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Housing and health: an updated glossary

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ABSTRACT

Recent crises have underscored the importance that housing has in sustaining good health and, equally, its potential to harm health. Considering this and building upon Howden-Chapman's early glossary of housing and health and the WHO Housing and Health Guidelines, this paper introduces a range of housing and health-related terms, reflecting almost twenty years of development in the field. It defines key concepts currently used in research, policy, and practice to describe housing in relation to health and health inequalities. Definitions are organised by three overarching aspects of housing: affordability (including housing affordability stress and fuel poverty), suitability (including condition, accessibility, and sustainable housing), and security (including precarious housing and homelessness). Each of these interrelated aspects of housing can be either protective of, or detrimental to, health. This glossary broadens our understanding of the relationship between housing and health to further promote interdisciplinarity and strengthen the nexus between these fields.

INTRODUCTION

There has been a gradual institutional recognition of the role of housing as a social, economic, environmental, and cultural determinant of health. This is almost certainly as a response to the World Health Organization's (WHO) framing for action on the Social Determinants of Health in 2010, which positioned housing as an intermediary determinant (Figure 1).[1] More recently, the 2018 WHO Housing and Health Guidelines has synthesised evidence on the often complex housing-to-health pathways, providing practical, evidence-based recommendations to inform localised and national policy and action.[2] These Guidelines aim to improve population and individual health by providing healthy housing and reducing the stark inequities in health that are generated by housing and housing systems globally. In doing so, they provide the most comprehensive housing and health-specific guidance published by the WHO to date.

Figure 1.

[FIGURE 1 HERE]

Note. WHO Commission on Social Determinants of Health conceptual framework. Reprinted.[1]

In recent years, the global pandemic and rapidly escalating climate crisis have heightened our awareness of the protective and health promoting potential of housing. With major disease and extreme weather events forecasted to increase and intensify, the role of housing in protecting and supporting public health will only increase in importance. After the experience of living with the COVID-19 pandemic, our relationship with housing has changed dramatically. Housing has become a space that must accommodate our living, working, and social needs–and deficiencies in our housing's ability to meet these demands have been both highlighted by, and resulted in, syndemic public health consequences.[3, 4] Housing inequalities cause immediate and long-term health inequalities, and our current societal challenges amplify this. Public health initiatives that fail to address housing are less effective when people are living in health-harming houses that increase their risk of adverse health outcomes. Similarly, medical treatments render poor health outcomes if the patient is released back into the same home that may have contributed to their condition in the first place.

Considering these developments, this updated glossary of housing and health extends Howden-Chapman's earlier contribution.[5] This glossary's content is not intended to be an exhaustive list of terms used in the field. Rather, its purpose is to broaden our scope of

understanding of housing and health-related concepts. We define housing concepts and terms that are used universally across countries and settings, while recognising that the usage of these terms may differ and that their applicability can vary in different contexts, particularly when used to describe conditions across high-, middle- and low-income nations.

With the relationship between housing and health at the fore of many contemporary global issues, it is vital that we continue to expand our understanding to further promote interdisciplinary engagement in this space. To this end, we begin this glossary by first defining healthy housing. Then, we organise the following terms according to three overarching and inter-related concepts often used in housing research and policy to demarcate the key elements of housing: affordability, suitability, and security (Figure 2). While these concepts are entwined–for example, unaffordable housing can quickly become insecure housing–they are useful categories for organising the definitions provided in this glossary.

Figure 2.

[FIGURE 2 HERE]

Note. Conceptual model illustrating the organisation of this glossary's terms within broader concepts.

HEALTHY HOUSING

Many definitions of healthy housing exist. Put simply, healthy housing sustains physical, mental, and social health and wellbeing. This conceptualisation applies to the housing's physical structure, as well as its social and economic characteristics.

Healthy houses are structurally sound, dry, clean, pest- and contaminant-free, ventilated, safe, thermally controlled, accessible, and affordable.[2] In practice: dry means without damp that sustains moulds which are associated with asthma and respiratory symptoms; contaminant-free means without exposure to lead, radon, pesticides, volatile organic compounds, per- and polyfluoroalkyl substances (PFAS), environmental tobacco smoke, and asbestos particles; safe means without risk of injury, falls, burns, poisoning, and electrocution; and thermally controlled means with an indoor temperature above 18 degree Celsius and below 24 degrees Celsius.[2] A healthy home environment also has adequate sanitation, a satisfactory living space, privacy, ensures its occupants are not subjected to excessive neighbourhood noise (for example, from traffic, trains, or airplanes), and provides protection from pollutants and the impacts of disasters.

