



## **ARC Centre of Excellence in Population Ageing Research**

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#### **Australia's ageing prisoner population: the demographic shift and implications for the economic and social costs of care**

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# **Australia's ageing prisoner population: the demographic shift and implications for the economic and social costs of care**

Natasha Ginnivan<sup>2</sup>, Rafal Chomik<sup>1</sup>, John Piggott<sup>1</sup>, Tony Butler<sup>2</sup> and Adrienne Withall<sup>3</sup>

## Abstract

The Australian prisoner population has experienced a dramatic increase in the number of older inmates over the past decade. Modelling presented in this paper shows that these trends are likely to continue over the next decade and that they will result in higher health costs of prisons under different imprisonment scenarios. Taking into consideration the continued rise in incarceration rates, our calculations show that health costs of prisoners could increase by anywhere between 17% to 90% depending on whether the increase of older prisoners continues as it has in the last decade. Policy responses have been slow so far. We suggest that in the absence of a coordinated policy response, covering a range of interventions, costs will continue to increase, as this population continues to age more rapidly than the general population. Well-conceived interventions would be a worthwhile investment from both financial and social perspectives.

Keywords: prisoners, accelerated ageing, economic policy, demographic ageing

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## 1. Introduction

Within the growing literature on the causes and consequences of population ageing, the prisoner population has attracted little attention. But around the world, and especially in OECD countries with substantial prisoner populations, such as Australia, the UK, the U.S., and Canada, the prisoner population is ageing more rapidly than in the general population. This presents special challenges to those authorities charged with administering prisons, and to society more generally, as the ageing profile of released prisoners reshapes post-release support requirements. Three sets of policy or social challenges can be identified. First, the necessary physical and process infrastructure of the prison environment will need to adjust to cope with a burgeoning older cohort of prisoners. Second, health costs, which are on average higher for a prisoner of a given age than for the general population, will climb disproportionately with prisoner ageing, with concomitant budgetary pressure. Finally, as more old and frail prisoners are released to freedom, social structures to facilitate re-establishing ex-prisoners into the general community will face different needs. Considerations for end of life care structures in prison will be an inevitable requirement. It is likely that as the profile of prisoners at release ages, more ex-prisoners will require immediate and targeted aged care services.

To provide a preliminary evidence base for policy reform, this paper generates some initial projections of estimates of prisoner demographics and health costs in Australia for the next decade. We document the ageing of prisoner population in Australia, explore its unfolding configuration and consequences, and offer some preliminary estimates of its resource implications. We argue that while these projections are preliminary and highly stylised, they point to an urgent need for policy reform if incarceration costs are to be contained.

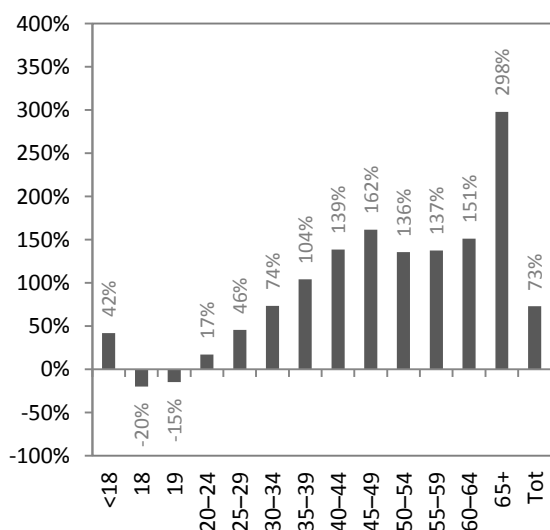
Section 2 lays out the current profile of the prisoner population, offers a comparison with the profile at the turn of the century, and discusses some possible reasons why accelerated ageing is observed in the prisoner population. Section 3 provides data on current health costs. In Section 4, we present the most prevalent groups of diseases for ageing cohorts, and those most expensive to treat, and relate these to prisoner data. While the issue of costs associated with ageing in prisons has received almost no academic attention in Australia<sup>1</sup>, limited literature has emerged over the last decade in some comparator countries, and we briefly review this in Section 5. Section 6 discusses some policy implications, drawing on international developments; Section 7 concludes.

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<sup>1</sup> Exceptions include Baidawi (2011), who provides a summary of contemporary statistics and discusses some policy implications, and Stavrou (2017), who reports contemporary trends in the age profile of offenders through this century. As well, the New South Wales Inspector of Custodial Service has produced a report on managing aged offenders in custody (2015), as Corrections Victoria (2015). We draw on these documents below.

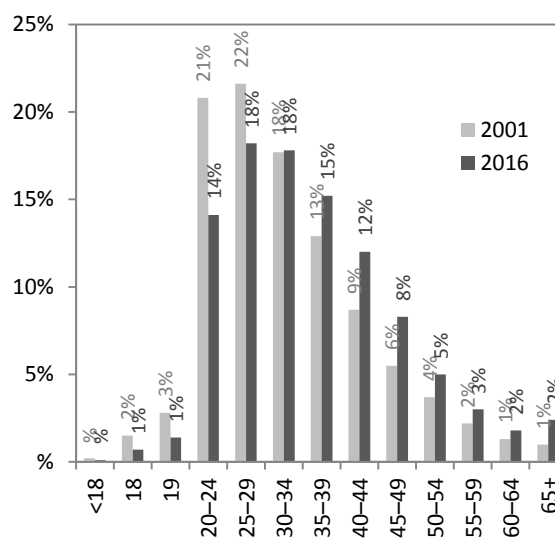
## 2. Developments in the Ageing of the Australian Prisoner Population

The past 15 years have seen a significant and progressive change in the age distribution of the Australian prisoner population (Figure 1). While the total prisoner population rose by 74%, the numbers of prisoners aged fifty years and over rose by 160% and that aged sixty-five or over increased by about 300%.



**Figure 1 Change in the Australian prison population by age group, 2001 – 2016**

Source: Authors' analysis based on ABS (2016a)

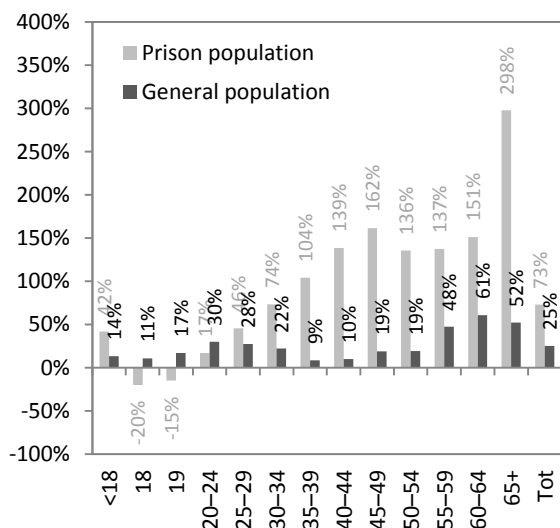


**Figure 2 Age share of prison population in 2001 and 2016**

Source: Authors' analysis based on ABS (2016a)

