Age-specific incidence of injury-related hospital contact after release from prison: a prospective data-linkage study

Jesse T Young[1,2,3], Rohan Borschmann[1,4,5,6], David B Preen[2], Matthew J Spittal[7], Lisa Brophy[7,8,9], Emily A Wang[10], Ed Heffernan[11], Stuart A Kinner[1,4,12,13,14]

[1]Justice Health Unit, Centre for Health Equity, Melbourne School of Population and Global Health, The University of Melbourne, Parkville, Victoria, Australia

[2]School of Population and Global Health, The University of Western Australia, Perth, WA, 6009, Australia

[3]National Drug Research Institute, Curtin University, Perth, WA, 6008, Australia

[4]Centre for Adolescent Health, Murdoch Children's Research Institute, Parkville, Victoria, Australia

[5]Health Service and Population Research Department; Institute of Psychiatry, Psychology & Neuroscience; King's College London, United Kingdom

[6]School of Psychological Sciences, The University of Melbourne, Parkville, Victoria, Australia

[7]Centre for Mental Health, Melbourne School of Population and Global Health, The University of Melbourne, Parkville, Victoria, Australia

[8]Mind Australia, Heidelberg, Victoria, Australia

[9]School of Allied Health, La Trobe University, Bundoora, Victoria, Australia

[10]Yale School of Medicine, Yale University, New Haven, Connecticut, United States

[11]School of Medicine, University of Queensland, Brisbane, Queensland, Australia

[12]Mater Research Institute-UQ, University of Queensland, South Brisbane, Queensland, Australia

[13]Griffith Criminology Institute, Griffith University, Mt Gravatt, Queensland, Australia

[14]School of Public Health and Preventive Medicine, Monash University, Melbourne, Victoria, Australia

WORD COUNT (Introduction – Conclusion): 2998; **ABSTRACT**: 250

NUMBER OF PAGES: 25; **NUMBER OF TABLES:** 4; **NUMBER OF FIGURES**: 1

CORRESPONDING AUTHOR:

Dr Jesse T Young; The University of Melbourne, Level 4, 207 Bouverie Street, Carlton, VIC, 3010, Australia; Tel: +61 3 8344 4413; Fax: +61 3 9348 1174; Email: jesse.young@unimelb.edu.au

Note: This is the pre-peer reviewed version of the following article: Young JT, Borschmann R, Preen DB, Spittal MJ, Brophy L, Wang EA, Heffernan E, Kinner SA. Age-specific incidence of injury-related hospital contact after release from prison: a prospective data-linkage study. ***Injury Prevention***. 2019; *Epub ahead of print*., which has been published in final form at http://dx.doi.org/10.1136/injuryprev-2018-043092. This article may be used for non-commercial purposes in accordance with BMJ publishing group terms and conditions for self-archiving.

ABSTRACT

Background: In population studies, the risk of injury declines after early adulthood. It is unclear if a similar age difference in the risk of injury exists among people released from prison.

Methods: Pre-release survey data collected between 1st August, 2008, and 31st July, 2010, from a representative cohort of sentenced adults (≥18 years) in Queensland, Australia, were linked prospectively and retrospectively to person-level emergency department, inpatient hospital, and correctional records. To ascertain predictors of injury, we fit a multivariate Andersen-Gill model and tested interactions between age group (<25/≥25 years) and each variable.

Results: In 1307 adults released from prison, there were 3,804 person-years of follow-up. The crude injury rate was 385 (95%CI: 364-407) per 1000 person-years and did not differ according to age group. Factors associated with increased injury-related hospital contact included mental illness, pre-incarceration injury, a history of incarceration prior to the index sentence, release from a short prison sentence (<90 days), being reincarcerated during follow-up, and identifying as Indigenous. The effect of mental illness, risky alcohol use, prior incarceration, and intellectual disability differed across age group and predicted increased risk of injury among people aged ≥25 years compared to their counterparts without these characteristics.

Conclusions: Unlike in the general population where the risk of injury declines with age, older adults released from prison are at similar risk compared to their younger peers. Adults released from prison with mental illness, with a history of injury, and who identify as Indigenous are particularly indicated groups for injury prevention.

KEY WORDS: Injury Diagnosis; Prisoners; Cohort Study; Mental Health; Hospital Care; Epidemiology

KEY MESSAGES

What is already known on this subject

- ***Among people of working age, injury disproportionately impacts young people***
- ***Injury is a leading cause of hospitalisation among people released from prison***
- ***People released from prison are at increased risk of death due to injury***

What this study adds

- ***Injury is the most common cause of hospital contact among people released from prison***
- ***Unlike in the general population, older adults released from prison are at similar risk of injury compared to their younger peers***
- ***People released from prison with mental illness, a history of injury, and those who identify as Indigenous are particularly indicated groups for injury prevention***

INTRODUCTION

Approximately one in twelve deaths globally is attributable to injury.[1] The global burden of injury has declined since 1990,[2] but injury still disproportionately impacts young people aged 15-29 years[3] and socially-excluded groups, including people with a history of incarceration.[4] People released from prison have a risk of death from injury seven times higher than the general population,[5] and this disparity is larger for those aged under 25 years.[6] It is unclear if a similar age-related disparity observed among young adults in the general population exists among people released from prison.

Evidence on non-fatal injury after release from prison is limited, however injury that leads to hospital contact can result in enduring morbidity, disability, decreased quality of life, reduced economic productivity, and considerable public expenditure.[7-10] In community studies, mental illness,[11] SUD,[12] homelessness[13] and Indigeneity[14 15] have been positively associated with non-fatal injury, and are more common among people in prison.[16] One Australian study found that injury accounted for 22% of all hospital bed days within 12 months after release from prison.[17] Studies of emergency department (ED) presentations and hospital admissions in the United States (US) have found that injury is more common among people with a history of incarceration.[18 19] However, no study of people released from prison has included both ED presentations and hospital admissions, disaggregated non-fatal injury findings by age, or examined predictors of non-fatal injury.

A greater understanding of the age-related causes of hospital contact among people released from prison, including the patterns and risk factors for injury, is critical to inform targeted prevention efforts. In a representative cohort of adults released from prison in Queensland, Australia we aimed to: 1) calculate the age-specific incidence of injury-related hospital contact; and 2) identify age-specific factors associated with injury.

METHODS

We used cohort data from the Passports study,[20 21] a randomised controlled trial of a low-intensity case management intervention for people released from prison. Briefly, between 1 August 2008 and

31 July 2010, a baseline survey was administered to 1325 sentenced adult (≥18 years) prisoners within six weeks of expected release from one of seven prisons in Queensland. Informed, written consent was obtained from all participants. The prison sentence in which the baseline survey was administered is herein called the index prison sentence.

The Passports study received approval from the Queensland Corrective Services Research Committee, the Queensland Health Human Research Ethics Committee (HREC/11/QHC/40), the University of Queensland Behavioural and Social Sciences Ethical Review Committee (#2007000607) and the Australian Institute of Health and Welfare Ethics Committee (EC2012/4/58).