Healthy housing also extends beyond the four walls of the home. The surrounding environment, a sense of belonging to place, and the community in which is it situated all play an important role. Healthy housing supports social interactions, provides access to services and green spaces, and facilitates the safe use of active and public transport options.[2]

AFFORDABILITY

Housing affordability is a global problem and manifests itself in different forms across high-, middle- and low-income nations. Housing is often understood to be unaffordable when its cost relative to income exceeds a particular threshold. A range of methods have been employed to assess housing affordability (see for example,[6]) with one such normative method used in research and policy around the world being the expenditure-to-income ratio, whereby housing costs exceeding a 30% threshold are typically considered 'unaffordable'.[7-10] Housing costs commonly encompass the sum of rent or mortgage payments, rates, home repairs and maintenance, and more recently have come to include transportation.[9, 11] Unaffordable housing can directly and indirectly have an impact on housing security and suitability through mechanisms such as the risk of eviction, overcrowding, and a household's inability to maintain the condition of their dwelling.[12] It also affects other domains of living, such as household expenditure on food, fuel, and medical care.[13] This can result in a range of adverse health and wellbeing outcomes, particularly in relation to mental health.[12, 14, 15]

Housing affordability stress

The housing affordability stress (HAS) indicator was constructed in recognition of the shortfalls of the traditional expenditure-to-income measure noted above; that is, how it fails to differentiate between those who *choose* to spend a large amount of their income on housing and those who are *forced* to.[16] HAS considers a household's size and composition, and identifies the point at which housing costs notably and involuntarily affect basic living standards and health. Households in the lowest 40% of a given income distribution who spend more than 30% of their disposable or gross income on housing costs have been classified as experiencing HAS.[17]

Fuel poverty

Fuel poverty is the inability to secure a healthy internal temperature in the home due to being unable to afford energy for heating and cooling.[18] This occurs as a result of a combination of low income, energy inefficient homes, and high fuel costs.[19] While standard measures are often contested in the literature, a commonly adopted approach for measuring fuel

poverty is to consider the point at which the proportion of a household's income that is spent on energy exceeds a particular threshold.[20] For example, fuel poverty has historically been measured as expenditure on household energy costs that exceed 10% of household disposable income.[18] In addition to the direct health impacts of fuel poverty, such as the cardiovascular and respiratory effects associated with living in a cold and damp environment, fuel poverty poses significant indirect effects on wellbeing, including increased stress and reduced emotional wellbeing as a result of the financial burden.[21] While fuel poverty is common terminology in studies focused on high-income countries, the related term '*energy poverty*' is sometimes used in the literature when specifically studying developing nations.[22] This term has often been used to refer to limited access to modern fuel sources and infrastructure to meet basic needs.[23] Energy poverty contributes to high levels of indoor air pollution, causing major health problems such as a variety of respiratory illnesses.[24, 25]

SUITABILITY

Housing suitability refers to a dwelling's capacity to meet the specific needs of its inhabitants (based on, for example, their age or ability) and maintain their good health, typically in relation to its location, condition, size, and design.[26] As such, it is a broad concept that encompasses elements such as a dwelling's physical properties, accessibility, cultural appropriateness, and sustainability.

Physical housing conditions

Physical housing conditions encompass building quality, materials, and design–all of which can affect health. Examples of construction materials that are hazardous for human health are: formaldehyde emissions from fibre-board materials; the release of asbestos from suspended ceilings; and fibres from glass insulation material.[27-29] Similarly, poor design, or inadequate maintenance or engineering, can have social implications, such as limiting privacy, and can even compromise structural integrity. For example, older units constructed from pre-fabricated concrete panels, and new build developments and building renovations that use highly flammable cladding.[30, 31] Inadequate waterproofing and ventilation, damp, and mould are other common housing condition defects.