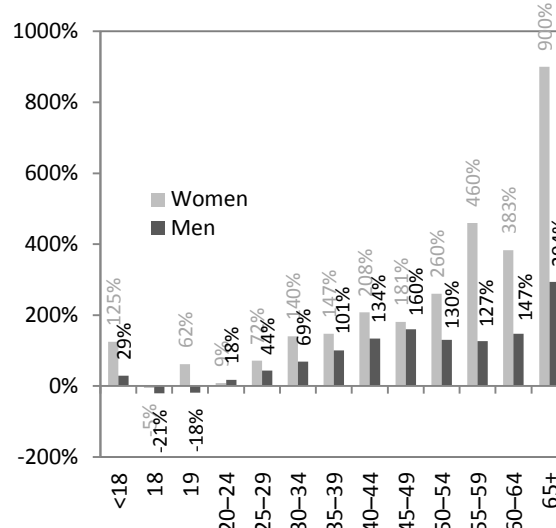
By contrast, the number of imprisoned younger offenders (18 – 29 years) decreased slightly over this period. An alternative lens is provided in Figure 2, which depicts changes in the age share of the prisoner population over this same period. For example, in 2001, about 8% of the prisoner population was aged 50 years or over, which increased to about 12% by 2016 (ABS, 2016a).

Between 2001 and 2016, the overall Australian population aged 50 years and over and 65 years and over increased by 45% and 52%, respectively – well below the increases seen in the older prisoner population of roughly 160% and 300% (Figure 3). An additional complication in this demographic snapshot is that female offender numbers continue to rise. This increase occurs across all age ranges, but the most dramatic increases are seen at older ages (Figure 4).



**Figure 3 Change in prison population compared with the general population 2001 - 2016**

Source: Authors' analysis based on ABS (2016a, 2016b)



**Figure 4 Change in Australian prison population by age and sex between 2001 - 2016**

Source: Authors' analysis based on ABS (2016a)

While the channels that lead to an older prisoner population naturally includes general population ageing, this nowhere near accounts for observed prisoner ageing, as Figure 3 indicates. Higher rates of remand, conviction or recidivism in later life, longer life expectancies of prisoners, and longer sentences for older prisoners, all contribute to the burgeoning prisoner population. For example, older prisoners are more likely to be in gaol for offences that attract longer sentences such as sexual assault. Sexual assault convictions were associated with a median aggregate sentence length of 7 years in 2016, the second longest sentence duration after homicide (ABS, 2016a). It was the most serious offence for only about 11% of the overall prisoner population but about 58% for those aged 65 years and over. While the overall sentence lengths have declined over the decade to 2016, sexual assault related sentences have not (ABS 2016a). Baidawi et al. (2011) assert that changes to mandatory minimum sentences have been a major contributor to the observed growth in the older prisoner population. Serious crimes committed by those awaiting trial have resulted in changes to bail laws making it harder for those charged with offences to be at liberty whilst waiting for court cases to proceed have resulted in increases in the prisoner population in the short term.

The Royal Commission into Institutional Responses to Child Sexual Abuse in Australia, since its launch in March 2013, has referred more than 2000 cases to authorities, including a large volume of cases where the events of interest took place many years ago, and the offender(s) now elderly. This will continue to impact the volume of older offenders entering the prison system in Australia, and due to the seriousness of crimes committed and the sentencing that these crimes attract (Royal Commission into Child Sexual Abuse, 2015; Freiberg, 2017; Joyner, 2017) many are likely to die in prison.

Limited publicly available data make it difficult to quantify the relative influence of different drivers of the ageing prisoner population. The best that the summary statistics can tell us is that overall imprisonment rates have increased at older ages. Indeed, only about one-fifth of the increase in the share of prisoners aged 50 and over was due to general population ageing and four-fifths due to higher rates of imprisonment of older people.

The policy implications of this demographic change in the prisoner population is exacerbated by “accelerated ageing” specific to this population. This is induced by both the stresses of the prison experience itself and by the lifestyle of this population prior to incarceration such as significant substance abuse. Fifty years of age is not considered advanced ageing in the general population, but in a prison context, fifty is old (Department of Justice & Regulation - Corrections Victoria, 2015, Williams and Abraldes, 2007). Accelerated ageing is associated with poorer health and a more rapid decline (Trotter and Baidawi, 2015, Baidawi et al., 2011, WHO, 2014). The rapid ageing of prison populations leads to myriad issues concerning health care provision which are not yet in place for the older offender, as well as the social and economic impact that this growing sub-population will have on budgets and the overall economy.

#### *Current costs of housing inmates*

According to the Productivity Commission, the net operating expenditure on Australian prisons was \$2.9 billion in 2015-16. New South Wales has the largest spend, making up 26% of Australia’s expenditure on prisons. On average, it costs approximately \$210 per day to house a prisoner in Australia. Tasmania spends the most per prisoner per day, at \$312, while New South Wales spends the least, at \$167 (Productivity Commission, 2017).

For comparability across jurisdictions official figures commonly exclude capital spend and payroll tax and have also been adjusted to mostly exclude transport and health spending. The health costs that are reported separately amounted to about 10% of net expenditure, or \$280 million in 2015-16 across Australia. This is equivalent to about \$25 per prisoner per day held in publicly operated prisons per day, or \$9,300 per year.<sup>2</sup>

How does this compare to spending on health in the civilian population? According to Rice, Temple & McDonald (2014); public spending on adults in the general population was about \$4,000 per person per year in 2009 to 2010 (expressed in 2015-16 dollars) suggesting that prisoner health costs are more than double the civilian health costs.

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<sup>2</sup> Health spending in privately operated prisons cannot be disaggregated and is included in total expenditure figures.

**Table 2.1 Expenditure on prisons, 2015-16**

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Net operating expenditure	\$750m	\$669m	\$487m	\$535m	\$205m	\$60m	\$46m	\$121m	\$2,873m
Net operating expenditure per prisoner per day	\$167	\$290	\$177	\$250	\$195	\$312	\$308	\$199	\$210
Health expenditure	\$113m	\$70m	\$21m	\$34m	\$22m	\$7m	-	\$17m	\$283m
Health expenditure per prisoner in public prison per day	\$29	\$42	\$10	\$21	\$25	\$37	-	\$28	\$25

Source: Authors' analysis of Productivity Commission (2017) Note: Not all jurisdictions are able to fully disaggregate prisoner health expenditure and some costs are included in operating expenditure (e.g., the cost of services delivered by some private correctional centre operators). Costs also exclude capital and payroll costs, and where possible, transport costs.