Baseline measures

Self-report measures at baseline included age, sex, Indigenous status (non-Indigenous/Indigenous), years of school completed (<10/≥10 years), relationship status (not in stable relationship/married or de facto), pre-incarceration accommodation (unstable/stable), pre-incarceration employment status (unemployed/employed), social visits in prison in the month prior to the baseline survey (none/≥1), history of juvenile detention (yes/no), and receipt of the Passports intervention[21] (yes/no). Given that the rate of injury peaks prior to 25 years of age and declines thereafter in the general population, we dichotomised age (<25/≥25 years).[22] Validated screening tools delivered at baseline included the Hayes Ability Screening Index[23] for ascertaining possible intellectual disability, the Kessler Psychological Distress Scale (K10)[24] for measuring psychological distress, and the Alcohol Use Disorders Identification Test[25] and the Alcohol, Smoking and Substance Involvement Screening Test,[26] for identifying harmful alcohol and other substance use, respectively.

Linked administrative data

Baseline survey data were probabilistically linked, both prospectively and retrospectively, to person-level, state-wide ED and inpatient hospital records, and prospectively to the National Death Index (for censoring deaths during follow-up). We deterministically linked survey data to correctional records to identify all prison admission and released dates during the study period. We had full

coverage for all administrative data sources from the date of prison release to 31 July 2012. For the period prior to, and during, the index prison sentence, we used International Classification of Diseases, 10th edition, Australian Modification (ICD-10-AM) codes[27] to determine ED presentations and hospital admissions in which mental illness (F01-F09 and F20-F99) or SUD (F10-F19) were documented as a principal or secondary diagnosis. In the year prior to the index prison sentence admission date, we identified ED presentations and hospital admissions with a principal diagnosis for injury (S00/T99).[28] From correctional records, we ascertained whether an individual was released on parole (yes/no), incarcerated prior to the index prison sentence (yes/no), and the length of their index prison sentence (<90/90-365/>365 days).

Diagnoses made by psychiatrists, psychologists, or general practitioners during the index prison sentence were extracted from prison medical records according to the International Classification of Primary Care, second edition (ICPC-2)[29] by two trained graduate researchers. We ascertained ICPC-2 diagnoses for mental illness, SUD, and injury (see supplementary Table S1).

Pre-release ICD-10-AM and ICPC-2 diagnoses were aggregated to generate composite dichotomous variables for a history of mental illness and SUD, respectively.

Outcomes

We ascertained all principal diagnoses in ED presentations and hospital admissions after release from prison and categorised them by ICD chapter. Our primary outcome was ED presentation and/or hospital admission resulting from injury as a principal diagnosis (ICD-10-AM codes S00-T99). Due to the possibility that multiple hospital contacts within 24 hours may be due to the same injury, we aggregated ED presentations and hospital admissions for injury that occurred within a 24-hour period into a single injury event. We categorised the nature and body region of injury using a modified Barell Injury Diagnosis Matrix.[30] ED presentations in which an individual did not wait to be assessed (i.e., discharge status 'Did not wait' and a principal diagnosis of Z53 'Procedure not carried out') were excluded.

Statistical methods

We calculated the proportion of total ED presentations, hours spent in the ED, hospital admissions, and hospital bed days, by ICD chapter. We compared crude differences between those who did and did not have an injury using chi-square tests, separately by age group. We calculated crude incidence rates (IRs) of ED presentation and hospital admission by ICD chapter, body region, nature, and external cause of injury, overall and by age group; and unadjusted incidence rate ratios (IRRs) collapsed across age group. Time at risk began on the date of release from the index prison sentence and was censored at death or the last day of the follow-up period (31st July, 2012), whichever occurred first. We interval truncated (i.e., removed) time spent reincarcerated and removed any injury events initiated from prison during reincarceration.

To ascertain predictors of injury, we fit univariate and multivariate Andersen-Gill models.[31] We tested for effects measure modification by fitting an interaction between age group and each measure in the adjusted model.

We replaced missing covariate data by multiple imputation (see supplementary material) and conducted sensitivity analyses restricted to complete cases only, and to investigate the potential impact of periods spent hospitalised, interval truncation for periods of reincarceration, and reincarceration during the study period.

We conducted all analyses using Stata v15.1.[32]

RESULTS

Ten participants were not linked to administrative records and eight were not released from prison during follow-up, leaving 1307 (98.6%) participants included in analyses. These participants experienced 3,052 ED presentations, excluding 397 (11.5%) presentations in which the individual did not wait to be assessed.

Overall, there were 3,804 person-years of follow-up and 1308 injuries resulting in hospital contact over the study period. Cohort characteristics are presented by injury status, overall and stratified by age group, in Table 1. One quarter (n=334; 25.6%) of participants were aged <25 years and most (n=1,126; 86.2%) were aged <45 years at baseline, 21.2% (n=277) were female, and 25.3% (n=331) identified as Indigenous. Almost one-third (n=404; 30.9%) of participants had at least one injury resulting in hospital contact during the study period.

Figure 1 displays the five most common causes of ED presentation, hours spent in ED, hospital admissions, and bed days, by ICD chapter. Injury was the leading cause of ED presentations (n=1,115/3,052; 37%), accounted for the most hours spent in the ED (n=5,449/15,642; 35%), was the leading cause of hospital admissions (n=307/1,155; 27%), and the second leading cause of hospital bed days (n=929/3,912; 24%), behind mental and behavioural disorders (n=1,116/3,912; 29%).

Crude IRs for the five most common causes of ED presentation and hospital admission are displayed, overall and stratified by age, in Table 2. The IRs of ED presentation and hospital admission for injury were 349 (95%CI: 329-370) and 98 (95%CI: 86-108) per 1000 person-years, respectively. No significant differences existed in injury IRs by age group (Table 2). The crude IR of injury during periods of reincarceration was 131 (95%CI: 104-163) per 1000 person-years. Excluding these events, the crude IR of injury in the community was 385 (95%CI: 364-407) per 1000 person-years and did not differ between the younger and older age groups (IR=403; 95%CI: 360-452 versus IR=379; 95%CI: 356-404; p=0.354).

Table 3 presents crude IRs of ED presentation and hospital admission by body region, nature, and external cause of injury, stratified by age group. The most common external causes of injury resulting in hospital admission were assault, mechanical force, and self-harm. Individuals aged <25 years had higher rates of hip and lower extremity injuries (IRR=1.49; 95%CI: 1.06-2.08) and amputation or open wound injuries (IRR=1.62; 95%CI: 1.20-2.16) resulting in ED presentations, compared to those aged ≥25 years (Table 3).

After adjusting for covariate effects, individuals diagnosed with a mental illness, who had at least one injury in the year prior to prison, who had been incarcerated prior to the index sentence, who identified as Indigenous, or who were released from a prison sentence shorter than 90 days (compared to a sentence over one year) were at increased risk of injury following release from prison (Table 4). Reincarceration during the study period was positively associated with injury. The effect of mental illness, risky alcohol use, prior incarceration, and intellectual disability differed across age group such that these factors predicted increased risk of injury among people aged ≥25 years compared to their counterparts without these characteristics (HR=1.88; 95%CI: 1.24-2.85; p=0.003, HR=1.81; 95%CI: 1.02-3.23; p=0.043, HR=1.57; 95%CI: 1.04-2.37; p=0.030, and HR=1.57; 95%CI: 1.00-2.46; p=0.050, respectively).

