

An investigation of the growing number of deaths of unidentified people in Russia

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Background: We examined mortality among working-age Russian men whose identity could not be determined, focusing on where and how they died. **Methods:** Employing micro-data from deaths that occurred in Izhevsk (Ural region) between June 2004 and September 2005, we analysed the characteristics of decedent men aged 25–54 ($n=2158$). Differences between completely identified ($n=1699$) and unidentified deaths ($n=282$) were compared via logistic regression. Data on all deaths in Russia in 2002 were used for supplemental comparisons. **Results:** We found that relative to identified men, unidentified men were at a higher risk of death from exposure to natural cold, violence, alcoholic cardiomyopathy, acute respiratory infections and poisonings. Our results also revealed that alcohol played an important role in the mortality of unidentified men. The places and causes of death among these unidentified men provide substantial evidence of their homelessness and social isolation. **Conclusion:** The increase in deaths among unidentified men of working-age indicates the emergence of a health threat associated with homelessness and social marginalization. This vulnerable group is exposed to different levels and causes of mortality compared with the larger population and represent a new challenge that requires serious and immediate scholarly attention and policy responses.

Keywords: alcohol consumption, homeless persons, mortality, Russia

Introduction

Russia experienced a significant decrease in life expectancy during the 1990s.¹ This unusual trend was driven mainly by extreme mortality among working-age men.^{2–4} Although this mortality crisis has been recognized and widely studied, another complex and less well-known phenomenon was also underway, namely, there was an explosive increase in deaths of those whose identity could not be determined. This is no trivial matter since the level of these deaths is alarmingly high in urban areas and is associated with ongoing social processes in Russia that are pushing growing numbers of working-age people to the margins of society.

In practice in Russia, if the precise date of birth of the deceased is not provided in the statistical record the person is deemed unidentified. Between 1989 and 1995, the proportion of deaths with unknown age at death increased 6-fold. During the 1990s, the state statistical agency (Rosstat) launched a new practice that approximates age at death (and the corresponding year of birth) based on estimates by forensic experts. This new practice had little discernible influence on mortality statistics, but instead only simplified the calculation of the procedure employed to redistribute those with an unknown age category into a specific age. While there was a decline in the proportion of all deaths with an unknown age from 1.19% in 1994 to 0.59% in 1998, this was back up to 1.15% in 2005.

Since 2000 Rosstat has kept track of and counted deaths with an incomplete date of birth. In 2003–04, such deaths constituted 3.2% of all deaths in Russia, representing a 30-fold

increase relative to 1989. In 2002, these unidentified decedents comprised nearly 6% of all deaths of males aged 25–54, 8% at the same ages in all urban areas and almost 11% at the same ages in cities with a population of 100 000 or more residents. A maximum share of these deaths of 18% was observed in the cities of Ekaterinburg and Krasnodar. Figure 1 reveals that the proportion of these deaths among males aged 25–54 continues to grow in Russia and in the Udmurt Republic (the region where a core part of the present research was carried out). To this point scholars have not determined why such a large and growing number of working-age male decedents remain unidentifiable. In this article, we scrutinize these deaths closely.

Mortality micro-data represent a crucial step toward learning about specific circumstances of deaths. This study relies on detailed data on male deaths at ages from 25 to 54 collected by the Izhevsk Family Study (IFS) of 2003–05.^{5–7} During the course of the IFS it was discovered that a high proportion of all deaths of men aged 25–54 were of those whose identity could not be determined. The present study investigates these deaths focusing on where they occurred, their medical causes and the role of alcohol.

