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Research Article

Progress in health care, progress in health? Patterns of amenable mortality in central and eastern Europe before and after political transition

Ellen Nolte

Rembrandt Scholz

Martin McKee

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Demographic Research – Special Collection 2: Article 6
-- Determinants of Diverging Trends in Mortality --

Research Article

Progress in health care, progress in health? Patterns of amenable mortality in central and eastern Europe before and after political transition

Ellen Nolte[1, 3]

Rembrandt Scholz[2]

Martin McKee[1]

Abstract

This paper examines the potential impact of changes in medical care on changing population health in Lithuania, Hungary and Romania, with west Germany included for comparison. We used the concept of deaths from certain causes that should not occur in the presence of timely and effective health care (*amenable mortality*) and calculated the contribution of changes in mortality from these conditions to changes in life expectancy between birth and age 75 [$e_{(0\text{-}75)}$] for the periods 1980/81 to 1988 and 1992 to 1997.

Temporary life expectancy improved consistently in west Germany (men: 2.7 years, women: 1.6 years). In contrast, gains were relatively small in the other countries, except among Hungarian women, who gained 1.3 years. Romanian men lost 1.3 years. In the 1980s, falling infant mortality made a substantial contribution to improvements in temporary life expectancy in all countries, of about a quarter to half a year. Of this, more than half can be attributed to amenable conditions.

At older ages, falling amenable mortality contributed about 40% among those aged over 40 in Germany and, to a lesser extent, Hungary, while causing a loss of life expectancy in Romania.

[1] European Centre on Health of Societies in Transition, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, United Kingdom

[2] Max Planck Institute for Demographic Research, Konrad-Zuse-Str. 1, 18057 Rostock, Germany

[3] Corresponding author; Phone: +44 (0)20 7 612 7809. Fax: +44 (0)20 7 612 7812. Email: ellen.nolte@lshtm.ac.uk

In the 1990s, improvements in infant mortality continued to make substantial contributions to life expectancy in Lithuania and Hungary but had little impact in either Germany or Romania. Among adults, improvements in amenable mortality continued to benefit Hungarians and west Germans. In Lithuania, up to two-thirds of the gain in temporary life expectancy were attributable to falling mortality from ischaemic heart disease whereas medical care otherwise seems to have had a negative impact. Romanian men and women experienced increases in amenable mortality that contributed up to a half of the overall loss of life expectancy.

Our findings suggest that during the last 20 years changes in medical care had considerable impact, positively as well as negatively, on changing mortality in selected central and eastern European countries.

1. Introduction

During the last 30 years the health of the peoples of central and eastern Europe underwent changes that were very different from health patterns seen in their western neighbours. After a period of stagnating or even increasing mortality especially during the 1980s many countries in this region experienced a mortality crisis in the early 1990s after the fall of communism. In some countries, this worsening of mortality was short-lived and followed by improvements in health, which were rapid in some countries, such as east Germany, Poland and the Czech Republic, and delayed in others, such as Hungary (Zatoński and Boyle 1996; Dzúrová 2000; Nolte, Shkolnikov and McKee 2000). In contrast, there was a continuing steady deterioration in Bulgaria and Romania until the late 1990s (Dolea, Nolte and McKee 2002). In countries such as Russia and the Baltic States life expectancy at birth has been increasing again since 1994, which almost succeeded in reversing the rapid decline associated with the break-up of the Soviet Union (McKee 2000; Shkolnikov, McKee and Leon 2001). In Russia, however, this improvement was arrested in 1998 and has since reversed.

The reasons for this diversity in patterns of changing mortality are multifaceted, reflecting a complex interplay of factors, ranging from underlying economic and political circumstances to more proximal risk factors, such as lifestyle related determinants of health. However, we now have evidence that changes in health care, associated with the socio-economic transition also contributed to changes in population health in central and eastern Europe. Recent research 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 birth weight babies (Koupilová, McKee and Holčik 1998; Nolte, Brand, Koupilová and McKee 2000) or in cancer survival (Becker and Boyle 1997; Shkolnikov et al. 1999) others have experienced deterioration as their economies, and their health systems, have weakened (Telishevska, Chenet and McKee 2001).

This paper builds on our earlier work that sought to quantify the contribution of medical care to changes in mortality in east and west Germany and Poland, using the concept of deaths from certain causes that should not occur in the presence of timely and effective health care (Nolte et al. 2002). This has given rise to the development of a variety of terms including "avoidable mortality" and "mortality amenable to medical/health care". This concept was originally developed by *Rutstein* and co-workers in the 1970s as a measure of the quality of medical care (Rutstein et al. 1976) and was subsequently adopted by a wide range of researchers especially in Europe (Charlton et al. 1983; Holland 1988).

In this paper we expand this work to examine Lithuania, Hungary and Romania, with west Germany included for comparison. These countries have followed very

different trajectories since the break up of the Soviet Union with implications for the scale and pace of health care reform. Hungary was one of the more successful of the communist bloc countries, already taking cautious steps to liberalise its economy in the 1980s. Romania under Ceaucescu was isolated even within the communist bloc and was slow to reform. Lithuania had been part of the Soviet Union, and so relatively isolated from developments elsewhere but then rapidly opened to the west, facilitated by its close links to Scandinavia.

To assess the potential impact of changing health care on population health we examine the contribution of changes in amenable mortality to overall life expectancy during the 1980s, when the then communist countries failed to achieve the improvements in life expectancy seen in the west, and in the 1990s, when they began to experience some recovery.

