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ABSTRACT

The Second Convict Age: Explaining the Return of Mass Imprisonment in Australia*

Constructing a new series of incarceration rates from 1860 to 2018, I find that Australia now incarcerates a greater share of the adult population than at any point since the late nineteenth century. Much of this increase has occurred since the mid-1980s. Since 1985, the Australian incarceration rate has risen by 130 percent, and now stands at 0.22 percent of adults (221 prisoners per 100,000 adults). Recalculating Indigenous incarceration rates so that they are comparable over a long time span, I find that incarceration rates for Indigenous Australians have risen dramatically. Fully 2.5 percent of Indigenous adults are incarcerated (2481 prisoners per 100,000 adults), a higher share than among African-Americans. The recent increase in the Australian prison population does not seem to be due to crime rates, which have mostly declined over the past generation. Instead, higher reporting rates, stricter policing practices, tougher sentencing laws, and more stringent bail laws appear to be the main drivers of Australia's growing prison population.

JEL Classification: I30, K14, N30
Keywords: prison, jail, incarceration, crime

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1. Introduction

For many who came to Australia in chains, the nation was a land of redemption. Over an 80-year period, more than 160,000 convicts were transported from Britain to Australia. Significant numbers ended up living prosperous and productive lives. Some of the leading figures in the colony were former convicts such as James Ruse, Mary Reibey and Samuel Terry – powerfully debunking the false idea that criminality was an immutable trait. Based on its history, Australia should be as committed as any nation to criminal justice policies that focus on rehabilitation over punitive sanctions.

Given this history, it is especially informative to study long-run trends in Australian incarceration. While prior research has focused on changes over a few decades, analysing the trend over nearly 160 years provides a fuller perspective and additional insights. In this study, I document the trend in Australian imprisonment rates from 1860 to 2018, put the recent increase in incarceration into historical and international context, and explore the factors that account for the rapid rise in incarceration over the past generation.

To preview the results, I find that in 2018, around 43,000 Australians were in prison, a rate of 221 for every 100,000 adults. Among Indigenous Australians, the 2018 incarceration rate was 2481 per 100,000 adults. Since 1985, the Indigenous incarceration rate and the overall incarceration rate have more than doubled. Imprisonment rates in Australia are higher than in Canada or England and Wales, and comparable to New Zealand. While the rates are lower than in the United States, that nation has seen a decline in imprisonment since 2007, while Australia has witnessed a marked increase over the same period. For the first time on record, Indigenous Australians are more likely to be in jail than African-Americans.

To better understand the drivers of incarceration, I first focus on the relationship between crime and incarceration. To shed light on this issue, I construct a long-run series of homicide rates in Australia since 1860. Until 1970, there is a strong *positive* correlation between homicide and imprisonment, suggesting that falling crime rates in recent years are unlikely to be caused by mass incarceration. Instead, it seems more likely that imprisonment has risen in spite of falling crime rates. Today's prisoner population is older than a generation ago, and includes more women and Indigenous Australians. The evidence suggests that reporting rates, policing practices, sentencing laws and bail laws explain most of the rise in incarceration.

Australia's second convict age has significant implications, as I detail in the next section. Imprisonment reduces employment prospects, and has adverse health impacts. Released prisoners have a high chance of being homeless, and many reoffend. Incarceration can have negative consequences for the 77,000 Australian children who have a parent in prison. Although prisoners are incapacitated from offending against the general population, the crime-reducing impact diminishes as the prison population grows. With imprisonment costing taxpayers billions of dollars annually, the opportunity cost of mass incarceration is substantial and growing.

The remainder of this paper is structured as follows. Section 2 reviews the relevant literature on the causes and consequences of incarceration. Section 3 discusses trends in incarceration in Australia. Section 4 compares the Australian experience with four other English-speaking countries: Canada, England and Wales, New Zealand and the United States. Section 5 sets out the evidence on incarceration of Indigenous Australians, and compares these rates with those for African-Americans. Section 6 explores the relationship between crime rates and incarceration rates. Section 7 looks at plausible explanations for the rise in incarceration, and the final section concludes.

2. Existing Research on Trends, Benefits and Costs of Incarceration

The increase in Australian incarceration rates over the past generation has been discussed by researchers in economics (eg. Schnepel 2016; Queensland Productivity Commission 2019) and law (see eg. Bagaric and Pathinayake 2015; Paget 2016; Russell and Baldry 2017; Sarre 2018; Weatherburn 2018), with a particular focus on Indigenous incarceration (eg. Weatherburn 2014). For the most part, this literature has tended to concentrate on the period since the 1980s, rather than taking a longer historical view.

Several studies have sought to explain the rise in incarceration over recent decades, studying factors such as more effective policing (Weatherburn 2018), a higher recidivism rate (Queensland Productivity Commission (2019), and tighter bail laws (Sarre, King and Bamford 2006). Researchers have also noted a shift towards imposing custodial sentences and towards longer sentences (Victorian Sentencing Advisory Council 2016; Freiberg and Ross 1999; Cunneen et al 2013; Pratt and Eriksson 2014). This shift shows up in spending patterns: Bushnell (2019) notes that the ratio of prison expenditure to police expenditure in Australia rose over the decade to 2018.

In a standard rational model of crime, potential criminals compare the expected benefit of committing a crime with the expected costs. In such a model, higher imprisonment rates reduce crime by incapacitating those who would otherwise commit crimes, deterring would-be offenders from committing crimes by raising the expected costs, and rehabilitating offenders by increasing the returns to non-criminal activities.

However, there are reasons to think that both incapacitation and deterrence have diminishing marginal returns. In the case of incapacitation, this is because criminal careers are relatively short, with the age-crime curve peaking in the late-teens and early-twenties (Loeber and Farrington 2014). As a result, sentences that go beyond the age range when individuals are most likely to commit crimes are likely to have a smaller impact on public safety.

In the case of deterrence, decreasing returns arise because the benefits of crime are immediate, while the costs are delayed. Higher discount rates in the target population will dampen the effect of incarceration on crime. This is more than a theoretical concern: researchers have found a strong positive association between individual discount rates and a propensity to engage in criminal activity (Åkerlund et al 2016).

Rehabilitation is less likely to be subject to decreasing returns – rather the concern with rehabilitation is whether the typical prison spell has a rehabilitative effect. A systematic review finds that prison sentences are no more effective than non-custodial approaches, such as community work, electronic monitoring and fines (Villettaz, Gilliéron and Killias 2015). Although there is some evidence that prison education programs can be effective (see Davis et al 2013 for a review), such formal education programs have relatively low uptake rates. Meanwhile, prisoners may teach each other how to commit future crimes. The impact of this informal skills transfer is more difficult to measure, but it may help explain the finding that the net effect of prison on recidivism is no better than non-custodial alternatives.

An empirical literature seeks to estimate the elasticity of crime with respect to incarceration, and whether that elasticity changes according to the level of incarceration. Summarising the findings, Chalfin and McCrary (2017) estimated that every 10 percent increase in the prison population cuts crime by around 2 percent. Many studies also find that the effect diminishes as the imprisonment rate rises. Using panel data across US states, Liedka, Piehl, and Useem (2006) found that the crime-preventing impact of incarceration declines with higher levels of imprisonment. Similarly, Johnson and Raphael (2012) showed that the elasticity of crime with respect to incarceration in the United States was smaller in the 1990s (when incarceration rates were higher) than it had been in the 1980s. Summarising the evidence for the United States, Lofstrom and Raphael (2016) concluded that while rising imprisonment rates might have had some effect of reducing crime in the 1970s and 1980s, they account for little of the observed crime decline since the 1990s. Indeed, as Donohue (2009) notes, even a constant elasticity of crime with respect to imprisonment implies that when the incarceration rate is high, adding an additional prisoner averts fewer crimes than when the incarceration rate is low. In Section 6, I return to the empirical implications of this issue in the Australian case.

In line with research on the diminishing marginal benefit of incarcerating additional people, other studies have found a diminishing impact of sentence lengths on crime (for a useful review, see Doob and Webster 2003). Mastrobuoni and Rivers (2016) find that most of the effect of prisons is in the first few years of a sentence – suggesting that increasing sentence lengths from 5 years to 7 years has minimal impact on deterrence. Similarly, a randomised experiment in California took a sample of around one thousand prisoners, who had served sentences of around two years (Berecochea, Jaman and Jones 1973). Half were released six months early. Early release had no detectable impact on crime.

Crime is only one of the impacts of incarceration. The budgetary cost of incarceration in 2017-18 was $302 per prisoner per day. This figure encompasses all recurrent expenditure – comprising net operating expenditure and capital costs (Productivity Commission 2019, Table 8A.17). In total, taxpayers spent $4.7 billion annually on incarceration, or $240 for every Australian adult.

The budgetary cost likely underestimates the total cost of incarceration (see Paget 2016; PwC 2017; Morgan 2018). In social capital terms, imprisonment is likely to weaken connections to

friends and family, while strengthening ties to criminal gangs (Moule, Decker and Pyrooz 2013), which may increase subsequent recidivism rates.

In human capital terms, incarceration typically means that inmates lose their jobs, and may have deskilled by the time they re-enter the formal labour market. This can be exacerbated if employers have formal policies of not hiring those who have served time in prison. This loss of experience is rarely compensated by improvements in formal schooling, with only 17 percent of inmates completing a formal qualification while incarcerated (AIHW 2019, 17). US studies have generally found a significant negative impact of incarceration on employment and earnings (Mueller-Smith 2015; Dobbie, Goldin and Yang 2018, though cf Kling 2006)

In terms of health, many of those entering prison have mental health disorders and chronic health conditions. While some improve during incarceration, incarceration can also expose prisoners to additional risks. While in prison, 5 percent of prisoners self-harm, 8 percent share needles, and 11 percent are attacked by another prisoner (AIHW 2019, 45, 99, 108). Upon release, more than half of prisoners expect to be homeless (AIHW 2019, 24).

Another social cost of incarceration is on the families of prisoners. In the US, Charles and Luoh (2010) find that rising incarceration rates had adverse consequences for women in the marriage market. For children of prisoners, there is a strong association between parental incarceration and adverse outcomes such as poor school performance, juvenile delinquency and psychological problems (for reviews of this literature, see Murray et al. 2009; Wildeman and Western 2010; Whitten et al 2019). This association is borne out in Australian data. Children whose parents offended were more likely to have conduct problems at age 11 (Tzoumakis et al 2019). The intergenerational correlation shows up in surveys of new prisoners. Among prison entrants, 18 percent had a parent or carer incarcerated during their childhood (AIHW 2019, 14).

To what extent is there a causal impact of incarceration on prisoners' children? Using random assignment across judges as an instrument, Dobbie et al (2018) find that disadvantaged Swedish children with an incarcerated parent are more likely to commit crimes, be jobless, and fall pregnant. Bhuller et al (2018) employ a similar approach with Norwegian data, and do not find such a pattern, though its standard errors are sufficiently large that the authors cannot reject large impacts in either direction.

