

# **RUSSIAN HEALTH STATUS IN THE 1990s:**

## **National Trends and Regional Variation**

Judyth Twigg  
Virginia Commonwealth University



The National Council for Eurasian and East European Research  
910 17<sup>th</sup> Street, N.W.  
Suite 300  
Washington, D.C. 20006

TITLE VIII PROGRAM

## **Project Information\***

<b>Sponsoring Institution:</b>	<b>Virginia Commonwealth University</b>
<b>Principal Investigator:</b>	<b>Judyth Twigg</b>
<b>Council Contract Number:</b>	<b>815-16g</b>
<b>Date:</b>	<b>June 28, 2000</b>

## **Copyright Information**

Scholars retain the copyright on works they submit to NCEEER. However, NCEEER possesses the right to duplicate and disseminate such products, in written and electronic form, as follows: (a) for its internal use; (b) to the U.S. Government for its internal use or for dissemination to officials of foreign governments; and (c) for dissemination in accordance with the Freedom of Information Act or other law or policy of the U.S. government that grants the public access to documents held by the U.S. government.

Additionally, NCEEER has a royalty-free license to distribute and disseminate papers submitted under the terms of its agreements to the general public, in furtherance of academic research, scholarship, and the advancement of general knowledge, on a non-profit basis. All papers distributed or disseminated shall bear notice of copyright. Neither NCEEER, nor the U.S. Government, nor any recipient of a Contract product may use it for commercial sale.

---

\* The work leading to this report was supported in part by contract or grant funds provided by the National Council for Eurasian and East European Research, funds which were made available by the U.S. Department of State under Title VIII (The Soviet-East European Research and Training Act of 1983, as amended). The analysis and interpretations contained herein are those of the author.

## **Executive summary**

Over the last decade, Russia has experienced a demographic shock of unprecedented proportions, which can be seen in figures for overall population, birth-rates and life expectancy. While this phenomenon has been thoroughly documented and analyzed at the national level, regional trends within Russia remain more opaque. This report will first summarize the national-level data on demographic and health changes since the beginning of the 1990s and assess their possible consequences for the economy and for the military. It will then present original research on regional trends in life expectancy, infant mortality and morbidity and identify their relationship to national patterns.

Over the last decade, Russia has experienced a demographic shock of unprecedented proportions. While this phenomenon has been thoroughly documented and analyzed at the national level, regional trends within Russia remain more opaque. This report will first summarize the national-level data on population, mortality, life expectancy, and morbidity, and assess their possible consequences. It will then present original research on regional trends and their relationship to national patterns.

## National trends

### *Population*

Currently, deaths are exceeding births in Russia by over fifty percent, amounting to about 700,000 people “lost” per year. As measured against 1987, the years 1992-1995 witnessed an excess mortality of 1.8 million people – more than the 1.7 million Russian combatants killed during World War I.<sup>1</sup> The latest official Russian figures show that the Russian population has shrunk by 2.8 million, or almost two percent, since 1992, with the numbers of “lost souls” accelerating rather than abating.

In 1999 alone, the number of inhabitants fell by 759,700, or more than 0.5 percent. This number reflects two components: the ratio of births (1,215,800 in 1999) to deaths (2,140,300 in 1999); and the ratio of immigrants (379,700 in 1999) to emigrants (214,900 in 1999). Each of these statistics represents a worsening of the situation over 1998, with the numbers of births and immigrants lower, and the numbers of deaths and emigrants higher.<sup>2</sup>

Table One. Natural population decrease, Russia, early 1999, 2000<sup>3</sup>

	1999		2000	
	January	February	January	February
Deaths	178,200	179,400	195,500	196,200
Births	94,500	99,200	93,900	92,400
Natural population decrease (deaths minus births)	83,700	80,200	101,600	92,400

Available figures for the early part of 2000 point to a continuation of the trend.

The rate of decrease of the population is accelerating, with the number by which deaths exceed births increasing by 17,900 from January of 1999 to January of 2000, an increase of 21.4 percent, and a 15.2 percent increase from February of 1999 to February of 2000. These numbers constitute a loss of population of over 2,500 persons *per day*.

Within these total population figures, the most worrisome trend involves adult male mortality. Annual death rates among men ages 15 to 24 climbed from 209.4 per 100,000 population in 1990 to 289.3 in 1993. For males ages 45 to 54, the 1990 to 1993 surge was from 1,443.4 per 100,000 population to 2,173.4.<sup>4</sup>

Birth rates have plummeted from 2.2 children per woman of childbearing age in the late Soviet period to 1.24 children per woman of childbearing age in 1997, a full forty percent below the population replacement rate of 2.1.<sup>5</sup> These low levels are due not merely to conscious decisions to defer childbearing until socioeconomic conditions improve. If that were the case, then Russia might expect a population “boomlet” should the economy stabilize and prospective parents therefore feel more comfortable and confident adding the burden and responsibility of an additional family member. But reliable estimates attribute at least part of the dismal birth rate to infertility, with 15 to 20 percent of all married couples unable to reproduce, and the prevalence of infertility currently increasing by more than three percent annually.<sup>6</sup> These alarming figures are due in part to a skyrocketing of sexually transmitted diseases – new incidence of syphilis has increased by 77 times (not percent, but times!) since 1990, and about 50 times for 10- to 14-year old girls – and also to multiple abortions. With abortion still free on demand at most hospitals and clinics within the first trimester (and not difficult to obtain later in a pregnancy), and with the American social stigma attached to the procedure absent in Russia, twice as many abortions as live births were experienced in 1997.<sup>7</sup> This amounted to almost 2.5 million terminated pregnancies, with nearly 40 percent of those botched by the health care system to the point that they required antibiotics or hospital treatment for the woman. Still another explanation for reduced fertility levels focuses on

unfavorable working conditions, which affect 1.5 million Russian women, according to Deputy Health Minister Olga Sharapova.<sup>8</sup>

### *Life expectancy*

Life expectancy at birth in 1997 was 66.9 years, a drop of 2.3 years from 1990's figure of 69.2. Most dramatic were the life expectancy patterns for males in the early part of the 1990s, which plunged from 64.2 years in 1989 to 57.6 in 1994, including an astonishing one-year drop (from 1992 to 1993) of more than three years, from 62.0 to 58.9.<sup>9</sup> While this figure has since rebounded to 61.0 in 1997, regaining almost 50 percent of its recent loss, considerable uncertainty clouds the future direction of this vital indicator. Only 54 percent of today's sixteen-year old males will survive to age sixty; in the United States, the comparable figure is 83 percent.<sup>10</sup> These survival odds are unparalleled, even in the developing world. The gap between male and female life expectancy is also troubling, standing now at approximately 13.5 years. In the words of U.S. sociologist Mark Field, "Russia is now on its way to becoming a country of widows and fatherless children."<sup>11</sup>

Speculation as to the causes of this mortality crisis points to a variety of possibilities. Perhaps the most intuitive explanation is poverty, the idea that the economic costs of the transition have taken their toll on the population's health and physical well-being. Yet the greatest falls in life expectancy have occurred in some of Russia's wealthiest regions, prompting a search for alternative theories.<sup>12</sup> In addition, those segments of the population that have been affected most adversely by the collapse of the social safety net – pensioners, children, the disabled – have not experienced the greatest losses in terms of mortality. Instead, the demographic crisis has hit those whom one might expect would weather the transition more easily, working-age adult males.<sup>13</sup>

Another obvious culprit is the environment, given the wanton abuse to which the Soviet system subjected its land, water, and air. The Russian Ministry of the Environment has classified 14-16 percent of the country's land mass as "environmental disaster zones," based on a 32-index scale taking into account factors ranging from air and water quality to deforestation and desertification. The Federal

Report on the Environmental Situation in 1997 claimed that 15 million Russians are regularly exposed to the effects of harmful airborne substances.<sup>14</sup> Reliable estimates hold that between twenty and thirty percent of population morbidity can be linked to environmental pollution.<sup>15</sup> Unquestionably there are specific geographic areas within Russia where the health impact of industrial pollutants is staggering. In the city of Krasnouralsk, for example, where lead from automobile battery production has been released into the air and settled into the soil and thus into the food supply, an astonishing three-fourths of children under age 15 suffer from mental retardation.<sup>16</sup>

The data at this point, however, do not support the hypothesis of environmental factors as a primary cause of increased mortality in the 1990s. Air pollution as a cause of excess death, for example, would lead to an increase in diseases of the respiratory system, and yet death dates from respiratory illnesses have actually been on the decline since the early 1980s. Similarly, death rates attributed to cancer have been fairly steady at about one percent for nearly a decade, despite reports of radiation risks.<sup>17</sup>

The rise of previously controlled infectious disease has also received a great deal of press, and might be assumed to play a primary causal role in the mortality situation. In recent years, Russia has experienced alarming outbreaks of cholera, diphtheria, typhus, typhoid, whooping cough, measles, hepatitis, hemorrhagic fever, and most disturbingly, tuberculosis and HIV/AIDS. Throughout the mid-1900s, parents avoided vaccinating their children because of fear of dirty needles in clinics and hospitals, and of poor-quality vaccines.<sup>18</sup> Yet communicable diseases have accounted for only two to five percent of Russian deaths in recent years.<sup>19</sup>

A careful examination of cause-of-death statistics for the 1990s reveals that the major factors behind excess death lie in two categories: cardiovascular disease (heart attacks, strokes, etc.), and “external causes” (injuries, suicide, homicide, poisonings, and the like) (see Figure One, at the end of this paper).<sup>20</sup> Between 1990 and 1994, cardiovascular illness and external factors accounted for over 65 percent of the decline in male and female life expectancy.<sup>21</sup> Russia’s suicide rate is one of the highest in

the world, forty per 100,000 inhabitants annually, and its murder rate is currently double that of the United States.<sup>22</sup>

Reasonable conjecture holds that alcohol plays an important proximate role behind both these sets of factors.<sup>23</sup> A recent three-year study of men aged 20 to 55 in Moscow and Udmurtia found that two-thirds of men who die do so drunk, and more than half that number are in an extreme state of intoxication, with most deaths occurring on Mondays after a weekend of heavy drinking. According to a *Kommersant* report on the study, “Everyone is drunk: murderers and their victims, drowning victims, suicides, drivers and pedestrians killed in traffic accidents, victims of heart attacks and ulcers.”<sup>24</sup> Nationwide, adult men consume an average of 160 to 180 half-liter bottles of vodka per year, equivalent to a bottle almost every other day.<sup>25</sup> The number of registered alcoholics has doubled since 1992, to 2.2 million, and a full five percent of those – 110,000 – are aged 12 to 16.<sup>26</sup> But these “officially registered” figures do not paint the full picture. The Ministry of Health estimates that forty percent of adult Russian men, and 17 percent of women, are alcoholics.<sup>27</sup> An astonishing 35,000 deaths annually result from direct alcohol poisoning alone, a figure 100 times that of the United States (and the U.S. population is nearly double Russia’s).<sup>28</sup>

Why the high rates of alcohol consumption during the transition period? Some sociologists have suggested that alcohol abuse may reflect psychosocial tension and stress due to economic and societal turmoil.<sup>29</sup> The postulated causal chain here is therefore complex, and difficult to unravel scientifically: the upheaval of the transition drives people to drink, which has a detrimental impact on life expectancy and other health outcomes, which further degrades society’s ability to cope with the transition – driving more people to reach for the vodka bottle.

This and other equally dire hypothesized sequences of cause and effect have led most commentators toward dire population projections. Murray Feshbach calculates that by 2010, Russia may contain as few as 135 to 138 million people, and by 2050, between 80 and 100 million, down from 148 million in 1996.<sup>30</sup> If Russia’s birth and death rates stabilize at current levels, in 2050 Russia’s population will fall to 116 million people.<sup>31</sup> Goskomstat in 1996 projected total life expectancy in 2010 at 66.2 years in its worst-case scenario, and 69.2 years in its most optimistic case.<sup>32</sup> Of course, that pessimistic



projection was exceeded the very next year, indicating that conditions improved more rapidly than some official projections would have predicted. Similarly, Nicholas Eberstadt, on the basis of data through 1995, projected male life expectancy in 2020 at 62.6 in a pessimistic scenario and 65.8 years in the best case, representing a gain of between 4.3 and 7.5 years between 1995 and 2020. However, from 1995 through 1997 alone, this indicator gained 2.7 years (from 58.3 to 61.0).

Indeed, based on post-1994 data, some Russian researchers have attempted to shift the focus away from an unmitigated gloom-and-doom scenario. As indicated earlier, life expectancy figures have, since the mid-1990s, trended upward and now stand at pre-transition levels (see Figure Two).

This pattern is commonly interpreted as representing an adaptation to the new socioeconomic situation. Vladimir Shkolnikov, of Moscow's Center for Demography and Human Ecology, offers a more nuanced explanation. He argues that deaths from circulatory disease and external causes decreased following the start of the infamous Gorbachev anti-alcohol campaign in 1985, and then increased again dramatically in the early 1990s when alcohol consumption resumed with a vengeance. This resumption in drinking was driven by the psychosocial stress of the political and economic transition, facilitated by increased availability and reduced prices for alcohol relative to other consumables, and its health effects were exacerbated by the typical Russian binge-drinking pattern.<sup>33</sup> Put bluntly, the 1990-1994 plunge in male life expectancy can be explained by the fact that men who should have died earlier – in the 1985-1990 anti-alcohol campaign period – did not. Their deaths were temporarily postponed due to the Gorbachev-inspired expense and decreased availability of vodka. Once their drinking resumed a few years later, those people all died at once, resulting in the unprecedented life expectancy and excess death figures experienced in the early 1990s. In other words, “a simple return to high alcohol consumption after a short-term relaxation explains a great part of [the] mortality variation in the post-Soviet space.”<sup>34</sup> Once this dynamic played itself out, male life expectancy surged back to “normal,” and by 1997, it had returned to late Soviet levels.

This line of reasoning has led Shkolnikov to debate the well-publicized pessimistic forecasts, and to speculate that life expectancy and other trends will show gradual improvement in coming years. A

minority of other observers has concurred, with Vladimir Kontorovich, for example, “[calling] into question the assumption of durable, intractable mortality crisis.”<sup>35</sup> But Feshbach and others counter that Shkolnikov does not take into account new threats on the horizon, in particular, a shift in the structure of causes of death toward infectious and parasitic disease – an argument bolstered by the causes-of-death trends in the mid to late 1990s (see Figure Three).<sup>36</sup> In particular, Feshbach is concerned about the growing contribution to mortality likely to be posed by tuberculosis and HIV/AIDS.<sup>37</sup>

### *Tuberculosis*

The Russian mortality rate for tuberculosis was 16.9 per 100,000 persons in 1997, 34 times that in the United States, representing a doubling over the last previous five years.<sup>38</sup> In 1998, prevalence of the disease was reported at 74 cases per 100,000 population, which ranks Russia among the top ten countries in the world for tuberculosis infections.<sup>39</sup> It is uncertain, however, whether even these official statistics capture the vast majority of Russians suffering the disease – prison inmates – and they almost surely miss other likely infected populations such as the homeless, forced migrants, refugees, people living in railroad stations, and the like. International specialists have called Russia’s city jails “the focal point of the TB epidemic,” with every third sufferer in a place of detention, one out of ten prisoners infected, and that number increasing by 25 percent a year.<sup>40</sup>

The wildfire-like spread of the airborne illness within prison cells is easy to understand, given incarceration conditions. The average inmate has a living space “smaller than the size of a coffin,” about sixty square centimeters, with prisoners taking turns lying or sitting on bunks.<sup>41</sup> In terms of financial, pharmaceutical, and staff resources for treatment, prisons fall woefully short. As a result, many prison physicians stretch their scarce resources at hand, doling out partial doses or incomplete regimens of medication to infected persons. This well-intentioned approach ignores the fact that tuberculosis is a disease better left untreated than partially treated; drug-resistant strains of the disease proliferate if a steady and complete stream of antibiotic medication is not available to kill all the bacteria. As a result, at least one-third of infected prisoners are now estimated to carry a multi-drug resistant strain of

tuberculosis, making a cure almost prohibitively expensive and the disease much more lethal.<sup>42</sup> The high rate of multi-drug resistant infection within prisons renders a recent proposed amnesty, which if passed by the Duma would release 100-120,000 minor offenders onto the streets, worrisome, as Russian public health officials fear a steady creep of the epidemic from the prisons out into the general public. In the meantime, a recent trend among prisoners has been to intentionally infect themselves with the disease, in the hopes of being transferred to TB wards in which conditions are perceived to be more comfortable than the astonishingly overcrowded main cells.

