



Who are the homeless and what kind of problems do they have? A review of the literature

Jerzy Romaszko¹ , Beata Januszko-Giergielewicz^{1,2} 

¹ Department of Family Medicine and Infectious Diseases, School of Medicine, Collegium Medicum, University of Warmia and Mazury in Olsztyn, Poland

² Academy of Applied Medical and Social Sciences, Poland

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Abstract

Introduction: The publications about homeless persons and homelessness are very popular among scientists. Entering the keyword ‘homeless’ returns about 17 thousand hits in the PubMed search engine. What is so interesting about homelessness that so many researchers devote their time and resources to this topic?

Aim: Our paper is an attempt to answer the question about that, and partially about the genesis of homelessness.

Material and methods: The PubMed and Scopus databases have been researched. We selected the articles related to the most common pathologies among the homeless.

Results and discussion: The background of the phenomenon of homelessness is described in the context of the most commonly reported shared elements i.e. poverty, social exclusion, high mortality rates, male predominance, alcohol and drug dependence, intellectual deficits, depressive disorders and suicides. We described the differences resulting from geographical location and environmental factors. We are trying to elucidate the reasons for the discrepancies between individual investigators studying similar problems at different places and at different times.

Conclusions: Homeless people are not a different species. They are a derivate of societies on the margins of which these people live. They are therefore different in the geographical sense, but in a given area they change with time similarly to the local population.

Corresponding author:

Jerzy Romaszko, University of Warmia and Mazury in Olsztyn, Warszawska 30, 10-082 Olsztyn, Poland. Tel.: +4889 524 61 65, +48 602 879 061.

E-mail: jerzy.romaszko@uwm.edu.pl

1. INTRODUCTION

The publications about homeless persons and homelessness are very popular among scientists. Entering the keyword 'homeless' returns about 17 thousand hits in the PubMed search engine and over 37 thousand hits in the ScienceDirect search engine. Why so many? What is so interesting about homelessness that so many researchers devote their time and resources to this topic? Most publications, however, focus on relatively few areas, mainly: nutritional status, addictions, psychiatric disorders, injuries and accidents, infectious diseases (mainly tuberculosis, HIV infection and hepatitis) and, to a lesser degree, cardiovascular disease.^{1–5} Interestingly, an analysis of these reports reveals that the results they describe vary considerably depending on when and where specific studies were conducted. Changes taking place in recent decades in the general population of most countries in the world, such as easy and cheap access to mobile technologies and widespread, often free access to the Internet. They are also changing the view of the subpopulation of homeless people.^{6–8} The phone number and e-mail address are often their only address. It seems, however, that despite the opportunity to draw knowledge from numerous sources, the main, core problems of this marginalized subpopulation change slower and differently than the general population. Thanks to these technologies, the homeless (especially youth) have easier access to social and medical care, but they are also more susceptible to the pathological influences of modern civilization.^{9,10} In order to explain this we should start from the basics: the definition of homelessness.

2. AIM

Our paper is an attempt to elucidate the reasons for the discrepancies among individual investigators studying the problem of homelessness in different places and at different times and partially to introduce the phenomenon of the genesis of homelessness.

3. MATERIAL AND METHODS

The PubMed and Scopus databases have been researched. We selected the articles related to the most common pathologies among the homeless. We present some elements of the social pathology represented by homelessness, and the differences resulting from geographical location and environmental factors. Our topics were poverty, addictions, psychiatric disorders, duration of life, infectious diseases, injuries and suicides.

4. RESULTS AND DISCUSSION

4.1. THE DEFINITION OF HOMELESSNESS

The problems start at the very outset: when we attempt to define homelessness. Until 2005, when FEANTSA introduced the ETHOS typology, there was considerable freedom in this respect.¹¹ Authors of publications, when defining the number of homeless individuals, relied upon legal, local (meaning national) definitions. The introduction of this standard has not, however, solved all the problems. The ETHOS typology is not used in the United States, the country where most scientific publications on homelessness originate. What is more, it is completely unsuitable for use in poorly developed and tropical countries. According to this typology, authors of medical publications are generally interested in people living in public spaces (ETHOS 1.1), those who stay in night shelters and in hostels (ETHOS 2.1 and 3.1) and residents of women's shelters (ETHOS 4.1), with all these categories combined being most commonly treated as the homeless. The remaining categories, e.g. care homes, rotational flats etc., are more a topic of interest among sociologists. It is therefore not surprising that this definition is not particularly popular among authors of medical scientific papers. So it can be assumed that there is no international consensus on the definition of homelessness.¹