2. Methods

2.1. Data

Mortality data were extracted from the World Health Organization (WHO) mortality files for the years 1980 to 1997 (Lithuania: 1981-1982, 1985-1997) (WHO 2002). Data for west Germany were only available to 1990 from this source; additional data were thus obtained from the Statistical Office Germany (Statistisches Bundesamt 1990-1997). Data include deaths in each year, using the 9th (abbreviated basic tabulation list) and/or 10th revision of the International Classification of Diseases (ICD) by sex and 5-year age band (with infant deaths listed separately). Population numbers by sex and age were obtained from the same sources.

2.2. Selection of causes of death

As in our earlier work (Nolte et al. 2002) the present study considered 28 conditions/groups of conditions as amenable to medical care (Table 1). The conditions selected in the present analysis were considered indicators of the impact of health care, e.g. secondary prevention or medical treatment, thus designated amenable conditions. The conditions were chosen on the basis of having identifiable effective interventions and being administered by health care providers. They were, however, not intended to cover all causes that are potentially treatable. Rather, it was assumed that while not all deaths from these causes would be 'avoidable', health services could contribute substantially to minimising mortality. Ischaemic heart disease (IHD) was treated

separately as (1) the precise contribution of medical care to reductions in deaths from this condition is unresolved (Tunstall-Pedoe et al. 2000), (2) IHD may be understood as an indicator of medical care but also for health policy, and (3) the large number of deaths involved is likely to conceal the impact of medical care on diseases other than IHD.

Table 1: *List of amenable causes of death*

Cause of death	ICD 9	ICD 10
Infectious diseases:		
intestinal infections, tuberculosis, diphtheria, tetanus, poliomyelitis, osteomyelitis, whooping cough, septicaemia, measles	001-009*, 010-018, 032, 033*, 037, 038, 045, 055†, 137, 730	A00-09*, A15-19A35, A36, A37*, A40-41, A80, B05†, B90, M462
Malignant neoplasms:		
skin, breast, cervix uteri, testis, Hodgkin's disease, leukaemia	173, 174, 180, 186, 201, 204-208*	C44, C50, C53, C62, C81, C91-95*
Endocrine, nutritional and metabolic diseases:		
diseases of thyroid, diabetes mellitus	240-246, 250‡	E00-07, E10-14‡
Circulatory diseases:		
chronic rheumatic heart disease, hypertensive disease, cerebrovascular disease	393-398, 401-405, 430-438	I05-09, I10-13, I15, I60-69
Respiratory diseases	460-479†, 488-519†, 480-487	J00-09†, J19-99†, J10-18
Diseases of digestive system:		
peptic ulcer, appendicitis, abdominal hernia, cholelithiasis & cholecystitis	531-533, 540-543, 550-553, 574-575.1	K25-27, K35-38, K40-46, K80-82
Genitourinary diseases:		
nephritis & nephrosis, benign prostatic hyperplasia	580-589	N00-07, N17-19, N25-27, N40
Maternal deaths	630-676	O00-99
Congenital cardiovascular anomalies	745-747	Q20-28
Perinatal deaths, all causes excluding stillbirths	760-779	P00-96
Ischaemic heart disease	410-414	I20-25

Notes:
* ages 0-14; † ages 1-14; ‡ ages 0-49

Three cause groups were thus analysed: amenable conditions, IHD and 'other causes', comprising the remaining causes of death.

A minor amendment was necessary for Lithuania because it was not possible to obtain sufficiently detailed published data until 1993 as data provided to WHO were coded in part according to the Soviet classification of diseases. Thus five causes or groups of causes (ICD 9 173, 186, 201, 240-46, 550-553) could not be extracted from the data format available to us. For this reason, these causes were excluded from the analysis for Lithuania.

We generally considered age 75 as upper limit of 'avoidability' of death but set different age limits for selected conditions such as diabetes mellitus, at age 50, because the avoidability of deaths at older ages from diabetes, and in particular the

effectiveness of good diabetic control in reducing vascular complications remains controversial.

2.3. Analysis

To examine mortality in Lithuania, Hungary and Romania, the period 1980 (Lithuania: 1981) to 1988 was chosen to assess changes before the political transition. To enable comparisons in the years after transition and with our earlier work, and taking account of data availability, we chose the period 1992 to 1997 for each region.

The contribution of mortality in 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 (Chiang 1984). Because of the age limit mentioned earlier, the analyses were based on temporary life expectancy between birth and age 75 [$e_{(0\text{-}75)}$] rather than life expectancy at birth.

Decomposition of differences in life expectancy was undertaken using methods developed independently by Andreev (1982), Arriaga (1984), and Pressat (1985). Analyses used Microsoft Excel. Age-standardised death rates for the whole period (Lithuania: 1981, 1985-1997) were calculated by direct standardisation to the European standard population (Waterhouse et al.1976).

3. Results

Temporary life expectancy improved consistently for men and women in west Germany, with a gain of 2.7 years for men and 1.6 years in women. The greater part of these increases occurred in the 1980s (Figure 1, Table 2). In contrast, gains were relatively small in the other countries, except among Hungarian women, who gained 1.3 years. Romanian men actually lost 1.3 years. For Lithuanian men, a large gain during the 1980s was almost completely lost in the 1990s, with temporary life expectancy in 1997 only 0.7 years greater than it had been 16 years previously. Men in Hungary and Romania both experienced a period of small losses in the mid or late 1980s, temporary improvements around 1990 and again losses in the 1990s. However, whilst among Hungarian men this was followed by an increase of 1.5 years in the late 1990s, Romanian men experienced a continued downward trend until 1997.