To the extent that prison has an adverse impact on the children of prisoners, it is worth estimating the scale of that effect. One recent survey found that for every prisoner, there are 1.8 children in the general community who were dependent on them for their basic needs (AIHW 2019, 14). This suggests that there are around 77,000 Australian children with an incarcerated parent. The rise in imprisonment rates since the 1980s has substantially increased the share of children who are exposed to parental incarceration.[1]

3. Long Run Australian Incarceration Rates

In a companion paper (Leigh 2020), I compile long-run incarceration rate series for five English-speaking nations: Australia, Canada, England and Wales, New Zealand and the United States. For Australia, this series spans the period 1860 to 2018, making it a considerably longer series than those that have typically been used by researchers.

These series improve on previous data sources not only because they cover a longer timespan, but also because imprisonment rates are estimated as a share of the adult population (aged 18 and over) rather than as a share of the total population. This matches the standard approach used by the Australian Bureau of Statistics to calculating modern-day incarceration rates.[2]

All figures presented in this paper include prisoners who are held in prison because they have been convicted and sentenced, plus those who are held in prison on remand awaiting trial (because they have been denied or unable to post bail). Prisoner statistics do not include convicted persons outside the prison system, subject to monitoring devices such as ankle bracelets. Nor do the prisoner statistics in this paper include those people who have been released from prison on parole, before the expiry of their full sentence.

To derive imprisonment rates, I first estimate the total number of prisoners, using figures published in Vamplew (1987), Mukherjee (1981), Biles (1984), Carcach and Grant (1999), Australian Bureau of Statistics (2001), Australian Bureau of Statistics (2008) and Australian Bureau of Statistics (2018). Adult population denominators are calculated from colonial censuses and Australian censuses until 1971, at which point the Australian Bureau of Statistics began publishing its own annual estimate of the adult population. Precise details of the sources and construction of the imprisonment series are set out in the Appendix to Leigh (2020).

Figure 1 shows my estimate for Australia's long-run incarceration rate. The solid line depicts the preferred incarceration rate estimate: using the adult population as the denominator. The dotted line shows another common measure, with the total population as the denominator. These estimates exclude Tasmania until 1870, and exclude Western Australia until 1875 (the population denominators are adjusted accordingly). The full series is set out in Table A1.

Expressing incarceration as a share of adults or a share of the total population, the series show a similar pattern. Prior to the end of penal transportation in 1868, Australia's incarceration rate was extremely high. In 1860, the first year of the series, 650 out of 100,000 Australian adults (and 371 out of 100,000 people) were in prison. As I show below, this was a far higher incarceration rate than in other English-speaking nations at the time. Indeed, it was not far off the imprisonment rate in South Africa during the height of the Apartheid era.[3] Through the course of the nineteenth century, the incarceration rate fell steadily. By the time of Federation in 1901, incarceration rates were one-third of their levels in 1860, at 203 prisoners for every 100,000 adults.

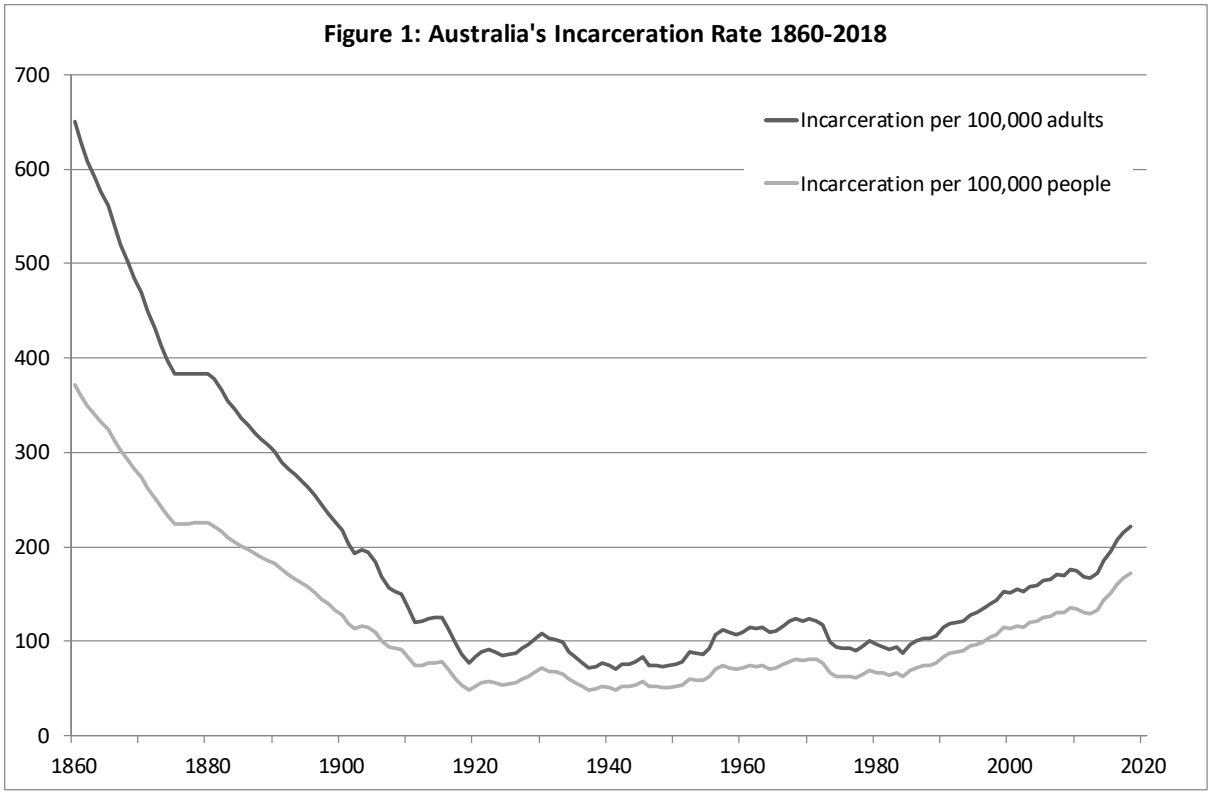
Through the decades after Federation, the Australian incarceration rate continued to decline. At the outbreak of World War I, the rate was 126 per 100,000 adults. By the end of the war, the rate was down to 87, less than half of what it had been in 1901. The 1920s saw a slight rise in incarceration, which was reversed during the Great Depression of the 1930s. By 1941, the incarceration rate was just 71 for every 100,000 adults, its lowest level across the entire twentieth century.

Following World War II, incarceration rates increased substantially in the 1950s, rising from 76 prisoners per 100,000 adults in 1950 to 110 in 1960. The rate rose again in the late-1960s, reaching 124 prisoners per 100,000 adults in 1968, before falling to 91 prisoners per 100,000 adults in 1977.

The modern-day rise in the imprisonment rate appears to begin in the mid-1980s. By 1990, the imprisonment rate was 114 prisoners per 100,000 adults. By 2000, Australia was imprisoning 152 prisoners per 100,000 adults. By 2010, the imprisonment rate was 175. In 2018, the Australian incarceration rate was 221 prisoners for every 100,000 adults. In proportionate terms, the rise in incarceration rates from 1985 to 2018 amounts to a 130 percent increase. Not since 1899 has Australia incarcerated such a large share of the adult population.

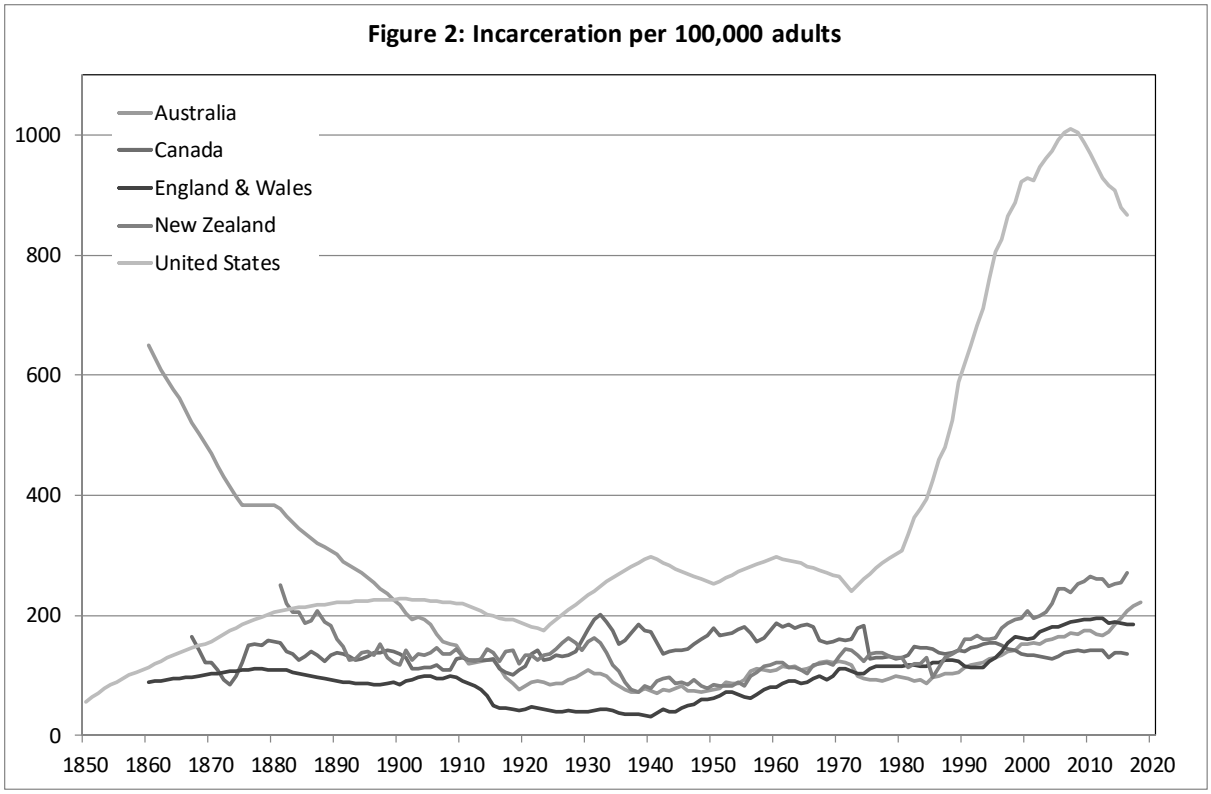
Determining incarceration rates as a share of adults rather than as a share of the total population makes most difference in the nineteenth century, when minors comprised a larger share of the total population. One way to see this is to compare the ratio of the two rates. In 1860, the incarceration rate as a share of adults is 75 percent higher than the incarceration rate as a share of all persons. By the 1930s, the gap had narrowed to around 50 percent. It widened slightly in the 1960s (as a consequence of the baby boom), and has shrunk to around 30 percent in the most recent decade. The consequence of this change in the age composition of the population is that using entire population as the denominator leads to an overstatement of the rise in incarceration rates.