4.2. DEMOGRAPHICS

FEANTSA estimates that in 2023 at least 895 thousand people will be homeless in Europe. In Germany in 2022 among 262 645 homeless 32 467 fulfilled the ETHOS 1 category (living rough).¹² The statistic of homelessness on the European scale presents a slow but systematic increase in past decades. For our further divagations more important is the fact that when one analysis reports on homelessness, one can easily notice that irrespective of the source (a scientific paper, a government report); the male-to-female predominance is emphasised. When one analyses reports on homelessness, one can easily notice that irrespective of the source (a scientific paper, a government report), the male-to-female predominance is emphasised. The FEANTSA report of 2012 estimates the percentage of males at about 65%–85% depending on the country, with the highest value being reported for Italy (87%) and the lowest for France and Sweden – 62% and 64%, respectively.¹³ The percentage of males reported for the United States is similar – 63%.¹⁴ Nilsson et al, in a quite fresh and based on a large database (152 publications) metaanalysis, estimated that the risk of becoming homeless among males is 1.5 higher.¹⁵ These figures are not only provided here for informative purposes but also because homeless-

ness is generally perceived as a sociological phenomenon, while-from the medical point of view-a marked predominance of one sex over the other, in any pathology, suggests the need for a more in-depth analysis. The data on the demographic aspects of homelessness is complemented by the information that most homeless individuals (often up to 90%) are people living a single life.^{16–18} The mean age of the homeless individuals in population reports varies publication to publication and seems to depend on the geographical region. The American and Western European authors most commonly deal with slightly younger populations than do the authors from Central European countries.^{19,20} The former also emphasise the considerably high percentages of African Americans, who often account for up to 70%–90% of the homeless populations investigated.²¹

4.3. POVERTY

Homeless people are the poorest stratum of society in virtually any geographical region. While the data on income among the homeless may vary from location to location, their income viewed from the perspective of their local community always places them in the category of poverty. Poverty, however, is a relative term. The mean income of a homeless individual in the US is reported at about 300–400 USD per month.²² For comparison, in a study from Poland almost 42.86% of the homeless lived below the existential minimum and only 5.10% of them had a monthly income exceeding 200 EUR.²³

4.4. ADDICTIONS

In their meta-analysis, Fazel et al. determined the percentages of individuals dependent on alcohol at 8.5%–58.1%, pointing out to two important facts.²⁴ Firstly, the data included in the analysis concerned only men (no publications on women had been identified), and secondly, the percentages of alcohol-dependent individuals among the homeless are generally higher in Europe than in the United States. In another, more fresh meta-analysis Gutwinski S et al. (Fazel is here a co-author) estimates that alcohol use disorders affect 36.7% of the homeless.² Much lower rates were determined by Morikawa et al. based on data obtained in Tokyo, Japan, where only 15% of the subjects were found to be dependent on alcohol, with men accounting for as many as 93.8% of the study population.²⁵ There is, however, a fundamental difference, most likely rooted in the cultural background: homelessness is 60 times more prevalent in New York City than in Tokyo. A very interesting point was made by McVicar D et al., who arrived at the following generalisation: ‘We find that the two are closely related: homeless individuals are more

likely to be substance users and substance users are more likely to be homeless.’²⁶ It is difficult not to agree with it. What is more, it seems that the specific type of psychoactive substances is of minor significance and is largely determined by the local environment. This explains why drug dependence is more commonly reported by American authors, while alcohol dependence prevails in European publications.²⁴

4.5. PSYCHIATRIC DISORDERS

The mean prevalence of any current mental disorder among the homeless was estimated at 76.2%.² Depression is one of the most commonly reported diagnosis in this group of people. According to the meta-analysis by Ayano, depressive symptoms affects 46.72% of homeless individuals (major depressive disorders – 26.24%).³ These findings are more interesting given the fact that, single middle-aged men account for the majority of homeless populations, within this age group, depression is twice as common in women.²⁷

