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Life Expectancy in Central and Eastern European Countries and Newly Independent States of the Former Soviet Union: Changes by Gender

Jack Reamy, Stjepan Oreškoviæ¹

Graduate Program in Health Services Administration, Xavier University, Cincinnati, Ohio USA; and
¹Andrija Štampar School of Public Health, Zagreb University School of Medicine, Zagreb, Croatia

Aim. To examine changes in life expectancy at birth for countries in Central and Eastern Europe (CEE) and the Newly Independent States of the former Soviet Union (NIS) for the period 1989-1996. Differences in the change by gender were examined and several factors which likely bear on the changes were discussed.

Methods. Data from the WHO Health for All European Data Base were used to determine changes in life expectancy and selected economic factors for CEE and NIS countries.

Results. Changes in life expectancy varied by gender in both CEE and the NIS, with the difference increasing for the two groups during the period with the largest increase occurring in the NIS. Both male and female life expectancy declined, with male life expectancy dropping at a more rapid rate. In 1994, the year in which most, but not all countries, reached a low point, life expectancy for males had declined below 60 years for two countries.

Conclusions. The most striking point about the decline in life expectancies was the short period in which the declines occurred, especially in the NIS. It is not possible to determine the exact cause for the changes, but there are likely multiple reasons. It is not completely clear why the decline in life expectancy was greater for males, although the linkage between economic and behavioral and lifestyle factors appear to have some association. Further research is necessary to determine why effects by gender vary so greatly and whether the negative outcomes are a short-term anomaly or will persist.

Key words: gender; health behavior; life expectancy; life style; longevity; quality of life; social environment; sex differences; sex ratio

A phenomenon found in the majority of countries in both Central and Eastern Europe (CEE) and the Newly Independent States (NIS) of the former Soviet Union in the post-communist era was a decline in life expectancy at birth. Even though countries in these areas tended to previously have more adverse health outcomes than western countries, the fall of communism and the transition to more market-based economies appear to have been associated with the negative changes in life expectancy, at least temporarily.

The causes of the change in life expectancy are many and varied. There is little doubt that epidemiological and public health factors such as life styles and behaviors, along with the resulting diseases are major contributors. There is also some indication that environmental problems have played a role in some areas. At the same time, countries in both CEE and NIS have undergone dramatic economic changes, in varying degrees. Beyond these issues, civil unrest and war have dramatically impacted on the population in some countries and some regions. While it is difficult to identify a specific reason for the changes in life expectancy at birth, and in reality there are likely multiple causes, there are some indications that economic issues such as income are among the most important factors (1-7).

Along with variances by country, changes in life expectancy also differ by gender. In this paper, the decline in life expectancy at birth by gender for the former communist countries of Central and Eastern Europe and the Newly Independent States of the former Soviet Union is explored, as well as a number of factors which may have affected the change in life expectancy, overall and by gender.

Transition in CEE and NIS

The shift from a socialist government with centrally planned economies to democratic governments and more market-based economies has taken place rapidly in both the CEE and NIS, but the transition has not been without economic problems. Countries in the area have often seen contractions in gross national product (GNP) per capita, increased unemployment, and rampant inflation. These factors have forced governments to operate with less and often deal with an expectation by the population of having more (2,8).

While this paper deals primarily with health and selected health outcomes, changes in these sectors cannot be viewed in isolation. Variations in socioeconomic factors have had a strong impact on the health systems of the countries and the health of their citizens.

The health systems found in most of the socialist countries relied heavily on central planning and contained few incentives to be more efficient. The health systems typically covered all residents, but were often under-funded. Clearly, a broad trend in health reform has been a move from a system funded by general taxation to one funded by an earmarked payroll tax, while still providing universal coverage (9-11).

Care must be taken to not lump all countries in the CEE and NIS into the same category for either overall comparison or when looking at reforms that have taken place in their health systems. The degree of democratization and the speed with which it occurred has varied from country to country. Internal and external strife have been major influences on health in some regions, but not all. From an economic perspective, the countries can be classified as low to middle income, but with a broad divergence from low to high within the groups (12).

Health system reform in CEE and NIS, while moving quite rapidly by most standards, has not taken place at the same pace in each country. In some instances, there has been some tendency to watch what others have done and learn from their mistakes before implementing a particular policy, but the luxury of waiting has not always been available. The degree of upheaval in the health system varies to some degree by how liberal the former socialist government was in allowing experimentation with providing a more efficient health system (13-15). The move from centralized control and planning to market based and more decentralized control has required some degree of change in the infrastructure of the health system. Many of the changes are based on new ways of providing care and doing so in a more efficient manner. Most countries in CEE and NIS have more hospital beds per 100,000 population than western health systems, an indication of the dependence on inpatient care. The numbers and organization of physician services also vary widely between countries throughout the region and compared to the west (16).