Universal housing

Universal housing caters to the changing needs of its occupants, regardless of age, ability, or social circumstances.[2] It is an approach that focuses on accessibility and meeting the needs of individuals across their lifespan, thus increasing people's sense of agency, and supporting

them to age in place. According to the Principles of Universal Design,[32] universal housing caters to a diverse population so, regardless of their age, level of ability or social or cultural background, the design of the house will support health and wellness throughout all stages of life. Design that facilitates control and autonomy over one's home environment promotes health and wellbeing and overall life satisfaction.[33] The key elements of universal housing are ease of access into and throughout the home, as well as safety and comfort. Additionally, the home should be designed for both occupants and visitors to the house. In this sense, universal housing can be considered an umbrella term that draws on the related ideas of accessible, visitable, and culturally appropriate housing.

Accessible housing

Accessible housing is housing that is modified or constructed to incorporate features that enable its use by people both with and without a disability across the lifespan. Accessible housing is typically characterised by design features that ensure ease of entry, exit, and navigation in and around the home, while also allowing for adaptation of the dwelling according to occupants' needs over time.[34] However, most housing stock around the world is not constructed with accessibility in mind. Homes that do not possess accessible design features expose occupants with functional impairments to risk of injury, limit their social participation, and adversely impact their overall quality of life.[2]

Visitable housing

Visitable housing is an approach to the design and construction of new dwellings that facilitates access to everyone through the integration of basic accessibility features.[35, 36] As such, it enables the inclusion and involvement of all people.[37] Visitable housing and, the visitability movement more broadly, advocates for the inclusion of a minimum of three key accessibility features into the design and construction of new dwellings: a zero-step entrance, wide doorways and hallways, and a half- or full bathroom on the entry level.[38] While visitable houses do not provide all of the accessibility features that may be required in a home, the incorporation of a few essential elements paves the way for the inclusion of many people who otherwise would find it difficult to navigate others' homes.

Culturally appropriate housing

Housing that is culturally appropriate (also known as culturally sensitive housing) is in its design cognisant of the diversity of living needs across and within cultures. In instances where the housing is being developed by actors who do not pertain to the occupants' cultural group, best-practice features their involvement, through methods such as co-design and co-

build, at each stage of the housing's development.[39] Culturally appropriate housing promotes the wellbeing of its occupants by supporting the realisation of their beliefs, practices, and ways of living.[40] When housing lacks culturally appropriate design, it can pose health consequences. For example, many cultural groups favour multi-generational and/or multi-family living arrangements, yet dwellings that are constructed to accommodate such forms of household composition are often rare, resulting in overcrowded housing and risk of adverse health outcomes, such as the spread of infectious disease.[2]

Climate resilient housing

Climate resilient housing is housing that is constructed or retrofitted to withstand and minimise the impacts of extreme environmental threats produced by the rapidly changing climate, thus enabling occupants to tolerate and recover from the effects of climate hazards promptly and efficiently.[41] Hazards include severe weather events such as bushfires, floods and heatwaves, and sea-level rises, which can damage critical infrastructure, further environmental degradation, and result in economic loss and even death.[42, 43]

Sustainable housing

Sustainable housing refers to housing that has been designed to minimise its impact on the environment, both in terms of its initial construction as well as the resources required during its lifespan. The term is often used with implicit expectations of improved energy efficiency and health benefits. While environmental sustainability is often the dominant focus of sustainable housing, it is important to acknowledge that the term also encompasses forms of social and economic sustainability.[44] That is, sustainable housing which is financially viable and socially acceptable. Sustainable housing has the potential to yield significant co-benefits with regard to emission reductions, cost savings, and health gains. For example, a housing retrofit project that, in addition to abated greenhouse gas emissions, reduces energy costs leading to increased annual household savings and decreases the risk of infectious disease.[45]

SECURITY

Housing security is the guarantee that occupants can reside in their homes without fear of forced eviction, harassment, and other threats. As such, housing security is often linked to tenure.[46] Secure housing is also affordable housing, with high housing costs being a factor in undesirable or forced housing moves. The term precarious housing (below) is often used when affordability is a driver of insecure housing.

Precarious housing

Precarious housing is housing that is unaffordable, unsuitable for the occupants (for example, overcrowded) or insecure in tenure.[12, 26, 47] The inclusion of a broad range of components in this definition reflects the overlaps and interactions between housing issues and their impacts on health.[48] These components are simultaneously shaped by systemic factors, including housing supply, welfare regimes, gender relations, and racial and ethnic discrimination,[47, 49] which drive inequalities in health. People in precarious housing can be left exposed in the face of external stressors or disasters, increasing their vulnerability to the effects of adversity and, in turn, limiting their resilience to such events.[12, 49] While the term housing insecurity is often used interchangeably with precarious housing, this definition demonstrates that precarious housing is a more multifaceted concept in which housing security is but one component.

