

Influenza Vaccination Rates, and Barriers to Influenza Vaccination, in People who are Homeless: A Systematic Review Protocol

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ABSTRACT

Background: Influenza is a highly infectious virus which is endemic in most high-income countries. People experiencing homelessness are at an increased risk of contracting influenza, and often have poorer outcomes associated with hospitalisation and mortality. Annual influenza vaccination is recommended for all adults, and highly recommended for ‘at-risk’ groups, including people who are homeless. Despite this, the vaccination uptake within the homeless community is low. This systematic review will identify influenza vaccination rates, and barriers to influenza vaccination, in people who are homeless.

Methods/Design: This review will consider primary studies about influenza vaccination in people who are homeless. Searches will be undertaken on five electronic databases and managed in EndNote X9. The literature will be screened by title/abstract, then by full-text, and citation chaining will be completed. Data about the influenza vaccination rates and barriers will be extracted. Each task, primarily the screening and extraction of data, will be completed by one researcher, and checked by at least one other.

Discussion: This review will identify influenza vaccination rates, and barriers to influenza vaccination, in people experiencing homelessness. This will inform vaccination delivery and funding, and may contribute to reducing the health disparities in this at-risk, hard-to-reach population.

Keywords: homelessness, influenza, flu, vaccination, rates, barriers

1. Background

1.1 Overview of homelessness

A universal definition of ‘homelessness’ does not exist, but a person is generally accepted to be experiencing homelessness if they lack adequate shelter (Organisation for Economic Cooperation and Development, 2019). While ‘sleeping rough’ in an unsheltered location is the most recognisable form of homelessness, most of the homeless population reside in overcrowded boarding houses, crisis dwellings, supported accommodation, and other forms of temporary housing (Australian Bureau of Statistics, 2016; Davies & Wood, 2018). In Australia,

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where the authors are located, the most recent data estimated that 290,000 people experienced homelessness in 2019 (Australian Bureau of Statistics, 2016; Pawson et al., 2020). This number has been seen to increase due to the recent COVID-19 pandemic (Australian Institute of Health and Welfare, 2021; Pawson et al., 2020).

1.2 Health disparities in people who are experiencing homeless

People who are experiencing homelessness have significantly poorer health outcomes when compared to the general population (Aldridge et al., 2018; Fazel et al., 2014). Homelessness is more likely to cause an individual to suffer from multiple comorbidities, including chronic health conditions related to substance abuse, smoking, and poor nutrition (Fallaise et al., 2017; Krupski et al., 2015; Lebrun-Harris et al., 2013). The prevalence of infectious diseases in the homeless community is also high, most notably for tuberculosis, hepatitis B, hepatitis C, pneumococcal pneumonia, diphtheria, and human immunodeficiency virus (HIV) (Bamrah et al., 2013; Hosseini & Ding, 2018; Khan et al., 2011; Lee et al., 2013; Lemay et al., 2019; Ly et al., 2021; McKee et al., 2018; Mosites et al., 2019; Noska et al., 2017; Peak et al., 2020; Romaszko et al., 2013). In comparison to the general population, people who are homeless have a higher likelihood of hospitalisation, intensive care unit admission, and mortality (Aldridge et al., 2018; Maness & Khan, 2014; Perry & Craig, 2015; Seastres et al., 2020).

These health disparities are underpinned by the social determinants of health, primarily the lower socioeconomic status and poor housing conditions experienced within homeless communities. People experiencing homelessness often live within transient populations in overcrowded settings, and without access to suitable hygiene facilities (Tsai & Wilson, 2020). Additionally, access to healthcare – even in countries such as Australia, with publicly-funded healthcare systems which are free at the point-of-care – is limited for this population (Stafford & Wood, 2017). People who are homeless cite the out-of-pocket cost of service as the primary barrier for accessing healthcare (Australian Bureau of Statistics, 2015). Other barriers include the inability to be contacted, and a lack of transport to health services (Australian Bureau of Statistics, 2015). Further, people experiencing homelessness often lack health literacy, which can lead to misinformation about conditions and treatments (Katzman & Katzman, 2021). This combined with past discrimination, causes some patients who are homeless to distrust the healthcare system. Consequently, issues such as vaccine hesitancy can arise, driven by concerns related to the safety, side effects and long-term efficacy of immunisation (Katzman & Katzman, 2021).