Methods

Changes in selected health outcomes, with a major focus on life expectancy at birth, are reviewed.

The difference in changes by gender are examined. Selected socioeconomic factors are examined to determine possible association or causality although, due to the short time period of data availability, few significant findings can be expected in this area.

The analysis relies primarily on the World Health Organization, Health for All European data base for the period 1989-1996, supplemented with the World Bank data (13,17). Central and Eastern Europe (CEE) countries are Albania, Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovakia, and Slovenia, whereas the Newly Independent States (NIS) of the former Soviet Union are Armenia, Azerbaijan, Belarus, Estonia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. If the sources had incomplete data available for a country, that country was eliminated from the study. In Central and Eastern Europe, two countries, Bosnia and Herzegovina and the Former Yugoslav Republic of Macedonia, were eliminated. In the Newly Independent States, Georgia was eliminated. The Baltic states of Estonia, Latvia, and Lithuania are normally considered part of CEE, but because the WHO data includes them in NIS, we do the same here.

Descriptive statistics are used to describe changes in life expectancy at birth by gender for CEE and the NIS as groups and for each country individually. Changes in GNP per capita, total health expenditures as a percent of GDP, unemployment, inflation, physicians per 100,000 population, and hospital beds per 100,000 population are also discussed. In addition, public health and life style factors such as smoking, alcohol consumption, and prevalence of various disease categories by gender are examined to determine differences by both country and by gender, where appropriate data were available.

Results

Life Expectancy

Life expectancy at birth in Central and Eastern Europe increased slightly by 0.54 years during the period from 1989 to 1996 (Table 1). In 1991, total life expectancy had declined by 0.19 years after a slight increase in 1990. When viewed by gender, male life expectancy at birth grew by a meager 0.19 years during the study period, with a 0.56 year drop between 1989 and 1991. Females during the same period saw an increase in life expectancy of 0.91 years, increasing each year except in 1991 (17).

In the Newly Independent States, an overall drop in life expectancy at birth of 2.78 years occurred, with males dropping 3.2 years and females by 1.61 years (Table 2). All categories hit a low in 1994 before beginning to increase (17).

The difference between life expectancy for men and women at birth increased by a total of 0.72 years in CEE. In the NIS a dramatic increase of 2.01 years in the gap between male and female life expectancy was experienced between 1989 and 1994 (Tables 1 and 2) (17).

[Table 1.](#) Life expectancy at birth in years and difference between men and women in Central and Eastern Europe, 1989-1996a

[Table 2.](#) Life expectancy at birth in years and difference between men and women in Newly Independent States, 1989-1996a

[Table 3.](#) Life expectancy at birth (years) and difference between men and women in individual countries in Central and Eastern Europe, 1989-1996

[Table 4.](#) Life expectancy at birth (years) and difference between men and women, in individual countries in Newly Independent States, 1989-1996

When looking at individual countries in CEE, the overall life expectancy at birth went up in all but two countries. The largest increase, 2.2 years, occurred in the Czech Republic and the largest decline, 0.7 years, in Bulgaria and Romania. Only Bulgaria had a decrease in female life expectancy with a decrease of 0.1 years (Table 3).

The results by country were more dramatic in the NIS. Total life expectancy declined for each country in the NIS between 1989 and 1996, except Armenia, with the largest decline of 4.4 years occurring in Kazakhstan. Male life expectancy also declined in all but two countries, with the Russian Federation and Kazakhstan having reductions of 4.4 and 5.0 years respectively. For females, life expectancy declined in all but three countries. The largest decline of 3.0 years occurred in Kazakhstan (Table 4). Life expectancy tended to hit a low point in 1994 for most countries in the NIS, with male life expectancy in Russia and Latvia dropping 6.9 and 6.5 years between 1989 and 1994 respectively. In CEE, the difference between male and female life expectancy at birth widened in five countries and narrowed in four. The widest gap between males and females in 1996 was 8.8 years in Hungary, down from 9.5 in 1994, while in 1989 it was in Poland with 8.8 years (Table 3).

The gap between life expectancy at birth for males and females increased in all but three countries in the NIS, Armenia, Turkmenistan, and Uzbekistan. The largest increase, 2.4 years, occurred in the Russian Federation where the difference between male and female life expectancy in 1996 was 12.8 years. The Russian Federation also had the largest gap by gender at the beginning of the study period in 1989 (Table 4).