Housing tenure

Tenure refers to the system or policies in place within jurisdictions that regulate and allocate housing. The most common categories of tenure are ownership (with or without a mortgage), private rental tenure (where occupants lease their home from a private landlord), and social or public housing (where occupants lease their home from a government agency or community service provider – see *'social housing'*). Home ownership is typically considered the most secure tenure, providing residents with a high level of protection from forced movement. Though varying by national context, rental tenures generally have lower levels of security, with varying lease lengths, rights, and eviction protections. Countries differ in the distribution of these categories of tenure across their housing system, with some jurisdictions being characterised by high rates of social housing (for example, Denmark and Austria at more than 20% of housing stock) and others low rates (for example, Spain at less than 2% of housing stock).[50]

Social housing

Social housing, when leased from a government agency, is understood to provide the highest level of 'security of tenure' in the rental sector, and in some countries gives residents the right to occupy their homes indefinitely.[51] Strict occupancy criteria, spanning categories such as income and health needs, often determine eligibility for a social housing dwelling at below-market rent.

Homelessness

Homelessness, as outlined by the European Typology on Homelessness and Housing Exclusion (ETHOS), encompasses rooflessness (for example, rough sleeping), houselessness (for example, residing in temporary or transitional accommodation), living in insecure housing (for example, under threat of violence or eviction), and residing in inadequate housing (for example, occupying a temporary structure or living in severely overcrowded housing).[52] ETHOS is based on a conceptual framework and is widely used; however this approach to defining and classifying homelessness is not without its critiques.[53] While homelessness generally refers to the inability to afford or access secure shelter, it exists along a continuum, with its drivers and experience varying markedly between countries and regions. For this reason, different definitions are needed to fully capture the disparate forms of homelessness that people can experience. However, the absence of a universally accepted frame of reference for homelessness poses challenges for holding authorities to account and drawing comparisons between regions. Homelessness presents major health concerns for those affected, increasing the risk of malnutrition, respiratory illnesses, infectious disease, and poor mental health outcomes.[54]

Housing discrimination

Housing discrimination refers to prejudiced practices in accessing housing based on personal characteristics, such as race, ethnicity, ability, gender, and/or sexuality. Across many housing systems, First Nations people, migrants, and ethnic minorities suffer discrimination from landlords if they are renting privately, from housing officers if renting social housing, and from institutional lenders if they are seeking a mortgage.[55, 56] Despite nations such as the U.S. introducing laws prohibiting such practices,[57] the phenomenon of housing discrimination continues to exist, often underreported or undetected.[58] Beyond the direct physical and mental health effects of housing discrimination, such acts may pose longer-term health implications by limiting access to employment, education, and economic opportunities.[59]

Housing displacement

Housing displacement is an involuntary relocation because of social, economic or climatic forces (for example, gentrification, war or disasters) that make continuing to live in one's current place of residence costly, hazardous or entirely infeasible.[60] In addition to the loss of housing, displaced persons may lose their employment, access to essential services, and social networks.[61] Given the wide-ranging factors influencing housing displacement, affected populations and their experiences (for example, temporary or permanent) are not

homogenous and thus their health and wellbeing implications are varied. Nonetheless, housing displacement poses far-reaching consequences for the physical and mental outcomes of affected populations, with psychological impacts commonly reported following the event.[62-64]

Informal housing

Informal housing bypasses formal regulatory regimes and is often inconsistent with local zoning regulation, building controls, and property laws.[65, 66] It may feature the absence of secure tenure and a lack of basic amenities. It is important to note the vast differences in informal housing internationally, ranging from large-scale informal settlements in low-income settings (for example, Dharavi in India and Khayelitsha in South Africa), to informal occupation of sheds, outbuildings, or other non-residential buildings in high-income settings (for example, Canada and Australia). These environments contribute to significant health consequences. For example, residents of informal settlements in Sub-Saharan Africa experience a high burden of both infectious and non-communicable conditions, including infections resulting from inadequate sanitation, respiratory illness, injury, and poor mental health.[67]

