbara Aboriginal population at the 2016 census has been estimated by the ABS to have been as much as 41% - a rate that has increased at each census since 2001. Unfortunately, estimates of the population that are constructed to compensate for this undercount are provided without any accompanying measures of confidence. They simply have to be accepted at face value despite the fact that an adjustment of this size inevitably comes with a wide margin of error. This now regular and increasing failure to fully enumerate Aboriginal residents of the Pilbara undermines the ability of the RIC to accurately represent their circumstances and needs to governments and of governments to adequately respond to them. It may benefit the RIC to engage the ABS over this issue for two reasons. First, to obtain a better understanding of why such a high level of census undercount might occur and just how regional estimates of this are derived. Second, to consider with them what actions might be taken to improve the count at the next census in 2021 including the possibility of greater local participation and community control over census processes in much the same way as recommended to the ABS following previous assessments of the enumeration in Aboriginal communities (Morphy et al. 2007:119-25; Taylor 2007: 85-6).

This issue aside, it appears that Aboriginal people more than shared equally in the demographic wave that swept over the Pilbara in recent years such that their proportion of the regional population has risen from 16% to 19% in 2016. This growth in resident numbers reflects a decade of net migration into the region, mostly from Perth and surrounds. An intriguing question to pose, but one that is impossible to answer from existing data, is the extent to which this migration has involved members of Pilbara Traditional Owner groups – in effect, a return migration?

The most important feature of Aboriginal population change, though, is structural ageing and the implications for potential demographic dividend that this brings. Indications are that the Aboriginal population of the Pilbara has been well into this unique phase of demographic transition for some time but may now be exiting as the oldest age groups, in particular, continue to expand. The pressing significance of this demographic trend in providing a business case for heightened investment in human

capital may well have been lost on policy-makers as it has unfolded over the past 20 years or so. The positive signs of the dividend at work are there to be seen as declines in economic dependency ratios but the key demographic question for now is whether recent downturn in the relative size of the working-age population will continue? The answer depends largely on future net migration – if this remains positive and mostly of working-age as during the mining boom then the dividend could keep on giving; if it becomes neutral or negative the phase of dividend will continue to recede as the population ages. In the meantime, the key economic question for the RIC is, what decisive steps should be taken to ensure that any ‘potential’ dividend becomes ‘actual’.

As this demographic transition unfolds, the higher the participation in employment with associated earnings, and the lower the levels of disengagement from the economy and reliance on welfare, then the less the likelihood of significant welfare dependence emerging as a long-term structural outcome. The observation has been made that non-Aboriginal Australians tended to be educated before they became ‘old’ with all the economic benefits that accrued from that (Jackson 2008). The risk for Aboriginal people is that they will become old before they are educated which is code, really, for work-ready. This suggests that the RIC would do well to focus urgent attention on the current circumstances of those aged under 35 years and consider what their needs and opportunities are. After all, it is this group that will be at the vanguard of any further bulge in working-age population or any future rise in dependency ratios.

It also signals another looming issue to do with the adequate provision of aged care services as the Aboriginal population becomes progressively older. Invariably to date, social policy with regard to the Aboriginal population has focussed on needs at younger ages, and while these are still paramount as noted above, the fastest rate of population growth is actually among those at advanced ages. Given the prevalence of out-migration at retirement ages among the Pilbara population more generally, the idea of a growing resident group in need of aged care is perhaps novel for the Pilbara but it is emerging in the Aboriginal population. Furthermore, this is a group that has cultural ties to particular parts of the Pilbara along with senior ceremonial and custodial roles suggesting a growing need for aged care services in home communities as much as in regional centres.

