ORIGINAL ARTICLE

Women sleeping rough: The health, social and economic costs of homelessness

Emily Box BSc, PGDip Environ Eng, MBA | Paul Flatau BEc, MEc, PhD [ID] |
Leanne Lester BSc, MAppEpi, PhD [ID]

Centre for Social Impact UWA, The Business School, The University of Western Australia, Crawley, Western Australia, Australia

Correspondence
Paul Flatau, Centre for Social Impact UWA, The Business School, The University of Western Australia, Crawley, WA 6009, Australia.
Email: paul.flatau@uwa.edu.au

Abstract

This study seeks to assess the health, social and economic outcomes associated with rough sleeping among women and compare those outcomes with those of (1) men sleeping rough, and (2) women experiencing other forms of homelessness (such as being housed in temporary supported accommodation due to family and domestic violence). The paper analyses survey data using the Vulnerability Index-Service Prioritization Decision Analysis Tool (VI-SPDAT) collected from 2735 women experiencing homelessness and 3124 men sleeping rough in Australian cities from 2010 to 2017. We find that women sleeping rough report poorer physical and mental health outcomes and greater problematic drug and or alcohol use relative to both men sleeping rough and women experiencing other types of homelessness (all $p < 0.5$). Women sleeping rough report significantly higher levels of crisis service utilisation (B = 17.9, SE = 3.9, $p < 0.001$) and interactions with police in the previous 6 months (B = 1.9, SE = 0.3, $p < 0.001$) than women experiencing homelessness not sleeping rough. Women sleeping rough also report greater healthcare utilisation, and, therefore, healthcare costs, than women experiencing homelessness not sleeping rough and men sleeping rough (all $p < 0.05$). From a policy perspective, the evidence presented in this paper supports a social determinants approach that moves from addressing symptoms of poor health outcomes associated with homelessness to preventing and ending homelessness with a particular focus on the life trajectories of women. Integrated services and homelessness strategies need to be developed through a gender lens, providing women sleeping rough with tailored permanent housing with wrap-around supportive housing to address poor health outcomes.

KEYWORDS
accommodation and Care, economics of social care, health and social services, health economics, rough sleeping, women

1 | INTRODUCTION

People experiencing homelessness exhibit elevated rates of morbidity and mortality (Aldridge et al., 2018; Baggett et al., 2013; Burgard et al., 2012; Fazel et al., 2014; Lin et al., 2015; Nielsen et al., 2011; Notaro et al., 2013; Vijayaraghavan et al., 2012; Winetrobe et al., 2017). Chronic conditions such as heart disease (Baggett et al., 2013; Fazel et al., 2014), HIV (Fazel et al., 2014), cancer (Baggett et al., 2013), mental illness (Fazel et al., 2014; Nielsen et al., 2011; Nielssen et al., 2018), as well as alcohol and other drug dependence and risky use (Baggett et al., 2013; Fazel et al., 2014; Nielsen et al., 2011; Nielssen et al., 2018) are reported to be the major risk factors for mortality among this population group.

Women experiencing homelessness have been identified as being particularly vulnerable to poor physical (Baggett et al., 2013; Burgard et al., 2012; Winetrobe et al., 2017) and mental health outcomes (Burgard et al., 2012; Nielsen et al., 2011; Winetrobe et al., 2017). Despite this, the experiences of women sleeping rough (that is those who are without shelter, often living on the streets, in parks, derelict houses or in improvised dwellings) have been neglected in homelessness health and social care studies. Women are often completely excluded or noted as a minority within mixed gender samples and ignored from further analysis (Bretherton, 2017). Those studies that do include women often focus on the association between homelessness and family and domestic violence (FDV) in the home, ignoring high levels of violence experienced by women on the streets, the diversity of trajectories and outcomes that women experiencing homelessness may encounter such as mental illness, alcohol and other drug use, breakdown in social structures, poor health, economic marginalisation, and interactions with the justice system (Bretherton, 2017). Many also use gender-isolated samples, (Bassuk & Beardslee, 2014; Vijayaraghavan et al., 2012) limiting their ability to inform strategies that consider the potential differences or similarities in experiences of homelessness and needs across genders.

The lack of attention given to women sleeping rough is in spite of the fact that people sleeping rough are more likely to experience poor health outcomes than people experiencing other forms of homelessness (Burgard et al., 2012; Lin et al., 2015; Moss & Singh, 2015; Wright et al., 2016), and the association between sleeping rough (Lin et al., 2015), high disease burden (Lin et al., 2015) and being female (Green & Pope, 1999).

Poor health outcomes, coupled with access and price barriers associated with accessing preventative healthcare services translate to high rates of people experiencing homelessness utilising acute public healthcare services (ambulance, hospital and accident and emergency departments); notwithstanding this, there is a high degree of variation in healthcare utilisation reflecting varying levels of health needs and opportunities for access among those experiencing homelessness (Flatau & Zaretzky, 2008; Hwang et al., 2011; Lin et al., 2015; Parsell et al., 2016; Rieke et al., 2015; Wood et al., 2016; Zaretzky et al., 2013, 2017). As a result, it is widely understood that homelessness, particularly rough sleeping, leads to high health costs.

What is known about this topic

- A significant international evidence base exists in relation to morbidity, mortality and mental health outcomes for men who are rough sleepers.
- There is limited research on women experiencing homelessness, and, in particular the circumstances of women sleeping rough.
- We know that the health costs associated with rough sleeping homelessness are high although very skewed; the evidence base is, however, largely focused on the experiences of men.

What this paper adds

- The present study is the first study to investigate health outcomes and the costs of high acute health service utilisation of women sleeping rough relative to men sleeping rough as well as other women in supported accommodation who are homeless (largely due to family and domestic violence).
- Women sleeping rough reported poorer physical and mental health outcomes and greater problematic drug and or alcohol use compared to both women experiencing homeless not sleeping rough and men sleeping rough. Women sleeping rough reported greater healthcare utilisation, and, therefore, healthcare costs, than women experiencing homelessness not sleeping rough and men experiencing homelessness. We find that women sleeping rough who were Indigenous, had been in prison or youth detention or had a permanent disability, made up the high-cost category for service utilisation expenditure.
- There is a need for a gendered as well as Indigenous lens when analysing health and social outcomes and designing services to meet the needs of people sleeping rough.

However, potential differences in health costs across genders have largely been ignored in the extant literature.

There are many pathways into homelessness including individual risk factors (e.g. intergenerational homelessness, co-morbidities, substance abuse, relationship conflicts, out-of-home care experience and involvement with the justice system) and structural factors whose impacts are felt disproportionately by women (e.g. sexism, violence, poverty, affordable housing barriers), with significant gender differences found in both the pathways into homelessness and the experiences of homelessness. Pathways into homelessness and life experiences that may make women more at risk of homelessness include: a history of intergenerational homelessness and a history of childhood and adolescent violence and homelessness (Flatau et al., 2013; Lafavor et al., 2020); victimisation (Harris et al., 2017); and higher rates of poverty, housing stress, domestic

violence, abuse and trauma; and family conflict (Bingham et al., 2019; Bretherton, 2017; Phipps et al., 2019).