### *HIV/AIDS*

The potential threat from HIV and AIDS is even more alarming. The AIDS virus first invaded Russia with a vengeance, in the town of Elista, 150 south of Volgograd near the Caspian Sea. There, in 1989, a nurse following the standard practice of reusing a syringe and needles for vaccinations transmitted the disease to 27 babies (the figure was subsequently upped to 49 children and nine mothers) in the local children's hospital.<sup>43</sup>

Russian authorities have had no more luck than other developing societies in halting the progression of the epidemic since then. Vadim Pokrovsky, the head of Moscow's Center for HIV/AIDS Research, forecast in 1999 that ten percent of the population could be infected with HIV by 2005; more recently, he has predicted that the number of cases in Russia would reach one million by 2003.<sup>44</sup> As of January 2000, officially reported data registered the number of confirmed HIV carriers at 25,000, but the primary means of contracting the disease in Russia – through intravenous drug use – has discouraged sufferers from reporting themselves to the authorities. Pokrovsky estimates that the official figures are understated by a factor of eight to ten, meaning that in reality approximately 200,000 Russians currently are HIV-positive.<sup>45</sup>

Whatever the absolute figures, it is clear that the spread of the disease is accelerating at an alarming pace, with three times as many new cases in 1999 as in the previous year, and an amazing twelve-fold increase from 1997 to 1998 in the city of Moscow and the Moscow region.<sup>46</sup> Arkadiusz

Majszyk, the United Nations AIDS representative in Russia, predicts that a “second wave” of infection, based on heterosexual transmission, is right around the corner. Already fourteen percent of Russian prostitutes, who often use intravenous drugs, are infected with the disease.<sup>47</sup> Rational prevention measures might help curb this expected new round of infection, but authorities are reluctant to introduce safe-sex education campaigns because of objections from the Orthodox church,<sup>48</sup> just as they were wary of providing drug addicts with clean needles or bottles of virus-killing bleach for fear of appearing to endorse illicit drug use.

### *Consequences of the demographic crisis*

It would therefore seem that the key to Russia’s health and demographic situation in the near- and medium-term future lies in its ability to cope with the emergence of tuberculosis, HIV, and other infectious disease threats. What are the consequences, should it fail, and the pessimistic projections of a downward spiral of life expectancy and health status come to pass? Reduced economic productivity is one obvious fear. Already, reliable estimates hold that diminished health status constrains the daily activities of 3-5 percent of children, 9-12 percent of adolescents, and 18-20 percent of adults.<sup>49</sup> If the Russian population continues to decline at its current rate, and the quality of the remaining population continues to suffer, then the pressure for increased labor productivity from those remaining in the healthy work force, just to maintain GDP at a steady level, will be considerable.<sup>50</sup>

The armed forces have been affected as well. Recent conscription campaigns have found that almost one in three potential draftees cannot be called up for health reasons, with another ten percent experiencing “alcohol or drug abuse problems.”<sup>51</sup> Even more alarmingly, the tuberculosis rate in the military doubled from 1992 through 1999.<sup>52</sup> Drunk and sickly military personnel are unlikely to be able to master the new technologies essential to twenty-first century training and combat.

In sum, as the Russian government itself has acknowledged in recent years, the country’s health and demographic crisis goes beyond humanitarian concerns. It represents a full-blown threat to the national security of this former superpower.

## **Regional analysis**<sup>53</sup>

The vast majority of the demographic and health analysis centered on Russia is conducted on the basis of national statistics, comparing Russia's situation with present-day and historical trends in other developed and developing countries.<sup>54</sup> It is vitally important, however, to realize that Russia is a far from homogenous country. Its 89 administrative territories represent a vast array of socioeconomic circumstances, ethnic and national groupings, geographic features, and other differences. In order to understand the nature of recent health trends, regional variations must be included in the picture. The final section of this report will explore the health crisis explicitly through the lens of Russia's regions and macro-regions, focusing on three key indicators commonly used to assess the health status of a society: life expectancy, infant mortality, and morbidity.

### *Life expectancy*

A first look at regional life expectancy trends since the mid-1980s should take into account Russia's geographic variation. In the latest year for which statistics are available, 1997, it is clear that some parts of the country are faring significantly better than others (See Figure Four. An Analysis of Variation calculation shows that the differences between the macro-regions are statistically significant.) Overall, the macro-regions with the highest life expectancy are the Northwest, Central Chernozem, Volga, and Northern Caucasus regions. At the opposite end of the spectrum, the three eastern-most macro-regions – the Far East, and Eastern and Western Siberia – currently experience the lowest life expectancy.

The most intriguing element of Figure Four is its demonstration of the gap between male and female life expectancy. Figure Five charts the differential between the two over time by macro-region, beginning in 1984-1985. It is notable that the male-female gap shows the same pattern as life expectancy trends at the national level, with the gap increasing as overall life expectancy decreases. This dynamic reflects the fact that male life expectancy plummeted much more dramatically than that for women over

the time period studied. It is also worth observing that the macro-region with the largest gender differential peak, the Central, is not the region with the worst life expectancy statistics overall.

Figure Six demonstrates that, for male life expectancy, each of Russia's eleven macro-regions has experienced the identical pattern as that at the national level: a precipitous drop in the early 1990s, followed by a rebound beginning in 1995. The most dramatic declines, of seven to eight years from 1984-1985 to 1994, were in Eastern Siberia, and in the North, Northwest, and Central macro-regions. The least severe losses, of 4.5 to 5.5 years over that same time period, took place in the North Caucasus, Volga, and Far East areas. It is interesting to note that, once again, it was not only the macro-regions that were faring most poorly in the absolute sense that saw the largest declines. A glance at the slope of the 1994 through 1997 curves on Figure Six, however, reveals that the Northwest recovered most quickly from the 1990-through-1994 losses. This chart also shows that, were Eastern Siberia alone factored out of the overall calculation, the absolute figures for male life expectancy in the early 1990s would not have been quite so astonishing. A further study of regional differences in male life expectancy, charted in Figure Seven, compares male life expectancy patterns by mid-point of each 1997 decile. Here, again, the national pattern is reflected in all regions, from the best-off to the worst-off, although the lowest-ranked Sakhalin region does indeed experience the largest plunge in 1995.

The most commonly used measure to study the degree of variability in a single measure across a population is the standard deviation. It is simply the square root of the sum of squared distances between the values of individual cases and the mean. In order to understand the degree to which Russia's 89 regions suffered male life expectancy drops to a similar extent during the early 1990s, Figure Eight plots the standard deviation in male life expectancy among the regions throughout the decade. It shows that, as overall life expectancy figures declined, the standard deviation increased, and then decreased again as life expectancy began to crawl upward again. In other words, as the situation worsened, the gap between the best-off and worst-off regions increased.

The standard deviation calculation can be misleading, however, because it includes any outliers that might be present – one or a few cases that may be significantly different from the rest of the statistical

population, and therefore skew the results. A plot of the range statistic – the difference between the smallest and largest values – shows that there are significant outliers in this case (Figure Nine), since the range increases through 1994 and then continues to maintain that level. In 1996 and 1997, clearly either a small number of regions were doing much better than others, or a small number were doing much worse than others, or both. The presence of outliers is confirmed by a plot of the interquartile range (Figure Ten), which shows the difference between the 25<sup>th</sup> and 75<sup>th</sup> percentile values and therefore is not easily affected by extreme values. The interquartile range graph follows the same pattern as the overall life expectancy curve, revealing that the majority of regions followed the same trends and did not diverge significantly in the last few years. In order to discover the identity of the outliers, Figure Eleven plots male life expectancy for each region (only 79 data points are included in Figure Eleven because the autonomous districts and Kaliningrad are omitted). Table Two summarizes its findings.

Table Two: Outlier Regions for Male Life Expectancy, 1997<sup>55</sup>

	Region	Life Expectancy
Average for Russia		60.75
Best-off regions	Ingushetia	67.06
	Dagestan	65.43
	St. Petersburg	64.18
Worst-off regions	Tyva	50.24
	Altai republic	56.72
	Kemerovo	57.19

*Infant mortality*

Figure Twelve plots infant mortality by macro-region over the same time period used above to study life expectancy.<sup>56</sup> It shows a general trend of worsening of infant mortality in 1993, followed by a slight improvement since then, but the pattern is certainly neither as pronounced nor as consistent across geographic areas as were the life expectancy trends. The difference between the two statistics may have to do with their hypothesized causes; scholars generally agree that life expectancy varies with a wide range of societal factors, while infant mortality is much more responsive to changes specifically in the quality of the health care system.

A study of changes in infant mortality over the 1990s by regions representing the mid-point of each decile shows literally no pattern at all; neither do the plots of standard deviation or range (Figures Thirteen, Fourteen, and Fifteen). Figure Sixteen's look at interquartile range, however, does seem to display the overall trend, with a peak in variation in 1993 and a decline since then. As was the case with life expectancy, there must be significant outliers in the 1996-1997 time frame. Again, a plot of each region for 1997 reveals their identity (Figure Seventeen).



Table Three: Outlier Regions for Infant Mortality, 1997

	Region	Infant mortality
Average for Russia		17.2
Best-off regions	St. Petersburg	11.0
	Leningrad region	11.1
Worst-off regions	Tyva	34.8
	Chukotka	31.6
	Amur	27.6
	Altai republic	25.3
	Karachaevo-Cherkess	24.4
	Jewish Autonomous Oblast	24.1

### *Morbidity*

A final commonly used measure of a society's health is morbidity – the number of illnesses officially registered among all patients, counting only first established diagnoses, per 1,000 population. Figure Eighteen shows morbidity figures from 1992 through 1997 for each of Russia's macro-regions, and it seems to demonstrate no pattern whatsoever. The North macro-region fares consistently the best, and the North Caucasus the worst, with a trend toward increased morbidity over time clear only for the North and Urals areas. When a similar plot is drawn for regions representing the mid-point of each decile (Figure Nineteen), the lack of a pattern also holds, although the presence of the Samara region as the one with highest morbidity provides a strong hint about how to interpret this statistic. Samara is well known as the region in the country with perhaps the best system of health care (excepting the capital cities of Moscow and St. Petersburg). If hospitals and polyclinics are known to be accessible and of high quality, people experiencing health problems are more likely to present themselves for treatment, therefore increasing the morbidity figure. Paradoxically, therefore, it may be the case that regions with better-than-average provision of health services suffer from higher morbidity counts, even though their people may in fact be "healthier" than or "as healthy" as those in neighboring areas where the population determines that it is not worth the effort or expense to see a physician.

In any case, it is useful to continue with the analysis to determine whether variations in morbidity grew during the 1990s. Figure Twenty shows that the standard deviation for morbidity has increased

steadily since 1994, as has the range (Figure Twenty-One). In contrast to life expectancy and infant mortality, the interquartile range for morbidity has shown the same pattern as the standard deviation and range (Figure Twenty-Two), indicating the lack of significant outliers in 1996 and 1997. In other words, in recent years, there has not been a small number of regions with a vastly different “sickness” experience than the rest, or than the average.

Since the causes-of-death figures cited earlier indicate that infectious disease is the largest morbidity threat looming over Russia's overall health status, Figure Twenty-Three examines the macro-regional variation in deaths from tuberculosis (the analogous numbers for HIV/AIDS are too small to form a meaningful diagram). Here, once again, the eastern-most geographic areas – the Far East, and Eastern and Western Siberia – along with the North Caucasus, are hardest hit.

#### *Urban/Rural Variation*

Geographic regions are not the only way to distinguish among various sectors of Russia’s population. It is also instructive to differentiate between the country’s rural and urban populations, to determine whether the health and demographic crisis has affected either one disproportionately. Figures Twenty-Four through Twenty-Six plot the percentage of urban population in each region against its 1997 figures for life expectancy, infant mortality, and morbidity, respectively. Simple correlation coefficients for each plot show that there is no relationship between urbanization and life expectancy, but that significant connections do exist between urbanization and infant mortality, and between urbanization and morbidity.

Table Four: Correlates of Urbanization and Health Status in Russia's Regions, 1997

	% urban population
Male life expectancy	-.042
Infant mortality	-.384**
Morbidity	.361**

\*\* - significant at the 0.01 level

In other words, there is a positive correlation between degree of urbanization and morbidity, and a negative correlation between degree of urbanization and infant mortality. Both of these results, once again, most likely reflect factors having to do with the quality and availability of urban versus rural health care systems. As mentioned earlier, infant mortality is known to depend on health services, and Russia's urban health care is certainly of superior quality to its rural outposts. In terms of morbidity, once again, the statistic may reflect propensity to seek care rather than absolute illness levels. A higher urban morbidity figure may reflect more sick people deciding to access the health care system, while people with health problems in rural areas may find the distances they have to travel to access a health care provider prohibitively large, or they may self-treat because of a perceived lower quality of available health services. Of course, the higher morbidity figure in urban areas may also indicate that people in the cities have been experiencing an absolute higher number of health problems than their rural cousins.

## **Conclusion**

Overall, therefore, the data demonstrate the existence of significant differences in health status among various geographic areas of Russia. A regional study of life expectancy, infant mortality, and morbidity data reveals that the quality of the health care system may be one of many significant factors affecting health outcomes. Future reports under this Research Grant will study health system quality at the regional level, in an effort to assess both quantitatively and through qualitative case study evidence the scope and manner in which health care system quality and reform are making a difference in the health of the Russian people.

---

<sup>1</sup> George F. Will, "Once a Great Power," *The Washington Post*, June 6, 1999.

<sup>2</sup> *Agence France Presse*, "Russia Sees Sharpest Drop in Population Since 1992," February 21, 2000.

<sup>3</sup> Data from *Interfax*, "Death Rate Almost Twice As High As Birth Rate," March 22, 2000; and "Russian Population Continues to Decline," *Novye Izvestiya*, April 22, 2000, translated and posted to Johnson's Russia List, April 25, 2000.

<sup>4</sup> Mark G. Field, David M. Kotz, and Gene Bukhman, "Neoliberal Economic Policy, 'State Desertion,' and the Russian Health Crisis," in Jim Yong Kim, et. al., eds., *Dying for Growth: Global Inequality and the Health of the Poor* (Monroe, Maine: Common Courage Press), 2000, p. 158.

<sup>5</sup> *Demograficheskii ezhegodnik Rossii* (Moscow: Goskomstat), 1997, p. 90.

- 
- <sup>6</sup> Murray Feshbach, "A Sick and Shrinking Nation," *The Washington Post*, October 24, 1999; *Agence France Presse*, June 17, 1998; Dr. Tatyana Ovsyannikova, Director of the Infertility Clinic of the Center for Obstetrics and Gynecology in Moscow, cited in Murray Feshbach, "Reaping the Whirlwind: Child Health in Russia and Its Future," prepared for Hicks & Associates, Inc., under a contract with Science Applications International Corporation, July 1998.
- <sup>7</sup> Marcus Warren, "Abortions Rise as Economy Falls in Russia," *The Electronic Telegraph [UK]*, January 24, 1999. Other, more recent estimates have put this figure at seven of every ten pregnancies ending in abortion. See *Itar-Tass*, "Fewer Russians Want Children as Baby Mortality Rate Grows," April 11, 2000.
- <sup>8</sup> Quoted in *Itar-Tass*, April 11, 2000.
- <sup>9</sup> *Demograficheskii ezhegodnik Rossii* (Moscow: Goskomstat), 1997, p. 101.
- <sup>10</sup> Murray Feshbach, "Dead Souls," *The Atlantic Monthly*, January 1999.
- <sup>11</sup> Field, et. al., "Neoliberal Economic Policy," p. 159.
- <sup>12</sup> Peder Walberg, et. al., "Economic Change, Crime, and Mortality Crisis in Russia: Regional Analysis," *British Medical Journal*, Vol. 317, August 1, 1998, pp. 312-318.
- <sup>13</sup> United Nations Development Program, *Human Development Report 1998: Russian Federation* (Moscow: United Nations Development Program), 1998, p. 49.
- <sup>14</sup> *Human Development Report 1998*, p. 73.
- <sup>15</sup> Andrei K. Demine, President of the Russian Public Health Association, "Health and Health Care Reform in Russia," unpublished manuscript, 2000. See also Field, et. al., "Neoliberal Economic Policy," p. 162.
- <sup>16</sup> Feshbach, "Reaping the Whirlwind," 1998, p. 8. This figure is confirmed by Russian authorities working in collaboration with the U.S. Centers for Disease Control and Prevention, the U.S. Environmental Protection Agency, and the U.S. Agency for International Development.
- <sup>17</sup> Nicholas Eberstadt, "Russia: Too Sick to Matter?" *Policy Review*, No. 95, June & July 1999.
- <sup>18</sup> William C. Cockerham, *Health and Social Change in Russia and Eastern Europe* (New York: Routledge), 1999, p. 101.
- <sup>19</sup> Francis Notzon, et. al., "Causes of Declining Life Expectancy in Russia," *Journal of the American Medical Association*, Vol. 279, No. 10, March 11, 1998, pp. 793-800.
- <sup>20</sup> Vladimir Kontorovich, "Can the Health Crisis and Environmental Pollution Retard Russian Economic Recovery?" prepared for Hicks & Associates, Inc., under a contract with Science Applications International Corporation, July 1998, p. 22.
- <sup>21</sup> Notzon, et. al., 1998, p. 793.
- <sup>22</sup> *Agence France Presse*, "Drink, Disease, and Depression Eat Away at Russian Population," February 22, 2000; "Report: Russia Leads for Suicides," April 1, 1999.
- <sup>23</sup> David A. Leon and Vladimir M. Shkolnikov, "Social Stress and the Russian Mortality Crisis," *Journal of the American Medical Association*, Vol. 279, No. 10, March 11, 1998, pp. 790-791.
- <sup>24</sup> "Most Russian Men Die Drunk, After Binge Weekend," Reuters, May 19, 2000. This study found no correlation between male death rate and education or financial standing, confirming the findings cited earlier.
- <sup>25</sup> Cockerham, *Health and Social Change*, 1999, p. 111. The World Health Organization stipulates that just over half this consumption level is the upper limit before major health problems are inevitable. See Murray Feshbach, "A Fuller Explanation of the Health Side of the Issue," posting to Johnson's Russia List, August 6, 1999.
- <sup>26</sup> "Russia's Population Ensures Rigid Foreign Policy," stratfor.com, April 13, 2000.
- <sup>27</sup> Alice Lagando, "Alcoholism Spreads," *The Times (UK)*, August 13, 1999.
- <sup>28</sup> Giles Whitell, "Vodka Worsens Population Crisis," *The Times (UK)*, January 27, 2000.
- <sup>29</sup> Field, et. al., "Neoliberal Economic Policy," p. 170.
- <sup>30</sup> Remarks at 1998 meeting of the American Association for the Advancement of Slavic Studies, Boca Raton, FL, September 1998; and "A Comment on Recent Demographic Issues and a Forbidding Forecast," posting to Johnson's Russia List, August 4, 1999.
- <sup>31</sup> Figures cited in "Russia's Dwindling Population Ensures Rigid Foreign Policy," stratfor.com, April 13, 2000.
- <sup>32</sup> Kontorovich, "Can the Health Crisis," pp. 3-4.
- <sup>33</sup> Leon and Shkolnikov, "Social Stress," 1998, pp. 790-791.
- <sup>34</sup> Vladimir Shkolnikov, "The Nature of the Russian Mortality Crisis in the Early 1990s and the Present Situation. Part I: Population-Level Evidence," presentation to the Social Cohesion Study Group of the Carnegie Corporation of New York Russia Initiative, Washington, D.C., April 28, 2000.
- <sup>35</sup> Kontorovich, "Can the Health Crisis," 1998, p. 4.
- <sup>36</sup> Kontorovich, "Can the Health Crisis," 1998, p. 21.

