Self-reported heart symptoms are strongly linked to past and present poverty in Russia: evidence from the 1998 Taganrog interview survey

Denny Vägerö1,2, Olga Kislitsyna2,3

Background: In this Russian–Swedish collaborative study the question of how symptoms of heart disease are linked to poverty in Russia was addressed. Method: A random sample household survey was conducted in Taganrog, southern Russia. It covered questions about living circumstances, poverty and health. Health questions included both symptoms of heart problems, such as chest pain and high blood pressure, psychological problems such as depression and anxiety, as well as health-related behaviours such as alcohol drinking. Answers from 1972 women and men aged 18–70 are analysed here. Results: The poorest fifth of the population were more than twice as likely as others to report heart symptoms. Problems in affording vegetables, meat or fish, clothes and footwear were linked to heart symptoms more closely than other economic indicators, such as car ownership or ownership of consumer durables. Psychological symptoms, sleeping problems and alcohol drinking were all related to self-reported heart symptoms, but explained little of the excess risks attributable to present poverty. Childhood poverty was also linked to present heart symptoms. Conclusion: Life-time accumulated experience of economic hardship contributes to present levels of heart disease symptomology in Russia.

Keywords: heart disease, poverty, Russia, self-reported symptoms, transition

C irculatory disease is an important contributor both to Russia’s high level of mortality as compared to western Europe and to the huge fluctuations in Russian mortality rates over the last 20 years.1 Since 1998, mortality has again risen in Russia, in total as well as for specific causes of death such as heart disease and stroke.2 A pertinent question is how stroke and heart disease are linked to the enormous social transformation that has occurred in Russia over the past decades. We were particularly interested in how they relate to one of its most negative aspects, namely the advent of mass poverty. In this study we were able to ask how self-reported heart symptoms are linked to poverty.

Low income, unemployment, material deprivation and poor socio-economic standing have been linked to poor health in numerous studies in western populations.3–6 In contrast there are far fewer studies7–9 that demonstrate such effects in the former communist countries. In Russia and the former Soviet Union such studies are especially scarce. However, it has been shown that mortality has become increasingly dependent on educational level in Russia10 as well as in Estonia11 in the 1990s. Comparing ethnic Russians and Estonians in Estonia, Leinsalu et al.12 also found a widening gap in wealth between the two groups. This was paralleled by a widening gap in health, including heart disease mortality,11 Carlson, using 1993/94 data from Taganrog, was able to demonstrate that material wealth and poverty were linked to self-rated health in general.12 The link between self-reported cardiovascular health and poverty in Russia has not previously been analysed as far as we are aware.

Studies of Russian poverty in the 1990s, using income data, are notoriously difficult. Actual inflow of money is difficult to estimate. Command of material resources is only in part dependent on monetary income. Four reasons are these:

1. De-monetisation of financial transactions. For instance, payment in kind has been a widespread practice and could consist of anything from products manufactured at one’s own place of work to vodka.

2. Private plots. Growing vegetables and raising animals on a small scale has always been a significant source of food in Russia; and particularly so in the 1990s.

3. Wage arrears and arrears of social transfers. For example, in November 1998, between 8 and 10% of those employed had not been paid for 6 months or more and 45% had not received their salary that month.13 Similarly, pension arrears averaged at nearly two months.

4. Monetary income from the black and grey sectors of the economy. The size of this informal economy may correspond to nearly 50% of monthly wages. Evaluations of the informal sector give different estimates, usually in the range of 10–40% of the ‘open’ economy.14

An alternative to measures of monetary income when studying the relation between health and poverty is to examine the ability to meet basic needs; this overcomes some of the above problems. It would also seem to be a theoretically sound way of conceptualizing the problem. In line with Sen’s analysis of the poverty concept,15 one can focus on an individual’s or a family’s capability to meet basic needs such as food, clothes, shelter and social recognition. Sen saw this as being the ‘irreducible absolute core’ of poverty. This capability can be inferred from questions about whether or not people have been able to buy necessary food, clothes and so on. For those unable to meet such basic needs a number of consequences could be considered. Poverty could lead to behavioural change (such as increased alcohol consumption), psychological change (such as
anxiety or depression), to poor sleep and to change in family relations (such as conflict in the family or divorce), all of which could influence cardiovascular health.