Labour force

Interpretation of change in social indicators can depend as much on revised definition of categories as it is to do with any real alteration to actual conditions. This is especially so with Aboriginal people as many of the social indicator categories that define their outcomes are state-imposed and subject to policy whim (Morphy 2016). A good example is the definition of what constitutes ‘employment’. In 2001, when baseline indicators for the Pilbara were prepared (Taylor and Scambary 2005), employment figures reported by the census included Aboriginal people working in the CDEP scheme. As we have seen, together with others in the workforce, these CDEP workers produced an employment rate of 42.5% in 2001. Using this as the base, the 2016 employment rate of 45.6% appears as a very meagre return on 15 years-worth of regional economic expansion and substantial effort to improve Aboriginal outcomes.

However, the CDEP scheme was disbanded in stages since 2001 and by 2016 it no longer existed. Many who had worked, or who might have worked, in CDEP were now to be classified as unemployed via the Community Development Program. Their

presence in the census vanished as a separate category. As we have seen, if a similar category shift is applied to 2001 employment data this produces a revised employment rate of 30.2% which makes the rate of 45.6% in 2016 look far more favourable. In one key sense it is – while the 2016 employment rate may not be much higher than the unadjusted 2001 rate, those employed in 2016 are far more numerous and have greatly enhanced earning capacities based on improved occupational mobility, longer working hours and higher wages than those employed in 2001. Most of this has been delivered by mining employment.

Again, some care is needed here in defining terms. In addition to the rise in resident population, there has also been a substantial increase in FIFO and other temporary workers in the Pilbara and Aboriginal people have been part of this trend. In 2001, very few Aboriginal people employed in the Pilbara were from outside of the region. By 2016, fully one-third of the Aboriginal workforce was from elsewhere, mostly from Perth but also from other parts of WA as well as from across Australia. The focus in this analysis has been on residents only, but it should be noted that around 12% of RTIO's workforce classified as Pilbara Aboriginal People are in fact FIFO Traditional Owners. If similar ratios applied with other major employers then, from a Traditional Owner perspective, the change to employment outcomes might be more favourable than reported here.

One significant change that has accompanied this rise in employment is an over-representation of Aboriginal employment in a single industry – mining, and in particular, iron-ore mining. In 2001, barely 20% of Aboriginal males in employment were working in the mining industry and less than 5% of females. Today, mining accounts for almost two-thirds of all Aboriginal male employment and one-third of all female employment – levels that far exceed those of other resident workers. This represents a major structural shift in the composition of Aboriginal employment. At one level it is testimony to the efforts made to engage Aboriginal people but it comes with the potential cost of that classic resource curse risk – over-dependency on a single sector (Langton 2010). This is all the more so as the very sector that Aboriginal people have come to depend on is experiencing downward pressure on labour demand as mining technologies shift towards remote operations and machine automation.

While there are data to reveal these high-risk stakes in the mining sector, we still have very little statistical information on the size, composition and economic potential regarding another important component of the regional economy – notably, the Aboriginal business and community organisation sector. There has been a flourishing of Aboriginal businesses and incorporated bodies since 2001 yet they remain statistically invisible, except to say that they almost certainly provide for more Aboriginal employment in the Pilbara than the three tiers of government put together. Since 2006, employment in the government sector, especially in state and local government, has fallen markedly and we can track this. However, over the same period there is every likelihood that employment in Aboriginal businesses and organisations has increased and yet we have no data for validation. To overcome this, a separate census category of Aboriginal sector employment would be a useful innovation and something that the RIC could lobby for as part of ABS preparations for the 2021 census. In the meantime, there is an urgent need to audit these Aboriginal contributions to the regional economy as a prelude to assessing and bolstering their potential to minimise the risk of over-dependence on mining. No doubt, many may themselves be dependent for their operations on mining, in which case the implications of industry restructuring

will need to be carefully considered by the RIC with a view to harm minimisation or the fashioning of alternate opportunities.

