# Research

# Health expectancy in the Russian Federation: a new perspective on the health divide in Europe

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**Objectives** To compare life expectancy and healthy life expectancy in the Russian Federation and in countries of Eastern and Western Europe.

**Methods** WHO mortality data and data on self-reported health from the World Values Survey and the Russian Longitudinal Monitoring Survey were used to compare the above three regions. Life expectancy was calculated using Sullivan's method, with years of life lived divided into healthy and unhealthy. The gap in healthy life expectancy between the Russian Federation and Western Europe was examined by decomposing the difference by gender and age.

**Findings** The probability of remaining alive and healthy declines faster in the Russian Federation than in Western Europe, with the gap between Eastern Europe and the Russian Federation widening at older ages. In the Russian Federation, this rapid decline is due mainly to the high probability of death or of poor health for men and women, respectively.

**Conclusions** There is a large toll of premature male mortality in the Russian Federation but there also appears to be a substantial burden of ill-health among women. As in other countries, the responses of men and women to adversity differ, leading to premature death in men but survival in a poor state of health in women. Epidemiological studies including objective measures of health would help policy-makers to estimate more precisely the scale and nature of this problem. Policy-makers must recognize that health expectancy in the Russian Federation is reduced in both men and women.

**Keywords** Life expectancy; Health status; Health status indicators; Mortality; Probability; Sex factors; Age factors; Comparative study; Russian Federation; Europe, Eastern; Europe (*source: MeSH, NLM*).

**Mots clés** Espérance vie; Etat sanitaire; Indicateur état sanitaire; Mortalité; Probabilité; Facteur sexuel; Facteur âge; Etude comparative; Fédération de Russie; Europe est; Europe (*source: MeSH, INSERM*).

**Palabras clave** Esperanza de vida; Estado de salud; Indicadores de salud; Mortalidad; Probabilidad; Factores sexuales; Factores de edad; Estudio comparativo; Federación de Rusia; Europa Oriental, Europa (*fuente: DeCS, BIREME*).

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## Introduction

It is increasingly recognized that an accurate view of a nation's health is inadequately captured by traditional measures such as life expectancy and infant mortality. Specifically, such measures underestimate the burden of disease that is attributable to chronic disabling disorders, such as mental health problems and the increasing number of physical diseases for which health care has postponed death but failed to restore normal functioning (*1*). Consequently, a concept of health expectancy has emerged in which overall life expectancy is partitioned into periods lived at different levels of health. The most common methods divide life expectancy into disability-free life expectancy and time lived with disability (*2*).

Although the need to move beyond the traditional measure of life expectancy is widely accepted, there are many unresolved issues, such as the means to measure and value states of health (*3*). For the present purposes, however, the use of a simple division of health into good and less than good makes it possible to examine the extent to which gains in life expectancy have been associated with a corresponding improvement in health while alive — a phenomenon known as compression of morbidity. This is becoming increasingly relevant to policy-makers as the complex interrelationships between health and economic prosperity are becoming better understood (*4*) and as countries begin to see the scope for reducing the growth in health care expenditures by improving health (*5*).

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Yet such comparisons have been limited, largely because of the lack of comparable data on disability. The landmark Global Burden of Disease study(*6*), which assessed the impact of selected diseases and risk factors on disability-adjusted life years, largely applied standard disability weightings to data on disease incidence and prevalence (*7*), and in many parts of the world these data were themselves estimated from other parameters (*8*). In particular, in the Russian Federation the only surveillance systems that can generate prevalence data cover cancer and tuberculosis, and even these systems are not without problems. The other potential source of data, the routine collection of invalidity data, has become highly problematic since the political transition in 1991 (*9*). The 2000 Global Burden of Disease study will, however, incorporate data from household surveys (*10*).

Over the past decade one of the greatest challenges faced by health researchers from many disciplines has been to understand the unprecedented changes in health, at least as measured by life expectancy, in the countries of the former Soviet Union during the 1980s and 1990s (*11*). Between 1987 and 1994, and since 1998, life expectancy at birth has declined in the Russian Federation and has been declining or stagnating in many of its neighbours, at a time when life expectancy has been improving steadily in the rest of Europe (*12*). Many aspects of this phenomenon are now relatively well understood, at least in relation to mortality. However, the contribution of various causes of death to overall mortality in the Russian Federation is different to that in western countries. Death rates from cancer in the Russian Federation and in western countries are relatively similar, so that cancer's share of the much higher total mortality in the Russian Federation is less than other causes; injuries and cardiovascular disease are much more important. But what can be said about the overall burden of disease in the Russian Federation population? On the one hand, many of the premature deaths are sudden, whether they are a result of injury or cardiovascular disease (*13*), and sudden cardiac death provoked by alcohol is especially common (*14*, *15*). These causes might be expected to cause little preceding morbidity. On the other hand, levels of self-reported ill-health in the early 1990s were much higher than in the West, perhaps reflecting an unknown number of disabling but less frequently fatal conditions such as those due to poor mental health (*16*). A better knowledge of this burden is important, not only to inform health policy-makers but also for understanding the implications of the health status of the Russian Federation population for that country's economic development.