The prevalence of schizophrenia and other psychotic disorders among homeless people are much higher than in general population.²⁸ According to meta-analysis by Gutwinski et al schizophrenia spectrum disorders affects 12.4% of them.² Depressive disorders and schizophrenia spectrum disorders usually coexist with cognitive impairment.²⁹ Waclawik et al. estimates that 56% of marginally housed youth suffers from cognitive impairment.³⁰ What is more, it seems that this phenomenon is independent of geographic location. The low intellectual level of homeless individuals is not only mentioned in publications originating from Europe or North America but also in reports from, for example, India and Japan.^{31–35}

4.6. DURATION OF LIFE

The issue of high mortality rates among homeless people, especially in the younger age groups, cannot be overlooked here. The life expectancy amongst the homeless is 15.9–17.5 years shorter than in the general population.^{36,37} The most frequent causes of death are circulatory system diseases. Cardiovascular diseases are also the most common cause of mortality in the general population, but in this case the association with lifestyle is particularly interesting. According to various sources, the percentage of active smokers amongst the homeless has been consistently estimated at 80%–90%, whether a given study has been conducted in Europe, America or Asia.^{38–40} Smoking is an evident cardiovascular risk factor but any further associations that have been reported are more difficult to understand. TLee et al. point out to the higher prevalence of hypertension and hypercholesterolaemia

in this population but this report should probably not be generalised. Kaldmäe et al. found that 100% of the homeless individuals they studied had normal values of HDL and this has not been the only publication to report that.^{41–43} Perhaps the issue of cardiovascular disease in this group of people should also be viewed in the context of addictions and local factors. Obesity is, after all, the strongest cardiovascular risk factor.⁴⁴ Obesity, i.e. the factor that is rarely associated with homelessness. The first association with homelessness that springs into mind is poverty, whose natural consequence should be malnutrition, not obesity. Meanwhile it turns out that reports of obesity amongst the homeless are currently much more common than those of malnutrition, especially in publications originating from North America. According to Maness et al. (USA), 64% of the homeless are obese or overweight.⁴⁵ These data are even more interesting when confronted with the fact that 71.6% of the male population in the United States are overweight.⁴⁶ However, in European and Asian publications these rates are lower. Scott et al. (Ireland) report that 22% of the homeless population they studied, had BMI exceeding 30 kg/m², Arnaud et al. report merely about 10% in their data from Paris.^{47–49} The data based on sources from Japan and Taiwan presents European level of obesity frequency.^{50,51}

4.7. INFECTIOUS DISEASES

Many authors point out in their papers to the fact that tuberculosis is several dozen times more prevalent amongst the homeless than in the general population.^{5,52} Typical for this subpopulation – delayed diagnosis, interrupting the treatment, and periodic (especially at winter time) cohabitation of healthy and sick persons at social care facilities (shelters) contribute to the transmission of the infection.^{53–55} It is especially evident in large urban agglomerations, and sufficiently well described at the same time to prompt the relevant bodies to issue official recommendations.⁵⁶ It is worth mentioning that the one of the most common causes of death among the young homeless – AIDS, currently after the implementation effective antiretroviral therapy, has lost some of its importance.^{57,58} However, infectious diseases are still a large problem in this subpopulation, COVID-19 epidemic was an example. People experiencing homelessness had several times greater mortality and risk of hospitalization than so-called general population.^{59,60}

4.8. INJURIES

Head injuries among homeless are much more common here than in the general population. Topolovec-Vranic et al. demonstrated a history of head injury in more

than a half of homeless individuals they investigated.⁶¹ Furthermore, returning to the issue of addictions, the association between injuries and alcohol consumption is obvious here, similarly to the association between excessive alcohol consumption and increased mortality – an U-shaped curve.^{62,63} Two further characteristic features should be mentioned here: one with a northward gradient, namely deaths from cold, and the other one with a southward gradient, namely deaths from overheating.^{64,65} Deaths caused by hypothermia (Poland) are 13-fold more frequently among the homeless than for the general population.³⁶

4.9. SUICIDES

The frequently reported cases of suicide in this group of people, much more common than in the general population, result from the widespread presence of depressive disorders, the frequent presence of schizophrenia spectrum disorders and from the high prevalence of addictions.^{66–68} Nilsson et al. estimate suicide-related mortality rate amongst the homeless at 174.4 per 100 thousand person-years.⁶⁶ The high risk of suicide generally shows no geographic variation. Fekadu et al. report that as many as 14.8 of the homeless individuals in Addis Ababa, Ethiopia, admitted to a suicide attempt in the previous month, while Okamuara et al. report that in their study 17.7% of homeless people in Tokyo, Japan, admitted to a suicide attempt in the past.^{69,70} These values, irrespective of the way they are presented, are very high.

