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PUBLIC HEALTH

The evolving pattern of avoidable mortality in Russia

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Background Life expectancy at birth in Russia is over 12 years less than in western Europe. This study explores the possible role of medical care in explaining this gap by examining the evolving pattern of mortality amenable to timely and effective medical care in Russia compared with Estonia, Latvia, and Lithuania, and the UK.

Methods Analysis of standardized death rates from causes amenable to health care (*treatable*) or inter-sectoral health policies (*preventable*) in all regions and decomposition of differences in life expectancy between Russia and the UK by age, sex, and cause of death for the period 1965–1999/2000.

Results Death rates from treatable causes remained stable between the mid-1960s and mid-1980s in Russia and the Baltic republics while steadily falling in the UK to less than half the rate in Russia. In the 1990s, rates increased in the former Soviet republics, reaching a peak in 1994 but reversing again in Russia in 1998. Deaths from causes amenable to inter-sectoral health interventions were higher in the UK in 1965 than in the Soviet Union but subsequently fell steadily while they increased in the East. Between 1965 and 1999, the male life expectancy gap between Russia and the UK rose from 3.6 to 15.1 years (women: 1.6 and 7.4 years). Treatable causes became an increasingly important contributor to this gap, accounting for almost 3 years by the end of the 1990s in men and 2 years in women. In Russia, elimination of treatable causes of death would have increased life expectancy by 2.9 years in men in 1995/99 compared with 1.2 years in the UK (women: 3.3 and 1.8 years), suggesting that, were the outcomes of health care achieved in the UK to be obtained in Russia, life expectancy for men might improve by about 1.7 years and for women by about 1.5 years.

Conclusions Our findings suggest that the Soviet health care system has failed to match the achievements of the West over the past three decades, highlighting the need to establish a system that provides effective and equitable care for the Russian population.

Keywords Avoidable mortality, medical care, Russia, Baltic republic, transition

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Life expectancy at birth in Russia is now over 12 years less than in western Europe.[1] The reasons for this difference are complex, reflecting the impact of factors acting at different levels and different points over the life course. One perspective is provided by the health field concept, which identifies four inputs to health: genetic predisposition; environmental circumstances; individual behaviour and lifestyle; and health services.[2] Although a combination of environmental and lifestyle factors, in particular the social consequences of rapid transition and excessive alcohol consumption, superimposed on high rates of smoking and poor nutrition, are the major determinants of the burden of disease afflicting the countries of the former Soviet Union,[3] it is also likely that timely and effective health care could ameliorate their effects.

The concept of avoidable mortality has become established as a way of identifying the contribution of health care to population health. Originally developed by Rutstein *et al.*[4] it designates deaths from particular conditions, at certain ages, as ones that should not occur in the presence of timely and effective health care. It does not imply that health care can prevent the occurrence of these diseases, rather that it can prevent death. Subsequent work has refined this concept by differentiating deaths amenable to health care, such as appendicitis, from those preventable by broader health policy measures, such as traffic injuries and lung cancer.[5–7]

It is important to recognize that these categories are to some extent inexact. There are few conditions that are either entirely amenable or non-amenable and advances in treatment mean that a growing percentage of many deaths categorized as non-amenable to either intersectoral health policies or health care may be avoidable, such as many common cancers.[8] However, these figures are difficult to quantify. This approach does, however, offer a means to compare changes over time and between places in terms of deaths that can, in broad terms, be linked to different sorts of potential intervention.

Research on trends in mortality in the former communist countries of central Europe found that the decline in mortality from causes amenable to medical care had been slower than in the West during the 1970s and 1980s.[9] Later work suggested that deaths from these causes accounted for between a quarter and a third of the gap in life expectancy between the east and west of Europe.[10]

More recent evidence suggests that, while some of the more economically successful former communist countries have seen tangible improvements in outcomes attributable to health care, such as improvement in survival of low birthweight babies[11,12] or in cancer survival,[13,14] others have experienced deterioration as their economies, and their health systems, have weakened.[15] Yet even in those countries that have fared well, such as former East Germany and Poland, causes of death amenable to health care still made a significant contribution to their persisting gap with the West in the late 1990s.[16]

In this paper we examine the changing impact of health care and inter-sectoral health policy since 1965 in Russia by means of analysis of avoidable mortality. For comparison, selected analyses also examine mortality in the three former Soviet republics, Estonia, Latvia, and Lithuania, that have been most successful economically and which are in the process of acceding to the European Union and in a representative western European country, the UK.

Assessing the outcome of health care has received renewed attention following the publication of the 2000 World Health Report,[17] which ranked the world's health care systems on measures of outcome (expressed as disability-adjusted life expectancy), responsiveness, and fairness of financing. The report has been subject to extensive criticism, one aspect of which is the failure to link explicitly health systems to health outcomes,[18] and there is a need to develop a better understanding of this relationship. This study contributes to this process.

Methods

Data

Mortality and population data were obtained by age (age groups 0, 1–4, 5–9,... 80–84, 85+) and sex, and for mortality, cause of death according to successive versions of the International Classification of Diseases (ICD).

The data for the four former Soviet republics were extracted from the reconstructed data sets developed by the Institut National d'Études Démographique (INED). These data include causes of death that were previously not reported for political reasons and have been mapped using validated tables from their original Soviet disease classification into the items of ICD-9.[19–21] With a few exceptions, such as data from Chechnya and, in Russia, some loss of detail in site-specific cancer mortality among older people during the 1990s, they have been found to be a valid source of information.[20]

For the most recent years mortality data for Russia (after 1997) and Russian regions (1999–2000) were taken from the original statistical tables ('forma S51') prepared by Goskomstat (Russian State Statistical Committee). For the Baltic republics, data from 1997–1998 were extracted from the WHO Mortality Database as were data for the UK (1965–1999).[22]

Selection of causes of death

Categorization of causes of death considered 'avoidable' was based on earlier work by Mackenbach *et al.*[23] and Holland,[5,24] separating causes amenable to medical intervention (treatable conditions) from those amenable to inter-sectoral health policies (preventable conditions).[16]

Initial concerns regarding the applicability of previously published lists of 'avoidable' causes of death to Russia prompted us to conduct a validation exercise. This involved structured interviews with 49 health professionals in four Russian cities (Moscow, Tver, Cheliabinsk, and St Petersburg), based on the list of 'avoidable' causes used in our previous study,[16] and a subsequent consultation in which the initial findings were fed back to 27 health professionals in Moscow and Tver.

