

## Chapter 6

# Rapidly Aging Populations: Russia/Eastern Europe

Natalia S. Gavrilova and Leonid A. Gavrilov

### Introduction

Population aging is a global phenomenon and countries of Eastern Europe are also experiencing a rapid increase in the proportion of older people. The proportion of elderly people in Eastern Europe is currently lower than in the European region as a whole. However population aging in this region is expected to continue over the next few decades, eventually leading to the convergence in the proportion of older people in the countries of Eastern and Western Europe.

Aging of population is often measured by the percentage of people of retirement ages. A society is considered to be relatively old when the fraction of the population aged 65+ years exceeds 8–10 per cent (Kinsella and Velkoff 2001). According to this definition, the populations of Eastern Europe and Russia are becoming very old, because the percentage of elderly people reached the levels of 14.2 and 13.8 per cent correspondingly in 2005 and it is expected to increase further. Because the choice of the boundary for old age (65 years and over) is rather arbitrary, many demographers who study Eastern European countries also use 60 years (retirement age for many countries of Eastern Europe) as a cut-off. In this case, a population is considered to be old when the proportion aged 60+ years exceeds 10–12 per cent (Kinsella and Velkoff 2001). Table 6.1 presents data on the proportion of population age sixty and over for selected countries. Note that populations of Bulgaria, Hungary

and Ukraine were older than the population of the European region in 2005. In addition to these three countries, the Czech Republic, Romania and Belarus have older populations than the Eastern European region. The proportion of very old population (80+) in all Eastern European countries is still lower than in the European region (Table 6.1), which may be explained by rather high mortality of the oldest age groups in these countries compared to Western Europe.

Figure 6.1 shows the trends in the proportion of people aged 60 years and over for Eastern Europe and Russia compared to the European region. Note that the fastest growth in the proportion of elderly in Russia and Eastern Europe occurred in the 1990s and since then both have experienced a slight decline in the proportion of people aged 60 years and over.

A useful indicator of age structure and population aging is the aging index (sometimes referred to as the elder-child ratio), defined as the number of people aged 65 and over per 100 youths under age 15 (see Table 6.2). In 1975 all countries of Eastern Europe had more youth than elderly (aging index below 100). Now all of them except Moldova have more elderly than youth. By 2030 all countries of Eastern Europe have a projected aging index of at least 100 and Bulgaria and Czech Republic are in excess of 200 (Kinsella and Velkoff 2001). The aging index is also useful in examining within-country differences in the level of population aging (Kinsella and Velkoff 2001).

The second class of indicators for population aging is a group of statistical measures of location (median, mean and modal ages of population). The median age is used particularly often as an indicator of the general age of people in some areas. Median age of population is the age at which exactly half the population is older and another half is younger. The 2005 median age in

---

N. S. Gavrilova (✉)  
Center on Economics and Demography of Aging  
NORC and The University of Chicago  
1155 East 60th Street  
Chicago, IL 60637, USA  
E-mail: nsgavril@alumni.uchicago.edu

**Table 6.1** Aging of population in Russia and the Eastern Europe

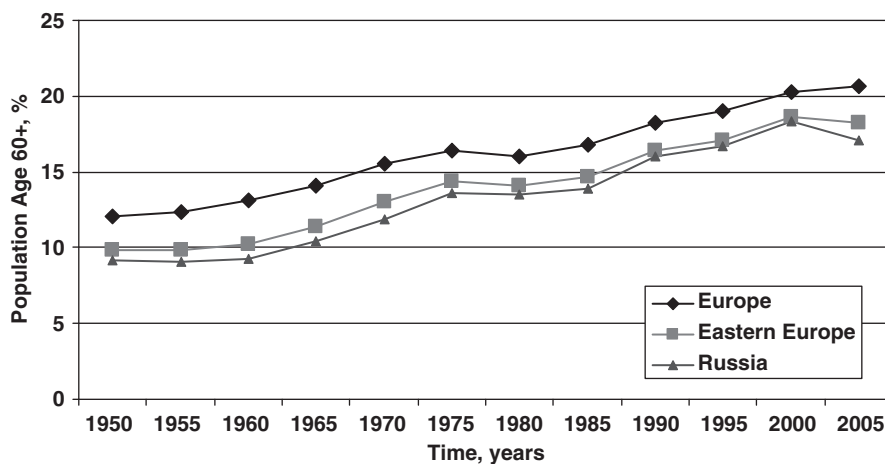
Countries/regions	Proportion of population 60+			Proportion of population 80+		
	1975	1995	2005	1975	1995	2005
Europe	16.4	19.0	20.7	1.8	3.1	3.5
Eastern Europe	14.4	17.1	18.2	1.3	2.3	2.4
Belarus	14.2	18.0	18.6	1.8	2.4	2.4
Bulgaria	16.1	21.4	22.4	1.4	2.6	2.9
Czech Republic	18.3	18.0	20.0	1.7	2.7	3.1
Hungary	18.3	19.4	20.8	1.7	2.9	3.2
Poland	13.8	15.8	16.8	1.2	2.1	2.5
Republic of Moldova	10.8	13.1	13.7	1.0	1.3	1.5
Romania	14.3	17.5	19.3	1.2	2.1	2.4
Russian Federation	13.6	16.7	17.1	1.2	2.2	2.2
Slovakia	13.8	15.1	16.2	1.2	2.1	2.5
Ukraine	15.8	18.4	20.9	1.6	2.6	2.7

Data source: United Nations 2007.

Europe was 39 years (Table 6.2), indicating that the number of people under age 39 equals the number who have already celebrated their 39th birthday. It is the simplest and most widely used indicator of the age of any population. Table 6.2 shows that population of Eastern Europe has a lower median age (37.5) than the population of the European region. At the same time, the population of Bulgaria has a higher median age than the population of Europe and Ukraine and Czech Republic have the same median age as Europe (Table 6.2). This indicator is also useful to monitor changes in population aging over time. Table 6.2 shows the increase in median age of Eastern European countries from 1975 to 2005. Note that Eastern Europe aged more slowly in the 1990s than the European region as a whole. However Bulgaria, Belarus and Slovakia demonstrated a particularly high pace of population aging.

Figure 6.2 shows time trends in median ages for populations of the European region, Eastern Europe and Russia. In contrast to the proportion of elderly (Fig. 6.1) this demographic indicator does not show any recent decrease in population aging for either Eastern Europe or Russia. This measure suggests that the fastest population aging in Eastern Europe and Russia happened in the 1950s and the 1960s.

The main problem in describing population aging is that any single indicator may be misleading because the age distribution of population is often very irregular, reflecting the scars of past events (wars, economic crises etc.). Thus, the age distribution cannot be described just by one number without significant loss of information. Therefore, perhaps the most adequate approach to study population aging is to explore the age distribution through a set of percentiles, or graphically by analyzing the population pyramids. The latter approach is particu-



**Fig. 6.1** Time trends in the proportion of the elderly (60+): Europe and Russia. Data source: United Nations 2006b

**Table 6.2** Changes in median age and aging index in Russia and the Eastern Europe

Countries/regions	Median age			Aging index	
	1975	1995	2005	1975	2007
Europe	32.1	36.2	39.0	69.1	136.2
Eastern Europe	31.2	35.1	37.5	61.5	123.4
Belarus	30.5	34.8	37.8	55.7	126.9
Bulgaria	34.0	38.4	40.6	73.2	172.5
Czech Republic	32.6	36.2	39.0	82.3	150.7
Hungary	34.2	37.4	38.8	90.0	140.1
Poland	28.6	33.8	36.5	57.3	112.3
Republic of Moldova	26.2	30.8	33.0	37.4	81.6
Romania	30.8	34.0	36.7	56.5	130.3
Russian Federation	30.8	35.1	37.3	58.4	114.0
Slovakia	28.1	32.5	35.6	52.9	106.1
Ukraine	33.6	35.9	39.0	68.6	149.5

Data source: United Nations 2007.

larly useful for countries of the former Soviet Union (Russia, Ukraine, Belarus, Moldova), which experienced low fertility during World War II with a subsequent increase in births during the postwar period. These population waves affected proportions of later generations in these countries when WWII and postwar generations reached reproductive ages.

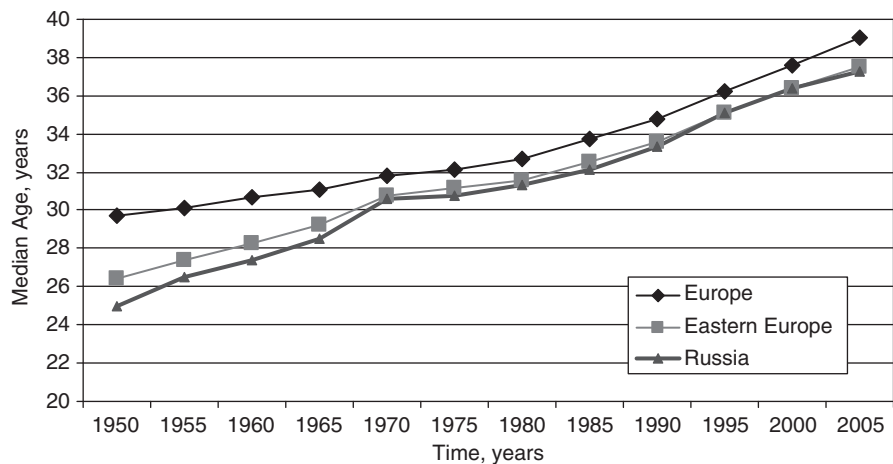
## Demographic Determinants of Population Aging in Eastern Europe

### *Decline in Fertility*

Demographic studies demonstrated that the declining fertility rates have the greatest role in causing population aging (Gavrilov and Heuveline 2003; Kinsella

and Velkoff 2001). Particularly rapid population aging, which is expected to occur in Eastern Europe and Russia after 2010, will mainly be due to fewer children born after the peak of the high postwar fertility. Population aging happens because the declining fertility rates make recent cohorts smaller than the preceding ones, thus tilting the age distribution towards older ages. Future changes in the rate of population aging will be conditioned by different sizes of birth cohorts entering and leaving reproductive ages.

