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Mortality and barriers to healthcare among people experiencing homelessness in Paris: a mixed-methods study

Eveline Cleynen[1*], Brecht Ingelbeen[2], Adèle Lenormand[3], Julien Kerami[3] and Christiana Nöstlinger[2]

Abstract

Background Homelessness is a global problem with significant public health implications. Persons experiencing homelessness (PEH) face poorer health outcomes and elevated risks of premature death compared to the general population. This is also true for PEH in France, despite the country's system of universal health coverage. This study investigates 10-year mortality patterns among PEH in Paris and barriers to accessing healthcare.

Methods Deaths among PEH—including demographic information and causes of death, identified through active case finding by volunteers—were compared to those in the general population of mainland France. Percentages were standardized for the sex distribution of the PEH population, using data from the National Institute of Statistics and Economic Studies and the Epidemiology Centre on Medical Causes of Death. We conducted semi-structured interviews with 11 healthcare and social service providers to explore barriers to healthcare access for PEH, using a pre-existing theoretical framework to guide interviews and analysis.

Results Between 2014 and 2023, 1 559 PEH (89.4% men) died in Paris. The median age of death was 54 years (IQR: 46–63), younger than the general population's median of 80 years (IQR: 67–88). Notably, 1184 (75.9%) died before age 65, compared to 19.5% in the general population. Most deaths (450, 68.1%) were due to disease, with circulatory diseases (128, 19.4%) and neoplasms (102, 15.4%) as most common causes, similar to the general population. Barriers to healthcare access were manifold. Acceptability was low due to mismatches between provider attitudes and practices and the needs of PEH. Availability was limited due to capacity constraints and poor interdisciplinary collaboration. Geographical accessibility, when services were far from PEHs habitual locations, reinforced reluctance to health care use. Affordability and administrative hurdles impeded access for the uninsured.

Conclusion PEH in Paris die from the same diseases as the general population, but at a much younger age, despite universal health coverage. The earlier onset of disease and multiple healthcare access barriers suggest an urgent need for improved social support and integrated care. Above all, the provision of stable, affordable housing could both mitigate the health impacts of homelessness and tackle its root causes.

Keywords Homelessness, Mortality, Access to health care, Premature death, Health inequities, France

*Correspondence:
Eveline Cleynen
ecleynen@gmail.com
[1]Independent Researcher, Antwerp, Belgium
[2]Instituut voor Tropische Geneeskunde, Antwerp, Belgium
[3]Collectif les Morts de la Rue, Paris, France

Background

Despite improving overall health and life expectancy worldwide, significant inequalities persist within countries, with worse health outcomes for people facing social exclusion [1] including underrepresented racial and ethnic groups, people from lower socio-economic background or persons experiencing homelessness (PEH) [2]. In 2024, at least 2 million people experienced homelessness across the OECD countries, a figure likely underestimated [3]. Homelessness is a complex social and public health problem, with housing widely recognized as an essential determinant of health [4].

PEH generally face barriers to health care like financial constraints, discrimination by health care providers, complex health needs and competing priorities, for instance food and shelter [5–7]. They are at higher risk of premature mortality than the general population [8]. Leading causes of death among persons experiencing homelessness include external causes like transport accidents, intoxication, intentional self-harm, homicide, and an array of non-communicable diseases like cardiovascular disease and cancers [9].

In France, a recent report estimated that 350 000 persons were homeless in 2025, a sharp increase compared to previous estimations [10]. The mean age of death among PEH dying in France between 2008 and 2010 was 49 years, significantly lower than the mean of 77 years among the general population [11]. In this study a relatively high proportion of deaths were attributed to non-violent causes among homeless in the capital region, compared to findings from other contexts [12, 13]. France provides universal health coverage (UHC) through statutory health insurance with residency-based benefits. Although some cost sharing is foreseen in the healthcare system, direct out-of-pocket payments are amongst the lowest in the OECD [14]. Programs like the Aide Médicale d'Etat (AME) or the Complémentaire Santé Solidaire (CSS) provide free healthcare access to undocumented migrants with stable residence and individuals with very low incomes respectively. Additionally, several public and non-governmental organizations provide free health care and social assistance to the most vulnerable, which should improve access to health care and health outcomes. Despite the increasing numbers of persons experiencing homelessness, there is no recent research on characteristics of mortality and associated factors among PEH in Paris.

