

The effect of local policy actions on mortality among homeless people: a before–after study

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Background: Homeless people have a 3–5-fold increased risk of mortality compared with general populations. After 2005, policy actions being implemented in Rotterdam, the Netherlands, have improved the living conditions of this group. This study examines the effect of policies aimed at improving living conditions on mortality risks of the homeless. **Methods:** Register-based 10-year follow-up study of homeless in Rotterdam, the Netherlands. The participants are homeless adults (aged 18+ years) who visited one or more services for homeless people in Rotterdam in 2001. The intervention of local policies after 2005 was to get homeless people into housing, increase their participation in employment and other regular daytime activities, and controlling drug and alcohol addictions. The main outcome measure is mortality rate ratios calculated using Poisson regression. Differences in mortality between the periods 2001–05 vs. 2006–10 were assessed. **Results:** The cohort of homeless adults in 2001 consisted of 1870 men and 260 women, with a mean age of 40.3 years. During the 10 years of follow-up, 265 persons (232 male and 33 female) died. Adjusted for age and sex, no significant difference in mortality was observed between the periods 2001–05 and 2006–10 ($P = 0.9683$). A different splitting in periods did not change the results. **Conclusion:** Five years of local policy efforts improved their living conditions, but left the mortality rate of a homeless cohort unchanged. Incomplete reach of the program and long previous histories of homelessness ask for additional policies beyond the provision of housing and other services. Attention to the prevention of homelessness seems needed.

Introduction

Mortality in homeless people is generally 3–5 times higher than could be expected given their age and sex.^{1–13} This has raised a call for more sustained efforts to improve the health of this vulnerable group.¹⁰ In 2006, the Dutch Government, together with the four major Dutch cities (Amsterdam, Rotterdam, The Hague and Utrecht) started an ambitious programme to guide all homeless persons into temporary care and social rehabilitation and subsequently into clustered or individual supported housing projects, with social education training and guidance into jobs. Since 2006, substantial local policy efforts have been made in Rotterdam, which have led to large improvements of the living conditions of the homeless in this city. In 2010, a policy evaluation showed that in Rotterdam, 3634 homeless persons had started an individual help trajectory and 2108 homeless people had been provided with housing for at least 3 months, were acquiring a legal income and had stable contacts with community services.¹⁴ The aim of this article was to assess whether mortality among homeless people decreased after 2006, in response to the policies that improved their living conditions.

Methods

We conducted a register-based 10-year follow-up study of homeless adults (aged 18+ years) who visited one or more institutions providing care to homeless people in Rotterdam in 2001. Institutions providing services to homeless people ranging from the provision of meals to night care facilities and convalescence care were approached to provide full name, date of birth and sex of persons who visited their facility in 2001. This information was

largely available because in 2001 homeless people were counted for research purposes.¹⁵ Both institutions subsidized by the local government and services provided by the church were included, covering services at different locations in Rotterdam. Pooling the lists of different facilities and removing duplicates yielded a cohort of 2130 persons, 1870 men and 260 women. Details on how the cohort with homeless people was identified have been described elsewhere.¹⁶ Data on mortality within this cohort were extracted from the municipal population registers with national coverage, extended with other registries (i.e. from general practice, health insurance and municipal public mental health care).

Poisson regression with offset (days at risk) was used to assess the association of mortality with period/calendar year. For this purpose, follow-up time of the homeless people was split into 1-year periods of follow-up time by age (in complete single-years), and calendar year and sex were added. Poisson regression yields rate ratios, which in our model indicate the increase/decrease in the mortality rate relative to the reference category (e.g. up to 2006). All analyses were corrected for sex and age. Age was grouped in 10-year age groups. Differences in mortality between the periods 2001–05 vs. 2006–10 were assessed. In sensitivity analyses, we explored whether an alternative distinction in periods (<2003, 2003–08, >2008 and single calendar years) would change the results.

Results

The presented cohort includes 2130 homeless adults aged ≥ 18 years in 2001. This cohort consisted of 1870 men and 260 women, with a mean age of 40.3 years (table 1). A total of 17 909 person years were observed, with a mean follow-up of 8.4 years. In total, 265 homeless persons (232 male and 33 female) died during follow-up.

Table 1 Characteristics of cohort of homeless men and women in Rotterdam, 2001

Characteristic	N=2130
Age	
Mean, year	40.3
<20	27
20–29	352
30–39	711
40–49	665
50–59	260
60–69	89
70+	26
Sex	
Men	1870
Women	260
Mean duration of follow up	8.4
Type of service	
Only day care	640
Convalescence care	80
Other (night care, day care + night care, sleeping rough)	140

Table 2 Mortality rate ratios comparing mortality within cohort of homeless, Rotterdam, 2001–10

Time	Rate ratio (95% confidence interval), adjusted for age and sex	P value
Main analyses: 2006–10 vs. 2001–05 (=ref)		0.97
2001–05 (reference)	1.00	
2006–10	1.05 (0.79–1.28)	
3 periods		0.71
2001–02 (reference)	1	
2003–08	0.91 (0.65–1.28)	
2009–10	1.01 (0.68–1.51)	
10 periods		0.61
2001	1.00	
2002	0.88 (0.47–1.66)	
2003	0.83 (0.44–1.57)	
2004	1.10 (0.60–2.02)	
2005	0.65 (0.34–1.27)	
2006	0.67 (0.34–1.29)	
2007	1.03 (0.56–1.91)	
2008	0.83 (0.44–1.57)	
2009	0.88 (0.47–1.65)	
2010	1.01 (0.54–1.88)	

Adjusted for age and sex, we found no significant difference in mortality between 2001–05 and 2006–10 ($P=0.97$) (table 2). These results did not change when the interactions age–sex ($P=0.99$) or type of service used (only day care, convalescence care, other) was added ($P=0.96$). Distinguishing three periods (before 2003, 2003–08 and 2008) did not show a significant difference in mortality between the periods ($P=0.07$). Using 10, 1-year periods showed that the mortality rates fluctuated from year to year, but also in this analysis there was no significant effect ($P=0.61$).