Acceleration of population aging in Russia and Eastern Europe in the 1990s was also caused by low fertility during the period of economic transition in these countries. The period after 1989 witnessed a profound transformation in childbearing patterns in the countries of Eastern Europe, including a rapid decline in fertility rates, the postponement of childbearing and an upsurge in the proportion of extramarital births (Sobotka 2003).



**Fig. 6.2** Time trends in the median age of population: Europe and Russia.  
Data source: United Nations 2006b

**Table 6.3** Total fertility rate (TFR)\*, life expectancy at birth (LE) and causes of population change in Eastern Europe

Countries/regions	TFR (per woman)	LE	Per cent change in population, 1989–2004		
	2000–2005	2000–2005	Total	Natural increase	Migration
Europe	1.40	73.7			
Eastern Europe	1.27	67.9			
Belarus	1.24	68.1	–3.0	–3.3	0.3
Bulgaria	1.24	72.1	–13.2	–5.5	–7.7
Czech Republic	1.17	75.5	–1.4	–1.6	0.2
Hungary	1.30	72.6	–4.5	–4.7	0.2
Poland	1.26	74.3	0.8	2.6	–1.8
Republic of Moldova	1.23	67.5	–2.1	3.4	–5.5
Romania	1.26	71.3	–6.1	–0.7	–5.4
Russian Federation	1.33	65.4	–1.9	–5.9	3.9
Slovakia	1.20	74.0	2.2	3.2	–1.0
Ukraine	1.12	66.1	–8.2	–6.7	–1.5

\* Average number of children that would be born to a woman in her lifetime, if she were to pass through her childbearing years experiencing the age-specific fertility rates for a given period.

Data Sources: United Nations 2005; Mansoor and Quillin 2007.

Currently, all countries of Eastern Europe demonstrate fertility below the European level (Table 6.3).

Researchers believe that the intensive decline of the total fertility rates indicate a uniform reaction of former Communist societies to the ongoing social and economic changes during the early 1990s and they note increasing diversity in current fertility patterns across the region (Sobotka 2003). It is believed that the more rapid postponement of parenthood was related to the success of the transition period, bringing more opportunities and choices for young people and shifting the institutional structure of many Eastern European societies considerably closer to the structure of Western European countries (Sobotka 2003). On the other hand, in many FSU countries like Ukraine, fertility declined to very low levels without a transition to a later pattern of childbearing, reflecting the persistence of traditional norms for childbearing and roles of men and women in this country (Perelli-Harris 2005).

### **Increasing Longevity**

The effects of increasing life expectancy on population aging are more complex. The increase in life expectancy has two components, with opposing effects on population aging. The first component is the mortality decline among infants, children and people younger than the mean age of the population. This component of mortality decline acts against pop-

ulation aging, because its effect (saving young lives) is similar to the effect of increased fertility (Preston et al. 2001). Thus, the increase in life expectancy in Russia and Eastern European countries during the postwar period led to partial alleviation of population aging, because mortality decline in such countries was concentrated in the younger age groups. The second component of the increase in life expectancy is related to a more recent trend of mortality decline, which emerged after the 1950s in the developed countries – an accelerating decrease in mortality rates among the old and the oldest-old (85+ years) and the oldest-old women in particular (Gavrilov and Gavrilova 1991; Kannisto et al. 1994). This second component of mortality decline, concentrated in older age groups, is becoming an important determinant of population aging (women in particular) in industrialized countries. However, this component has not played a significant role in the aging of Russian and Eastern European populations so far. None of these countries experienced a significant increase in life expectancy during the last decades and in some of these countries (Russia, Belarus, and Ukraine) life expectancy decreased after 1990.

All countries of Eastern Europe and the former Soviet Union, with exception of the Czech Republic and Slovakia, have life expectancy below the European level (Table 6.3). There is also diversity in mortality trends and patterns across these countries. After a period of stagnating or even improving mortality in the 1980s, many countries of Eastern Europe experienced a

mortality crisis in the early 1990s after the fall of Communism (Nolte et al. 2005). In the Eastern European countries the increase of mortality did not last long and was replaced by mortality decline and growth in life expectancy. Now many countries of Eastern Europe are beginning to see a rapid decline in mortality at older ages (Mesle and Vallin 2006), so one may expect an increasing role of mortality decline as a contributing factor of population aging in these countries. Countries of the former Soviet Union (Russia, Moldova, Ukraine and Belarus) demonstrated a different pattern of mortality during the 1990s. Mortality fluctuations in these countries (with exception of Belarus) generally followed the mortality pattern observed in Russia (Andreev 1999, 2001), reflecting economic crises in this country (Gavrilova et al. 2000). Life expectancy in FSU countries at this time is either decreasing or stagnating at a relatively low level (Nolte et al. 2005). In the beginning of the 1990s, Belarus had the highest life expectancy among the FSU countries mentioned above (Andreev 2001). However, this advantage was lost due to a gradual decline in life expectancy during the late 1990s and early 2000s (Andreev 2001). The uncertain future of mortality changes in FSU countries affects the quality of demographic forecasts of population aging in these countries.

It is useful to consider population aging in a broader context of the demographic transition where a society moves from high rates of fertility and mortality to low rates. This transition is characterized first by declines in infant and childhood mortality as infectious and parasitic diseases are reduced. Other things being equal, this initial decline in mortality generates a younger population age structure. Then, when fertility starts to decline, populations begin to age. At the next step population aging is accelerated further, when the late-life mortality rates also start to decline. The combined synergistic effect of fertility decline and old-age mortality decline is known as the double aging process (Gavrilov and Heuveline 2003; Kinsella and Velkoff 2001). The demographic transition in Russia and countries of Eastern Europe started later than in Western Europe. As a result, Russian and Eastern European populations are younger than populations of the rest of Europe. Most countries of Eastern Europe lag behind Western Europe in their improvement of mortality at older ages. In some countries (Russia, Belarus, Ukraine) the process of rapid mortality decline at older ages is yet to

be observed, so that the double aging process in these countries remains a possibility at some future date.

## **Migration**

The rate of population aging may also be affected by migration. Immigration usually slows down population aging, because immigrants tend to be younger. On the other hand, emigration of working-age adults accelerates population aging, as is observed now in many Eastern European nations. The Eastern European countries are not uniform in the direction and size of migrant flows (see Table 6.3). For example, the Czech Republic and Hungary have positive levels of net migration (Kaczmarczyk and Okolski 2005). On the other hand, Moldova, Romania, Poland and Ukraine are losing population due to migration (Kaczmarczyk and Okolski 2005). Emigration of young people may significantly accelerate population aging as happened in Bulgaria (Hristov 2004). Russia is the largest country in the region accepting immigrants (Kaczmarczyk and Okolski 2005) and has the second largest flow of immigrants after the United States (Mansoor and Quillin 2007). Immigration to Russia from other countries (mainly from the countries of the former Soviet Union) helps to alleviate the effects of population aging. Within Russia the migration processes accelerate population aging in rural regions of the European north and center (due to out-migration of youth) and slow it down in big cities like Moscow. Some demographers expect that migration will have a more prominent role in population aging in the future, particularly in low-fertility countries with stable or declining population size. For example, demographers at the Center of Demography and Human Ecology in Russia believe that immigration may help to slow down both population aging and depopulation in Russia (Vishnevskiy 2006).

The effects of fertility and migration on population growth and aging in Eastern European countries are shown in Table 6.3. Note that only Poland and Slovakia do not have negative population growth or depopulation (due to higher fertility). Also note that some countries (Bulgaria, Romania, Ukraine) demonstrate both negative natural increase (caused by low fertility) and negative net migration, thus being in “double

jeopardy” for rapid population aging. Some countries with high fertility like Moldova may experience rapid population aging due to high out-migration while immigration to Russia is able to alleviate negative consequences of low or negative natural increase.