The list of 'avoidable' conditions produced from this consultation (Table 1) was comparable to that used previously by other authors and led to only minor changes from that used in our earlier study,[16] such as the inclusion of accidental alcohol poisoning as preventable and creation of separate categories for ischaemic heart disease (IHD) and tuberculosis, on grounds of their importance as causes of premature death in the former Soviet Union. Limitations of the data meant, however, that a pragmatic approach had to be taken to capture accidental alcohol poisoning. If narrowly defined it includes the ICD-9 codes E860.0, 860.1, 860.2 only, or group E860 in total ('Accidental poisoning by alcohol, not elsewhere classified'). However, the Basic Tabulation List (BTL) combines E860 with E861–866 that refer to accidental poisoning by substances other than alcohol into the group BTL 481 ('Accidental poisoning by other solid and liquid substances'). Thus it was impossible to separate out accidental alcohol poisoning. Nonetheless, our studies of death certificates in Russia[25] suggest that these other causes will contribute relatively little to this category overall.

Although some of the Russian interviewees had proposed an upper age limit of 60 we feel that excluding deaths over 60 would underestimate what could be achieved, even if it is not possible under present circumstances and thus included all deaths under 75 except for causes specifically related to childhood. However, both 'avoidability' and accuracy of death certification become questionable above age 75.[23]

Table 1 List of 'avoidable' causes of death

Cause of death	ICD-9[a]	Age group
Causes amenable to medical care		
1 Intestinal infections	001–009	0–14
2 Other infectious (Diphtheria, Tetanus, Poliomyelitis)	032, 037, 045	0–74
3 Whooping cough	033	0–14
4 Septicaemia	038	0–74
5 Measles	055	1–14
6 Malignant neoplasm of skin	173	0–74
7 Malignant neoplasm of breast	174	25–74
8 Malignant neoplasm of cervix uteri	180	0–74
9 Malignant neoplasm of testis	186	0–74
10 Hodgkin's disease	201	0–74
11 Leukaemia	204–208	<15
12 Diseases of the thyroid	240–246	0–74
13 Diabetes mellitus	250	0–49
14 Hypertensive disease	401–405	0–74
15 Cerebrovascular disease	430–438	0–74
16 All respiratory diseases (excluding pneumonia /influenza)	460–479, 488–519	1–14
17 Pneumonia/influenza	480–487	0–74
18 Peptic ulcer	531–533	0–74
19 Appendicitis	540–543	0–74
20 Abdominal hernia	550–553	0–74
21 Cholelithiasis and cholecystitis	574–575.1	0–74
22 Nephritis and nephrosis	580–589	0–74
23 Maternal deaths	630–676	All
24 Congenital cardiovascular anomalies	745–747	0–74
25 Perinatal deaths, all causes excluding stillbirths	760–779	All
26 Ischaemic heart disease	410–414	0–74
27 Tuberculosis	010–018, 137	0–74
Causes amenable to intersectoral health policies		
28 Malignant neoplasm of trachea, bronchus, and lung	162	0–74
29 Accidental alcohol poisoning	E860[b]	All
30 Motor vehicle accidents	E810–825	All
31 AIDS	042	All

[a] International Classification of Diseases, Ninth Revision.

[b] See text.

Analyses

The contribution of each category was estimated by decomposing life expectancy by age and cause of death. This enables separation of differences between life expectancies into contributions according to age and cause of death, expressed in years gained or lost. Life expectancy was calculated using standard life table techniques.[26] Decomposition of differences in life expectancy was undertaken using methods developed independently by Andreev,[27] Arriaga,[28] and Pressat.[29] Analyses used Microsoft Excel.

To provide an additional perspective, the hypothetical consequences for life expectancy of eliminating different categories were calculated using the same method of decomposition.

Age-standardized death rates were calculated by direct standardization to the European standard population.[30]

Results

Age-standardized death rates for both sexes combined in each category are shown in Figure 1. Death rates from treatable conditions were similar in Russia, Estonia, Latvia, and the UK in the 1960s, with somewhat lower rates in Lithuania. Over the subsequent two decades rates remained stable in the Soviet republics but from 1970 onwards began to fall steadily in the UK. By 1990 the death rate in the UK had fallen to less than half that in Russia. In the late 1980s deaths from these causes in the Soviet republics began to fall but in the early 1990s they increased once again, reaching a peak in 1994. The increase was steepest in Russia. They subsequently fell back but unlike in the three Baltic republics this recovery was reversed in Russia in 1998.

Patterns of mortality from treatable conditions were largely driven by deaths from hypertension and cerebrovascular disease, contributing consistently about two-thirds in the former Soviet republics and, initially, almost 50% in the UK but falling to one-third by the end of the 1990s.

Deaths from preventable causes, which consist mostly of smoking-related diseases and traffic injuries, had been higher in the UK in 1965 than in the Soviet Union but subsequently fell steadily, reflecting both a longer history of widespread smoking and greater traffic volumes. In contrast, rates in the four Soviet republics increased until 1980, falling during the late 1980s but then increasing before decreasing in the late 1990s. There was a transient decline in the Baltic republics in 1991, coinciding with a Russian blockade on fuel supplies and consequent reduction in traffic, and with it, traffic injuries.