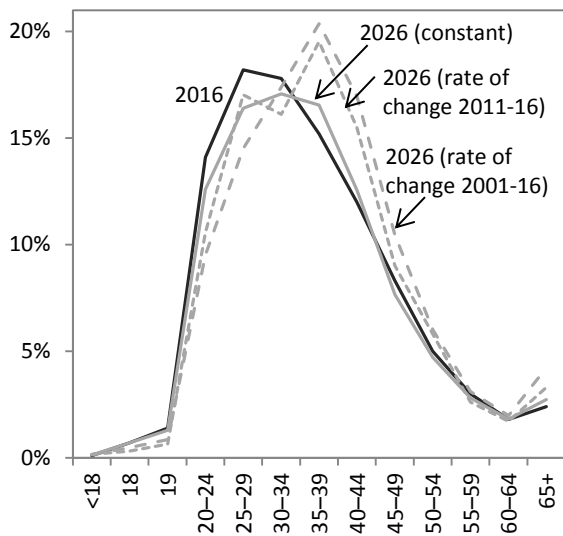
A full analysis of the likely budgetary implications and possible responses to the ageing prisoner population thus seems warranted. We know from data for the general population and from international studies of prisons that health costs increase with age and that cost growth over time may be greater at later ages (AIHW, 2016, Rice et al., 2014, .U.S. Department of Justice, 2015). Such a cost gradient by age, along with observed demographic trends, will seriously impact future prison health budgets. Yet little information exists about current health expenditures and needs by age. In section 3 we take the first steps to closing this knowledge gap.

### 3. Demographic and cost projections

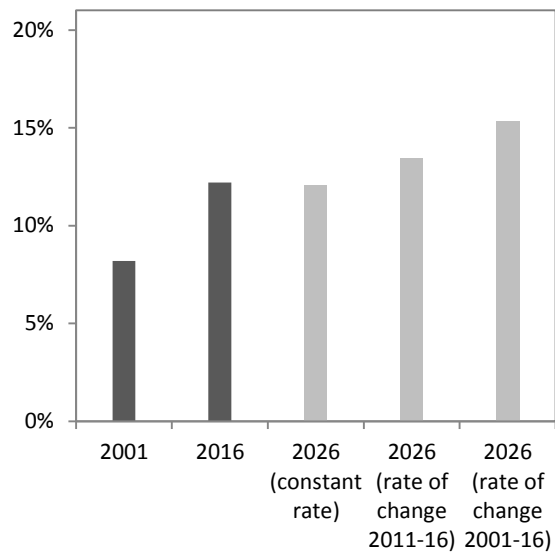
What might the demography of the Australian prison population look like in future and what would this mean for costs that vary by age? To answer this question, we conduct an illustrative projection, modelling different rates of imprisonment and their impact on age related health costs.

Figures 5 and 6 show the historic and projected prisoner population age distribution and share of older prisoners under three scenarios, where the imprisonment rate by age (1) remains constant at the 2016 level; (2) changes at the rate observed over five years between 2011 and 2016; and (3) changes at the rate observed over fifteen years between 2001 and 2016.

If the imprisonment rate remained constant by age, it would only be driven by the demography of the overall population. Under this scenario one could expect more prisoners in their 40s and 65 years and over, and slightly fewer in their 50s. Overall, the proportion of prisoners aged 50+ would be expected to remain stable at 12% of the prison population. If imprisonment rates by age were to change in line with rates seen in the last five and fifteen years, the prisoner population would become decidedly older, with prisoners aged 50+ making up to 15% of the total Australian prisoner population.



**Figure 5. Historic and projected age distribution of prison population by imprisonment rate scenario (%)**  
 Source: Authors' analysis based on ABS (2016a, 2016b)

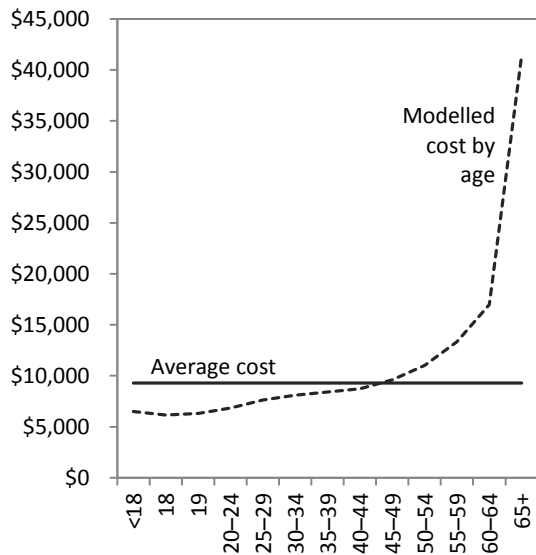


**Figure 6. Historic and projected share of prison population aged 50+ by imprisonment rate scenario (%)**  
 Source: Authors' analysis based on ABS (2016a, 2016b)

These demographic shifts are likely to affect public expenditure on prisons, particularly health costs. In the absence of prisoner health data by age we apply the cost gradient by age observed in the general population and scale this to the average per prisoner health expenditure reported by the Productivity Commission (2017). The result, shown in Figure 7, suggests a very steep age gradient, with those aged 65 years and over attracting a health cost of over \$40,000 per person per year.

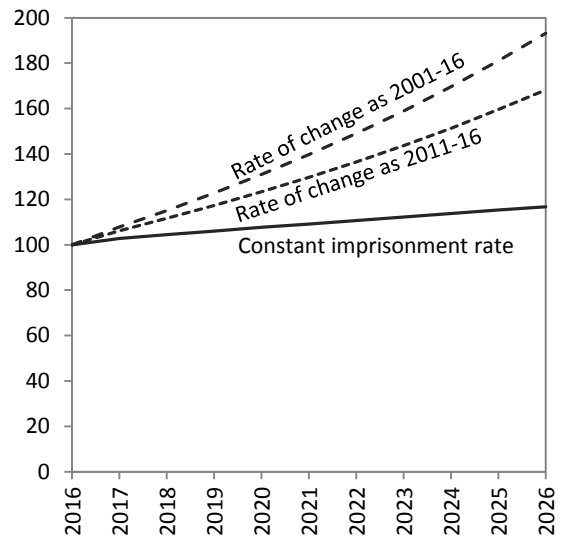
Combining modelled health costs by age with projections shown above results in a projection of aggregate health costs as presented in Figure 8. The exercise reveals that even without changes to the age-specific imprisonment rate, real health costs in prisons could increase by 17% between 2016 and 2026 simply as a function of an age based health cost gradient and general population demographics. If imprisonment rates of older people were to keep increasing as they have in recent years, this increase in expenditure could be between about 70% and 90%. Such modelling is illustrative but points to an urgent need to consider the health needs of older prisoners and appropriate service level responses.