Mental and physical health issues and substance abuse problems are higher for women experiencing homelessness than the general population (Bingham et al., 2019), with women experiencing homelessness reporting greater anxiety disorders, depression, multiple mental disorders, and higher suicidality than men experiencing homelessness (Bingham et al., 2019; Cherner et al., 2018; Laporte et al., 2018; Montgomery et al., 2017; Winetrobe et al., 2017). Women experiencing homelessness are also more likely to report engagement with exchange sex than men, higher rates of unemployment and poverty than men (Harris et al., 2017; Phipps et al., 2019), and substance abuse significantly increases their likelihood of unsheltered homelessness (Montgomery et al., 2017).

This study seeks to address the gender gap in the homelessness and health and social care literature by analysing a large data set covering homelessness in Australia's cities between 2010 and 2017, to explore the health, social and economic impact of sleeping rough across genders. A comparison between women sleeping rough and women experiencing other forms of homelessness, including those in supported accommodation who would otherwise be without shelter (principally due to family and domestic violence in the home), is used to determine if there are within-gender differences associated with different experiences of homelessness. Given that much of the historical research does not account for the heterogeneity of experiences of homelessness, particularly between genders, and those sleeping rough, this study also explores the characteristics and experiences that lead to higher health and economic costs among women sleeping rough.

The findings of this study will inform homelessness, health and social care strategies to ensure that women's needs, particularly those sleeping rough are no longer excluded, and investment is targeted towards those most at risk of poor health and economic outcomes. Using self-report survey data collected over a seven-year period in Australian cities by non-government agencies supporting those experiencing homelessness, this study provides one of the largest samples of women sleeping rough as well as experiencing other forms of homelessness.

2 | METHODS

2.1 | Setting

Data for the present paper's secondary analysis was collected as part of Australian homelessness service delivery programmes that aimed to create a register of people experiencing homelessness to assist in the prioritisation of service delivery and permanent housing to those most in need. Originally, homelessness agencies went onto the 'streets' to interview people sleeping rough and in supported accommodation during intensive agency-led coordinated data collection efforts labelled 'Registry Weeks'. The first Registry Week

originated in New York through Common Ground, a homelessness and supportive accommodation service under its Street to Home campaign. Its success was followed by other US communities which eventually led to a national campaign led by Common Ground to house 100,000 people (Leopold & Ho, 2015). Since its establishment in 2004, Canada and Europe have also conducted Registry Weeks. In 2010, the first Registry Week was also conducted in Brisbane Australia (Micah Projects, 2017). However, over the seven-year period of data collection covered by this study, homelessness services increasingly moved to surveying people on an ongoing basis rather than in specific Registry Weeks or Connections Weeks as they became known.

2.2 | Data collection

This paper analyses the secondary cross-sectional data collected from 2735 women experiencing homelessness (both rough sleeping and in sheltered supported temporary housing) and 3124 men sleeping rough in Australian cities over a seven-year period (2010–2017). Data were collected by homelessness services through interviewer completed surveys. Survey participants were not reimbursed for their time.

2.3 | Survey tool

The Vulnerability Index (VI) and subsequently the Vulnerability Index-Service Prioritization Decision Analysis Tool (VI-SPDAT) was used by interviewers to collect data. The original VI survey instrument was developed by Common Ground's Street to Home team in the United States to identify risks factors for early mortality among people experiencing homelessness. The selection of risk factors was based on work from Boston Massachusetts, which identified that sleeping in unsheltered situations for 6 months or more, and having at least one high medical risk condition, increased their risk of premature death (Montgomery et al., 2016).

The Service Prioritisation Decision Analysis Tool (SPDAT) was designed by OrgCode Consulting, Inc. in the United States to assist service providers to triage service delivery based on socioeconomic and psycho-social needs (Orgcode, 2019). The VI and SPDAT were combined together to form the VI-SPDAT, a tool that is now widely used to assess people's broader vulnerability and needs. The version of the VI-SPDAT used in the present analysis directs the interviewee through 101 questions primarily composed of frequency and yes/no questions grouped into the following broad domains: demographics, histories of interactions with juvenile justice and out-of-home care; current and past homelessness; long-term chronic health conditions, other physical health conditions and mental health outcomes; use of healthcare and other services; and violence and exploitation on the streets and justice interactions.

Table 1 defines the key questions and responses of the VI-SPDAT survey used in the present study to examine homelessness

and housing, health, alcohol and other drug use and healthcare utilisation outcomes. Sleeping rough and crisis and emergency accommodation are included in US and European approaches to homelessness. In Australia, a wider approach to homelessness is considered including couch surfing without formal tenure rights (Australian Bureau of Statistics, 2018). Institutionally based accommodation and permanent housing represent very small proportions of the total sample (1.4% for institutionally based accommodation and 3.3% for permanent housing) and would ordinarily not be included in a homelessness category, but respondents have been retained in the study as they would have been interviewed because they may be temporarily homeless or are at high risk of homelessness. In the case of the VI-SPDAT, the term 'emergency accommodation' is used to refer to temporary housing in replace of the term 'shelter' used in the VI. This is because the term 'shelter', while common in North America is not often used in the Australian context.

In addition to the homelessness and housing, health, alcohol and other drug use and healthcare utilisation domains, the VI-SPDAT survey also includes variables covering age, sexual identification, Indigenous status, whether the respondent is a current Australian Defence Force member or veteran, citizenship or residency status, level of educational attainment, and whether the respondent has a permanent physical disability. There are strong relationships between homelessness and histories of out-of-home care (foster care or institutional residential care) as a child and histories of crime, violence and justice interactions (histories of youth detention or prison, facing standover behaviour for money, cigarettes, drugs and alcohol, being physically attacked since becoming homeless, self or other harm and facing legal issues). These factors are hypothesised to both cause and exacerbate existing physical and/or mental health-related conditions.

2.4 | Ethics

Ethics approval was provided by The University of Western Australia Human Research Ethics Committee (Ref: RA/4/1/8827) to undertake the study of deidentified data collected by homelessness services using the VI and VI-SPDAT tools. All data were collected by homelessness services prior to the research team conducting their study. The University of Western Australia (the host university of the researchers) signed a Memorandum of Understanding and Confidentiality Agreement covering the use of the data with the Australian Alliance to End Homelessness on behalf of affiliated homelessness services who collected the data.

Written informed consent was obtained from all subjects by homelessness services involved in the collection of data using the VI and VI-SPDAT tools. Respondents were supported by homelessness services while completing the tool. Although some interviews were conducted with young people throughout data collection, this analysis only considers those interviewed who were over the age of 18.

2.5 | Statistical analysis

SPSS v 23 and STATA v 15 were used to analyse the data. Women sleeping rough were compared to women experiencing other forms of homelessness and not sleeping rough, and men sleeping rough across a range of demographic characteristics and experiences: age; sexual identity; Indigenous status; experience in the defence force; Australian citizen or resident; education; time without stable housing; in foster care or institutional residential care as a child; youth detention; watch house; in prison; ongoing financial insecurity; facing standover behaviour for money, cigarettes, drugs and alcohol; physically attacked since becoming homeless; self or other harm; permanent physical disability; and legal actions. Other forms of homelessness included in the study are crisis and emergency accommodation, temporary accommodation (e.g. couch surfing), short-term accommodation (boarding houses, hostels, caravans) and institutional accommodation (prison, hospitals, alcohol and other drug residential facilities etc.).