5. CONCLUSIONS

The dominant elements of homelessness that are shared irrespective of the geographical location are: male sex, single living, poverty, and various addictions along with their consequences. Addictions develop particularly easily and are particularly highly prevalent in the group of people with the lowest qualifications and intellect. Secondarily to or independently of addictions, we find psychiatric disorders, amongst which depressive disorders and cognitive deficits come to the forefront. Depressive disorders (further) exacerbate the addictions and the intellectual deficits. Personality disorders seem to contribute to the triggering of the cascade of events that leads to homelessness. Other commonly reported elements of this phenomenon, such as racial differences, differences in the nutritional status, differences in the incidence of tuberculosis etc., are most likely a result of local background and/or are secondary to a specific lifestyle. We believe that the associations described above are responsible for the complex interpretation of the causes of homelessness,

which are independent of the geographic and cultural settings and which are a shared feature of the homeless worldwide. Homeless people, however, are not a different species. They are a derivate of societies on the margins of which these people live. They are therefore different in the geographical sense, but in a given area they change with time similarly to the population of 'normal' people inhabiting that area, and studies of the homeless populations resemble looking at a portrait (a portrait of the general population) in a distorting mirror.

CONFLICT OF INTEREST

Not declared.

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REFERENCES

- 1 Liu M, Hwang SW. Health care for homeless people. *Nat Rev Dis Primers*. 2021;7(1):5. <https://doi.org/10.1038/s41572-020-00241-2>.
- 2 Gutwinski S, Schreiter S, Deutscher K, Fazel S. The prevalence of mental disorders among homeless people in high-income countries: An updated systematic review and meta-regression analysis. *PLoS Med*. 2021;18(8):e1003750. <https://doi.org/10.1371/journal.pmed.1003750>.
- 3 Ayano G, Belete A, Duko B, Tsegay L, Dachew BA. Systematic review and meta-analysis of the prevalence of depressive symptoms, dysthymia and major depressive disorders among homeless people. *BMJ Open*. 2021;11(2):e040061. <https://doi.org/10.1136/bmjopen-2020-040061>.
- 4 Medlow S, Klineberg E, Steinbeck K. The health diagnoses of homeless adolescents: a systematic review of the literature. *J Adolesc*. 2014;37(5):531–542. <https://doi.org/10.1016/j.adolescence.2014.04.003>.
- 5 Beijer U, Wolf A, Fazel S. Prevalence of tuberculosis, hepatitis C virus, and HIV in homeless people: a systematic review and meta-analysis. *Lancet Infect Dis*. 2012;12(11):859–870. [https://doi.org/10.1016/s1473-3099\(12\)70177-9](https://doi.org/10.1016/s1473-3099(12)70177-9).
- 6 Swahn MH, Braunstein S, Kasirye R. Demographic and psychosocial characteristics of mobile phone ownership and usage among youth living in the slums of Kampala, Uganda. *West J Emerg Med*. 2014;15(5):600–603. <https://doi.org/10.5811/2Fwestjem.2014.4.20879>.
- 7 Humphry J. Looking for Wi-Fi: youth homelessness and mobile connectivity in the city. *Inf Commun Soc*. 2021;24(7):1009–1023. <https://doi.org/10.1080/1369118X.2019.1670227>.
- 8 Harpin S, Davis J, Low H, Gilroy C. Mobile phone and social media use of homeless youth in Denver, Colorado. *J Community Health Nurs*. 2016;33(2):90–97. <https://doi.org/10.1080/07370016.2016.1159440>.
- 9 Jennings L, Lee N, Shore D, et al. U.S. minority homeless youth's access to and use of mobile phones: Implications for mHealth intervention design. *J Health Commun*. 2016;21(7):725–733. <https://doi.org/10.1080/10810730.2015.1103331>.
- 10 Heaslip V, Richer S, Simkhada B, Dogan H, Green S. Use of technology to promote health and wellbeing of people who are homeless: a systematic review. *Int J Environ Res Public Health*. 2021;18(13):6845. <https://doi.org/10.3390/2Fijerph18136845>.
- 11 Amore K, Baker M, Howden-Chapman P. The ETHOS definition and classification of homelessness: an analysis. *Eur J Homelessness*. 2011;5(2):19–37.
- 12 FEANTSA. *Report: 8th Overview of Housing Exclusion in Europe 2023*. 2023. <https://www.feantsa.org/en/report/2023/09/05/report-8th-overview-of-housing-exclusion-in-europe-2023?bcParent=27>. Accessed: 2023-12-18.
- 13 FEANTSA. *Extent and Profile of Homelessness in European Member States. European Observatory on Homelessness. A Statistical Update*. 2014. http://www.feantsaresearch.org/IMG/pdf/feantsa-studies_04-web2.pdf. Accessed: 2023-12-18.
- 14 Solari CD, Cortes A, Henry M, et al. *The 2013 Annual Homeless Assessment Report (AHAR) to Congress*. 2014. <https://www.huduser.gov/portal/sites/default/files/pdf/2013-AHAR-Part-2.pdf>. Accessed: 2023-12-18.
- 15 Nilsson SF, Nordentoft M, Hjorthøj C. Individual-level predictors for becoming homeless and exiting homelessness: a systematic review and meta-analysis. *J Urban Health*. 2019;96(5):741–750. <https://doi.org/10.1007/s11524-019-00377-x>.
- 16 Thomsen RL, Balslov KD, Benjaminsen SE, Petersen P. Homeless persons residing in shelters in the county of Funen I. Psychosocial characteristics and need of treatment [in Danish]. *Ugeskr Laeger*. 2000;162(9):1205–1210.
- 17 Yoon C, Ju YS, Kim CY. Disparities in health care utilization among urban homeless in South Korea: a cross-sectional study. *J Prev Med Public Health*. 2011;44(6):267–274. <https://doi.org/10.3961/jpmph.2011.44.6.267>.
- 18 Fichter MM, Quadflieg N. Prevalence of mental illness in homeless men in Munich, Germany: results from a representative sample. *Acta Psychiatr Scand*. 2001;103(2):94–104. <https://doi.org/10.1034/j.1600-0447.2001.00217.x>.