- 
- <sup>37</sup> Feshbach, "Dead Souls," 1999. Feshbach is supported in this conjecture by Nikolai Shestopalov, chairman of the State Sanitary and Epidemiological Service, quoted in "Russia Sets a Bitter Record," *Segodnya*, January 26, 2000.
- <sup>38</sup> Feshbach, "Dead Souls," 1999.
- <sup>39</sup> "Health: Caught Between Old and New, Diseases Rise in Russia," Inter Press Service, April 5, 1999.
- <sup>40</sup> "Diplomats Shown TB Sufferers in Moscow Prison," Reuters, March 20, 2000; "Justice Minister Says Jails Major Site of TB Infection," RFE/RL Newline, Vol. 4, No. 57, Part I, March 21, 2000. Feshbach puts the prison infection rate even higher, at fifty percent.
- <sup>41</sup> "Large Prisoner Amnesty Proposed," RFE/RL Newline, Vol. 4, No. 84, Part I, April 28, 2000.
- <sup>42</sup> Vladimir Pokrovsky, "Incurable TB Is Making a Comeback," *Obschaya Gazeta*, August 6-12, 1997; Yana Dlugy, "The Prisoners' Plague," *Newsweek International*, July 5, 1999.
- <sup>43</sup> David E. Powell, "The Problem of AIDS," in Mark G. Field and Judyth L. Twigg, eds., *Russia's Torn Safety Nets: Health and Social Welfare during the Transition* (New York: St. Martin's), 2000, pp. 126-127.
- <sup>44</sup> Cited in Murray Feshbach, "A Small, But I Hope Important Comment," posting to Johnson's Russia List, December 1, 1999; and "Expert Predicts HIV Cases To Reach One Million by 2003," RFE/RL Newline, Vol. 4, No. 80, Part I, April 21, 2000.
- <sup>45</sup> Murray Feshbach, "An AIDS Catastrophe," *The Moscow Times*, January 14, 2000.
- <sup>46</sup> "Russian Official Criticizes Government Over HIV," Reuters, January 29, 2000; "There Are Over 30,000 HIV-Infected People in Russia," Itar-Tass, March 2, 2000; "HIV Infection May Affect One Million Russians in Two Years," Itar-Tass, July 1, 1999.
- <sup>47</sup> Michael Wines, "Heroin Carries AIDS to a Region in Siberia," *The New York Times*, April 22, 2000.
- <sup>48</sup> "Russian Orthodox Church Objects to Health in Schools," RFE/RL Newline, Vol. 4, No. 19, Part I, January 27, 2000.
- <sup>49</sup> Demine, "Health and Health Care Reform," 2000, p. 4.
- <sup>50</sup> Feshbach, "A Sick and Shrinking Nation," 1999.
- <sup>51</sup> "Military Finds Draftees in Poor Shape," RFE/RL Newline, Vol. 3, No. 15, Part I, January 22, 1999; "Almost 1/3 of Muscovites Can't Be Recruited on Health Reasons," Itar-Tass, March 17, 2000.
- <sup>52</sup> "Health Worsening in Russian Army," Associated Press, June 4, 1999.
- <sup>53</sup> Unless otherwise indicated, data for the tables in the remainder of this report are taken from *Ðààèíú Ðíñèè* (Moscow: Goskomstat), 1998.
- <sup>54</sup> See, for example, *The Impact of Demographic Crisis on Russia's Future Economy*, prepared for the Advisor to the Secretary of Defense for Net Assessment, by Hicks & Associates, Inc, McLean, Virginia, May 1999.
- <sup>55</sup> These findings raise some obvious questions. Why are some of the poorest, even war-torn regions, experiencing the highest male life expectancy, while one of the regions known throughout the country for its success in health care system reform (Kemerovo) is faring the worst? These are precisely the kinds of questions that will be pursued in future reports to the NCEEER as part of this Research Grant.
- <sup>56</sup> Infant mortality here is defined using the standard international definition -- the number of deaths experienced by children after a live birth, and before one year of age.