Starting from a higher rate in the 1960s, deaths from IHD in the UK began to fall in the late 1970s. In the Soviet republics they increased during the 1960s and 1970s before a series of fluctuations from the 1980s onwards, with a very large increase in the early 1990s and a subsequent decline, again reversed in Russia in 1998.

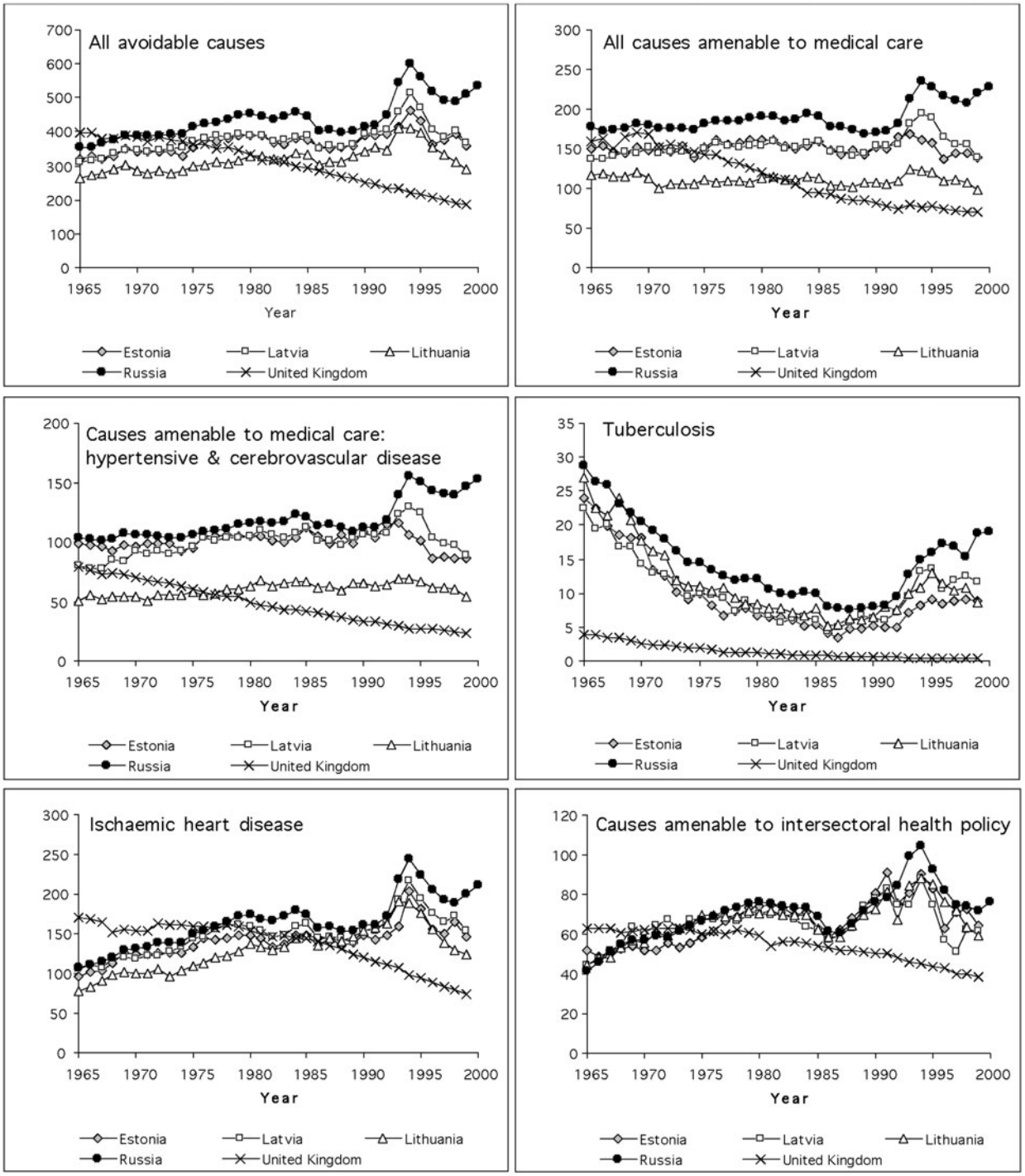

Figure 1 Trends in age-standardized death rates (per 100 000) in each category in Russia, the Baltic states and the UK, 1965–2000

Deaths from tuberculosis have consistently been lower in the UK than in the Soviet republics, where they declined until 1990 and subsequently rose, with no sign yet of a sustained decrease.

The contribution of different categories of cause of death to the growing gap in life expectancy between Russia and the UK is shown in Figure 2. Between 1965 and 1999, the gap in male life expectancy at birth rose from 3.6 to 15.1 years (women: 1.6 and 7.4). The much greater male–female mortality gap in Russia compared with the west is apparent, at 12.5 and 4.8 years in 1999, as is the greater contribution of preventable causes to the gender difference. With the exception of brief periods in the late 1960s and between 1985 and 1989, treatable causes became an increasingly important contributor to the rising life expectancy gap between Russia and the UK in both sexes. Among men, the contribution of treatable causes had been 1.2 years in 1965, remained at around 2 years since the late 1970s, and rose to