As has been noted, the incarceration rate as a share of adults has risen by 130 percent since 1985 (from 96 to 221 prisoners per 100,000 adults), while the incarceration rate as a share of persons has risen by 150 percent (from 69 to 172 prisoners per 100,000 people). While the rise has been significant under either metric, the adult benchmark more accurately reflects the relevant population.



4. Long-Run Incarceration Rates in Canada, England and Wales, New Zealand and the United States

How does Australia's incarceration rate compare with other nations? Figure 2 shows the incarceration rate per 100,000 adults. Looking at Australia's high incarceration rate in the nineteenth century, it is worth noting that penal transportation had the effect of both raising the Australian incarceration rate and lowering the incarceration rate in England and Wales (which had the lowest reported incarceration rate of the five countries during the late-nineteenth century). However, given that these series start at the end of the transportation era, this impact is likely to be modest.



During the late nineteenth century, Australia's incarceration rate fell by around two-thirds, taking it from the highest of these five countries to the second-lowest by the 1910s. Australia's incarceration rate remained the second-lowest among these English-speaking countries for much of the mid-twentieth century. From 1973 to 1990, Australia had the lowest incarceration rate of all five countries. During this period, the Australian incarceration rate averaged 97 prisoners per 100,000 adults. By the most recent year in the series, Australia's incarceration rate had risen to third place, above both Canada and England and Wales, slightly below New Zealand, and considerably below the United States.

While the United States incarceration rate remains the highest in this grouping (and indeed, among the highest in the world), it has fallen considerably in the past decade, from 1011 prisoners per 100,000 adults in 2007 to 866 prisoners per 100,000 adults in 2016. This change is largely due to policy shifts, driven by a bipartisan reform coalition that included libertarians and progressives, and saw incarceration rates fall in 34 out of 50 states, including Texas, New York, Alabama and California (Kimble and Grawert 2019).

Over the past generation, the substantial increase in Australia's incarceration rate mirrors the trend in England and Wales, New Zealand and the United States. Since 1985, the incarceration rate has risen by 130 percent in Australia, 52 percent in England and Wales, 181 percent in New Zealand, and 104 percent in the United States. In Canada, the incarceration rate has fallen by 5 percent since 1985.

5. Racial Differences in Incarceration

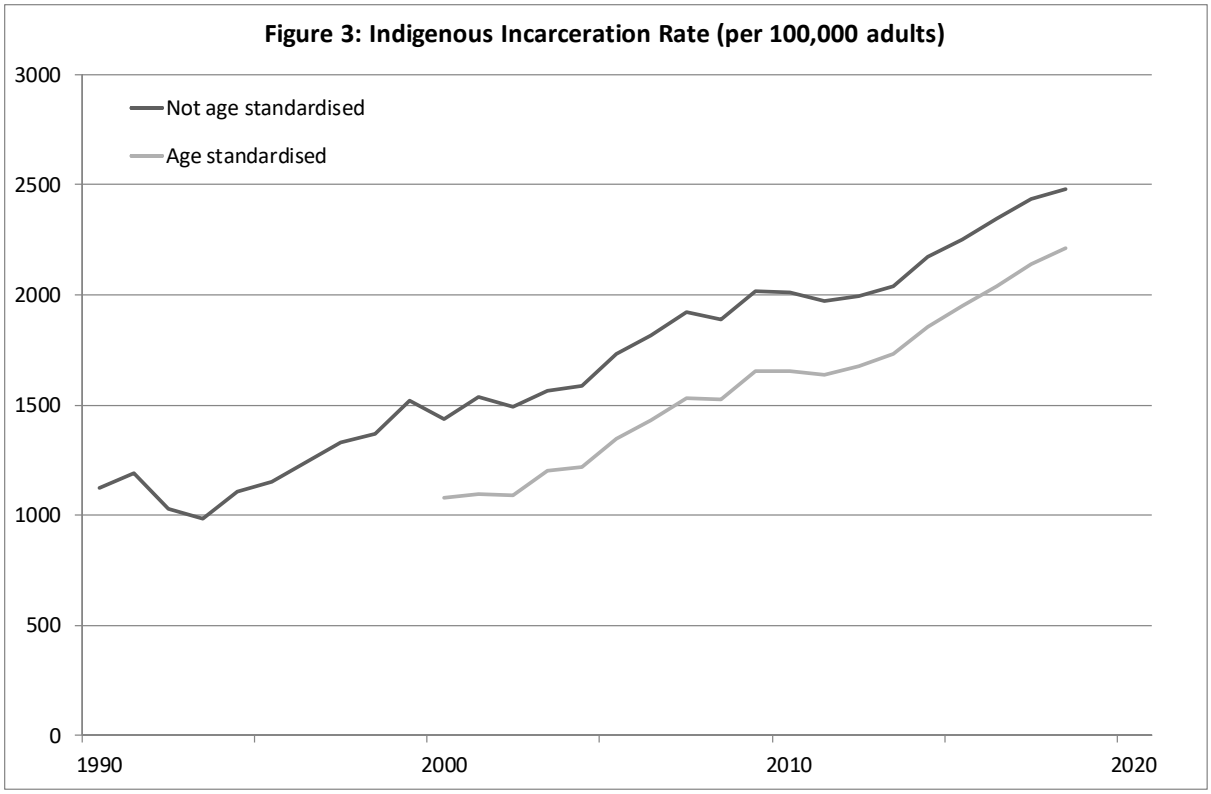
In 1991, the Royal Commission into Aboriginal Deaths in Custody reported that Aboriginal people in custody do not die at a greater rate than non-Aboriginal people in custody. Instead, it found that the large numbers of Indigenous deaths in custody were due to the disproportionate rate at which Indigenous people are incarcerated. In 1988, for example, Indigenous people were 29 times more likely to find themselves in police cell custody (Johnston 1991).

The overrepresentation of Indigenous Australians in the criminal justice process has a long history. Analysing prosecutions in Western Australia, Finnane and Kaladelfos (2016) find that Indigenous people comprised two-thirds of those indicted for homicide in the nineteenth century. However, comparable national data on Indigenous incarceration remain frustratingly incomplete until the late-twentieth century (Weatherburn 2014).

Since 1990, the Australian Bureau of Statistics has reported the Indigenous incarceration rate as a share of the adult population (see ABS 2018 and prior years). However, due to significant changes in estimates of the Indigenous population, these series are not consistent over time. In recent decades, Indigenous Australians have become increasingly willing to identify as Indigenous in the Census (Altman, Biddle and Hunter 2005; ABS 2014, p.61).[4] For example, the same person who identifies as non-Indigenous in the 2001 Census might identify as Indigenous in the 2006 Census.

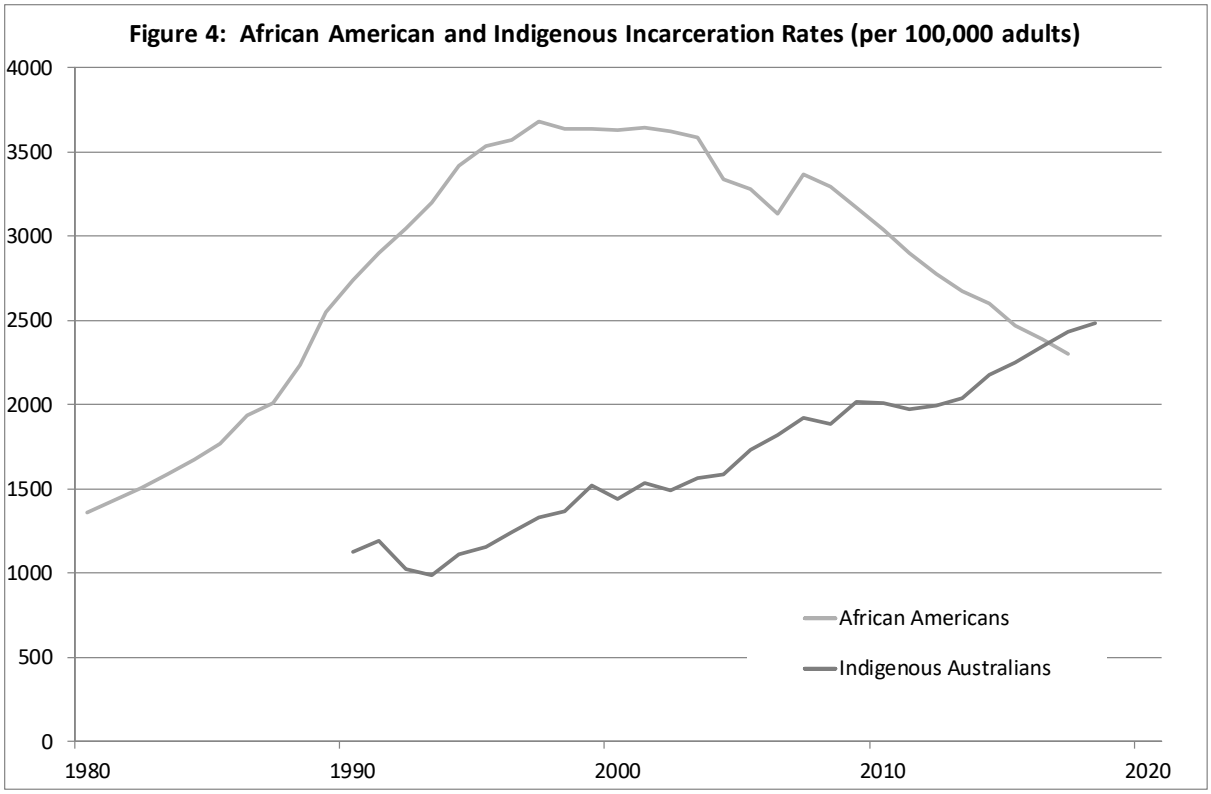
The impact of this change in the denominator is to conceal the true increase in Indigenous incarceration. For example, methodological changes by the Australian Bureau of Statistics carried out between their 2003 and 2005 reports saw the estimated Indigenous incarceration rate fall by one-quarter. Another change from 2013 to 2014 saw the rate fall by one-sixth. Using the overlap years, it is possible to derive an adjustment factor, which can then be applied to earlier years. The Appendix provides further details of how these adjustments are made. A consequence of these adjustments is that my estimated incarceration rate for 1990 is lower than the estimate reported at that time (for example, in the Royal Commission into Aboriginal Deaths in Custody report). The full series is set out in Table A2.

Figure 3 reports the Indigenous incarceration rate over the past three decades. Over this period, the share of Indigenous adults in prison has more than doubled, from 1124 per 100,000 adults in 1990 to 2481 per 100,000 adults in 2018. These rates are so high that it is perhaps simpler to express them as percentages, with the rate rising from 1.1 percent in 1990 to 2.5 percent in 2018. In that most recent year, the Indigenous incarceration rate was even higher in the jurisdictions with the largest Indigenous population. In the Northern Territory (where 30 percent of the population is Indigenous), 2.9 percent of Indigenous adults were incarcerated. In Western Australia (where 4 percent of the population is Indigenous), 4.3 percent of Indigenous adults were incarcerated.