This study aimed at obtaining a solid understanding of mortality among people experiencing homelessness in Paris over a 10-year time period, and of their barriers for adequate health care access and use. The study findings may contribute to informing public health policies to reduce premature deaths among this vulnerable population.

Methods

We conducted a sequential, explanatory mixed-methods study, starting from the results from an unpublished quantitative data analysis of 2017 which pointed to a high percentage of mortality from disease, to define the scope of the qualitative study done in 2018, which used semi-structured interviews to explore barriers to healthcare access for this population with healthcare workers and social service providers who worked with persons experiencing homelessness. The interviews were conducted face-to-face and lasted about one hour. The results of this qualitative study subsequently led to the design of the full quantitative study, combining a retrospective analysis of mortality surveillance data collected by the Collectif les Morts de la Rue (CMDR), a Paris-based non-governmental organization, covering the period from 2014 to 2023, with national data on the general population from the National Institute of Statistics and Economic Studies (INSEE) and of the Epidemiology Centre on Medical Causes of Death (CépiDC).

Study setting

The CMDR conducts mortality surveillance of persons experiencing homelessness in France. About 500 deaths are recorded each year. These are notified by organizations working with PEH, official sources like police or hospitals, or through a media search. Volunteers from the CMDR conduct a phone-based structured interview with informants close to the deceased. The CMDR death registry is considered to be the most exhaustive source of homeless death records in France [15].

Quantitative study methods

We included all death records in the CMDR database of PEH aged 18 or older who died in Paris between January 2014 and December 2023. A homeless person was defined as a person who was, in the 3 months before death, either sleeping rough, in a place not intended for habitation or in a shelter. Frequencies and percentages were calculated for categorical variables; numeric data were summarized as a median with interquartile ranges. The assigned ICD-10 codes for the reported causes of death were regrouped in their respective chapters. We grouped ICD-codes of disease-related causes of death and ICD-codes related to external causes of death and compared frequencies with those in the general population in mainland France. Surveillance data completeness varied over the 10 years, affecting the proportion of unknown causes of death. To assess potential bias, we compared the 10-year cause-of-death distribution to that of 2016—when the proportion of completed death investigations to verify the cause of death was higher—using a Chi^2 test. To compare characteristics such as age at death, the proportion of premature death (< 65 and < 70 years of age) and causes of death

with those of the general population, we used data from the National Institute for Statistics and Economic Studies (INSEE) and medical causes of death according to the International Statistical Classification of Diseases and Related Health Problems (ICD-10) from the Epidemiology Centre on Medical Causes of Death (CépiDC). We standardized percentages among deaths in the general population to the sex-distribution among deaths of persons experiencing homelessness.

Qualitative study methods

We interviewed providers delivering services to persons experiencing homelessness. We recruited them purposively from organizations that notify deaths to the CMDR, aiming for maximum variation across shelters, outreach organizations and health care services. We aimed at including at least three of each type. In the first round, six individuals were interviewed. One organization did not react to our request, one refused to participate. Based on preliminary analysis and in line with the iterative nature of qualitative research, we expanded the sample to include mental health professionals and staff working in specialized healthcare centers for the homeless. We used snowball sampling to identify these additional participants, additionally including four health professionals and one social worker, resulting in a total of eleven interviews conducted between April and July 2018. With this sample we reached information power [16]. For the semi-structured interviews, an initial topic guide was used, containing questions to address the study objectives. During preliminary analysis of the first interviews, the access to care model [17] emerged as a relevant theoretical framework to iteratively guide further interviews and analysis. The interview guide was adapted to incorporate themes from this model, and relevant themes and issues emerging from interviews, in line with the iterative nature of qualitative research. All interviews were audio recorded and transcribed verbatim by the first author. All transcripts were uploaded in QSR N-VIVO 12 and analyzed thematically using directed content analysis [18]. As analysis progressed, additional codes were developed to capture subcategories identified inductively from the data. Quotes were translated from French to English using DeepL software, with careful attention to preserving meaning.

Ethical considerations

The study protocol was reviewed and approved by the Institutional Review Board of the Institute of Tropical Medicine, Antwerp, Belgium (ref 1229/18) and the study was conducted in accordance with the Declaration of Helsinki. The quantitative analyses used anonymized surveillance data. Informed consent was obtained from all interview participants.