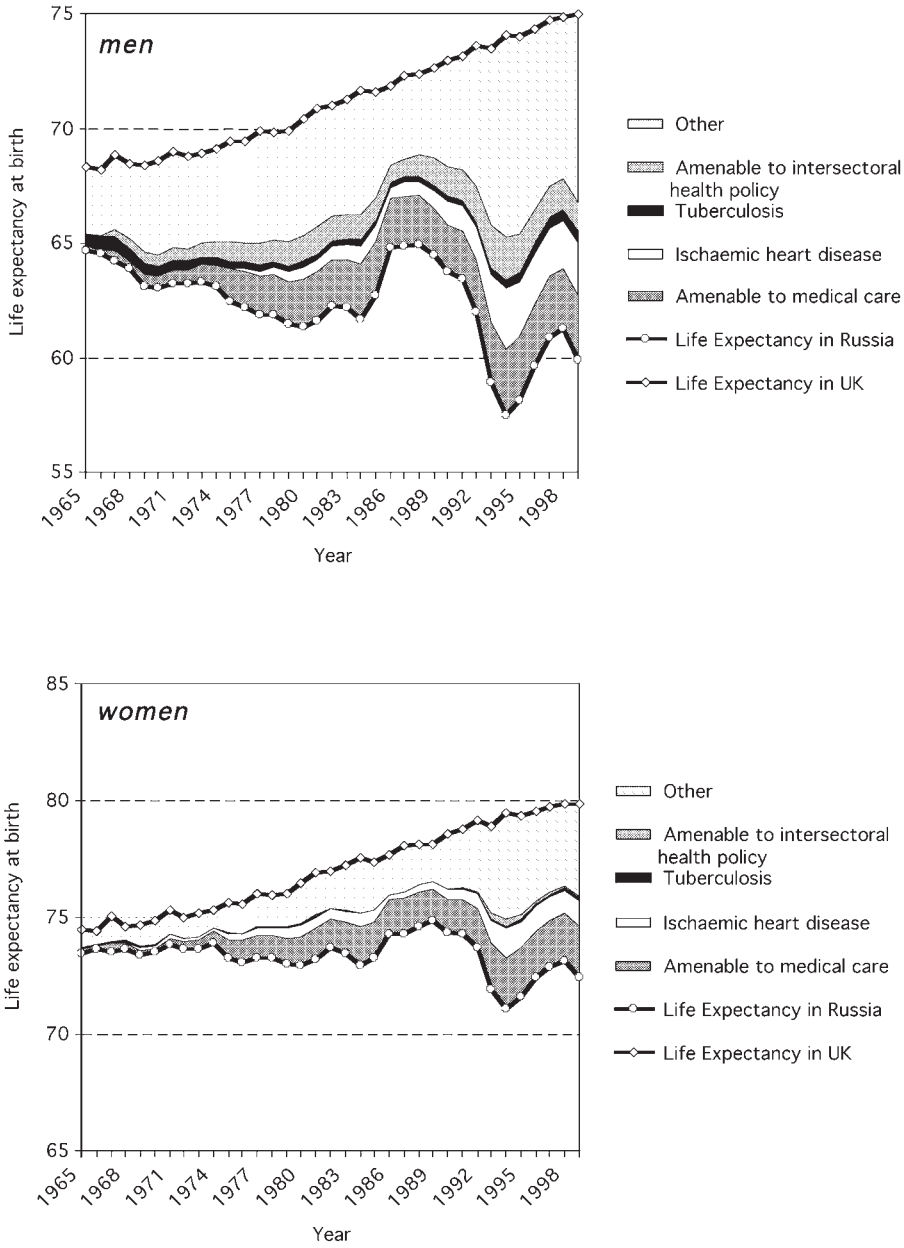

Figure 2 The contribution of deaths in each category to the difference in life expectancy in the UK and Russia

almost 3 years by the end of the 1990s. Among women, treatable causes accounted for half a year of the life expectancy gap in 1965, steadily rising to around 2 years in the 1990s. Since 1990, among men, deaths from IHD have become an equally important contributor to the increasing gap, accounting for about 2.3 years in the mid-1990s.

Table 2 shows the theoretical impact of preventing deaths amenable to medical care, from IHD and from tuberculosis at different time periods in the UK and for the Soviet republics. Among men, elimination of treatable causes would have increased life expectancy by between 2.2 and 3.4 years in the five countries in 1965–1969. By 1995–1999 the figure had fallen from 2.6 to 1.2 years in the UK but by much smaller amounts in the Baltic republics. In Russia, where this would have increased life expectancy by 3.4 years in 1965–1969, the figure was still 2.9 years by 1995–1999, higher than it had been in the UK in 1965–1969. Among women the decline was less in all countries but again was rather greater in the UK than in the Soviet republics. This suggests that, were the outcomes of health care achieved in the UK to be obtained in Russia, life expectancy for men might improve, at a conservative estimate, by about 1.7 years and for women by about 1.5 years.

In contrast, while the impact of treatable causes gradually declined in the former Soviet republics, the impact of IHD actually increased, especially among men. In 1965–1969, eliminating IHD would have increased life expectancy by 1.5–1.8 years in the Baltic republics and Russia compared with 2.8 years in the UK. By the end of the 1990s this figure had reversed, to about

Table 2 Consequences for life expectancy of eliminating deaths in different categories (potential gain in years)