**Figure One: Contribution of causes of death to increased deaths of working age population, 1990-1994**

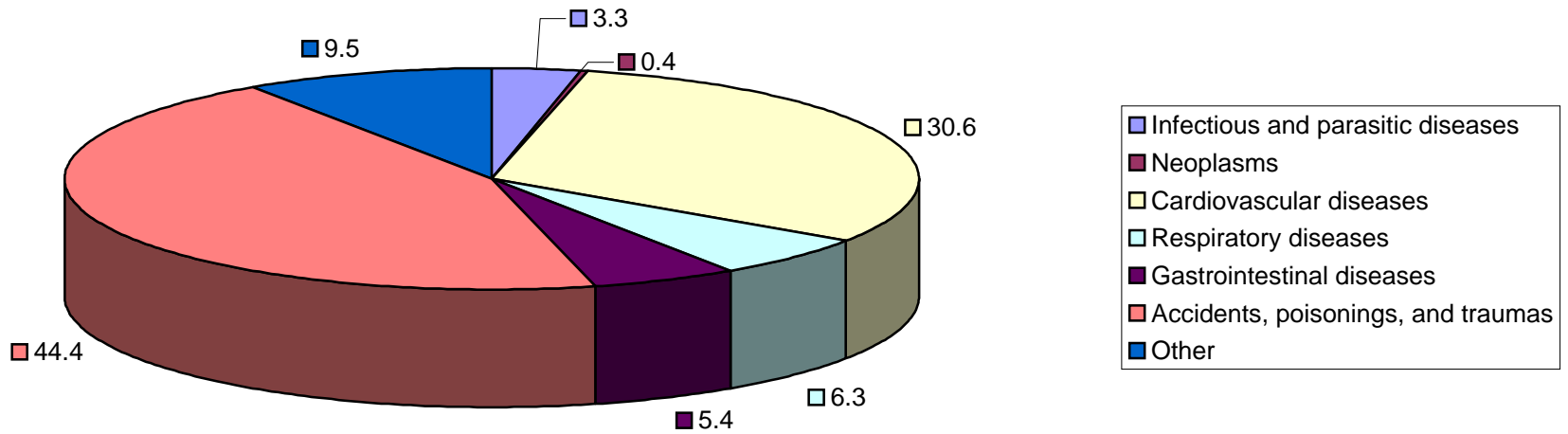


Figure Two: Life expectancy at birth, 1984-1997

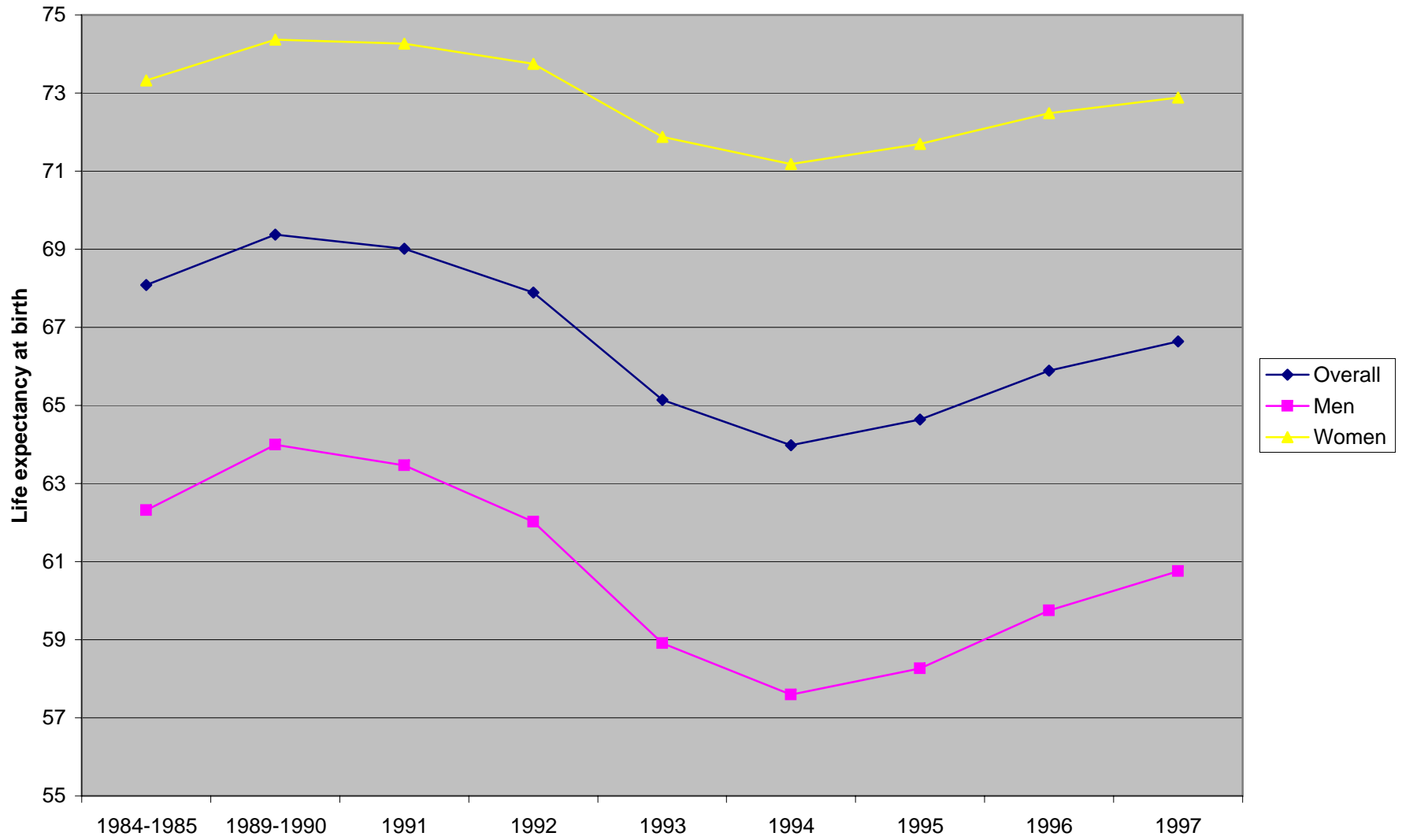


Figure Three: Causes of death for working age population, 1991-1996

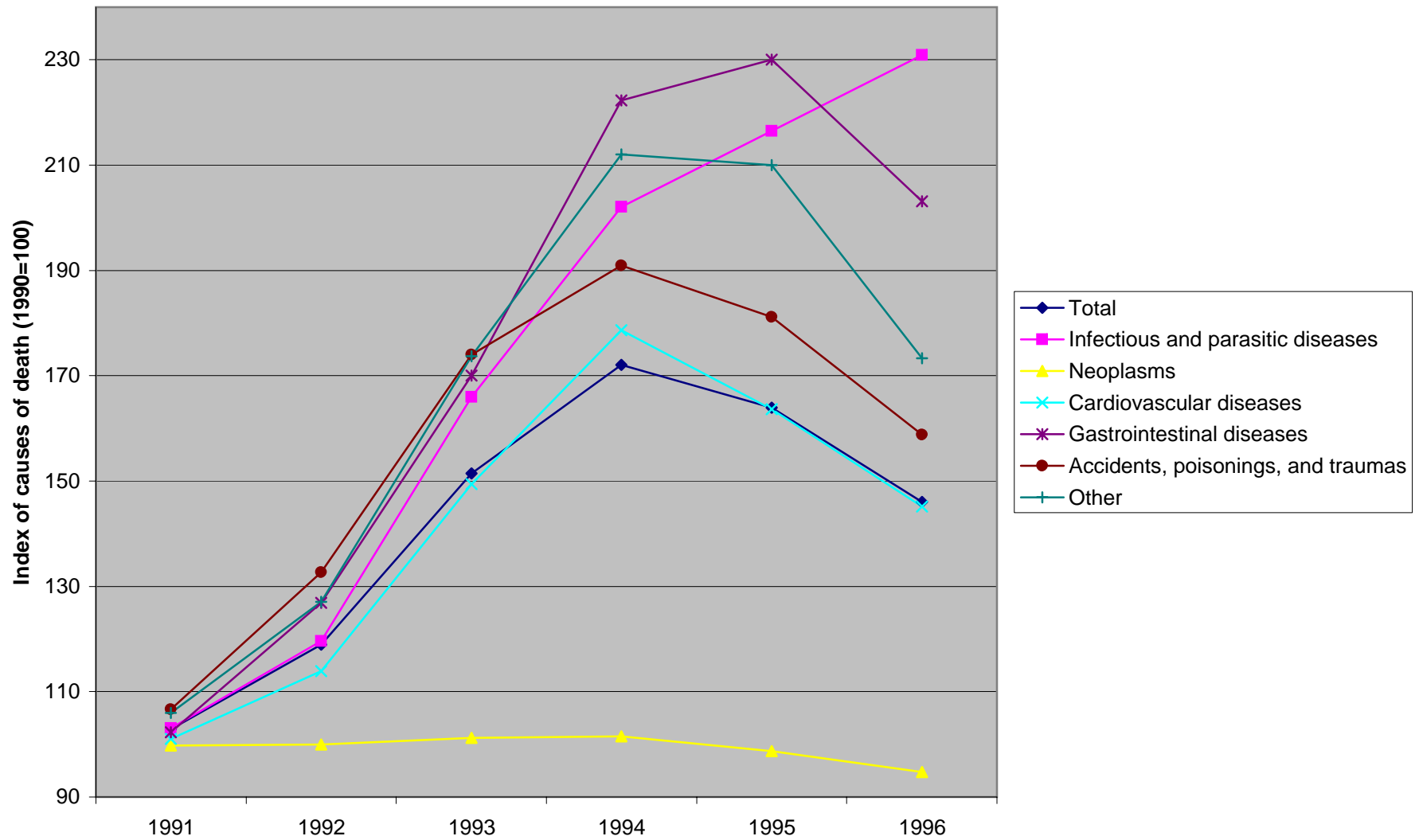




Figure Four: Life expectancy at birth, by macro-region, 1997

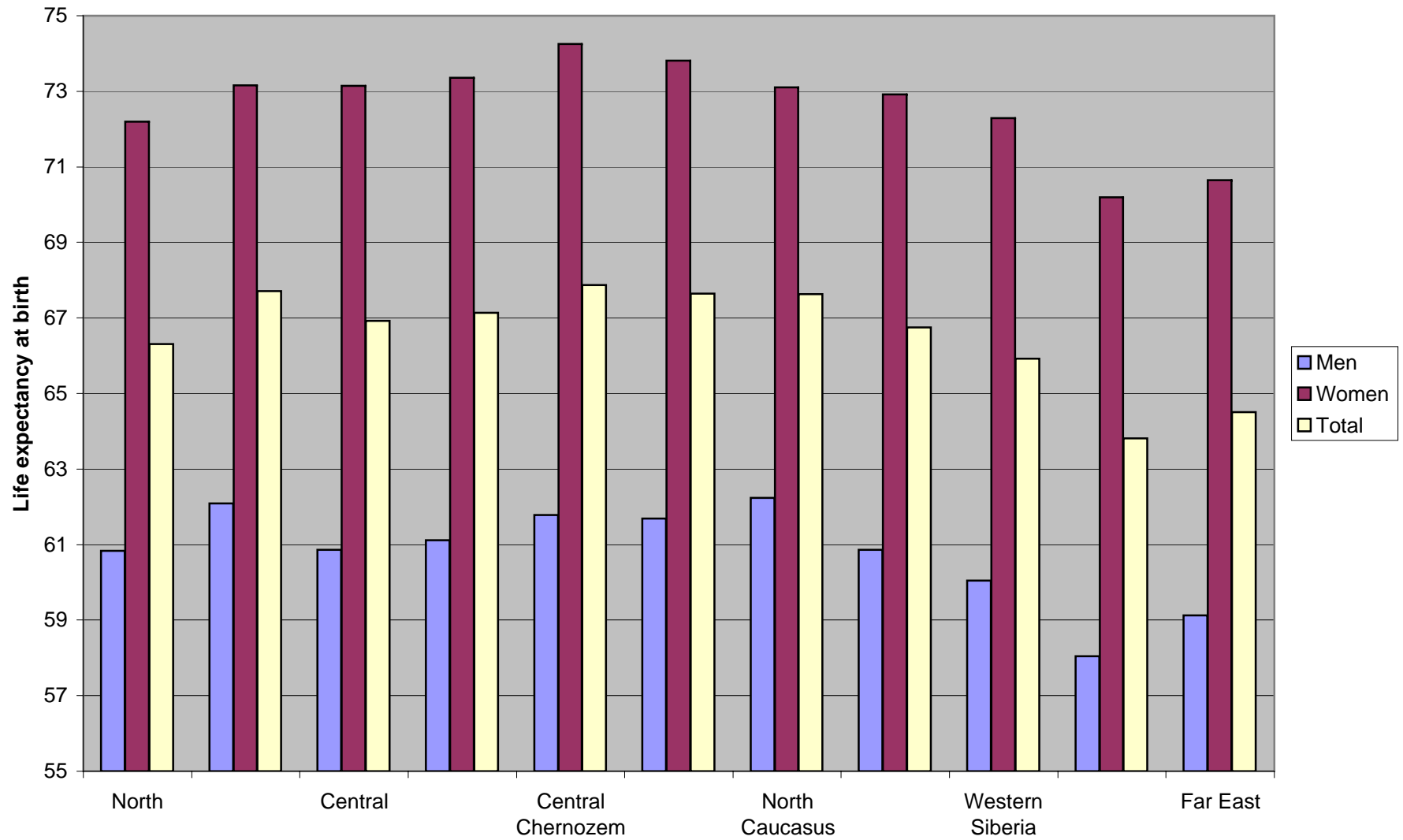


Figure Five: Male/Female Life Expectancy Differential, 1984-1997, by Macro-Region

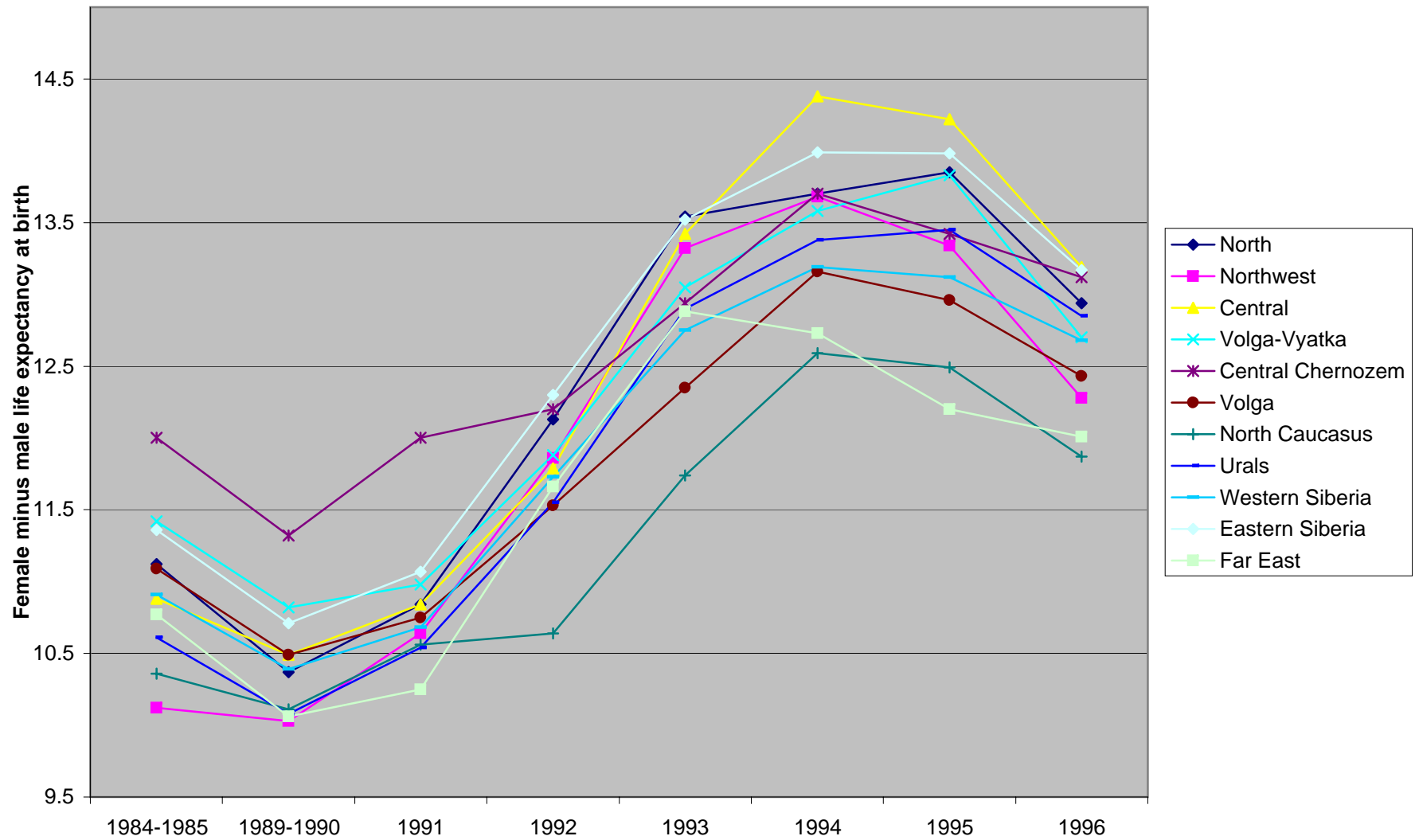
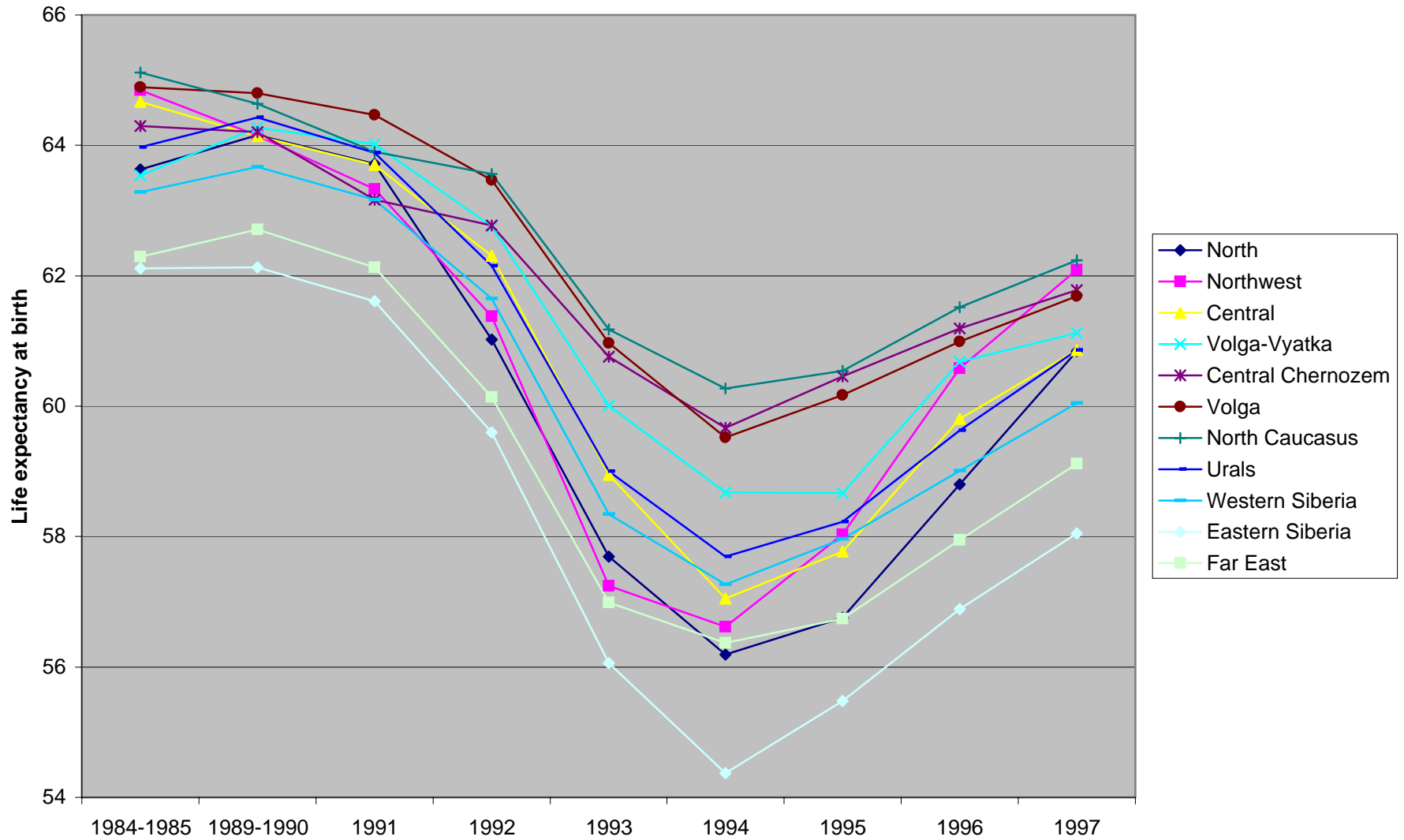


Figure Six: Male Life Expectancy at Birth, by Macro-Region, 1984-1997



**Figure Seven: Male Life Expectancy at Birth, by Regions Representing Each 1997 Decile, 1984-1997**

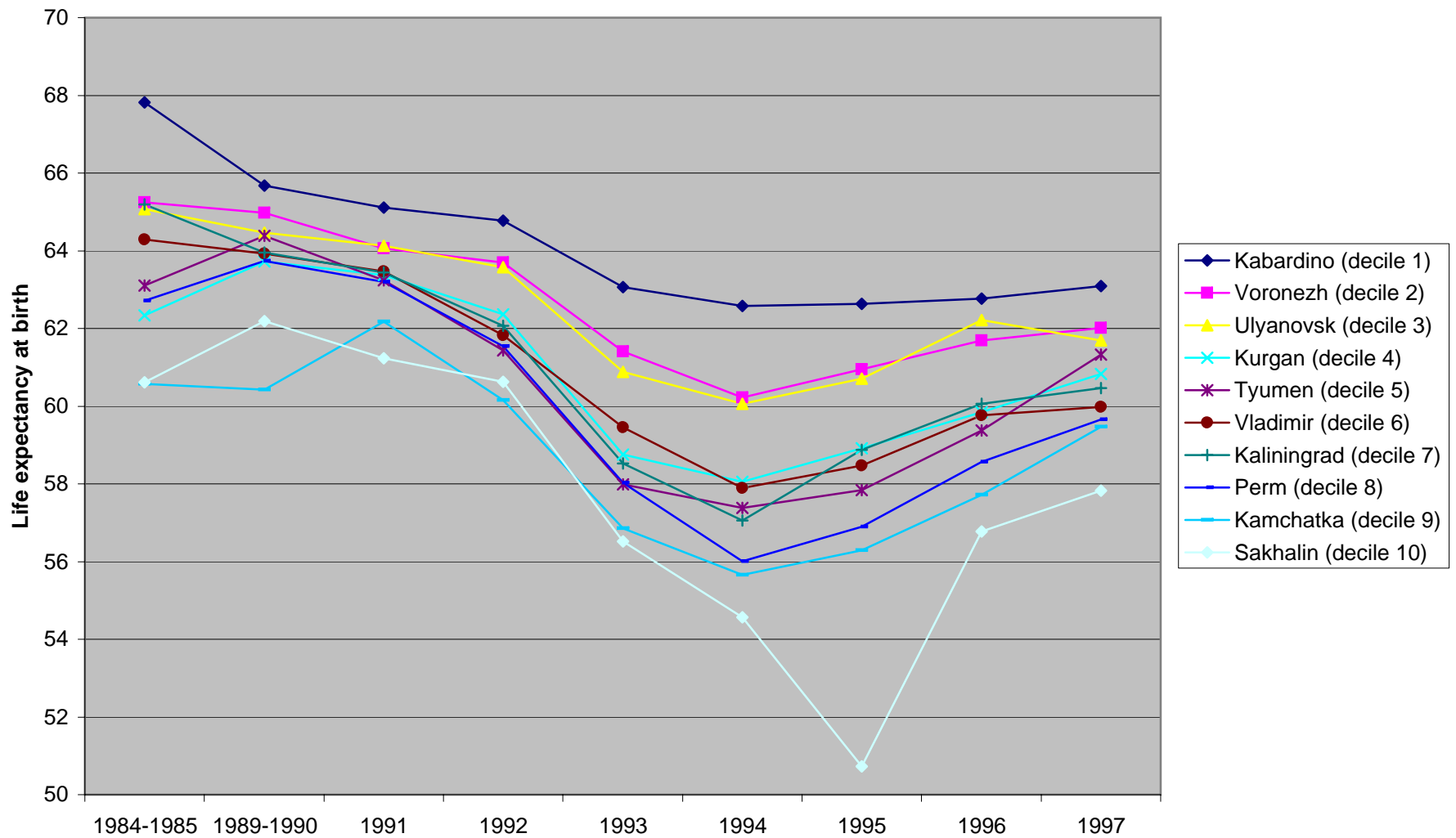
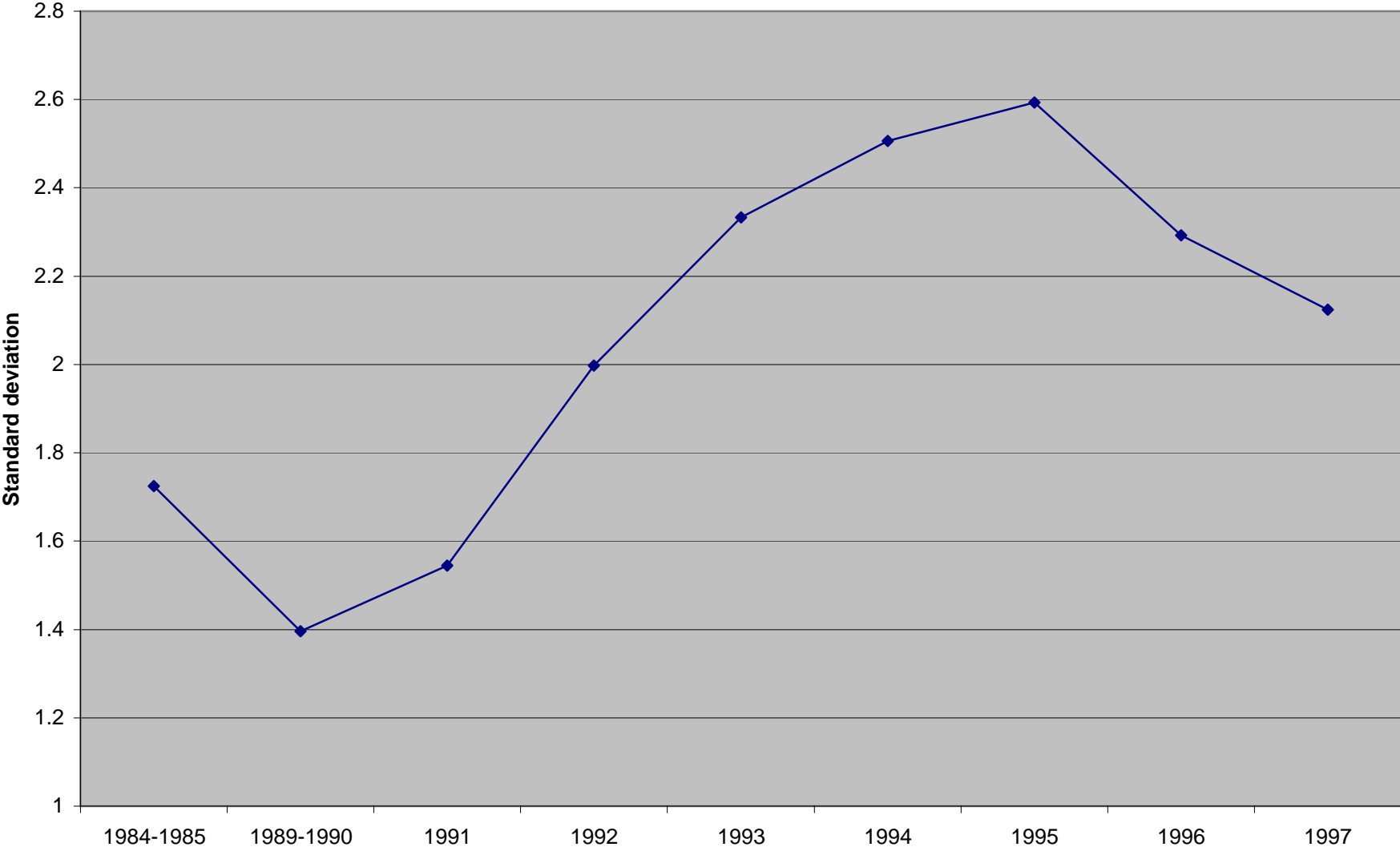