Discussion

Mortality among homeless men and women in Rotterdam was not lower in the period after 2006 than in the period 2001–05, despite important policy efforts that improved the living situation of homeless people in this city.

Other recent studies covering the 21st century also suggest that the high mortality among homeless men and women is rather persistent. A Dutch study among socially marginalized, including homeless, persons found a 3 times higher risk of mortality in this

group as compared with the general population for the period 2002–10.¹⁷ A large register-based Danish nationwide study¹¹ showed more than 5–6 times higher mortality rates among homeless people than among the general population. Three other recent studies found rate ratios of 3.1 for homeless men and 2.5 for homeless women,³ 4.4 for both sexes combined¹⁰ and 9.6 for homeless persons ages 25–44 years, 4.5 for ages 45–64 years and 1.1 for ages 65–84 years.¹⁸ These studies confirm prior studies focusing on the 20th century,^{1,2,4–9,12,13,17,19} showing that the high burden of mortality among homeless men and women is persistent and present in different regions, countries and subpopulations.

The lack of reduction of the excess mortality was also reported in a recent study by Baggett,¹⁸ who found that in 2003–08 the mortality rate of 18–64-year-old homeless in Boston had not changed as compared with 1988–93. Our study adds that mortality among homeless remains high, notwithstanding the presence of substantial policy efforts to improve their living conditions. In our study, short-term effects (i.e. within 5 years after policy changes) of local policies could not be demonstrated among the population who was already homeless in 2001.

We obtained our results in a very comprehensive sample of homeless adults. We have not limited our sample to homeless people in particular circumstances, such as users of convalescence care, but included a wide range of services with partly different users and including those sleeping rough. We also have not limited our sample to services provided by the local authorities, but we also included services provided by the church. Our study is also comprehensive by including both men and women with a long follow-up period of about 10 years (average follow-up of 8.4 years due to mortality). But our study also has some limitations. First, homeless people who did not use any local service in 2001 were not included, and not all institutes could provide data for 2001. We cannot rule out that specific groups were more likely to be missed (e.g. homeless immigrants without a legal residence status could not be matched and may have faced worse living circumstances than their legal homeless peers). We had no data on whether the homeless people in 2001 were still homeless during follow-up. But to assess whether there are effects of policy measures on mortality in a homeless cohort, it is appropriate to include these persons, even when they are no longer homeless, as this could have been the success of the policy efforts.

Despite an ambitious programme to guide all homeless persons into temporary care and social rehabilitation and from there to clustered or individual supported housing projects, with social education training and guidance into jobs and psychiatric support, we found no significant differences in mortality before and after the year 2006. One possible explanation is that it takes some time for policy measures to have their effect and, for that purpose, we did an additional analysis with three periods: one before policy changes (<2003), one in a transition period (2003–08) and one after full implementation of the new policy (2008–09). This also did not reveal differences, nor did considering the year-by-year changes provide an indication of any systematic change in mortality rates during the study period.

The lack of a reduction in mortality among homeless people after 5 years implies that the policy efforts had no short-term effect on mortality among people who were already homeless in 2001. This is contrary to the success of these policies in terms of the objectives of the policy intervention, which were all met,¹⁴ as well as on other relevant parameters, such as the safety index of Rotterdam. After 2006, the safety index of the city as a whole and of several problem areas has rapidly improved, reflecting reductions in violent crimes, street use of illegal drugs and feelings of unsafety, among others.²⁰ This provides an indication of improved quality of life of all Rotterdam citizens, including the (former) homeless. Moreover, a 75% decrease in tuberculosis incidence among homeless persons has been observed.²¹ However, in spite of these successes, these policies were so far not successful in reducing

mortality among homeless people in our cohort. This could be due to incomplete reach of the program and persistent excess mortality in a subgroup remaining homeless. Another possible explanation is that policy efforts will have their beneficial effects on mortality in the long term, but that this is not yet reflected in reduced mortality up to 2010. The cohort of homeless persons established in 2001 carries the burden of a long previous history of homelessness, unhealthy living circumstances and lifestyles (e.g. use of alcohol and illicit drugs, heavy smoking) and related chronic health problems (e.g. damage to the cardiovascular and respiratory system, such as atherosclerosis and chronic obstructive pulmonary disease). Providing housing, daytime activities and controlling addictions of homeless persons have certain benefits but cannot provide a survival advantage for the chronically disadvantaged. Combating other health problems that result from long-term exposure to unfavourable lifestyles and environmental factors (e.g. cardiovascular and respiratory diseases) may be a preventative measure able to produce the largest health benefits.²² Our results indicate that reducing the still very high mortality rates of homeless people asks for additional policies beyond the provision of housing and other services, and attention to the prevention of homelessness seems needed.

Ethics statement: The Medical Ethical Review Committee of the Erasmus MC declared that this study was not subject to the Law on Medical Research with human beings and that it had no objections to the performance of this study.

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Conflicts of interest: None declared.

Key points

- This study examines the effect of policies aimed at improving living conditions.
- Five years of local policy efforts improved their living conditions, but left the mortality rates of a homeless cohort unchanged.
- Reducing mortality rates of homeless people asks for additional policies beyond the provision of housing and other services.
- Attention to the prevention of homelessness seems needed.

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