Tests of statistical difference were made using Mann–Whitney tests (for age, time homeless and service utilisation) and Chi-square tests (demographics, physical and mental health conditions, alcohol and other drug use). Tobit regression models were used to determine the types of homelessness predictors of women's health service utilisation, while logistic regression models were used to determine predictors of physical and mental health. All models control for: age; sexual identity; Indigenous status; experience in the defence force; Australian citizen or resident; education; time without stable housing; in foster care or institutional care as a child; youth detention; watch house; in prison; ongoing financial insecurity; facing standover behaviour for money, cigarettes, drugs and alcohol; physically attacked since becoming homeless; self or other harm; permanent physical disability; and legal action.

Cluster analysis is used to further understand the impact of these characteristics on healthcare costs. Government health services-associated unit costs were sourced from the Independent Hospital Pricing Authority (IHPA) (2017) and Australian Productivity Commission (2018) and allocated as follows: AUD$5230 for hospital admissions (public acute hospital including mental health units in public hospitals); $630 for Emergency/casualty department; and $948.13 for ambulance services (all figures Australian dollars). Survey respondents were then sorted into a zero and (log of) non-zero costs for health costs with a fixed number of three clusters being formed for the non-zero costs group using the SPSS two-step cluster technique. Four clusters were formed which we name zero costs, low costs, moderate costs, and high costs. The cut-offs for the clusters are determined using a likelihood distance measure. The demographic and health characteristics of those in each of these clusters are examined, and Chi-square tests for significance of differences conducted.

TABLE 1 Questions and response options for key homelessness, health, drug and alcohol use and healthcare utilisation items

Domain	Question	Response options
Homelessness and housing	I am going to read types of places people sleep. Please tell me which one you sleep at most often.	Open-ended responses recoded to: • Sleeping rough (sleeping on the 'street', sleeping in a park or in bushland, beaches and riverbeds, in a car, in a squat/cave, tents, train or bus station); • Crisis and emergency accommodation provided by community and homelessness agencies (including shelters and women's refuges); • Temporary accommodation (e.g. couch surfing); • Short-term accommodation without formal tenure rights (e.g. boarding house, hostel, caravan); • Institutionally based accommodation (hospitals, drug and alcohol facilities, and prison); • Permanent housing (public and community housing and private rental accommodation).
	What is the total length of time you have lived on the streets or in emergency accommodation?	Length of time in months
	How long has it been since you lived in permanent stable housing?	Length of time in months
	What is the total length of time you and your family have not had your own tenancy?	Length of time in months
	How long has it been since you and your family lived in permanent stable housing?	Length of time in months
Chronic medical conditions, other health conditions and mental health outcomes	Do you have now, have you ever had, or has a healthcare provider ever told you that you have any of the following medical conditions?	• Kidney disease/end stage renal disease or dialysis • History of frostbite, hypothermia or immersion foot • Liver disease, cirrhosis or end-stage liver disease • HIV+/AIDS • History of heat stroke/heat exhaustion • Heart disease, arrhythmia or irregular heartbeat • Emphysema • Diabetes • Asthma • Cancer • Hepatitis C • Tuberculosis • 'other' medical condition
	Do you have any of the following?	• Cellulitis • Foot/skin infections • Scabies • Dehydration • Convulsions • Epilepsy • Pregnancy • Dental problems
	Ever been taken to a hospital against your will for a mental health reason?	Yes No
	Gone to Accidents and Emergencies at the hospital because you were not feeling 100% well emotionally or because of your nerves?	Yes No
	Spoken with a psychiatrist, psychologist or other mental health professional in the last 6 months because of your mental health—whether that was voluntary or because someone insisted that you do so?	Yes No
	Surveyor: Do you observe signs or symptoms or problematic alcohol or drug abuse?	Yes No

(Continues)

TABLE 1 (Continued)

Domain	Question	Response options
	Yes or No—Have you experienced any emotional, physical, psychological, sexual or other type of abuse or trauma in your life which you have not sought help for, and/or which has caused your homelessness?	Yes No
	Had a serious brain injury or head trauma?	Yes No
	Ever been told you have a learning disability or developmental disability?	Yes No
	Do you have any problems concentrating and/or remembering things?	Yes No
Drug and alcohol use	Have you consumed alcohol and/or drugs almost every day or every day for the past month?	Yes No
	Have you used injection drugs or shots in the last 6 months?	Yes No
	Have you been treated for drug or alcohol problems and returned to drinking or using drugs?	Yes No
	Have you blacked out because of their alcohol or drug use in the past month?	Yes No
	Surveyor is asked whether they observe signs or symptoms or problematic alcohol or drug use?	Yes No
Healthcare utilisation	In the last 6 months, how many times have you been to Accidents and Emergencies at the hospital?	Number of times
	In the last 6 months, how many times have you been taken to the hospital in an ambulance?	Number of times
	In the last 6 months, how many times have you been hospitalised as an in-patient, including hospitalisations in a mental health hospital?	Number of times

3 | FINDINGS

3.1 | Demographics and history of the types of homelessness

One-third (31%) of women surveyed were currently sleeping rough, and a further 69% were not rough sleeping (34% had temporary accommodation, 13% crisis and emergency accommodation, 9% short term accommodation, 3% permanently housed, 1% institutional accommodation, 4% 'other' and 4% not stated) (Table 2).

The average age of women sleeping rough within the sample was 36 years: 17% were aged 15–24; 28% were aged 25–34; 29% were aged 35–44; 21% were aged 45–54; and 5% aged 55 and over. This was significantly older than women experiencing homelessness who were not rough sleeping (mean age 34 years; $Z = -5.196$, $p < 0.001$), but significantly younger than men sleeping rough (mean age 41 years; $Z = -10.264$, $p < 0.001$). A significantly greater proportion of women experiencing homelessness who were not rough sleeping (90%; $X^2 = 5.719$, $p = 0.017$) and men sleeping rough (94%; $X^2 = 38.783$, $p < 0.001$) identified as straight, compared to women sleeping rough (86%). A significantly greater proportion of women sleeping rough identified as Indigenous (39%) compared to women not sleeping rough (14%; $X^2 = 240.369$, $p < 0.001$) and rough sleeping men (21%; $X^2 = 125.171$, $p < 0.001$).

A significantly smaller proportion of women sleeping rough were a current Defence Force member or veteran (3%) compared to men sleeping rough (8%; $X^2 = 29.351$, $p < 0.001$). A significantly smaller proportion of women sleeping rough had completed high school or higher education (22% compared to 32% respectively; $X^2 = 28.050$, $p < 0.001$) and a significantly greater proportion of women sleeping rough had a permanent physical disability (17% compared to 15% respectively; $X^2 = 23.042$, $p < 0.001$), and had been in a watch house (65% compared to 43% respectively; $X^2 = 125.118$, $p < 0.001$) compared to women experiencing homelessness who were not sleeping rough.

A significantly greater proportion of women sleeping rough had been in foster care or institutional residential care as a child (34% compared to 28% respectively; $X^2 = 11.943$, $p = 0.018$) and a significantly smaller proportion of women sleeping rough had been in youth detention (13% compared to 17% respectively; $X^2 = 10.008$, $p = 0.018$), and prison (41% compared to 58% respectively; $X^2 = 78.272$, $p < 0.001$) compared to men sleeping rough.