Figure Eight: Standard deviation, male life expectancy, by region, 1984-1997



**Figure Nine: Range, regional variation in adult male life expectancy, 1984-1997**

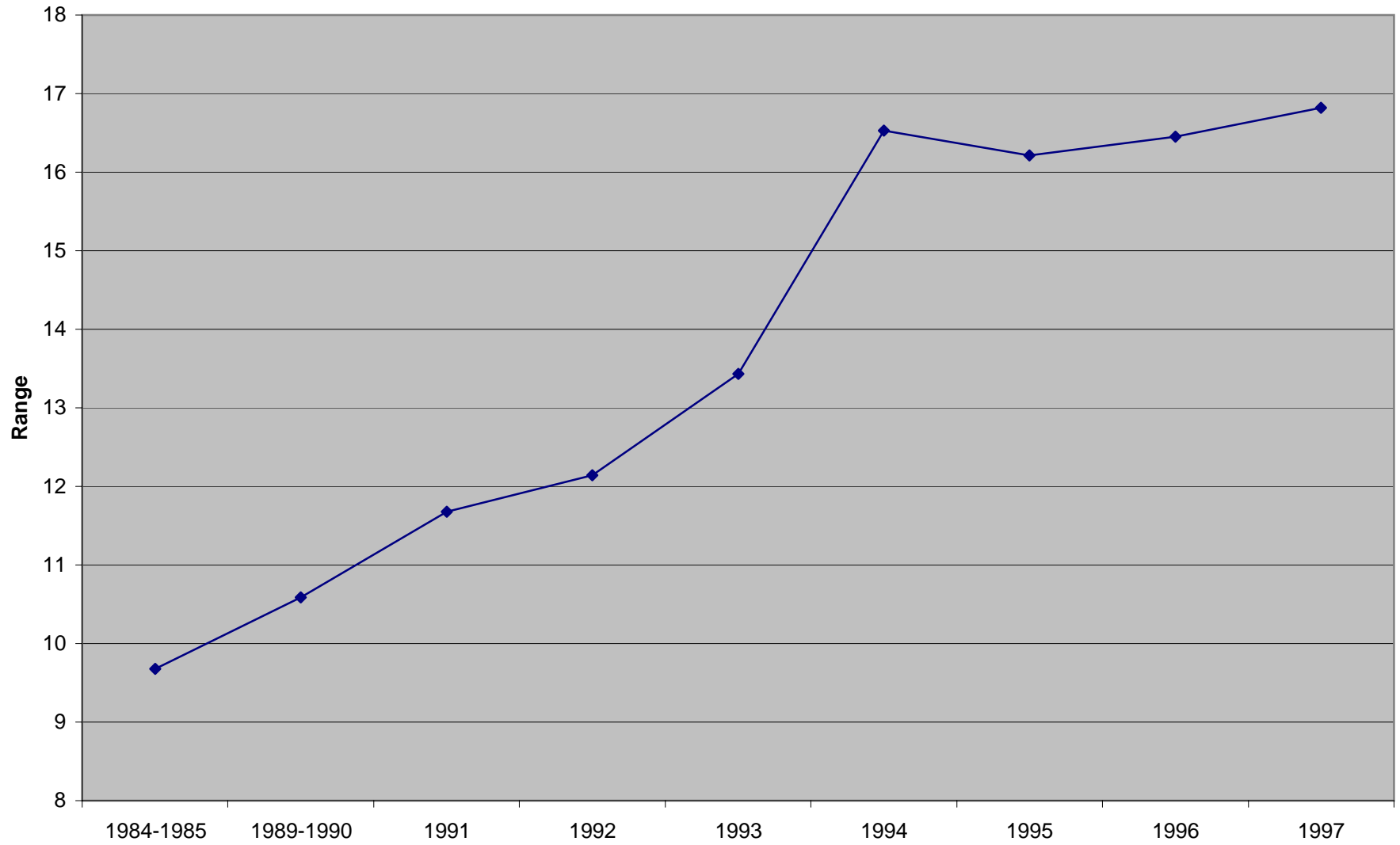


Figure Ten: Interquartile range, male life expectancy, by region, 1984-1997

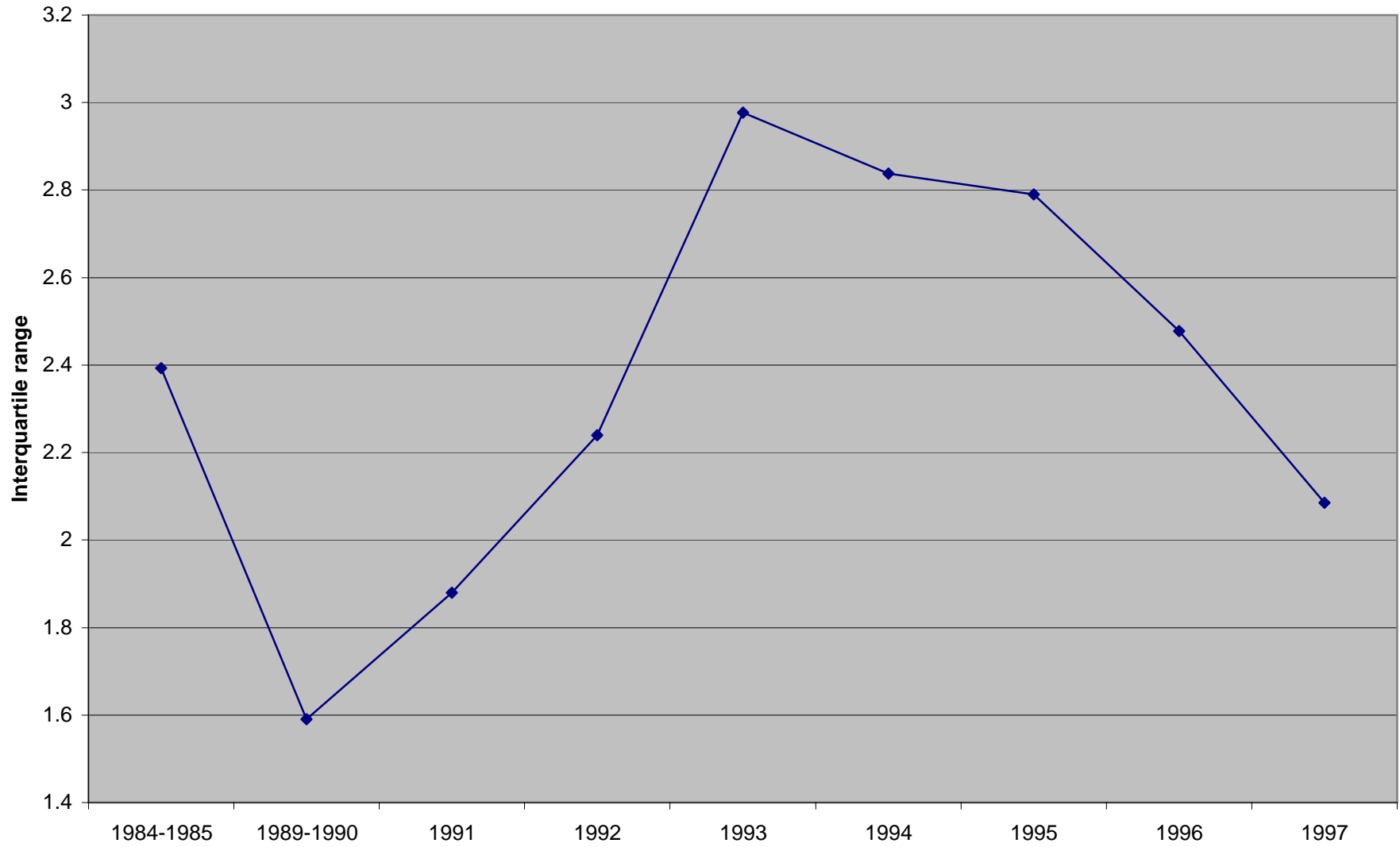


Figure Eleven: Male life expectancy, 1997, by region, in ascending order

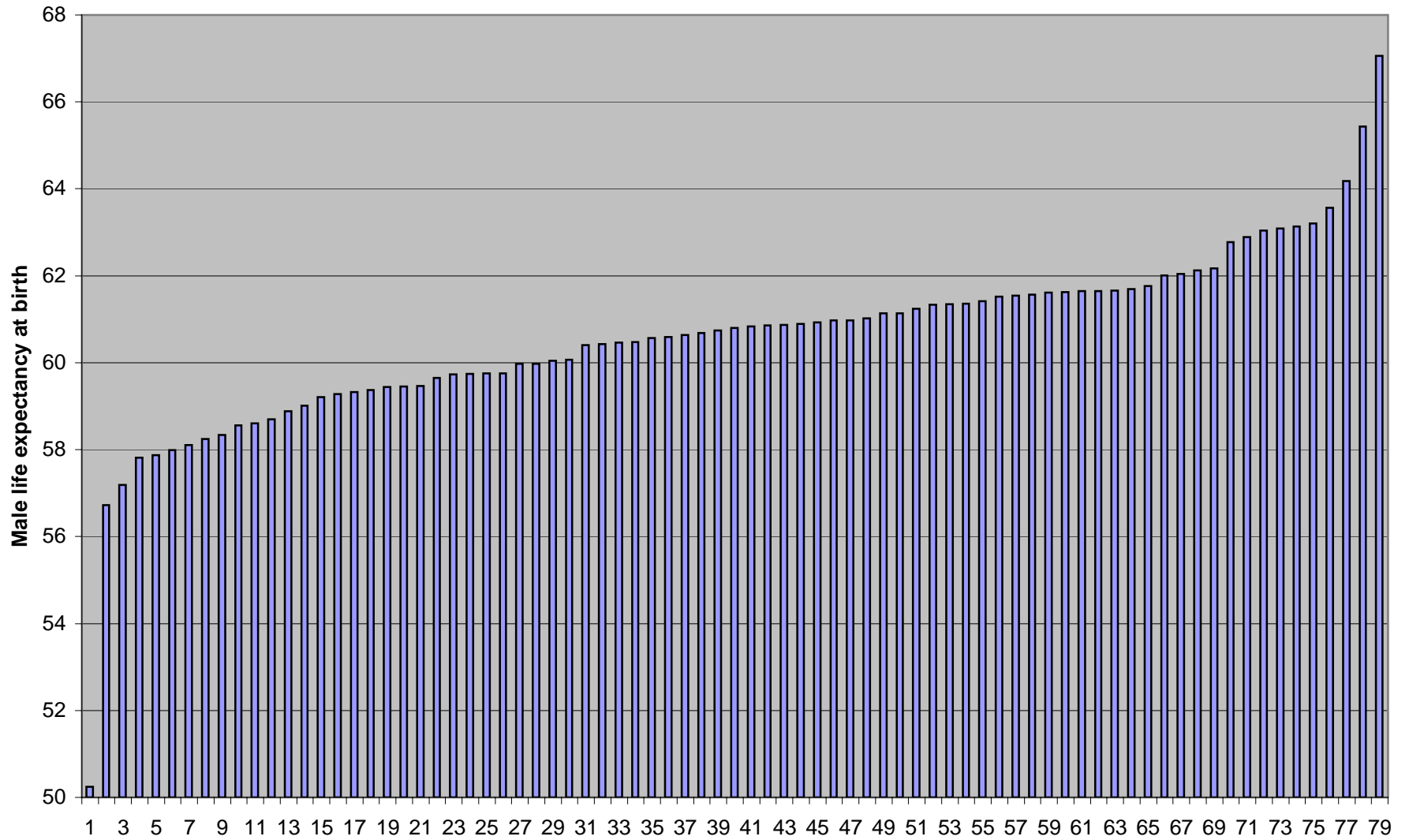




Figure Twelve: Infant Mortality, by Macro-Region, 1985-1997

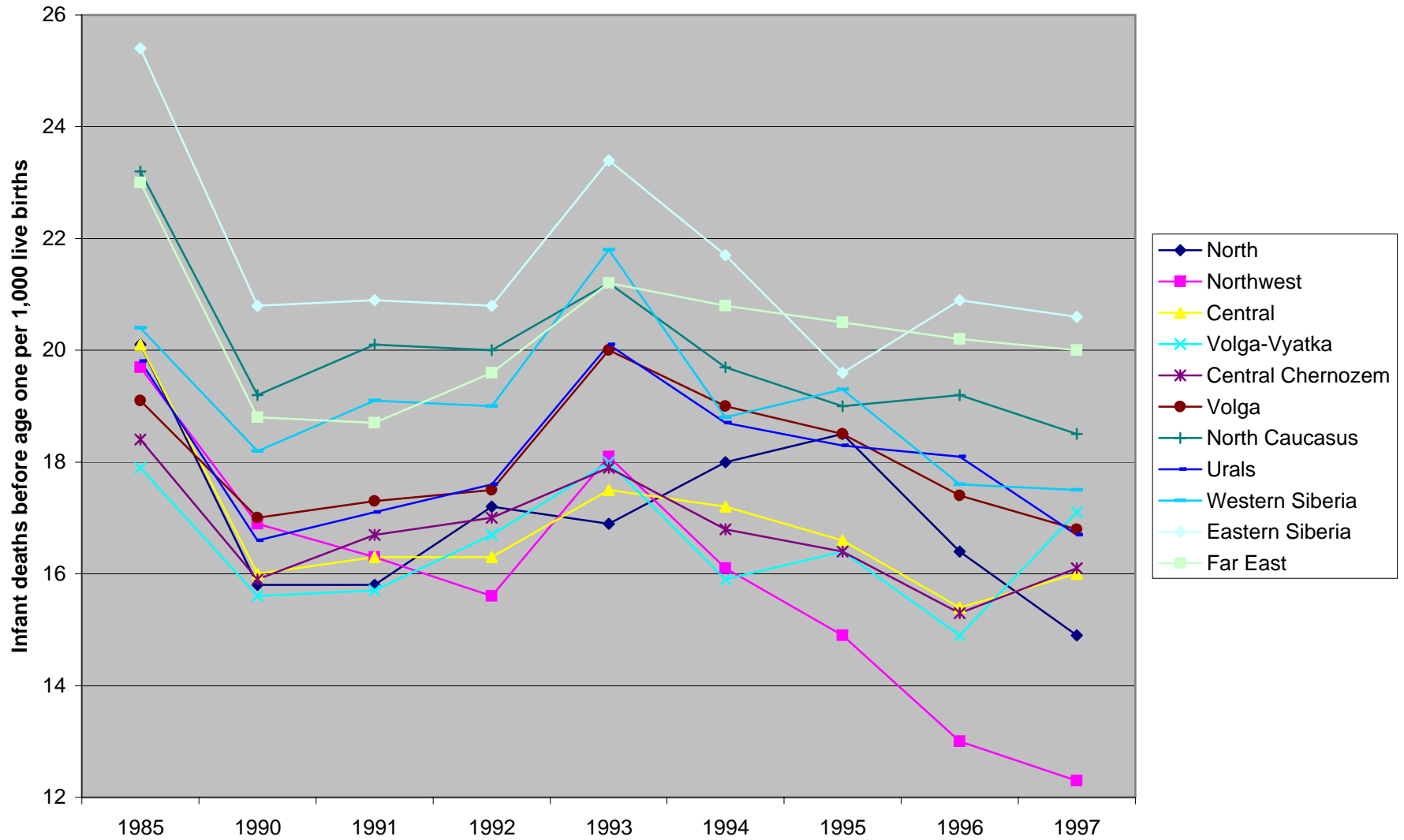


Figure Thirteen: Infant Mortality, by Regions Representing Each 1997 Decile, 1985-1997