Sensitivity analyses supported our primary analysis (see supplementary Table S2). However, the association between Indigenous status and injury attenuated to the null when we restricted analysis to complete cases. When we restricted analysis to participants who remained in the community for the entire study period, not being in a stable relationship predicted an increased risk of injury after release from prison.

DISCUSSION

In a large cohort of adults released from prison in Australia, we found that injury was the primary cause of hospital contact. Factors associated with increased injury-related hospital contact included mental illness, injury in the year prior to incarceration, a history of prior incarceration, being released from a short prison sentence (<90 days), being reincarcerated, and identifying as Indigenous. We observed higher rates of ED presentation for hip or lower extremity, and amputation or open wound injury, among younger people released from prison. Although age did not predict all-cause injury, it modified the effect of mental illness, intellectual disability, risky alcohol use, and a history of incarceration, with greater effects among people aged ≥25 years than those aged <25 years.

Consistent with the general population, injury was the leading cause of ED presentations among adults released from prison. However, it accounted for a higher proportion of ED presentations in our study compared to in the general population (37% versus 27%).[33] Furthermore, the rate of hospital admission for injury was almost four times higher than in the general population (98 versus 27 per 1,000 person-years).[34] Our findings are consistent with a prior Australian study that found that injury was the second leading cause of hospital bed days and accounted for the largest proportion of individuals admitted to hospital after release.[17] Prior research in the US has observed an increased prevalence of hospitalisation due to injury in the first 90 days after release from prison, compared to matched controls without a history of incarceration.[19] This is strong evidence that adults released from prison experience a disproportionate burden of non-fatal injury compared to people without a history of incarceration.

Mental illness was a strong, independent predictor of injury after release from prison, consistent with findings from the general population,[11] and our prior findings that co-occurring mental illness and SUD predicted increased non-fatal injury after release from prison.[35] However, injury is both a risk factor for, and a consequence of, mental illness making hospital contact for injury a key opportunity to address mental health.[36-38] Mental illness is often poorly identified and treated in people presenting with injury,[39] but our findings highlight the importance of mental health screening in acute care, enabling appropriate referrals to mental health providers.[40] Psychotropic medications have been associated with reduced violence, driving-related risk taking, and ED presentations among people with dual diagnosis and a history of incarceration.[41] Psychotic disorders have been associated with increased violent recidivism among people released from prison[42] and we found high rates of hospital admissions for assault injuries. In this context, our findings suggest that initiating mental healthcare in prison, ensuring continuity of this care after release, and hospital-centred violence prevention programs where indicated[43] may be effective in reducing the disproportionate injury burden experienced by people released from prison.

Release from short sentences (<90 days) and reincarceration during follow-up were associated with increased risk of non-fatal injury. Therefore, people serving short sentences should be a priority for health interventions aimed at alleviating gaps in care and support for these individuals who cycle rapidly through the criminal justice system.

Injury prior to incarceration predicted injury after release from prison, the rate of injury was lower during periods of incarceration than in the community, and injury in prison did not predict injury after release. Thus, incarceration should only be considered an interruption to the risk of injury in the community; this risk is strongly associated with social and economic disadvantage.[44] Addressing these social, economic, and environmental determinants of inequality that people with a history of incarceration experience will reduce the risk of reincarceration and injury.[45]

Indigenous people are overrepresented in Australian prisons by an age-adjusted factor of 13.[46] We found rates of hospital contact for injury was high in this group reflecting a risk of enduring morbidity and mortality. Therefore, culturally-informed health interventions to prevent injury may be a key component of addressing the Indigenous health gap in Australia.[14]

In contrast to trends in the general population,[22] we found that the risk of injury remains high among adults aged ≥25 years released from prison. Incarceration compounds disadvantage[47] and, as disadvantage increases, the demographic disparities in injury attenuate as key determinants of injury such as unstable housing, poverty, mental health problems, risky substance use, stigma and discrimination, and social isolation become more prominent.[44 48] Consistent with this, we found no significant sex differences in the rate of injury, in contrast to general population studies.[22] However, the effect of mental illness and incarceration was more prominent as age increased. Given the increased risk of injury among older adults with a history of mental illness, intellectual disability, risky alcohol use, and/or incarceration, younger adults with these characteristics in contact with the criminal justice system are key target groups for prevention.

Injury accounted for over one-third of all hours spent in the ED and one in four hospital bed days. Such high rates of tertiary healthcare for injury impose substantial costs on the health system. Subsequent costs associated with chronic morbidity, and decreased social and economic participation, compound the economic burden.[49] There is an imperative to make better use of scarce public resources and our findings show a clear need to identify cost-effective means of reducing the burden of injury in this population.

While universal injury prevention strategies have shown substantial success preventing injury on a population level, far less is known about targeted injury prevention strategies in marginalised groups where injury morbidity remains high.[50] To our knowledge there are no prevention strategies for non-drug-related causes that specifically target people released from prison. In marginalised groups, peer support appears to provide key elements required for successful intervention, such as open communication, trust, and engagement.[45] A trial in the US found that peer-integrated case management and early primary care contact reduced preventable ED presentations in people released from prison.[51] Efforts to establish effective intervention strategies for this group, such as testing the effect of peer-integrated injury prevention, should be a priority for future research.

Our study had several strengths. The cohort was representative on demographic and criminal justice characteristics of all individuals released from prisons in Queensland during the study period.[20] The combination of person-level, linked administrative ED, hospital, correctional, mortality, and prison medical records, with comprehensive survey data allowed for adjustment of a range of confounders. Our study design also accounted for the effect of reincarceration on the risk of injury, substantially reducing the possibility of informative censoring.

Our study also had some limitations. Our outcome of interest was injury resulting in hospital contact and thus, would not capture the entire burden of injury experienced by people released from prison. However, it does include the more severe injuries and those generating the greatest costs for the health sector. We included both the intervention and control arms of the Passports study in our

analyses. The aim of this low-intensity intervention was to increase contact with primary care, and no significant association with hospital contact was observed. Nevertheless, we adjusted for randomisation group in our final model. Our study was conducted in one Australian state and therefore may not be generalisable to jurisdictions that have different social and environmental drivers of injury and/or different prison age demographics and correctional systems.

Conclusions

There is a large disparity in the burden of injury among people released from prison. Unlike in the general population where the risk of injury declines with age, older adults released from prison are at equivalent risk of injury compared to their younger peers. Targeted preventions strategies for people involved in the criminal justice system are urgently needed; those who identify as Indigenous, people with mental illness, and those with a history of injury are particularly indicated groups for injury prevention.

AUTHOR DISCLOSURES

Role of Funding Source

The Passports study was funded by National Health and Medical Research Council (NHMRC) Strategic Award APP409966 and NHMRC Project Grant APP1002463. Stuart Kinner is supported by NHMRC Senior Research Fellowship APP1078168. Rohan Borschmann is supported by NHMRC Early Career Fellowship APP1104644. Lisa Brophy receives salary support from Mind Australia Limited. Jesse T Young is supported by a Melbourne Research Scholarship (PhD) from the University of Melbourne. The funding source had no additional role in the research design; data collection, analysis, or interpretation; the writing of the manuscript; or the decision to submit the article for publication.