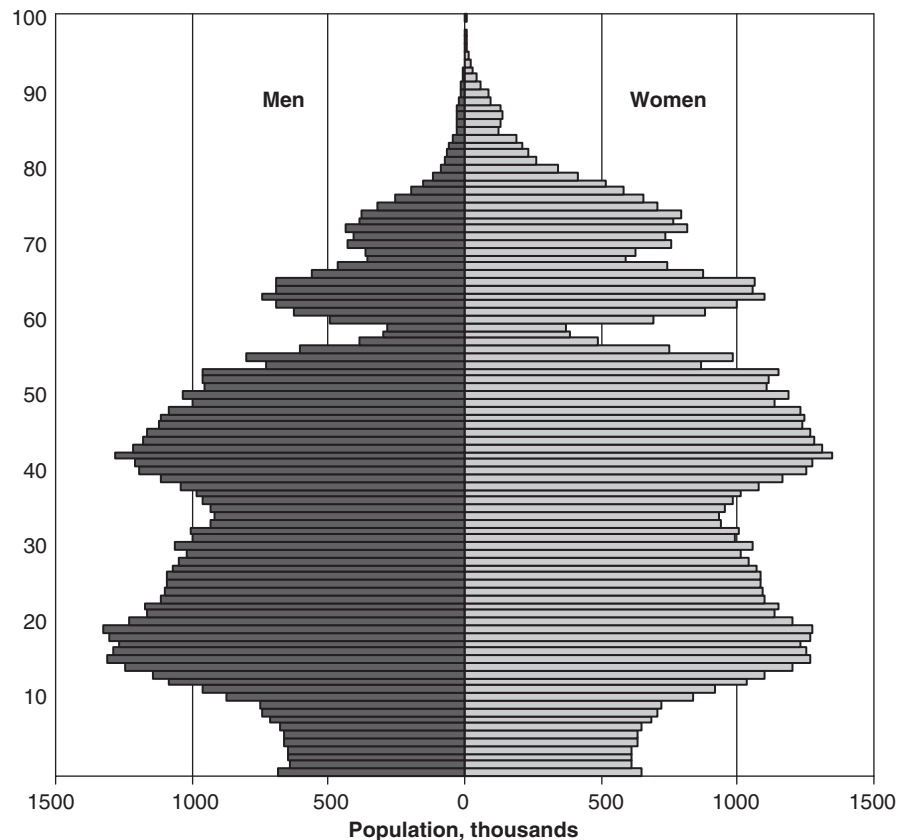
### Demographic Processes and Population Aging in the Russian Federation

Russia, with an elderly proportion of less than 14 per cent in 2005, is rather young by European standards although it is older than the United States (12.3 per cent).

### Historical Events and Population Aging in Russia

Population aging in Russia is affected by its past historical events, which are best observed in the form of

a demographic pyramid. Figure 6.3 demonstrates a contemporary population pyramid of Russia, which resembles a shape of a Christmas tree due to sharp differences in the sizes of different birth cohorts. The irregular shape of the Russian demographic pyramid is a direct consequence of the following past events (Vassin 1996): (1) World War I and Civil War (1914–1922) resulting in decreased fertility during these years; (2) The famine of the early 1930s causing sharp decrease in the size of 1933–1934 birth cohorts as a result of both increased child mortality and decreased fertility; (3) World War II producing the largest distortions in the demographic pyramid including decrease of male cohorts born before 1927 and very small size of cohorts born in 1941–1945 due to low fertility. Very small birth cohorts born during the war period consequently produced a fall in the number of births during the 1960s. Later these small birth cohorts contributed to the decline in the number of births observed during the 1990s. All these historical events are reflected in the Russian demographic pyramid.



**Fig. 6.3** Demographic pyramid of the Russian Federation according to the 2002 census. Goskomstat data

## Recent Changes in Fertility and Mortality

The shape of the 2002 pyramid has the characteristics of an old population and is different from the 1989 pyramid, which had a broad base of young children born in the 1980s (Andreev et al. 2005). These population pyramid changes are a direct consequence of fertility decline in Russia during the economic transition period of the 1990s.

From 1950 to 1970, fertility in Russia changed from being amongst the highest in Europe (nearly three children per woman) to one of the lowest (1.8 children per woman in the birth cohort of 1945) (Avdeev and Monnier 1994; DaVanzo and Grammich 2001). In early 1980s the Soviet government introduced pronatalist policies, which resulted in a temporary increase in fertility rates between 1982 and 1987 (DaVanzo and Grammich 2001). By the end of the 1980s, however, the fertility pattern in Russia had shifted from one with highly diverse family sizes to one in which the one or two-child family model had been widely adopted (Avdeev and Monnier 1994). It is believed that pronatalist measures of the Soviet government did not produce a fundamental change in fertility behavior. The main result was that women spaced their births closer together rather than increasing the number of children that they ultimately had (DaVanzo and Grammich 2001). After 1990, fertility in Russia started to decline rapidly, most likely as a result of economic and political changes after the break-up of the Soviet Union. An increase in the cost of living and the cost of raising children in particular resulted in impoverishment of many families with children. In 1989 poverty in Russia was heavily concentrated among the elderly. However, in 2000 poverty became to a large extent a problem for people of work-active ages and their children (Gustafsson and Nivorozhkina 2004). Many Russian couples now cannot afford to raise children and fertility rates in Russia are now among the lowest in the world. There is significant regional variability in fertility rates within Russia, with North Caucasus demonstrating the highest and big cities (Moscow, St. Petersburg) the lowest (DaVanzo and Grammich 2001).

The rapid decline of fertility in early 1990s coincided with a rapid increase in mortality. In 1991–1992 the mortality trajectory crossed over the fertility trajec-

tory, forming a pattern that is now called the “Russian cross” (see Fig. 6.4) (Khalturina and Korotaev 2006).

In addition to the lowest-low fertility, declining life expectancy is another substantial component of an ongoing demographic crisis in Russia. Although life expectancy in Russia significantly increased from 1920 to 1960, after 1965 Russia experienced a slow but steady decrease in life expectancy for both men and women (DaVanzo and Grammich 2001). This decline temporarily stopped in 1985 with the introduction of Gorbachev’s anti-alcohol campaign (Mesle and Shkolnikov 1995; Shkolnikov et al. 1998). A significant decrease of alcohol sales was a substantial component of this campaign. Demographic results coming from this anti-alcohol campaign were a reduction of mortality (particularly among men) and an increase in life expectancy by more than 3 years from 1985 to 1987 (DaVanzo and Grammich 2001). Gorbachev’s anti-alcohol campaign, although successful from the view of public health results, was highly unpopular in Russia and was no longer in effect by the late 1980s. After this time mortality started to grow again and from 1992 to 1994 life expectancy of Russian males dropped from 63.8 to 57.7 years. Female life expectancy over these years dropped from 74.4 years to 71.2 years (Gavrilova et al. 2000). This decrease in life expectancy coincided in time with the introduction of painful market “reforms” in Russia, which lead to a rapid decrease in real wages and pensions, a nearly complete loss of personal savings and a tremendous increase in the poverty rate. The main causes of death that contributed to this mortality increase were diseases of the circulatory system, accidents, poisoning, injuries and diseases of the respiratory system (Notzon et al. 1998). After 1995, mortality in Russia showed a slow but stable decrease. However,

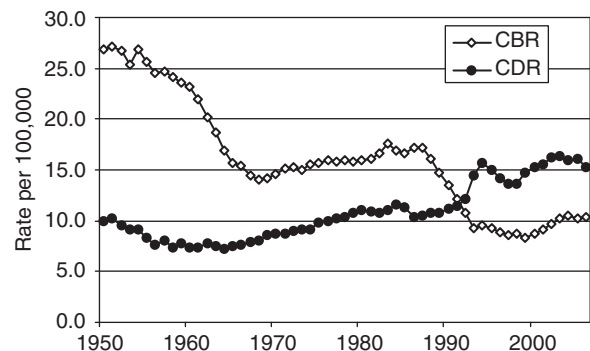


Fig. 6.4 Russian crude birth rate (CBR) and crude death rate (CDR), 1950–2006

in August 1998 Russia experienced another economic crisis (crash of the banking system) resulting in mass impoverishment. Shortly after this crisis mortality started to grow again and male life expectancy dropped from 61.3 in 1998 to 58.7 years in 2001, while female life expectancy dropped from 72.6 to 71.6 years during the same period (Gavrilova et al. 2000). For both men and women, those in the working age category appeared to be the most vulnerable, while children and the elderly were not significantly affected (Gavrilova et al. 2000; Notzon et al. 1998; Shkolnikov et al. 1998). The losses in life expectancy during 1992–1994 were more than 5 years for males and 3 years for females, compared to the life expectancy in pre-crisis 1991. This fall in life expectancy is beyond the peacetime experience of any industrialized country. After 2000 life expectancy in Russia stabilized at very low levels.

There are several explanations of the Russian mortality crisis of the 1990s. Increase in alcohol consumption is considered to be the major factor of the mortality increase and caused a rise of mortality from external causes (Anderson 2002; DaVanzo and Grammich 2001; Mc Kee et al. 2001; Nemtsov 1997, 2002; Pridemore 2002; Shkolnikov et al. 1998). Russian men drink alcohol significantly more often than women and have an exceptionally low life expectancy (the gender gap in life expectancy in Russia is the highest in the world). Gains in life expectancy during the Gorbachev anti-alcohol campaign were significantly higher for men than women, suggesting that alcohol plays a major role in the observed high mortality of Russian men. A recent small increase in Russian life expectancy in 2006, many experts argue, was a result of the temporary reduction of alcohol sales during summer of 2006. Another potentially important cause of increasing mortality after 1992 is the psychological stress experienced by adults during the transition period (Shkolnikov et al. 1998). The hypothesis of deteriorating medical care and public health system as a primary cause of mortality increase after 1992 did not find support from available data (Shkolnikov et al. 1998).