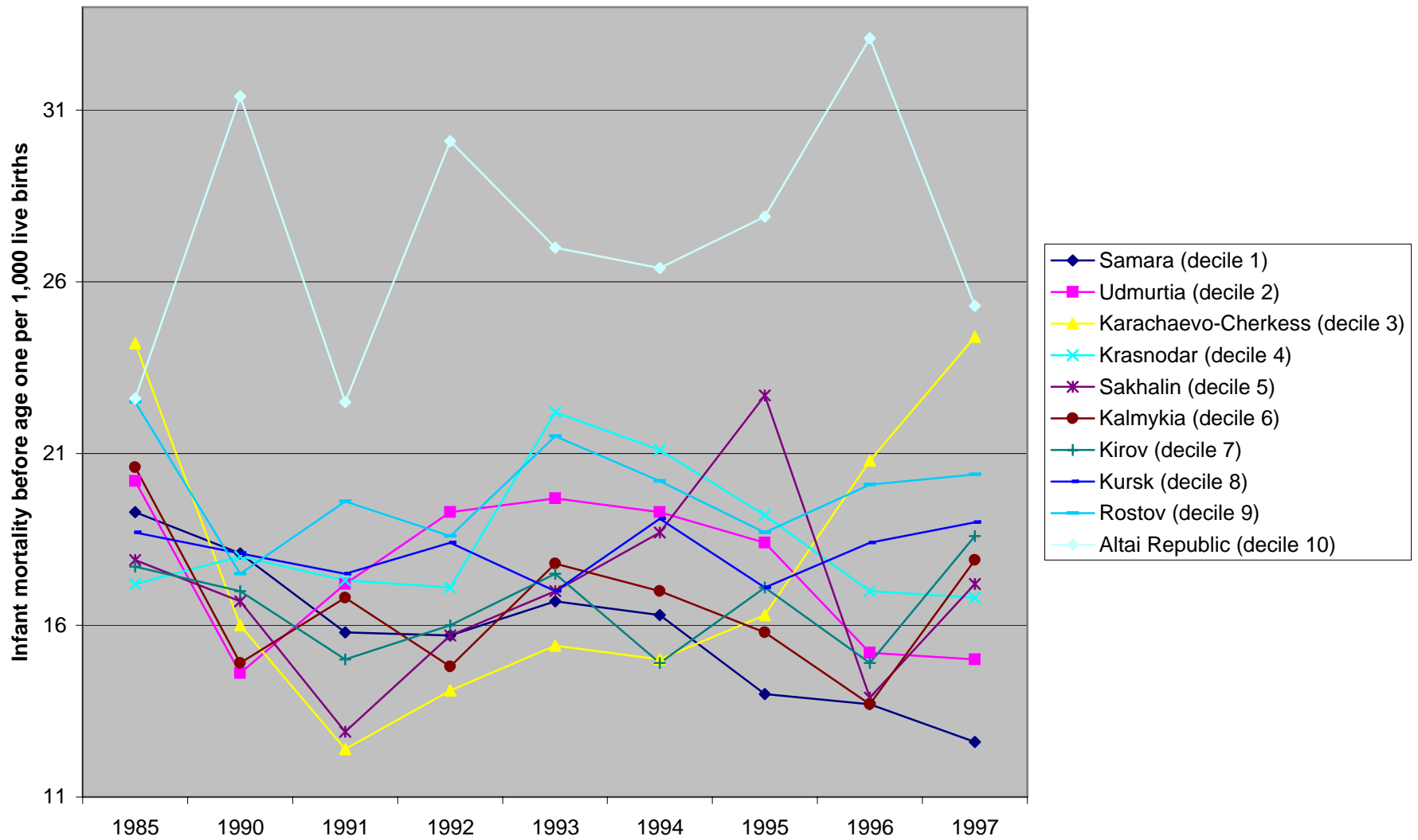
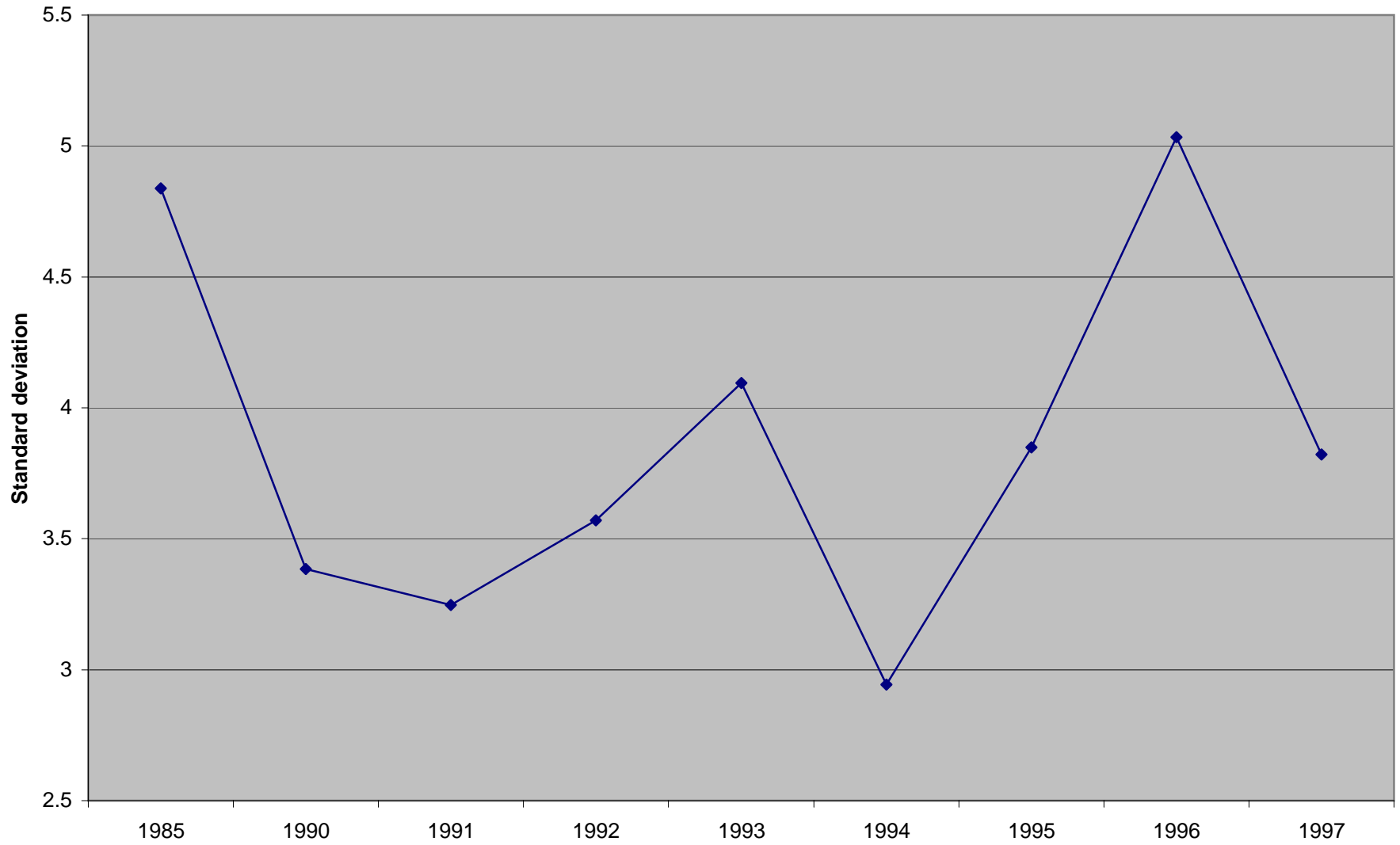
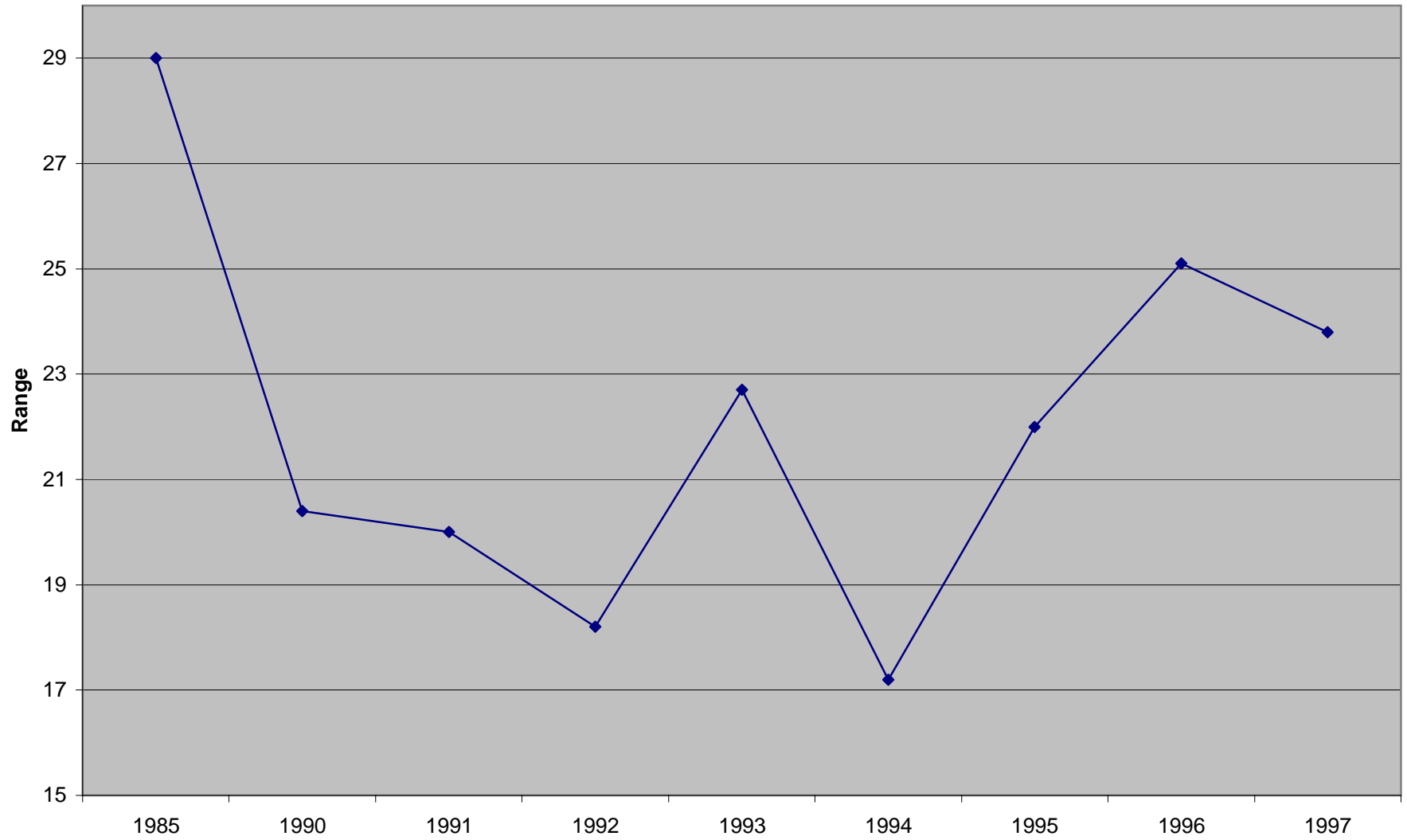