Males						Females					
	Estonia	Latvia	Lithuania	Russia	UK		Estonia	Latvia	Lithuania	Russia	UK
Effects of elimination of causes amenable to medical care											
1965–1969	2.21	2.41	2.30	3.41	2.59	1965–1969	2.60	2.78	2.74	3.62	3.25
1970–1974	2.09	2.24	1.90	3.16	2.54	1970–1974	2.62	2.67	2.32	3.42	3.21
1975–1979	2.27	2.25	1.85	3.26	2.07	1975–1979	2.67	2.63	2.29	3.55	2.79
1980–1984	2.26	2.13	1.75	3.14	1.55	1980–1984	2.60	2.48	2.22	3.46	2.37
1985–1989	2.04	1.95	1.50	2.97	1.21	1985–1989	2.40	2.43	2.07	3.31	2.08
1990–1994	2.01	2.09	1.58	2.75	1.13	1990–1994	2.40	2.53	2.17	3.22	1.93
1995–1999	2.00	2.18	1.58	2.87	1.16	1995–1999	2.41	2.75	2.19	3.34	1.81
Males						**Females**					
	Estonia	Latvia	Lithuania	Russia	UK		Estonia	Latvia	Lithuania	Russia	UK
Effects of elimination of ischaemic heart disease											
1965–1969	1.78	1.84	1.47	1.77	2.80	1965–1969	0.96	1.13	1.09	1.19	1.32
1970–1974	2.06	2.00	1.62	1.98	2.86	1970–1974	1.10	1.17	1.13	1.34	1.23
1975–1979	2.25	2.48	1.97	2.31	2.95	1975–1979	1.23	1.32	1.20	1.50	1.28
1980–1984	2.22	2.50	2.30	2.48	2.91	1980–1984	1.21	1.31	1.31	1.56	1.28
1985–1989	2.34	2.57	2.60	2.51	2.73	1985–1989	1.19	1.24	1.35	1.45	1.25
1990–1994	2.41	2.71	2.90	2.67	2.33	1990–1994	1.27	1.38	1.52	1.54	1.09
1995–1999	2.44	2.65	2.49	2.62	1.88	1995–1999	1.37	1.36	1.29	1.55	0.84
Males						**Females**					
	Estonia	Latvia	Lithuania	Russia	UK		Estonia	Latvia	Lithuania	Russia	UK
Effects of elimination of tuberculosis											
1965–1969	0.50	0.49	0.61	0.64	0.06	1965–1969	0.17	0.17	0.21	0.24	0.04
1970–1974	0.31	0.28	0.35	0.42	0.04	1970–1974	0.07	0.09	0.11	0.13	0.02
1975–1979	0.17	0.19	0.24	0.30	0.03	1975–1979	0.06	0.07	0.07	0.07	0.02
1980–1984	0.13	0.14	0.19	0.25	0.02	1980–1984	0.04	0.05	0.05	0.05	0.01
1985–1989	0.10	0.13	0.16	0.22	0.01	1985–1989	0.03	0.04	0.04	0.04	0.01
1990–1994	0.14	0.19	0.21	0.25	0.01	1990–1994	0.02	0.04	0.05	0.04	0.01
1995–1999	0.21	0.27	0.28	0.40	0.01	1995–1999	0.05	0.08	0.06	0.07	0.01

2.5 and 1.9 years. This was essentially similar among women, although at a lower scale.

Elimination of deaths from tuberculosis would have had little impact in the UK in any of the time periods but would have added over half a year among men and about a fifth of a year among women to life expectancy in the Baltic states and in Russia in 1965–1969. By the end of the 1980s this had fallen considerably in all regions, especially in the Baltic States, although still higher than in the UK 30 years previously. However, since the early 1990s, the potential impact of tuberculosis has been increasing again.

Finally, given the size of Russia, it is possible that the aggregate figures conceal important regional variations. Figures 3a and 3b show regional variations in age-standardized mortality rates across regions of European Russia in 1999–2000. A clear south–north divide is characteristic of mortality from all amenable causes except IHD. Thus, with a few exceptions, mortality in this category is higher in northern regions than that in southern ones. The spatial pattern of mortality from IHD is somewhat different with high mortality concentrated in north-western regions.

Discussion

Analyses such as these clearly depend upon the quality and completeness of information on population and deaths. The comparability of cause-of-death data across time is always a concern. In our study this problem has been addressed by using a previously validated continuous series of mortality data.[18,19] Thus ICD-9 is used for the whole period between the mid-1960s and the late 1990s. Potential problems could have arisen from the transition to ICD-10 in 1997/98 in the Baltic republics and in 1999 in Russia. Although not subject to in-depth study, this transition has not caused any obvious inconsistencies or significant discontinuities in cause-specific trends. In a separate study Shkolnikov and colleagues have examined the contribution to a fall in the precision of coding of cancer deaths in Russia in the late 1980s and 1990s.[31] They found evidence for under-recording of cancer deaths. This was, however, essentially limited to the elderly living in rural areas and is therefore not expected to cause problems as the age-limit in the present study is set at 75 years.

We are unable to address problems related to individuals with AIDS that are infected with tuberculosis. In both Russia and the Baltic republics tuberculosis is responsible for about 75% of deaths within the class of infectious diseases, while there are very few deaths recorded as due to HIV/AIDS: about 100 (<0.2%) in Russia and 1–2 deaths in the Baltic republics. This suggests that some of the rise in tuberculosis deaths could be attributable to the dramatic increase in HIV/AIDS, which is apparent from surveillance data but which is not being revealed in mortality data.

One other issue is that, since the mid-1990s, the Baltic republics began coding of causes of death using detailed ICD terms while Russia continued to use an abbreviated classification of about 250 items based on the original ICD items. This difference is, however, unlikely to produce a bias in aggregate categories used in the present study.