CONCLUDING REMARKS

Good health starts with, and depends upon, healthy housing. Greater emphasis must be placed on the potential for joined-up housing and health policy to support population wellbeing by reducing health inequalities. Given the evidence accumulated to date on the strong relationship between housing and health, policies that increase housing affordability (for example, inclusionary zoning, greater provision of social housing), tackle housing security (for example, housing first, improving tenancy and anti-discrimination legislation) and improve suitability across a jurisdiction's housing stock (for example, minimum standards in the private rental sector, changing building codes), will advance population and societal health and wellbeing. There is a growing body of literature that also demonstrates the importance of housing interventions, such as retrofits to enhance thermal comfort, as a mechanism for improving health.[68] However, further work is needed to strengthen this evidence base and account for the differential impacts of housing interventions, enabling a more robust analysis of their potential to reduce health inequalities.[68, 69]

This glossary supports the growing field of healthy housing studies, which has become increasingly important with the combined impact of climate change and the COVID-19 pandemic, among other crises. Using these terms as a shared frame of reference, housing and

health actors and organisations can strengthen their interdisciplinarity across jurisdictions and national borders, leading to a more comprehensive and future-fit approach to achieving healthy housing globally.

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The authors declare no competing interests.

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REFERENCES

1. Solar O, Irwin, A. A conceptual framework for action on the social determinants of health: Social Determinants of Health discussion paper 2 (policy and practice). Geneva: World Health Organization; 2010. https://apps.who.int/iris/bitstream/handle/10665/44489/?sequence=1
2. World Health Organization. WHO Housing and Health Guidelines. 2018. https://www.who.int/publications/i/item/9789241550376
3. Ahmad K, Erqou S, Shah N, et al. Association of poor housing conditions with COVID-19 incidence and mortality across US counties. *PLoS One*. 2020;15(11):e0241327.
4. Bambra C, Riordan R, Ford J, et al. The COVID-19 pandemic and health inequalities. *J Epidemiol Community Health*. 2020;74(11):964-8.
5. Howden-Chapman P. Housing standards: a glossary of housing and health. *J Epidemiol Community Health*. 2004;58(3):162-8.
6. Stone ME. A Housing Affordability Standard for the UK. *Housing Studies*. 2006;21(4):453-76.
7. Meltzer R, Schwartz A. Housing Affordability and Health: evidence from New York City. *Housing Policy Debate*. 2016;26(1):80-104.
8. Bangura M, Lee CL. The differential geography of housing affordability in Sydney: a disaggregated approach. *Australian Geographer*. 2019;50(3):295-313.
9. Acolin A, Green RK. Measuring housing affordability in São Paulo metropolitan region: incorporating location. *Cities*. 2017;62:41-9.
10. Özdemir Sarı ÖB, Aksoy Khurami E. Housing affordability trends and challenges in the Turkish case. *Journal of Housing and the Built Environment*. 2018.
11. Australian Bureau of Statistics. Housing occupancy and costs, 2017–18; 2019. https://www.abs.gov.au/statistics/people/housing/housing-occupancy-and-costs/2017-18 (accessed Dec 2021).
12. Clair A, Reeves A, McKee M, et al. Constructing a housing precariousness measure for Europe. *Journal of European Social Policy*. 2019;29(1):13-28.
13. Pollack CE, Griffin BA, Lynch J. Housing Affordability and Health Among Homeowners and Renters. *Am J Prev Med*. 2010;39(6):515-21.
14. Bentley R, Baker E, Mason K, et al. Association between housing affordability and mental health: a longitudinal analysis of a nationally representative household survey in Australia. *Am J Epidemiol*. 2011;174(7):753-60.
15. Baker E, Lester L, Mason K, et al. Mental health and prolonged exposure to unaffordable housing: a longitudinal analysis. *Soc Psychiatry Psychiatr Epidemiol*. 2020;55(6):715-21.
16. Baker E, Mason K, Bentley R. Measuring Housing Affordability: A Longitudinal Approach. *Urban Policy and Research*. 2015;33(3):275-90.
17. Nepal B, Tanton R, Harding A. Measuring Housing Stress: How Much do Definitions Matter? *Urban Policy and Research*. 2010;28(2):211-24.
18. Moore R. Definitions of fuel poverty: implications for policy. *Energy Policy*. 2012;49:19-26.
19. Charlier D, Legendre B. Fuel poverty in industrialized countries: definition, measures and policy implications a review. *Energy*. 2021;236:121557.
20. Awaworyi Churchill S, Smyth R, Farrell L. Fuel poverty and subjective wellbeing. *Energy Economics*. 2020;86:104650.
21. Grey CNB, Schmieder-Gaite T, Jiang S, et al. Cold homes, fuel poverty and energy efficiency improvements: a longitudinal focus group approach. *Indoor and Built Environment*. 2017;26(7):902-13.