Contributors

SK and EH developed the original research proposal and methodology. JY developed and conducted the statistical analysis. JY wrote the initial draft manuscript. All authors contributed significantly to the interpretation and synthesis of results, and were involved in the development of the final manuscript submitted. JY had full access to the data used in this study and takes responsibility for the integrity of the data and accuracy of the data analysis.

Conflict of Interest

Apart from the funding resources disclosed in the acknowledgements section, all authors declare no conflicts of interest.

Acknowledgements

The authors would like to acknowledge the Passports project team and the late Professor Konrad Jamrozik, for his pivotal role in conceiving and designing the Passports study. The authors thank Professor James Ogloff for his support and contributions to this study. The authors also wish to acknowledge the Passports study participants for sharing their stories with us. The authors would like to acknowledge the assistance provided by Queensland Corrective Services to the Passports

study. The views expressed herein are solely those of the authors, and in no way reflect the views or policies of Queensland Corrective Services.

TABLES/FIGURES

Table 1: Cohort characteristics by injury status, overall and stratified by age group

Characteristic	<25 years 334 (25.6%)			≥25 years old 973 (74.4%)			All participants
	No injury N (%) 230(100.0%)	≥1 injury N (%) 104(100.0%)	p-value[c]	No injury N (%) 673(100.0%)	≥1 injury N (%) 300(100.0%)	p-value[c]	N (%) 1307 (100.0%)
Sex							
Male	185 (80.4%)	81 (77.9%)	0.665	534 (79.3%)	230 (76.7%)	0.347	1030 (78.8%)
Indigenous status							
Indigenous	75 (32.6%)	32 (30.8%)	0.739	157 (23.3%)	67 (22.3%)	0.733	331 (25.3%)
Years of school completed							
<10 years	107 (46.5%)	58 (55.8%)	0.118	263 (39.3%)	135 (45.2%)	0.085	563 (43.2%)
Valid n				670 (99.6%)	299 (99.7%)		1303 (99.7%)
Relationship status[a]							
Not in stable relationship	146 (64.6%)	60 (58.8%)	0.316	376 (56.2%)	175 (58.5%)	0.500	757 (58.4%)
Valid n	226 (98.3%)	102 (98.1%)		669 (99.4%)	299 (99.7%)		1296 (99.2%)
Accommodation[a]							
Unstable	35 (15.2%)	16 (15.5%)	0.941	120 (17.9%)	49 (16.4%)	0.579	220 (16.9%)
Valid n		103 (99.0%)		670 (99.6%)	298 (99.3%)		1301 (99.5%)
Employment status[a]							
Unemployed	120 (52.2%)	50 (48.5%)	0.540	332 (49.3%)	142 (47.3%)	0.565	644 (49.3%)
Valid n		103 (99.0%)					1306 (99.9%)
Social visits in prison[b]							
None	126 (54.8%)	50 (48.1%)	0.256	355 (52.7%)	170 (56.7%)	0.258	701 (53.6%)
Intellectual disability							
Yes	24 (10.7%)	14 (13.5%)	0.461	44 (6.8%)	31 (10.5%)	0.046	113 (8.9%)
Valid n	225 (97.8%)			651 (96.7%)	294 (98.0%)		1274 (97.5%)
Psychological distress							
High/very high	62 (27.1%)	29 (27.9%)	0.878	514 (76.8%)	207 (69.0%)	0.010	963 (74.0%)
Valid n	229 (99.6%)			669 (99.4%)			1302 (99.6%)
Mental illness							
Yes	52 (22.6%)	29 (27.9%)	0.298	169 (25.1%)	126 (42.0%)	<0.001	376 (28.8%)
Substance use disorder							
Yes	86 (37.4%)	46 (44.2%)	0.236	301 (44.7%)	158 (52.7%)	0.022	591 (45.2%)
AUDIT risky alcohol use							
High/probable dependence	118 (52.0%)	48 (48.0%)	0.507	185 (28.2%)	120 (40.8%)	<0.001	471 (36.9%)
Valid n	227 (98.7%)	100 (96.2%)		657 (97.6%)	294 (98.0%)		1278 (97.8%)
ASSIST risky substance use							
Methamphetamine							
Moderate/high	98 (42.8%)	45 (43.3%)	0.935	251 (37.3%)	107 (35.8%)	0.652	501 (38.4%)
Valid n	229 (99.6%)				299 (99.7%)		1305 (99.8%)
Heroin							
Moderate/high	32 (14.0%)	12 (11.7%)	0.564	131 (19.5%)	57 (19.1%)	0.884	232 (17.8%)
Valid n	229 (99.6%)	103 (99.0%)		672 (99.9%)	299 (99.7%)		1303 (99.8%)
Injury in the year prior to prison							
Yes	51 (22.2%)	35 (33.7%)	0.026	125 (18.6%)	94 (31.3%)	<0.001	305 (23.3%)
Injury during prison sentence							
Yes	53 (23.0%)	30 (28.8%)	0.256	161 (23.9%)	74 (24.7%)	0.802	318 (24.3%)
Released on parole							
No parole	135 (58.7%)	61 (58.7%)	0.994	434 (64.5%)	192 (64.0%)	0.883	822 (62.9%)

Juvenile detention history								
Yes		89 (39.7%)	27 (26.5%)	0.020	169 (25.2%)	76 (25.5%)	0.926	361 (27.9%)
	Valid n	224 (97.4%)	102 (98.1%)		670 (99.6%)	298 (99.3%)		1294 (99.0%)
Incarcerated prior to the index sentence								
Yes		147 (63.9%)	65 (63.1%)	0.888	457 (68.0%)	217 (72.6%)	0.154	886 (67.9%)
	Valid n		103 (99.0%)		672 (99.9%)	299 (99.7%)		1304 (99.8%)
Length of index prison sentence								
<90 days		64 (28.1%)	34 (33.0%)	0.442	176 (26.3%)	94 (31.4%)	0.216	368 (28.3%)
90-365 days		119 (52.2%)	54 (52.4%)		346 (51.6%)	148 (49.5%)		667 (51.3%)
>365 days		45 (19.7%)	15 (14.6%)		148 (22.1%)	57 (19.1%)		265 (20.4%)
	Valid n	228 (99.1%)	103 (99.0%)		670 (99.6%)	299 (99.7%)		1300 (99.5%)
Passports intervention								
Control		116 (50.4%)	48 (46.2%)	0.469	341 (50.7%)	148 (49.3%)	0.700	653 (50.0%)

[a]Assessed at baseline; [b]In the month prior to the baseline interview; [c]Chi-square test

ASSIST: Alcohol, Smoking and Substance Involvement Screening Test; AUDIT: Alcohol Use Disorders Identification Test

Table 2: Incidence rates for the top five causes of ED presentation and hospital admission stratified by age