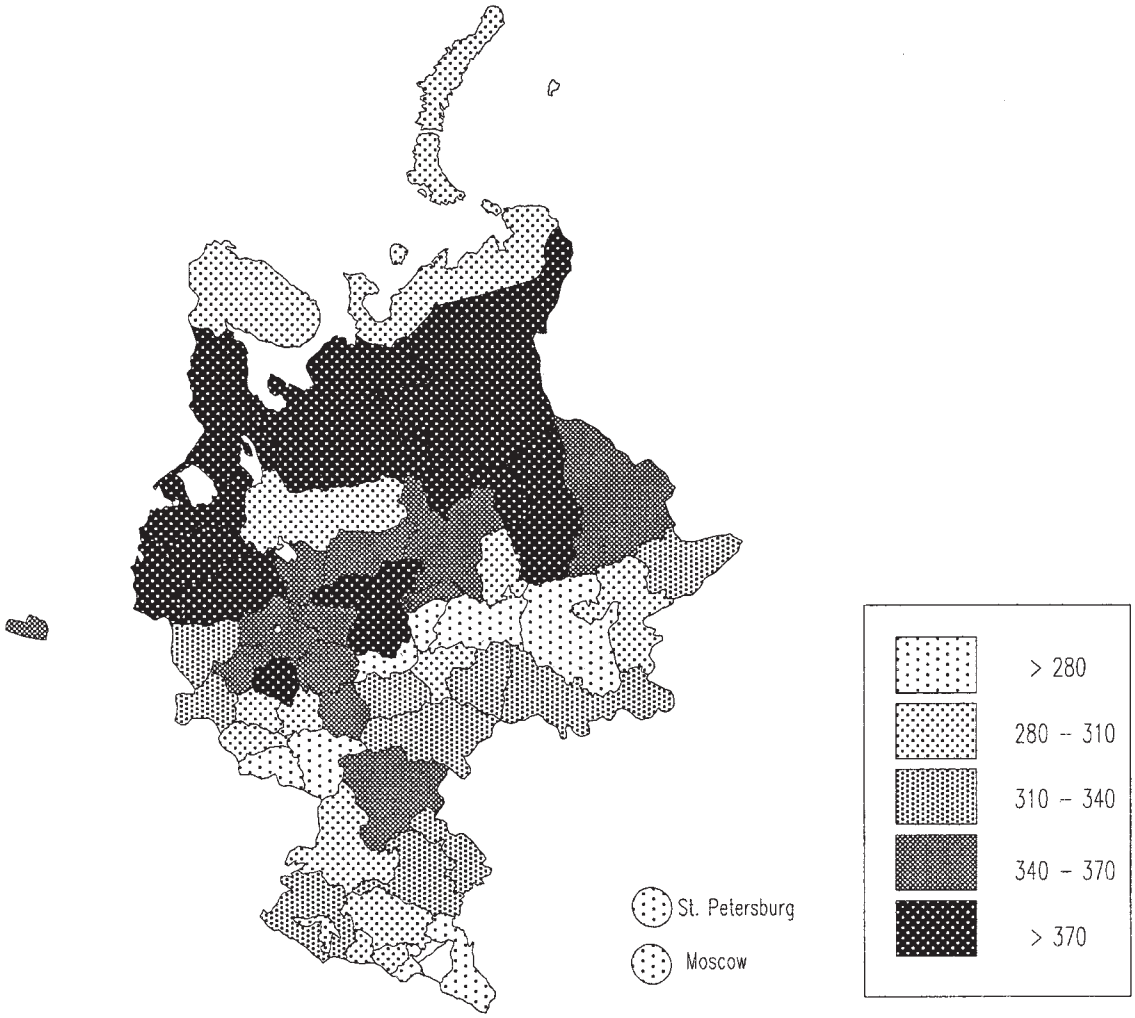

Figure 3a Standardized death rates (per 100 000) for all amenable causes other than ischaemic heart disease by region of European Russia, 1999–2000

As noted in the introduction, these analyses should not be over-interpreted because of the inherent limitations of the concept of avoidability. For example in the earliest years studied, some of the diseases included as amenable to medical care were only theoretically so in any of the countries studied, as the necessary advances had not yet occurred. Conversely, it is very likely that some of the causes included in the category 'other' will be amenable in the future. In addition, the approach is intrinsically conservative. Many people with common cancers are already cured. Many of the deaths from IHD are also preventable. Consequently, estimates of what can be achieved by improved health care will underestimate the true scale of benefit.

The Soviet health care system had many important achievements in the post-war period, extending basic care to many remote areas. Campaigns to control vectors and provide immunization brought many epidemic diseases under control. However, the potential benefits of health care were changing by the 1960s, with the introduction of many new pharmaceutical products and technological advances. The Soviet health care system was unable to take full advantage of these developments, for several reasons. The diversion of resources into the military-industrial complex, accelerating in the 1960s, starved both the Soviet health industry and health care system of resources. The Soviet Union also faced restrictions on its ability to import many technologies, such as computers, that had potential military uses. And Soviet health professionals were often isolated from knowledge of developments in other parts of the world, a situation exacerbated by the secrecy that prevented discussion of the true health situation. Many treatment regimes, including some that are still widely used, were ineffective. In fact, there was considerable diversion of resources into activities of little benefit, such as many of the large-scale screening programmes that were established. This diverted attention from more effective preventive strategies.

There was a reduction in deaths from amenable causes in the late 1980s, coinciding with the period of glasnost and perestroika. This was a period when the Soviet Union was opening up rapidly to Western medical knowledge and an expanded range of modern pharmaceuticals. However, it is also possible that part of this decline could be linked to the effects of Gorbachev's anti-alcohol campaign between 1985 and 1987, in particular deaths from tuberculosis and haemorrhagic stroke.[32]