- ¹⁹ Rhoades H, Wenzel SL, Golinelli D, et al. The social context of homeless men's substance use. *Drug Alcohol Depend.* 2011;118(2–3):320–325. <https://doi.org/10.1016/j.drugalcdep.2011.04.011>.
- ²⁰ Toro PA, Hobden KL, Wyszacki Durham K, Oko-Riebau M, Bokszczyński A. Comparing the characteristics of homeless adults in Poland and the United States. *Am J Community Psychol.* 2014;53(1–2):134–145. <https://doi.org/10.1007/s10464-014-9632-8>.
- ²¹ Israel N, Toro PA, Ouellette N. Changes in the composition of the homeless population: 1992–2002. *Am J Community Psychol.* 2010;46(1–2):49–59. <https://doi.org/10.1007/s10464-010-9326-9>.
- ²² Lee BA, Greif MJ. Homelessness and hunger. *J Health Soc Behav.* 2008;49(1):3–19. <https://doi.org/10.1177/002214650804900102>.
- ²³ Romaszko J, Kuchta R, Opalach C, et al. Socioeconomic characteristics, health risk factors and alcohol consumption among the homeless in north-eastern part of Poland. *Cent Eur J Public Health.* 2017;25(1):29–34. <https://doi.org/10.21101/cejph.a4464>.
- ²⁴ Fazel S, Khosla V, Doll H, Geddes J. The prevalence of mental disorders among the homeless in western countries: systematic review and meta-regression analysis. *PLoS Med.* 2008;5(12):e225. <https://doi.org/10.1371/journal.pmed.0050225>.
- ²⁵ Morikawa S, Uehara R, Okuda K, Shimizu H, Nakamura Y. Prevalence of psychiatric disorders among homeless people in one area of Tokyo [in Japanese]. *Nihon Koshu Eisei Zasshi.* 2011;58(5):331–339.
- ²⁶ McVicar D, Moschion J, van Ours JC. From substance use to homelessness or vice versa? *Soc Sci Med.* 2015;136–137:89–98. <https://doi.org/10.1016/j.socscimed.2015.05.005>
- ²⁷ Gutiérrez-Lobos K, Scherer M, Anderer P, Katschnig H. The influence of age on the female/male ratio of treated incidence rates in depression. *BMC Psychiatry.* 2002;2:3. <https://doi.org/10.1186/1471-244x-2-3>.
- ²⁸ Ayano G, Tesfaw G, Shumet S. The prevalence of schizophrenia and other psychotic disorders among homeless people: a systematic review and meta-analysis. *BMC Psychiatry.* 2019;19(1):370. <https://doi.org/10.1186/s12888-019-2361-7>.
- ²⁹ Elvevåg B, Goldberg TE. Cognitive impairment in schizophrenia is the core of the disorder. *Crit Rev Neurobiol.* 2000;14(1):1–21.
- ³⁰ Waclawik K, Jones AA, Barbic SP, et al. Cognitive impairment in marginally housed youth: Prevalence and risk factors. *Front Public Health.* 2019;7:270. <https://doi.org/10.3389/fpubh.2019.00270>.
- ³¹ Nishio A, Yamamoto M, Ueki H, et al. Prevalence of mental illness, intellectual disability, and developmental disability among homeless people in Nagoya, Japan: A case series study. *Psychiatry Clin Neurosci.* 2015;69(9):534–542. <https://doi.org/10.1111/pcn.12265>.
- ³² Tripathi A, Nischal A, Dalal PK, et al. Sociodemographic and clinical profile of homeless mentally ill inpatients in a north Indian medical university. *Asian J Psychiatr.* 2013;6(5):404–409. <https://doi.org/10.1016/j.ajp.2013.05.002>.
- ³³ Oakes PM, Davies RC. Intellectual disability in homeless adults: a prevalence study. *J Intellect Disabil.* 2008;12(4):325–334. <https://doi.org/10.1177/1744629508100496>.
- ³⁴ Bremner AJ, Duke PJ, Nelson HE, Pantelis C, Barnes TR. Cognitive function and duration of rooflessness in entrants to a hostel for homeless men. *Br J Psychiatry.* 1996;169(4):434–439. <https://doi.org/10.1192/bjp.169.4.434>.
- ³⁵ Gonzalez EA, Dieter JN, Natale RA, Tanner SL. Neuropsychological evaluation of higher functioning homeless persons: A comparison of an abbreviated test battery to the mini-mental state exam. *J Nerv Ment Dis.* 2001;189(3):176–181. <https://doi.org/10.1097/00005053-200103000-00006>.
- ³⁶ Romaszko J, Cymes I, Dragańska E, Kuchta R, Glińska-Lewczuk K. Mortality among the homeless: Causes and meteorological relationships. *PLoS One.* 2017;12(12):e0189938. <https://doi.org/10.1371/journal.pone.0189938>.
- ³⁷ Nusselder WJ, Slokiers MT, Krol L, Slokiers CT, Looman CW, van Beeck EF. Mortality and life expectancy in homeless men and women in Rotterdam: 2001–2010. *PLoS One.* 2013;8(10):e73979. <https://doi.org/10.1371/journal.pone.0073979>.
- ³⁸ Wincup E, Buckland G, Bayliss R. Youth homelessness and substance use: Report to the drugs and alcohol research unit. 2003. https://www.drugsandalcohol.ie/5575/1/Home_Office_Research_Study_258_Youth_Homelessness.pdf. Accessed: 2023-12-18.
- ³⁹ Baggett TP, Rigotti NA. Cigarette smoking and advice to quit in a national sample of homeless adults. *Am J Prev Med.* 2010;39(2):164–172. <https://doi.org/10.1016/j.amepre.2010.03.024>.
- ⁴⁰ Chen Q, Wan M, Ban C, Gao Y. Retrospective assessment of the prevalence of cardiovascular risk factors among homeless individuals with schizophrenia in Shanghai. *Shanghai Arch Psychiatry.* 2014;26(3):149–156. <https://doi.org/10.3969/j.issn.1002-0829.2014.03.006>.
- ⁴¹ Lee TC, Hanlon JG, Ben-David J, et al. Risk factors for cardiovascular disease in homeless adults. *Circulation.* 2005;111(20):2629–2635. <https://doi.org/10.1161/circulationaha.104.510826>.