In recent decades, the Australian Bureau of Statistics has also produced an Indigenous incarceration series that takes account of the fact that Indigenous Australians are considerably younger on average than the non-Indigenous population. For example, in 2001, two-fifths of the total Australian population was aged 40 and over, compared with just one-fifth of the Indigenous population. The age-standardised rate reflects what the Indigenous incarceration rate would be if the Indigenous population had the same age distribution as the overall Australian population in 2001. The age-standardised rate is lower than the unadjusted rate, reflecting the fact that Indigenous Australians are more likely to be in the age ranges with the highest imprisonment rates.

If the Indigenous population had the same age distribution as the overall Australian population had in 2001, then the incarceration rate would have been 1079 per 100,000 adults in 2000, and 2210 per 100,000 adults in 2018. Even adjusting for the age composition of the Aboriginal and Torres Strait Islander population, the Indigenous incarceration rate doubled over the first two decades of the twenty-first century. On an age-adjusted basis, the Indigenous incarceration rate in 2018 was 13 times the non-Indigenous incarceration rate (ABS 2018, Table 18).



How does this compare to the rate at which African Americans are incarcerated? United States justice statistics only report the race of sentenced prisoners. In recent years, sentenced prisoners only comprise about two-thirds of all prisoners, so the incarceration rate of sentenced African American prisoners is an underestimate of the overall incarceration rate. I therefore estimate the African American incarceration rate on the assumption that the share of sentenced prisoners among the African American population matches the share of sentenced prisoners among the overall prison population.

The African American incarceration rate series are shown in Figure 4, alongside the Indigenous Australian incarceration rate. In 2000, African Americans were incarcerated at more than twice the rate of Indigenous Australians (3628 per 100,000 adults, compared with 1438 per 100,000 adults). But in the two decades since, the African American incarceration rate has fallen, while the Indigenous incarceration rate has risen.

In 2007, the African American incarceration rate was 75 percent higher than the Indigenous incarceration rate. In 2017, the Indigenous incarceration rate for the first time on record exceeded the African American incarceration rate. In 2017, the African American incarceration rate had fallen to 2304 per 100,000 adults, slightly below the Australian Indigenous incarceration rate of 2433 per 100,000 adults. Indigenous Australians are now more likely to be in prison than African Americans. Based on the available data, incarceration rates for Indigenous Australians are also higher than for Indigenous people in Canada, New Zealand and the United States, leading Noel Pearson to argue that Indigenous Australians are 'the most incarcerated people on the planet Earth'.[5]

These figures are only a snapshot at a single point in time. If incarceration has ongoing impacts, then it is important to also measure the lifetime risk of imprisonment. For the US, Western and Pettit (2010) find that African-American men born in the late-1970s have a 27 percent chance of going to prison (and 68 percent among those who did not complete high school). According to the 2014-15 National Aboriginal and Torres Strait Islander Social Survey, 23 percent of Indigenous men born in the 1970s had spent time in prison (ABS 2016, Table 15).

It is possible that for some cohorts of Indigenous men – such as those without formal educational qualifications living in Western Australia and the Northern Territory – the lifetime incarceration risk exceeds 50 percent.[6] Supporting evidence comes from analysis of police apprehension data in Western Australia. Using administrative data for the 1977 birth cohort, Ferrante (2013) finds that by age 29, 89 percent of Indigenous men had been apprehended by police (ie. formally arrested and charged, or issued with a police summons), compared with 29 percent of the overall male population.

6. Australian Incarceration and Crime Rates

An obvious explanation for the rise in incarceration would be if crime rates had increased commensurately. Measuring crime rates over a long time span turns out to be quite difficult, due to changes in reporting and conviction rates. I therefore begin with the crime that is most comprehensively reported: homicide. Homicide rates tend to track the level of violent crime within a society (UNDOC 2014). Naturally, the correlation between homicide rates and other crime rates is not perfect. Homicide rates may also be affected by factors unrelated to the underlying level of violence in a community, such as access to weapons (which raise the probability that violence will be fatal) and improvements in emergency medicine (which reduce the chances that a victim with a given injury will die).

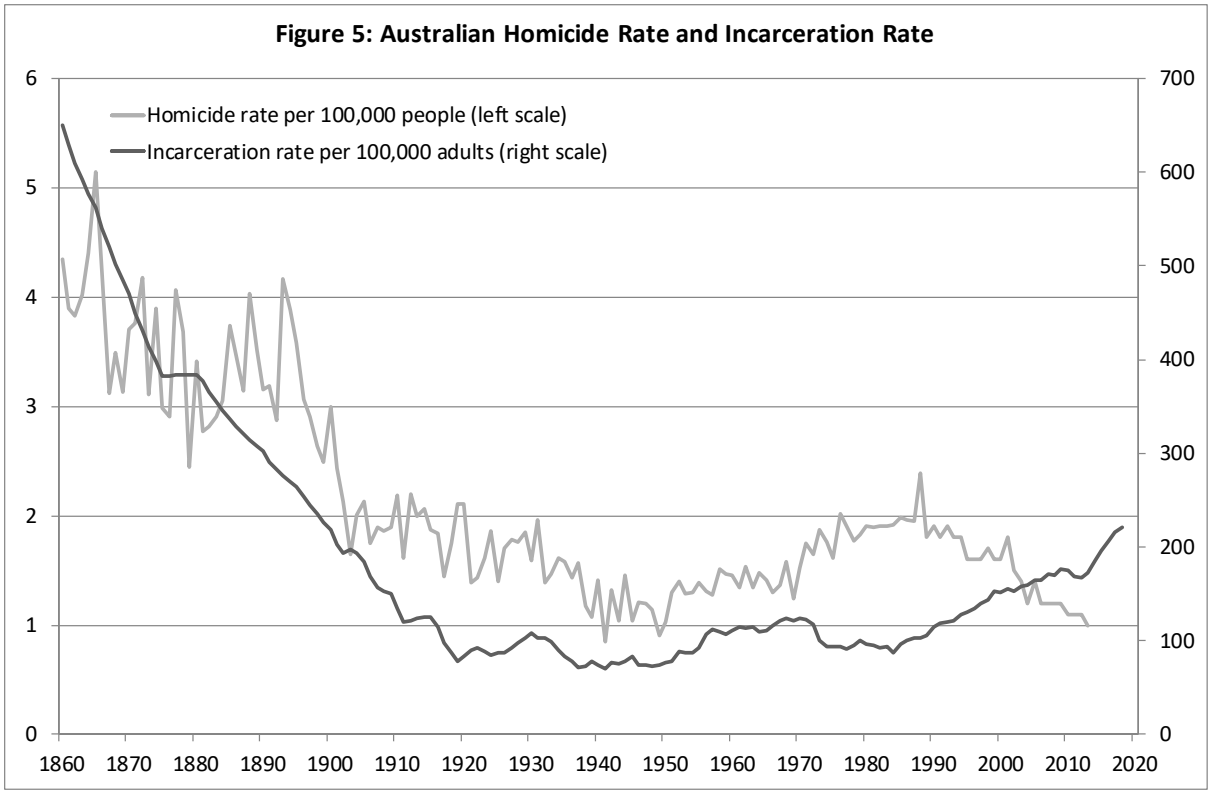
To study the relationship between homicide and incarceration, I construct a long-run homicide series, primarily using data from de Looper (2014) and AIHW (2018). This series covers 1860 to 2013 (the most recent year covered by the National Homicide Reporting Program). So far as I am aware, this is the longest consistent homicide series ever compiled for Australia. Since homicide victims can be of any age, the series shows the homicide rate as a share of all persons (in contrast to the preferred incarceration series, which uses adults as the denominator). Further details are provided in the Appendix.

Figure 5 shows Australian homicide rates, plotted alongside the incarceration rate. The two series track one another from 1860-1900, as homicide rates dropped from 4 to 3 victims per 100,000 people, and incarceration rates fell from around 650 to 220 prisoners per 100,000 adults. This positive relationship between homicide and imprisonment continued until 1970, with both falling in the 1910s and 1930s, and both rising in the 1950s.

By contrast, after 1970, there is a negative relationship between homicide and imprisonment. Homicide rates rose through the 1970s, while incarceration rates fell. In the mid-1980s, both

series changed direction. Since 1985, homicide rates have halved, while the incarceration rate has doubled.

To see this formally, I estimate the correlation between homicide and imprisonment before and after 1970. In the period from 1860 to 1970, the correlation between the homicide rate and the incarceration rate was 0.9. Conversely, in the years 1971 to 2013, the correlation between homicide and incarceration was -0.9. These results invite two conclusions. First, there is no long-term tendency for high imprisonment levels to correlate with low homicide rates. Second, the rise in incarceration over the past generation was not driven by a spike in the homicide rate, which is now at near-historic lows.



Another way of looking at the relationship between crime and incarceration is to estimate the change in crime rates since 1985, being the point at which the most recent rise in incarceration began. Table 1 shows crime rates from around 1985, using victimisation surveys carried out by the Australian Bureau of Statistics. Where possible, I use the 1983 survey. Otherwise, I use the next-closest survey, which was carried out in 1993. These figures are compared with the Australian Bureau of Statistics' 2017-18 *Crime Victimisation Survey*. In the latter survey, I show only physical assaults, since this appears to most closely match the earlier definition of that offence.

Across six crimes that are analysed, motor vehicle theft is down 65 percent, robbery is down 50 percent, break-ins are down 43 percent, and assault and attempted break-in are both down 29 percent. Only the sexual assault rate is unchanged. Weighting offences by their prevalence in the earlier pair of surveys, the overall drop in crime is 38 percent. This is comparable to the 50 percent drop in homicide rates from 1985 to 2013, and is reinforced by other studies

looking at overall crime trends across this era (see eg. Mayhew 2012; Weatherburn and Holmes 2013; Nelson 2015; Queensland Productivity Commission 2019). For example, Payne, Brown and Broadhurst (2019) compare offending rates by age 21 for two NSW birth cohorts: those born in 1984 and those born in 1994. They find that the offending rate of the 1994 birth cohort was around half the offending rate in the 1984 birth cohort, with significant reductions in violent crime, property crime, and drug offences.

Table 1: How Has Crime Changed Since the Mid-1980s?
Table shows victimisation rates for each crime

	1983 or 1993	2017-18	Proportionate change
Robbery	0.60%	0.30%	-50%
Physical assault	3.40%	2.40%	-29%
Sexual assault	0.50%	0.50%	0%
Motor vehicle theft	1.70%	0.60%	-65%
Break-in	4.40%	2.50%	-43%
Attempted break-in	3.10%	2.20%	-29%
Weighted average			-38%

Note: Victimisation rates are for the previous 12 months. Robbery, assault and sexual assault figures are from the 1983 survey. Motor vehicle theft, break-in and attempted break-in are from the 1993 survey. Robbery and assault rates are the share of persons aged 15+. Sexual assault rates are the share of women aged 18+. The remaining crimes are the share of households.