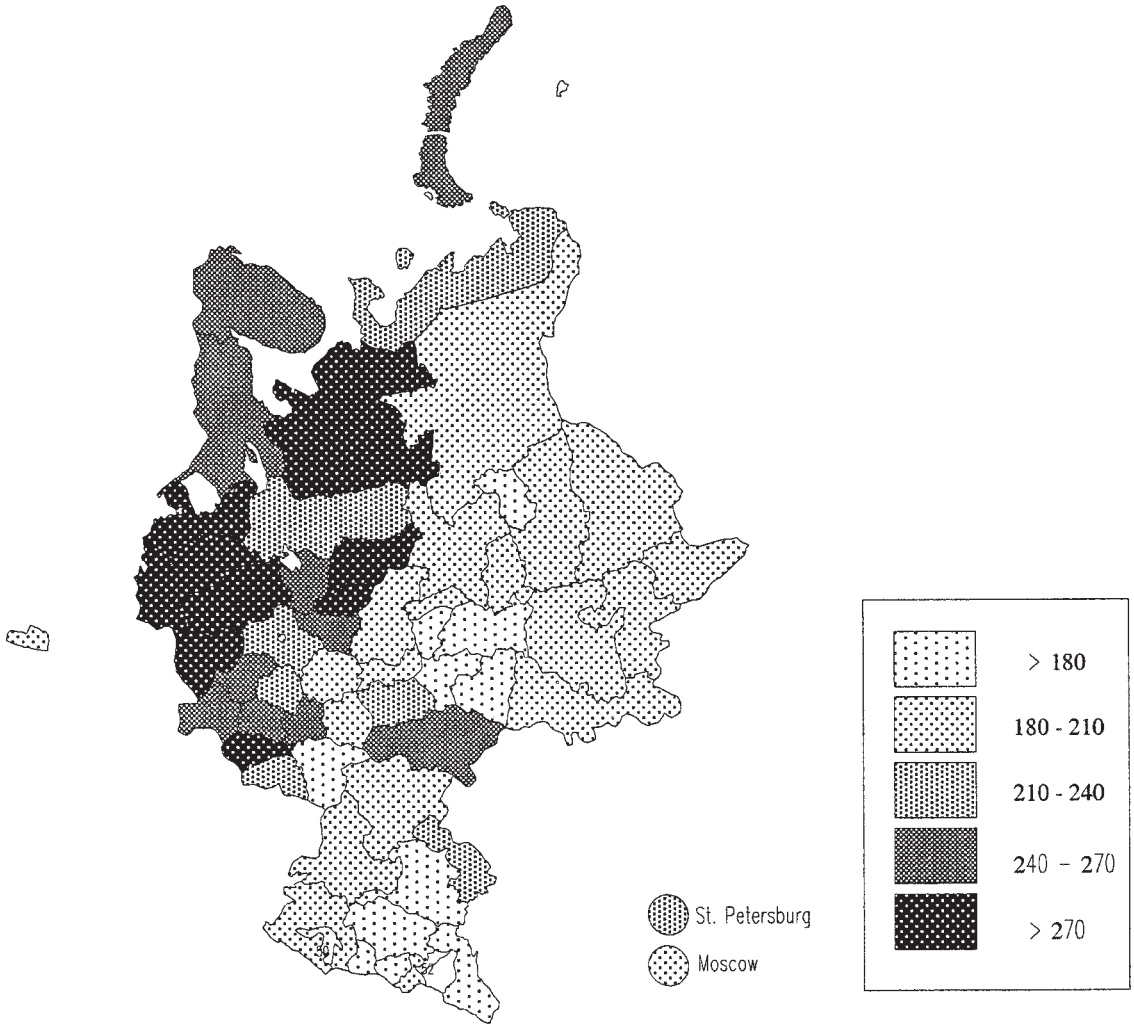

Figure 3b Standardized death rates (per 100 000) for ischaemic heart disease by region of European Russia, 1999–2000

This mortality decline was unfortunately short-lived as the now post-Soviet republics struggled to come to terms with their new situation. Elsewhere we have shown how changes in overall mortality during this period were driven largely by the pace of transition, with the greatest increases in mortality experienced in regions with the most rapid changes in employment.[33] This process led to dramatic increases in alcohol consumption and consequent deaths from injuries, violence, and cardiovascular disease. However, this study also suggests that there was deterioration in the quality of health care. This is supported by other research that sought explanations for the eightfold rise in deaths from diabetes among young people in Ukraine, where it was found that individuals experienced a disruption in supplies of insulin and were unable to obtain specialized care when complications arose.[15]

Interpretation of the geographical patterns identified in the present study should be undertaken with care at this level of aggregate analysis, as the chosen approach of 'avoidable' mortality does not take into account differences in the underlying incidence of disease, or of the severity of disease at presentation. The latter is a function of health-seeking behaviour and thus is partly outside the scope of health services. However, it may also reflect access to care and should therefore, at least in part, be amenable to health services. Moreover, in studies that have taken account of underlying disease incidence significant geographical heterogeneity remained, suggesting that variations in amenable mortality cannot simply be explained by differences in disease incidence.[34,35] Thus, the geographical variation seen in the present analysis seems to indicate that the challenges facing the health care system are greatest in parts of northern Russia, which have been facing major economic problems as central support for heavy industry has collapsed.[36]

By the end of the 1990s it is apparent that a gap had opened between Russia and the Baltic republics. After the disruptions of the early 1990s the Baltic republics were able to rebuild their economies and thus their health care systems. Deaths amenable to medical care have fallen steadily. In contrast, in Russia the improvement after 1994 was slower and was reversed in 1998, coinciding with a major financial crisis. These trends are consistent with popular experience of the quality of the health care system.

Importantly, an emerging gap in amenable mortality between Russia and the Baltic republics is due to the decrease in overall

mortality in the Baltic republics since 1993–1994, which contrasts with the situation in Russia, where mortality has been increasing since 1998.

Interpretation of the data on deaths amenable to inter-sectoral health policies must be undertaken with caution as they combine two major causes with very different time lags between exposure and death. Deaths from lung cancer reflect decisions to begin smoking decades previously and elsewhere we have shown how a contemporary decline in deaths from this cause can be linked to fewer men starting to smoke in the late 1940s and early 1950s.[37] The large changes during the 1990s seen in this study are due largely to the fluctuating levels of traffic injuries, propelled by trends in alcohol consumption.