Results of this study suggest a close relationship between deaths of those in this unidentified group and increasing homelessness. Although the homeless have received some research attention, and the public health significance of morbidity and mortality in this group has been recognized, there has been very little empirical analysis of the causes of mortality among the homeless. In Russia specifically, while there has been some discussion of mortality among socially disadvantaged groups,^{8,9} the authors of such studies included in this category broad population strata, such as those with a low education or manual labourers, that are likely distinct from the homeless population in several respects. Mortality among the homeless and other socially isolated groups remains largely invisible in most routine statistics and these people are unlikely to be recruited in health surveys. Our study thus takes advantage of a rare opportunity to examine mortality among this emerging population, and our results point to specific

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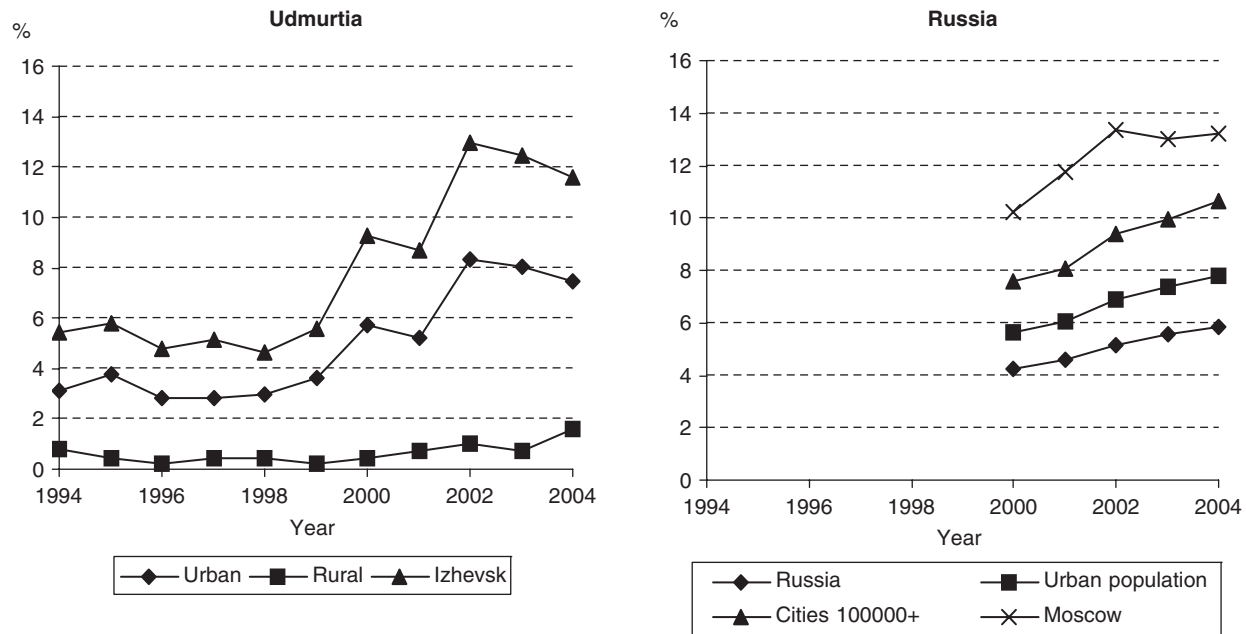


Figure 1 Percentage of all deaths among men aged 25–54 that were unidentified in Udmurtia (1994–2004) and Russia (2000–2004)

health problems and mortality risks in this vulnerable and growing population.

Data and method

The Izhevsk Family Study was conducted in Izhevsk, Udmurtia, a typical Russian industrial city with a population of about 650 000 (based on the 2002 census) situated in the western part of the Ural region of the Russia. The IFS employed a case–control design: cases were all men aged 25–54 who died during a 24-month period beginning in October 2003, and controls were living male residents in Izhevsk, frequency matched on age and randomly selected from a population register. Due to the necessity of collecting data from proxy informants who had lived with the deceased, the original design excluded men who lived alone, in institutions, or were homeless. During the pilot stage of the IFS, however, we discovered that an unexpected high proportion (about 13%) of deaths were of persons who were unidentifiable. ‘Unidentified’ meant that their full name and date of birth were unknown. If an official from the vital statistics registration system (ZAGS) was unable to find a passport, corresponding birth certificate, or some other document that could be matched to official records, then ZAGS could not be sure of the decedent’s identity. It is important to note that the identity of these men also could not be determined by the subsequent gathering of information about missing persons from the police or local authorities, from family members or friends and/or from places of work. Thus one can assume that these unidentified decedents are predominantly people who have no place of permanent residence and who have severed the social ties associated with family members and the local community.