Clearly, crime rates alone do not explain the rise in incarceration. Indeed, if the prison population were proportional to the crime rate, one might expect that a 38 percent fall in crime rates since 1985 would have led to a 38 percent *fall* in the incarceration rate. This would have produced a 2018 incarceration rate of 60 prisoners per 100,000 adults – less than one third of the actual figure of 221 prisoners per 100,000 adults.

Conversely, one might argue that the rise in incarceration was the chief cause of the fall in crime rates. As noted above, a literature review by Chalfin and McCrary (2017) estimates that the elasticity of crime with respect to imprisonment is -0.2. This implies that a 130 percent increase in incarceration rates should have coincided with a 26 percent fall in crime, which is around two-thirds of the 38 percent drop estimated in Table 1.

However, there are reasons to be cautious about such a simple answer. As noted in section 2, there is considerable evidence that the elasticity of crime with respect to imprisonment comes closer to zero as the imprisonment rate rises. Incapacitation is likely to have most impact on crime when prisons comprise those who are in their peak offending years. As a result, sentences that go beyond the age range when individuals are most likely to commit crimes are likely to have a smaller impact on public safety. In 1985, 62 percent of prisoners were aged in their teens and twenties, but by 2018, this figure had fallen to 33 percent (see Appendix for details). It seems improbable that an increasingly grey-haired prison population has been the chief driver of a fall in crime. Deterrence is also likely to be subject to

diminishing returns, with the literature suggesting that doubling the length of sentences does not come close to doubling the deterrent effect – perhaps because potential offenders tend to have high discount rates.

Moreover, the Australian evidence on homicide and crime casts suggests that the long-run pattern is for homicide and imprisonment rates to be *positively* correlated, not negatively correlated. It is difficult to see why incarceration should suddenly be acting as a deterrent to homicide in recent decades, yet not earlier eras. Looking across countries, it is difficult to detect any consistent relationship between crime and incarceration. Since 1990, the overall crime rate has steadily fallen in Australia, Canada and the United States. Yet the incarceration rate has risen in Australia, stayed constant in Canada, and risen then fallen in the United States.

Another point is worth emphasising. Recall that even with a constant elasticity of crime with respect to imprisonment, the number of crimes averted per extra prisoner will fall as the incarceration rate rises and the crime rate falls. This occurs because the elasticity is the ratio of percentage changes. Thus when imprisonment is at a high base, one additional prisoner represents a smaller percentage increase in incarceration. Similarly, when crime is at a lower base, one additional crime represents a larger percentage increase. Formally, where η is the elasticity, δc is the number of crimes averted, c is the total number of crimes, and p is the prison population, the number of crimes averted by an additional prisoner is:

$$\delta c = \frac{\eta c}{p}$$

In the Australian case, this makes a considerable difference. With a 38 percent fall in crime and a 130 percent increase in imprisonment, each additional prisoner averts only one-quarter as many crimes in 2018 as in 1985, *holding the crime-incarceration elasticity constant*. If the crime-incarceration elasticity diminished at higher levels of incarceration (as studies tend to suggest), this pattern would be further magnified.

If incarceration was not the primary driver of Australia's crime drop, then the question remains as to what caused the change. Likely explanations include better community policing (Weatherburn and Holmes 2013), immigration (Wadsworth 2010), and rising incomes (Wan et al 2012). Other contributing factors include the legalisation of abortion in the 1970s and 1980s (Donohue and Levitt 2001; Levitt 2004; Leigh 2014, 119-120), and the removal of lead from petrol in the 1980s (Wolpaw Reyes 2007; Leigh 2014, 120-121). In the case of car theft, laws making electronic immobilisers mandatory on new vehicles from 2001 onwards were a significant factor in reducing crime rates (Brown 2015; Farrell and Brown 2016).

7. Explaining the Recent Rise in Australian Incarceration

A useful starting point for explaining changes in incarceration since the mid-1980s is to document the patterns across Australia's eight states and territories. Although the 1985 prison census did not report incarceration rates, it is straightforward to calculate them by combining

jurisdictional prison counts with demographic statistics. Special care must be taken with the ACT, which had no prison prior to the opening of the Alexander Maconochie Centre in 2008. I therefore assign prisoners held in NSW institutions to the ACT if their last address prior to imprisonment was in the ACT (and remove these prisoners from the NSW count).

Table 2 shows the change in incarceration rates across jurisdictions. Incarceration rose in all states and territories across the period from 1985 to 2018, and the ranking of jurisdictions remained largely unchanged. In absolute terms, the largest increases in incarceration rates occurred in the Northern Territory (up 607 prisoners per 100,000 adults), and Western Australia (up 194 prisoners per 100,000 adults), while the smallest increases in absolute terms were in Victoria and Tasmania. In relative terms, the largest increases were in the ACT (up 207 percent) and South Australia (up 179 percent), while the smallest increases in relative terms were in Queensland (up 105 percent) and Tasmania (up 102 percent).[7] Even the jurisdiction with the smallest relative increase saw a doubling in its imprisonment rate.

Table 2: Changes in Incarceration Rates Across Jurisdictions

Year	Incarceration rate per 100,000 adults in 1985	Incarceration rate per 100,000 adults in 2018	Absolute change from 1985 to 2018	Percentage change from 1985 to 2018
NSW	102.7	221.7	119.0	116%
Vic	63.6	152.3	88.7	140%
Qld	111.0	227.2	116.2	105%
SA	78.4	218.8	140.4	179%
WA	150.0	344.1	194.1	129%
Tas	73.3	148.2	74.9	102%
NT	347.7	955.0	607.3	175%
ACT	49.2	151.0	101.8	207%
Australia	96.3	221.4	125.1	130%

What accounts for the increase in Australian incarceration since 1985? A number of studies have sought to explain the changes. For example, the Queensland Productivity Commission (2019) notes that reported crime rates in Queensland have trended down for the past two decades. They attribute increased incarceration in that state to more reporting of crime, greater policing effort, a stronger propensity of police to use court action (rather than cautions or penalty notices), a higher willingness of courts to impose custodial sentences (rather than home detention or community orders), tighter bail laws and a higher recidivism rate. Other relevant studies include Freiberg and Ross (1999), Cunneen et al (2013), Pratt and Eriksson (2014), Sarre, King and Bamford (2006), Victorian Sentencing Advisory Council (2016) and Weatherburn (2018).

To augment this literature, I study how the prison population has changed over the past generation. Using the National Prison Census for 1985 and 2018, I estimate a number of key

metrics. Details of how the estimates are constructed are provided in the Appendix, and the results are set out in Table 3.

Over this three decade period, the share of women prisoners nearly doubled, from 4.6 percent to 8.4 percent. The share of Indigenous prisoners nearly tripled, from 10.6 percent to 27.6 percent. The average age of prisoners rose by seven years, from 29.0 years old to 36.2 years old. As in other nations (Baidawi et al. 2011), Australian authorities have increasingly had to cope with accommodating a prison population that is markedly older than in the past (Paget 2015b). Taken together, these gender, race and age trends imply that young white men comprise a smaller share of prisoners today than they did a generation ago.

Table 3: How Has the Prison Population Changed Since the Mid-1980s?		
	1985	**2018**
Incarceration rate per 100,000 adults	96.3	221.2
Total prisoners	10,844	42,974
Share female	4.6%	8.4%
Share Indigenous	10.6%	27.6%
Average age	29.0	36.2
Share with prior imprisonment	62.8%	56.7%
Average sentence for sentenced prisoners, ignoring remissions and parole (years)	5.2	4.9
Average time expected to serve for sentenced prisoners (years)	2.4	3.7
Share expected to serve less than 1 year	43.1%	31.5%
Share expected to serve more than 10 years	1.8%	8.6%
Share unsentenced	13.3%	32.3%
Most serious offence convicted/charged:		
Homicide	10.7%	7.4%
Assault (acts intended to cause injury)	6.4%	22.5%
Sexual assault	8.7%	12.3%
Robbery	13.9%	7.5%
Unlawful entry with intent (break and enter)	18.2%	10.2%
Illicit drug offences	10.3%	15.8%

Additionally, Table 3 looks at the share of prisoners with some prior imprisonment. This figure has fallen from 63 percent to 57 percent over the past three decades. This is consistent with the increasing share of women and older people in prisons, and implies that incarceration is shifting to include a lower-risk population today than in the 1980s.

I also estimate the average sentence length. Prison statistics report multiple sentence measures, and it is instructive to look at trends in these different metrics. The 'aggregate sentence length' is the longest period that an offender may be detained under sentence in the current episode, ignoring any possibility of remissions or parole. This measure has fallen by about 5 percent, from 5.2 years to 4.9 years. Although the data are imperfect, there is also some evidence that the variance of sentence lengths has decreased (see Appendix for details).

However, from the point of view of prisoners and taxpayers, what matters most are not the sentences that are handed down, but the sentences that are actually served, taking account of likely remissions and parole. Here, the data paint an entirely different picture. Since 1985, average time served in prison has risen by 56 percent, from 2.4 years to 3.7 years. The share of sentenced prisoners expected to be in prison for less than one year has dropped from 43 percent to 31 percent, while the share of sentenced prisoners expected to be incarcerated for more than a decade has risen from 2 percent to 9 percent.

In the bottom row of Table 3, I look at the share of prisoners who have not been sentenced. This shows a considerable increase, from 13 percent to 32 percent. Much of this increase took place in the last two decades, with the share of prisoners who were unsentenced being 14 percent in 1998, 23 percent in 2008, and 32 percent in 2018 (ABS 2008, 2018). As Sarre (2018) notes, 'That rate takes Australia, for the first time in its modern history, out of the 15 to 30 per cent range – which includes Britain, the United States, Canada, Russia, Israel, Poland, New Zealand and Germany — and into the 30 to 50 per cent group with countries including Brazil, Thailand, Papua New Guinea, France and Mexico.'

In 2018, the share of prisoners who are unsentenced was particularly high among those charged with assault (45 percent), and illicit drug offences (36 percent). Half of all unsentenced prisoners have been incarcerated for over 3 months, and one in ten unsentenced prisoners have been in prison for over 14 months (ABS 2018). Adverse impacts of prison – which may include severing ties to labour markets and social networks, damaging prisoners' physical and mental health, and harming the children of inmates – all affect unsentenced as well as sentenced prisoners. I return below to the impact of unsentenced prisoners on the overall prison population.

There are also clear patterns in the offences for which prisoners have been charged or convicted. Compared with a generation ago, a smaller share of prisoners are behind bars for homicide, robbery or unlawful entry with intent (the category formerly known as break and enter). But a larger share of prisoners are incarcerated for sexual assault, illicit drug offences, and assault (reported in the prison survey as 'acts intended to cause injury'). The increased share of prisoners convicted of assault is especially striking, with the share more than tripling from 6 percent to 23 percent of all prisoners. One reason for the rising number of people imprisoned for assaults is that, according to crime victimisation surveys, Australians show a greater willingness to report assaults to police (Mayhew 2012; Nelson 2015).