22. Sy SA, Mokaddem L. Energy poverty in developing countries: a review of the concept and its measurements. *Energy Research and Social Science*. 2022;89:102562.
23. Li K, Lloyd B, Liang X-J, et al. Energy poor or fuel poor: what are the differences? *Energy Policy*. 2014;68:476-81.
24. Owusu Boadi K, Kuitunen M. Factors affecting the choice of cooking fuel, cooking place and respiratory health in the Accra metropolitan area, Ghana. *J Biosoc Sci*. 2006;38(3):403-12.
25. Rehfuess E, World Health Organization. Fuel for life: household energy and health: World Health Organization; 2006.
26. Mallett S, Bentley R, Baker E, et al. Precarious housing and health inequalities: what are the links? Summary report. 2011.
27. Kim K-H, Jahan SA, Lee J-T. Exposure to formaldehyde and its potential human health hazards. *Journal of Environmental Science and Health, Part C*. 2011;29(4):277-99.
28. Gualtieri AF, Lassinantti Gualtieri M, Scognamiglio V, et al. Human health hazards associated with asbestos in building materials. In: Malik JA, Marathe S, editors. Ecological and health effects of building materials. Cham: Springer International Publishing; 2022. p. 297-325.
29. Park S-H. Types and health hazards of fibrous materials used as asbestos substitutes. *Safety and Health at Work*. 2018;9(3):360-4.
30. Oswald D, Moore T, Lockrey S. Flammable cladding and the effects on homeowner well-being. *Housing Studies*. 2021:1-20.
31. Milstead TM, Miles R, Röbbel N. Housing and neighborhood conditions and exposure to cockroaches in three central and eastern European cities. *Journal of Housing and the Built Environment*. 2006;21(4):397-411.
32. Story MF. Maximizing usability: the principles of universal design. *Assistive technology*. 1998;10(1):4-12.
33. Carr K, Weir PL, Azar D, et al. Universal design: a step toward successful aging. *Journal of Aging Research*. 2013:1-8.
34. Wellecke C, D'Cruz K, Winkler D, et al. Accessible design features and home modifications to improve physical housing accessibility: A mixed-methods survey of occupational therapists. *Disabil Health J*. 2022:101281.
35. Maisel JL. Toward inclusive housing and neighborhood design: a look at visitability. *Communty Development*. 2006;37(3):26-34.
36. Memken J, Earley N. Accessible housing availability for the growing US elderly population. *Housing and Society*. 2007;34(1):101-15.
37. Ward M, Franz J. The provision of visitable housing in Australia: down to the detail. *Social Inclusion*. 2015;3:31-43.
38. Smith SK, Rayer S, Smith EA. Aging and disability: implications for the housing industry and housing policy in the United States. *Journal of the American Planning Association*. 2008;74(3):289-306.
39. Rodd K, Romero J, Hunter V, et al. Aboriginal community co-design and co-build: far more than a house. *Sustainability*. 2022;14(9).
40. Memmott P, Keys C. Redefining architecture to accommodate cultural difference: designing for cultural sustainability. *Architectural Science Review*. 2015;58(4):278-89.
41. Anh TT, Phong TVG, Mulenga M. Community consultation for climate resilient housing: a comparative case study in Vietnam. *International Journal of Disaster Risk Reduction*. 2014;10:201-12.

