

## Introduction

- The U.S. is facing a worsening housing crisis, with rising rents, high eviction risk, and increasing unsheltered homelessness, limiting access to safe indoor environments during winter
- Housing instability contributes to prolonged cold exposure, making frostbite and hypothermia increasingly predictable public health issues
- People experiencing homelessness (PEH) have a disproportionately higher risk of frostbite, but outcome differences remain underexplored
- PEH are heterogeneous: sheltered vs unsheltered individuals differ in exposure risk, access to care, and comorbidity burden

## Objectives

- To examine frostbite outcomes in PEH vs general populations
- To understand differences in outcomes between sheltered and unsheltered PEH

## Methods

- **Study Design:** Systematic literature review of frostbite and cold-related injuries among PEH conducted in accordance with PRISMA guidelines
- **Search Strategy:** Comprehensive search through 2024 in PubMed, Medline (Ovid), and Web of Science using expanded terms for cold-related injuries and housing status; supplemented with a targeted Google Scholar search
- **Inclusion Criteria:** Included peer-reviewed studies with quantitative data on cold-related injuries and housing status or outcomes
- **Exclusion Criteria:** Non-original studies, non-English articles, and studies without relevant outcomes
- **Screening & Extraction:** Two reviewers independently screened and reviewed studies, with disagreements resolved by third reviewer; data extracted using a standardized form

## Results

- Included studies were primarily retrospective cohort (n=9) and cross-sectional or registry-based studies (n=6), with additional case series or chart reviews (n=2), observational or descriptive studies (n=3), and prospective or case-control designs (n=4)

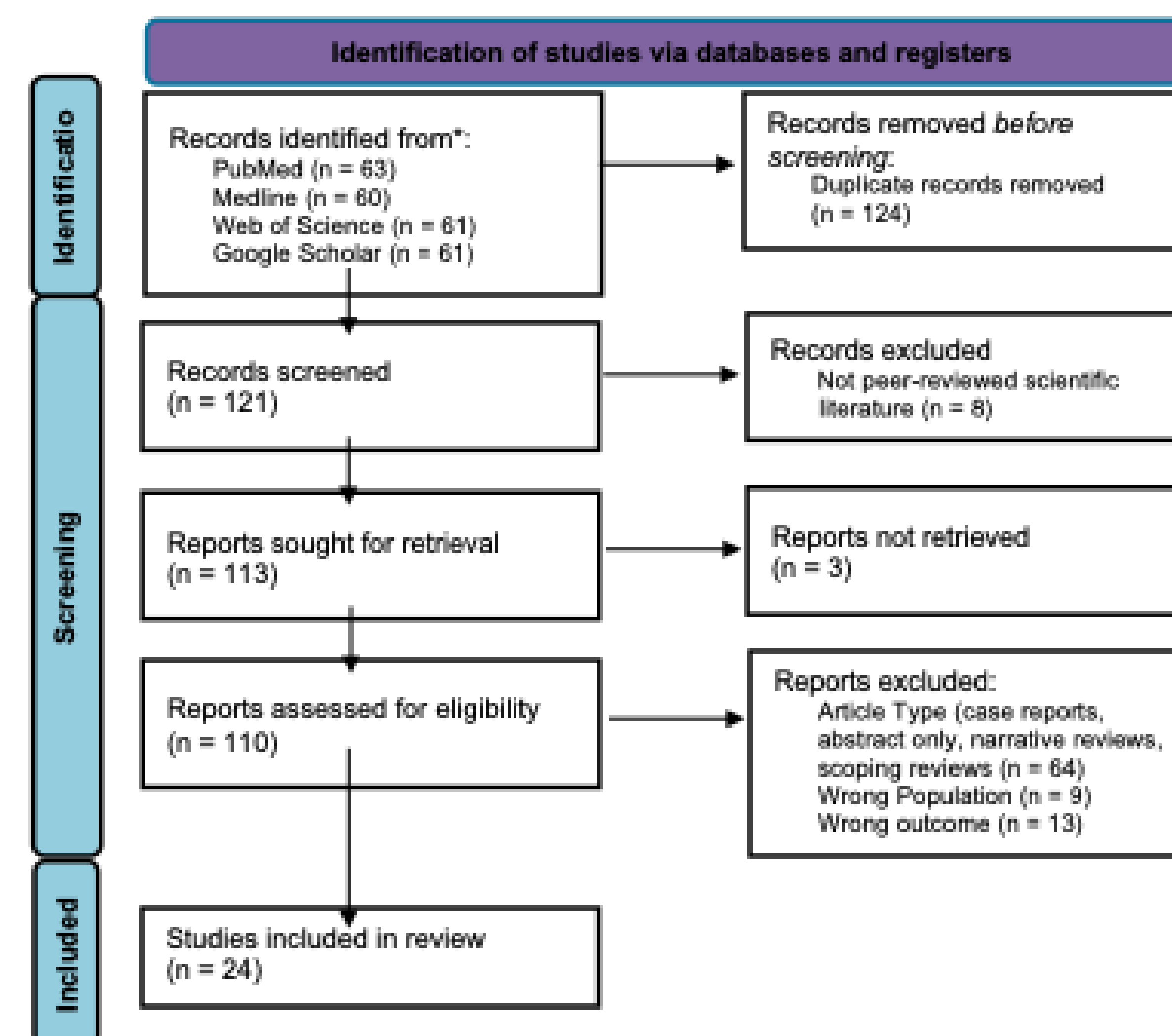


Fig. 1 Study selection shown using the PRISMA 2020 flow diagram<sup>9</sup>

## Burden & Demographics

- 8–76% of cold-exposed patients were experiencing homelessness across studies
- High rates of substance use and psychiatric illness
- PEH are overrepresented in ED visits, admissions, and deaths

## Risk of Cold Injury

- PEH are 4–18× more likely to be diagnosed with frostbite or hypothermia in ED setting compared to housed populations
- Disparities consistent across regions and study designs

## Results cont.

### Clinical Outcomes

- ↑ Amputation (aOR ~1.6–1.8)
- ↑ Infectious complications (e.g., cellulitis)
- ↑ Readmissions (~35%; >5× if discharged to shelter)
- ↑ Length of stay and cost
- ↑ Mortality, especially among unsheltered

### Housing Matters

- Unsheltered individuals have the highest morbidity and mortality
- Cold-related deaths were observed in unsheltered populations, with none reported among sheltered or low-SES housed comparison groups in multiple studies
- Housing First programs are associated with reduced cold-related mortality

## Conclusion

- PEH experience a markedly higher burden of cold-related injuries and worse clinical outcomes, including increased amputation, readmission, and mortality
- Unsheltered individuals are at greatest risk, highlighting the importance of housing status as a key determinant of outcomes
- High healthcare utilization and readmissions may reflect gaps in discharge planning, rehabilitation, and post-acute support
- Housing interventions, including low-barrier shelters and supportive housing, are critical to reducing cold-related morbidity and mortality