In the present paper we examine the magnitude of the health divide in Europe in terms of the concept of health expectancy, rather than just mortality, to ask first, whether the population of the Russian Federation and of central and Eastern Europe die younger than their counterparts in the West, and second, whether they spend more of their shorter lives in a state of poor health. This is, to our knowledge, the first time either that health expectancy has been calculated for the Russian Federation using health survey data or that the health expectancy gap between the Russian Federation and other parts of Europe has been measured and categorized according to age-band and mortality and health status within each age group.

## Methods

This study uses two sources of data on self-reported health: the World Values Survey (WVS) and the Russian Longitudinal Monitoring Survey (RLMS).

The WVS arose from collaboration between researchers worldwide (*17*). It began as the European Values Survey in 1981, involving 10 countries, but has since expanded to cover more than 60 countries. The third wave of the survey, from which the data used in this study have been taken, was undertaken in 1995–98; a fourth wave is presently under way. Each survey is designed to be nationally representative of the population aged over 18. A disadvantage of the WVS is that samples from each nation typically include only 1000–2000 respondents, which means that age-specific figures are subject to unduly large random fluctuations. To overcome this problem, data from several countries were combined to create three synthetic regions for comparison.

Data from the Russian Federation were taken from the RLMS. Although the WVS had been undertaken in the Russian Federation in 1995, the sample size (1961) was smaller than that in the RLMS (6202). The latter was deemed preferable because of the need to use age-specific rates, as the smaller sample size leads to instability within age bands due to random fluctuations. The relevant questions asked (see later) were the same in the two surveys. A comparison of self-reported health in the RLMS and the Russian data in the WVS showed a close correspondence between the two sources after smoothing random fluctuations in the WVS data. The RLMS is a repeated cross-sectional household survey of the Russian Federation population that has now completed nine rounds (*18*). The sample has been shown to be representative of the population of the Russian Federation. In the present study data were taken from the seventh round.

To assess morbidity the present analysis used responses to the question: "All in all, how would you describe your state of health these days? Would you say it is ... Very good/Good/Fair/Poor/Very poor?" Many researchers regard the question as a valid and reliable measure of health (*19*) that is correlated with other measures of morbidity (*20*) and valid for comparisons among ethnic groups (*21*). It has been shown to correlate well at an individual level with subsequent mortality (*22*), even after adjusting for known disease and risk factors (*23*), and with use of health services (*24*). However, some researchers argue that, because there is no "gold standard" measure of non-fatal health and that self-ratings are influenced by expectations (which do vary for example, by age and income), survey questions should ideally be replaced by more objective measures of performance in terms of vision, cognition, and mobility (*25*). At present, however, such sources of data are rarely available.

Palosuo completed a detailed investigation of self-reported health responses in the Russian Federation (*26*), comparing them with more objective information on physical performance, diseases, and disability. She found that comparability with other countries was optimized when health was categorized into "healthy" if health was reported as very good, good, and fair, and "unhealthy" if health was reported as poor and very poor.

Our exploratory analysis (not shown here) supports her findings, suggesting that the above division is more stable across countries than when fair self-reported health is included in the unhealthy category. Health was treated as a dichotomous variable for further analyses, with 1 (healthy) as very good, good, or fair self-reported health, and 0 (unhealthy) otherwise.

To see the extent to which our results depend on formulation of the question on health, we made an additional comparison of the health expectancy estimates using equivalent estimates derived from questions about physical performance

(ability to walk, sit for a long time, stand up, lift weights, etc.).

Mortality data were obtained from the WHO Mortality Database (*27*), which contains data on deaths and populations broken down by sex and five-year age bands. The data used were from 1995 to 1996.