Results

Characteristics of deaths among PEH

Between 2014 and 2023, deaths of 1559 adults (89.4% men) experiencing homelessness were reported in Paris (Table 1). The median age of death was 54 years (Interquartile range, IQR, 46 - 63) - among men 55 years (IQR 46–62 years), among women 53 years (IQR 43–65). Over

Table 1 Characteristics of adult PEH deceased in Paris 2014–2023 (*N* = 1559) compared to adult deaths in the general population of mainland France

		Persons experiencing homelessness (N = 1559)		General population		
		N	%	N	%	standardized %
Sex	Female	160	10.3	3029040	50.1	
	Male	1393	89.7	3010995	49.9	
	Unknown	6				-
Premature death	< 65 years	1184	75.9	931615	15.4	19.5
	< 70 years	1330	85.3	1302450	21.6	28.05
Cause of death	External cause	211	31.9	322102	6.9	7.9
	Illness	450	68.1	4353904	93.1	92.1
	Unknown	898		252716		
Country of origin	France	543	34.8	5281005	86.9	86.0
	EU	336	21.6	331667	5.5	5.5
	Outside EU	586	37.6	467883	7.7	8.5
	Unknown	94	6.0			

Source for Sex, Age and Country of origin: INSEE 2014–2023, N = 6040035

Source for Cause of death: CépiDC 2015–2022, N = 4929722

For the general population, the absolute percentage and percentages standardized for the sex distribution among reported PEH deaths are reported

Unknown causes of death are excluded in the percentages. Most unknowns relate to periods of less exhaustive case investigation; EU = European Union; Where age-specific data on the general population was available (for sex and premature death), deaths of < 18 year old were excluded. Sudden infant death syndrome was excluded in counts and percentages of causes of death

the same period, the median age of death in the general population in mainland France was 83 years (IQR 70–90 years) – among men 78 years (IQR 66–87 years) and among women 86 years (IQR 76–92).

Among the study population, 1184 (75.9%) had died before the age of 65 compared to 19.5% among the general population when standardized for sex. Among adults experiencing homelessness, 59.2% of were born outside France, as compared to 14% of the general population.

Out of 661 deaths with recorded cause, 211 (31.9%) had external causes: accidents (89, 13.5%), assault (42, 6.4%), intentional self-harm (38, 5.7%, Table 2). In general population (standardized for the sex distribution among PEH), 7.9% of deaths were from external causes (4.8% accidents, 2.0% intentional self-harm and 0.1% assault). 450 (68.1%) deaths among adults experiencing homelessness were due to disease. Most frequently reported causes of death were diseases of the circulatory system (128, 19.4%) and neoplasms (102, 15.4%). These were also the most frequently reported causes of death among the sex-standardized general population. Among adults experiencing homelessness dying of these two causes only ($n = 230$), the median age of death was 57 years (IQR 50 - 63 years)

No cause of death was recorded for 898 out of 1559 deaths among persons experiencing homelessness. This proportion was highest in 2022 (178/178, 100%) and lowest in 2016 (48/163, 29.4%). Nevertheless, we found no statistically significant difference between the fraction of external causes of death in 2016 (27.8%, 32 of 115 with recorded cause of death) and that in the 10-year period (31.9%, 211 of 661, $p = 0.38$).

Barriers in access to health care

We conducted 11 in-depth interviews with health care and social services providers (Table 3).

We identified four main themes related to barriers in accessing health care. We found acceptability and availability to be the key dimensions of access to care, mentioned by all interviewees as problematic. We identified two other themes, geographical accessibility and affordability, as important additional barriers, especially for persons experiencing homelessness who do not master

Table 2 Frequencies and percentages of causes of death per ICD-10 chapter of homeless adults who died between 2014 and 2023 in Paris, compared to the general population of mainland France between 2015 and 2022