The most plausible explanation of rising mortality during the 1990s and current persistence of very high mortality in Russia is a hypothesis of population poverty and marginalization (Ivanova et al. 2004). Economic conditions of the early 1990s resulted in a rapid impoverishment of large segments of the population. Individuals who failed to cope with economic changes

lost jobs, housing, engaged in alcohol abuse and eventually became socially marginalized. Regional studies in Russia showed that socially less adapted persons (unemployed or those involved in low-skilled activities) are responsible for the majority (up to 90 per cent) of deaths at working ages (Ivanova et al. 2004). Survey data demonstrate that poverty is the major contributor to high cardiovascular mortality in Russia (Vagero and Kislitsyna 2005). The poorest fifth of the studied population were more than twice as likely as others to report heart symptoms (Vagero and Kislitsyna 2005). At the same time, other studies demonstrated that wealthy groups (e.g., persons having university/college degree) or population living in good socio-economic conditions (resident population of Moscow) have life expectancy comparable to that observed in developed countries (Shkolnikov et al. 1998). It is difficult to estimate accurately the proportion of the socially less adapted group in the total population but existing data indicate that it may comprise about 15–20 per cent of the population. This group appears to be responsible for the very high mortality in Russia of the working age population.

Most alcohol-related deaths in Russia occur in the narrow age interval of 45–55 years (Gavrilova et al. 2005). Therefore, the elderly in Russia may be considered as a selected population, which is less prone to alcohol abuse. Indeed, mortality at older ages did not demonstrate any significant increase during the 1990s and for men it has already returned to its pre-crisis levels (Nolte et al. 2005). However, physicians report a growing number of alcoholics among elderly men after 1994 as a response to the social and economic crisis (Gafarov et al. 2003).

Currently Russia is experiencing a decline in the proportion of older people due to relatively small cohorts born during the World War II period, which comprise a sizable part of the older population. However, as the large postwar birth cohorts begin to reach age 65 after 2010, the percentage of elderly in the Russian Federation will rise markedly – likely reaching 20 per cent by the year 2040 (United Nations 2006b). A similar increase in the proportion of the elderly in the United States is expected due to the very large baby boom cohorts reaching old age after 2010. During the period between the last two censuses of 1989 and 2002, the proportion of young people (below age 20) declined by 4.7 per cent while the proportion of older people (60 years and over) increased by 3.2 per cent (Andreev et al. 2005). Mean age of population increased by 3



years. What determined the population aging in Russia between 1989 and 2002 censuses? Andreev et al. (2005) estimated a contribution of different demographic processes in the population aging of Russia between the two censuses. It was estimated that living population enumerated in 1989 should age during the intercensal period by 13.7 years. However, part of this population did not survive to older ages thereby decreasing the actual mean population age by 5.5 years. Children born during this period helped to decrease the mean age of population by almost 5 years (their contribution would have been higher if the total fertility had not declined in the 1990s). Immigration of predominantly younger people also had some “rejuvenating” effect on the population of Russia. This process decreased the mean age of population by 0.2 years. According to (Andreev et al. 2005), population aging in Russia could be less prominent if the levels of fertility and mortality would remain stable at the level of 1988 (mean age would have increased by only 1 year instead of 3 years).

### ***Regional Pattern of Population Aging***

Within Russia, the current level and pace of population aging vary widely by geographic region and usually within regions as well (Andreev et al. 2005; Heleniak 2003). However, virtually all regions of Russia are now experiencing growth in their numbers of elderly residents. The percentage of population aged 60 and over in 2002 varied from 8 in the Far Eastern region to 21 per cent in the Central region. For many years the Central region has had the highest proportion of the older population. Table 6.4 shows changes in median age of population between two censuses for total,

urban and rural populations of Russia and its seven administrative territories (okrugs). Note that rural populations of the Central and Northwestern regions are the oldest while rural populations of the Far Eastern and Southern regions remain the youngest regions in Russia. Thus the rural population of Russia has higher regional differentiation by level of population aging than the urban population. On average the urban population of Russia is slightly younger due to migration of youth from rural areas to cities.

Due to a combination of long-term demographic trends and processes (including migration), population aging in Russia is the strongest among rural women. Whereas the proportion of women aged 65 and over in Russia is 16 per cent, older women comprise more than 30 per cent of the female population of some regions of Central and Northwestern Russia (Andreev et al. 2005).

The Russian population remains relatively young compared to other European countries, including countries of Eastern Europe. Currently, Russia is not aging rapidly but this situation will change after 2010 when the large postwar generations will reach age 60 and produce rapid aging of the population.

### **Demographic Profile of the Older Eastern European Populations**

#### ***Feminization of Population Aging***

The fact that in most nations females have lower mortality than males in every age group and for most

**Table 6.4** Median age of population by Russian regions (‘okrug’)

Region	Total population		Urban population		Rural population	
	1989	2002	1989	2002	1989	2002
Russia	32.8	37.1	32.7	37.1	33.1	37.4
Central	35.9	39.9	34.8	39.3	41.1	42.2
Northwestern	33.0	38.5	32.9	38.2	33.9	40.2
Southern	32.0	34.2	32.8	35.2	30.7	32.9
Privolzhsky (adjacent to Volga)	32.5	37.4	32.0	36.9	34.1	38.5
Ural	31.3	35.8	31.4	35.5	31.0	36.8
Siberian	30.8	35.1	31.0	34.8	30.1	35.9
Far Eastern	29.3	33.9	29.9	34.3	27.7	32.3

Data source: Goskomstat 2004.

causes of death results in the “feminization” of population aging. This phenomenon is particularly acute in Russia and the other FSU countries that demonstrate high male/female mortality differentials. For example, Russia has the highest gender gap in life expectancy in the world, which exceeds 13 years (Table 6.5). At very old ages (80 years) differences in mortality between men and women in Russia decline and become even lower than in Europe (Table 6.5). On the other hand, most of the Eastern European countries have lower male/female mortality differentials than in the European region, being particularly low in Bulgaria and the Czech Republic (Table 6.5).

In 2005, in Russia there were 16.8 million older women and 8.4 million older men aged 60 and over, or a sex ratio of 50 men for every 100 women. This is the lowest proportion of men in populations aged 60 and over in the region. In 2007 in Eastern Europe this ratio was 57 men per 100 women and in the European region it was 69 men per 100 women. Some countries (Bulgaria, Romania and Czech Republic) have a higher male to female ratio in older population compared to the European region probably due to better longevity of men in Romania and Czech Republic and poor survival of older women in Bulgaria (Table 6.5). The male to female ratio decreases with age reaching 34 men to 100 women for persons 80 and over in Eastern Europe and only 27 in Russia (Table 6.6). Losses of men during World War II also contributed to this sex disproportion of older populations. It is projected that in Russia this sex disproportion will be partially allevi-

ated in the future (Vassin 1996). For comparison, in the United States the male/female ratio in 2007 was equal to 78 for persons aged 60 years and over and 54 for persons 80 years and over (United Nations 2007).

### ***Aging of the Oldest-Old Population***

Another notable observation in the aging world is that aging population has itself been aging: the “oldest-old” (people aged 80 and over) are now the fastest growing portion of the total population in many countries, including those in the European region (Gavrilov and Heuveline 2003). This process is observed in Eastern Europe but the pace of the oldest-old population increase is not as rapid as in the United States and other industrialized countries. In Russia, from 1990 to 2005, the population 80 years and over increased by 12 per cent and the population 60 to 79 years old increased by 8 per cent. In Eastern Europe the population 80 years and over increased by 13 per cent from 1990 to 2005. In contrast, the population 60 to 79 years old increased by 5 per cent. Compare these numbers with the United States where the population of the oldest-old increased by 59 per cent during the same period.

The proportion of oldest-old in the older population increased from 1975 to 2005 in the countries of Eastern Europe with average annual increase of 3 per cent, which was slower than in the European region (4 per cent, see Table 6.6). However, from 1995 to 2005, the proportion

**Table 6.5** Sex differences in life expectancy, 2005–2010

Country/region	Life expectancy at birth			Life expectancy at age 60		Life expectancy at age 80	
	M	F	Gender gap in life expectancy	M	F	M	F
Europe	70.2	78.4	8.2	18.2	22.6	7.0	8.5
Eastern Europe	62.7	73.8	11.1	15.0	19.9	5.9	7.1
Belarus	63.1	74.5	11.4	14.1	19.5	5.6	6.8
Bulgaria	69.8	76.3	6.5	16.3	20.1	5.4	6.7
Czech Republic	73.1	79.4	6.3	17.5	22.0	6.1	7.6
Hungary	69.8	77.7	7.9	16.3	21.4	5.9	7.6
Poland	71.2	79.0	7.8	17.1	22.2	6.4	8.1
Republic of Moldova	66.0	73.1	7.1	15.4	18.9	5.7	6.8
Romania	68.7	75.7	7.0	16.6	20.1	6.0	6.8
Russia	58.7	71.8	13.1	13.9	19.2	5.9	7.1
Slovakia	71.1	78.7	7.6	16.7	21.7	6.4	7.7
Ukraine	60.7	72.5	11.8	14.6	19.6	5.6	6.8

Source: United Nations 2007.