The present study will use survey questions covering these areas in order to relate poverty to the presence of self-reported heart symptoms. Our hypothesis is specifically that mass poverty in Russia has given rise to symptoms of heart disease.

Population under study

From the 1998 ‘survey of health and living standards of households’, conducted in Taganrog (‘Taganrog IV’) we analysed data on health and poverty. Taganrog, 70 km southwest of Rostov-on-Don, is situated on the shore of the Sea of Azov. It is a chiefly industrial city with 300 000 inhabitants. In the late 1960s it was chosen for a series of surveys (conducted in 1968, 1979, 1989, 1993/1994 and 1998) because at that time it was regarded as a typical medium-sized Russian industrial town in terms of average income, employment, living conditions and family size. However, from 1993 onwards this situation changed abruptly, and in 1994 and 1998 Taganrog average wages were only half of those in the country as a whole. In 1998, therefore, Taganrog provides an example of a city that has been hard hit by Russia’s social transformation, and is looking for a role and a position in the new economy.

The health survey was conducted from January to the beginning of December in 1998; more than three quarters of the 1009 households were interviewed after August 1998, the time of the ‘rouble crisis’, which triggered an upsurge in unemployment, new wage arrears and price rises. In total, the survey included 2812 individuals, including children. The sample frame was the electoral register, by means of which individuals aged 18 and above were randomly selected. Every member of the household was included in the survey. Adults always answered questions about themselves personally. In this study, we analysed data on those aged 18–70. The response rate was 81%, giving 1972 individuals in this age group.

Survey respondents were asked whether they had suffered, during the previous 12 months, from symptoms that could be related to their circulatory function, namely chest pain, heart weakness or elevated blood pressure. Social and demographic data included information on age, marital status and educational level. There were several questions about present household economic situation including household assets, car ownership, access to a garden plot, opportunity to buy vegetables, meat and fish, clothes and footwear. There was a question about poverty during childhood.

Such factors as alcohol drinking and whether family relations were peaceful or strained were also covered. Respondents answered two questions about psychological distress, namely whether they had experienced nervousness and anxiety or depression and low spirits. Respondents were also asked if they had problems in sleeping well at night. We hypothesized that these factors might mediate the influence of poverty on heart symptoms.

Methods of analysis

Questions on heart symptoms, psychological distress, night sleep and family relations were dichotomized into those with and those without a problem, following previous research using the same questions. Alcohol drinking was a categorical variable, distinguishing between heavy drinkers (>11 of 40% alcohol/week), middle drinkers (0.5–11), moderate drinkers (0.5–11), non-drinkers and non-responders.

Ten questions indicating present or past economic difficulties, mainly in the form of restricted consumption opportunities, were analysed. The eight questions concerned with present poverty are listed in table 1. These were combined into an index of present poverty, ranging from no present economic problems to eight such problems. We considered giving items of immediate need (food, clothes, housing) more weight than items such as car ownership and consumer durables, but opted for the simple solution of giving each item the same weight. In tables 2, 3 and 4 this index was grouped into problem categories of 0–1, 2–4 and 5+. The poorest group (5+ economic problems) comprises about a fifth of the population.

Prevalence of heart and other problems were analysed by the use of logistic regression. Odds ratios [ORs, with 95% confidence intervals (CI)] were always adjusted for age, education and marital status. Estimates for men and women combined (table 1) were adjusted for gender. Anxiety, depression, poor sleep, alcohol drinking and family tensions were introduced in additional adjustments (table 3). The reduction of an OR on adjustment (say, comparing Model 1 and Model 2 in table 3) was seen as evidence that the introduced factor was either a mediating or a confounding factor. If ORs were only marginally affected this was seen as evidence against a causal pathway from poverty to heart symptoms via the introduced factor. To rule out the possibility that results were confounded due to the sampling of households rather than individuals, a diagnostic test was performed, the so called Huber–White test. This test gave no support to the assumption that clustering may affect the results presented below.

Results

Self-reported heart symptoms were linked to present and past poverty, measured by a variety of indicators. The inability to meet the most basic needs, food and clothing (table 1), was closely linked to heart symptoms. Thus, those individuals who reported that they regularly had to abstain from buying necessary clothes and footwear were more likely to report heart problems than other women and men. Similarly, those who often had to abstain from eating fish and meat were more likely than others to report heart problems. In addition, those individuals who were able to get fresh vegetables and fruits in the winter months were less likely to report heart problems for women there was a significant trend according to the amount of fresh fruit and vegetables they were able to consume. Other indicators of current poverty, such as ownership of consumer durables, of a car or a garden plot, were less important (ORs were smaller and often non-significant).