**Figure 7. Modelled health cost per public prisoner per year, 2015-16 (\$)**

Source: Authors' analysis based on Rice et al 2016 and Productivity Commission 2017



**Figure 8. Projected real health cost index by imprisonment rate scenario, 2016-2026 (2016=100)**

Source: Authors' analysis based on ABS (2016a, 2016b), Rice et al 2016 and PC 2017

#### 4. Ageing and the Burden of Disease in Prisons

It is widely recognized among health experts that ageing prisoners face more complex and severe age-related decline than those of the general population (Williams and Abraldes, 2007). Lifestyle factors, mental health and SES, combined with the stresses of the prison setting may contribute to 'accelerated ageing' (Baidawi et al., 2011, Trotter and Baidawi, 2015, Williams and Abraldes, 2007). A recent increase in cold-case investigations and historical prosecutions enables research into whether older first-time offenders present with the same health disadvantages as lifelong recidivists (McKinnell, 2018, Baidawi, et al., 2011, Ginnivan et al., forthcoming). Similarly, research is needed to determine *how* health service delivery in prison impacts on neurological diseases such as dementia (Aday & Krabill, 2012, Kivipelto et al., 2005, Rovio et al., 2005, Anstey et al., 2011, Deckers et al., 2015, Ridley et al., 2013, Withall et al., 2014, Cations et al., 2016).<sup>3</sup>

A direct comparison between the general population and the prisoner population health expenditure is difficult. Data on costs and health services delivery for the prison system are limited (Andrew, 2016). Nevertheless, the evidence that does exist leads experts in ageing

<sup>3</sup> Dementia is becoming a major concern to correctional services given the heightened risk of individuals who may become vulnerable to victimisation, lose their ability to carry out activities of daily living and display unpredictable behaviour that can become difficult to manage (Department of Justice & Regulation - Corrections Victoria, 2015).

prisoners' health to suggest preventative interventions to decrease the incidence of both disease and disability (Williams and Abraldes, 2007).

One approach to understanding the relative impact of the burden of disease on the prisoner population relative to the general population is to focus on specific disease categories. For example, one of the most common serious diseases in both the general and prisoner populations is cardiovascular disease (CVD). Research on CVD shows that individuals are more at risk of developing the disease as they age (AIHW, 2016), and in turn if diagnosed with CVD, are at higher risk of developing dementia (Kivipelto et al., 2005). In 2011-2012, 22% of Australian adults in the general population reported having one or more cardiovascular conditions, including heart disease, stroke or heart failure (AIHW, 2016).

According to the most recent survey-based report on prisoner health (AIHW, 2015), inmates in age group 45 years and over were 4 times as likely than the younger groups of prison entrants to report that they had been diagnosed with a cardiovascular disease<sup>4</sup>. A comparative study between a large Australian Diabetes survey and prison survey of inmate participants on cardiovascular disease and diabetes mellitus showed that prisoners manifested CVD risk factors at a relatively young age, with a significantly higher prevalence of hypertension among prisoners than amongst the non-prisoner population (Funnell et al., 2009).

A second disease category of relevance to the prison population is musculoskeletal disorder. Again, these are age-related. Its importance in the context of a prisoner population is that if mobility is compromised, prisoner management becomes much more difficult.<sup>5</sup> The World Health Organisation (WHO) have recommended that with the ageing of many prisoner populations, the increase in prisoners with disabilities will require that structural alterations be made to minimise potential accidents of older prisoners, including provision of handrails, ladders on bunk beds, and appropriate accessible bathroom facilities (World Health Organization, 2014, World Health Organization, 2011). The remediation of the prison environment is one option for managing the care needs of older prisoners, as is the proposed redesigning of metropolitan-based established aged-care facilities (Inspector of Custodial Services, 2015b). Such responses have significant cost implications that do not arise in the same way in the general population.

##### **5. International developments in prisoner aged care and cost implications**

To our knowledge, the analysis of costs associated with *ageing* in prisons has received almost no academic attention in Australia<sup>6</sup>, a limited literature has appeared over the last

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<sup>4</sup> CVD data exclude New South Wales which did not provide data for this particular indicator

<sup>5</sup> Inspector of Custodial Services (2015b); (Department of Justice & Regulation – Corrections Victoria, 2015)

<sup>6</sup> Exceptions include Baidawi (2011), who provides a summary of contemporary statistics and discusses some policy implications, and Stavrou (2017), who reports contemporary trends in the age profile of offenders

decade in some comparator countries, and we briefly review this here. We report both cost analysis and intervention overviews, since, as we point out below, these are related – as in the general population, screening and other early interventions can actually cut costs (WHO, 2014b).

Perhaps the most thorough documentation of these issues comes from the U.S., a country which accounts for some 20% of the global prisoner population (World Prison Brief, 2018). A recent study conducted by the U.S. Federal Bureau of Prisons provides an overview of how health costs of ageing inmates can increase sharply when negotiating aged care within the unique residential setting of prison. This includes co-ordination of staff overtime and transport for external medical attention within security constraints which increases the average cost of housing an inmate from \$30K to \$69K per year for older prisoners (U.S. Department of Justice, 2015).

Detailed costs analyses across countries have not been done on the ageing in prisons crisis except for the US Federal Bureau of Prisons (BOP) who have cited medical care, transport and staff over time as contributors to driving up the average price of per prisoner costs. The BOP report shows that the average per prisoner health and *medical* costs are largely determined by the ratio of older prisoners in a facility’s care. The BOP’s healthcare calculations showed that spending coincides with the percentage of ageing inmates at an institution. For example, the BOP found that the five institutions with the highest percentage of aged inmates spent significantly more per inmate on medical costs than the five institutions with the lowest percentage of ageing inmates - See table 4. (U.S. Department of Justice, 2015).

**Table 4.**

**Medical Spending per Inmate at Institutions with the Five Highest and Lowest Percentages of Ageing Inmates**

<b>FY 2009</b>	<b>Percentage of Ageing Inmates</b>	<b>Cost per Inmate</b>	<b>FY 2013</b>	<b>Percentage of Ageing Inmates</b>	<b>Cost per Inmate</b>
Highest	27%	\$6,528	Highest	31%	\$10,114
Lowest	5%	\$2,110	Lowest	7%	\$1,916

Source: BOP medical spending data

The pattern of demographic changes across other Anglophone countries such as New Zealand, Canada, the United Kingdom, Scotland and Ireland is similar to that being experienced in Australia, and in all cases the management of ageing inmates is becoming a major concern (Brown, 2016, Cunneen et al., 2016, Berman and Dar, 2013, New Zealand Department of Corrections, 2017, Her Majesty's Inspectorate Prisons for Scotland, 2017,

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through this century. As well, the New South Wales Inspector of Custodial Service has produced a report on managing aged offenders in custody (2015), as Corrections Victoria (2015). We draw on these documents below.

Maschi, 2016). Japan's population has also increased in older prisoners with a reported 20% of all crimes being committed by the elderly of 65 years and older (Weller, 2017). A white paper on crime from Japan's Ministry of Justice (2017) shows that 23% of elderly prisoners who were released in 2015 were re-incarcerated in 2016. Most crimes committed by the elderly in Japan are petty theft and traffic-related (The Economist, 2017).