A significantly greater proportion of women sleeping rough had been physically attacked since becoming homeless (57% compared to 33% respectively; $X^2 = 162.045$, $p < 0.001$) compared to women not sleeping rough. Reflecting a differentiated gender experience on the streets between women and men, a significantly greater proportion of women sleeping rough were facing standover behaviour for

money, cigarettes, drugs and alcohol (23% compared to 13% respectively; $X^2 = 53.916$, $p < 0.001$), compared to men sleeping rough. A significantly greater proportion of women sleeping rough had also been involved in self or other harm (30% compared to 29% and 20% respectively), compared to women not sleeping rough ($X^2 = 161.693$, $p < 0.001$) and men sleeping rough ($X^2 = 37.172$, $p < 0.001$).

The average time homeless for women sleeping rough was 57 months, and 69 months without stable housing, significantly greater than non-rough sleeping women (14 months; $Z = -21.285$, $p < 0.001$, and 39 months; $Z = -7.651$, $p < 0.001$ respectively) and significantly less time homeless than men sleeping rough (76 months; $Z = -4.158$, $p < 0.001$).

3.2 | Physical and mental health

A significantly greater proportion of women sleeping rough reported chronic diagnosed medical conditions or other physical health conditions than women not sleeping rough (Table 3) (all $p < 0.05$). Women sleeping rough also exhibited significantly poorer health outcomes compared to male rough sleepers. A significantly higher proportion of women sleeping rough reported asthma (46% to 28%; $X^2 = 103.910$, $p < 0.001$), history of heat stroke/heat exhaustion (29% compared to 25%; $X^2 = 5.325$, $p = 0.021$), heart disease, arrhythmia or irregular heartbeat (23% compared to 18%; $X^2 = 13.801$, $p < 0.001$), diabetes (14% compared to 8%; $X^2 = 34.300$, $p < 0.001$), cancer (11% compared to 6%; $X^2 = 25.276$, $p < 0.001$), kidney disease/end stage renal disease or dialysis (10% compared to 7%; $X^2 = 16.150$, $p = 0.003$), cellulitis (6% compared to 4%; $X^2 = 121.096$, $p < 0.00$), foot/skin conditions (16% compared to 15%; $X^2 = 122.744$, $p < 0.001$), scabies (4% compared to 2%; $X^2 = 122.667$, $p < 0.001$), dehydration (27% compared to 19%; $X^2 = 122.744$, $p < 0.001$), convulsions (12% compared to 10%; $X^2 = 124.084$, $p < 0.001$), epilepsy (8% compared to 7%; $X^2 = 70.086$, $p < 0.001$), than men sleeping rough.

In terms of mental health outcomes, a significantly greater proportion of women sleeping rough reported brain injuries (28% compared to 18%; $X^2 = 40.361$, $p < 0.001$), interviewer observed severe, persistent mental illness or severely compromised cognitive functioning (29% compared to 19%; $X^2 = 69.434$, $p < 0.001$) than women not rough sleeping, and a significantly smaller proportion of women sleeping rough reported a learning disability or developmental disability (14% compared to 23%; $X^2 = 165.930$, $p < 0.001$), problems concentrating (42% compared to 49%; $X^2 = 176.092$, $p < 0.001$), and emotional, physical, psychological, sexual or other type of abuse or trauma where no help was sought or perceived to have caused homelessness (42% compared to 48% respectively; $X^2 = 171.241$, $p < 0.001$).

A significantly higher proportion of women sleeping rough reported attending hospital against their will for mental health reasons (33% compared to 29%; $X^2 = 4.783$, $p = 0.029$), a mental health professional in the last 6 months (30% compared to 25%;

$X^2 = 6.029$, $p = 0.014$) and Accidents and Emergencies for mental health issues (30% compared to 20%; $X^2 = 35.799$, $p < 0.001$) than men sleeping rough. A significantly greater proportion also reported problems concentrating and remembering things (42% compared to 34%; $X^2 = 17.029$, $p < 0.001$), and emotional, physical, psychological, sexual or other type of abuse or trauma where no help was sought or perceived to have caused homelessness (42% compared to 29%; $X^2 = 57.035$, $p < 0.001$) compared to men rough sleepers.

The majority of women sleeping rough report problematic drug or alcohol use (68%), 33% very high frequency use of alcohol and/or drugs in the last month, 43% used injection drugs or shots in the last six months, 40% received drug and alcohol treatment, but returned to drug and alcohol use, 7% had used non-beverage alcohol or inhalants and 17% had blacked out because of alcohol or drug use (Table 3). A significantly greater proportion of women sleeping rough had blacked out because of alcohol or drug use than women not sleeping rough (17% compared to 8%; $X^2 = 275.511$, $p < 0.001$).

3.3 | Sleeping rough as a predictor of health service utilisation

On average, in the prior 6 months, women sleeping rough had a significantly greater number of interactions with crisis services (25.3 compared to 7.1; $Z = -9.243$, $p < 0.001$), number of trips to the emergency department (3.6 compared to 2.2; $Z = -3.857$, $p < 0.001$) and trips to hospital in an ambulance (2.3 compared to 1.2; $Z = -2.917$, $p = 0.004$), greater numbers of hospitalisations as an in-patient (1.4 compared to 1.0; $Z = -2.606$, $p = 0.009$) and number of interactions with police (13.7 compared to 2.8 respectively; $Z = -11.726$, $p < 0.001$) than women not sleeping rough (Table 4).

Tobit linear regression models were used to determine rough sleeping as a predictor of women's health service utilisation. After controlling for covariates, women sleeping rough reported significantly greater crisis service utilisation in the previous 6 months ($B = 17.9$, $SE = 3.9$, $p < 0.001$) and number of interactions with police in the past 6 months ($B = 1.9$, $SE = 0.3$, $p < 0.001$) than women not sleeping rough.

3.4 | Sleeping rough as a predictor of physical and mental health

Logistic regression models were used to determine rough sleeping as a predictor of women's physical and mental health conditions. After controlling for covariates, women sleeping rough with kidney disease/End Stage Renal Disease or Dialysis ($OR = 1.8$, $p = 0.038$), cellulitis ($OR = 2.2$, $p = 0.024$), dehydration ($OR = 1.7$, $p = 0.002$), are significantly less likely to have had mental health professional support in the last 6 months ($OR = 0.7$, $p = 0.009$) than women not sleeping rough.