Table 2 shows how a global measure of poverty, such as our index of present economic problems, demonstrated a graded (perhaps curvilinear) relationship between degree of poverty and self-reported heart problems, giving high ORs of 2.8 (women) and 2.4 (men) for the poorest group. The experience of worsening economic circumstances during the 1988–1998 period was strongly linked to heart symptoms for women (OR = 2.5) and men (OR = 2.1). The association with childhood poverty is nearly of the same magnitude (ORs = 1.8, 2.1, men).

Table 3 shows the corresponding ORs for present poverty when a number of cardiovascular risk factors are adjusted for, namely two indicators of psychological symptoms (anxiety and depression) and poor sleep (Model 2), alcohol drinking (Model 3) and strains in the family (Model 4). Model 5 simultaneously adjusts for all of these. Unexpectedly, most of the excess risks from poverty remain, giving ORs of 2.3 (women) and 2.1 (men) in the fully adjusted model. This was in spite of significant associations between the factors for which we adjusted and self-reported heart symptoms (data not shown).

Thus, the poorest fifth of the population is considerably more likely to report heart problems than other individuals. This excess can only to a limited degree be explained by any of the psychological problems, which are also more prevalent
Table 1 Self-reported heart symptoms by specific items of poverty (men and women aged 18–70, Taganrog 1998)

<table>
<thead>
<tr>
<th>Specific poverty indicator</th>
<th>Odds ratios (95% CI)</th>
<th>Men</th>
<th>Women</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of consumption of fresh vegetables and fruits during winter time</td>
<td>ns</td>
<td>( P &lt; 0.01 )</td>
<td>( P &lt; 0.005 )</td>
<td></td>
</tr>
<tr>
<td>almost never</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1 or 2 times per week</td>
<td>0.62 (0.39–0.99)</td>
<td>0.52 (0.34–0.80)</td>
<td>0.58 (0.43–0.79)</td>
<td></td>
</tr>
<tr>
<td>once a month</td>
<td>0.84 (0.52–1.36)</td>
<td>0.82 (0.52–1.28)</td>
<td>0.84 (0.61–1.16)</td>
<td></td>
</tr>
<tr>
<td>frequently had to abstain from eating meat or fish</td>
<td>1.81 (1.25–2.62)</td>
<td>1.54 (1.09–2.18)</td>
<td>1.66 (1.30–2.13)</td>
<td></td>
</tr>
<tr>
<td>frequently had to abstain from buying necessary clothes or footwear</td>
<td>1.58 (1.15–2.16)</td>
<td>1.71 (1.28–2.29)</td>
<td>1.64 (1.33–2.02)</td>
<td></td>
</tr>
<tr>
<td>frequently had to abstain from cinema, theatre, concerts?</td>
<td>1.41 (0.96–2.07)</td>
<td>1.19 (0.85–1.68)</td>
<td>1.30 (1.01–1.68)</td>
<td></td>
</tr>
<tr>
<td>owns less than four consumer durables</td>
<td>1.11 (0.82–1.52)</td>
<td>1.35 (1.01–1.80)</td>
<td>1.24 (1.01–1.53)</td>
<td></td>
</tr>
<tr>
<td>has no garden plot</td>
<td>1.21 (0.89–1.63)</td>
<td>1.19 (0.90–1.57)</td>
<td>1.20 (0.98–1.46)</td>
<td></td>
</tr>
<tr>
<td>has no car</td>
<td>1.32 (0.94–1.84)</td>
<td>1.17 (0.84–1.61)</td>
<td>1.26 (1.00–1.58)</td>
<td></td>
</tr>
</tbody>
</table>

ORs (95% CI) adjusted for age, education and marital status. ns, not significant.

among these individuals, by their poorer sleeping, or by differences in alcohol drinking and family relations.

Table 4, finally, combines experience of childhood poverty with adult poverty. The combination of both yields high ORs, particularly for women.

This result supports the notion that present heart disease risks are determined by experience of economic hardship accumulated over the life cycle.