This discovery motivated us to undertake systematic data collection on the deaths of these unidentified men. From the beginning of June 2004 to the end of September 2005 we collected information about those deaths that were not identified by the termination of the IFS from civil death records, medical death certificates and forensic autopsy reports. Since the precise date of birth of these men was unknown, their age was estimated by a pathologist from the Bureau for Forensic Expertise. If they were estimated to be

between 25 and 54, we included them in our analysis. The procedures employed to estimate age are based upon specific recommendations appended to Decree Number 161 (24 April 2003), entitled *Об утверждении инструкции по организации и производству экспертных исследований в бюро судебно-медицинской экспертизы* (On the establishment of instructions for the organization and production of expert research in the Bureau of Forensic Expertise), of the Ministry of Health of the Russian Federation. In theory, the methods of estimating age are based on an analysis of cartilaginous tissue using histological methods and infrared spectrophotometry. These more sophisticated means are only used in complex cases, however, and in practice the majority of experts estimate age based upon their professional experience. It is also important to point out that in urban Russia a high proportion of deaths in the age group under study result in an autopsy. For example, except in those cases of chronic diseases where the diagnosis is clear, a forensic autopsy must be performed. Accordingly, in our data 100% of the death certificates from the unidentified deaths and 88% of death certificates from the identified deaths included forensic diagnoses resulting from autopsies. Overall, our data included information on all identified and unidentified male deaths registered in Izhevsk during the study period whose age was (or estimated to be) between 25 and 54 years. These data allowed for detailed comparisons of unidentified and identified deaths by place of death, cause of death and concentration of alcohol in the blood of the deceased.

Urban working-age males are members of the most productive and socially active age group, and the loss of documents among individuals in this group is rare. A passport is necessary for employment and is often used for other aspects of daily life in Russia (e.g. carrying out bank transactions with cash, buying train tickets, routine police checks, moving to a new residence, etc.). There are also usually family members or friends who can provide supporting documentation as to the deceased’s identity. These are immediate clues that decedents with an unknown date of birth are generally unidentifiable. Finally, beginning in 2005 in Russia routine information recorded on the death certificate includes specific information

about whether or not the decedent was identified (i.e. there is now a specific category for this information and scholars no longer need to rely solely on a missing date of birth to identify such cases). This allowed us to compare the set of deaths of unidentified people with the set of decedents whose full date of birth was unknown. For the whole Udmurt Republic, we found that in 2005 the two sets were nearly identical, with a 97% match of the death records. As we show below, the places and causes of death reported for this group provide further evidence supporting the hypothesis that a large proportion of the unidentified decedents were homeless.

Table 1 Distribution of place of death by identified status in Izhevsk, June 2004–September 2005

Place of death	Unidentified (<i>n</i> =282)	Identified, address unknown (<i>n</i> =1699)	Completely identified (<i>n</i> =1699)
Residence ^a	13.5%	30.5%	53.4%
Stairwell, cellar, attic, or courtyard of a residence ^b	27.3	37.3	13.6
Street	22.3	8.5	6.9
Forest or other unsettled area	9.2	4.5	3.5
Hospital (includes emergency room or ambulance)	17.4	13.0	13.4
Near heating pipeline connector	4.6	0.0	0.1
Other or unknown	5.7	6.2	9.1

a: Residence could be any home or dwelling, not necessarily that of the deceased

b: These 'parts' of residences almost universally apply to apartment (or other types of) buildings, not stand alone individual residences. In other words, places like stairwells and attics are places where many homeless people seek warmth and shelter from the elements, as well as from authorities and from those who may harass them

In the main analysis carried out below we employed logistic regression procedures using STATA 9. Specifically, we generated odds ratios that allowed us to compare the distribution of causes of death among the unidentified group with that of the deceased men who were known. Further, for supplemental comparisons beyond our Udmurt data we also employed (less detailed) data on all deaths in Russia as a whole in 2002.