- ⁴² Kaldmäe M, Zilmer M, Viigimaa M, et al. Cardiovascular disease risk factors in homeless people. *Ups J Med Sci.* 2011;116(3):200–207. <https://doi.org/10.3109/03009734.2011.586737>.
- ⁴³ Buciński A, Romaszko J, Kaliszan R, et al. Can homelessness be treated as a defined risk factor for cardiovascular diseases? [in Polish]. *Zdrowie Publ.* 2007;3(117):324–329.
- ⁴⁴ Hubert HB, Feinleib M, McNamara PM, Castelli WP. Obesity as an independent risk factor for cardiovascular disease: A 26-year follow-up of participants in the Framingham Heart Study. *Circulation.* 1983;67(5):968–977. <https://doi.org/10.1161/01.cir.67.5.968>.
- ⁴⁵ Maness SB, Reitzel LR, Hernandez DC, et al. Modifiable risk factors and readiness to change among homeless adults. *Am J Health Behav.* 2019;43(2):373–379. <https://doi.org/10.5993/ajhb.43.2.13>.
- ⁴⁶ Wang Y, Beydoun MA, Min J, Xue H, Kaminsky LA, Cheskin LJ. Has the prevalence of overweight, obesity and central obesity levelled off in the United States? Trends, patterns, disparities, and future projections for the obesity epidemic. *Int J Epidemiol.* 2020;49(3):810–823. <https://doi.org/10.1093/ije/dy273>.
- ⁴⁷ Langnase K, Muller MJ. Nutrition and health in an adult urban homeless population in Germany. *Public Health Nutr.* 2001;4(3):805–811. <https://doi.org/10.1079/phn2000119>.
- ⁴⁸ Arnaud A, Fagot-Campagna A, Reach G, Basin C, Laporte A. Prevalence and characteristics of diabetes among homeless people attending shelters in Paris, France, 2006. *Eur J Public Health.* 2010;20(5):601–603. <https://doi.org/10.1093/eurpub/ckp197>.
- ⁴⁹ Scott J, Gavin J, Egan AM, et al. The prevalence of diabetes, pre-diabetes and the metabolic syndrome in an Irish regional homeless population. *QJM.* 2013;106(6):547–553. <https://doi.org/10.1093/qjmed/hct063>.
- ⁵⁰ Nishio A, Horita R, Sado T, et al. Relationship between non-communicable diseases and background characteristics among homeless people in Nagoya City, Japan. *Plos One.* 2019;14(7):e0219049. <https://doi.org/10.1371/journal.pone.0219049>.
- ⁵¹ Chen C-L, Chen M, Liu C-K. The effects of obesity-related anthropometric factors on cardiovascular risks of homeless adults in Taiwan. *Int J Environ Res Public Health.* 2020;17(18):6833. <https://doi.org/10.3390%2Fijerph17186833>.
- ⁵² Romaszko J, Buciński A, Kuchta R, Bednarski K, Zakrzewska M. The incidence of pulmonary tuberculosis among the homeless in north-eastern Poland. *Cent Eur J Med.* 2013;8(2):283–285. <https://doi.org/10.2478/s11536-012-0114-9>.