Principal diagnosis	Events	Incidence Rate (95%CI) per 1000 person-years			IRR (95%CI)[a]
		Overall	<25 years old	≥25 years old	
ED presentations					
All cause	3052	956 (923, 991)	942 (874, 1014)	961 (923, 1000)	0.98 (0.90, 1.07)
Injury, poisoning and certain other consequences from external causes	1115	349 (329, 370)	369 (328, 416)	343 (321, 367)	1.08 (0.93, 1.23)
Mental and behavioural disorders	505	158 (145, 173)	134 (110, 163)	166 (150, 182)	0.81 (0.64, 1.01)
Factors influencing health status and contact with health services	321	101 (90, 112)	105 (84, 131)	99 (88, 113)	1.06 (0.81, 1.37)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	279	87 (78, 98)	67 (50, 88)	94 (82, 106)	0.71 (0.51, 0.97)
Diseases of the skin and subcutaneous tissue	208	65 (57, 75)	91 (72, 116)	57 (49, 68)	1.59 (1.17, 2.14)
Hospital admissions					
All cause	1155	362 (342, 383)	327 (288, 371)	372 (349, 397)	0.88 (0.76, 1.01)
Injury, poisoning and certain other consequences from external causes	307	98 (86, 108)	105 (84, 131)	94 (82, 106)	1.12 (0.85, 1.46)
Mental and behavioural disorders	207	65 (57, 74)	61 (46, 82)	66 (56, 77)	0.93 (0.65, 1.30)
Diseases of the digestive system	84	26 (21, 33)	26 (17, 41)	26 (21, 34)	0.98 (0.55, 1.65)
Pregnancy, childbirth and the puerperium	77	24 (19, 30)	37 (25, 54)	20 (15, 27)	1.81 (1.09, 2.94)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	71	22 (18, 28)	15 (8, 27)	24 (19, 31)	0.61 (0.29, 1.18)

[a]Those aged ≥25 years old is the reference category.

ED: Emergency department; IRR: Incidence rate ratio; 95%CI: 95% confidence interval

Table 3: Injury incidence rates from ED presentation and hospital admission, by body region and nature of injury, stratified by age

Measure	Events	Incidence Rate (95%CI) per 1000 person-years			IRR (95%CI)[a]
		Overall	<25 years old	≥25 years old	
ED presentations for injury[b]	1115	349 (329, 370)	369 (328, 416)	343 (321, 367)	1.08 (0.93, 1.23)
Body region					
Head and neck	279	87 (78, 98)	87 (68, 111)	87 (77, 100)	1.00 (0.74, 1.32)
Thorax, spine, and torso	100	31 (26, 38)	30 (20, 46)	32 (25, 40)	0.94 (0.56, 1.53)
Upper extremities	270	85 (75, 95)	102 (82, 128)	79 (69, 91)	1.29 (0.97, 1.69)
Hip and lower extremities	172	54 (46, 63)	72 (55, 95)	48 (40, 58)	1.49 (1.06, 2.08)
Multiple body regions/system wide	138	43 (37, 51)	31 (21, 47)	47 (39, 56)	0.67 (0.41, 1.05)
Unspecified	156	49 (42, 57)	46 (33, 65)	50 (42, 59)	0.93 (0.62, 1.37)
Nature of injury					
Fracture or dislocation	197	62 (54, 71)	61 (46, 82)	152 (53, 72)	0.99 (0.69, 1.39)
Internal organ or blood vessel	41	13 (9, 17)	16 (9, 29)	12 (8, 17)	1.39 (0.64, 2.80)
Amputation or open wound	221	69 (61, 79)	98 (78, 124)	61 (52, 71)	1.62 (1.20, 2.16)
Contusion or superficial	158	49 (42, 58)	55 (40, 74)	48 (40, 57)	1.14 (0.77, 1.64)
Crushing or burn	33	10 (7, 15)	8 (4, 18)	11 (8, 16)	0.74 (0.25, 1.84)
Poisoning or toxic effects	113	35 (29, 43)	25 (15, 39)	39 (32, 47)	0.63 (0.36, 1.06)
Other (specified)[c]	200	63 (55, 72)	63 (47, 84)	63 (53, 73)	1.00 (0.70, 1.40)
Unspecified	152	48 (41, 56)	44 (31, 62)	49 (41, 58)	0.89 (0.58, 1.33)
Hospital admissions for injury	307	98 (86, 108)	105 (84, 131)	94 (82, 106)	1.12 (0.85, 1.46)
Body region					
Head and neck	80	25 (20, 31)	27 (18, 42)	24 (19, 31)	1.12 (0.64, 1.88)
Thorax, spine, and torso	33	10 (7, 15)	8 (4, 18)	11 (8, 16)	0.74 (0.25, 1.84)
Upper extremities	79	25 (20, 31)	30 (20, 46)	23 (18, 30)	1.29 (0.75, 2.15)
Hip and lower extremities	39	12 (9, 17)	18 (10, 31)	11 (7, 16)	1.67 (0.79, 3.38)
Multiple body regions/system wide	67	21 (17, 27)	18 (10, 31)	22 (17, 29)	0.80 (0.40, 1.50)
Unspecified	9	3 (1, 5)	4 (1, 13)	2 (1, 5)	1.67 (0.27, 7.84)
Nature of injury					
Fracture or dislocation	79	25 (20, 31)	26 (17, 41)	24 (19, 31)	1.06 (0.60, 1.80)
Internal organ or blood vessel	31	10 (7, 14)	16 (9, 29)	8 (5, 12)	2.12 (0.94, 4.59)
Amputation or open wound	58	18 (14, 24)	23 (14, 37)	17 (12, 23)	1.38 (0.74, 2.50)
Contusion or superficial	17	5 (3, 9)	3 (1, 11)	6 (4, 10)	0.45 (0.05, 1.92)
Crushing or burn	4	1 (0,3)	1 (0, 10)	1 (0, 4)	1.12 (0.02, 13.9)
Poisoning or toxic effects	63	20 (15, 25)	18 (10, 31)	20 (15, 27)	0.87 (0.43, 1.63)
Other (specified)[c]	35	11 (8, 15)	14 (7, 25)	10 (7, 16)	1.34 (0.57, 2.89)
Unspecified	20	6 (4, 10)	4 (1, 13)	7 (4, 11)	0.59 (0.11, 2.04)
External cause of injury (n=350)[d]					
Transport accidents	36	11 (8, 16)	18 (10, 31)	9 (6, 14)	1.89 (0.88, 3.90)
Accidental falls	47	15 (11, 20)	12 (6, 24)	15 (11, 21)	0.79 (0.34, 1.67)
Mechanical force	57	18 (14, 23)	23 (14, 37)	16 (12, 22)	1.42 (0.76, 2.57)
Accidental poisoning	21	7 (4, 10)	7 (3, 16)	7 (4, 11)	1.05 (0.30, 2.99)
Other accidental exposures	22	7 (5, 10)	4 (1, 13)	8 (5, 12)	0.53 (0.10, 1.80)
Intentional self-harm	49	15 (12, 20)	12 (6, 24)	16 (12, 22)	0.75 (0.32, 1.58)
Assault	93	29 (24, 36)	29 (19, 44)	29 (23, 37)	0.98 (0.57, 1.61)
Other external causes[e]	25	8 (5, 12)	5 (2, 15)	9 (6, 13)	0.64 (0.16, 1.89)

[a]≥25 years is the reference category; [b]ED records in Australia contain principal diagnosis ICD-10-AM codes only and do not contain external cause of morbidity and mortality codes; [c]Includes foreign body or other effects of external causes and multiple injuries (within same body region); [d]total exceeds the number of hospital admissions as hospital records in Australia can contain multiple external causes of morbidity and mortality ICD-10-AM codes; [e]Includes electric current, smoke, forces of nature, accidental drowning and submersion, other accidental threats to breathing, events of undetermined intent, and legal intervention.