ICD codes	Description	Persons Experiencing Homelessness		General population		
		N	%	N	%	standardized %
	Disease					
A00–B99	Infectious diseases	11	1.7	90 971	1.9	1.9
C0–D48	Neoplasms	102	**15.4**	1 365 287	29.2	**32.2**
D50–D89	Blood diseases	1	0.2	21 003	0.4	0.4
E00–E90	Endocrine/metabolic	3	0.5	182 291	3.9	3.6
F00–F03	Mental and behavioural disorders: dementia	/	/	155 170	3.3	2.4
G00–G99	Nervous system	7	1.1	306 592	6.6	5.6
I00–I99	Circulatory system	128	**19.4**	1 126 870	24.1	**22.9**
J00–J99	Respiratory system	24	3.6	339 571	7.3	7.4
K00–K93	Digestive system	27	4.1	199 471	4.3	4.6
L00–L99	Diseases of the skin	1	0.2	12 821	0.3	0.2
M00–M99	Diseases of the musculoskeletal system	/	/	33 234	0.7	0.6
N00–N99	Genitourinary system	3	0.5	91 398	2	1.9
O00–O99	Pregnancy/childbirth	1	0.2	332	0	0
U07	Covid-19	6	0.9	171 435	3.7	3.8
R00–R94	Other symptoms and signs; Unspecified causes of morbidity	136	20.6	257 458	5.5	4.6
	External causes					
V01–X59	Accidents	89	**13.5**	226 713	4.8	5.1
X60–X84	Intentional self-harm	38	5.7	70 904	1.5	2.1
X85–Y09	Assault including transport accidents and accidental injury	42	6.4	3 375	0.1	0.1
Y10–Y34	Event of undetermined intent	15	2.3	10 268	0.2	0.3
	other external causes	27	4.1	10 842	0.2	0.2
R96–R99	*Unknown causes*	898		252 716		
TOTAL		**1559**		**4 928 722**		

Source data general population: CépiDC 2015–2022

For the general population, absolute percentage and percentages standardized for the sex distribution among reported PEH deaths are reported

Unknown causes of death are excluded in the percentages. Most unknowns relate to periods of less exhaustive case investigation. Sudden infant death syndrome was excluded in counts and percentages of causes of death among the general population

Table 3 Overview of interview participants ($n = 11$; 5 female, 6 male)

Category	Subcategory	N
Total Interviews	-	11
Health Care staff	-	6
	Health services	*4*
	Shelters	*2*
Social Services staff	-	5
	Outreach	*3*
	Shelter	*1*
	Alcohol rehab centre	*1*

French or who do not have a residence permit. Several factors influenced these barriers simultaneously, as shown in Fig 1.

Acceptability of health care services

We found acceptability of health care services to be hampered by both the population's low level of health seeking behavior and by provider attitudes and practices. Interviewees noted reluctance among persons experiencing homelessness to seek health care, leading to late diagnosis and poor follow-up. Contributing factors included low self-esteem, mental illness, and survival priorities (e.g., food, shelter). All providers cited discriminatory attitudes by healthcare workers as further barriers.

> *Then there's perhaps one of the reasons why people don't want to go to hospital, which is that generally when one looks a bit filthy, things don't go well. So [as a social worker] you go with them and stay with them [...], so that they're treated well by the doctor and the medical team, because otherwise we talk to them like dogs, and in the end they will provide some [basic] care quickly like that so that they get out (Social staff, outreach)*

Prejudices reportedly led to withholding key treatments due to assumptions about assumed poor adherence to medical advice (e.g. quit smoking, stop drinking).

> *I'm following a patient with serious health problems and who I take to the hepatologist, and the hepatologist treats cirrhosis and so on, but doesn't offer him any consultations for addiction treatment. [...] I think there's still a perception that, being in a precarious situation, there's no question of detox. So detox will be a failure. (Medical staff, Shelter)*

Participants also mentioned that rigid adherence to clinical protocols further excluded persons experiencing homelessness from appropriate care.