Standardised sentencing laws and mandatory sentences have raised the probability that a given offence will result in incarceration, and increased sentence lengths (Law Council of Australia 2014).[8] A range of new offences have also been created since the mid-1980s, including one-punch laws, knife possession, bushfire arson, and cybercrimes.

Weatherburn (2018) argues that the role of policing policy is even more important than penal policy. He gives the example of the offence in NSW of stalking/intimidation, for which convictions rose from 2 to 4166 over the seven years from 2009 to 2016. Weatherburn notes that in recent decades, police have been urged to take a tougher line on a number of crimes,

'including trafficking in "party" drugs, family violence, gun crime and alcohol-related violence'. Policing of family violence may be especially important, given that around of one-third of all violence is committed by intimate partners (ABS 2017, Table 1.1).

Another way of presenting the data is by calculating the ratio of prisoners to offences for specific crimes. Naturally, this has some limitations. Crimes are not always defined the same way over time, nor do the crime definitions in victimisation surveys necessarily match those in prison records. Prison records are tabulated by the most serious offence, so will undercount less serious crimes. Additionally, there will be lags, as prisoners are not immediately convicted, and may then spend multiple years in prison.

Bearing in mind all these limitations, I have identified four crimes for which it is possible to estimate the ratio of prisoners to victims: homicide, assault, sexual assault and robbery. The results of this analysis are shown in Table 4. For each offence, the ratio of prisoners to victims more than doubled. For homicide (the crime least subject to changes in definition and reporting rates), the number of prisoners per victim rose from 3.7 in the mid-1980s to 12.2 in the recent era. The rise in the ratio of prisoners to victims is greatest in the case of assaults. In the mid-1980s, there were 0.002 prisoners incarcerated for assault for every assault victim. By 2018, there were 0.02 prisoners for every assault victim – more than a tenfold increase.[9] Compared with a generation ago, the perpetrator of an assault is significantly more likely today to end up behind bars.

Table 4: Prisoners per crime victim
Table shows the number of prisoners convicted or charged for that offence, divided by the number of victims reporting the offence

	Circa 1985	Circa 2018	Increase
Homicide	3.7	12.2	232%
Physical assault	0.002	0.020	1055%
Sexual assault	0.036	0.105	196%
Robbery	0.023	0.064	176%

Note: Homicide victimisation rates are for 1985 and 2013 (the latter being the most recent available year), and prison statistics are for the same years. Physical assault, sexual assault and robbery victimisation rates are from surveys conducted in 1983 and 2017-18, and prison statistics are for 1985 and 2018 respectively.

Finally, the prison statistics make it possible to explore a counterfactual in which sentence lengths and bail laws did not change. To estimate the change in expected sentence lengths and changes in bail laws on the prison population, Table 5 sets out the results from two hypothetical exercises. First, suppose that mean sentence lengths had remained at their 1985 levels (but the share of unsentenced prisoners was at 2018 levels). In this case, the imprisonment rate would have been 168 prisoners per 100,000 adults. Alternatively, suppose that the share of unsentenced prisoners had remained at its 1985 level (but mean sentence lengths were at 2018 levels). In this hypothetical, the incarceration rate would have been 179 prisoners per 100,000 adults.

Table 5: What Effect Did Sentence Length and Bail Law Changes Have on the Prison Population?
Actual incarceration rate in 2018
221.2 per 100,000 adults
Hypothetical rate if average expected sentences had not risen since 1985
167.6 per 100,000 adults (explains 43% of total change)
Hypothetical rate if share unsentenced had not risen since 1985
179.2 (explains 34% of total change)
Hypothetical rate if average expected sentences had not risen and share unsentenced had not risen since 1985
125.6 per 100,000 adults (explains 77% of total change)

Assuming there are no interactions between these two hypotheticals, it is possible to simply add them together to derive a hypothetical in which both sentence lengths and the share of unsentenced prisoners had remained at their 1985 levels.[10] In this case, the incarceration rate would have been 126 prisoners per 100,000 adults. This implies that rising sentence lengths account for 43 percent of the increase in incarceration, and that changes in bail laws account for 34 percent of the increase. Together these two effects could account for 77 percent of the rise in Australia's prison population.

Like most hypothetical exercises, this one is not without its limitations. If stricter bail laws and longer sentences had the effect of incapacitating people who would otherwise commit offences, then these hypotheticals will overstate the reduction in imprisonment that would be achieved by shifting back to the bail and sentencing approaches of the mid-1980s. In interpreting the results, it is also worth recognising that the results in Table 5 may be capturing not only statutory changes, but also shifts in the composition of those who come before the courts, and the amount of evidence adduced by the prosecution.

8. Conclusion

Australian prisons are operating at 116 percent of their design capacity (Productivity Commission 2019, p.8.17). In several jurisdictions, prisons overcrowding has led to health problems for inmates, stresses on prison staff, and the threat of greater violence. In 2015, the NSW Inspector of Custodial Services reported that prison overcrowding had led to doubling up (or even tripling up) of prisoners in cells, and reduced the average amount of time spent out of cells to 8 hours a day (Paget 2015a). In 2016, the Western Australian Inspector of Custodial Services reported that the state's prison system was 'unsustainably stretched'.

States and territories have responded with capital programs. For example, the 2019 Victorian budget included $1.8 billion for building a new prison in Geelong and adding beds to existing prisons, with spending on corrections rising more rapidly than spending on hospitals, schools or social housing (Millar and Vedelago 2019). Other states are in a similar position (see eg Queensland Productivity Commission 2019), suggesting that new prison facilities could cost Australian taxpayers several billion dollars in coming years.

Recall that recurrent spending on prisons totals $4.7 billion annually, or $240 for every Australian adult. Consequently, if the incarceration rate had remained at its 1985 level, Australia would have saved $2.6 billion. Put another way, the rise in incarceration since the mid-1980s costs every Australian adult $140 annually.

Rising incarceration rates can have the effect of distorting other economic statistics. For the purposes of calculating the unemployment rate, the *Labour Force Survey* includes a sample of prisoners. They are as classed as 'institutionalised' in 'non-private dwellings', and automatically classified as 'not in the labour force' (neither employed nor unemployed). If the entire prison population were instead classified as 'unemployed' in 2018, the effect would have been to increase the unemployment rate by 0.3 percentage points. By contrast, classifying all prisoners as unemployed in 1985 would only have increased the unemployment rate by 0.1 percentage points.

For inmates that are not a threat to the community, non-custodial sentencing options that allow people to maintain social and employment ties may help reduce the loss of social and human capital that occurs as a result of incarceration. There could also be straightforward ways of helping prisoners stay in touch with loved ones, such as reducing the cost of telephone calls (ACCAN 2016). This might also have the effect of reducing the adverse effect of parental incarceration on children.

Within prison, policies to increase formal education levels would be worth contemplating, lest prisons merely serve as 'universities of crime'. With fewer than one-fifth of inmates completing a formal qualification, there is considerable scope for experimenting with strategies to increase the educational levels of prisoners. In the post-release environment, Australian researchers could consider conducting random audit studies to estimate the extent of hiring bias towards ex-prisoners, in the manner of Pager (2003). Policies might then be crafted to ensure that employers do not unnecessarily discriminate against those with criminal records – taking account of the issue of statistical discrimination (Agan and Starr 2017).

As Kleiman (2009) notes, policymakers may have placed too much emphasis over recent years on the severity of the punishment and not enough on the issues of certainty and swiftness. Focusing on certainty, improving the quality of rehabilitation programs, and intervening early with youth programs such as a cognitive behavioural therapy help reduce the incarceration rate. Youth-focused programs do not have to have high success rates in order to justify their cost, given that the recurrent cost of prison is about ten times as high as the recurrent cost of school. For a range of other evidence-based solutions, see Sarre (2017).

Australian state policymakers could draw on the body of research that has seen the United States reduce both crime and incarceration (eg. Aos et al 2006; Pew Charitable Trusts and MacArthur Foundation 2015; Council of Economic Advisers 2016). It may also be useful to collaborate with New Zealand, the country whose incarceration rates most closely track Australia's. Better evaluation of criminal justice programs is essential, including making more use of randomised trials where feasible (see Leigh 2018 for examples).

Ultimately, the challenge is moral as well as economic. As Churchill (1910) noted:

> 'the mood and temper of the public in regard to the treatment of crime and criminals is one of the most unfailing tests of civilisation of a country. A calm and dispassionate recognition of the rights of the accused against the State, and even those of convicted criminals against the State, a constant heart searching by all charged with the duty of punishment, a desire and eagerness to rehabilitate in the world of industry all those who have paid their dues in the hard coinage of punishment, tireless efforts towards the discovery of curative and regenerating processes, and an unfaltering faith that there is a treasure, if you can only find it, in the heart of every man—these are the symbols which in the treatment of crime and criminals mark and measure the stored-up strength of a nation and are the sign and proof of the living virtue in it.'

The rise in Australian incarceration rates over the past generation is a policy choice, not an accident. While rates for most crimes have fallen, governments have deliberately chosen policies that have toughened bail laws and increased the amount of time that the typical prisoner serves.

As a consequence, 0.22 percent of adults in 2018 were in prison – a higher share than at any time since Federation. Australia's incarceration rate is above the rate in Canada and in England and Wales. Although Australia's imprisonment rate is still well below the rate in the United States, that country has seen a marked drop in imprisonment rates over the past decade, while Australia has gone in the opposite direction.

Among Indigenous Australian adults, the rate of incarceration is 2.5 percent, which is higher than the rate at which African-American adults are imprisoned. Over the course of a lifetime, a significant share of Indigenous people are incarcerated. Among Indigenous men born in the 1970s, almost one in four have spent time in prison. Nine-tenths of Western Australian Indigenous men in born in the late-1970s have been arrested, charged or summonsed by police.

Mass incarceration has likely reached the point at which its costs outweigh its benefits. Even if the elasticity of crime with respect to incarceration did not diminish, each additional prisoner averts only one-quarter as many crimes as in the mid-1980s. It is likely that more rational criminal justice policies would save taxpayers money, improve community safety, and avoid the scarring effect of prison on offenders and their families. Better policies would avert a second convict age, and produce a society with less crime, and less punishment.

Appendix

For the derivation of long-run incarceration rates for Australia, Canada, England and Wales, New Zealand and the United States, see the Appendix to Leigh (2020).