- ⁵³ Mitruka K, Winston CA, Navin TR. Predictors of failure in timely tuberculosis treatment completion, United States. *Int J Tuberc Lung Dis.* 2012;16(8):1075–1082. <https://doi.org/10.5588/ijtld.11.0814>.
- ⁵⁴ Curtis AB, Ridzon R, Novick LF, et al. Analysis of Mycobacterium tuberculosis transmission patterns in a homeless shelter outbreak. *Int J Tuberc Lung Dis.* 2000;4(4):308–313.
- ⁵⁵ Hwang SW, Kiss A, Ho MM, Leung CS, Gundlapalli AV. Infectious disease exposures and contact tracing in homeless shelters. *J Health Care Poor Underserved.* 2008;19(4):1163–1167. <https://doi.org/10.1353/hpu.0.0070>.
- ⁵⁶ van Hest NA, Aldridge RW, de Vries G, et al. Tuberculosis control in big cities and urban risk groups in the European Union: a consensus statement. *Euro Surveill.* 2014;19(9):20728. <https://doi.org/10.2807/1560-7917.es2014.19.9.20728>.
- ⁵⁷ Hessol NA, Eng M, Vu A, Pipkin S, Hsu LC, Scheer S. A longitudinal study assessing differences in causes of death among housed and homeless people diagnosed with HIV in San Francisco. *BMC Public Health.* 2019;19(1):1–12. <https://doi.org/10.1186/s12889-019-7817-7>.
- ⁵⁸ Hwang SW. Mortality among men using homeless shelters in Toronto, Ontario. *JAMA.* 2000;283(16):2152–2157. <https://doi.org/10.1001/jama.283.16.2152>.
- ⁵⁹ Ochal M, Kuchta R, Tokarczyk-Malesa K, Romaszko M, Skutecki R. A COVID-19 micro-epidemic in the shelter for the homeless in Olsztyn. *Pol Ann Med.* 2021;28(2):194–198. <https://doi.org/10.29089/2021.21.00180>.
- ⁶⁰ Ogbonna O, Bull F, Spinks B, Williams D, Lewis R, Edwards A. The impact of being homeless on the clinical outcomes of COVID-19: Systematic review. *Int J Public Health.* 2023;68:1605893. <https://doi.org/10.3389/ijph.2023.1605893>.
- ⁶¹ Topolovec-Vranic J, Ennis N, Howatt M, et al. Traumatic brain injury among men in an urban homeless shelter: observational study of rates and mechanisms of injury. *CMAJ Open.* 2014;2(2):E69–E76. <https://doi.org/10.9778%2Fcmajo.20130046>.
- ⁶² McLeod R, Stockwell T, Stevens M, Phillips M. The relationship between alcohol consumption patterns and injury. *Addiction.* 1999;94(11):1719–1734. <https://doi.org/10.1046/j.1360-0443.1999.941117199.x>.
- ⁶³ de Labry LO, Glynn RJ, Levenson MR, Hermos JA, Lo-Castro JS, Vokonas PS. Alcohol consumption and mortality in an American male population: recovering the U-shaped curve – findings from the normative Aging Study. *J Stud Alcohol.* 1992;53(1):25–32. <https://doi.org/10.15288/jsa.1992.53.25>.
- ⁶⁴ Centers for Disease Control and Prevention. Hypothermia-related deaths-United States, 1999–2002 and 2005. *MMWR Morb Mortal Wkly Rep.* 2006;55(10):282–284.