Table 2: *Life expectancy between birth and age 75 in Lithuania, Hungary, Romania and west Germany since 1980 (in years)*

	Life expectancy between birth and age 75			
Country	**1980***	**1988**	**1992**	**1997**
	Males			
Lithuania	62.08	64.00	61.95	62.82
Hungary	63.25	63.54	62.28	63.77
Romania	63.68	63.46	63.18	62.42
W-Germany	*66.43*	*68.04*	*68.50*	*69.12*
	Females			
Lithuania	68.93	69.64	69.22	69.92
Hungary	68.09	68.73	68.55	69.39
Romania	67.51	67.63	68.27	68.10
W-Germany	*70.14*	*71.18*	*71.47*	*71.78*

Note:
* Lithuania: 1981

Among women the pattern was essentially similar although there has been a general upward trend over the entire period. As with men this encompassed temporary losses in the mid/late 1980s in Hungary and Romania and, in the early 1990s, in Lithuania (Figure 1).

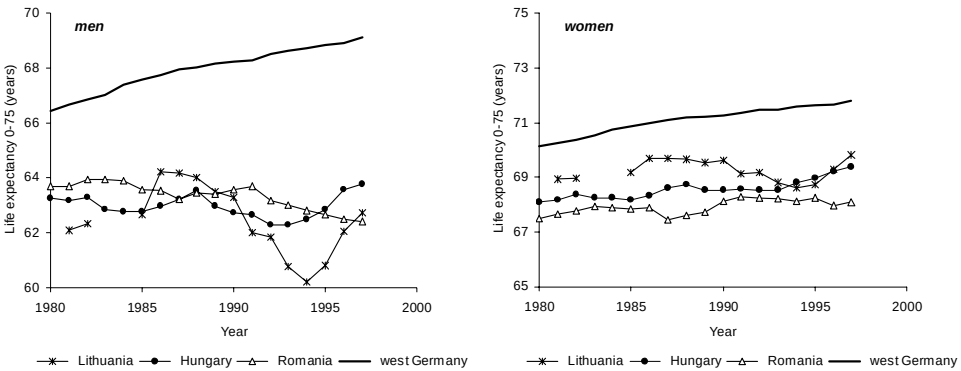

Figure 1: *Life expectancy between birth and age 75 in Lithuania, Hungary, Romania and west Germany: 1980-1997*

These figures do, of course, relate only to deaths under 75, so it is important to note that they do not account for the entire improvement in life expectancy at birth. The relative importance differed, however, between countries, with deaths under 75 accounting for about 80% of the overall improvement in life expectancy at birth in both Lithuania, Romania and Hungarian men whereas this proportion was much lower in Hungarian women, at 60%. In west Germany in the 1990s, changes in mortality under 75 contributed only about 40% to the increase in life expectancy at birth among women and about half among men as advances in health at old age have become increasingly important in shaping the overall pattern of mortality (data not shown).

3.1. Amenable mortality in the 1980s

Figure 2 shows the contribution to changes in temporary life expectancy at different ages and from different groups of causes during the 1980s (see also Table A1 in Appendix). In all countries falling infant mortality made a substantial contribution to gains in life expectancy, ranging from a quarter to half a year. Of this, more than half can be attributed to conditions amenable to medical care. At older ages, however, there is a very diverse picture, with improvements in amenable mortality contributing to sizeable gains among those aged over 40 in Germany and, to a lesser extent, Hungary, while worsening amenable mortality actually caused a loss of life expectancy in Romania.

The substantial, although short-lived improvement in life expectancy in Lithuanian men of 1.9 years between 1981 and 1988 can be seen to be due largely to causes that are not easily amenable to medical care, primarily injuries and violence and cardiovascular disease. Still, about a fifth of the overall gain can be attributed to amenable conditions. Among Lithuanian women the gain due to conditions amenable to medical care was smaller, at just over one tenth of a year, but this was just over half of the overall improvement.