Economic Factors

Economic factors in most of the countries in CEE responded negatively to initial changes and in some cases began a more positive move by the end of the period. Unemployment increased in all CEE countries between 1989 and 1996 (Table 5).

GNP per capita in US dollars was less consistent in the direction of change during the period (Table 5). A problem with reviewing GNP per capita results from the fact that prior to the move from communism some of the CEE countries were a part of another country, which resulted in data not being available for each country prior to the separation.

As with other factors, there is variation between CEE countries and the amount of GDP spent on health care (Table 5). In all but Albania the percent spent increased during the period.

[Table 5.](#) Selected economic factors in individual countries in Central and Eastern Europe, 1989-1996a

[Table 6.](#) Selected economic factors in individual countries in Newly Independent States, 1989-1996a

Inflation, while declining in all but two CEE countries during the seven year period remained extremely high by most standards. In 1996, Slovakia had a low of 6.2% and Bulgaria a high of 162.0%. This compared to a low of 35.0% in Hungary in 1989 and a high of 254.3% in Bulgaria (Table 5).

Economic factors in the NIS tended to deteriorate somewhat more dramatically than in CEE. GNP per capita generally moved downward, although the trend was not consistent throughout the NIS. Unemployment was high in some countries of the NIS, but data on unemployment were more incomplete than in CEE, making it difficult to draw any conclusions from the data (Table 6).

The direction of movement of the percent of GDP spent on health care tended to be somewhat erratic

in the NIS (Table 6). Inflation in NIS went from bad to worse in many countries during the seven-year study period. In 1996, only six countries were below triple digit inflation and the lowest of those, Lithuania, was 13.1%. The highest inflation was found in Turkmenistan where it was running at an astronomical 2710.0% per year (Table 6).

Health System Factors

When looking at various health system structure factors, as with many other areas that have been examined, wide variation is found between countries and between CEE and the NIS.

Two health system structural indicators, physicians per 100,000, population and hospital beds per 100,000 reflect changes in the area. The changes were mixed for physician density, ranging from 140.8 to 353.9 in CEE and 200.4 to 443.1 in the NIS. Hospital bed density generally tended to shrink during the period, however there were exceptions to the trend in both CEE and the NIS (17).

There are estimates that some health systems in the former Soviet countries may be collapsing under the weight of hyperinflation and the inability of people to afford the system. Prices, though not high by western standards, have in many cases out-paced the ability of low-wage earners to make health care purchases. Even though theoretically free, health care must often be purchased by gratuities to gain access (18). While it is unclear what effect the effectiveness of medical care has on differences in life expectancy, there are some indications that there is some relationship (19).

Lifestyles

Without strong and immediate action, it is estimated that by the year 2000 20% of all deaths in Europe will result from tobacco usage. In 1995, smoking was responsible for 1.2 million deaths or 14% of deaths in the European region of the WHO (20).

The epidemic of diseases related to tobacco in Eastern Europe has already reached unprecedented levels for men. Further increases are also expected for women during the next 20-40 years. Smoking rates for men are very high, with rates greater than 50% in a number of the countries. Although smoking rates for women are more than 10% lower than men, they are still high at 20% to 30% (20). Smoking rates among adolescents, especially girls, are increasing in the Russian Federation, where about two-thirds of men and one-third of women currently smoke (21). Alcohol consumption is also a problem in Russia, where consumption of alcohol is 13 liters of pure alcohol equivalent per person for those aged 15 and over. This level is over 60 percent higher than the WHO's standard of eight gennua, the point where health effects become exacerbated (22).

Russia is not alone in facing an alcohol problem. In Hungary, every fifth male is considered an alcoholic. The rate of cirrhosis of the liver is 14 times the rate in Sweden, which also has a reputation for heavy drinking (18).

People in Central and Eastern Europe "smoke a lot, drink a lot, and have unhealthy diet habits," is the simple succinct explanation given by Guy Ellena, a senior World Bank health economist, in explaining the growth in chronic disease in the area (23).

The prevalence of smoking by men is, in part, responsible for the differences in life expectancy found between men and women. The heavy marketing by U.S. tobacco companies which have heavily targeted women, may over time narrow the difference in life expectancy found by gender. However, for the present, unhealthy lifestyles for men far outweigh those of women. The international market is essential for tobacco companies as pressure grows in the U.S. market (24).