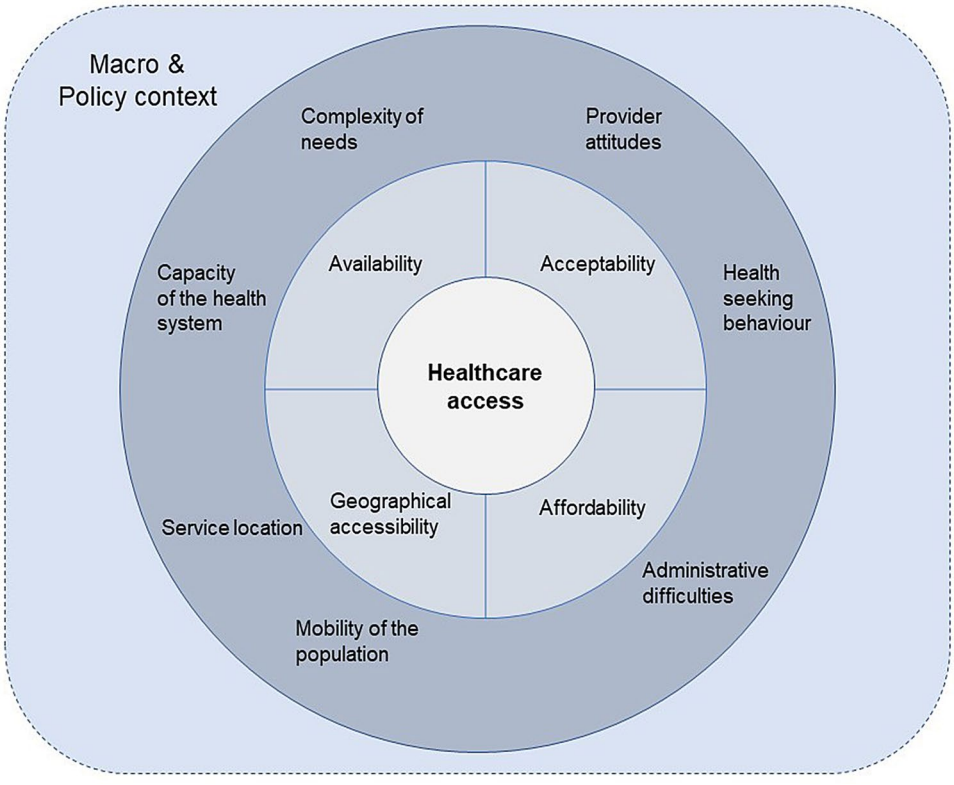

Fig. 1 Barriers of access to health care for persons experiencing homelessness, with influencing factors, adapted from Peters et al

[…] we are dealing with health professionals who are very used to strict protocols […] If one knows that this man won't consent to [a specific treatment], or one knows that health education will be impossible, what else can one come up with? Something that respects both the person and the … help, support and care that we have to give them. And for that, we're still negotiating. (Medical staff, Shelter)

Availability of care

We found that care availability of care was hampered by both health system capacity and its inadequate responsiveness to complex needs. Providers highlighted the intense pressure on the public health care system, compounded by lack of capacity within social services. The context in which care was provided was described as health care facilities under constant pressure to shorten people's stays, specialized consultations facing long delays, long term nursing care facilities being at full capacity, and housing initiatives with long waiting lists.

We're completely saturated. [To get an appointment it takes] 4 weeks, 6 weeks. And we try not to give appointments too far in time either, because the later we plan the consultations, the fewer people come. (Medical staff, Health facility)

The Lits Halte Soins Santé (LHSS) are facilities where unhoused persons can stay for a period of maximum two months after their hospitalization. However, providers shared concerns about their capacity, as they were completely full with people in need of serious nursing care, who have nowhere to go, since in shelters or (therapeutic) housing or care facilities there was no room. As a consequence, the LHSS could not accommodate people for whom they were conceived. Participants described a chain reaction due to the fact that the whole circuit of shelters, social and medical housing was at full capacity. permanent or specialized structures could no longer meet the demand, creating bottlenecks that blocked access to other services further down the line.

I could free up at least half of the beds here. I think that perhaps that's the first way to approach the problem, to clear the system so that we can get people out […] I think that in all the LHSSs at the moment we all have at least half of our beds occupied by people who no longer have any care at all. (Medical staff, Health facility)

Several participants mentioned language barriers as an additional difficulty for the many non-French speaking homeless persons. Although translation services existed, they were considered expensive and difficult to organize.

[…] last year we've tried to find the cheapest [translation service] possible, so it's telephone interpreting, a service called Cofrimi, a service in Toulouse, which agreed to do the telephone translation for us. […] they can meet 2 thirds of the requests and then you have to make do with a third. (Medical staff, Health facility)

Participants also described how comorbidities including mental illness and substance use and related complex health care needs intensified difficulties to access appropriate care.

Such difficulties came on top of people's dire physical health conditions, further deteriorating after many years of life in difficult conditions, adding to social problems which already hampered access to health care.