1.3 Influenza in people who are homeless

Influenza is a highly infectious virus that poses a significant healthcare concern despite being vaccine preventable. In Australia, the country where the authors are located, pre-COVID-19 data showed over 300,000 influenza cases in 2019, including 4,000 hospitalisations and 800 deaths¹ (Australian Government, 2019; Wong et al., 2019). Influenza can be particularly harmful in the homeless population, with factors such as poor hygiene practices, transient populations, and congregate living conditions facilitating the spread of the virus (Ly et al., 2021). Severe manifestations of influenza are more common in the homeless community, and there is an increased likelihood of complications including pneumonia, bacterial bronchitis,

¹ The 2020-2021 influenza data should be used with caution, as the circumstances of COVID-19 have greatly diminished the accuracy of influenza reporting. This could be due to the changes in community behaviour associated with healthcare, the impact of social distancing measures on influenza transmission, and the overall focus on the COVID-19 response.

acute respiratory distress syndrome and myocarditis (Sellers et al., 2017). Further, influenza can cause significant exacerbations of chronic comorbidities common in people who are homeless, namely asthma and heart disease (Vallesi et al., 2021).

Influenza can be effectively prevented through immunisation, and hence inadequate vaccination uptake is a primary cause of the significant mortality and hospital burden seen in at-risk groups. The introduction of an inactivated form of the virus into the body stimulates an antibody-mediated immune response, limiting the risk of future infection (Nypaver et al., 2021). In Australia, multiple influenza vaccines are available during the flu season each year (Australian Government Department of Health, 2021a).

1.4 Vaccination in people who are homeless

In most high-income countries, annual influenza vaccination is recommended for all adults. The efficacy of influenza vaccination against specific strains in adult populations is around 60%, and those who contract influenza after vaccination experience milder symptoms and decreased length of hospital stay (Osterholm et al., 2012; Thompson et al., 2018).

Further, the vaccine is often highly recommended for people in ‘at-risk’ groups, including people aged ≥ 65 years, pregnant women, people with chronic health conditions, and people who are homeless (Australian Government Department of Health, 2021b). Specifically in Australia, the vaccines for most of these groups are covered under the National Immunisation Program (NIP), but there remains no funding available for people experiencing homelessness (Australian Government Department of Health, 2021b). Accordingly, both in Australia and globally, influenza vaccination coverage in homeless populations is estimated to be far lower than in general populations.

In scoping searches conducted for this protocol, multiple studies reporting influenza vaccination rates, and barriers to influenza vaccination, in homeless communities were identified. However, there are currently no systematic reviews that collate this data. Consequently, there is a lack of evidence to support the design and delivery of influenza vaccination programs to people who are homeless. This may further reinforce the poorer health and health-related outcomes related to influenza in this at-risk, hard-to-reach population.

1.5 Aim

This systematic review aims to evaluate and summarise the current evidence relating to two key areas of influenza vaccination in people who are homeless. This will be achieved by retrieving and analysing existing primary studies from high-income countries, to: (1) collate influenza vaccination coverage, and (2) what barriers to influenza vaccination in people who are homeless.

1.6 Review questions

This systematic review will answer the questions: (1) What are the current influenza vaccination rates in people who are homeless in high-income countries?, and (2) What barriers exist in relation to influenza vaccination for people who are homeless?

2. Methods/Design

2.1 Study design

The existing primary literature about influenza vaccination in people who are homeless will be systematically reviewed. This protocol has been preceded by preliminary scoping searches to determine the extent of current literature, effective search terms, and suitable

databases/limiters/data extraction items. The Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guidelines have been used to report this protocol and inform the review methods (Shamseer et al., 2015) (see Additional File #1).