A review of health care interventions for older prisoners shows that most countries are struggling to manage the care needs from increases in older prisoners (Stevens et al., 2017). International examples of best practice for the care of older prisoners include the California Men's Colony, San Luis California, U.S. who screens for dementia train and educate eligible younger inmates to care for older inmates suffering from dementia (Hodel and Sánchez, 2013, Wintringham specialty aged care, 2013, Brown, 2016). Another model of care from the U.S. is a retro-fitted hospital, Laurel Highlands, Somerset Pennsylvania that closed in June 1996, and re-opened as a minimum-security facility for referred prisoners who have mobility problems, typically those who are older (over 40 years). This facility has age-appropriate facilities with grab rails, level floors, seats and shower tables for inmates who are unable to sit up. Fishkill, New York State is another medium-security age facility in the U.S. that has a 30-bed unit for the cognitively impaired. The U.K. are trialling screening and care programs within selected prisons, as are Ireland and Scotland (Walsh et al., 2014, Joyce and Machi, 2016, Inspectorate of Prisons for Scotland, 2017), however struggle to produce high quality interventions within their budget constraints (Wintringham specialty aged care, 2013). New Zealand have followed suit with the country's first dementia unit at Rimutaka Prison, north of Wellington. According to the Prison Manager, these changes were introduced to meet the targets for the overall correctional facility (Wintringham specialty aged care, 2013, Brown, 2016).

## **6. Policy Implications**

The combination of demographic trends within the prisoner population and rising health costs for both the prisoner and the general population suggest that policy responses are required. Bushnell (2017) reports that in comparison to other OECD countries, Australia's average cost of incarceration are amongst the highest and in this regard the 'underperforming' criminal justice system needs reforming. Current reports highlight prison systems that are ill-equipped to deal with frail prisoners, many of whom will eventually die in prison (Wiseman, 2016, Department of Justice & Regulation - Corrections Victoria, 2015). But to our knowledge, there are no reports with any true indication of what the cost of housing and caring for ageing inmates are, or will be in relation to current incarceration trends by age demographic. This paper will hopefully serve to galvanise interest in this important and emerging area.

Perhaps the most important message to draw from the paper is that there is an urgent need for a comprehensive health and housing costing for older prisoners, say those over the age of 50 years. This would serve to focus attention on interventions which may have both financial and social payoffs. The South Australian Justice Reinvestment Working Group suggests that the social costs of imprisonment not only impact offenders but their families as well. Social costs include the breakdown of family bonds that potentially guides individuals away from crime, poorer health outcomes and a relatively high risk of mortality post-release (Parliamentary business committee, 2015).

Second, increased rates of incarceration, issues of accelerated ageing and its antecedents will require policy intervention to stem the flow of the health cost burden this will likely have on Australia's health system and recidivism rates. This is because there is an association between prison release, lack of through-care, mental health issues, homelessness and recidivism (Fazel et al., 2008, Wooden, 2012, Griffiths, 2017, Niessen et al., 2018, Steen, 2018).

Beyond that, proper costing would place in perspective interventions for ageing in prison drawn from both the international health literature and in government reports. These address the management of mobility, depression, substance abuse, assisted daily living, post-release and social care of older offenders (Fazel et al., 2004, Fazel et al., 2001, Maschi and Aday, 2014, Baidawi et al., 2011, Trotter and Baidawi, 2015, Inspector of Custodial Services, 2015b, Wooden et al., 2012, Barry et al., 2016, Williams et al., 2006, Williams, 2007, Williams, 2013, Simpson et al., 2016, Baidawi, 2016; Stevens et al., 2017).

Reports in recent years from Inspectors of Custodial services in NSW and in Victoria have made many recommendations to address the health crisis arising within corrective services (Inspector of Custodial Services, 2015, Department of Justice & Regulation - Corrections Victoria, 2015). Following a roundtable meeting of 13 prison health service directors on research priorities, "ageing prisoners" was ranked as the fourth most urgent issue after mental health, cognitive and intellectual disabilities, and post-release care (Simpson et al., 2017). Policy responses include the Corrections Victoria & Justice Health's jointly established *Ageing prisoner and Offender Policy Framework 2015-20* (Department of Justice & Regulation - Corrections Victoria, 2015). As is often the case with state-based government services undergoing changing demands, however, a nationally coordinated approach to leverage the established expertise would have benefits of shared information and experience.

## **7. Conclusion**

This paper highlights an emerging and important issue in Australia's prison system – the rising costs of health care consequent upon the rapid increase in average age of the prisoner population. It outlines the emerging needs of this growing subgroup within the ageing population and evaluates the potential increases in health costs. The barriers to health and

aged care provision for older prisoners are many; institutional, architectural, environmental, attitudinal, socio-cultural and fiscal. The cost of inaction in addressing the ageing prisoner population crisis has both social and financial dimensions. Criminal justice reform needs a strategic perspective on mitigating the factors that are contributing to the continued rise in the older prisoner population (Bushnell, 2017, Cunneen et al., 2016, Williams and Abraldes, 2007, Angus, 2015, Baidawi et al., 2011, Trotter and Baidawi, 2015). We conclude that a multi-faceted approach, combining comprehensive costing of current trends in prisoner demography and health costs, appraisal of the likely outcomes of alternative interventions, both social and financial, and careful analysis of international experience in addressing the issue, would provide the evidence base necessary to fashion appropriate action.