	Women		Men
	Rough sleeping[c]	Not rough sleeping	Rough sleeping
n (%)	853 (31.2)	1882 (68.8)	3124 (56.9%)
Demographics			
Age (mean)[a,b]	36.3	34.2	41.1
Age categories (%)[a,b]			
15–24	17.4	28.4	8.7
25–34	27.7	26.8	20.9
35–44	29.3	23.5	32.5
45–54	21.0	13.8	25.1
55+	4.6	7.5	12.7
Identifying as straight (%)[a,b,d]	85.6	89.5	94.0
Indigenous (%)[a,b]	39.2	14.0	21.1
Current Defence Force member or veteran (%)[b]	2.6	2.6	7.6
Australian citizen or resident (%)	91.6	85.9	88.0
High school completion, apprenticeship or tertiary education (%)[b]	22.1	32.2	24.4
Permanent physical disability [a] (%)	17.4	14.6	20.1
Ever been in foster care or institutional care as a child[b]	33.9	22.7	28.3
Ever been in youth detention[d]	13.1	5.7	16.5
Ever been in watch house[a]	65.5	43.2	77.7
Ever been in prison[b]	41.4	19.4	58.2
Ongoing financial insecurity[d]	24.3	42.0	31.4
Facing standover behaviour for money, cigarettes, drugs and alcohol[b,d]	23.0	22.8	12.9
Physically attacked since becoming homeless[a,b]	57.3	32.8	51.1
Self or other harm[a,b,d]	30.1	28.8	20.4
Facing legal issues[d]	26.7	21.3	23.2
Time homeless (months)			
Total time homeless[a,b]	57.4	14.3	76.1
Time without stable housing[a]	68.6	38.8	69.4

TABLE 2 Age, sexual identity, Indigenous status and time homeless by types of homelessness

[a]$p < 0.05$ women sleeping rough compared to women not rough sleeping.

[b]$p < 0.05$ women sleeping rough compared to rough sleeping men. Mann–Whitney tests used for age and time homeless comparisons by rough sleeping. Chi-square tests used for other demographic comparisons by rough sleeping.

[c]Rough sleeping includes crisis and emergency accommodation (short-term accommodation for people experiencing homelessness), temporary accommodation (staying temporarily with other households, e.g., couch surfing), short-term accommodation (boarding house, hostel, caravan), institutional accommodation (prison, hospitals, immigration detention centre, alcohol and other drug facility etc) and other forms of homelessness.

[d]Indicates data are sourced from VI, n ranges from 492 to 529. Remaining data are sourced from VI-SPDAT, n ranging from 846 to 853.

3.5 | Health service utilisation costs for women sleeping rough

Women sleeping rough had higher costs (AUD$11,904) associated with health service utilisation than women not sleeping rough ($7453), and men sleeping rough ($10,265) (Table 5). When comparing men and women not sleeping rough, men had a higher average cost of health service utilisation ($8107 compared to $7453 respectively). The mean total health cost of women sleeping rough over a six-month period is $11,904 (median $3153), with hospital admissions (63%) the greatest contributor to total health cost (Table 6).

Cluster analysis was used to further understand the impact of health service utilisation on the cost for women sleeping rough (Table 7). Four clusters were formed, grouping people from no cost ($0), low cost ($630–$3474), moderate cost ($3787–$22,633) to high cost ($22,939–$346,150).

A significantly greater proportion of women sleeping rough who identified as Indigenous, had been in prison, youth detention or had a permanent disability were in the high-cost group than in the zero, low, or moderate cost groups. Physical conditions associated with the high-cost group include brain injury, asthma, hepatitis C, history of heat stroke/heat exhaustion, heart problems, liver problems, cancer, foot/skin conditions, dehydration, convulsions and epilepsy. Being hospitalised against their will, interviewer observed severe, persistent mental illness or severely compromised cognitive function, seeing a professional mental health practitioner in the last 6 months, being hospitalised for emotions/nerves and having a learning or developmental disability were also significantly related to the high-cost cluster. Mental health outcomes associated with the moderate or high-cost group include being in hospital against their will, interviewer observed severe, persistent mental illness or severely compromised cognitive functioning, having mental health professional support in the last 6 months, accidents and emergencies admission: mental health issues, and having a learning or developmental disability.

4 | DISCUSSION

This study not only demonstrates that women sleeping rough differ demographically to both men sleeping rough and women not sleeping rough but that they are at higher risk of poorer physical and mental health outcomes and higher levels violence and exploitation on the streets. Of concern is that the conditions experienced by women sleeping rough are among the leading causes of poor health (Australian Institute of Health and Welfare [AIHW], 2019a; 2016) and mortality (AIHW, 2018a) within the Australian population, and reported causes of mortality among the homeless in the existing literature (Baggett et al., 2013; Fazel et al., 2014; Nielsen et al., 2011). Therefore, this study shows that women sleeping rough may be at particular risk of early mortality and morbidity. The poor health outcomes experienced by those sleeping rough, particularly women, translated into high acute service utilisation and therefore, high health costs. The disproportionate health and economic impact of homelessness experienced by women sleeping rough suggests that housing strategies focussing on women sleeping rough may result in the greatest impact to individuals, and cost savings to the health sector.

Without stable housing, people's ability to effectively prevent and manage health conditions that lead to high acute service utilisation has been reported to be limited by poor access to healthcare and support services (Fazel et al., 2014; Ponce et al., 2014; Winetrobe et al., 2017) and at times, active avoidance due to negative experiences and perceptions of services (Wen et al., 2007). Housing is, therefore, a critical factor in improving health outcomes (Burgard et al., 2012), reducing acute health service utilisation (Lin et al., 2015; Rieke et al., 2015; Wright et al., 2016) and, providing savings to the healthcare system (Conroy et al., 2014; Latimer et al., 2019; Ly & Latimer, 2015; Parsell et al., 2016; Wright et al., 2016). However, women may face additional barriers accessing services that support women to find housing and access healthcare with reports of women feeling unsafe and experiencing intimidation and harassment when accessing homelessness services (Davis-Berman, 2011; Ponce et al., 2014). The historical exclusion of women sleeping rough from homelessness studies leads to their differing health needs and risks (particularly in terms of gendered based violence and exploitation on the streets) being ignored in the design and prioritisation of homelessness strategies, which perpetuates poor health outcomes. This study demonstrates that the needs and experiences of people sleeping rough differs across genders and, therefore, an understanding of these differences is needed to ensure housing strategies are tailored to meet the needs of women as well as men.

In this study, high acute service utilisation costs among women sleeping rough were also associated with a history of out-of-home care, youth detention and imprisonment. Previous studies have also linked these experiences with an increased risk of homelessness (AIHW, 2019b; Flatau et al., 2013), and poor physical and mental health outcomes (Abbot et al., 2017; Butler et al., 2020; Cutcher et al., 2014; van der Molen et al., 2013; Young et al., 2018; Zlotnick et al., 2012). This highlights the impact social contexts and circumstances have on women's health. As a result, strategies to reduce the economic burden of homelessness on the health system need to consider combining social and health policies and systems to prevent women (and girls) entering these systems, support women's physical and mental health while they are there and facilitate housing and continuation of care upon exit, ultimately, preventing and ending homelessness.

Indigenous people were over-represented across all homelessness cohorts, particularly among women sleeping rough (39.2%) when compared to the proportion of people identifying as Indigenous in Australian population data (3.3%) (Australian Bureau of Statistics, 2019). Indigenous women sleeping rough were also more likely to have poor health outcomes and, therefore, be in the high-cost category of acute health service utilisation. These results show that Indigenous women sleeping rough are particularly vulnerable to morbidity and early mortality, reflecting the disproportionate social disadvantage and resulting health disparities experienced by Indigenous people in Australia (AIHW, 2016, 2018a).