Results

During the period of the IFS (October 2003–September 2005), ZAGS registered 4948 deaths of men aged 25–54 in Izhevsk. Of these, 4171 (84%) were immediately identifiable, and a further 143 were eventually identified before the termination of the study. This left 634 cases, representing 13% of all deaths of males aged 25–54 in Izhevsk, whose identity could not be determined. Beginning in June 2004 (and continuing until the end of the study in September 2005) we collected information on the place of death of these men (*n*=282 for the unidentified decedents during this period). The first column in table 1 shows those who were unidentified, those in the second column were identified but did not have a precise address of permanent residence and those in the third column were completely identified. The table reveals that relative to the identified decedents, unidentified men were only about one-quarter as likely to die in a residence, more than thrice as likely to die in the street, nearly thrice as likely to die in a forest or unsettled area and twice as likely to die in a stairway, cellar, attic, or courtyard of a residence (usually apartment buildings). It is suggestive that 4.6% of unidentified deaths and only 0.1% of identified deaths took place around heating collector pipelines, a typical place of sleep for the homeless during the winter. That so many died outside, away from a residence and in auxiliary spaces of buildings confirms our expectations

Table 2 Comparison of probability of cause of death of unidentified men aged 25–54 (*n*=282 and *n*=15 816 in Izhevsk and Russia, respectively) with identified men aged 25–54 (*n*=1699 and *n*=409 994 in Izhevsk and Russia, respectively)^a

	Izhevsk (June 2004–October 2005)			Russia (2002)		
	Percent of deaths among the unidentified men	Odds ratio ^b	95% CI	Percent of deaths among the unidentified men	Odds ratio ^c	95% CI
Infections	1.4	0.5	(0.17–1.15)	4.5	1.5	(1.42–1.68)
Neoplasms	0.5	0.1	(0.04–0.38)	0.5	0.1	(0.01–0.58)
Ischaemic heart disease	7.4	1.0	[reference]	9.6	1.0	[reference]
Cerebrovascular diseases	0.9	0.4	(0.18–0.89)	1.3	0.5	(0.40–0.52)
Other circulatory diseases	3.0	0.8	(0.47–1.52)	3.9	1.4	(1.32–1.56)
Acute respiratory infections	9.8	2.0	(1.32–3.02)	5.9	2.1	(1.95–2.30)
Other respiratory diseases	1.3	1.6	(0.63–3.88)	0.2	0.9	(0.74–1.07)
Other digestive diseases	1.6	0.8	(0.43–1.39)	1.5	0.5	(0.48–0.62)
Transport accidents	1.3	1.2	(0.52–2.53)	3.1	1.3	(1.14–1.43)
Exposure to natural cold	19.9	8.4	(5.69–12.33)	10.0	7.6	(7.04–8.18)
Alcohol-related						
Accidental alc. poisoning	2.8	1.4	(0.81–2.36)	5.2	1.6	(1.44–1.71)
Alc.-related ment. & beh. disorders	0.9	1.4	(0.51–3.61)	0.8	1.0	(0.80–1.20)
Alcoholic cardiomyopathy	10.9	2.5	(1.71–3.77)	5.0	2.0	(1.85–2.19)
Alcoholic liver disease	4.3	1.9	(1.20–3.11)	0.4	0.7	(0.58–0.92)
Violence						
Suicide	1.9	1.1	(0.68–1.85)	2.4	0.7	(0.60–0.76)
Homicide	4.9	1.8	(1.07–3.15)	8.0	1.8	(1.61–1.93)
Violence, undetermined intent	9.3	2.5	(1.60–3.74)	9.7	2.6	(2.42–2.80)
Accidental poisoning (not alcohol)	4.1	2.0	(1.07–3.59)	2.0	1.5	(1.31–1.69)
Other external causes	3.3	1.7	(0.99–2.76)	7.2	2.1	(1.96–2.34)
Ill-defined & unspecified causes	11.0	5.1	(3.32–7.78)	17.2	3.6	(3.35–3.86)
All other	1.3	1.2	(0.58–2.43)	1.6	0.5	(0.47–0.55)

a: Odds ratios are derived from regressions linking the unidentified/identified dichotomous variable with various explanatory variables. ORs compare odds of being an unidentified versus identified death depending on values of explanatory variables

b: Odds ratios adjusted for age groups

c: Odds ratios adjusted for age, urban-rural residence, and geographic region

that a large proportion of these unidentified men were homeless.