Interpretation of the trends in IHD is also complex because of the many factors involved, some of which are especially important in the countries of the former Soviet Union. Traditional risk factors such as dietary fat and smoking play a part in the high rates of disease, but a diet low in anti-oxidants also seems to be important,[38] and the fluctuations in the 1990s are related to changes in patterns of alcohol consumption, specifically episodic heavy drinking.[39] In addition, in the light of the trends in mortality amenable to medical care, it would be surprising if the gains from treatment of cardiovascular disease in the West had been achieved in the Soviet bloc. This view is supported by data from the MONICA study which, although limited to a small number of sites, showed that the substantial increase in treatments shown to be effective in the West in the 1980s and 1990s was not seen in eastern Europe.[40]

These findings also highlight the high toll of premature mortality from tuberculosis in the former Soviet Union, with many of the gains in the 1970s being lost.[41] It is especially worrying that the three Baltic republics, despite progress in other areas, have so far been unable to reduce these deaths, although the concern about the possible involvement of AIDS in these deaths should be noted.

The use of aggregate groupings, as in this study, has the benefit of reducing what would otherwise be a vast amount of data into something that is manageable, although at the expense of overlooking trends in individual diseases where specific actions are needed. This must obviously be the next step. For now, however, this paper has shown that the Soviet health care system has failed to match the achievements of the West over the past three decades and, while the trend is now positive in the Baltic republics, it is continuing to deteriorate in Russia. This emphasizes the need for the Russian government and the international donor community to explore how they can establish a health care system that provides effective and equitable care for the Russian population, which the present system clearly does not.

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KEY MESSAGES

- Between 1965 and 1999 the male life expectancy gap between Russia and the UK rose from 3.6 to 15.1 years (women: 1.6 and 7.4 years).
- Part of this gap is attributable to conditions amenable to medical care.
- Were the outcomes of health care seen in the UK to be achieved in Russia, life expectancy at birth might improve by at least 1.5 years.
- There is a need to establish a health care system in Russia that provides effective and equitable care for the population.

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Commentary: Should we not go further than descriptions of avoidable mortality?

WW Holland

The paper by Andreev and his colleagues[1] is an interesting and thought-provoking article. It examines, in some detail, both trends and variations in the certified causes of death of a number of conditions which are considered to reflect either the quality and effectiveness of clinical care or the presence, and application, of national policies intended to reduce mortality from a number of behavioural risks, e.g. smoking, road accidents, and alcohol. The authors demonstrate that while death rates from these conditions were falling in the UK, between the mid 1960s and the mid 1980s the rates were stable in Russia and then began to increase in the 1990s, reaching a peak in 1994. There are similar marked variations between Russian regions, as has been described in other European Countries.

The authors comment that 'the concept of avoidable mortality has become established as a way of identifying the contribution of health care to population health'. It is worthwhile considering this statement.

Concern with the performance of health services is a relatively recent, but logical development, given the apparently inexhaustible demand for health care. An example of this was the controversial WHO Report[2] which compared national health systems but, as Andreev *et al.*[1] point out, was not concerned with outcome. Donabedian,[3–5] the most scholarly and one of the first workers in this field, identified three components of heath care—its structure or organization, its process, and outcomes—about which it is necessary to obtain information in an assessment of health care quality. Doll,[6] in this journal, recognized three major components to evaluation—economic efficiency, social acceptability, and medical efficiency. Although infant mortality rates have long been used in global assessments of a country or region's health services, it was not until a working group chaired by Rutstein[7,8] that a more comprehensive and systematic proposal was made to use certain other causes of mortality to examine the quality of care as a measure of outcome.

Consideration of the concept of 'avoidable mortality' raises a number of issues and demonstrates the time it can take for a concept to be disseminated. Although Rutstein *et al.*[7] first published their proposed list in 1976, it was not until 1983 that it was applied to examining the performance of a national health service.[9] As Andreev *et al.*[1] illustrate, it has since that time been used in many countries in Europe, the Americas, and Asia, with a steady increase in number of publications since the late 1980s.

Although there have been some critical publications, (e.g. Carr Hill[10]) the concept has continued in use. It is, however, worrying that little progress has been made in advancing the original concept.

In choosing the conditions included in the concept 'avoidable' the authors[9] who first applied it consulted and discussed these, at length, with clinical colleagues and, in a number of instances, limited the age ranges analysed, e.g. 5–49 for pneumonia and bronchitis, and 5–34 for Hodgkin's disease. Subsequent authors, e.g. Andreev,[1] have both extended the list and age ranges, e.g. Hodgkin's ages 0–74, pneumonia/influenza 0–74, nephritis and nephrosis ages 0–74.

Although it is usually stated that in some of the categories, e.g. cancer, only some deaths are avoidable, looking at trends over time for these conditions allows advances in the application of effective treatment to be identified. Andreev *et al.*,[1] in contrast to some other workers, were careful to consult with local health professionals to ensure the validity and acceptability of the classification. Nonetheless, in spite of advice for an upper age limit of 60 years, this was rejected as '… it would underestimate what could be achieved …'. But this ignores the possible errors in death certification particularly in the elderly, where death may be due to multiple causes and certification has often been shown to be fallible.

Of far greater concern has been the neglect by epidemiological researchers of both the validity of the findings and their application to improving clinical services.

Death rates from 'causes amenable to intersectoral heath policies' such as cancer of the lung and motor vehicle accidents, and those from conditions prevented by immunization such as whooping cough, measles, and diphtheria, have long been used to influence health policies at central level. Apart from maternal and infant mortality there are, however, relatively few examples of systematic investigation, locally or nationally, to identify the possible causes for failure and what can be done to improve outcome. This is of particular importance at local levels and can identify bad practice which can be easily remedied.[11]

The concept of avoidable/amenable mortality is an interesting example of the use of descriptive epidemiology which can influence the delivery of both health and clinical services. It now deserves closer analytical, systematic scrutiny, and investigation at both local and national level so it can contribute to the remedy of the failures it describes.

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