TABLE 3 Physical and mental health conditions and drug and alcohol use by types of homelessness

%	Women		Men
	Rough sleeping (n = 853)[c]	Not rough sleeping (n = 1882)	Rough sleeping (n = 3124)
Physical health			
Brain injury[a,b]	27.3	18.2	34.0
Asthma[b]	45.8	42.3	27.6
Hepatitis C[a]	23.6	12.1	26.3
History of frostbite, hypothermia or immersion FOOT[a,b]	6.3	2.4	9.3
History of heat stroke/Heat exhaustion[a,b]	29.2	20.4	25.2
Heart disease, arrhythmia or irregular[a,b] heartbeat	23.1	17.0	17.5
Liver disease, cirrhosis, or end-stage liver disease[a]	16.9	8.6	19.2
Diabetes[a,b]	14.4	10.9	7.9
Cancer[a,b]	11.0	7.6	6.3
Kidney disease/End stage renal disease or dialysis[a,b]	10.1	5.6	6.8
HIV+/AIDS	1.2	0.7	1.5
Emphysema[a]	9.8	5.2	12.8
Tuberculosis[a]	1.6	1.0	1.8
Cellulitis[a,b]	5.7	1.6	4.0
Foot/skin conditions[a,b]	15.8	6.3	14.5
Scabies[a,b]	3.5	1.2	2.2
Dehydration[a,b]	27.1	10.9	19.0
Convulsions[a,b]	12.3	5.5	9.9
Epilepsy[a,b]	8.2	5.0	6.7
Pregnancy[a]	7.4	10.4	0
Mental health			
Hospital against will for a mental health reason[b]	33.3	27.1	29.4
Brain injury or head trauma[a]	27.3	18.3	27.0
Interviewer observed severe, persistent mental illness or severely compromised cognitive functioning[a]	29.2	19.1	27.0
Mental health professional support in the last 6 months[b,d]	29.5	41.8	25.3
Accidents and emergencies admission: mental health issues[b,d]	29.9	29.2	20.3
Learning disability or developmental disability[a,d]	14.4	22.7	17.1
Problems concentrating and/or remembering things[a,b,d]	41.7	48.5	34.0
Emotional, physical, psychological, sexual or other type of abuse or trauma where no help sought or perceived to have caused homelessness[a,b,d]	41.9	48.0	28.7
Alcohol and other drug use			
Ever had a problematic alcohol and/or drug use	68.2	48.5	70.6
Very high frequency use of alcohol and/or drugs (last month)	32.7	12.1	37.5
Used injection drugs or shots (last six months)	43.0	16.3	42.6
Received drug and alcohol treatment but returned to drug and alcohol use	40.1	24.1	44.5
Use of non-beverage alcohol (e.g. methylated spirits) and/or inhalants (e.g. petrol)[d]	6.7	2.1	7.0
Blacked out because of alcohol or drug use[a,d]	16.9	7.7	17.4

[a]$p < 0.05$ women sleeping rough compared to women not rough sleeping.

[b]$p < 0.05$ women sleeping rough compared to rough sleeping men. Mann–Whitney tests used for age and time homeless comparisons by rough sleeping. Chi-square tests used for other demographic comparisons by rough sleeping.

[c]Rough sleeping includes crisis and emergency accommodation (short-term accommodation for people experiencing homelessness), temporary accommodation (staying temporarily with other households e.g. couch surfing), short-term accommodation (boarding house, hostel, caravan), institutional accommodation (prison, hospitals, immigration detention centre, alcohol and other drug facilities etc), and other forms of homelessness.

[d]Indicates data are sourced from VI, n ranging from 523–525. Remaining data are sourced from VI-SPDAT, n ranging from 852 to 853. + indicates data are sourced from VI, n ranging from 519 to 521. Remaining data are sourced from VI-SPDAT, n = 853.

TABLE 4 Service utilisation in the last six months by types of homelessness

Last 6 months (mean)	Women		Men
	Rough sleeping (n = 853)	Not rough sleeping (n = 1882)	Rough sleeping (n = 3124)
Number of interactions with crisis services (last 6 months)[a,b]	25.31	7.08	17.50
Number of trips to ED (last 6 months)[a,b]	3.59	2.16	2.7
Trips to hospital in an ambulance (last 6 months)[a,b]	2.25	1.23	1.40
Hospitalisations as an in-patient (last 6 months)[a]	1.43	0.95	1.4
Number of interactions with the police (last 6 months)[a,c]	13.65	2.77	13.32

[a]$p < 0.05$ women sleeping rough compared to women not rough sleeping.

[b]$p < 0.05$ women sleeping rough compared to rough sleeping men. Mann–Whitney tests used for age and time homeless comparisons by rough sleeping. Chi-square tests used for other demographic comparisons by rough sleeping.

[c]Indicates data are sourced from VI, $n = 525$. Remaining data are sourced from VI-SPDAT, $n = 853$.

TABLE 5 Average six-month health costs among people experiencing homelessness

	Women rough sleepers	Women non-rough sleepers	Men rough sleepers	Men non-rough sleepers
Total cohort (N)	522	1560	1742	1574
Mean	$11,904	$7453	$10,265	$8107
Median	$3153	$1890	$1578	$1578
SD deviation	$26,447	$14,019	$25,999	$17,944
Minimum	$0	0	0	0
Maximum	$346,150	$177,416	$479,750	$224,720
Homelessness cohort with non-zero cost %	68%	66%	63%	61%
Geometric mean	$7452	$5589	$6863	$6247
SD deviation	$8.80	$8.54	$8.72	$8.64

To reduce health system costs associated with homelessness, Indigenous women need to be prioritised in health and homelessness strategies that recognise their needs and preferences which may differ to non-Indigenous women (Peterson, 2015). While women sleeping rough are under-represented in the homelessness literature, Indigenous women sleeping rough are particularly overlooked. Future studies should focus on engaging Indigenous women sleeping rough in the design of strategies tailored to their personal, local and cultural contexts (Petersen, 2015).

5 | LIMITATIONS

A limitation of this study is that the data collected were self-reported. Hwang et al. (2016) found that adults experiencing homelessness provided relative accurate reports of their health service utilisation rates when compared to administrative data. While there may be limitations in this approach, self-reported data remain one of the only ways to obtain health data through organised counts without being too intrusive to participants. Studies of the reliability and validity of the VI-SPDAT have found challenges to the reliability and validity of the VI-SPDAT in practical use, which may be caused by instrument design, implementation or administration (Brown et al., 2018; Salim, 2020).

However, a major limitation of this study is that it did not include people from regional and remote areas of Australia where health outcomes among the general population are known to be poorer than those in major cities (AIHW, 2018a), and, therefore, the experiences and health outcomes of people experiencing homelessness may differ from people in metropolitan areas. This is particularly the

TABLE 6 Health service use among women rough sleepers and annual costs

Health services	Mean number of incidents per person/ 6 months	Mean cost per person/6 months	Median cost per person/ 6 months	Percentage of total health cost
Hospital admission public acute hospital (includes mental health units in public hospitals)	1.43	$7501	0	63.0%
Emergency/casualty department	3.59	$2261	$630	19.0%
Ambulance services	2.25	$2131	0	18.0%
Total health cost		$11,904	$3153	100%
				Total health costs
Mean				$11,904
25th percentile				$0
50th percentile (median)				$3153
75th percentile				$14,007
SD deviation				$28,594
Minimum				$0
Maximum				$346,150
Women rough sleepers with non-zero cost (%)				68%
Geometric mean				$7452
SD deviation				$8.80

case with respect to Indigenous women experiencing homelessness in Australia in outer regional and remote areas.