Table 2 compares the distribution of causes of death among the unidentified group with that of the deceased men who were known. The table shows the percent of all deaths resulting from a specific cause and provides an odds ratio representing the proportion of deaths due to this cause among the unidentified relative to the identified men. It is important to note that the estimates provided by the odds ratios are conservative, since the unidentified decedents are being compared with a group of men that have themselves proven to be at higher risk due to their premature mortality. Our discussion focuses on Izhevsk, though all-Russian data are provided for comparative purposes. Exposure to excessive natural cold was responsible for about 20% of deaths among the unidentified men. Violence, whether self-inflicted or suffered at the hands of others, was the second leading cause, accounting for 16% of deaths. Known homicides and suicides were about 5% and 2% of deaths, respectively and more than 9% of deaths were known to result from violence, though it could not be determined if these deaths were self-inflicted or homicides.^{9,10} Intent is more difficult to determine among those who are socially isolated (e.g. homeless, illegal immigrants). Their violent deaths may not have been witnessed, or witnessed only by like others who are wary of interacting with police. Thus these deaths are more likely to be 'discovered' well after they occur rather than being 'reported' soon after the event, which creates difficulties in determining intent. Finally, deaths from alcoholic cardiomyopathy (11%), acute upper respiratory infections (10%) and ischaemic heart disease (7%) were also leading causes of death among these unidentified men.

Table 2 also shows that in both absolute terms and relative to the identified deceased men, the unknown men rarely died from chronic illnesses or diseases. One reason for this is that many homeless people do not live long enough to reach the age at which they would be at most risk for many cancers and certain other chronic illnesses or diseases most associated with old age. On the other hand, they were nearly 8.5 times as likely as the identified group to die from exposure to cold and twice as likely to die from acute upper respiratory infections, including influenza and pneumonia. When taken together with where these deaths occurred, these findings again support our argument that a large proportion of these unidentified men were homeless.

The unidentified men were about 2.5 times as likely to die from alcoholic cardiomyopathy and nearly twice as likely to die from alcoholic liver disease. The unidentified men were also more likely to die of external causes, including violence. The chances of being a victim of homicide were nearly twice as high among the unidentified, though their likelihood of suicide was no higher than identified men. The ORs for homicide and suicide are certainly underestimated, however, as the 'violence, intent undetermined' category is twice as high among unidentified decedents. Further, an earlier Izhevsk study that employed double-coding the causes of death found a relatively high percentage of disagreement for suicide, which tended to mix together with accidental falls and poisonings.⁵ For the unidentified deaths, it may be the case that acute alcohol poisoning might have been suicides in some cases, though this would not be captured in these mortality statistics. Finally, the cause of death was ill-defined or unspecified about five times more often among the unidentified men.

Table 2 shows that, taken together, the different causes of death due directly to alcohol rival exposure to cold for the leading cause of death among the unidentified men. These causes include alcoholic cardiomyopathy, alcohol-related liver disease, accidental alcohol poisoning, and

Table 3 The role of alcohol in deaths of unidentified men aged 25–54 in Izhevsk, June 2004–September 2005^a

	Total number	Percent
Total number of unidentified deaths	282	100
Primary cause of death was disease or pathological process related to alcohol	59	20.9
Deceased had a concentration of alcohol in blood or urine >0.10	96	34.0
Deceased had alcoholic cardiomyopathy or alcoholic liver disease	172	61.0

a: Categories are not mutually exclusive and thus the sum of deaths from the three categories exceeds the total number of deaths

mental and behavioural disorders due to the use of alcohol.¹¹ Table 3 provides data on deaths of unidentified working-age men in Izhevsk between June 2004 and September 2005, showing that 21% of deaths were due directly to one of the alcohol-related causes, 34% of the men had a blood-alcohol concentration <1 promille at the time of death and in 61% of the cases the decedent was suffering from alcohol cardiomyopathy or alcoholic liver disease, even if it was not the most proximate cause of death.