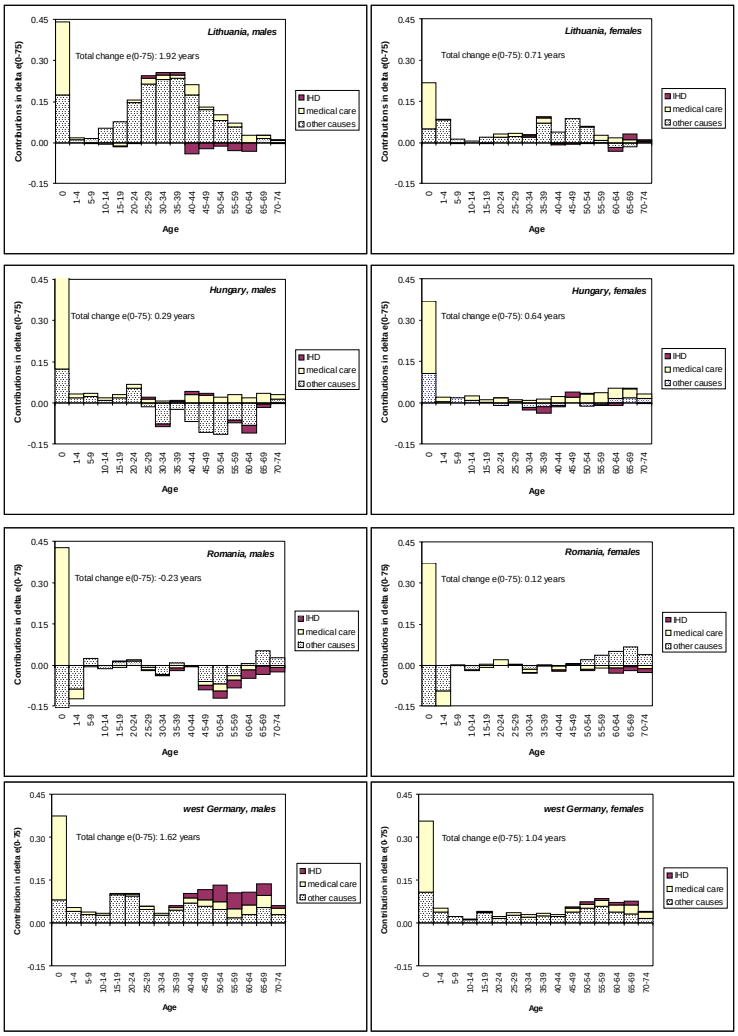

Figure 2: *Age- and cause specific contributions to changes in life expectancy in Lithuania, Hungary, Romania and west Germany: 1980/81-1988*

In Hungary in the 1980s, men achieved a substantial gain in temporary life expectancy due to falling amenable mortality, of 0.6 of a year, but this was more than offset by

losses from other causes. The improvement in temporary life expectancy seen in women of 0.64 years was almost entirely attributable to declining mortality from amenable conditions, contributing almost 0.6 of a year. However, in contrast to men there was also a reduction in mortality from other causes, although only among the young and women over 60. In Romania, both men and women gained about a quarter of a year that was due to declining mortality from amenable causes but increases in deaths from other causes, in particular ischaemic heart disease, almost completely reversed this gain. This resulted in an overall reduction in temporary life expectancy of 0.2 of a year in men whereas among women the improvements achieved by falling mortality from amenable conditions were approximately halved by the rise in death rates from other causes.

In contrast, in west Germany, in both sexes falling amenable mortality contributed about 40% to the substantial overall improvement in temporary life expectancy.

3.2. Amenable mortality in the 1990s

In the 1990s, an even more diverse picture can be seen (Figure 3, Table A2 in Appendix). Improvements in infant mortality continued to make substantial contributions to life expectancy in Lithuania and Hungary. However they had little impact in either Germany, which had already achieved a rate from which further improvements would be difficult, and Romania, where rates remained very high. This is further illustrated by age-standardised death rates (Table A3 in Appendix) that show continuous falls in mortality rates from amenable conditions among the under 15s in all countries except Romania.

In Lithuanian men two-thirds of the overall gain in life expectancy of 0.9 years between 1992 and 1997 was attributable to reductions in deaths from ischaemic heart disease, with the remainder attributable to the fall in infant mortality. Medical care otherwise seems to have had a slightly negative impact among those aged 15+. Among Lithuanian women declining mortality from IHD contributed about one third to the increase in temporary life expectancy of 0.7 years whereas falling infant mortality accounted for almost half of the overall improvement. As in men, among those aged over 15 worsening amenable mortality had a slightly negative impact.

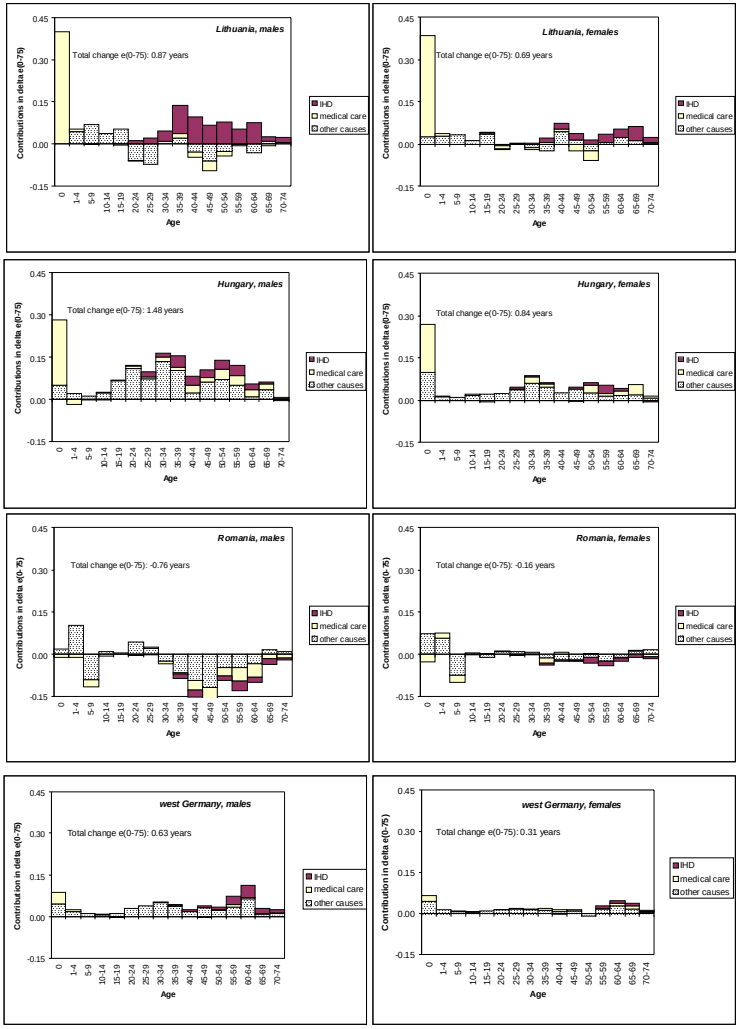

Figure 3: *Age- and cause specific contributions to changes in life expectancy in Lithuania, Hungary, Romania and west Germany: 1992-1997*

Among Hungarian men, improving amenable mortality among adults and falling ischaemic heart disease each contributed about 15% to the overall increase in temporary life expectancy of 1.5 years. Among women, the contribution of amenable mortality among adults to improving life expectancy of 0.8 years between 1992 and 1997 was similar to that seen in men, at 15%, whereas the contribution of declining IHD was less important, contributing only 7%.