Discussion

Three methodological problems were considered. First, the cross-sectional design of this study gives little or no information about the time order of events, which makes it difficult to draw conclusions about cause and effect. However, knowing the scale of Russian poverty in 1998, it would be difficult to argue that symptoms of heart disease usually preceded, or indeed caused, poverty. A massive increase of poverty took place in Russia in the 1990s. There was also a great rise in heart disease mortality, roughly mirroring poverty trends. In their analysis of economic trends Bloom and Malaney, who were able to conclude that health symptoms should be more common among the poor, unless one assumes that poverty reporting is also due to negative affectivity. Milanovich and Jovanovich, who studied changing perceptions of poverty in Russia in the mid 1990s, found no evidence that perceptions became inflated as poverty increased; indeed the opposite was rather the case.

This result supports the notion that present heart disease risks are determined by experience of economic hardship accumulated over the life cycle.

Secondly, the problem of ‘negative affectivity’ needs to be addressed. A ‘negative’ response to one question may be linked to a tendency on the part of some people to respond negatively to many questions, perhaps due to personality factors. In such cases correlations between survey questions would be biased upwards. One would expect that negative feelings stemming from the experience of poverty would ‘spill over’ more towards psychological distress questions than towards questions about heart symptoms, such as blood pressure and chest pain, but this did not seem to be the case. Depression was the psychological item most closely linked to poverty. The OR for the poorest group of women reporting depression was 2.4 (95% CI = 1.22–2.21) and for the poorest group of men the OR was 2.1 (95% CI = 1.22–3.61), in both instances somewhat lower than corresponding ORs for heart disease symptoms.

Further, there is no evidence that a biased perception of heart symptoms should be more common among the poor, unless one assumes that poverty reporting is also due to negative affectivity. Milanovich and Jovanovich, who studied changing perceptions of poverty in Russia in the mid 1990s, found no evidence that perceptions became inflated as poverty increased; indeed the opposite was rather the case. Neither was the relationship between poverty and heart disease symptoms much affected when psychological distress was controlled for (table 3).

Thirdly, the validity of the questions about heart symptoms was considered. Self-rated heart symptoms and clinically
Table 3  Self-reported heart symptoms by present economic difficulties (men and women aged 18–70, Taganrog 1998)

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>Women</td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
</tr>
<tr>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>0–1 problems</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2–5 problems</td>
<td>1.07 (0.73–1.58)</td>
<td>1.43 (0.99–2.05)</td>
<td>1.05 (0.70–1.57)</td>
<td>1.28 (0.87–1.89)</td>
</tr>
<tr>
<td>5 and more problems</td>
<td>2.39 (1.46–3.91)</td>
<td>2.76 (1.74–4.38)</td>
<td>2.13 (1.26–3.59)</td>
<td>2.22 (1.35–3.65)</td>
</tr>
</tbody>
</table>

Adjusted for age, education and marital status.

Adjusted for age, education and alcohol consumption.

Adjusted for age, education, marital status and psychological distress and poor sleep.

Adj. for all above factors.

Index of present poverty

0–1 problems 1 1 1 1 1 1 1 1 1 1
2–5 problems 1.07 (0.73–1.57) 1.40 (0.97–2.01) 1.03 (0.68–1.55) 1.26 (0.85–1.87)
5 and more problems 2.39 (1.46–3.91) 2.76 (1.74–4.38) 2.13 (1.26–3.59) 2.22 (1.35–3.65) 2.09 (1.22–3.43) 2.66 (1.96–3.74)

ORs (95% CI) adjusted as follows: Model 1, adjusting for age, education and marital status; Model 2, adjusting for age, education, marital status, psychological distress and poor sleep; Model 3, adjusting for age, education, marital status and alcohol consumption; Model 4, adjusting for age, education, marital status and family relations; Model 5, adjusting for all the above factors.

The fact that childhood poverty also adds to risk can be seen as due to earlier problems with health and inadequate nutrition, especially, one would assume, in those individuals who are frail. The population does indeed act directly on the human organism, much the same way as we found to be the case for self-reported heart symptoms in Taganrog.

In conflict with the more relativistic poverty concept advocated by Peter Townsend, Amartya Sen suggested that poverty has an irreducible absolute core, namely the unmet need for food, shelter and social recognition. This concept and its three components seem particularly relevant in the context of present day Russia. Between 1988 and 1998 average income fell in absolute terms, and a majority of the population seems to have experienced a worsening of their economic circumstances. In August 1998, the so-called rouble crisis hit Russia, ending a 3-year-long economic recovery and again leading to the immediate loss of employment, income and savings for many. Unexpectedly, for western observers, poverty at the end of the 1990s was most common among men and women of working age rather than among pensioners, in other words among the same groups for whom circulatory mortality had increased most (in relative terms).