## References

- ADAY, R. H. 2003. Aging prisoners: Crisis in American corrections, Penn State Press.
- ADAY, R. H. and J. J. KRABILL. 2012. "Older and geriatric offenders: critical issues for the 21st century." *Special needs offenders in correctional institutions 1*: 203-233.
- AIHW 2010. Health of Australia's Prisoners 2009.
- AIHW 2012. Dementia in Australia. *In*: GOVERNMENT, A. (ed.). Canberra, ACT, Australia.
- AIHW 2015. Health of Australia's prisoners 2015.
- AIHW 2016. Health expenditure Australia 2014 - 15. *In*: AUSTRALIAN GOVERNMENT (ed.). Canberra, ACT: Australian Institute of Health and Welfare.
- ANDREW, J., BAKER, MAX AND ROBERTS, PHILLIP 2016. Prison Privatisation in Australia: The State of the Nation. University of Sydney.
- ANGUS, C. 2015. Older prisoners: trends and challenges. *NSW Parliamentary Research Service*.
- ANSTEY, K., CHERBUIN, N., BUDGE, M. & YOUNG, J. 2011. Body mass index in midlife and late-life as a risk factor for dementia: a meta-analysis of prospective studies. *Obesity Reviews*, 12.
- AUSTRALIAN BUREAU OF STATISTICS. 2016a. Prisoners in Australia, cat. no. 4517.0 [online] 2016 <http://www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/B71303136AEF6F59CA2581EF00FDE55?opendocument>
- AUSTRALIAN BUREAU OF STATISTICS. 2016b. Australian Demographic Statistics, Dec 2016, cat. no. 3101.0 [Online]. Available: <http://www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/432B4729A87614B1CA2581A70015892B?opendocument>
- AUSTRALIAN BUREAU OF STATISTICS. 2016c. Recorded Crime - Victims, Australia, 2016, cat. no. 4510.0 [Online]. Available: <http://www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/DA3DED213BAE8114CA257178001B6949?opendocument> [Accessed December 12th 2017].
- BAIDAWI, S., TURNER, S., TROTTER, C., BROWNING, C., COLLIER, P., O'CONNOR, D. & SHEEHAN, R. 2011. Older prisoners-a challenge for Australian corrections. *Trends and issues in crime and criminal justice*, 1.
- BALDRY, E., CLARENCE, M., DOWSE, L. & TROLLOR, J. 2013. Reducing vulnerability to harm in adults with cognitive disabilities in the Australian criminal justice system. *Journal of Policy and Practice in Intellectual Disabilities*, 10, 222-229.
- BARRY, L. C., WAKEFIELD, D. B., TRESTMAN, R. L. & CONWELL, Y. 2016. Disability in prison activities of daily living and likelihood of depression and suicidal ideation in older prisoners. *International journal of geriatric psychiatry*.
- BERMAN, G. & DAR, A. 2013. Prison population statistics. *London: House of Commons Library*.
- BROWN, J.-A. 2016. Living with Dementia in Prison. *The Winston Churchill Memorial Trust of Australia*, 1-55.
- BUSHNELL, A. 2017. Australia's Criminal Justice Costs: An International Comparison. Unstitute of Public Affairs.
- BUTLER, T., INDIG, D., ALLNUTT, S. & MAMOON, H. 2011. Co-occurring mental illness and substance use disorder among Australian prisoners. *Drug and alcohol review*, 30, 188-194.
- CATIONS, M., WITHALL, A., LOW, L.-F., & DRAPER, B. (2016). What is the role of modifiable environmental and lifestyle risk factors in young onset dementia? *European journal of epidemiology*, 31(2), 107-124
- COMMONWEALTH OF AUSTRALIA 2013. Value of a justice reinvestment approach to criminal justice in Australia. Department of the Senate, Parliament House, Canberra.
- CUNNEEN, C., BALDRY, E., BROWN, D., BROWN, M., SCHWARTZ, M. & STEEL, A. 2016. *Penal culture and hyperincarceration: The revival of the prison*, Routledge.
- DECKERS, K., BOXTEL, M. P., SCHIEPERS, O. J., VUGT, M., MUÑOZ SÁNCHEZ, J. L., ANSTEY, K. J., BRAYNE, C., DARTIGUES, J. F., ENGEDAL, K. & KIVIPALTO, M. 2015. Target risk factors for

- dementia prevention: a systematic review and Delphi consensus study on the evidence from observational studies. *International journal of geriatric psychiatry*, 30, 234-246.
- DEPARTMENT OF JUSTICE & REGULATION - CORRECTIONS VICTORIA 2015. Corrections Ageing Prisoner and Offender Policy Framework 2015-20. Victoria, Australia: Corrections Victoria & Justice Health.
- DAVOREN, M., FITZPATRICK, M., CADDOW, F., CADDOW, M., O'NEILL, C., O'NEILL, H. & KENNEDY, H. G. 2015. Older men and older women remand prisoners: mental illness, physical illness, offending patterns and needs. *International Psychogeriatrics*, 27, 747-755.
- FAZEL, S., BAINS, P. & DOLL, H. 2006. Substance abuse and dependence in prisoners: a systematic review. *Addiction*, 101, 181-191.
- FAZEL, S., HOPE, T., O'DONNELL, I. & JACOBY, R. 2001. Hidden psychiatric morbidity in elderly prisoners. *The British Journal of Psychiatry*, 179, 535-539.
- FAZEL, S., HOPE, T., O'DONNELL, I. & JACOBY, R. 2004. Unmet treatment needs of older prisoners: a primary care survey. *Age and ageing*, 33, 396-398.
- FAZEL, S., KHOSLA, V., DOLL, H. & GEDDES, J. 2008. The prevalence of mental disorders among the homeless in western countries: systematic review and meta-regression analysis. *PLoS medicine*, 5, e225.
- FAZEL, S. & WOLF, A. 2015. A systematic review of criminal recidivism rates worldwide: current difficulties and recommendations for best practice. *PLoS one*, 10, e0130390.
- FORSYTHE, K. E. A. 2017. THE EFFECTIVENESS OF THE OLDER PRISONER HEALTH AND SOCIAL CARE ASSESSMENT AND PLAN (OHSCAP): A RANDOMISED CONTROLLED TRIAL. NIHR Journals Library: National Institute for Health Research.
- FREIBERG, A., DONNELLY, H AND GELB, K., 2017. *Sentencing for Child Sexual Abuse in Institutional contexts* [Online]. Available: <https://www.childabuseroyalcommission.gov.au/getattachment/8f9e5bb9-f560-408f-a5cc-de8700796a89/Sentencing-for-Child-Sexual-Abuse-in-Institutional>.
- FUNNELL, W. N., JUPE, R. & ANDREW, J. 2009. *In government we trust: market failure and the delusions of privatisation*, UNSW Press.
- GINNIVAN, N. A., Butler, T. & WITHALL, A., (forthcoming). The rising health, social and economic costs of Australia's ageing prison population.
- GELB, K. & COUNCIL, S. A. 2007. Recidivism of sex offenders research paper. *Melbourne: Sentencing Advisory Council*.
- GREENHALGH, T., HOWICK, J. & MASKREY, N. 2014. Evidence based medicine: a movement in crisis? *Bmj*, 348, g3725.
- GRIFFITHS, A., ZMUDZKI, F., BATES, S., . 2017. Evaluation of ACT Extended Throughcare Pilot Program (pp. 1-78). Social Policy Research Centre: University of New South Wales
- HARRISON, M. T. 2006. True grit: An innovative program for elderly inmates. *Corrections Today*, 68, 46.
- HAYES, A. J., BURNS, A., TURNBULL, P. & SHAW, J. J. 2012. The health and social needs of older male prisoners. *International journal of geriatric psychiatry*, 27, 1155-1162.
- HER MAJESTY'S INSPECTORATE PRISONS FOR SCOTLAND 2017. Who Cares? The lived experience of older prisoners in Scotland's prisons.
- HODEL, B. & SÁNCHEZ, H. G. 2013. The Special Needs Program for Inmate-Patients with Dementia (SNPID): A psychosocial program provided in the prison system. *Dementia*, 12, 654-660.
- HOUSE OF REPRESENTATIVES COMMITTEES 2011. The Criminal Justice System. Parliament of Australia.
- INSPECTOR OF CUSTODIAL SERVICES, N. G. 2015a. Full House: The growth of the inmate population in NSW.
- INSPECTOR OF CUSTODIAL SERVICES, N. G. 2015b. Old and inside: Managing aged offenders in custody.