Alcohol addiction is huge. It's consistent, it's common. Just about everyone - everyone drinks, with varying degrees of success. (Social staff, outreach worker)
We have many, many, many patients with psychiatric disorders. So it's not the main reason for admission, but it's an additional one. (Medical staff, health facility)

Participants recognized multidisciplinary care as essential but hard to coordinate due to system fragmentation, often resulting in unavailability of the full package of care needed.

There are difficulties linked to co-morbidity. In other words, a mental disorder, an addiction and [social] exclusion. These 3 factors mean that either the social sector won't take them on, because they're ill, they're addicts; or the structures that deal with addiction won't take them on, because well, either they're in a precarious situation, they don't have health insurance, or they're seriously ill, and finally psychiatry will say, well, we're willing to look after the psychological aspect, but not the addiction, or the housing. Those 3 pass each other the buck. (Medical staff, health facility)

Geographical accessibility

Participants reported that the distances between the PEH's habitual living spaces and facilities constituted major barriers, due to difficulty navigating the system or traveling for a population reluctant to seek care. Complex care pathways involving multiple locations reportedly discouraged persons experiencing homelessness to follow through.

Participants explained, however, that having in-house medical staff helped to overcome this barrier.

And it's mainly that, once there, he cut his hair, took a shower and got dressed: 'There's a doctor there! […] An excellent opportunity! We saw that your feet were wounded - shall we go and see him? So we'll go and see him. Because it's on the spot, it's now, it's immediately, it's easy. (Social staff, outreach worker)

Other participants described a similar reality when patients were obliged to pass through different facilities and different locations to complete one health care visit (e.g. nurse – clinician - pharmacy). Participants found the different steps too difficult to understand for patients, leading to involuntarily skipping some of the required steps.

It's a complicated trajectory … each time there's a different place and different opening times. For example, the pharmacy is open between 1pm and 4pm. So it's very complicated for people who don't speak French, it's really difficult. (Medical staff, health facility)

Frequent relocations would further disrupt retention in care, particularly in mental health where follow-up care would normally be organized in a Centre Médico-Psychologique (CMP), a multidisciplinary practice free of costs, serving the population in a specific territory.

The idea is that care should be community-based, linked to the place where you live. As long as the place where you live keeps changing, you cannot receive community-based care. (Medical staff, health facility)

Affordability

Several providers mentioned health care cost as a barrier. Though France offers universal coverage, administrative complexity to obtain a legal address and provider refusal to accept schemes like AME reportedly posed barriers.

At some point you have to go to great lengths to get a legal domiciliation, it's crazy, it's extremely complicated to get registered, to be able to open up AME rights. […] And in fact, after a year, the person will no longer have the AME, will no longer have the domiciliation and will have to start all over again. The AME has to be renewed. (Social staff, outreach worker)

A reason for refusing fee exemption regimes that interviewees reported was the state's slowness of reimbursement to providers. In addition, participants described the prevailing perception that people eligible for these procedures would generally be 'difficult' patients, with limited capacity to understand a treatment or diagnosis, limited knowledge of French or overly complex health needs, believed to consume a disproportionate amount of time and resources of a health system already under pressure.

We can't go private, that's for sure. We stay in hospitals. If you go to the private sector, you, well, I must have made thousands of phone calls, where, even if you explain nicely, you're systematically turned down, even with the AME. A lot of doctors refuse the AME. […] When I call to make an appointment for someone, I say, 'Do you accept AME? 75% of people turn me down. (Social staff, shelter)

Solutions to overcome barriers

One of the most frequently mentioned strategies that providers used to meet the complex needs of PEH was to employ dedicated staff in a role as mediator. They helped to adapt care pathways and mitigate geographical barriers, ensuring timely arrival at the appropriate facility. Participants described that when an 'external' person accompanied the homeless individual, health care staff were less inclined to send the patient away or to make them wait for a long time. The presence of this mediator, either volunteer or professional with a social or medical background, would facilitate communication about the illness and treatment, offering concrete assistance to both PEH and health care staff. The accompanying person's role was also to motivate the patient to stay and wait.

When I started working, one of my main tasks was to accompany people to hospital to give them the courage to go there, and to keep them company during the waiting period […] You accompany them and stay with them to help them wait, to cheer them up, to tell them jokes, to have a laugh and so on. (Social staff, outreach worker)

A second strategy providers highlighted was the development of referral networks, to tackle administrative hurdles and facilitate navigating the healthcare system for a population with complex health needs. At the same time the connection with specialized staff allowed health care providers to leverage help when PEH ended up in emergency services and needed social support.