**Table 6.6** Aging among the older population, Russia and Eastern Europe

Countries/regions	Percentage of the oldest-old (80+) in older population (60+)			Annual percentage increase in the oldest-old population	
	1975	1995	2005	1975–2005	1995–2005
Europe	10.7	16.3	17.1	3.9	8.0
Eastern Europe	9.3	13.5	13.3	2.9	–2.0
Belarus	12.5	13.1	12.7	1.3	–4.0
Bulgaria	8.7	12.1	13.1	2.9	10.0
Czech Republic	9.5	15.2	15.3	2.7	1.0
Hungary	9.2	14.7	15.5	2.8	8.0
Poland	8.6	13.5	15.1	4.8	10.6
Republic of Moldova	9.0	10.0	11.1	2.4	10.1
Romania	8.2	12.1	12.4	3.6	3.0
Russian Federation	9.1	13.3	12.9	3.0	–4.0
Slovakia	9.0	14.2	15.2	1.3	10.0
Ukraine	10.0	14.3	12.7	2.0	–10.6

Source: United Nations 2007.

of oldest-old in older population decreased rather than increased in Russia, Ukraine and Belarus (Table 6.6). This phenomenon may be explained by increasing mortality of older persons in these countries and structural effects of different sizes of birth cohorts. At the same time such countries as Bulgaria, Poland, Moldova and Slovakia experienced rapid growth of the oldest-old proportion among the older population.

### **Social and Economic Implications of Population Aging in Eastern Europe**

Population aging represents a challenge for public health (growing proportion of older people who need health assistance) and economic development (shrinking and aging of labor force, possible bankruptcy of pension systems). Rapid population aging of Russia and Eastern European countries will result in a range of potential problems including growing economic pressure on countries' pension systems, higher demand for health care and an increasing tax burden on a shrinking working-age population (Heleniak 2003).

#### ***Increasing Load on Social Welfare System***

This problem is associated with the increase in the older population relative to the economically active

population. As age structures change and older individuals become a proportionally greater part of national populations, there are social and political pressures on transfer systems with a potential crisis of social support.

The potential support that the elderly may receive from the working population can be measured by the potential support ratio: the ratio of population aged 15–64 years to that aged 65 years and over (Mujahid 2006). This ratio of economically active (working) population to the elderly dependent population is crucial for an understanding of intergenerational transfers, taxation policies and saving behavior. It is used to estimate the support base available to carry the burden of the older population. The ratio is measured as an inverse of old-age dependency ratio (Gavrilov and Heuveline 2003). Values of the potential support ratio for the countries of Eastern Europe are presented in Table 6.7.

A falling potential support ratio from 1975 to 2007 indicates a shrinking support base. It is interesting that all countries of Eastern Europe, with exception of Ukraine and Bulgaria, still have higher potential support ratios than Europe. The potential support ratio implicitly assumes that people aged 15–64 are working and that those aged 65 years and over are not. In reality older people may work or have other sources of income and support their adult children. For example Kuhn and Stillman (2004) studied interhousehold transfers during the transition period in Russia and found that net interhousehold transfers flow predominantly from elderly and “empty-nest” households to younger households.

**Table 6.7** Shrinking support base for the elderly in the countries of Eastern Europe

Country/region	Potential support ratio (population 15–64/ population 65+)			Parent support ratio (population 85+/ population 50–64)		
	1975	2007	2025	1975	2007	2025
Europe	5.7	4.3	3.1	4.3	8.1	12.9
Eastern Europe	6.9	5.0	3.5	3.5	4.8	9.1
Belarus	6.6	4.9	3.9	5.7	4.6	7.9
Bulgaria	6.1	4.3	3.1	3.1	4.3	8.1
Czech Republic	5.0	4.9	2.9	3.2	4.9	9.0
Hungary	5.3	4.5	3.1	3.2	5.6	10.1
Poland	7.0	5.5	3.2	2.6	5.0	10.0
Republic of Moldova	9.5	7.2	4.4	2.8	3.0	6.1
Romania	6.8	4.7	3.6	2.7	4.3	8.1
Russia	7.7	5.3	3.8	3.6	4.8	8.8
Slovakia	6.7	6.0	3.5	2.8	4.7	7.8
Ukraine	6.4	4.3	3.3	3.9	5.0	10.2

Source: United Nations 2007.

Transfers allowed older Russians to subsidize working-age families adjusting to post-Soviet labor market and help them to raise children (Kuhn and Stillman 2004). This became possible because older people received more stable income in the form of pension payments while people at working ages were subjected to all of the uncertainties and fluctuations created by a free market.

Another indicator of potential support is a parent support ratio: a ratio of population aged 85 years and over to the population aged 50–64 years. This measure approximately relates those aged 85 and over to their presumed offspring (Mujahid 2006). This indicator reflects a burden of oldest-old population to their “offspring,” indicating the resource base of family support available to the oldest-old population. Table 6.7 shows uniform increase of the parent support ratio from 1975 to 2007 in the countries of Eastern Europe and highlights the growing challenge of providing adequate care for the oldest-old. Nevertheless, the values of parent support ratios in Eastern European countries are still much lower than in the entire European region.

In the developed countries, rapid aging places strong pressure on social security programs. In the countries of Eastern Europe this problem is exacerbated by a very low retirement age, particularly for women (see Table 6.8).

Eastern European countries inherited very generous and near universal pension systems from their Communist past based on the “pay-as-you-go” (PAYGO) principle. Benefits were based on years of service and

not the amount of contributions paid. The non-FSU countries of Eastern Europe tried different approaches to restructuring their pension systems against a general background of political changes and acute financial constraints (Fultz and Ruck 2001). Most of them restructured existing PAYGO systems and adopted a system of pension accounts based on individual contributions (Kritzer 2002).

Before the breakup of the Soviet Union, pensions in Russia were close to the average wage levels (DaVanzo and Grammich 2001). During the 1990s, pensions fell to less than 30 per cent of average wage value, resulting in widespread impoverishment of older people (DaVanzo and Grammich 2001). Even these small pensions were not paid on time between 1996 and 1999. This problem was also exacerbated by wage arrears experienced by many working families in the 1990s. Data from the Russia Longitudinal Monitoring Survey (RLMS) showed that wage arrears had detrimental effects on the well-being of the elderly in these families (Richter 2006). Salaries in households with wage arrears dropped by almost two-thirds and poverty doubled. The elderly cut back on food expenses and the nutritional content of food consumed, resulting in vitamin and mineral deficiencies. Functional limitations rose by 8 per cent for men and 3 per cent for women, and self-rated health declined by 2.5 per cent for men and 0.5 per cent for women (Richter 2006).

Difficulties with timely pension payments forced the Russian government to take steps toward reforming the Soviet style pension system. This old system

**Table 6.8** Population aged 60 and over by marital status, economic activity, living arrangements and sex in the countries of the Eastern Europe: 2006

Country/region	Percentage currently married	Percentage living alone	Percentage in labor force	Statutory retirement age
	Men/Women	Men/Women	Men/Women	Men/Women
Europe	80/47	13/35	15/7	–
Eastern Europe	83/47	11/31	16/7	–
Belarus	81/39	–	12/4	60/55
Bulgaria	80/53 <sup>1</sup>	12/25	11/3	62.5/57.5 <sup>2</sup>
Czech Republic	79/40	17/44	14/5	61.6/59–60 <sup>3</sup>
Hungary	75/36	13/32	2/1	62/60 <sup>4</sup>
Poland	74/46	10/28	14/7	65/60
Republic of Moldova	81/40 <sup>1</sup>	–	37/23	62/57
Romania	88/50	11/28	10/6	65/60
Russian Federation	77/36 <sup>5</sup>	10/31	20/9	60/55
Slovakia	78/38	–	6/2	62/62
Ukraine	83/35 <sup>1</sup>	–	16/6	60/55

Source: United Nations 2006a.

<sup>1</sup> Data for 1985–1994.

<sup>2</sup> Increasing by 6 months every year until age 63 (men) and age 60 (women).

<sup>3</sup> Increasing to age 63 (men) and ages 59–63 (women) by 2013. Age can vary for women according to the number of children raised.

<sup>4</sup> Increasing for women to age 61 by 2007 and age 62 by 2009.