- INSTITUTE FOR CRIMINAL POLICY RESEARCH. 2017. Available: <http://www.icpr.org.uk/news-events.aspx> [Accessed 4/09/2017].
- JACOBSON, J., HEARD, C AND FAIR, H, 2017. Prison: Evidence of its use and over-use from around the world.
- JOYCE J AND MACHI T 2016. In here the time stands still: the rights, needs and experiences of older people in prison.
- JOYNER., T 2017. Child sexual abuse royal commission: What's happened and when is it due to finish? *ABC News*, 6/03/17.
- KIVIPELTO, M., NGANDU, T., FRATIGLIONI, L., VIITANEN, M., KÅREHOLT, I., WINBLAD, B., HELKALA, E.-L., TUOMILEHTO, J., SOININEN, H. & NISSINEN, A. 2005. Obesity and vascular risk factors at midlife and the risk of dementia and Alzheimer disease. *Archives of neurology*, 62, 1556-1560.
- LA PORTE, T. R. 2015. *Organized Social Complexity: challenge to politics and policy*, Princeton University Press.
- LILJEGREN, M., NAASAN, G., TEMLETT, J., PERRY, D. C., RANKIN, K. P., MERRILEES, J., GRINBERG, L. T., SEELEY, W. W., ENGLUND, E. & MILLER, B. L. 2015. Criminal behavior in frontotemporal dementia and Alzheimer disease. *JAMA neurology*, 72, 295-300.
- LOWSKY, D. J., OLSHANSKY, S. J., BHATTACHARYA, J. & GOLDMAN, D. P. 2013. Heterogeneity in healthy aging. *Journals of Gerontology Series A: Biomedical Sciences and Medical Sciences*, 69, 640-649.
- MANN, A. 2017. Elderly sex offenders clog Australian jails, but struggle to find housing once released. ABC News.
- MASCHI, T. & ADAY, R. R. H. 2014. The social determinants of health and justice and the aging in prison crisis: A call for human rights action. *International Journal of Social Work*, 1, 15-33.
- MASCHI, T. A. J., J., 2016. In here, time stands still: the rights, needs and experiences of older people in prison. The Irish Penal Reform Trust.
- MASCHI, T., KWAK, J., KO, E. & MORRISSEY, M. B. 2012. Forget me not: Dementia in prison. *The Gerontologist*, 52, 441-451.
- MASCHI, T., VIOLA, D., MORGEN, K. & KOSKINEN, L. 2015. Trauma, stress, grief, loss, and separation among older adults in prison: The protective role of coping resources on physical and mental well-being. *Journal of Crime and Justice*, 38, 113-136.
- MCKINNELL, J. 2018. All murder cold cases reopened in NSW. *The Australian*, Australian Associated Press.
- MCNIEL, D. E. & BINDER, R. L. 2007. Effectiveness of a mental health court in reducing criminal recidivism and violence. *American Journal of Psychiatry*, 164, 1395-1403.
- NEUROLAW, <https://neurolaw.edu.au/cases> (accessed 18/04/2018)
- MENDOZA, J., BRESNAN, A., ROSENBERG, S., ELSON, A., GILDBER, Y., LONG, P., WILSON, K. & HOPKINS, J., 2013. Obsessive Hope Disorder: Reflections on 30 years of mental health reform in Australia and visions for the future. *Summary Report*. Caloundra, QLD, Australia: ConNectica.
- NEW ZEALAND DEPARTMENT OF CORRECTIONS. 2017. *Prison facts and statistics - June 2017* [Online]. Available: [http://www.corrections.govt.nz/resources/research\\_and\\_statistics/quarterly\\_prison\\_statistics/prison\\_stats\\_june\\_2017.html](http://www.corrections.govt.nz/resources/research_and_statistics/quarterly_prison_statistics/prison_stats_june_2017.html) [Accessed 15/12/17].
- NIELSSEN, O. B., STONE, W., JONES, N. M., Challis, S., NIELSSEN, A., ELLIOT, G., BURNS, N., ROGOZ, A., COOPER, L.E. and LARGE, M. M. 2018. Characteristics of people attending psychiatric clinics in inner Sydney homeless hostels. *The Medical Journal of Australia*, 208(4), 169-173.
- O'HARA, K., FORSYTH, K., WEBB, R., SENIOR, J., HAYES, A. J., CHALLIS, D., FAZEL, S. & SHAW, J. 2016. Links between depressive symptoms and unmet health and social care needs among older prisoners. *Age and ageing*, 45, 158-163.

- OMOLADE, S. 2014. The needs and characteristics of older prisoners: Results from the Surveying Prisoner Crime Reduction (SPCR) survey. *Ministry of Justice*.
- PARLIAMENTARY BUSINESS COMMITTEE. 2015. *The economic and social costs of imprisonment* [Online]. 2017].
- PAWSON, R. & TILLEY, N. 1997. *Realistic evaluation*, Sage.
- PLUECKHAHN, T. M., KINNER, S. A., SUTHERLAND, G. & BUTLER, T. G. 2015. Are some more equal than others? Challenging the basis for prisoners' exclusion from Medicare. *The Medical journal of Australia*, 203, 359-361.
- PRODUCTIVITY COMMISSION. 2017. Report on Government Services. Chapter 8: 8.1 - 8.49.
- REEKIE, J. M., LEVY, M. H., RICHARDS, A. H., WAKE, C. J., SIDDALL, D. A., BEASLEY, H. M., KUMAR, S. & BUTLER, T. G. 2014. Trends in HIV, hepatitis B and hepatitis C prevalence among Australian prisoners-2004, 2007, 2010. *Med J Aust*, 200, 277-80.
- RICE, J. M., TEMPLE, J. & MCDONALD, P. 2014. National transfer accounts for Australia: 2003-04 and 2009-10 detailed results. Australian National University, accessed.
- RIDLEY, N. J., DRAPER, B. & WITHALL, A. 2013. Alcohol-related dementia: an update of the evidence. *Alzheimer's research & therapy*, 5, 1.
- ROVIO, S., KÄREHOLT, I., HELKALA, E.-L., VIITANEN, M., WINBLAD, B., TUOMILEHTO, J., SOININEN, H., NISSINEN, A. & KIVIPELTO, M. 2005. Leisure-time physical activity at midlife and the risk of dementia and Alzheimer's disease. *The Lancet Neurology*, 4, 705-711.
- ROWE, J. W. & KAHN, R. L. 2015. Successful aging 2.0: Conceptual expansions for the 21st century. *The Journals of Gerontology: Series B*, 70, 593-596.
- ROYAL COMMISSION INTO CHILD SEXUAL ABUSE 2015. Redress and Civil Litigation Report,. Commonwealth of Australia.
- ROYAL COMMISSION INTO CHILD SEXUAL ABUSE. 2017. *Royal Commission into Institutional Responses to Child Sexual Abuse*, [Online]. [Accessed 7/09/2017 2017].
- RUTTER, H., SAVONA, N., GLONTI, K., BIBBY, J., CUMMINS, S., FINEGOOD, D. T., GREAVES, F., HARPER, L., HAWE, P., MOORE, L., PETTICREW, M., REHFUESS, E., SHIELL, A., THOMAS, J. & WHITE, M. 2017. The need for a complex systems model of evidence for public health. *The Lancet*, 390, 2602-2604.
- SIMPSON, P., GUTHERIE, J. & BUTLER, T. 2016. Prison health service directors' views on research priorities and organizational issues un conducting research in prison: outcomes of a national deliberative roundtable. . *International Journal of prisoner health, under review*.
- SMITH, N. E. & JONES, C. 2008. Monitoring trends in re-offending among adult and juvenile offenders given non-custodial sanctions. *BOCSAR NSW Crime and Justice Bulletins*, 12.
- SMITH-MERRY, J., HANCOCK, N, MCKENZIE, K, 2017. From Custody to Community: Transitioning people with mental ill-health from the criminal justice system to the community. Faculty of Health Sciences, University of Sydney.
- SNYDER, C., VAN WORMER, K., CHADHA, J. & JAGGERS, J. W. 2009. Older adult inmates: The challenge for social work. *Social work*, 54, 117-124.
- SPAULDING, A. C., SEALS, R. M., MCCALLUM, V. A., PEREZ, S. D., BRZOZOWSKI, A. K. & STEENLAND, N. K. 2011. Prisoner survival inside and outside of the institution: implications for health-care planning. *American Journal of Epidemiology*, 173, 479-487.
- STAVROU, E. 2017. Changing age profile of NSW offenders. *Crime and Justice Statistics*. no.123 ed.: NSW Bureau of Crime Statistics and Research.
- STEEN, A. 2018. The many costs of homelessness. *The Medical Journal of Australia*, 208(4), 167-168.
- STEVENS, B. A., SHAW, R., BEWERT, P., SALT, M., ALEXANDER, R. & LOO GEE, B. 2017. Systematic review of aged care interventions for older prisoners. *Australasian Journal on Ageing*, n/a-n/a.
- THE ECONOMIST 2017. Grey Peril: Crooks are getting older and more hardened. *The Economist*. (add date and link accessed)