ED: Emergency department; IRR: Incidence rate ratio; 95%CI: 95% confidence interval

Table 4: Predictors of injury resulting in hospital contact in adults released from prison

Characteristic	Unadjusted HR(95%CI)	p-value	Adjusted HR(95%CI) with imputed values[c]	p-value
Age (years)				
≥25	1 (ref)		1 (ref)	
<25	1.06 (0.87, 1.30)	0.553	1.07 (0.89, 1.30)	0.460
Sex				
Female	1 (ref)		1 (ref)	
Male	0.99 (0.78, 1.26)	0.919	1.24 (0.96, 1.58)	0.093
Indigenous status				
Non-Indigenous	1 (ref)		1 (ref)	
Indigenous	1.58 (1.23, 2.03)	<0.001	1.33 (1.02, 1.72)	0.033
Years of school completed				
≥10 years	1 (ref)		1 (ref)	
<10 years	1.38 (1.13, 1.70)	0.002	1.10 (0.90, 1.35)	0.359
Relationship status[a]				
Married or de facto	1 (ref)		1 (ref)	
Not in stable relationship	1.16 (0.95, 1.43)	0.085	1.03 (0.85, 1.24)	0.747
Accommodation[a]				
Stable	1 (ref)		1 (ref)	
Unstable	1.33 (0.99, 1.77)	0.053	1.01 (0.79, 1.29)	0.940
Employment status[a]				
Employed	1 (ref)		1 (ref)	
Unemployed	1.47 (1.21, 1.79)	<0.001	1.08 (0.91, 1.30)	0.376
Social visits in prison[b]				
One or more	1 (ref)		1 (ref)	
None	1.41 (1.15, 1.72)	<0.001	1.04 (0.85, 1.26)	0.725
Intellectual disability				
No	1 (ref)		1 (ref)	
Yes	1.34 (0.90, 1.99)	0.150	1.08 (0.78, 1.49)	0.657
Psychological distress				
Low/moderate	1 (ref)		1 (ref)	
High/very high	1.23 (0.98, 1.55)	0.069	1.00 (0.82, 1.22)	0.998
Mental illness				
No	1 (ref)		1 (ref)	
Yes	2.23 (1.82, 2.74)	<0.001	1.92 (1.56, 2.37)	<0.001
Substance use disorder				
No	1 (ref)		1 (ref)	
Yes	2.03 (1.67, 2.47)	<0.001	1.10 (0.87, 1.39)	0.418
AUDIT risky alcohol use				
Low/moderate	1 (ref)		1 (ref)	
High/probable dependence	1.50 (1.22, 1.85)	<0.001	1.18 (0.95, 1.48)	0.136
ASSIST risky substance use				
Methamphetamine				
Low	1 (ref)		1 (ref)	
Moderate/high	1.30 (1.06, 1.59)	0.013	0.99 (0.82, 1.20)	0.938
Heroin				
Low	1 (ref)		1 (ref)	
Moderate/high	1.51 (1.18, 1.93)	0.001	1.23 (0.98, 1.56)	0.080
Injury in the year prior to prison				
No	1 (ref)		1 (ref)	
Yes	2.13 (1.73, 2.61)	<0.001	1.72 (1.44, 2.06)	<0.001
Injury during prison sentence				
No	1 (ref)		1 (ref)	
Yes	1.15 (0.90, 1.46)	0.269	1.18 (0.95, 1.48)	0.134
Released on parole				
Parole	1 (ref)		1 (ref)	
No parole	0.92 (0.75, 1.12)	0.413	0.98 (0.82, 1.17)	0.812
Juvenile detention history				
No	1 (ref)		1 (ref)	
Yes	1.54 (1.20, 1.98)	<0.001	1.10 (0.88, 1.38)	0.409
Incarcerated prior to the index sentence				
No	1 (ref)		1 (ref)	
Yes	2.08 (1.67, 2.58)	<0.001	1.49 (1.19, 1.86)	<0.001
Length of index prison sentence				
>365 days	1 (ref)		1 (ref)	
90-365 days	1.05 (0.81, 1.35)	0.737	1.03 (0.79, 1.33)	0.833
<90 days	1.36 (1.03, 1.78)	0.029	1.33 (1.02, 1.74)	0.038
Passports intervention				

Intervention	1 (ref)		1 (ref)	
Control	0.97 (0.79, 1.20)	0.804	0.98 (0.82, 1.18)	0.844
Releases from prison during follow-up (TVC)[d]	1.29 (1.21, 1.37)	<0.001	1.05 (1.01, 1.08)	0.006

[a]Assessed at baseline; [b]In the month prior to the baseline interview; [c]The multivariate model was adjusted for age group, sex, Indigenous status, years of schooling completed, relationship status, accommodation, employment status, social visits in prison, intellectual disability, psychological distress, mental illness, SUD, AUDIT score, ASSIST scores for methamphetamine and heroin, injury in the year prior to prison, injury during the index prison sentence, parole on release, history of juvenile detention, incarcerated prior to the index sentence, length of the index prison sentence, and receipt of the Passports intervention; [d]The number of releases from reincarcerations during the study period was fit as a time-varying covariate.

ASSIST: Alcohol, Smoking and Substance Involvement Screening Test; AUDIT: Alcohol Use Disorders Identification Test; HR: Hazard rate ratio; SUD: Substance use disorder; TVC: Time-varying covariate; 95%CI; 95% confidence interval