Of course, the essential backdrop to labour force engagement is projected growth in the Aboriginal population of working-age. Because of this, a key requirement from now on if a reduction in the employment rate for Pilbara Aboriginal people is to be avoided, is to ensure that the current core stock of those employed (aged 25-54) is maintained (2,700) and that an additional 125 jobs are created each year over the next 10 years. Every additional job beyond this would represent an improvement on the current outcome. As to where these additional individuals might come from, primary consideration should be given to the 1,000 or so Aboriginal students currently in, or just out of, the high school system and what their requirements might be for securing work. Also crucial is a need to better understand the situation facing those of early working-age who are either unemployed or marginally attached to the labour force. In effect, an immediate audit of capacity to engage is required of the younger Aboriginal age groups in order to direct strategic investments into matching potential supply with emerging demand. The economics of potential demographic dividend provide a strong opportunity cost business case for this. They also provide some urgency.

Income

One of the more striking observations following 15 years of regional economic growth is the absolute and relative increase in Aboriginal income. While median personal and household incomes still fall way behind the rest of the Pilbara population, a greater share of the Aboriginal population is now found at the upper end of the income distribution – the downside is that an even greater share is also now found at the lower end. In short, there is increasing income disparity within the Aboriginal population with the key difference being whether one is employed (especially in mining) or on income support. While many Aboriginal people have clearly benefitted from the mining boom, the problem is that not enough have. As a consequence, despite average Aboriginal income from employment more than doubling in real terms to reach \$93,000, we have also seen an increase in the Aboriginal rate of poverty in what has become Western Australia's most expensive region to live. If there was ever an indicator of the resource curse at work it would be this contradiction in economic outcomes. At the same time, there appears to have been some amelioration of this in the context of household incomes, no doubt due to a mix of improved family support payments and wages growth.

One reason for growing income disparity is a rise in the proportion of Aboriginal people with no income. We can see from census data that more than half of these are neither employed nor in education or training. What is less clear is whether individuals have dropped out of the income support system as well. The likelihood that substantial compliance breaching off the Community Development Program (CDP) involving no pay penalties cannot be discounted, although regional data on this are difficult to access as a recent federal Senate committee investigating this matter itself discovered. Statistical confusion is rife regarding those who are most marginalised in society. Aside from issues to do with the CDP we see this in the ongoing lack of concordance between census figures on unemployment and Centrelink figures on Newstart payments. The danger is with no clear information and with a focus in policy (including company policy) on achieving successful outcomes, those left behind for whatever reason can at worst be forgotten and at best be misunderstood and misrepresented. In terms of proper regional profiling and planning for all Pilbara Aboriginal people, there is need for better

linkage of and access to administrative data and for the RIC to identify priority sub-groups in the population.

Education and training

As we have seen, interest in the educational status of current Aboriginal students and young adults is given added impetus by the potential for demographic dividend. In realising this, a good deal matters regarding how well placed this cohort is to participate in the future regional labour market. Unfortunately, the general prognosis does not appear favourable. While 44% of young adults aged 15-34 years are fully engaged in employment, education or training and a further 15% are partially engaged, this means that as much as 41% of this age group are disengaged. To avoid any worsening of this outcome, this places a burden on the estimated 1,860 persons who are fully engaged to ensure that they remain so and for the estimated 620 who are only partially engaged to do so as well. As for the estimated 1,700 who are not engaged, greater effort should be made to identify why this is so and what may be done to reduce this proportion. Data from other parts of this report indicate that factors such as ill-health, disability, home duties, and incarceration all play a significant part.

A key contributor to this disengagement, at least in terms of employment participation, also includes persistently low levels of school attendance. Unlike in some parts of remote Australia, Aboriginal enrolment in schooling in the Pilbara appears to be more or less universal. However, not all of those who are enrolled attend school often enough to maximise the benefits from education. Even average attendance rates are low at 70% in primary schools and 60% at secondary. More to the point these rates have remained fairly constant since 2008. Of more concern, however, are the very low attendance levels that indicate the proportion of students attending for more than 90% of available school days. These have also remained constant but at the much lower levels of 30% in primary schools and 20% in secondary. In terms of absolute numbers, then, we can estimate that there are just short of 700 students overall who are currently in the system who have an attendance record that is likely to assist in their ultimate achievement of WACE and/or VET qualifications. It seems unlikely to be a coincidence that roughly the same number achieve above National Minimum Standards in NAPLAN testing. If this continues to be the level of successful output from schooling then it may be enough to sustain the current rate of employment in the region but it would not be sufficient to achieve any parity targets. This is especially so given that occupational shifts involving higher qualification requirements are planned for the mining industry. In the context of demographic dividend such an outcome would be sub-optimal.