<sup>5</sup> Goskomstat data based on 2002 Russian census (UN data present unrealistically high percentage of married women for Russia).

had several limitations (Maleva and Sinyavskaya 2005): (1) low level of pension payments, which were not adjusted for inflation, resulting in persons who retired long ago having very small pensions compared to recent retirees; (2) low differentiation of pension benefits, which did not take into account past income; (3) relatively low retirement age (60 years for men and 55 for women); and (4) common occurrence of early retirement (even earlier than 60 or 55 years) for many professional groups. Western researchers also mention lack of individual choice and lack of alternative pension financing as limitations of the Soviet pension system (Williamson et al. 2006), although probably most Russians did not consider this to be a limitation (few Russians opted out of state pension financing and chose private pension funds during the recent pension reform). Since 1991 there were several attempts to reform the pension system in Russia (Maleva and Sinyavskaya 2005). Finally, in 2001, Russia selected the World Bank model of pension reform, which implements individual pension accounts (Maleva and Sinyavskaya 2005; Williamson et al. 2006). The World Bank strongly recommended a transition from the existing defined benefit scheme to an alternative that included a notional defined contribution component (Williamson et al. 2006). This reform is currently

underway but it faces many difficulties besides population aging *per se*. The reforms adopted in Russia were largely based on the system of accumulating funds in personal pension accounts. Current actuarial forecasts in Russia show that the proportion of these funds in the total pension for young adults is very small and does not exceed 15 per cent. Many young people in Russia are involved in informal jobs, which do not include any paperwork and hence, no taxation and pension payments. It was also planned to reduce the early retirement practice and to replace it by professional pension systems. However, difficulties in reaching agreement between state, employers and employees postponed the introduction of such pension systems. It was expected that the new pension system would encourage both employers and employees to participate in legal businesses, thus increasing contributions to the Pension Fund. However population surveys show that this has not taken place. Increase of retirement age meets very strong opposition in the Russian society, where life expectancy of men does not even reach the statutory retirement age. The state monopoly in pension system management has not decreased but has rather increased in recent years (Maleva and Sinyavskaya 2005). Finally, authors of the report note very high dependence of the Russian pension system on

political decisions and political risks, which strongly affect its solvency (see Maleva and Sinyavskaya 2005 for more detail). Currently the Russian pension system encounters numerous problems besides those created by population aging.

## Living Arrangements Among the Elderly in Eastern Europe

Population aging also causes changes in living arrangements, resulting in an increasing number of older people living alone (see Table 6.8). Because older persons usually have lower incomes, with many living below the poverty line, population aging results in increasing poverty in many countries of Eastern Europe. This is particularly the case for the countries of the former Soviet Union (Russia, Ukraine, Belarus, Moldova) with small pensions, which are generally below the subsistence level. Economic needs may force older people to continue their work beyond the retirement ages.

The consequence of very high male mortality in Russia and other FSU countries is a high proportion of non-married women at older ages: over sixty per cent of women over age 60 in 2005 were not married. The proportion of non-married women was slightly lower in Bulgaria, Romania and Poland but still higher than in many industrialized countries (Table 6.8).

Table 6.9 shows proportion of persons living alone in selected Eastern European countries. Note the high proportion of older people living alone in the Czech Republic, which may reflect an adoption of western lifestyle rather than abandonment of the elderly. It also shows that unmarried people are more likely to live alone. Although relatively high proportion of older Russian women live alone, older Russian men are the least likely to live alone among the compared countries.

The data discussed above however are rather old and may not reflect the most recent trends in living arrangements of older people. Such data were obtained during a survey conducted by the fund "Public Opinion" in Russia (Vovk 2006). According to this survey, there are no established social norms regarding coresidence of older people with their children in Russia. When asked about benefits of older people coresiding with their children and grandchildren, 40–43 per cent of respondents found more negative than positive aspects in such living arrangements while 34–36 per cent had an opposite opinion. The responses were similar for both older and younger respondents. On average slightly more respondents found negative aspects of coresidence with the elderly compared to those who found more positive aspects of coresidence (Vovk 2006). Another survey of 1,500 respondents conducted in 2005 in Russia gives information on living arrangements among older people of different ages (Presnyakova 2006). According to the survey, 26 per cent of people aged 60–69 years and 39 per cent of those aged 70 years and over live alone. These data show that proportion of older people living alone increases with age. Table 6.10 demonstrates the same phenomenon for five selected countries. The highest proportion of the oldest-old living alone is observed in the Czech Republic and the lowest proportion in Russia.

The proportion of older population living in institutions reflects the demand for long-term care but may also reflect constraints related to government ability to provide sufficient funds for this kind of service. Existing data on the proportion of institutionalized population by age presented in Table 6.10 refer to the early 1990s. The proportion of older people residing in institutions is higher in the oldest age group but is overall much lower than in the Western European countries (De Vos and Sandefur 2002).

**Table 6.9** Proportion of persons aged 60 years or over living alone: Total and unmarried population, by sex (percentage)

Country/region	Year	All			Unmarried		
		Total	Men	Women	Total	Men	Women
Bulgaria	1992	19.0	11.9	24.8	52.4	57.9	50.5
Czech Republic	1991	33.6	17.4	44.2	70.1	74.4	69.1
Hungary	1990	24.3	13.0	32.0	51.7	53.7	51.2
Romania	1992	20.3	10.6	27.7	52.5	56.5	51.5
Russia	1989	24.8	10.1	31.3	47.3	56.2	46.3

Source: United Nations 2005.

**Table 6.10** Proportion of persons aged 60 years or over living alone and in institution, by age group (percentage)

Country/region	Year	Age						
		Total	60–64	65–69	70–74	75–79	80–84	85+
<b>Proportion living alone</b>								
Bulgaria	1992	19.0	11.8	16.9	22.0	27.6	29.9	28.9
Czech Republic	1991	33.6	21.1	28.8	36.2	44.1	50.2	51.3
Hungary	1990	24.3	17.1	22.0	27.0	31.8	33.4	32.3
Romania	1992	20.3	12.6	17.9	24.4	29.4	31.8	31.5
Russia	1989	24.8	18.4	25.5	30.5	31.2	29.4	23.5
<b>Proportion living in institution</b>								
Country/region		Total	60–64	65–69	70–74	75+		
Bulgaria	1992	0.4	0.2	0.2	0.3	0.7		
Czech Republic	1991	2.0	0.5	0.7	1.3	4.6		
Hungary	1990	1.2	0.5	0.6	1.0	2.6		
Romania	1992	0.3	0.2	0.2	0.3	0.5		
Russia	1989	0.7	0.4	0.5	0.7	1.1		

Source: United Nations 2005.

### Rising Demand for Health Services

One of the main challenges of an aging population is the increasing demand for health care services. Older people (oldest-old in particular) are prone to higher rates of morbidity. As nations age, a shift in disease patterns become inevitable, increasing the societal burden of providing adequate resources for elders' health care.

Healthy life expectancy (HALE) can be used to assess differences in mortality and morbidity across countries and is interpreted as expected lifetime in full health (WHO 2004). Table 6.11 shows values of HALE at birth and at age 60 for countries of Eastern Europe, as

well as expectation of lost healthy years at birth. Note that FSU countries have the lowest values of HALE among the countries of Eastern Europe. At the same time, men and women in Russia, Ukraine and Belarus have the fewest years spent in a state of ill health because of high mortality at all ages. Shorter time spent in the state of ill health decreases the overall burden on health care system in these countries. It was estimated that the working-age mortality in Russia may be so high that the future pension obligations would be reduced to the levels sufficient for the nation to support current pension programs (DaVanzo and Grammich 2001).

Health surveys demonstrate consistently worse health in Russia compared to Western countries. For

**Table 6.11** Healthy life expectancy in the countries of Eastern Europe, 1992

Country	Healthy life expectancy				Expectation of lost healthy years at birth (years)		Percentage of total life expectancy lost	
	Men		Women		Men	Women	Men	Women
	At birth	At age 60	At birth	At age 60				
Belarus	56.6	10.5	64.9	14.6	6.1	9.4	9.7	12.6
Bulgaria	62.6	12.5	67.1	15.0	6.2	8.5	9.1	11.3
Czech Republic	65.9	13.5	70.9	16.8	6.6	8.1	9.1	10.3
Hungary	61.5	12.1	68.2	16.0	6.8	8.6	10.0	11.2
Poland	63.1	12.8	68.5	16.1	7.5	10.2	10.6	13.0
Republic of Moldova	57.2	11.0	62.4	13.2	6.8	9.2	10.6	12.9
Romania	61.0	12.3	65.2	14.6	7.0	9.7	10.3	13.0
Russian Federation	52.8	9.7	64.1	14.0	5.5	7.7	9.4	10.7
Slovakia	63.0	12.3	69.4	16.1	6.7	8.9	9.6	11.4
Ukraine	54.9	10.3	63.6	13.7	6.8	9.4	11.0	12.8

Source: WHO 2004.

example, surveys conducted in Galesburg, Illinois and Moscow, Russia found that self-assessed health was good for 77 per cent of Americans and only 6 per cent of Russians (Jogerst et al. 2006), although the Russian sample was about ten years younger than the American sample (mean age of 67 years and 78 years respectively). It is interesting that sixty per cent of Russians took no medications compared with 14 per cent of Americans but Russians reported more cardiovascular disease, angina and hypertension (Jogerst et al. 2006). These differences may be partially explained by difficulties in gaining access to medical care by older people in Russia (Sinyavskaya 2006). Although the health care system in Russia includes free services, many pensioners report difficulties in obtaining qualified medical care (Sinyavskaya 2006).