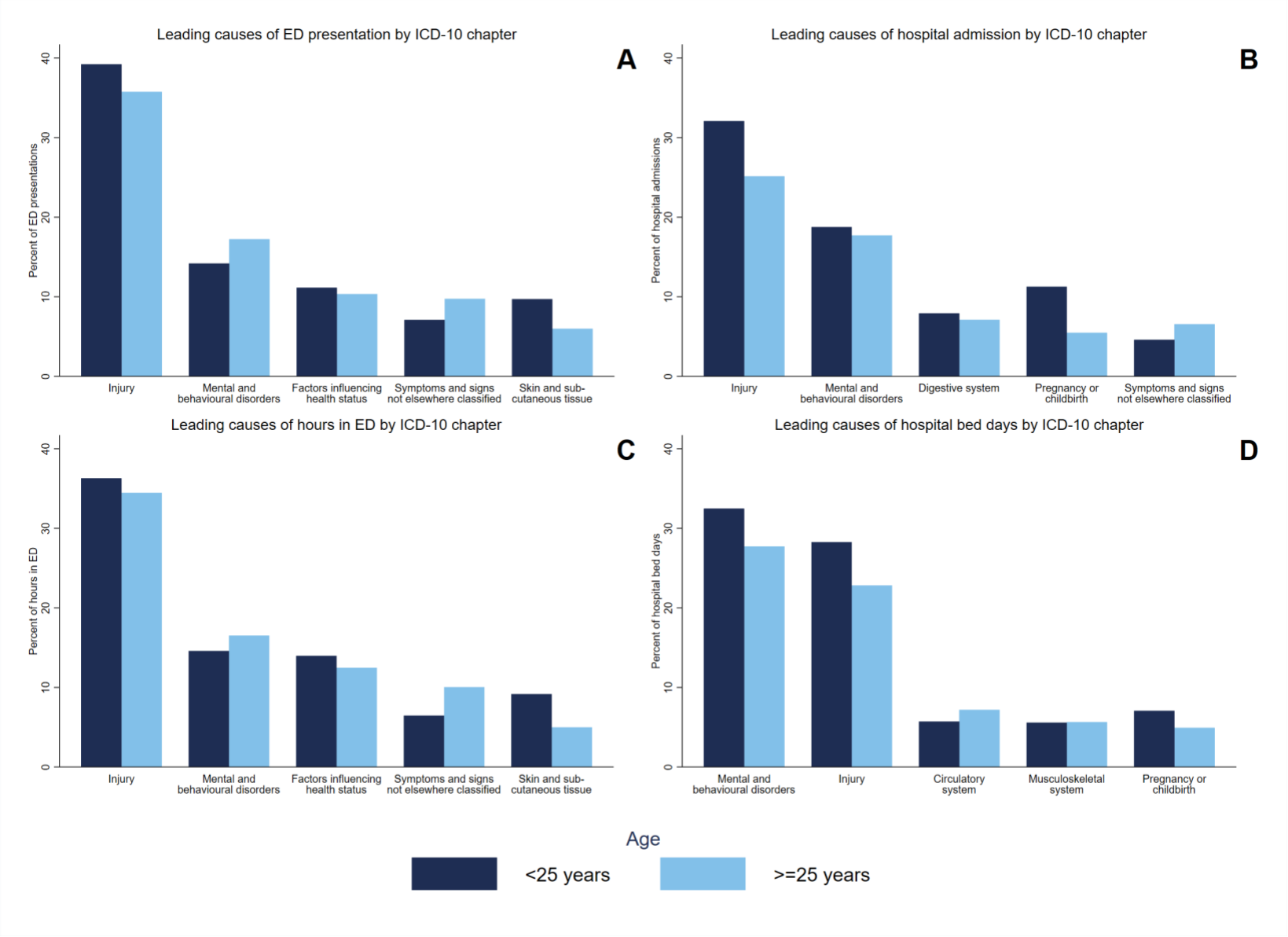

Figure 1: Five leading causes of A) ED presentation; B) hospital admission; C) hours in ED; and D) hospital bed days by ICD chapter

REFERENCES

1. GBD 2016 Causes of Death Collaborators. Global, regional, and national age-sex specific mortality for 264 causes of death, 1980–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet* 2017;390(10100):1151-210. doi: 10.1016/S0140-6736(17)32152-9
2. Haagsma JA, Graetz N, Bolliger I, et al. The global burden of injury: incidence, mortality, disability-adjusted life years and time trends from the Global Burden of Disease study 2013. *Inj Prev* 2016;22(1):3-18. doi: 10.1136/injuryprev-2015-041616
3. Chandran A, Hyder AA, Peek-Asa C. The Global Burden of Unintentional Injuries and an Agenda for Progress. *Epidemiol Rev* 2010;32(1):110-20. doi: 10.1093/epirev/mxq009
4. Aldridge RW, Story A, Hwang SW, et al. Morbidity and mortality in homeless individuals, prisoners, sex workers, and individuals with substance use disorders in high-income countries: a systematic review and meta-analysis. *The Lancet* 2017;391(10117):241-50. doi: 10.1016/S0140-6736(17)31869-X
5. Kouyoumdjian FG, Kiefer L, Wobeser W, et al. Mortality over 12 years of follow-up in people admitted to provincial custody in Ontario: a retrospective cohort study. *CMAJ Open* 2016;4(2):E153-E61. doi: 10.9778/cmajo.20150098
6. van Dooren K, Kinner SA, Forsyth S. Risk of death for young ex-prisoners in the year following release from adult prison. *Aust N Z J Public Health* 2013;37(4):377-82. doi: 10.1111/1753-6405.12087
7. Curtis K, Lam M, Mitchell R, et al. Acute costs and predictors of higher treatment costs of trauma in New South Wales, Australia. *Injury* 2014;45(1):279-84. doi: 10.1016/j.injury.2012.10.002
8. Corso P, Finkelstein E, Miller T, et al. Incidence and lifetime costs of injuries in the United States. *Inj Prev* 2006;12(4):212-18. doi: 10.1136/ip.2005.010983
9. Van Son MAC, De Vries J, Roukema JA, et al. The course of health status and (health-related) quality of life following fracture of the lower extremity: a 6-month follow-up study. *Qual Life Res* 2016;25(5):1285-94. doi: 10.1007/s11136-015-1167-4
10. Gabbe BJ, Lyons RA, Simpson PM, et al. Disability weights based on patient-reported data from a multinational injury cohort. *Bull World Health Organ* 2016;94(11):806-16C. doi: 10.2471/BLT.16.172155
11. Wan JJ, Morabito DJ, Khaw L, et al. Mental Illness as an Independent Risk Factor for Unintentional Injury and Injury Recidivism. *Journal of Trauma-Injury Infection & Critical Care* 2006;61(6):1299-304.
12. Soderstrom CA, Smith GS, Dischinger PC, et al. Psychoactive substance use disorders among seriously injured trauma center patients. *JAMA* 1997;277(22):1769-74. doi: 10.1001/jama.1997.03540460033029
13. Fazel S, Geddes JR, Kushel M. The health of homeless people in high-income countries: descriptive epidemiology, health consequences, and clinical and policy recommendations. *The Lancet* 2014;384(9953):1529-40. doi: 10.1016/S0140-6736(14)61132-6
14. Vos T, Barker B, Begg S, et al. Burden of disease and injury in Aboriginal and Torres Strait Islander Peoples: the Indigenous health gap. *Int J Epidemiol* 2009;38(2):470-77. doi: 10.1093/ije/dyn240
15. Lakhani A, Townsend C, Bishara J. Traumatic brain injury amongst indigenous people: a systematic review. *Brain Inj* 2017;31(13-14):1718-30. doi: 10.1080/02699052.2017.1374468
16. Kinner SA, Young JT. Understanding and improving the health of people who experience incarceration: An overview and synthesis. *Epidemiol Rev* 2018;40(1):4-11. doi: 10.1093/epirev/mxx018