Romanian men and women, in contrast, experienced actual worsening of amenable mortality that accounted for almost 40% of the overall decline in temporary life expectancy between 1992 and 1997, of 0.8 years in men and 0.2 years in women. A particular feature is the negative contribution of increasing deaths among children aged 5-9 (Figure 3). Also in contrast to all other countries included in this analysis, Romanian men and women experienced increases in mortality from ischaemic heart disease, further contributing to the overall loss of temporary life expectancy in the 1990s.

In west Germany improvements in causes amenable to medical care among adults made only a small contribution, of 12% in men and a quarter in women, to the overall gain in life expectancy, of 0.6 years in men and 0.3 years in women.

3.3. Age standardised death rates

The overall pattern of amenable mortality in the four countries during the 1980s and 1990s is further illustrated by standardised death rates (for deaths under age 75) relative to trends in all cause mortality (Figure 4). Actual levels of amenable mortality vary considerably between countries, with, in the early 1980s, rates in Romania and Hungary being twice as high as those seen in west Germany while all cause mortality exceeded rates in Germany by about 20% (Romanian men) to almost 50% (women). In contrast, in Lithuania levels of amenable mortality were considerably lower, although still higher than levels seen in Germany, by about 50%, roughly similar to the relative difference in all cause mortality. The relative distance to rates in west Germany increased in all countries, mainly because of a sustained decline in amenable mortality of 31% in men and 40% in women in Germany while the other countries lagged behind, although at varying degree. Thus, Hungary also saw declines in amenable mortality between 1980 and 1997, of about one third in both sexes. Romanian men, in contrast, experienced an increase in amenable mortality of 20% between 1980 and 1997 while, despite some fluctuations, there was little change in among women in Romania.

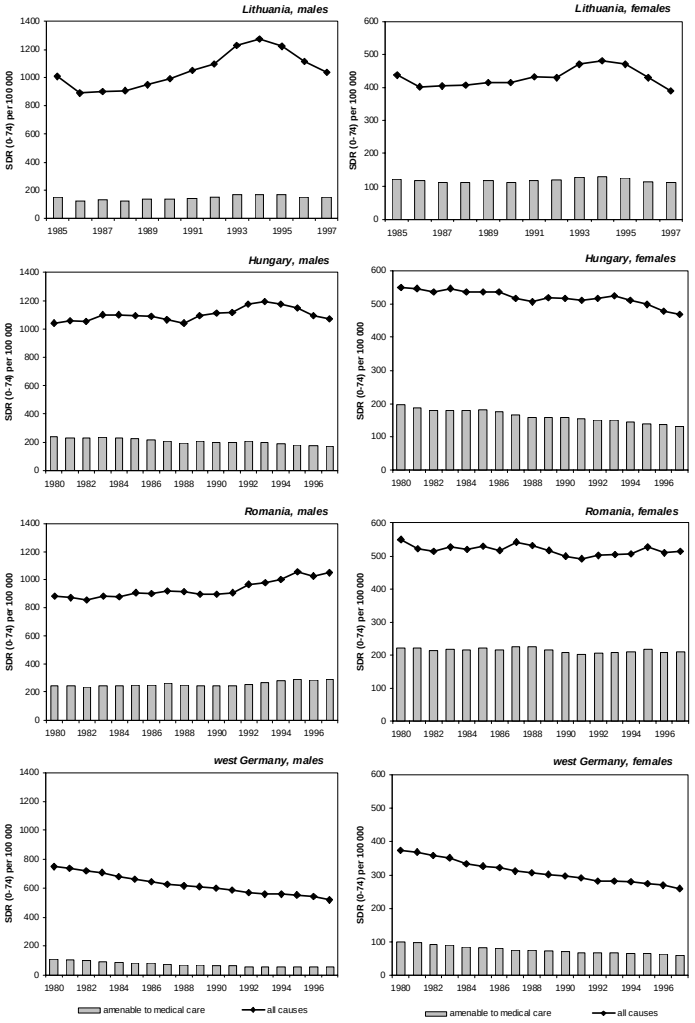

Figure 4: *Standardised death rates per 100,000 population for all causes and for causes amenable to health care in Lithuania, Hungary, Romania and west Germany, 1980/85-1997*

Yet another pattern was seen in Lithuania where, between the mid-1980s and early 1990s amenable mortality fell by about 10% but then increased again until 1995, followed by subsequent decline, similar to the pattern in all cause mortality. As a consequence, in 1997 mortality rates among men were very similar to those seen in 1985 while among women amenable mortality had fallen by about 7%.