Psychological problems, poor sleep, alcohol drinking and family conflict did not mediate between poverty and heart symptoms in our data. Mechanisms invoking psychological, sleeping or behavioural problems in heart symptomology may still be operating, since precision in measuring is problematic, thus leaving open the possibility that these factors are insufficiently controlled for in models. This may especially be the case for alcohol drinking, the measurement of which in surveys is notoriously difficult. As Westerterp et al. noted, alcohol consumption may replace food consumption (particularly among the poor, one would assume) in a situation where alcohol prices were falling relative to food prices, as was the case in Russia during the 1990s.

However, it would be prudent also to consider alternative mechanisms. Rush and Welch, who in the autumn of 1992 surveyed a random sample of 2300 persons from eight ex-Soviet cities, found that weight loss was strongly associated with not having enough money to buy food and with previous health problems. Median weight loss was 5 kg over a 6 month period. Consumption of vegetables was less than 0.5 kg per week per person. Low consumption of vegetables was linked to heart disease mortality in Poland, according to Zatonski et al. in much the same way as we found to be the case for self-reported heart symptoms in Taganrog.

Perhaps food shortage, or poor food, in the Russian population does indeed act directly on the human organism, especially, one would assume, in those individuals who are frail due to earlier problems with health and inadequate nutrition. The fact that childhood poverty also adds to risk can be seen as...
support for this proposition. If the accumulated experience of economic hardship over the life course can increase heart disease risk, this is certainly relevant for Russia. The unusually large fluctuations and steep rise in cardiovascular mortality in Russia over the last 20 years suggest that we are looking at both a vulnerable population and a strong immediate set of risk factors.

Finally, the above methodological considerations should caution against any far-reaching conclusions. We see the results first and foremost as support for the proposition that heart disease in the 1990s was linked to Russia’s emerging mass poverty. The inability to meet immediate human needs, such as the need for food, may provide a causal pathway. There may also be a more indirect route through lack of social recognition. Both aspects are core elements of poverty, as conceived by Sen. Enabling people to overcome such poverty is not only a matter of their health, but also, as Sen has shown, a prerequisite for their development and freedom.31

Acknowledgements

The Swedish Foundation for Baltic and Eastern European Studies financed several guest research visits to Stockholm for Olga Kisiltsyna. The Council for Working Life and Social Research (FAS) supported the collection of data material. Academician Natalia Rimachevskaya’s help in getting the health survey underway was invaluable. Thanks also to Dr Nina Korkhova and the interviewers and respondents in Taganrog for their willingness and enthusiasm. Dr Per Carlson and Asst Professor Ilkka Mäkinen gave valuable comments to an earlier version of this paper.

Key points

- We wanted to examine to what extent experience of poverty in Taganrog, Russia, was linked to the presence of self-reported heart symptoms.
- Not affording to buy meat, vegetables, clothes and footwear predicted heart symptoms, even when adjusting for psychological distress, alcohol drinking and family conflict.
- Life time accumulated experience of economic hardship contributes to levels of heart symptoms; among women very strongly so.
- Tackling mass poverty is likely to reduce the burden of cardiovascular disease in Russia.

References

19 Stata Corporation. Stata statistical software; release V.0. College Station, TX: Stata Corporation, 1997.

Table 4 Self-reported heart symptoms by past and present economic difficulties (men and women aged 18–70, Taganrog 1998)

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No childhood poverty</td>
<td>Childhood poverty</td>
</tr>
<tr>
<td>0–1 present problems</td>
<td>1</td>
<td>2.72 (1.36–5.42)</td>
</tr>
<tr>
<td>2–4 present problems</td>
<td>1.29 (0.75–2.24)</td>
<td>2.36 (1.35–4.13)</td>
</tr>
<tr>
<td>≥ 5 present problems</td>
<td>2.61 (1.30–5.26)</td>
<td>5.53 (2.73–11.23)</td>
</tr>
<tr>
<td>Significance</td>
<td>P &lt; 0.001</td>
<td></td>
</tr>
</tbody>
</table>

ORs (95% CI) adjusted for age, education and marital status.

Received 4 November 2003, accepted 6 April 2004