- ⁶⁵ Harlan SL, Deplet-Barreto JH, Stefanov WL, Pettiti DB. Neighborhood effects on heat deaths: social and environmental predictors of vulnerability in Maricopa County, Arizona. *Environ Health Perspect.* 2013;121(2):197–204. <https://doi.org/10.1289/ehp.1104625>.
- ⁶⁶ Feodor Nilsson S, Hjorthoj CR, Erlangsen A, Nordentoft M. Suicide and unintentional injury mortality among homeless people: a Danish nationwide register-based cohort study. *Eur J Public Health.* 2014;24(1):50–56. <https://doi.org/10.1093/eurpub/ckt025>.
- ⁶⁷ Hor K, Taylor M. Suicide and schizophrenia: a systematic review of rates and risk factors. *J Psychopharmacol.* 2010;24(4 Suppl):81–90. <https://doi.org/10.1177/1359786810385490>.
- ⁶⁸ Galaif ER, Sussman S, Newcomb MD, Locke TF. Suicidality, depression, and alcohol use among adolescents: a review of empirical findings. *Int J Adolesc Med Health.* 2007;19(1):27–35. <https://doi.org/10.1515/ijamh.2007.19.1.27>.
- ⁶⁹ Fekadu A, Hanlon C, Gebre-Eyesus E, et al. Burden of mental disorders and unmet needs among street homeless people in Addis Ababa, Ethiopia. *BMC Med.* 2014;12:138. <https://doi.org/10.1186/s12916-014-0138-x>.
- ⁷⁰ Okamura T, Ito K, Morikawa S, Awata S. Suicidal behavior among homeless people in Japan. *Soc Psychiatry Psychiatr Epidemiol.* 2014;49(4):573–582. <https://doi.org/10.1007/s00127-013-0791-y>.