17. Alan J, Burmas M, Preen D, et al. Inpatient hospital use in the first year after release from prison: a Western Australian population-based record linkage study. *Aust N Z J Public Health* 2011;35(3):264-69. doi: 10.1111/j.1753-6405.2011.00704.x
18. McConville S, Mooney AC, Williams BA, et al. How do ED patients with criminal justice contact compare with other ED users? A retrospective analysis of ED visits in California. *BMJ Open* 2018;8(6) doi: 10.1136/bmjopen-2017-020897
19. Wang EA, Wang Y, Krumholz HM. A high risk of hospitalization following release from correctional facilities in medicare beneficiaries: A retrospective matched cohort study, 2002 to 2010. *JAMA Internal Medicine* 2013;173(17):1621-28. doi: 10.1001/jamainternmed.2013.9008
20. Kinner SA, Lennox N, Williams GM, et al. Randomised controlled trial of a service brokerage intervention for ex-prisoners in Australia. *Contemp Clin Trials* 2013;36(1):198-206. doi: 10.1016/j.cct.2013.07.001
21. Kinner SA, Alati R, Longo M, et al. Low-intensity case management increases contact with primary care in recently released prisoners: a single-blinded, multisite, randomised controlled trial. *J Epidemiol Community Health* 2016;70:683-88. doi: 10.1136/jech-2015-206565
22. Dinh MM, Russell SB, Bein KJ, et al. Age-related trends in injury and injury severity presenting to emergency departments in New South Wales Australia: Implications for major injury surveillance and trauma systems. *Injury* 2017;48(1):171-76. doi: 10.1016/j.injury.2016.08.005
23. Hayes S. Hayes Ability Screening Index (HASI) Manual: Faculty of Medicine, University of Sydney, 2000.
24. Kessler RC, Barker PR, Colpe LJ, et al. Screening for serious mental illness in the general population. *Arch Gen Psychiatry* 2003;60(2):184-89. doi: 10.1001/archpsyc.60.2.184
25. Babor TF, Higgins-Biddle JC, Saunders JB, et al. AUDIT: The Alcohol Use Disorders Identification Test, Guidelines for Use in Primary Care (2nd Ed). Geneva: World Health Organisation (WHO), 2001.
26. WHO ASSIST Working Group. The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): development, reliability and feasibility. *Addiction* 2002;97(9):1183-94. doi: 10.1046/j.1360-0443.2002.00185.x
27. National Centre for Classification in Health. International statistical classification of diseases and related health problems, Tenth Revision, Australian Modification (ICD-10-AM). National Centre for Classification in Health, Faculty of Health Sciences, University of Sydney. , 2004.
28. Cryer C, Langley JD. Developing valid indicators of injury incidence for “all injury”. *Inj Prev* 2006;12(3):202-07. doi: 10.1136/ip.2006.011635
29. ICPC-2. International Classification of Primary Care. Second ed. Oxford: Oxford University Press 1998.
30. Barell V, Aharonson-Daniel L, Fingerhut LA, et al. An introduction to the Barell body region by nature of injury diagnosis matrix. *Inj Prev* 2002;8(2):91-96. doi: 10.1136/ip.8.2.91
31. Andersen PK, Gill RD. Cox's Regression Model for Counting Processes: A Large Sample Study. *Annals of Statistics* 1982;10(4):1100-20. doi: 10.2307/2240714
32. Stata Statistical Software: Release 15 [program]. College Station, TX: StataCorp LLC, 2017.
33. AIHW. Emergency department care 2015-16: Australian hospital statistics. Health services series no. 72. Cat. no. HSE 182. Canberra: Australian Institute of Health and Welfare, 2016.
34. AIHW. Admitted patient care 2014-15: Australian hospital statistics. Health services series no. 68. Cat. no. HSE 172,. Canberra: Australian Institute of Health and Welfare, 2016.
35. Young JT, Heffernan E, Borschmann R, et al. Dual diagnosis of mental illness and substance use disorder and injury in adults recently released from prison: a prospective cohort study. *The Lancet Public Health* 2018;3(5):e237-48. doi: 10.1016/S2468-2667(18)30052-5
36. Richard A. Bryant, Meaghan L. O'Donnell, Mark Creamer, et al. The Psychiatric Sequelae of Traumatic Injury. *Am J Psychiatry* 2010;167(3):312-20. doi: 10.1176/appi.ajp.2009.09050617

37. MacGregor AJ, Corson KS, Larson GE, et al. Injury-specific predictors of posttraumatic stress disorder. *Injury* 2009;40(9):1004-10. doi: 10.1016/j.injury.2009.04.006
38. Connorton E, Miller M, Perry MJ, et al. Mental health and unintentional injurers: results from the national co-morbidity survey replication. *Inj Prev* 2011;17(3):171-75. doi: 10.1136/ip.2010.028464
39. Wiseman T, Foster K, Curtis K. Mental health following traumatic physical injury: An integrative literature review. *Injury* 2013;44(11):1383-90. doi: 10.1016/j.injury.2012.02.015
40. Prince M, Patel V, Saxena S, et al. No health without mental health. *The Lancet* 2007;370(9590):859-77. doi: 10.1016/S0140-6736(07)61238-0
41. Robertson AG, Easter MM, Lin H, et al. Medication-Assisted Treatment for Alcohol-Dependent Adults With Serious Mental Illness and Criminal Justice Involvement: Effects on Treatment Utilization and Outcomes. *Am J Psychiatry* 2018;175(7):665-73. doi: 10.1176/appi.ajp.2018.17060688
42. Chang Z, Larsson H, Lichtenstein P, et al. Psychiatric disorders and violent reoffending: a national cohort study of convicted prisoners in Sweden. *The Lancet Psychiatry* 2015;2(10):891-900. doi: 10.1016/S2215-0366(15)00234-5
43. Purtle J, Rich JA, Fein JA, et al. Hospital-Based Violence Prevention: Progress and Opportunities. *Ann Intern Med* 2015;163(9):715-17. doi: 10.7326/M15-0586
44. Cubbin C, LeClere FB, Smith GS. Socioeconomic status and the occurrence of fatal and nonfatal injury in the United States. *Am J Public Health* 2000;90(1):70-77. doi: 10.2105/ajph.90.1.70
45. Luchenski S, Maguire N, Aldridge RW, et al. What works in inclusion health: overview of effective interventions for marginalised and excluded populations. *The Lancet* 2017;391(10117):20-26. doi: 10.1016/S0140-6736(17)31959-1
46. ABS. Prisoners in Australia 2017. Canberra: Australian Bureau of Statistics, 2017.
47. Marmot M. Inclusion health: addressing the causes of the causes. *The Lancet* 2017;391(10117):186-88. doi: 10.1016/S0140-6736(17)32848-9
48. McGinty EE, Baker SP, Steinwachs DM, et al. Injury risk and severity in a sample of Maryland residents with serious mental illness. *Inj Prev* 2013;19(1):32-37. doi: 10.1136/injuryprev-2011-040309
49. Kellezi B, Baines DL, Coupland C, et al. The impact of injuries on health service resource use and costs in primary and secondary care in the English NHS. *Journal of Public Health* 2016;38(4):e464-e71. doi: 10.1093/pubmed/fdv173
50. Winston FK, Puzino K, Romer D. Precision prevention: time to move beyond universal interventions. *Inj Prev* 2016;22(2):87-91. doi: 10.1136/injuryprev-2015-041691
51. Wang EA, Hong CS, Shavit S, et al. Engaging Individuals Recently Released From Prison Into Primary Care: A Randomized Trial. *Am J Public Health* 2012;102(9):e22-e29. doi: 10.2105/AJPH.2012.300894