4. Discussion

4.1. Data quality

Before discussing the findings of the present study it is necessary to explore some of its limitations. Any study using routinely collected mortality statistics must take account of possible problems related to quality and completeness of data. The quality of data from the Baltic Republics is thought to have been similar to that in the west during the Soviet period. In fact, Lithuanian data may have been of higher quality than in neighbouring republics because, unlike the rest of the Soviet Union, data were coded first using the more precise International Classification of Disease, before being translated into the Soviet classification for transmission to the World Health Organization (European Observatory on Health Care Systems 2000). In Romania, all deaths have to be registered after being certified by a physician and it is estimated that 95% of deaths are medically certified (WHO 1998) whereas in Hungary virtually all deaths are believed to be medically certified (WHO 1989). Systematic investigations of the quality of data have not been undertaken. We are, however, not aware of any changes in the process of certifying and coding of causes of death in the countries and periods studied with the exception of Hungary where ICD-10 was introduced in 1996. However, inspection of mortality trends by selected causes suggests that, with the possible exception of liver cirrhosis, which is not included as separate category in our study, this transition has not caused any obvious inconsistencies. Furthermore, to minimise any effect from possible variation in coding practices we used broad diagnostic categories.

Potential problems may, however, arise from changes in the definition of a live birth. Thus, following the adoption of the WHO recommendations for defining live and stillbirths, Lithuania experienced a substantial rise in infant mortality in 1991 that is believed to be a direct consequence of these changes in legal definitions (Gourbin and Masuy-Stroobant 1995). However, we do not expect any problems as we chose 1992 as the baseline for the second period studied, the same year the adverse trend in infant mortality in Lithuania reversed (WHO 2002). In contrast, in Romania and

Hungary there has not been any change in the definition of a live birth and is therefore unlikely to have had an impact on observed changes in mortality.

4.2. Selection of causes of death

It is important to recognise that any list of indicators of 'avoidable' mortality used is, to some extent, arbitrary as a death from any cause is typically the final event in a complex chain of events. The choice of category is essentially based on a judgement about the relative effectiveness of different interventions that might prevent death. Thus amenable conditions are those from which it is reasonable to expect death to be averted even after the condition is developed. This includes causes such as appendicitis and hypertension, where the medical nature of the intervention is apparent, they also include causes of deaths susceptible to secondary prevention through early detection and effective treatment, such as cancer of the cervix uteri, for which effective screening programmes exist, and such as tuberculosis where, although the acquisition of disease is largely driven by socio-economic conditions, timely treatment is effective in preventing mortality.

We recognise that the division of conditions into 'amenable' and 'other' is invariably inexact as there are few conditions that are either entirely amenable or non-amenable and advances in treatment mean that many conditions may have become amenable over time, such as many common cancers (Richards et al. 2000). 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.

4.3. Changing patterns of amenable mortality

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 (Boys, Forster and Jozan 1991). 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 (Velkova, Wolleswinkel-van den Bosch and Mackenbach 1997). Our findings on the potential contribution of medical care to changing mortality patterns in Lithuania, Hungary, Romania and west Germany in the 1980s agree with these and other analyses (Gaižauskienė and Gurevičius 1995; Gaižauskienė and Westerling 1995), extending this early work into the 1990s. The findings of the present study do, however, paint a

rather complex picture. Nonetheless, it is possible to draw some conclusions about the potential contribution of medical care to changing life expectancy in these four diverse countries over the past 20 years.

Medical care made a significant contribution in both west Germany and Hungary in the 1980s, although at this time overall life expectancy in west Germany was considerably longer. Other work has shown how the impact of medical care on life expectancy in western Europe had already become apparent in the 1970s (Mackenbach et al. 1988). As a consequence, it seems likely that there were relatively fewer further gains to be made in west Germany in the 1990s. In contrast, Hungary still had some way to go, as shown by the continuing contribution of amenable mortality through the 1990s, with rates remaining about twice as high as those seen in west Germany.

The situation in Lithuania is different. Although the impact of amenable mortality was positive in the 1980s, it was small, especially in relation to the overall large gains in temporary life expectancy achieved by men. These changes have been linked to the effects of Gorbachev's anti-alcohol campaign between 1985 and 1987 (Shkolnikov and Nemtsov 1997). In the 1990s, medical care, except in infancy, failed to bring further gains, except to the extent that it contributed to the considerable improvement in deaths from ischaemic heart disease. It is likely that the decline in infant mortality in Lithuania since 1992 is at least in part attributable to a comprehensive preventive programme to reduce perinatal and neonatal mortality that was implemented in 1992 (Basys and Liubsys 1997). It is, however, noteworthy that the actual level of amenable mortality in Lithuania seems to be considerably lower than in the two other former communist countries. This is, in part, due to the fact that some causes of death considered amenable to medical care were not available for Lithuania and had therefore to be excluded from this analysis. Thus, standardised death rates from amenable causes are not entirely comparable between the different countries included in this study. One other reason relates to the relatively lower death rates from cerebrovascular disease in Lithuania, which has been attributed, in part, to the practice of coding of causes of death in the Soviet period as mentioned above.

Romania stands out as the one country in which deaths amenable to medical care, except in infancy in the 1980s, have consistently contributed negatively to life expectancy. The increase in mortality in the 5-9 years age group in the 1990s was largely attributable to 'other' causes. Elsewhere we have shown how this was predominantly due to AIDS (Dolea, Nolte and McKee 2002), reflecting the impact of specific practices in pre-transition Romania (Hersh et al. 1991).