As an example, Romania, a relatively poor country, still struggles with the transition from communism to capitalism eight years after the overthrow of Nicolae Ceausescu. While 60% of Romanian men and 25% of women smoke, a staggering 61% of male doctors and 51% of female doctors smoke (24).

Discussion

One of the most striking things about the changes in life expectancy at birth that occurred in the NIS was the magnitude of the change between 1989 and 1994, especially in the Russian Federation and Latvia. A male born in either country in 1994 could expect to live 6.5-6.9 years less than a male born in 1989, or put another way, a male born in 1994 would die 1.5 years before a male born 5 years earlier. This is a dramatic change to have occurred over such a short period and is without parallel in modern times (17,25).

Changes in the NIS were much more drastic than those found in CEE countries. The declines in life expectancy found in a number of the NIS countries continue to show a downward trend. While the majority of CEE countries trended down early, they have started an upward trend. The declines in CEE were never as sharp or deep as those found in the NIS countries. Kazakstan had the most pronounced changes of any country in either group through 1996.

The changes in life expectancy were not as pronounced for females. Turkmenistan and Uzbekistan were the only countries where life expectancy at birth, in actual years, declined more for females than for males. During the period examined, female life expectancy actually increased in CEE while in the NIS it declined at about 50% the rate of the male decline.

While the difference in life expectancy increased for both groups, the increase in CEE resulted more from the increase in female life expectancy than in the male decline. The difference in the NIS resulted from the greater decline for males.

To put the changes in both CEE and NIS into perspective it is helpful to compare the changes to the averages for the European Union (EU) countries for the same period. Total life expectancy in the EU, as well as for both males and females, increased steadily, reaching 77.44, 74.05, and 80.73 years respectively by 1995. The difference between the EU and both CEE and the NIS increased during the period, with the difference in total life expectancy between the EU and NIS increasing over 67% to more than 11 years (17).

Health system structural factors tended to show some movement to a more efficient system, but with wide variance by country. Physicians per 100,000 in CEE (246.98) was increasing at the end of the period, but was below the 297.42 found for the EU, while in the NIS the ratio was also increasing and remained above the EU average (17).

The average hospital beds per 100,000 population in CEE was slightly below the EU average and increasing, although not in all countries. In the NIS the average hospital beds per 100,000 was substantially above the EU and declining, but with significant reductions needed to bring the number down to the EU average (17).

The lifestyle and behavioral health factors that were found in both CEE and the NIS and the diseases which result from these factors may be a major explanation of the difference between male and female life expectancy. Chronic liver disease and cirrhosis per 100,000 population is substantially higher in CEE and the NIS than in the EU, with rates for males being much greater than for females. Rates were more than double in CEE (16). Similar experience is found when comparing the occurrence of diseases of the respiratory system and heart disease. Although it should be remembered that these differences existed prior to the collapse of communism and the period of transition that has occurred in CEE and the NIS. (17).

At first glance, one might want to blame defective data or changes in the way the data are collected on the changes that occurred. There are critics of the reliability of measurements used in the former Soviet Union. However, World Bank investigation finds that data are unlikely to be a major explanation of the changes experienced (12).

The World Bank found that increasingly indirect evidence points to a link between economic hardship and declining health. Many of the lifestyle and disease related factors, which differ between men and women, include smoking, alcohol consumption, and death from cardiovascular disease, may be linked to high unemployment, lower income, and high inflation (12).

The growth in the gap between the life expectancy at birth for males and females in Central and Eastern Europe and the Newly Independent States of the former Soviet Union have major implications for the countries in which the increase has been experienced. While there appears to be stabilization and some recovery, especially in CEE, it is not clear at this point whether the trends have reached the bottom in all of the region. The Russian Federation and Latvia male life expectancies of 57.7 years and 58.9 years respectively reached in 1994, were comparable to those found in more underdeveloped countries (12).

While it appears that the worse is over in many countries in the area, recent economic decline in the Russian Federation and continued civil strife in areas of the former Yugoslavia raise serious questions about the long-term stabilization of life expectancy in parts of the area. There are some predictions that male life expectancy will remain virtually unchanged in the former socialist economies of Europe through the year 2020 and female life expectancy will grow at slower rate than other parts of the world (26).

Further research is needed to determine more precisely the causes of the differences in the changes in life expectancy at birth for males and females in Central and Eastern Europe and the Newly Independent States. The evidence from these countries can provide important information for other developing countries.

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Correspondence to:

Jack Reamy

Xavier University

Department of Health Services Administration

3800 Victory Parkway

Cincinnati, OH 45207-7331, USA

reamy@xavier.xu.edu