- THE MINISTRY OF JUSTICE 2017. White Paper on Crime 2017. Japan Government Ministry., <http://www.moj.go.jp/ENGLISH/>
- TROTTER, C. & BAIDAWI, S. 2015. Older prisoners: Challenges for inmates and prison management. *Australian & New Zealand Journal of Criminology*, 48, 200-218.
- U.S. DEPARTMENT OF JUSTICE 2015. The Impact of an Aging Inmate Population on the Federal Bureau of Prisons. *Evaluation and Inspections Division*
- WALSH, E., FORSYTH, K., SENIOR, J., O'HARA, K. & SHAW, J. 2014. Undertaking action research in prison: Developing the Older prisoner Health and Social Care Assessment and Plan. *Action Research*, 12, 136-150.
- WANGMO, T., HANDTKE, V., BRETSCHEIDER, W. & ELGER, B. S. 2015. Prisons should mirror society: the debate on age-segregated housing for older prisoners. *Ageing and Society*, 1-20.
- WEATHERBURN, C., RAMSEY, FITZGERALD 2016. Why is the NSW prison population still growing? Another look at prison trends between 2011 and 2015. *In: STATISTICS, C. A. J. (ed.). NSW Bureau of Crime Statistics and Research.*
- WEATHERBURN, F. 2013. The impact of the NSW Bail Act (2013) on trends in bail and remand in New South Wales. *In: BOCSAR. (ed.). Crime and Justice Statistics.*
- WILLIAMS, B. & ABRALDES, R. 2007. Growing older: Challenges of prison and reentry for the aging population. *Public health behind bars*, 56-72.
- WILLIAMS, B., AHALT, C. AND GREIFINGER, R., 2014. The older prisoner and complex chronic medical care. *Prisons and Health*. WHO Regional Office for Europe, UN City, Marmorvej 51, DK-2100 Copenhagen Ø, Denmark: World Health Organization.
- WILLIAMS, B. A., LINDQUIST, K., SUDORE, R. L., STRUPP, H. M., WILLMOTT, D. J. & WALTER, L. C. 2006. Being old and doing time: Functional impairment and adverse experiences of geriatric female prisoners. *Journal of the American Geriatrics Society*, 54, 702-707.
- WILLIAMS, J. 2013. Social care and older prisoners. *Journal of Social Work*, 13, 471-491.
- WILLIAMS, K., POYSER, J. & HOPKINS, K. 2012. Accommodation, homelessness and reoffending of prisoners: Results from the Surveying Prisoner Crime Reduction (SPCR) survey. *Research Summary*, 3, 12.
- WINTRINGHAM SPECIALTY AGED CARE 2013. "Silver Bullet" or confused greying fox? Best Practice Support Model for Older Prisoners.
- WISEMAN, H. 2016. *Frail elderly put new pressure on prisons to provide palliative care* [Online]. Palliative Care Australia. Available: <http://palliativecare.org.au/palliative-matters/frail-elderly-prisoners-put-new-pressure-on-prisons/> [Accessed 19/12/17]
- WITHALL, A., DRAPER, B., SEEHER, K., & BRODATY, H. 2014. The prevalence and causes of younger onset dementia in Eastern Sydney, Australia. *International psychogeriatrics*, 26(12), 1955-1965
- WOODEN, M., BEVITT, A., CHIGAVAZIRA, A., GREER, N., JOHNSON, G., KILLACKEY, E., MOSCHION, J., SCUTELLA, R., TSENG, Y. P. & WATSON, N. 2012. Introducing 'Journeys Home'. *Australian Economic Review*, 45, 368-378.
- WORLD HEALTH ORGANIZATION 2011. World report on disability. World Health Organization.
- WORLD HEALTH ORGANIZATION 2014a. Prisons and Health. *In: ENGGIST, S., MOLLER, L, GALEA, G AND UDESEN, C (ed.). Copenhagen, Denmark: World Health Organization, Europe.*
- WORLD HEALTH ORGANIZATION 2014b. The case for investing in public health (A public health summary report for EPHO 8 ed.). Regional office for Europe: World Health Organisation.
- WORLD PRISON BRIEF. 2018. "Highest to Lowest - Prison Population Total." Retrieved 16/05/18, 2018, from [http://www.prisonstudies.org/highest-to-lowest/prison-population-total?field\\_region\\_taxonomy\\_tid=All&=Apply](http://www.prisonstudies.org/highest-to-lowest/prison-population-total?field_region_taxonomy_tid=All&=Apply).

YLIKOSKI, R., YLIKOSKI, A., KESKIVAARA, P., TILVIS, R., SULKAVA, R. & ERKINJUNTTI, T. 1999.  
Heterogeneity of cognitive profiles in aging: successful aging, normal aging, and individuals  
at risks for cognitive decline. *European Journal of Neurology*, 6, 645-652.