These findings are not entirely surprising. By the 1980s, as in other parts of western Europe, west Germany was achieving a high uptake of the growing number of effective treatments for common conditions such as hypertension, cardiovascular and respiratory disease, as well as delivering increasingly effective advanced care to those

with acute illnesses. Hungary, with its policy of openness to the west, at least compared with some of its neighbours, was also achieving sizeable benefits from health care, although it seems likely that it still lagged some way behind the west. As a consequence, by the 1990s, further sizeable improvements remained possible.

In contrast, Lithuania has yet to achieve the gains seen in a country like Hungary. However interpretation of trends in mortality in the 1990s in any of the former Soviet republics must take account of the sizeable fluctuations in life expectancy during this period. Thus, although it was not possible to obtain data from all countries for more recent years, disaggregating Lithuanian data for the period after 1994 only yields a picture similar to that seen in Poland in the early and mid 1990s, with substantial declines in mortality from ischaemic heart disease and appreciable improvements in death rates from amenable conditions (Nolte et al. 2002).

The situation in Romania is the most concerning of all the countries studied, suggesting that the health care system has steadily deteriorated over the past two decades. This is consistent with popular perceptions, as well as other evidence on, for example, mortality from testicular cancer which has increased in Romania (although this almost certainly reflects greater recognition) at a time when substantial improvements have occurred in the rest of Europe (Levi et al. 2001).

Looking to the future it is important to recognise the pitfalls of predicting patterns of health in this region, in which life expectancy in many countries has unexpectedly increased or decreased rapidly, for reasons that remain imperfectly understood. However it is already clear from existing data that the outlook at least in Romania and Lithuania is not as pessimistic as portrayed here as both countries have at last experienced substantial improvements in population health in the last years of the 1990s.

These analyses are, of necessity, somewhat superficial and they should be interpreted with caution. They are an initial step in identifying a problem that can then be studied in more depth. Nonetheless, they do indicate the importance of thinking about the contribution that improved health care can make to population health in many countries.

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Appendix

Table A1: *Cause specific contribution to changes in temporary life expectancy (e_{0-75}), in years, by cause group in Lithuania, Hungary, Romania and west Germany: 1980/81-1988*

	Men 1980-1988*				Women 1980-1988*			
	Medical care	IHD	Other causes	All	Medical care	IHD	Other causes	All
Lithuania								
0	0.2680	0.0000	0.1747	0.4427	0.0234	0.0000	0.0563	0.0797
1-14	-0.0018	0.0000	0.0760	0.0742	-0.0202	0.0000	-0.0350	-0.0552
15-39	0.0449	0.0242	0.8982	0.9672	-0.0034	0.0043	-0.0024	-0.0016
40-64	0.1093	-0.1363	0.4317	0.4046	0.0868	0.0406	-0.0330	0.0943
65-74	0.0109	0.0000	0.0232	0.0340	0.0214	0.0134	0.0546	0.0894
All	0.4312	-0.1122	1.6037	1.9227	0.1080	0.0582	0.0405	0.2067
Hungary								
0	0.3488	0.0000	0.1238	0.4725	0.2634	0.0000	0.1056	0.3690
1-14	0.0314	0.0000	0.0532	0.0846	0.0323	0.0000	0.0327	0.0649
15-39	0.0547	0.0005	-0.0421	0.0130	0.0571	-0.0285	-0.0399	-0.0112
40-64	0.1281	-0.0210	-0.4322	-0.3252	0.1503	0.0030	-0.0174	0.1360
65-74	0.0494	-0.0168	0.0103	0.0430	0.0508	-0.0016	0.0327	0.0819
All	0.6124	-0.0373	-0.2872	0.2879	0.5540	-0.0271	0.1137	0.6406
Romania								
0	0.4286	0.0000	-0.1561	0.2725	0.3732	0.0000	-0.1472	0.2260
1-14	-0.0460	0.0000	-0.0759	-0.1219	-0.0561	0.0000	-0.1141	-0.1702
15-39	-0.0311	-0.0133	-0.0068	-0.0512	-0.0096	0.0010	-0.0066	-0.0153
40-64	-0.0754	-0.1077	-0.1644	-0.3475	-0.0459	-0.0313	0.1032	0.0260
65-74	-0.0149	-0.0445	0.0790	0.0196	-0.0197	-0.0294	0.1027	0.0536
All	0.2612	-0.1655	-0.3242	-0.2285	0.2419	-0.0597	-0.0621	0.1201
West Germany								
0	0.2932	0.0000	0.0806	0.3738	0.2507	0.0000	0.1057	0.3563
1-14	0.0265	0.0000	0.0966	0.1231	0.0187	0.0000	0.0714	0.0902
15-39	0.0364	0.0111	0.3109	0.3584	0.0354	0.0006	0.1238	0.1597
40-64	0.1318	0.2143	0.2202	0.5662	0.0782	0.0343	0.2053	0.3177
65-74	0.0659	0.0483	0.0821	0.1963	0.0506	0.0185	0.0487	0.1178
All	0.5537	0.2736	0.7904	1.6177	0.4335	0.0534	0.5548	1.0417

Note:
* Lithuania: 1981-1988

Table A2: *Cause specific contribution to changes in temporary life expectancy (e_{0-75}), in years, by cause group in Lithuania, Hungary, Romania and west Germany: 1992-1997*