Alcohol abuse and other lifestyle factors (tobacco smoking, malnutrition, low exercise) are usually mentioned as the main cause of high mortality and poor health in Russia and other FSU countries (Nolte et al. 2005). Indeed, WHO data show high prevalence of lifestyle risk factors in these countries. For example, prevalence of smoking among Russian (56.7 per cent) and Ukrainian (66.8 per cent) men is significantly higher than among Czech men (38.9 per cent) (WHO 2007). Although the consumption of alcohol in Russia reported by WHO is not the highest in Europe, Russian men tend to consume predominantly strong liquors (vodka), which are the most detrimental to health and to drink in binges (McKee et al. 2001; Shkolnikov et al. 1998; Shkolnikov et al. 2002).

DALY (Disability Adjusted Life Years) is a useful indicator to measure the contribution of different causes to mortality and morbidity. DALYs for a disease or health condition are calculated as the sum of the years of life lost due to premature mortality (YLL) in the population and the years lost due to disability (YLD) for incident cases of the health condition (WHO 2002). According to WHO data, the burden of cardiovascular disease accounted for almost one third of the overall burden of disease in Russia, Ukraine and Belarus, while the impact of neuropsychiatric disease and cancer was significantly lower than in Western European countries (Nolte et al. 2005). Contribution of injuries to burden of disease was also exceptionally high in the FSU countries compared to the countries of Western Europe. The World Health Report (WHO 2002) also provides data on contribution of major risk factors to the overall burden of disease using DALYs. Alcohol and tobacco use are

the major factors of ill health for men in the FSU countries, in contrast to obesity and tobacco use for men in Western Europe (WHO, 2002). Contribution of alcohol to ill health was higher and the contribution of tobacco use was lower for FSU women compared to Western European women (WHO 2002).

However, alcohol abuse is not the only factor of poor health among Russian men and women. Studies showed that the economic hardship and poverty of the 1990s have had detrimental effects on health, particularly for men. For example, during 1996–1999, many pensioners did not receive pensions for an extended period of time. RLMS data showed that among affected pensioners, poverty rates doubled and the intake of calories and protein and the use of health services and medications declined significantly. These pensioners were also 5 per cent more likely to die in the two years following the crisis (Jensen and Richter 2004). Another survey demonstrated that the poorest fifth of the respondents were more than twice as likely as others to report heart symptoms. Problems in affording vegetables, meat or fish, clothes and footwear were linked to heart symptoms more closely than other economic indicators (Vagero and Kislitsyna 2005).

Summarizing this brief review of health in the countries of Eastern Europe, we may conclude that FSU countries lagged behind other countries of Eastern Europe in both health indicators and reforms of their health care systems. Many countries of Eastern Europe (such as the Czech Republic or Poland) could successfully reform their health systems and make significant achievements in mortality reductions. FSU countries reformed their health systems in the direction of replacing free services by paid services, which made many of them unaffordable to less wealthy groups and to older people in particular.

## Projections of Population Aging in the 21st Century

Before the 1980s the process of population aging was considered as an exclusive consequence of fertility decline and it was predicted that the pace of population aging would decrease after stabilization of fertility rates at some low levels. However, the rapid decline in mortality at older ages observed in developed countries in the last decades of the 20th century accelerated the process



**Table 6.12** Dynamics of population aging in Russia and Eastern Europe

Country /region	1975		2000		2030	
	60+	80+	60+	80+	60+	80+
Europe	16.4	1.6	20.3	2.9	29.7	6.0
Eastern Europe	14.4	1.3	18.6	2.0	26.4	4.1
Belarus	14.2	1.8	19.3	1.9	26.1	3.3
Bulgaria	16.1	1.4	22.0	2.1	29.5	5.2
Czech Republic	18.3	1.7	18.3	2.3	30.2	6.4
Hungary	18.3	1.7	19.8	2.5	28.4	5.6
Poland	13.8	1.2	16.6	2.0	27.6	4.9
Republic of Moldova	10.8	1.0	13.8	1.2	23.0	2.9
Romania	14.3	1.2	19.1	1.8	26.7	4.1
Russia	13.6	1.2	18.3	2.0	24.9	3.6
Slovakia	13.8	1.2	15.4	1.8	27.3	4.6
Ukraine	15.8	1.6	20.7	2.3	28.6	4.6

Observed and Forecasted (Medium Variant) Percentages of the Elderly (60+ years) and the Oldest-Old (80+ years) in Different Countries of the Eastern Europe: 1975, 2000 and 2030

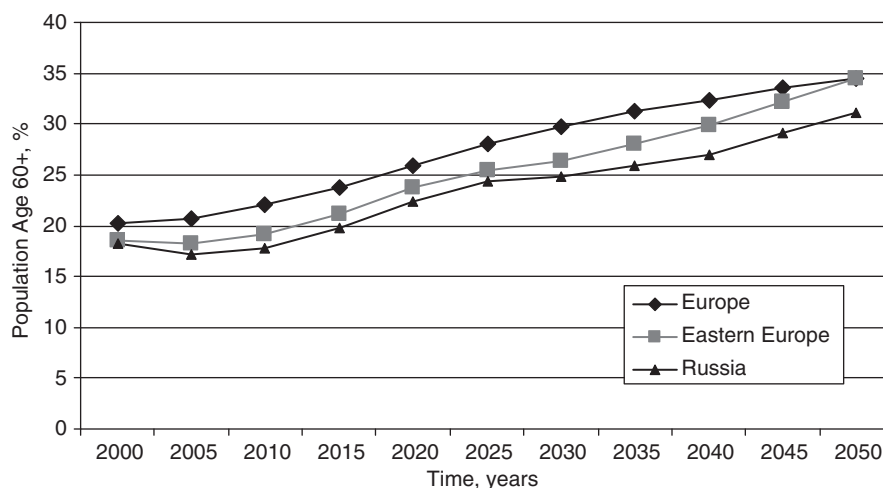
Data source: United Nations 2006b.

of population aging in these countries. Now human mortality is a key demographic component in projecting the size and composition of the world's future elderly population. Current and future uncertainties about changing mortality may produce widely divergent projections of the size of tomorrow's elderly population. The problem of uncertainty about future changes in mortality is particularly acute for Russia and the countries of Eastern Europe, which demonstrated periods of both mortality growth and decline during the last two decades.

Table 6.12 shows observed and forecasted proportions of the elderly and the oldest-old in the countries of Eastern Europe. Forecasted data correspond to the medium variant of the UN demographic projections. The medium variant assumes that total fertility in

all countries will converge eventually toward a level of 1.85 children per woman. Note that all countries, with the exception of the Czech Republic, will have lower proportions of older age groups in 2030 than the total European population. Relatively high proportions of older people in 2030 are also expected in Hungary, Bulgaria, Poland, Slovakia and Ukraine.

An example from Russia illustrates the range of future uncertainty about the future size of the oldest-old population. The United Nations projections estimated the proportions of people aged 60 and over in Russia to be 24.9 per cent (medium fertility variant), 23.2 per cent (high fertility variant), 27 per cent (low fertility variant) and 25.9 (constant fertility variant). The differences in these projections result almost exclusively from the assumptions about fertility rates. Adult mor-



**Fig. 6.5** Projected proportions (medium variant) of the population aged 60 and over for Europe and Russia. Source: United Nations 2006a

tality rates are assumed to decline in all countries, with smaller improvements occurring the higher the life expectancy already reached.

According to the IASA projections, from 2000 to 2050 the proportion of the world population above age 60 would increase from 10 to 22 per cent. In Western Europe it would increase from 20 to 35 per cent for the same period (Lutz et al. 2001). Around year 2050 the proportion of population above age 60 in Eastern Europe would be approximately the same as in Western Europe. The projected trends in the proportions of the elderly (60+) made by the United Nations are presented in Fig. 6.5. Note that by 2050 population aging in Eastern Europe will reach the same level as exists for the rest of Europe. In Russia, however, the proportion of the elderly will remain relatively low compared to the European region.

## Summary

Russia and most countries of Eastern Europe lag behind Western Europe in the degree of population aging. Low fertility is the major determinant of population aging in these countries. The role of migration varies across the countries and is a significant determinant of population aging in the countries experiencing high out-migration flows (like Bulgaria or Moldova). Until recently, increasing longevity did not play a significant role in population aging in Russia and Eastern Europe. It is expected that longevity may soon become a significant determinant of population aging in the countries demonstrating a rapid decrease of mortality (Czech Republic, Slovakia, Poland). In the FSU countries, the effects of longevity increases on population aging is a possibility in the more distant future. The latter fact makes overall pressure on social welfare and health care systems caused by population aging less prominent for these countries compared to other industrialized countries.