42. United Nations Environment Programme. A practical guide to climate-resilient buildings & communities. Nairobi; 2021. https://www.unep.org/resources/practical-guide-climate-resilient-buildings
43. Baniassadi A, Heusinger J, Gonzalez PI, et al. Co-benefits of energy efficiency in residential buildings. *Energy*. 2022;238:121768.
44. Choguill CL. The search for policies to support sustainable housing. *Habitat International*. 2007;31(1):143-9.
45. Röbbel N. Health in the green economy: health co-benefits of climate change mitigation-housing sector. World Health Organization; 2011. https://apps.who.int/iris/handle/10665/44609?locale-attribute=pt&
46. Office of the United Nations High Commissioner for Human Rights. The right to adequate housing. Geneva, Switzerland: UN OHCHR; 2009. https://www.ohchr.org/en/special-procedures/sr-housing/human-right-adequate-housing
47. Beer A, Bentley R, Baker E, et al. Neoliberalism, economic restructuring and policy change: precarious housing and precarious employment in Australia. *Urban Studies*. 2016;53(8):1542-58.
48. Bentley R, Baker E, Aitken Z. The 'double precarity' of employment insecurity and unaffordable housing and its impact on mental health. *Soc Sci Med*. 2019;225:9-16.
49. Pendall R, Theodos B, Franks K. Vulnerable people, precarious housing, and regional resilience: an exploratory analysis. *Housing Policy Debate*. 2012;22(2):271-96.
50. OECD Directorate of Employment Labour and Social Affairs - Social Policy Division. PH4.2 Social Rental Housing Stock 2022. https://www.oecd.org/els/family/PH4-2-Social-rental-housing-stock.pdf
51. Fitzpatrick S, Watts B. Competing visions: security of tenure and the welfarisation of English social housing. *Housing Studies*. 2017;32(8):1021-38.
52. European Federation of National Organisations. ETHOS 2007 European typology of homelessness and housing exclusion; 2007. http://www.feantsa.org (accessed Jun 2022).
53. Amore K, Baker M, Howden-Chapman P. The ETHOS definition and classification of homelessness: an analysis. *European Journal of Homelessness*. 2011;5.
54. Onapa H, Sharpley CF, Bitsika V, et al. The physical and mental health effects of housing homeless people: a systematic review. *Health Soc Care Community*. 2022;30(2):448-68.
55. Bianchi SM, Farley R, Spain D. Racial inequalities in housing: an examiation of recent trends. *Demography*. 1982;19(1):37-51.
56. Charsley K, Lambert H, Davey Smith G. Housing tenure, ethnicity and inequalities: towards a contextualised approach. *Health Variations*. 1999;3:6-9.
57. Calmore JO. Race/ism lost and found: The fair housing act at thirty. *U Miami L Rev*. 1997;52:1067.
58. Mehdipanah R, Ramirez J, Abedin S, et al. Housing discrimination and health: understanding potential linking pathways using a mixed-methods approach. *Social Sciences*. 2018;7(10):194.
59. Bell JF, Zimmerman FJ, Almgren GR, et al. Birth outcomes among urban African-American women: a multilevel analysis of the role of racial residential segregation. *Soc Sci Med*. 2006;63(12):3030-45.
60. Baeten G, Westin S, Pull E, et al. Pressure and violence: housing renovation and displacement in Sweden. *Environment and Planning A: Economy and Space*. 2017;49(3):631-51.

61. Uscher-Pines L. Health effects of relocation following disaster: a systematic review of the literature. *Disasters*. 2009;33(1):1-22.
62. Fullilove MT, Wallace R. Serial forced displacement in American cities, 1916-2010. *J Urban Health*. 2011;88(3):381-9.
63. Fussell E, Lowe SR. The impact of housing displacement on the mental health of low-income parents after Hurricane Katrina. *Soc Sci Med*. 2014;113:137-44.
64. Kett ME. Internally displaced peoples in Bosnia-Herzegovina: impacts of long-term displacement on health and well-being. *Medicine, Conflict and Survival*. 2005;21(3):199-215.
65. Dekel T. The institutional perspective on informal housing. *Habitat International*. 2020;106:102287.
66. Gurran N, Maalsen S, Shrestha P. Is 'informal' housing an affordability solution for expensive cities? Evidence from Sydney, Australia. *International Journal of Housing Policy*. 2020:1-24.
67. Weimann A, Oni T. A systematised review of the health impact of urban informal settlements and implications for upgrading interventions in South Africa, a rapidly urbanising middle-income country. *Int J Environ Res Public Health*. 2019;16(19):3608.
68. Jacobs DE, Brown MJ, Baeder A, et al. A systematic review of housing interventions and health: introduction, methods, and summary findings. *Journal of Public Health Management and Practice*. 2010;16(5):S5-S10.
69. Thomson H, Thomas S, Sellstrom E, et al. Housing improvements for health and associated socio-economic outcomes. *Cochrane Database Syst Rev*. 2013(2).