We work through special partnerships, which are familiar with this vulnerable population and can therefore offer us solutions that are a little more appropriate than what we could offer the general population. (Medical staff, shelter)

By supporting health care staff, mediators indirectly helped to improve provider attitudes by acting as

intermediaries who foster greater understanding between people experiencing homelessness and health care providers.

> *We introduced ourselves to the teams by saying, we do outreach work, we're social workers, so when someone turns up with signs of extreme precariousness, give us a call because we might know the person … And If you can't communicate with them, we might have more leverage to try to set up [medical help]. (Social staff, outreach worker)*

According to participants, medical staff needed to be present in some shelters or other day-time facilities for the homeless. For a population sometimes reluctant to see a doctor, having familiar medical staff on site was seen as an important way to avoid the extra barrier of having to go elsewhere …

> *With the association's doctor it's easier because they know him, he's there every Thursday, he eats in the refectory, so they see him at mealtimes, and that changes things […] in general with this doctor we find solutions. (Social staff, shelter)*

Finally, several participants emphasized the need to keep a long-term perspective and of allowing sufficient time and respecting homeless persons' own pace when addressing social issues or health concerns.

> *[…] the longer the person has been on the streets, the longer it will take to be able to offer support, the more complicated it is, and the more you have to work with the person's time frame. If you push too hard, they'll close up and you won't get anything out of them and you won't be able to work with them. So you really have to work with them at their own pace. (Social staff, shelter)*

Discussion

Between 2014 and 2023, people experiencing homelessness in Paris died at a median age of 54 years, 26 years earlier than the general population, with the sharpest difference for women (median age of death 53 years compared to 86 years). Most deaths were due to the same two illnesses that are the leading causes of death in the general population—cancer and cardiovascular diseases—but there was a higher proportion of deaths from external causes. Most deceased were non-French nationals.

The qualitative findings highlighted intersecting structural and individual factors that shape access to care. The four key access dimensions operated synergistically aggravating health outcomes [1]: Acceptability of care, with provider attitudes and practices often poorly aligned with the needs of a population, struggling with competing priorities and a tendency to delay care [2]. Availability of care, marked by insufficient capacity in both medical and social services and a lack of integration needed to address the complex health needs of this population [3]. Geographical accessibility, for services far from PEHs habitual locations who have limited levels of health-seeking behavior [4]. Affordability and administrative barriers, which complicate access to existing special health coverage schemes, particularly for a vulnerable population frequently born outside France and the EU.

The low median age of death of the study population is consistent with findings in other studies [1]. However, persons experiencing homelessness in Paris died mainly due to disease, while other studies have found much higher proportions of external causes [9, 12, 19]. This difference could be attributed to a difference in study populations, as our study population represented a more complete sample of persons PEH: The CMDR database uses a broader definition of homelessness than some other studies which focus on people living rough or in emergency accommodation [20]. Moreover, the well-established relationship between CMDR and the network of support organizations for this population in Paris most probably allowed for greater exhaustivity of deaths registered in Paris, avoiding exclusive reliance on media reports or on official information on death certificates, which have been shown to be incomplete and biased towards more spectacular deaths [21]. Our data showed that similar causes lead to a much earlier death among the study population than among the general population in France; for instance, the median age of cancer diagnosis in France is 70 [22], an age at which almost 90% of our population had already died. The qualitative findings revealed that barriers to healthcare access for persons experiencing homelessness are numerous and more than likely play an important role in the premature mortality among this population. Our findings aligned with the broad categories of Peters' framework for healthcare access, but revealed a higher degree of interconnection among upstream determinants, indicating that healthcare access in this setting is more complex than the original framework suggests. While financial barriers are often central in other contexts, they emerged as a secondary concern in our study—a finding echoed in other universal health care settings [23]. However, for the growing number of PEH from outside France, financial barriers persist due to complex administrative procedures required to access coverage. These intersecting obstacles create inequities within an already marginalized group, compounding existing disparities and further disadvantaging the most vulnerable individuals, notably migrants [24]. Prejudice among providers, real or perceived, and the population's complex health needs have

been described elsewhere as important factors negatively influencing access to health care [25]. Providers serving this population have adopted various strategies, including the development of informal referral networks, the integration of medical and social services – also in outreach approaches, and the creation of personalized care pathways that include accompaniment. While these approaches are often complex, resource-intensive, and reliant on committed staff or volunteers, they have emerged across countries in response to the diverse and multifaceted needs of this group and should be strengthened to improve access to healthcare for persons experiencing homelessness and other inclusion health target populations [23, 26].