Indigenous Incarceration Rates

As noted in the text, Indigenous incarceration rates have been subject to significant revisions over time, due to changes in the Indigenous population denominator (unfortunately, while the Australian Bureau of Statistics produces a backcast population series, this only goes back to 1996: see ABS 2014). The most significant revision in Indigenous incarceration rates occurred between the *Prisoners in Australia 2003* and *Prisoners in Australia 2005* publications, which saw the estimate of Indigenous incarceration in 1995 fall from 1682 to 1335 (by a factor of 1.26). Another significant revision occurred between the *Prisoners in Australia 2013* and *Prisoners in Australia 2014* publications, which saw the estimate of Indigenous incarceration in 2004 fall from 1839 to 1590 (by a factor of 1.16). I adjust the series for prior years by scaling down the reported Indigenous incarceration rate from *Prisoners in Australia 2005* to *Prisoners in Australia 2013* by a factor of 1.16, and further scaling down the reported Indigenous incarceration rate in *Prisoners in Australia 2004* and prior years by a factor of 1.46 (1.26×1.16).

Similarly, I adjust the age-adjusted Indigenous incarceration rate reported in *Prisoners in Australia 2013* and prior years by a factor of 1.16 (this series is not reported prior to 2000, so only one adjustment is required).

Prisoner Characteristics in 1985 and 2018

In comparing sentence lengths in 1985 and 2018, I use the 1985 National Prison Census (ABS 1986, Tables 10 and 35) and the 2018 National Prisoner Census (ABS 2018, Table 1). Sentenced prisoners include those with no appeal current; awaiting appeal; unfit to plead; and not guilty on grounds of insanity. Unsentenced prisoners include those who are unconvicted awaiting court hearing or trial; awaiting sentence; and awaiting deportation. The 1985 calculation excludes the 35 Queensland prisoners whose status is listed as ‘unknown’. The 2018 calculation excludes 86 prisoners subject to ‘post-sentence detention’.

In calculating the mean aggregate sentence length and the mean actual expected sentence length for 1985, I assume that prisoners receive a sentence in the midpoint of the range (eg. that the average sentence for those reported as 1-2 years is 1.5 years). The highest reported band is 10 years and over, so for sentences in this range, I assume that the distribution of those in this range matches the distribution of 10+ year sentences in 2018. For aggregate sentences, this distribution is 56 percent 10-14.9 years, 20 percent 15-19.9 years and 24 percent 20 years and over. These categories are coded as being in the midpoint of the range, with 20 years and over coded as 22.5 years. The same approach is applied to expected sentence lengths, where the distribution of 10+ year sentences in 2018 was 46 percent 10-14.9 years, 29 percent 15-19.9 years and 25 percent 20 years and over.

Table 2 reports the share of prisoners with expected sentences of less than 1 year and 10 years or more in the 1985 and 2018 surveys. A similar calculation can be carried out for aggregate sentences. Those with an aggregate sentence length of less than 1 year made up 22.4 percent of prisoners in 1985, and 16.2 percent of prisoners in 2018. Those with an aggregate sentence length of 10 years or more comprised 13.4 percent of prisoners in 1985 and 13.2 percent of prisoners in 2018. These figures suggest that the variance of aggregate sentence lengths has also fallen slightly over this period, along with the mean aggregate sentence length.

For both 1985 and 2018, ages are presented in bands (see ABS 1986, Table 2 and ABS 2018, Table 4). I assume that those incarcerated are at the midpoint of each age band, coding those aged under 16 in 1985 as 15, those aged under 18 in 2018 as 17, and those aged 65+ as 67 years old. As a check on these estimates, I calculate the share aged under 30 and 50+ in both years. Over this period, the share of prisoners aged under 30 fell from 62 percent to 33 percent, while the share of prisoners aged 50+ rose from 4 percent to 13 percent.

Prior imprisonment rates are from ABS (1986, Table 9A) and ABS (2018, Table 9). Offence/charge breakdowns are from ABS (1986, Table 22) and ABS (2018, Table 3).

Crime Rates

Homicide rates for 1860-1906 are from data supplied by Michael de Looper, based on data collected for his PhD thesis (de Looper 2014). These data are compiled from annual reports of each of the six colonial registrars and statisticians (during the colonial era, what is now the Northern Territory was part of South Australia, and what is now the Australian Capital Territory was part of New South Wales). As de Looper noted in an email to me, the completeness and accuracy of colonial deaths reporting is variable, since different cause-of-death classifications were used in the colonies at different times, and the judicial and coronial determination of homicide varied. In addition, Indigenous homicides were most likely underreported. The series is based on only Victoria in 1860-1861. This was then supplemented by data for South Australia (from 1862), New South Wales (from 1863), Queensland (from 1864), Tasmania (from 1868) and Western Australia (from 1869), with the population denominator adjusted accordingly.

Homicide rates for 1907-1909 are from the Griffith University Prosecution Project, compiled by Mark Finnane. These are based on counts of court prosecutions for homicide, which are then scaled down by 77 percent, being the ratio of homicide trials to officially recorded homicides in AIHW (2018).

Homicide rates from 1910 to 1988 are from the *General Record of Incidence of Mortality* books (AIHW 2018), covering assault, which includes ICD-10 categories X85 to Y09. Deaths in previous years, categorised in successive years using ICD-1 to ICD-9 codes, have been recoded to match the ICD-10 coding system. These figures have been used by others writing about Australian homicide (eg. Mouzos 2000, p.9).

From 1989 to 2013, figures are from the National Homicide Reporting Program, available at http://crimestats.aic.gov.au/NHMP/. These are reported on a fiscal year basis, and I attribute them to the earlier calendar year (eg. 1989-90 is attributed to 1989). At the time of writing, the most recent year available in the National Homicide Reporting Program dataset is 2013-14.

Data for other crimes are from the 1983 National Crime Survey and the 1993 Crime and Safety Survey, both reported in ABS 1994. The most recent year's figures are from the 2017-18 Crime Victimisation Survey (ABS 2019). All figures are the share who have experienced that crime in the previous 12 months. Robbery, assault and sexual assault figures are from the 1983 survey. Motor vehicle theft, break-in and attempted break-in are from the 1993 survey (break-in was previously referred to as break and enter). Robbery and assault rates are as a share of persons aged over 15. Sexual assault rates are as a share of women aged over 18 (since the 1983 survey did not ask about the sexual assault of men). Motor vehicle theft, break-in and attempted break-in estimates are as a share of households. In the 2017-18 survey, I use the rate of physical assaults, since this appears to most closely match the definition used in 1983. The weighted average change reported in Table 1 uses rates in 1983/1993 (eg. assault has a prevalence of 3.4 percent, so receives twice the weighting of motor vehicle theft, with a prevalence of 1.7 percent).

African American Incarceration Rates

United States justice statistics only report the race of sentenced prisoners, so the incarceration rate of sentenced African American prisoners is an underestimate of the overall incarceration rate. I therefore also estimate the African American incarceration rate on the assumption that the share of sentenced prisoners among the African American population matches the share of sentenced prisoners among the overall prison population. As with estimates of the total incarcerated population, the African American imprisonment rate includes those held in local jails and in state and federal prisons, and excludes people on probation or parole.

Table A1: Incarceration and homicide rates						
	Incarceration rate per 100,000 adults					Homicide rate per 100,000 people
Year	Australia	Canada	England & Wales	New Zealand	United States	Australia
1850					55.9	
1851					63.7	
1852					71.0	
1853					77.7	
1854					84.0	
1855					89.9	
1856					95.4	
1857					100.5	
1858					105.4	
1859					110.0	
1860	650.5		89.5		114.3	4.3
1861	628.5		90.7		119.5	3.9
1862	609.1		91.9		124.5	3.8
1863	591.7		93.1		129.2	4.0
1864	576.3		94.3		133.7	4.4
1865	562.4		95.6		138.0	5.1
1866	540.4		96.8		142.1	4.2
1867	520.2	164.2	98.0		146.0	3.1
1868	501.9	143.1	99.6		149.7	3.5
1869	485.0	121.6	101.1		153.3	3.1
1870	469.6	121.1	102.7		156.8	3.7
1871	449.5	108.6	104.2		163.1	3.8
1872	431.0	92.8	105.7		169.1	4.2
1873	413.7	84.9	106.9		174.7	3.1
1874	397.8	99.3	108.0		180.0	3.9
1875	382.7	121.6	109.1		184.9	3.0
1876	382.9	150.4	110.3		189.6	2.9
1877	383.0	152.9	111.4		194.0	4.1
1878	383.1	150.3	110.8		198.2	3.7
1879	383.2	159.2	110.3		202.2	2.4
1880	383.3	157.5	109.7		206.0	3.4
1881	377.5	154.8	109.2	249.7	207.9	2.8
1882	365.7	140.9	108.6	220.3	209.7	2.8
1883	355.0	136.8	106.2	205.9	211.5	2.9
1884	345.1	125.4	103.8	205.0	213.1	3.1
1885	336.0	132.2	101.4	186.4	214.6	3.7
1886	328.1	140.6	99.0	192.2	216.1	3.5
1887	320.8	133.8	96.6	208.2	217.5	3.1
1888	314.0	124.4	95.0	189.3	218.8	4.0
1889	307.7	133.8	93.3	183.3	220.0	3.5
1890	301.7	137.9	91.6	159.6	221.2	3.2
1891	290.0	135.5	90.0	148.7	222.0	3.2
1892	283.1	131.4	88.3	126.6	222.7	2.9
1893	276.5	126.0	87.6	127.9	223.4	4.2
1894	270.1	127.4	87.0	137.2	224.1	3.9
1895	263.8	131.3	86.4	139.9	224.7	3.6
1896	254.1	138.0	85.7	134.8	225.3	3.1
1897	244.6	138.4	85.1	152.6	225.9	2.9
1898	235.4	142.7	86.6	130.8	226.4	2.6
1899	226.5	140.5	88.1	121.0	227.0	2.5
1900	217.8	136.2	84.7	118.0	227.5	3.0
1901	203.2	130.0	91.2	142.9	227.1	2.4
1902	193.2	111.3	92.4	124.9	226.5	2.1
1903	196.8	111.0	97.8	136.2	226.1	1.6