## References

- Anderson BA (2002) Russia faces depopulation? Dynamics of population decline. *Popul Environ* 23(5):437–464
- Andreev E (1999) The dynamics of mortality in the Russian Federation. In: *Health and mortality. Issues of global concern*. New York, United Nations, pp 262–283
- Andreev EM (2001) Six Post-Soviet countries: Mortality before and after the break-up of the USSR. *Demoscope Weekly* [online journal] 43–44, <http://www.demoscope.ru/weekly/043/tema01.php>.
- Andreev EM, Vishnevsky AG, Kvasha E, Kharkova T (2005) Russian age-sex pyramid. *Demoscope Weekly* [online journal] 215–216, <http://www.demoscope.ru/weekly/0215/tema02.php>
- Avdeev A, Monnier A (1994) A survey of modern Russian fertility. *Population* 49(4–5):859–901
- DaVanzo J, Grammich CA (2001) Dire demographics. *Population trends in the Russian Federation*. RAND, Santa Monica, CA
- De Vos S, Sandefur G (2002) Elderly living arrangements in Bulgaria, the Czech Republic, Estonia, Finland, and Romania. *Eur J Popul* 18(1):21–38
- Fultz E, Ruck M (2001) Pension reform in Central and Eastern Europe: Emerging issues and patterns. *Int Labour Rev* 140(1):19–25
- Gafarov VV, Pak VA, Gagulin IV, Babina TD (2003) Ten year dynamics of attitude to health problems in male population of Novosibirsk. *Ter Arkhiv* 75(1):27–30
- Gavrilov LA, Gavrilova NS (1991) *The biology of life span: A quantitative approach*. Harwood Academic Publisher, New York
- Gavrilov LA, Heuveline P (2003) Aging of population. In: Demeny P, McNicoll G (eds) *The encyclopedia of population*, Macmillan Reference USA, New York, pp 32–37
- Gavrilova NS, Gavrilov LA, Semyonova VG, Evdokushkina GN, Ivanova AE (2005) Patterns of violent crime in Russia. In: Pridemore WA (ed) *Ruling Russia: Law, crime, and justice in a changing society*, Rowman & Littlefield Publ., Inc., Boulder, CO, pp 117–145
- Gavrilova NS, Semyonova VG, Evdokushkina GN, Gavrilov LA (2000) The response of violent mortality to economic crisis in Russia. *Popul Res Policy Rev* 19(5):397–419
- Goskomstat (2004) Results of the 2002 All-Russia population census. Distribution by age, sex and marital status. vol 2, Moscow: Statistika Rossii
- Gustafsson B, Nivorozhkina L (2004) Changes in Russian poverty during transition as assessed from microdata from the city of Taganrog. *Econ Transit* 12(4):747–776
- Heleniak T (2003) Geographic aspects of population aging in the Russian Federation. *Eurasian Geogr Econ* 44(5):325–347
- Hristov E (2004) The aging of the population in South-Eastern Europe. *SEER - South-East Eur Rev Labour Soc Aff* 3:119–130
- Ivanova AE, Semyonova VG, Dubrovina E (2004) Marginalization of Russian mortality. *Demoscope Weekly* [online journal] 181–182, <http://demoscope.ru/weekly/2004/0181/tema01.php>
- Jensen RT, Richter K (2004) The health implications of social security failure: evidence from the Russian pension crisis. *J Public Econ* 88(1–2):209–236
- Jogerst GJ, Daly JM, Hesli V, Saha C (2006) Comparison of health and effective functioning in Russia and the United States. *Clin Interv Aging* 1(2):189–196
- Kaczmarczyk P, Okolski M (2005) International migration in Central and Eastern Europe – current and future trends. UN Population Division, New York
- Kannisto V, Lauritsen J, Thatcher AR, Vaupel JW (1994) Reductions in mortality at advanced ages - several

- decades of evidence from 27 Countries. *Popul Dev Rev* 20(4):793–810
- Khalturina DA, Korotaev AV (2006) Russian Cross. Factors, mechanisms and pathways of overcoming demographic crisis in Russia. [In Russian]. Moscow: Komkniga
- Kinsella K, Velkoff VA (2001) *An aging world: 2001*. U.S. Government Printing Office, Washington, DC
- Kritzer BE (2002) Social security reform in Central and Eastern Europe: Variations on a Latin American theme. *Soc Secur Bull* 64:16–32
- Kuhn R, Stillman S (2004) Understanding interhousehold transfers in a transition economy: Evidence from Russia. *Econ Dev Cultural Change* 53(1):131–156
- Lutz W, Sanderson W, Scherbov S (2001) The end of world population growth. *Nature* 412(6846):543–545
- Maleva TV, Sinyavskaya OV (2005) Pension reform in Russia: history, results, prospects. Pomatur, Moscow
- Mansoor A, Quillin B (2007) Migration and remittances. Eastern Europe and the Former Soviet Union. The World Bank, Washington, DC
- McKee M, Shkolnikov V, Leon DA (2001) Alcohol is implicated in the fluctuations in cardiovascular disease in Russia since the 1980s. *Annals Epidemiol* 11(1):1–6
- Mesle F, Shkolnikov VM (1995) Mortality in Russia: A public health crisis in two stages. *Rev Etud Comp Est Ouest* 26(4):9
- Mesle F, Vallin J (2006) Interpreting recent mortality changes in the former USSR in the light of long term trends and reference to Central Europe. In: *Mortality in countries of the former USSR. Fifteen years after break-up: Change or Continuity?* IUSSP: Kiev, vol. 2, pp 68–88
- Mujahid G (2006) Population ageing in East and South-East Asia. UNFPA, Bangkok, Thailand
- Nemtsov AV (1997) Alcohol consumption and mortality in Russia. *Sotsiol Issled* 9:113–116
- Nemtsov AV (2002) Alcohol-related human losses in Russia in the 1980s and 1990s. *Addiction* 97(11):1413–1425
- Nolte E, McKee M, Gilmore A (2005) Morbidity and mortality in the transition countries of Europe. In: Macura M, MacDonald AL, Haug W (eds) *The new demographic regime. Population challenges and policy responses*, United Nations: New York and Geneva, pp 153–176
- Notzon FC, Komarov YM, Ermakov SP, Sempos CT, Marks JS, Sempos EV (1998) Causes of declining life expectancy in Russia. *J Am Med Assoc* 279(10):793–800
- Perelli-Harris B (2005) The path to lowest-low fertility in Ukraine. *Popul Stud J Demogr* 59(1):55–70
- Presnyakova L (2006) Social, material and emotional climate of aging in Russia. *Demoscope Weekly* [online journal] 257–258, <http://www.demoscope.ru/weekly/2006/0257/analit01.php>
- Preston SH, Heuveline P, Guillot M (2001) *Demography. Measuring and modeling population processes*, Blackwell Publishers, Oxford, UK
- Pridemore WA (2002) Vodka and violence: Alcohol consumption and homicide rates in Russia. *Am J Public Health* 92(12):1921–1930
- Richter K (2006) The well-being of the elderly and wage arrears in Russia. *J Eur Econ Assoc* 4(1):116–152
- Shkolnikov VM, Cornia GAA, Leon DA, Mesle F (1998) Causes of the Russian mortality crisis: Evidence and interpretations. *World Dev* 26(11):1995–2011
- Shkolnikov VM, Leon DA, Adamets S, Andreev E, Deev A (1998) Educational level and adult mortality in Russia: An analysis of routine data 1979 to 1994. *Soc Sci Med* 47(3):357–369
- Shkolnikov VM, McKee M, Chervyakov VV, Kyrianov NA (2002) Is the link between alcohol and cardiovascular death among young Russian men attributable to misclassification of acute alcohol intoxication? Evidence from the city of Izhevsk. *J Epidemiol Community Health* 56(3):171–174
- Sinyavskaya OV (2006) Poverty of pensioners. *Demoscope Weekly* [online journal] 257–258, <http://www.demoscope.ru/weekly/2006/0257/tema01.php>
- Sobotka T (2003) Re-emerging diversity: Rapid fertility changes in Central and Eastern Europe after the collapse of the Communist regimes. *Population* 58(4–5):511–547
- United Nations (2005) *Living arrangements of older persons around the world*. New York: United Nations
- United Nations (2006a) *Population aging 2006*. Wall chart. <http://esa.un.org/unpp/>
- United Nations (2006b) *World population prospects: The 2004 revision population database*, <http://esa.un.org/unpp/>
- United Nations (2007) *World population ageing 2007*. United Nations, New York
- Vagero D, Kislitsyna O (2005) Self-reported heart symptoms are strongly linked to past and present poverty in Russia: Evidence from the 1998 Taganrog interview survey. *Eur J Public Health* 15(4):418–423
- Vassin SA (1996) The determinants and implications of an aging population in Russia. In: DaVanzo J (ed) *Russia's demographic "crisis"*, RAND Corporation, Santa Monica CA
- Vishnevskiy AG (2006) *Demographic modernization of Russia: 1900–2000*. Novoe Izdatelstvo, Moscow
- Vovk E (2006) Elderly in family: Specifics of intergenerational interactions. *Demoscope Weekly* [online journal] 249–250 <http://www.demoscope.ru/weekly/2006/0249/analit05.php>
- WHO (2002) *World Health Report*. Geneva
- WHO (2004) *Estimated healthy life expectancy (HALE) at birth and age 60, by sex, WHO Member States, 2002*. Geneva [www.who.int/healthinfo/statistics/gbdwhr2004hale.xls](http://www.who.int/healthinfo/statistics/gbdwhr2004hale.xls).
- WHO (2007) *World health statistics 2007. Risk factors*. Geneva
- Williamson JB, Howling SA, Maroto ML (2006) The political economy of pension reform in Russia: Why partial privatization? *J Aging Studies* 20(2):165–175