Figure Fourteen: Standard deviation, infant mortality, by region, 1985-1997



**Figure Fifteen: Range, regional variation in infant mortality, 1985-1997**



**Figure Sixteen: Interquartile range, infant mortality, by region, 1985-1997**

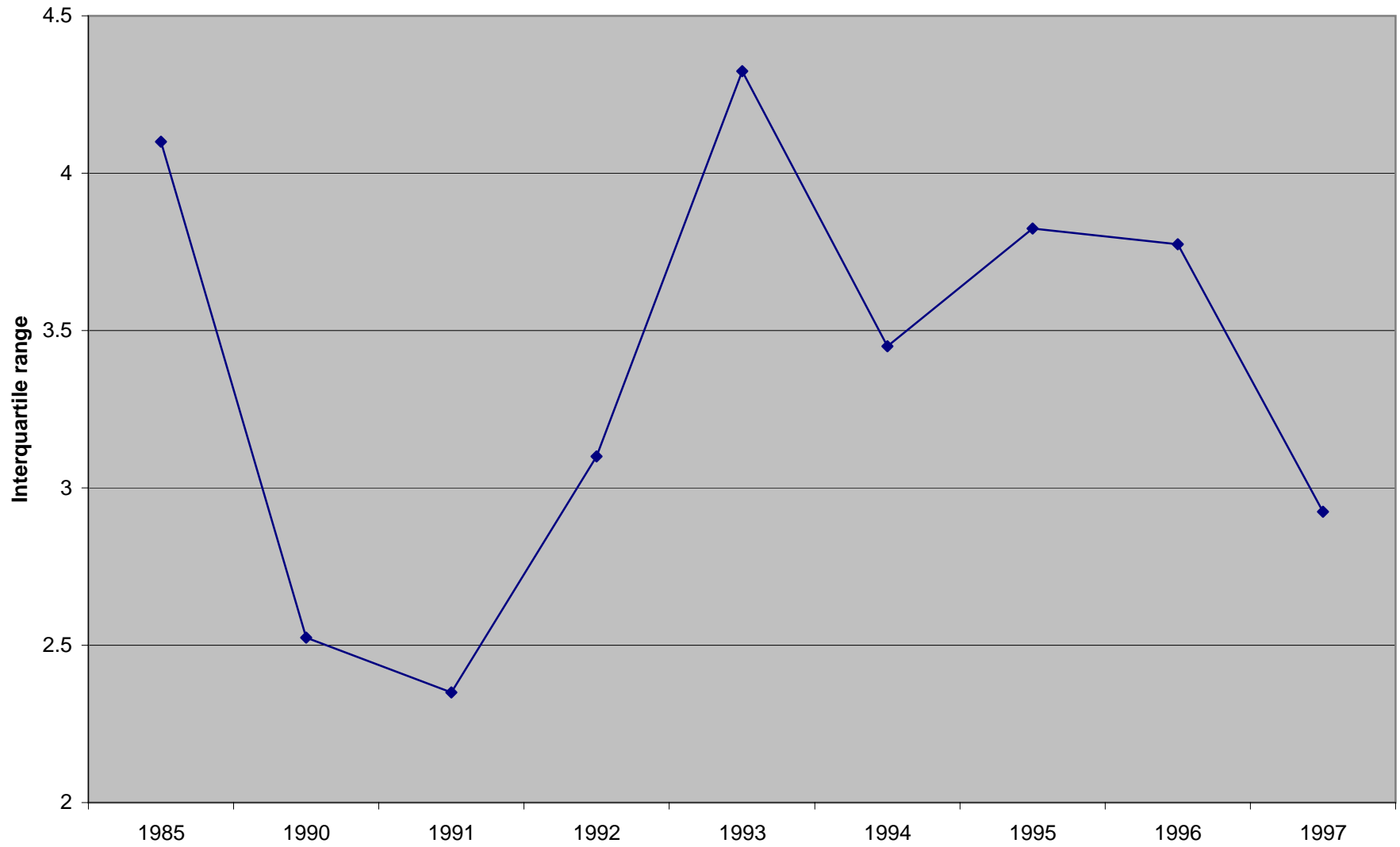


Figure Seventeen: Infant mortality, 1997, by region, in ascending order

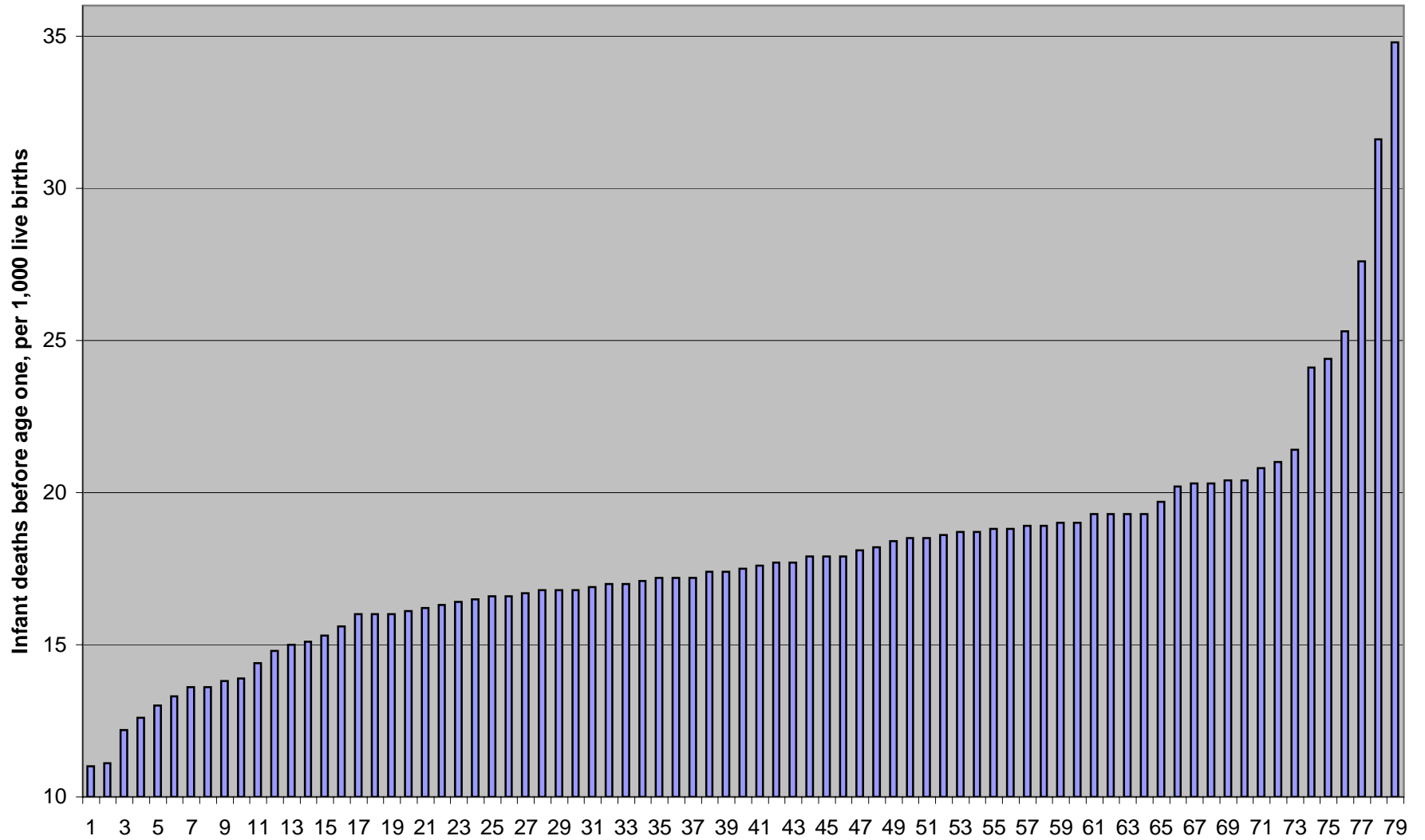


Figure Eighteen: Morbidity, by Macro-Region, 1992-1997

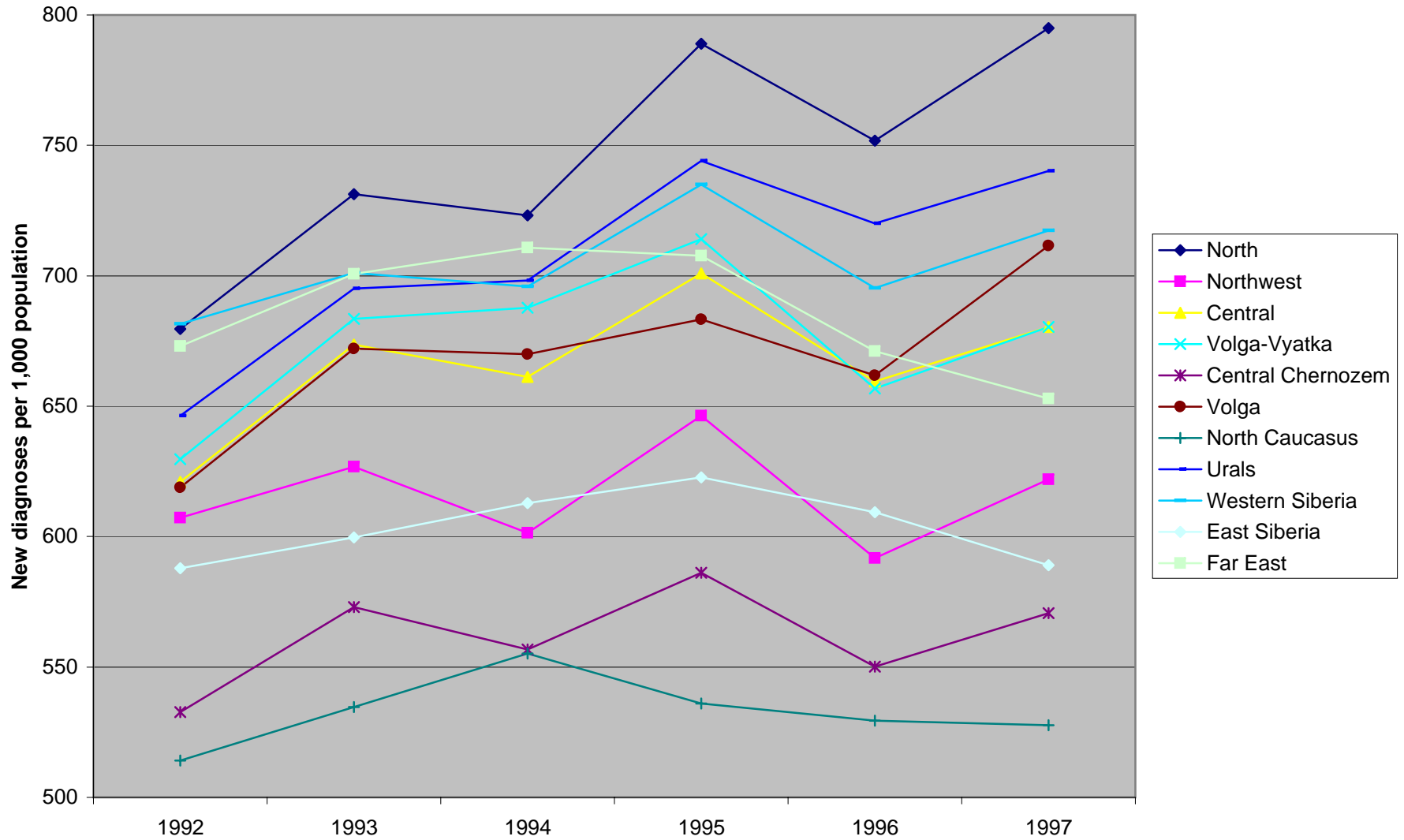


Figure Nineteen: Morbidity, by regions representing each 1997 decile, 1992-1997

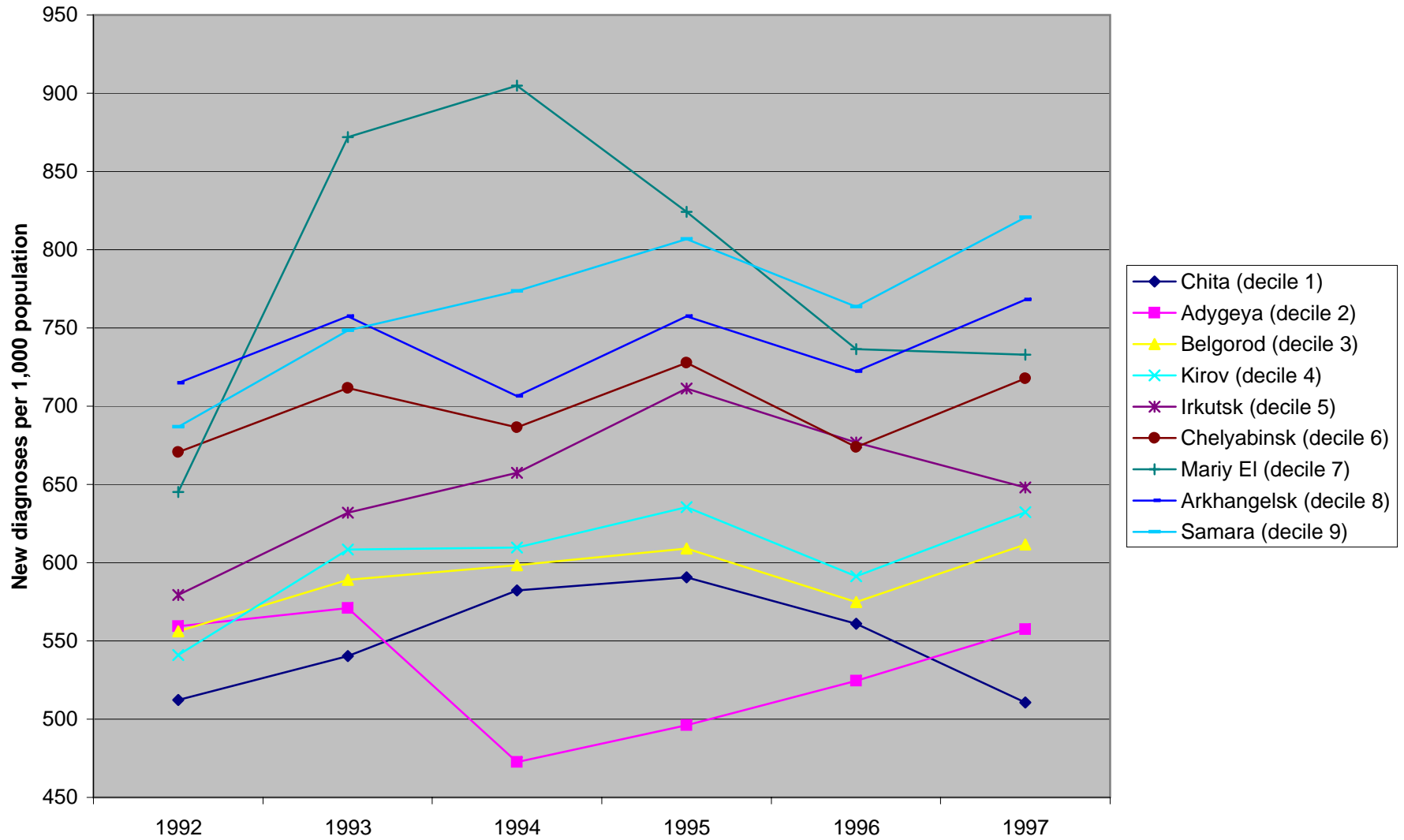




Figure Twenty: Standard deviation, morbidity, by region, 1992-1997

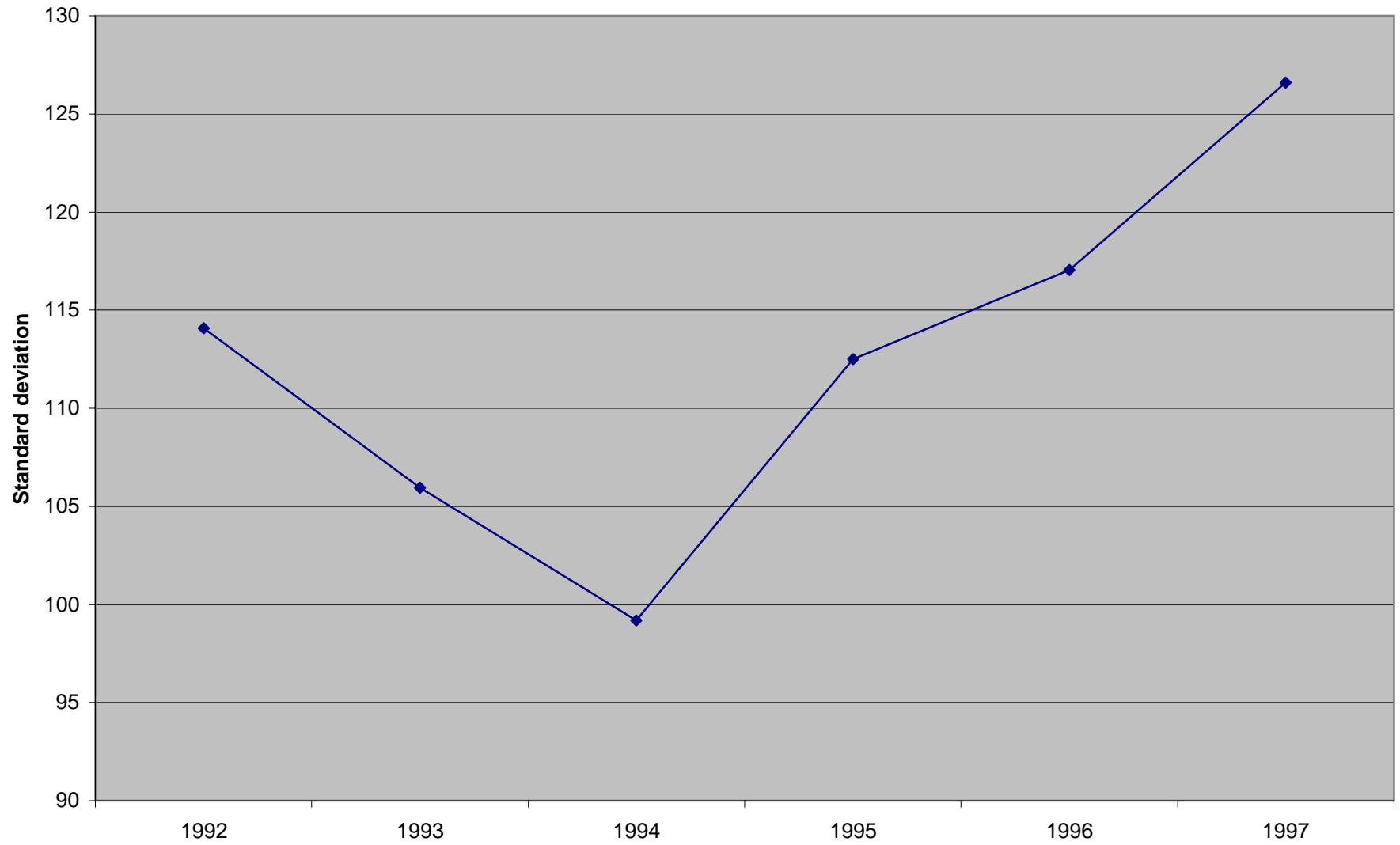