In addition, FDV accommodation services were not prominent in the group of services engaged in data collection. While in Europe, Bretherton (2017) identified that women accessing FDV services are rarely counted in homelessness statistics, in Australia that is not the case (Mclaren, 2013). FDV is a major contributor to women experiencing homelessness (Bretherton, 2017; Huey et al., 2013; Mclaren, 2013; Ponce et al., 2014; Vijayaraghavan et al., 2012; Warburton et al., 2018) and FDV accommodation services act as a measure to remove women from risk and prevent rough sleeping homelessness or unsafe forms of accommodation where remaining safe at home is not an option.

6 | CONCLUSION

This study highlights the fact that woman sleeping rough are particularly vulnerable to morbidity and early mortality. It highlights the need for a gendered lens when analysing data and designing services to meet people's needs. In addition, it identifies that to move from addressing symptoms of poor health outcomes associated with homelessness to ending and preventing homelessness, there is a need to use a social determinants approach that also addresses circumstances and experiences associated with disadvantage. Supporting other evidence that housing people, particularly women sleeping rough, and providing them with tailored wraparound support is needed to address poor health and social outcomes and ultimately reduce the economic burden to the health system.

AUTHOR CONTRIBUTIONS

The study was conceptualised by PF and EB. The design of the statistical methods used in the study was developed by LL and PF. LL undertook the quantitative analysis. EB was responsible for the initial writeup of the background sections, LL for the initial writeup of the results section, with PF completing the paper to a first draft point. All authors provided critical input to develop the manuscript for submission and were involved in subsequent revisions. All authors approved the final manuscript.

TABLE 7 Characteristics of clusters formed based on health cost incurred

	Zero cost	Low cost	Moderate cost	High cost
Number of respondents	166	104	179	73
Per cent of sample	32%	20%	34%	14%
Mean cost	$0	$1446	$11,371	$55,180
Minimum cost	$0	$630	$3787	$22,939
Geometric mean	$0	$1242	$10,138	$45,009
Maximum cost	$0	$3474	$22,633	$346,150
Proportion of group who…				
Identify as straight	86%	85%	87%	81%
Indigenous*	37%	39%	37%	58%
Current Defence Force member or veteran	3%	3%	3%	3%
Australian citizen or resident	90%	90%	93%	93%
High school completion, apprenticeship or tertiary education	27%	22%	26%	19%
Ever been in foster care or institutional care as a child	31%	27%	36%	40%
Ever been in youth detention*	18%	11%	25%	33%
Ever been in watch house	60%	58%	68%	80%
Ever been in prison*	41%	32%	45%	60%
Ongoing financial insecurity	40%	39%	40%	37%
Facing standover behaviour for money, cigarettes, drugs and alcohol	26%	41%	42%	47%
Physically attacked since becoming homeless	41%	45%	68%	45%
Self or other harm	36%	39%	60%	67%
Permanent physical disability*	10%	11%	14%	32%
Facing legal issues	43%	38%	45%	48%
Physical health				
Brain Injury*	14%	21%	36%	54%
Asthma*	38%	42%	53%	59%
Hepatitis C*	15%	18%	23%	35%
History of frostbite, hypothermia or immersion foot	3%	1%	5%	13%
History of heat stroke/Heat exhaustion*	21%	25%	32%	47%
Heart problems*	17%	26%	22%	43%
Liver disease, cirrhosis or End-stage liver disease*	9%	17%	12%	29%
Diabetes	12%	18%	17%	20%
Cancer*	5%	7%	13%	14%
Kidney disease/end stage renal disease or dialysis	8%	8%	8%	22%
HIV+/AIDS	1%	1%	0%	7%
Emphysema	7%	10%	12%	8%
Tuberculosis	1%	1%	2%	3%
Cellulitis	5%	7%	6%	7%
Foot/skin conditions*	14%	15%	14%	32%
Scabies	1%	5%	5%	8%
Dehydration*	22%	26%	32%	53%
Convulsions*	5%	7%	15%	26%
Epilepsy*	2%	8%	12%	19%
Pregnancy	8%	4%	8%	14%

TABLE 7 (Continued)

	Zero cost	Low cost	Moderate cost	High cost
Mental health				
Hospital against will*	25%	23%	39%	59%
Interviewer observed severe, persistent mental illness or severely compromised cognitive functioning*	18%	21%	34%	36%
Mental health professional support in the last 6 months*	39%	38%	60%	52%
Accidents and emergencies admission: mental health issues *	33%	36%	60%	75%
Learning or developmental disability*	13%	24%	28%	33%
Problems concentrating and/or remembering things	55%	65%	73%	81%
Emotional, physical, psychological, sexual or other type of abuse or trauma where no help sought or perceived to have caused homelessness	60%	64%	73%	80%
Alcohol and other drug use				
Ever had a problematic alcohol and/or drug use	58%	58%	76%	80%
Very high frequency use of alcohol and/or drugs (last month)	35%	35%	35%	62%
Used injection drugs or shots (last six months)	30%	30%	47%	51%
Received drug and alcohol treatment but returned to drug and alcohol use	31%	27%	44%	56%
Use of non-beverage alcohol (e.g. methylated spirits) and/or inhalants (e.g. petrol)	8%	4%	14%	18%
Blacked out because of alcohol or drug use	18%	2%	2%	1%

*$p < 0.05$.

CONFLICT OF INTEREST
No competing interests to declare.

DATA AVAILABILITY STATEMENT
The data custodians of the data analysed in this study are the Australian Alliance to End Homelessness (AAEH), Micah Projects and the individual organisations which collected the data. Researchers who wish to access the data must seek approval from the Australian Alliance to End Homelessness and sign a Memorandum of Understanding and Confidentiality Agreement with the AAEH.

ORCID
Paul Flatau https://orcid.org/0000-0002-9547-4297
Leanne Lester https://orcid.org/0000-0003-2339-7832

REFERENCES
Abbott, P., Magin, P., Davison, J., & Hu, W. (2017). Medical homelessness and candidacy: Women transiting between prison and community health care. *International Journal for Equity in Health*, 16(1), https://doi.org/10.1186/s12939-017-0627-6

Aldridge, R. W., Story, A., Hwang, S. W., Nordentoft, M., Luchenski, S. A., Hartwell, G., Tweed, E. J., Lewer, D., Vittal Katikireddi, S., & Hayward, A. C. (2018). 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*, *391*(10117), 241–250. https://doi.org/10.1016/S0140-6736(17)31869-X

Australia Productivity Commission. (2018). Report on government services 2018. Australian Productivity Commission. Retrieved October 6, 2020, from https://www.pc.gov.au/research/ongoing/report-on-government-services/2018

Australian Bureau of Statistics (2018). *Census of population and housing: Estimating homelessness, 2016*. Retrieved October 6, 2020, from https://www.abs.gov.au/statistics/people/housing/census-population-and-housing-estimating-homelessness/latest-release

Australian Bureau of Statistics (2019). *Estimates of Aboriginal and Torres Strait Islander Australians*. Retrieved October 6, 2020, from https://www.abs.gov.au/statistics/people/aboriginal-and-torres-strait-islander-peoples/estimates-and-projections-aboriginal-and-torres-strait-islander-australians/latest-release

Australian Institute of Health and Welfare. (2016). Australia's Health 2016 (No. AUS 199). Retrieved October 6, 2020, from https://www.aihw.gov.au/reports/australias-health/australias-health-2016/contents/summary