2.2 Eligibility criteria

The CoCoPop (Condition, Context, Population) framework was used to develop the eligibility criteria for this review. Application of the framework to the topic is as follows:

- Condition: influenza
- Context: vaccination
 - o The primary outcome will be vaccination coverage. Vaccination coverage may be measured in a variety of ways (e.g. the number (N) of people receiving a vaccination, the percentage (%) of eligible people vaccinated in a given timeframe, the difference between baseline coverage and the N/% improvement in vaccination coverage from a baseline)
 - o The secondary outcome will be barriers to vaccination uptake
- Population: people who are homeless
 - o The definition of 'homeless' cited in Section 1.1 will be used
 - o Only literature involving homeless adults (≥ 18 years) will be considered, because influenza vaccination recommendations in children are variable

This review will include different types of studies for each of the review questions regarding (1) vaccination coverage, and (2) barriers to vaccination. For vaccination coverage, the review will include only cohort, cross sectional, and case-control studies. For the vaccination barriers, we will include cohort, cross sectional, case-control studies, and qualitative studies. If these are absent or if insufficient numbers are retrieved, all other study types will be considered. Studies will be included if they were undertaken in a high-income country similar to the authors location in Australia (e.g. North America, Western Europe, etc.). Only literature available in full-text, in English, and in a peer-reviewed journal will be considered. To ensure the review is manageable, literature will be date-limited to the introduction of the use of quadrivalent vaccines in 2012 (2012 to 2022).

2.3 Search strategy

The searches will use three groups of keywords: (1) those related to 'homelessness', (2) those related to 'vaccination' (including 'immunisation'), and (3) those related to 'influenza'. An example search strategy for each database is provided in Additional File #2.

2.4 Information sources

The following five electronic databases will be searched: CINAHL Complete, Scopus, Embase, MEDLINE, and Web of Science. The reference lists of each piece of literature selected for inclusion in the review will also be manually searched.

2.5 Data collection

The literature retrieved in the searches will be exported into EndNote X9, and duplicates will be removed using EndNote's 'find duplicate' function. The items will then be screened against the eligibility criteria outlined in Section 2.2, by: (1) reading the title/abstract of all items, then (2) reading the full text of the remaining items. Each step will be completed by one researcher, checked by a second and, where needed, a third researcher will be involved to achieve agreement. The selection process will be recorded via a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) chart (Moher et al., 2009).

2.6 Data extraction

Information from the literature will be extracted into EndNote, and then imported into COVIDENCE. The extraction will be completed by independently by two researchers, and then compared. If inconsistencies arise, a third researcher will be involved to achieve agreement. The information extracted will include:

- Information about the study – including the authors, publication date, study type and location
- Information about the study participants – including the sample size, type of homelessness experienced, risk factors for influenza infection, and context for influenza vaccination
- For Review Question 1: information about the vaccination coverage – as outlined in Section 2.2
- For Review Question 2: information about the barriers to vaccination – as reported by people who are homeless, people delivering influenza vaccination, and/or other relevant stakeholders

2.7 Quality assessment

The appropriate tool will be used to evaluate the literature included in review:

- Cohort studies: Risk of Bias in Non-Randomised Studies of Interventions (ROBINS-1) tool (Cochrane Methods, n.d)
- Cross-sectional studies: Appraisal Tool for Cross-Sectional Studies (AXIS) (Downes, 2016)
- Case control studies: Critical Appraisal Programme Skills (Critical Appraisal Skills Programme, 2018)
- Qualitative studies: Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Qualitative Research (Joanna Briggs Institute, 2019)

2.8 Data synthesis

If appropriate, a meta-analysis will be undertaken to collate influenza vaccination coverage. If this is not possible, and for the barriers to vaccination, narrative synthesis will be used.