Improving access to care addresses however only one part of the equation. For achieving equitable health outcomes, work is needed to avoid or delay the onset of disease—maintaining a healthy diet, engaging in regular physical activity, and participating in routine screening programs—factors that remain particularly difficult for individuals experiencing homelessness [27]. To tackle both the root cause and the adverse effects of homelessness, ensuring access to affordable, stable housing is an essential policy measure. Initiatives as Housing First, providing housing for persons experiencing homelessness irrespective of substance use have proven effect on some aspects of health [28, 29]. However, it is crucial to prevent homelessness in the first place, given the evidence of worse health status among homeless from this study and others [30, 31].

This study has the following limitations: First, deaths were reported voluntarily by social organizations, hospitals, police, citizens and media, potentially underestimating the number of actual deaths registered. However, no other systematic mortality surveillance of this population is done in France, and most deaths were confirmed by multiple sources. The CMDRs national network of reporting organizations is the strongest in Paris, providing a high degree of trustworthiness to the data used. By limiting the analysis to deaths that occurred in Paris, we cannot provide an insight in the degree to which other, less saturated or otherwise organized health and social services, would influence health outcomes for this population. Second, for an important proportion of the deaths, no cause was recorded. However, a comparison of the findings for the 10-year period with findings from a year with a higher response rate for cause of death, showed no difference. Third, the number of interviews in the qualitative study was limited, yet, we conducted two rounds of sampling, aiming for maximum variation of participants. Given the study aim, the specificity of the participant group, the use of the theoretical framework to guide the interviews and the strong quality of dialogue, the information power of the final sample was deemed adequate to address the research questions with internally valid data.

A clear limitation is that no interviews were done with people experiencing homelessness, suggesting that we miss out on the lived experiences of the people affected, which could have led to different or additional insights. Even though the interviews were conducted in 2018, current work shows that our findings are still fully relevant with similar barriers to accessing health care [23, 32].

Conclusion

This study contributes to the understanding of premature mortality among persons experiencing homelessness. Although external causes of death are more common among our study population than in the general population, the majority died from similar diseases as those affecting the general population. Even in settings where healthcare and specialized social services are provided free of charge, numerous barriers to prevention and treatment persist, contributing significantly to premature mortality. Access to healthcare is a major challenge for this population, hindered by low acceptability of the care, limited availability of appropriate services, geographical barriers, as well as affordability in terms of administrative obstacles.

After prolonged periods of homelessness, healthcare needs become increasingly complex, and navigating the healthcare system becomes even more difficult. In addition to improving the availability and accessibility of general and dedicated healthcare services, and providing shelter and stable housing for better health outcomes for persons experiencing homelessness, greater efforts are needed to address the root causes of homelessness.

Author contributions

E.C. did the lead work on the conception of the study, did qualitative data collection and analysis and wrote the main manuscript text. B.I. contributed to the conception of the study, did the quantitative analysis and prepared Table 1–2. A.L. and J.K. collected the quantitative data and reviewed the manuscript. C.N. contributed to the conception of the study and reviewed the manuscript. All authors have approved the submitted manuscript.

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Data availability

All demographic data are presented in the article. General population data are from open repositories available at https://www.insee.fr/en/statistiques and https://www.cepidc.inserm.fr/Pseudonymised data on mortality among homeless in France can be requested to Collectif les Morts de la Rue, Paris, France.

Declarations

Ethical approval and consent to participate

This study was approved by the Institutional Review Board of the Institute of Tropical Medicine of Antwerp, Belgium (ref 1229/18). The study was conducted in accordance with the standards of the Helsinki Declaration. All interview participants were healthcare or social workers who provided written

informed consent prior to participation. Participation was voluntary, and participants were informed about their right to withdraw at any time from this study, without consequence. The data related to deceased individuals were fully anonymized prior to analysis, complying with French regulations regarding the use of post-mortem data in research.

Competing interests
The authors declare no competing interests.

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