Australian Institute of Health and Welfare. (2018a). Australia's Health 2018 (No. AUS 221). Retrieved October 6, 2020, from https://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/table-of-contents

Australian Institute of Health and Welfare. (2018b). Specialist Homelessness Services Annual Report 2017-18 (No. HOU 299). Retrieved October 6, 2020, from https://www.aihw.gov.au/reports/homelessness-services/specialist-homelessness-services-2017-18/contents/contents

Australian Institute of Health and Welfare. (2019a). Australian burden of disease study: Impact and causes of illness and death in Australia 2015—Summary report. Australian Burden of Disease Study series

homelessness. *Women's Health Issues*, 27(3), 256–263. https://doi.org/10.1016/j.whi.2017.03.014

Montgomery, A. E., Szymkowiak, D., Marcus, J., Howard, P., & Culhane, D. P. (2016). Homelessness, unsheltered status, and risk factors for mortality: Findings from the 100 000 homes campaign. *Public Health Reports*, 131(6), 765–772. https://doi.org/10.1177/0033354916667501

Moss, K., & Singh, P. (2015). *Women rough sleepers in Europe: Homelessness and victims of domestic abuse*. Policy Press.

Nielsen, S. F., Hjorthøj, C. R., Erlangsen, A., & Nordentoft, M. (2011). Psychiatric disorders and mortality among people in homeless shelters in Denmark: A nationwide register-based cohort study. *The Lancet*, 377(9784), 2205–2214. https://doi.org/10.1016/S0140-6736(11)60747-2

Nielssen, O. B., Stone, W., Jones, N. M., Challis, S., Nielssen, A., Elliott, G., Burns, N., Rogoz, A., Cooper, L. E., & Large, M. M. (2018). Characteristics of people attending psychiatric clinics in inner Sydney homeless hostels. *Medical Journal of Australia*, 208(4), 169–173. https://doi.org/10.5694/mja17.00858

Notaro, S. J., Khan, M., Kim, C., Nasaruddin, M., & Desai, K. (2013). Analysis of the health status of the homeless clients utilizing a free clinic. *Journal of Community Health*, 38(1), 172–177. https://doi.org/10.1007/s10900-012-9598-0

Orgcode. (2019). *SPDAT*. Retrieved April 28, 2019, from http://org-eehivegroupcadev.nationbuilder.com/spdat

Parsell, C., Petersen, M., & Culhane, D. (2016). Cost offsets of supportive housing: Evidence for social work. *British Journal of Social Work*, 47(5), 1534–1553. https://doi.org/10.1093/bjsw/bcw115

Petersen, M. (2015). Addressing older women's homelessness: Service and housing models. *Australian Journal of Social Issues*, 50(4), 419–438. https://doi.org/10.1002/j.1839-4655.2015.tb00358.x

Phipps, M., Dalton, L., Maxwell, H., & Cleary, M. (2019). Women and homelessness, a complex multidimensional issue: Findings from a scoping review. *Journal of Social Distress and the Homeless*, 28(1), 1–13. https://doi.org/10.1080/10530789.2018.1534427

Ponce, A. N., Lawless, M. S., & Rowe, M. (2014). Homelessness, behavioral health disorders and intimate partner violence: Barriers to services for women. *Community Mental Health Journal*, 50(7), 831–840. https://doi.org/10.1007/s10597-014-9712-0

Rieke, K., Smolsky, A., Bock, E., Erkes, L. P., Porterfield, E., & Watanabe-Galloway, S. (2015). Mental and nonmental health hospital admissions among chronically homeless adults before and after supportive housing placement. *Social Work in Public Health*, 30(6), 496–503. https://doi.org/10.1080/19371918.2015.1063100b

Salim, K. B. (2020). *Examining the reliability and validity of the second version of the Vulnerability Index-Service Prioritization Decision Tool (VI-SPDAT) for Single Adults* (Doctoral dissertation, The University of North Carolina at Charlotte).

van der Molen, E., Vermeiren, R., Krabbendam, A., Beekman, A., Doreleijers, T., & Jansen, L. (2013). Detained adolescent females' multiple mental health and adjustment problem outcomes in young adulthood. *Journal of Child Psychology and Psychiatry*, 54, 950–957. https://doi.org/10.1111/jcpp.12044

Vijayaraghavan, M., Tochterman, A., Hsu, E., Johnson, K., Marcus, S., & Caton, C. L. M. (2012). Health, access to health care, and health care use among homeless women with a history of intimate partner violence. *Journal of Community Health*, 37(5), 1032–1039. https://doi.org/10.1007/s10900-011-9527-7

Warburton, W., Whittaker, E., & Papic, M. (2018). Homelessness pathways for Australian single mothers and their children: An exploratory study. *Societies*, 8(1), 16. https://doi.org/10.3390/soc8010016

Wen, C., Hudak, P., & Hwang, S. (2007). Homeless people's perceptions of welcomeness and unwelcomeness in healthcare encounters. *Journal of General Internal Medicine*, 22(7), 1011–1017. https://doi.org/10.1007/s11606-007-0183-7

Winetrobe, H., Wenzel, S., Rhoades, H., Henwood, B., Rice, E., & Harris, T. (2017). Differences in health and social support between homeless men and women entering permanent supportive housing. *Women's Health Issues*, 27(3), 286–293. https://doi.org/10.1016/j.whi.2016.12.011

Wood, L., Flatau, P., Zaretzky, K., Foster, S., Vallesi, S., & Miscenko, D. (2016). *What are the health, social and economic benefits of providing public housing and support to formerly homeless people? AHURI final report no. 265*. Australian Housing and Urban Research Institute. Retrieved October 6, 2020, from https://www.ahuri.edu.au/research/final-reports/265

Wright, B. J., Vartanian, K. B., Li, H. F., Royal, N., & Matson, J. K. (2016). Formerly homeless people had lower overall health care expenditures after moving into supportive housing. *Health Affairs*, 35(1), 20–27. https://doi.org/10.1377/hlthaff.2015.0393

Young, J. T., Heffernan, E., Borschmann, R., Ogloff, J. R. P., Spittal, M. J., Kouyoumdjian, F. G., Preen, D. B., Butler, A., Brophy, L., Crilly, J., & Kinner, S. A. (2018). 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*, 3(5), e237–e248. https://doi.org/10.1016/S2468-2667(18)30052-5

Zaretzky, K., Flatau, P., Clear, A., Conroy, E., Burns, L., & Spicer, B. (2013). *The cost of homelessness and the net benefit of homelessness programs: A National Study. Findings from the baseline client survey*. AHURI final report no. 205. Australian Housing and Urban Research Institute. Retrieved October 6, 2020, from https://www.ahuri.edu.au/research/final-reports/205

Zaretzky, K., Flatau, P., Spicer, B., Conroy, E., & Burns, L. (2017). What drives the high health care costs of the homeless? *Hiousing Studies*, 32(7), 931–947. https://doi.org/10.1080/02673037.2017.1280777

Zlotnick, C., Tam, T. W., & Soman, L. A. (2012). Life course outcomes on mental and physical health: The impact of foster care on adulthood. *American Journal of Public Health*, 102(3), 534–540. https://doi.org/10.2105/AJPH.2011.300285