	Men 1992-1997				Women 1992-1997			
	Medical care	**IHD**	**Other causes**	**All**	**Medical care**	**IHD**	**Other causes**	**All**
Lithuania								
0	0.4004	0.0000	0.0002	0.4006	0.3589	0.0000	0.0271	0.3860
1-14	0.0101	0.0000	0.1488	0.1589	0.0076	0.0000	0.0747	0.0823
15-39	0.0123	0.1707	-0.0532	0.1298	-0.0083	0.0182	-0.0062	0.0036
40-64	-0.0783	0.3694	-0.1528	0.1383	-0.0419	0.1154	0.0607	0.1341
65-74	-0.0039	0.0381	0.0084	0.0427	0.0007	0.0699	0.0169	0.0875
All	0.3407	0.5782	-0.0486	0.8703	0.3170	0.2034	0.1731	0.6934
Hungary								
0	0.2320	0.0000	0.0513	0.2834	0.1700	0.0000	0.0999	0.2699
1-14	-0.0240	0.0007	0.0548	0.0315	0.0052	0.0000	0.0415	0.0467
15-39	0.0425	0.0798	0.4871	0.6094	0.0321	0.0160	0.1867	0.2348
40-64	0.1377	0.1462	0.2151	0.4990	0.0464	0.0519	0.1256	0.2239
65-74	0.0239	0.0007	0.0369	0.0616	0.0460	-0.0040	0.0249	0.0669
All	0.4123	0.2273	0.8453	1.4848	0.2997	0.0638	0.4787	0.8421
Romania								
0	-0.0130	0.0000	0.0165	0.0035	-0.0278	0.0000	0.0709	0.0431
1-14	-0.0453	0.0000	0.0210	-0.0243	-0.0112	0.0000	-0.0166	-0.0278
15-39	-0.0130	-0.0246	-0.0236	-0.0611	-0.0184	-0.0116	-0.0007	-0.0307
40-64	-0.1998	-0.1039	-0.3430	-0.6467	0.0004	-0.0564	-0.0905	-0.1465
65-74	-0.0303	-0.0261	0.0243	-0.0322	-0.0065	-0.0203	0.0247	-0.0020
All	-0.3014	-0.1546	-0.3048	-0.7607	-0.0635	-0.0883	-0.0122	-0.1640
West Germany								
0	0.0418	0.0000	0.0452	0.0870	0.0197	0.0000	0.0461	0.0658
1-14	0.0096	0.0000	0.0317	0.0413	0.0031	0.0000	0.0271	0.0302
15-39	0.0033	0.0018	0.1635	0.1686	0.0161	-0.0035	0.0617	0.0743
40-64	0.0153	0.0965	0.1668	0.2786	0.0276	0.0113	0.0541	0.0930
65-74	0.0060	0.0308	0.0160	0.0528	0.0132	0.0143	0.0213	0.0488
All	0.0760	0.1292	0.4232	0.6284	0.0797	0.0221	0.2103	0.3121

***Table A3**: Age standardised death rates (per 100 000) for selected causes and cause groups in Lithuania, Hungary, Romania and west Germany: 1980/81, 1988, 1992 and 1997: age 0-74*

	Lithuania				Hungary			
	1981	**1988**	**1992**	**1997**	**1980**	**1988**	**1992**	**1997**
Men								
Causes amenable to medical care	148.7	124.9	150.8	145.8	241.1	196.1	203.0	171.1
ages 0-14	20.8	13.7	23.5	12.4	34.4	24.2	21.3	15.7
ages 15-74	127.9	111.2	127.4	133.4	206.7	171.8	181.7	155.4
Ischaemic heart disease	242.8	257.4	310.2	242.8	204.9	215.4	223.1	204.9
Other causes	615.6	524.6	635.7	635.7	596.1	631.3	752.4	694.9
All causes	1007.1	906.9	1096.8	1035.6	1042.2	1042.7	1178.4	1071.0
Women								
Causes amenable to medical care	122.1	111.9	118.3	112.5	195.7	160.0	150.6	130.8
ages 0-14	15.6	11.4	17.6	8.7	26.4	19.0	16.7	12.4
ages 15-74	106.7	100.4	100.7	103.8	169.4	141.0	133.9	118.5
Ischaemic heart disease	101.8	98.8	103.6	78.0	76.2	79.1	80.6	76.8
Other causes	214.6	195.5	208.3	199.1	278.7	268.3	286.5	260.6
All causes	438.5	406.2	430.1	389.6	550.6	507.5	517.7	468.3

	Romania				West Germany			
	1980	**1988**	**1992**	**1997**	**1980**	**1988**	**1992**	**1997**
Men								
Causes amenable to medical care	243.8	250.1	255.2	292.8	111.3	69.3	59.9	54.8
ages 0-14	48.0	37.7	36.2	37.8	16.6	8.6	6.9	5.7
ages 15-74	195.8	212.4	218.9	255.0	94.7	60.7	52.9	49.1
Ischaemic heart disease	105.6	134.2	166.3	188.4	164.5	132.0	111.7	94.0
Other causes	536.7	530.8	544.9	568.7	473.4	416.1	399.3	370.6
All causes	886.1	915.0	966.4	1049.9	749.2	617.4	570.9	519.4
Women								
Causes amenable to medical care	221.2	224.3	203.7	209.3	100.3	74.5	66.6	60.9
ages 0-14	38.9	30.9	27.5	28.4	12.8	6.4	5.1	4.5
ages 15-74	182.3	193.4	176.2	180.9	87.5	68.1	61.5	56.4
Ischaemic heart disease	54.1	66.1	71.6	82.2	46.9	40.5	34.2	30.3
Other causes	273.4	242.3	225.4	223.3	227.1	192.0	180.8	168.6
All causes	548.6	532.7	500.7	514.8	374.3	307.0	281.6	259.8