Discussion

A deep economic crisis in Russia followed the collapse of the Soviet Union. Unemployment and underemployment increased sharply, and official sources estimated that one-third of the Russian population was living in poverty in the mid-1990s.¹² This occurred at a time when the former Soviet social safety net—including guarantees of employment, medical care, housing and food, as well as a host of other social programmes—disappeared nearly overnight. People languished while political parties and the executive and legislative branches of the new Russian government bickered over the control, amount, type and distribution of social welfare.¹³ Several scholars have noted the impact of the economic collapse on mortality experienced by working-age males,^{14,15} and Shkolnikov and Meslé¹⁶ concluded that the mixture of economic reforms and the disappearance of Soviet state paternalism were largely responsible for these disastrous effects.

Relative to the mid-1990s, however, the political situation and economic conditions have now stabilized, yet the mortality situation has not improved. According to data from Russia as a whole, the proportion of deaths of unidentified people increased sharply during the 1990s. Today, such deaths comprise over one-tenth of all deaths of working-age males in Russian cities with a population of at least 100 000 residents.

The detailed data from the Izhevsk Family Study showed that exposure to natural cold is not only the leading cause of death among the unidentified group, but also exhibits the greatest differential between the unidentified and identified samples. This is a preventable cause of death, and we know that homelessness and alcohol abuse are risk factors.¹⁷ Localized public health responses aimed at preventing these deaths can focus on addressing the needs of those most at risk, including opening temporary shelters during severely cold weather, providing emergency kits for the homeless, educating them to recognize the symptoms of hypothermia and providing accurate information about the dangers of heavy drinking during these periods. More generally, plans can be devised to monitor the homeless, the elderly and other socially isolated

groups during extremely cold weather. Klinenberg's¹⁸ research in Chicago on the opposite weather extreme, a heat wave, is useful here. A major finding was that neighbourhood-level social capital played an important role in mortality for at-risk populations, and he hypothesized that social capital is a protective factor against other types of ecological disturbances, including freezing temperatures. In other words, while formal public health initiatives are important, in extreme conditions the informal actions of individuals and communities play a key role in protecting those at risk.

Violence was another preventable cause of death that was more common among unidentified decedents. The Russian homicide rate is among the highest in the world, and research has consistently shown negative economic conditions to be closely associated with levels of and changes in Russian homicide rates.^{19–21} Providing more shelters for the homeless may protect against violent victimization. More and better social and psychiatric services for those in this group, especially those addicted to alcohol, may reduce offending and victimization. Other likely sources of unidentified persons who die violent deaths in Russia are sex workers and undocumented immigrant workers in other trades. Human trafficking is a serious problem in the country and the Russian government must do more to address it.²²

Another preventable cause of death experienced at higher rates by the unidentified group was acute respiratory infections, of which pneumonia is the most common. Pneumonia is usually treatable with antibiotics, and it is estimated that about 60% of deaths resulting from acute respiratory infections are preventable. Prevention strategies include improving the quality and affordability of care, especially at first-level public health facilities.

The unidentified decedents in our sample were about twice as likely as identified decedents to die from accidental poisoning. Although this category is meant to be separate from accidental alcohol poisoning, it is likely that some of these deaths resulted from ingestion of alcohol surrogates such as aftershaves, medicinal compounds and antifreeze. Our prior studies^{7,23} revealed that 7% of the population consumed surrogate alcohol products, which often not only contain high concentrations of ethanol but also other toxic contaminants. It was argued that many of these surrogates are produced with the knowledge they will be consumed, and even packaged in larger containers that make them more suitable for consumption. An obvious prevention strategy is to regulate the marketing and distribution of these products, as well as to educate the poor and homeless of their danger.