Table A1: Incarceration and homicide rates						
	Incarceration rate per 100,000 adults					Homicide rate per 100,000 people
Year	Australia	Canada	England & Wales	New Zealand	United States	Australia
1904	194.0	114.0	99.8	133.4	225.5	2.0
1905	184.4	113.6	99.2	138.4	224.5	2.1
1906	168.3	117.3	96.1	146.8	223.6	1.8
1907	156.4	110.0	94.5	136.3	222.9	1.9
1908	152.5	110.0	98.9	136.8	221.9	1.9
1909	149.7	127.8	97.3	144.1	220.8	1.9
1910	134.3	130.5	91.5	131.0	219.4	2.2
1911	120.2	126.6	86.0	126.4	215.3	1.6
1912	121.1	125.7	83.6	123.0	211.3	2.2
1913	124.3	126.8	77.7	127.5	206.7	2.0
1914	125.6	125.1	66.4	144.3	202.2	2.1
1915	125.7	127.5	50.8	137.7	198.9	1.9
1916	114.2	112.4	46.4	123.6	195.6	1.8
1917	97.7	105.8	45.2	139.5	192.9	1.4
1918	86.8	102.0	43.1	143.0	194.3	1.7
1919	77.7	108.5	42.2	119.3	190.1	2.1
1920	83.5	116.5	44.6	133.6	185.8	2.1
1921	89.3	136.2	48.3	134.7	182.0	1.4
1922	92.0	141.3	46.3	126.8	179.3	1.4
1923	88.3	125.5	43.1	133.7	175.6	1.6
1924	84.8	128.2	40.9	136.0	184.2	1.9
1925	86.7	133.0	39.6	143.8	193.3	1.4
1926	87.8	131.2	40.5	154.1	202.0	1.7
1927	92.6	134.5	41.2	163.2	210.2	1.8
1928	97.2	141.1	40.4	153.8	218.2	1.8
1929	103.5	157.8	39.1	142.0	226.1	1.8
1930	108.8	176.9	40.4	156.8	233.2	1.6
1931	102.9	193.9	41.1	163.1	241.1	2.0
1932	102.4	200.9	44.6	153.8	248.8	1.4
1933	98.6	188.4	44.9	138.3	256.3	1.5
1934	89.4	174.3	42.0	117.1	262.9	1.6
1935	83.3	152.1	38.3	107.7	269.4	1.6
1936	77.4	158.2	35.6	88.8	275.8	1.4
1937	71.8	170.6	35.1	76.0	282.1	1.6
1938	73.0	184.9	36.6	72.4	287.9	1.2
1939	77.7	174.3	33.8	82.1	293.4	1.1
1940	74.4	172.5	32.1	79.7	298.1	1.4
1941	70.7	154.0	37.5	91.2	292.7	0.8
1942	76.4	135.4	44.3	95.8	287.6	1.3
1943	75.3	139.3	40.2	96.8	282.6	1.0
1944	78.2	142.2	40.4	87.2	277.9	1.5
1945	83.3	142.5	45.8	87.9	273.5	1.0
1946	74.3	144.2	49.1	84.7	269.5	1.2
1947	74.2	151.5	53.0	92.1	265.3	1.2
1948	73.0	160.2	60.9	81.9	261.0	1.1
1949	74.7	165.8	61.0	78.1	256.6	0.9
1950	76.4	178.9	62.9	84.4	252.0	1.0
1951	78.5	167.6	67.1	82.6	257.1	1.3
1952	88.2	169.3	72.8	83.8	262.3	1.4
1953	87.0	171.5	72.4	82.5	267.5	1.3
1954	86.7	177.7	68.6	89.4	272.3	1.3
1955	92.8	180.9	64.5	83.2	277.0	1.4
1956	106.6	170.8	63.3	99.7	281.5	1.3
1957	111.7	156.3	68.5	105.6	285.8	1.3

Table A1: Incarceration and homicide rates						
	Incarceration rate per 100,000 adults					Homicide rate per 100,000 people
Year	Australia	Canada	England & Wales	New Zealand	United States	Australia
1958	109.6	162.3	76.7	116.1	290.4	1.5
1959	107.1	174.0	80.1	118.0	294.4	1.5
1960	110.3	187.1	81.0	122.1	297.9	1.5
1961	115.3	180.7	86.5	122.5	294.4	1.3
1962	113.2	184.6	91.8	113.5	291.7	1.5
1963	114.9	179.2	90.9	114.4	289.2	1.3
1964	109.7	183.0	86.6	109.1	286.8	1.5
1965	110.5	185.6	88.1	103.5	282.3	1.4
1966	115.9	181.3	95.1	116.8	278.5	1.3
1967	121.1	158.0	100.0	120.6	274.8	1.4
1968	124.4	154.2	92.4	121.6	271.4	1.6
1969	121.8	155.7	98.4	117.3	268.0	1.2
1970	124.0	161.1	110.6	132.6	264.1	1.5
1971	122.0	158.1	111.9	144.8	252.1	1.7
1972	117.3	161.2	107.6	141.4	240.4	1.6
1973	99.7	178.4	103.0	134.0	250.8	1.9
1974	94.2	182.1	103.1	123.7	260.7	1.8
1975	93.2	128.1	111.0	136.1	269.9	1.6
1976	93.4	129.3	115.1	138.7	278.6	2.0
1977	90.8	130.5	114.9	138.4	287.0	1.9
1978	95.0	131.8	115.0	132.3	295.0	1.8
1979	100.1	128.0	115.4	130.0	301.1	1.8
1980	96.3	129.0	114.8	130.5	307.8	1.9
1981	94.7	134.9	116.9	113.2	334.9	1.9
1982	92.0	147.7	117.4	119.1	362.7	1.9
1983	93.7	145.4	115.9	119.4	378.1	1.9
1984	87.6	146.7	114.6	130.2	393.9	1.9
1985	96.3	143.5	121.4	96.5	424.5	2.0
1986	100.1	138.9	122.1	114.4	459.8	2.0
1987	103.3	135.4	125.7	130.7	479.1	1.9
1988	102.9	137.4	126.2	136.8	524.4	2.4
1989	105.8	142.8	124.6	142.5	588.4	1.8
1990	114.4	140.9	115.0	160.8	619.6	1.9
1991	118.2	146.3	114.2	160.6	649.5	1.8
1992	120.6	149.3	113.7	167.7	681.6	1.9
1993	121.6	152.6	113.1	159.8	711.9	1.8
1994	128.3	155.1	123.3	161.2	759.2	1.8
1995	130.3	153.4	129.1	162.4	805.6	1.6
1996	134.1	151.2	139.8	179.2	826.6	1.6
1997	139.1	144.8	154.0	187.0	864.3	1.6
1998	143.1	141.8	163.9	193.1	888.0	1.7
1999	152.8	136.0	161.7	194.9	922.5	1.6
2000	151.9	133.9	160.3	207.3	927.3	1.6
2001	154.8	133.0	163.5	196.3	924.6	1.8
2002	152.8	132.6	173.4	198.7	947.0	1.5
2003	157.7	129.0	177.7	206.2	961.5	1.4
2004	159.6	128.8	180.4	220.9	973.4	1.2
2005	165.0	132.3	181.7	243.8	991.2	1.4
2006	165.2	138.3	185.1	244.5	1004.6	1.2
2007	170.9	140.4	188.3	237.8	1010.7	1.2
2008	169.5	141.2	192.0	252.7	1004.5	1.2
2009	175.8	139.8	192.7	256.5	987.7	1.2
2010	175.0	141.1	193.5	265.9	968.9	1.1
2011	168.8	142.6	194.5	260.4	947.5	1.1

Table A1: Incarceration and homicide rates						
	Incarceration rate per 100,000 adults					Homicide rate per 100,000 people
Year	Australia	Canada	England & Wales	New Zealand	United States	Australia
2012	167.3	142.5	194.6	260.4	928.6	1.1
2013	172.0	130.5	188.0	248.6	915.9	1.0
2014	185.9	138.5	188.8	252.9	908.0	
2015	195.8	139.0	187.9	254.3	878.2	
2016	207.2	136.3	185.7	271.2	865.8	
2017	215.8		185.2			
2018	221.2					

Table A2: Incarceration rate per 100,000 adults for Indigenous Australians and African-Americans			
	Indigenous Australians	**Indigenous Australians (age-adjusted)**	**African-Americans**
1980			1,360.0
1981			1,436.9
1982			1,506.3
1983			1,584.7
1984			1,673.1
1985			1,772.5
1986			1,938.9
1987			2,011.1
1988			2,236.2
1989			2,547.9
1990	1,124.3		2,736.6
1991	1,193.1		2,902.6
1992	1,027.8		3,043.8
1993	987.1		3,198.4
1994	1,110.1		3,419.6
1995	1,154.2		3,534.0
1996	1,241.5		3,572.9
1997	1,331.9		3,680.5
1998	1,367.1		3,641.0
1999	1,519.6		3,640.1
2000	1,438.4	1,079.0	3,628.5
2001	1,536.1	1,094.6	3,642.3
2002	1,493.2	1,090.6	3,623.7
2003	1,566.1	1,204.7	3,585.8
2004	1,589.6	1,221.3	3,338.2
2005	1,732.5	1,345.0	3,278.5
2006	1,818.4	1,432.0	3,132.9
2007	1,923.3	1,531.4	3,368.5
2008	1,888.0	1,524.4	3,297.4
2009	2,018.7	1,652.1	3,169.5
2010	2,013.3	1,655.7	3,041.2
2011	1,972.8	1,637.8	2,902.8
2012	1,993.8	1,677.9	2,778.3
2013	2,040.3	1,730.9	2,671.2
2014	2,174.5	1,857.2	2,602.4
2015	2,252.6	1,951.0	2,469.1
2016	2,345.9	2,038.6	2,389.2
2017	2,433.6	2,141.6	2,304.4
2018	2,481.0	2,209.8	

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Notes

[1] I have been unable to find reliable data on the average number of children per prisoner in Australia in the 1980s. However, the substantial increase in the average age of prisoners (combined with only a small fall in fertility rates) makes it likely that there were fewer than 1.8 children per prisoner in the 1980s.

[2] In principle, one could also exclude elderly people from the population denominator, since they comprise only a small share of prisoners. However, given that the share of elderly prisoners has been growing significantly in the past generation, I opt not to take such an approach.

[3] According to Politifact, the imprisonment rate in South Africa in 1984 was 441 prisoners for every 100,000 people (Greenberg 2014).

[4] A similar issue affects estimates of Indigenous populations in Canada (personal correspondence from Canadian criminologist Anthony Doob).

[5] Anthony (2017) compiles the available incarceration rates for Indigenous populations in Canada, New Zealand and the United States.

[6] For example, Western and Sirois (2018) interview men and women from Northern Territory communities where incarceration has become pervasive.

[7] The large proportionate increase in incarceration in the ACT may reflect a greater willingness of judges to impose custodial sentences after the ACT opened its first prison in 2008. However, this was not the only factor, since incarceration in the ACT also increased more rapidly than the national average over the period 1985 to 2008 (90 percent, compared with a national average increase of 76 percent).

[8] The Law Council has expressed serious concerns about the efficacy of mandatory sentencing, citing a number of anomalous and unjust cases. For example, a 16-year-old with one prior conviction received a 28-day prison sentence for stealing a bottle of spring water. An Aboriginal woman and first-time offender received a 14-day sentence for stealing a can of beer.

[9] Recall that estimates of assault compare total assaults in the 1980s to physical assaults in 2017-18, since this appears to be the most accurate way of tracking changes over time. However, even if threatened assaults are included in 2017-18, the ratio of assault prisoners to assault victims has still risen by 486 percent over this period.

[10] It is possible to imagine scenarios in which the share of unsentenced prisoners and the average expected sentence might interact. For example, suppose that a fixed share of people released on bail end up breaching their bail conditions, and are then given longer sentences as a consequence. In this scenario, tightening of bail laws might lead to fewer bail breaches, and therefore shorten the average expected sentence.