Housing and infrastructure

Perhaps no other area of public policy epitomises the decline in public access data on the circumstances of Aboriginal people in the Pilbara (and generally in remote areas of Australia) more than that of housing and infrastructure. From the early 1990s ATSIC lobbied for and financially supported the Community Housing and Infrastructure Needs Survey (CHINS) up to the last of four surveys in 2006. The Western Australian Government also conducted three rounds of an Environmental Health Needs Survey (EHNS) up to 2008. Since that time, the very detailed data on Aboriginal housing and infrastructure available from those sources has evaporated under the influence of the post-ATSIC new public management regime. This shift towards mainstreaming is epitomised by the National Partnership Agreement on Remote Indigenous Housing. This redirected Australian government funding and responsibility for housing and

municipal and essential services away from Indigenous-controlled organisations to State governments (Hunt 2018). In the process, the acquisition of detailed and comprehensive data with which to assess wholesale needs and measure progress, appears to have taken a back seat in favour of a focus on tenancy compliance and rationalisation of essential services. Consequently, it is now not possible to measure change in the details or the range of housing and environmental health infrastructure for Aboriginal communities across the Pilbara since the data required for such a comprehensive exercise no longer exist. The primary source now available to assess Aboriginal housing conditions (on advice from the Department of Communities) is the national census and this, quite simply, is not up to, or even designed for, the task.

The census does, however, furnish some insight into change in respect of some aspects of housing over the past 15 years. What it shows most clearly is the lack of any change. For example, in 2001, Aboriginal households were overwhelmingly in rental accommodation and this remains the case, in fact more so. As a consequence, the very low rates of home ownership recorded in 2001 are now even lower still. This is not surprising given that escalating housing costs represent a large and persistent contributor to the Pilbara's high regional price index and a classic resource curse indicator. As for overcrowding, the percentage of dwellings deemed to be overcrowded has reduced but the absolute number has increased. Having said that, doubt remains over ultimate figures here due to census population undercount and so levels reported by the census are a minimum estimate only. Crude adjustments to numbers per dwelling can be made but the official measures of housing need based on the composition of families in dwellings are unadjustable.

From the perspective of the RIC, then, as it seeks to lobby for and plan for Pilbara Aboriginal people, the key take-home message from the analysis of available housing and infrastructure data is that Aboriginal interests in meaningful and informed decision-making have been compromised by a diminution of data sources over the past decade. This highlights the ongoing lack of Aboriginal data sovereignty in Australia (Kukutai and Taylor 2016). It demonstrates how unilateral actions by governments continue to devalue and hinder the capacity of Aboriginal people to pursue self-determination and participate in decision-making on matters that directly affect them in line with the various articles of the *United Nations Declaration on the Rights of Indigenous Peoples*. This is despite the fact that the Australian government announced its support for the declaration in 2009. One recommendation for the RIC would be to assert its rights to data sovereignty and negotiate the establishment of data-sharing protocols with the Department of Communities and, where data are lacking, to lobby for their reinstatement. Having said that, the same would apply to any data that governments hold about Pilbara Aboriginal people.