Figure Twenty-One: Range, morbidity, by region, 1992-1997

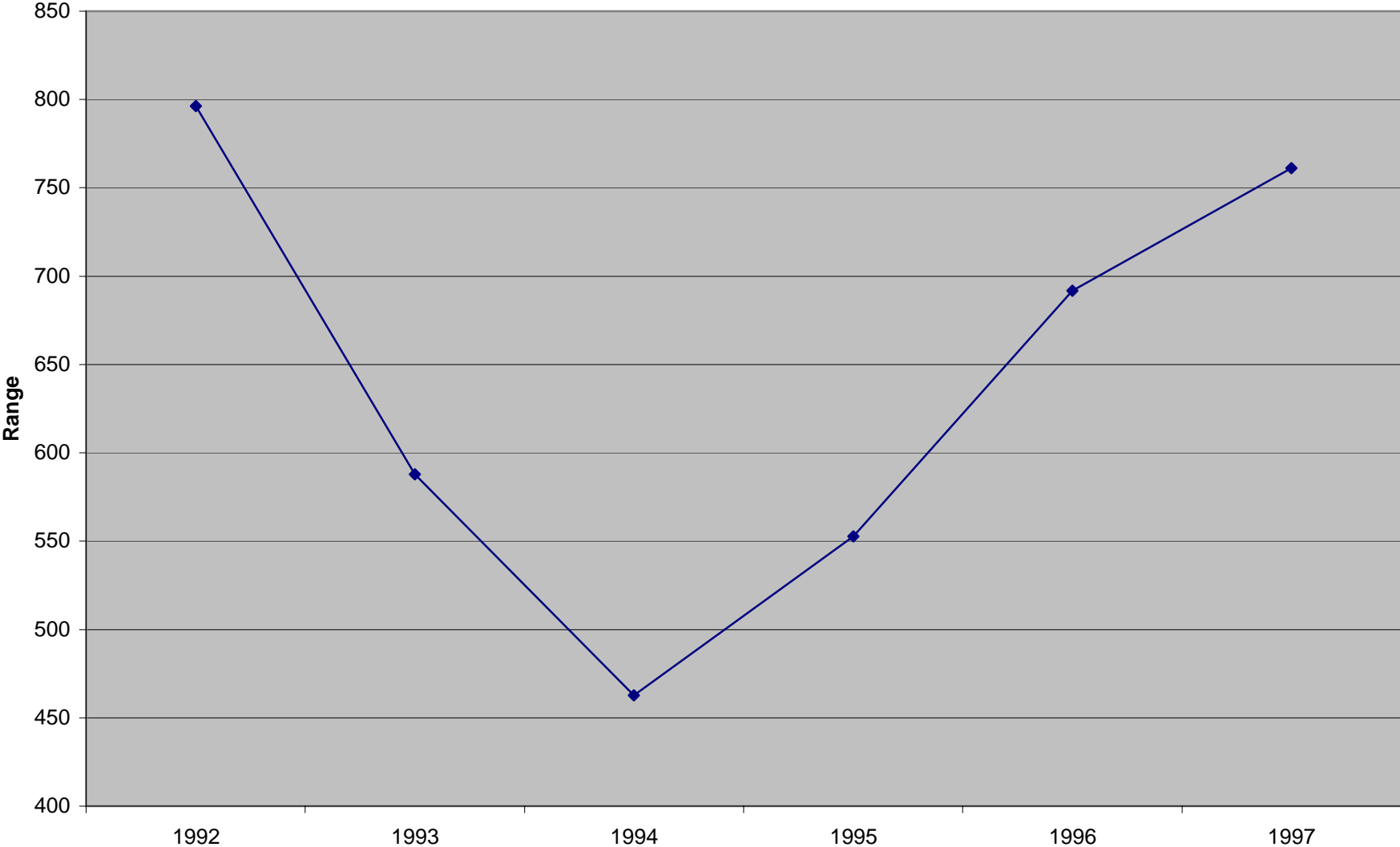
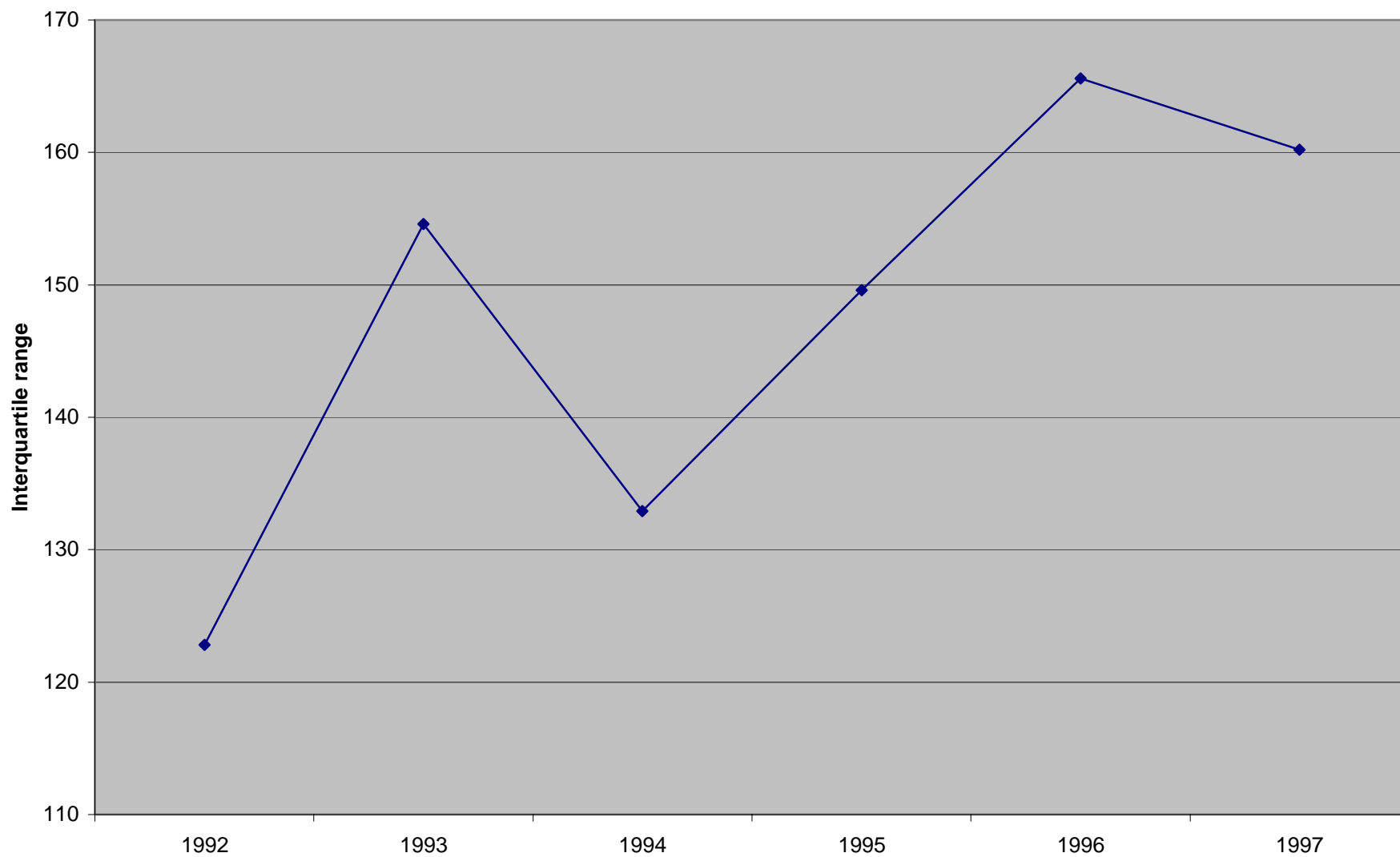


Figure Twenty-Two: Interquartile range, morbidity, by region, 1992-1997



**Figure Twenty-Three: Deaths from tuberculosis, 1997, per 100,000 population, by macro-region**

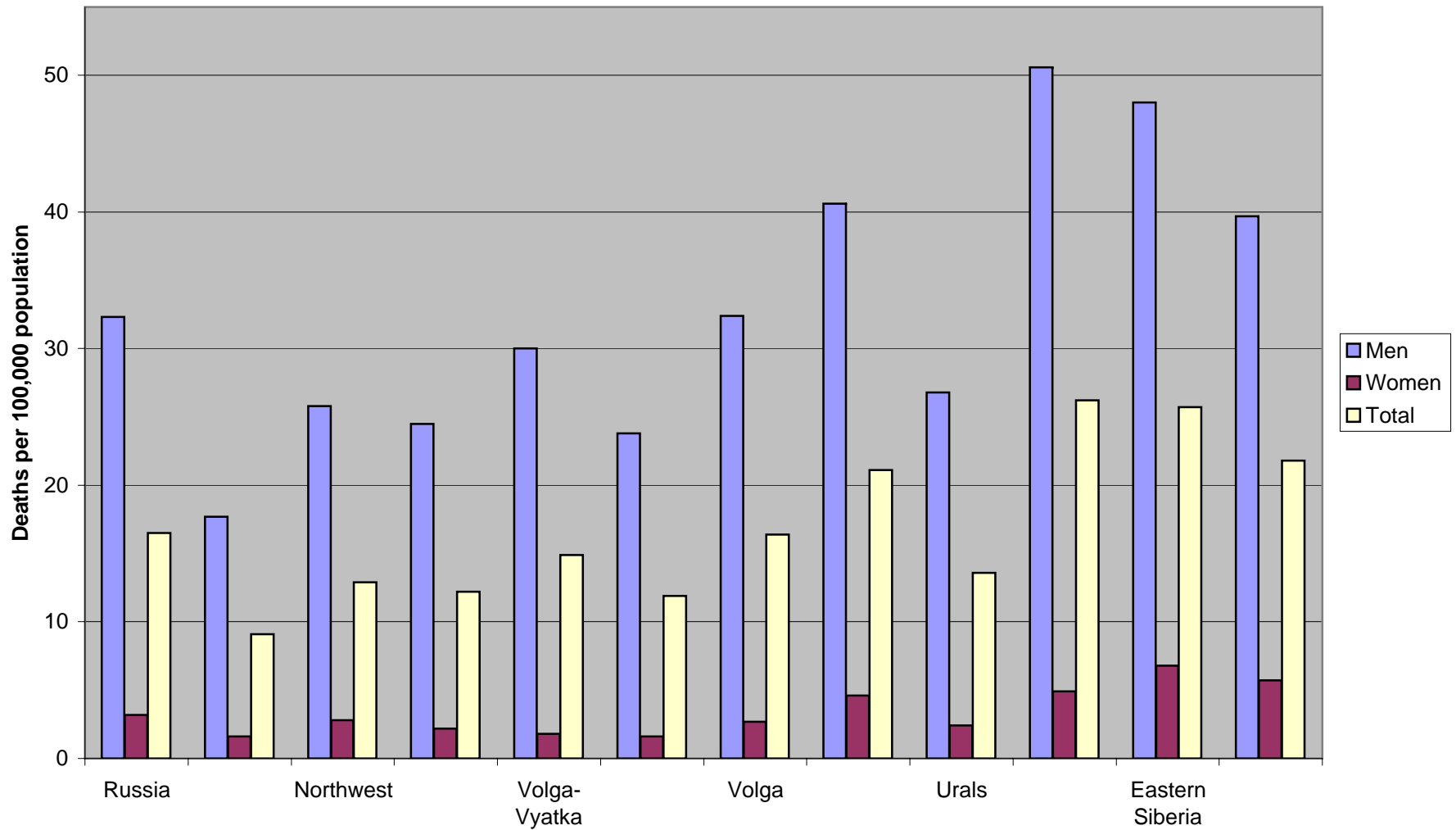


Figure Twenty-Four: Plot of % urban population vs male life expectancy, by region, 1997

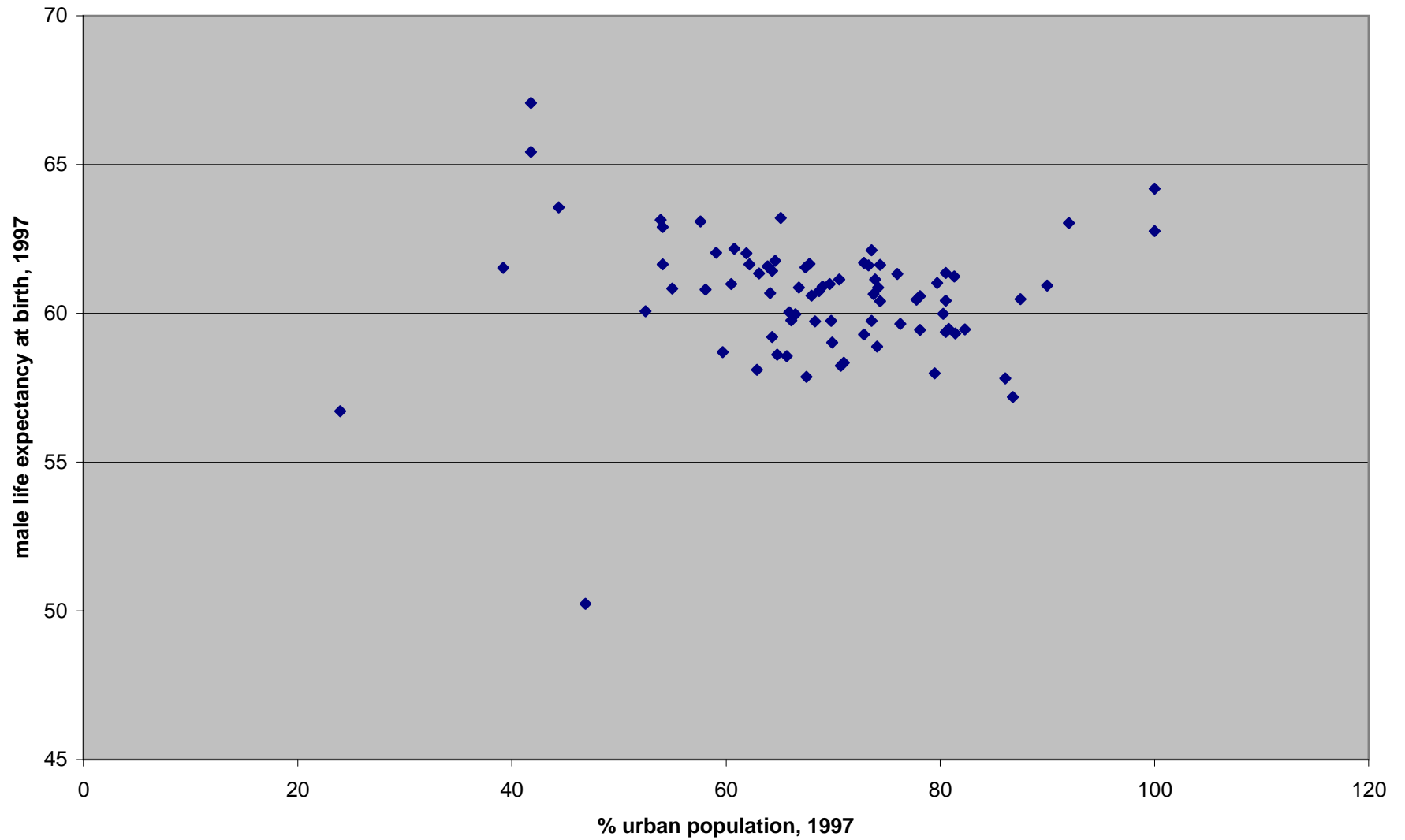


Figure Twenty-Five: Plot of % urban population vs. infant mortality, by region, 1997

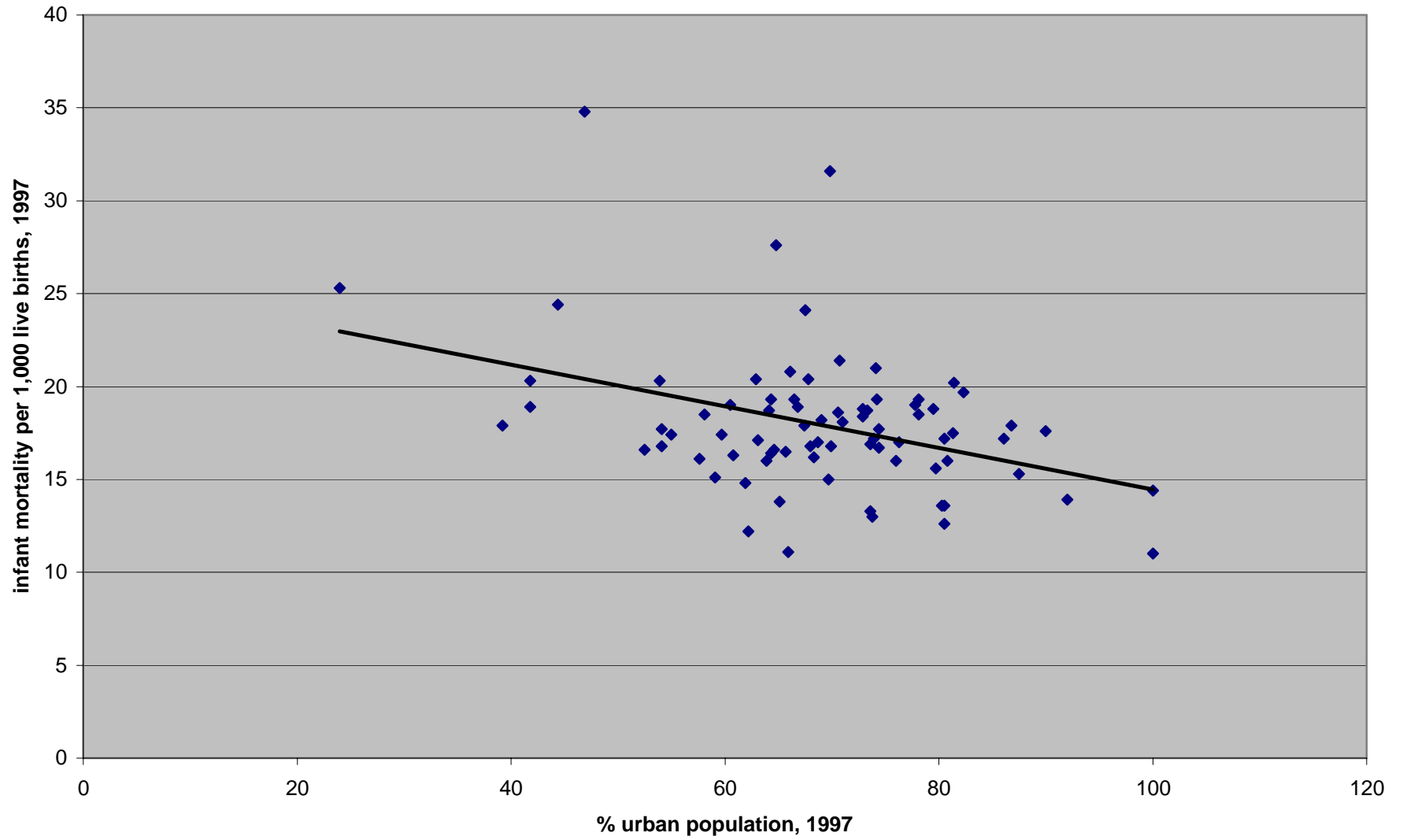


Figure Twenty-Six: Plot of % urban population vs. morbidity, by region, 1997