Our findings revealed that when taken together the causes of death due directly to alcohol rivaled exposure to natural cold for the leading cause of death among the unidentified cohort, and that these causes were more common among unidentified relative to identified decedents. Our results generally coincide with those of Nemtsov,¹¹ who estimated that one-third of all Russian deaths are related to alcohol in some way. Indirectly, there is a strong association between heavy drinking and homicide in Russia,²⁴ and research elsewhere has shown acute alcohol intoxication to be common among those who die of exposure to natural cold.

Alcohol is not only a cause of death, but likely an important risk factor for homelessness and social isolation in the first place. A prior study revealed that heavy drinking among Russian men was significantly associated with lower educational status and employment in manual occupations, and that it was closely connected to family conflict and dissolution.²⁵ The authors concluded that heavy drinking was most common among men who had experienced considerable

loss in social and/or economic standing during the transition. This suggests that heavy drinking and the loss of social bonds are closely linked, putting these men at a higher risk for social isolation. This can result in a dangerous downward spiral since stress, despair and weakened bonds likely increase involvement in the type of hazardous drinking that heightens the risk of death due directly or indirectly to alcohol consumption.

It is worth mentioning briefly here that during 2006 the Russian Government launched several measures meant to strengthen control over production and sales of ethanol.²⁶ Initial evidence suggests that these measures had an immediate impact, as there was a significant decrease in related mortality in 2006. Hopefully, these policies will act to further reduce consumption of cheap vodka and non-beverage alcohol-containing substances and to lower mortality among working age men, especially those living at the margins of Russian society.

In conclusion, the homeless and other socially marginalized groups are too often overlooked by public health scholars. People living on the margins are usually absent from public health surveys and epidemiological studies. This is a serious limitation because the homeless represent a vulnerable population and because we cannot assume similar levels and distributions of causes of mortality among this group as among the larger population. Furthermore, this is not a negligible group in terms of its size, especially in urban areas. In our study of Russia, we found that unidentified decedents accounted for 6% of all male deaths among those aged 25–54, with double or triple this proportion in large cities. These problems are not confined to Russia, and other scholars have recently lamented the lack of research on this largely invisible population.²⁷ Their vulnerability is evident in the leading causes of death found in our study, both in absolute terms and relative to those deaths in which the decedent was identified: exposure to natural cold, alcohol, violence, acute upper respiratory infections. A large proportion of these deaths are preventable.

We are disturbed by the increasing rates of deaths of unidentified persons in Russia in recent years. During the 1990s, Russia faced repeated economic and political crises, leaving the state unable to respond to the ills of its citizens. Since the economic crisis of 1998, however, Russia has experienced relative political stability and a slowly but steadily improving economy. We should thus expect an increasing ability on the part of the government to respond to the needs of the more vulnerable segments of the population. Unfortunately, this is not the case, as a large part of the population continues to be at risk with respect to their chances for health and survival to old age. Our data suggest that the increasing proportion of deaths of unidentified persons highlights a serious public health issue that demands further research attention and represents a matter of urgency to public health officials in Russia.

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Conflicts of interest: None declared.

Key points

- Little is known about the levels and distributions of causes of death among unidentified and/or homeless decedents. Findings from recent studies, however, reveal the detrimental impact of alcohol and severe heat and cold, as well as the importance of social capital as a protective factor.
- This article reveals the distribution of causes of death among unidentified decedent males in Russia. We show that relative to identified decedent males the unidentified males face a higher risk of mortality from several preventable causes of death, including exposure to natural cold, alcohol-related mortality, violence and acute respiratory infections.
- The homeless are a vulnerable segment of Russian society and of many societies throughout the world. They require public health interventions and policy responses that are relevant to their specific conditions. We have identified and suggested several public health and policy responses specific to the leading causes of preventable death that they face.

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