Health status

Given the prevalence of so-called 'lifestyle diseases' in the baseline profile of Aboriginal mortality and morbidity in the Pilbara (Taylor and Scambary 2005) it was always to be expected that measurable improvement in health outcomes would be subject to a long lead time. However, with so many variables impacting on such outcomes and on their underlying determinants, it was inevitably difficult to establish just what a 'long lead time' might reasonably constitute. Given that most of the baseline measures in the initial report referred to the period 1994-2001 (and some to even earlier periods) it would not seem unreasonable to have assumed that by 2016 (a generation later) the weight of investment in health infrastructure and public health measures,

along with socioeconomic improvement in the population itself, would have resulted in at least some discernable positive change in health status. Such an expectation would be especially so in a region of rapid economic growth such as the Pilbara. As it turns out there are signs that Aboriginal health status has improved, although across many measures this remains way behind that of the general population and all too often it detracts from the capacity of people to participate economically.

Presently, Aboriginal male deaths in the Pilbara outnumber non-Aboriginal male deaths by almost 4 to one, while Aboriginal female deaths outnumber non-Aboriginal female deaths by more than 5 to one. Aboriginal mortality also remains overly premature. It is perhaps surprising, then, to report that Aboriginal mortality rates have improved since 2002. Overall, male rates remain consistently higher than female, and Aboriginal rates generally are much higher than non-Aboriginal rates. However, all rates have fallen to a statistically significant degree.

Of particular interest as a measure of development outcomes is the rate of childhood mortality as this has formed a key plank of the COAG Closing the Gap strategy – indeed, it is one of only two out of 7 headline indicators that appears to be on track towards achievement. In situations of relatively high mortality and low life expectancy, as found among Aboriginal people in the Pilbara, a disproportionate number of deaths typically occur before the age of 5 and reducing this outcome has been a major goal of public health interventions. Internationally, high child mortality levels have been associated with poverty, the availability, accessibility and quality of health services, environmental health risks, maternal health and poor nutrition. The focus, then, in prevention, falls inevitably on the effectiveness and adequacy of the many public health activities conducted by the State government and Aboriginal Medical Services. To this extent, it is encouraging to find that Aboriginal child mortality rates in the Pilbara have followed the national trend downwards although they remain relatively high.

While all-cause Aboriginal mortality rates have fallen steadily since 2001, the leading causes of mortality observed over the period 2002-06 have remained the same and include diseases of the circulatory system followed by endocrine, nutritional and metabolic diseases. In effect, Aboriginal mortality remains dominated by so-called 'lifestyle' diseases that, by definition, are potentially avoidable. They are therefore amenable to screening and primary prevention and reflect the effectiveness of population health initiatives. It is therefore encouraging to report a statistically significant drop in potentially avoidable mortality since 2007 and that the Aboriginal rate in the Pilbara is now below the national rate, as this suggests that the primary health care work of Aboriginal Medical Services in the Pilbara and the state system are having their desired effect. As an update to the original baseline report, examination of Health Framework Tier 3 measures that focus on public health initiatives was considered out of scope. Nonetheless, there would be considerable value in considering the establishment of an information-sharing mechanism between the RIC and local Aboriginal Medical Services in particular both to maintain a watch on outcomes and to explore where public health initiatives might be mutually supported.

Of course, one health outcome that requires on-going strategic support is the matter of dialysis treatment for end-stage renal disease. As in many parts of Australia, Aboriginal hospitalisation rates in the Pilbara are excessively high if they include separations for dialysis. The evidence from age-specific rates in the Pilbara is suggestive of successive waves of dialysis treatment progressing through the population on a cohort basis, with