2.9 Ethics

Approval from a human research ethics committee is not required for this systematic review.

3. Discussion

This systematic review will address the identified gap in the literature regarding influenza vaccination in people who are homeless. Rates of homelessness have increased throughout the past decade, and the COVID-19 pandemic has accelerated this increase (Australian Institute of Health and Welfare, 2021; Pawson et al., 2020). While the incidence of influenza has temporarily reduced due to COVID-19-related health precautions such as social distancing and travel restrictions, it is expected that influenza incidence will increase as these precautions are withdrawn (Steinfort et al., 2020). A renewed focus on influenza vaccination in people who are homeless – an at-risk and hard-to-reach group – is essential.

This review will provide evidence about the current state of influenza vaccination coverage in homeless populations. It will also identify the barriers which must be overcome to effectively deliver influenza vaccination to people who are homeless. These results may contribute to

addressing the health disparities in the homeless population, by informing future vaccination practice and influencing policymakers to push for further funding.

It must be acknowledged that several limitations exist in relation to this systematic review. The scoping searches conducted for this protocol identified a lack of high-quality studies, and a high degree of heterogeneity among the studies included may prevent the completion of a meta-analysis. Additionally, literature published in languages other than English will be excluded. The findings of the review must be interpreted in the context of these limitations.

List of Abbreviations

AMSTAR-2	Assessing the Methodological Quality of Systematic Reviews tool
AXIS	Appraisal Tool for Cross-Sectional Studies
CASP	Critical Appraisal Skills Program
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CoCoPop	Condition, Context, Population framework
COVID-19	Coronavirus-2019
HIV	Human Immunodeficiency Virus
JBI	Joanna Briggs Institute
MEDLINE	Medical literature Analysis and Retrieval System Online
NIP	National immunisation Program
OECD	Organisation for Economic Co-Operation and Development
PRISMA	Preferred Reporting Items for Systematic Review and Meta-Analysis
PRISMA-P Protocols	Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols
RoB-2	Cochrane Risk of Bias Tool for Randomised Controlled Trials
ROBINS-1	Risk of Bias in Non-Randomised Studies of Interventions tool

Declarations

Competing interests: The authors declare they have no competing interests.

Authors' contributions: VK, LKM, RW and MD developed the research topic. VK and LKM conducted the scoping searches, designed the search strategy, and drafted the manuscript. All other authors, including JH, HB, JKR, PT, reviewed the search strategy, and edited and approved the manuscript. VK is the guarantor of the work.

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Additional File #1

PRISMA-P (Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols) Checklist

Section and topic	Item checklist item No		Location in submission
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	Title
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	N/A
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	N/A
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	Authors and Affiliations
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	Authors' Contributions
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	N/A
Support:			
Sources	5a	Indicate sources of financial or other support for the review	Funding Statement
Sponsor	5b	Provide name for the review funder and/or sponsor	
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	N/A
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	Section 1.4
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	Section 1.5, 1.6

METHODS

Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	Section 2.1, 2.2
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	Section 2.4
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	Section 2.3, Additional File #2
Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	Section 2.5, 2.6
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	Section 2.6
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	Section 2.7
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2 , Kendall's τ)	Section 2.8
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	

Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	N/A
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	N/A

Additional File #2

Search #1: homeless*

Search #2: (vaccin* OR immuni*)

Search #3: (influenza OR flu)

CINAHL Complete with subject headings: (MM "homeless persons" OR MM "homelessness" OR Search #1) AND (MH 'immunisation+' OR Search #2) AND (Search #3)

Embase with index terms: ('homeless person'/exp OR homeless*) AND (Search #2) AND (Search #3)

Scopus: (Search #1) AND (Search #2) AND (Search #3)

Web of Science: (Search #1) AND (Search #2) AND (Search #3)

MEDLINE (via EBSCOhost) with subject headings: (MH "homeless persons+" OR homeless*) AND (MH "vaccination+" OR Search #2) AND (Search #3)

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