the current population aged over 45 years displaying elevated rates due to earlier lifestyle disease and, probably, improved access to treatment. Prevention, of course, is more complicated than treatment not least because many underlying determinants have their antecedents in foetal and infant life as per the Barker (1994) hypothesis. It is certainly the case, even from the initial baseline study, that many Aboriginal adults in the Pilbara today have experienced less than optimal life circumstances as would have their parents before them. As Eades (2000) has put it, from a life-course perspective a person's current physiological status can be seen as a marker of their past social position. The essential point here is that the need for dialysis treatment will inevitably be around for some time to come and, indeed, is likely to continue rising even though hospitalisation data show a significant reduction in the rate of endocrine, nutritional and metabolic disease due largely to a statistically significant drop in the age-standardised rate for diabetes mellitus from 2,257 per 100,000 in 2002-06 to 791 per 100,000 in 2012-16. From the perspective of the RIC and its ambition to enhance the wellbeing of Pilbara Aboriginal people, dialysis treatment will continue to be highly disruptive to many people's lives (not just patients) due to the frequency of visits and the time required, especially where this involves long-distance travel away from a home base.

Further disruption to the lives of Aboriginal people in the Pilbara is caused by disability defined as any continuing condition that restricts everyday activities. Since the present exercise is focused on measuring change in outcomes over time the only continuous source of data for this purpose is provided by the five-yearly ABS census. Unfortunately, this typically has a high rate of Aboriginal non-response to the census question on disability, but we can say that Aboriginal people have consistently accounted for almost half of those in the Pilbara with a disability despite comprising only 16% of the population. This refers only to those with profound or severe core activity limitation and so should be considered a conservative metric. As for actual numbers, these have risen over time but the rate has been stable since 2011 at 3.9% of the population. This is a relatively low rate in Western Australian terms but it still means that somewhere in the region of 460 Aboriginal people are substantially hampered in their capacity for economic participation. It also means that others have to forgo at least some of this capacity in order to provide care and the census yields an estimate of around 1,100 such carers in 2016. Estimates of this magnitude when combined with the numbers impacted by dialysis and other health conditions, to say nothing of those who die at premature age, start to comprise a sizeable proportion of the Pilbara Aboriginal population. Clearly, the collective social and economic impacts of diminished health status have been little altered by the mining boom and they present an ongoing and substantial challenge for the RIC in its quest to improve Aboriginal wellbeing.

Crime and justice

As if the challenge of overcoming persistent poor health status was not enough, added burden for the RIC in planning for economic participation is provided by continuing Aboriginal over-representation in the criminal justice system. The original baseline study found that interaction with the police and subsequently with the court system and various custodial institutions was a pervasive element of Aboriginal social and economic life in the Pilbara. From the latest data it is clear that this remains the case. Almost all criminal cases brought to the Children's Court in the Pilbara refer to Aboriginal defendants and while the Aboriginal share of Magistrates Court cases is lower, this has steadily risen over recent years and is now at almost 80%. Feeding into this are rates of arrest that, while lower than they have been, still account for 19% of

the Aboriginal population aged 10 years and over and reach up to 33% among males aged between 18 and 29 years. Given empirical evidence of a negative association between arrest and employability these levels are a cause for concern. In addition, as much as one fifth of Aboriginal males aged between 18 and 34 years could have been either in custody or subject to a CBO (rather than potentially in work) at any one time over the decade of the mining boom. More likely it was less than this given overlap in the data sets, but it would be no less than 13%.

Clearly, any notion that an economic dividend might emerge from the demographic shifts underway in the Pilbara, would have to address the scale of social and economic disengagement implied by these figures. In this regard, it is timely that the recent Australian Law Reform Commission inquiry into the incarceration rate of Aboriginal and Torres Strait Islander peoples has presented recommendations (albeit many made before) to reform underlying procedural causes of Aboriginal over-representation in the criminal justice system. In particular, the inquiry calls for a reassessment of mandatory sentencing and statutory fine enforcement as these affect Aboriginal people disproportionately. It also calls for the formation of Aboriginal Justice Agreements that would enhance Aboriginal leadership and participation in the development and delivery of strategies and programs for Aboriginal people in contact with the criminal justice system. As part of this it seeks to promote justice reinvestment through redirection of resources from incarceration to prevention, rehabilitation and support in order to reduce reoffending and the long-term economic costs of incarceration. These are all objectives that the RIC may be well placed to engage with.

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