In the first analysis health expectancy was estimated using Sullivan's method (*28*). This entails, first, construction of sex-specific life tables from mortality data to calculate the number of years lived in each age group (in this case using five-year age bands). These numbers are then apportioned to healthy or unhealthy years according to the proportion found to be unhealthy in that age group, using data from surveys. Thus,

$$h_x = \sum_{y=x}^{\omega} L_y \cdot \pi_y ,$$

where $h_x$ is healthy life expectancy at age $x$, $\omega$ is the oldest age group, $L_y$ is the life table-derived number of person-years lived within age group $y$, and $\pi_x$ is the share of person-years lived in "good" health.

Sullivan's health expectancy does, however, have certain shortcomings as a construct. Most importantly, mortality is assumed to be at the same average level among the "healthy" and "unhealthy". In spite of this limitation, health expectancy is widely used in empirical studies, reflecting its conceptual clarity and ease of estimation from health survey data (*29*).

Although the national data were aggregated into regions, there were still some random fluctuations between contiguous age bands at older ages so the following formula was used for smoothing $\pi_x$: $\text{logit}(\pi(x)) = a + bx + cx^{\gamma}$, where the parameters $a, b, c, \gamma$ ($\gamma \neq 0$ and 1) are estimated by the method of weighted least squares by minimizing the functional,

$$\sum_i V_i \left[\text{logit}(\pi(x_i)) - a + bx_i + cx_i^{\gamma})\right]^2,$$

where $x_i$ is the middle of the age interval $i$ and the weights $V_i = \sqrt{P_i}$ ($P_i$ is the number of respondents at age group $i$).

A second analysis examined the health divide in Europe by decomposing the difference in health expectancy in different age bands. The method developed independently by Andreev (*30*), Arriaga (*31*), and Pressat (*32*) was modified to enable decomposition of differences between health expectancy (*33*). The method has been used extensively to assess the contributions of differences in mortality from different causes and at different ages to the gap in life expectancy between two populations. It first decomposes the gap in health expectancy between two populations by age and then splits each age-component according to differences in mortality and in health.

## Results

The countries and numbers of cases included in the final data sets are shown in Table 1. Fig. 1 shows, for each region, the expected decrease with age in the probability of reporting being healthy. However, the decline is much steeper in the Russian Federation than in Eastern or Western Europe. In Western Europe and in the Russian Federation the decline is steeper in men than in women; in Eastern Europe the converse is true (Fig. 1).

The differences can be seen more clearly in Fig. 2, which for clarity omits the unsmoothed lines and confidence intervals. Health begins to decline from an early age more rapidly in both Eastern Europe and the Russian Federation than in the West, although levels in Eastern Europe and the Russian Federation are similar until about the age of 50, even though mortality in the Russian Federation at these ages is very much higher. However, as noted above, the leading causes of premature death in the Russian Federation at these ages are predominantly events or circumstances that lead to sudden deaths. At older ages, however, the trends diverge, with a more rapid decline in health in the Russian Federation.

The effect of combining data on health and mortality is shown in Fig. 3 (web version only, available at: http://www.who.int/bulletin). It shows the very rapid decline in survival among Russian men, especially when compared with either their male counterparts in the West or with Russian women. However, these analyses clearly show that even though Russian women may be more likely than men to survive into old age, very few do so in good health. Thus, there is a very great burden of ill-health afflicting Russian Federation women that is not apparent from analysing mortality data. A similar but less marked pattern can be seen in Eastern Europe. By contrast, in Western Europe, not only do many people survive to a much older age; they are also much more likely to do so in good health.

Fig. 4 shows the contribution that ill-health and mortality make to the difference in health expectancy between the Russian Federation and Western Europe. Interpretation of this graph can be aided by looking at a single age band — for example, 50–54-year-old men, and returning to Fig. 3 (web version only, available at: http://www.who.int/bulletin). Fig. 3 shows that Western European men can expect to experience 4.6 years of life in this five year period, with 0.4 years lost due to deaths. Of this 4.6 years, 4.3 years will be spent in good health. Russian men, by contrast, can expect only 3.6 years of life, reflecting the much higher mortality. In addition, they can expect to spend 0.5 years of the 3.6 years in poor health, 0.2 years more than Western European men.

From the 50–54 age band in Fig. 4, it can be seen that Russian men have 1.4 years less of healthy life expectancy in this age band than do their Western European counterparts. Most of this is due to premature death. Russian women in this age band also have a year less of healthy life expectancy than their Western European counterparts. However, in this case the gap is largely due to poor health rather than to premature death.

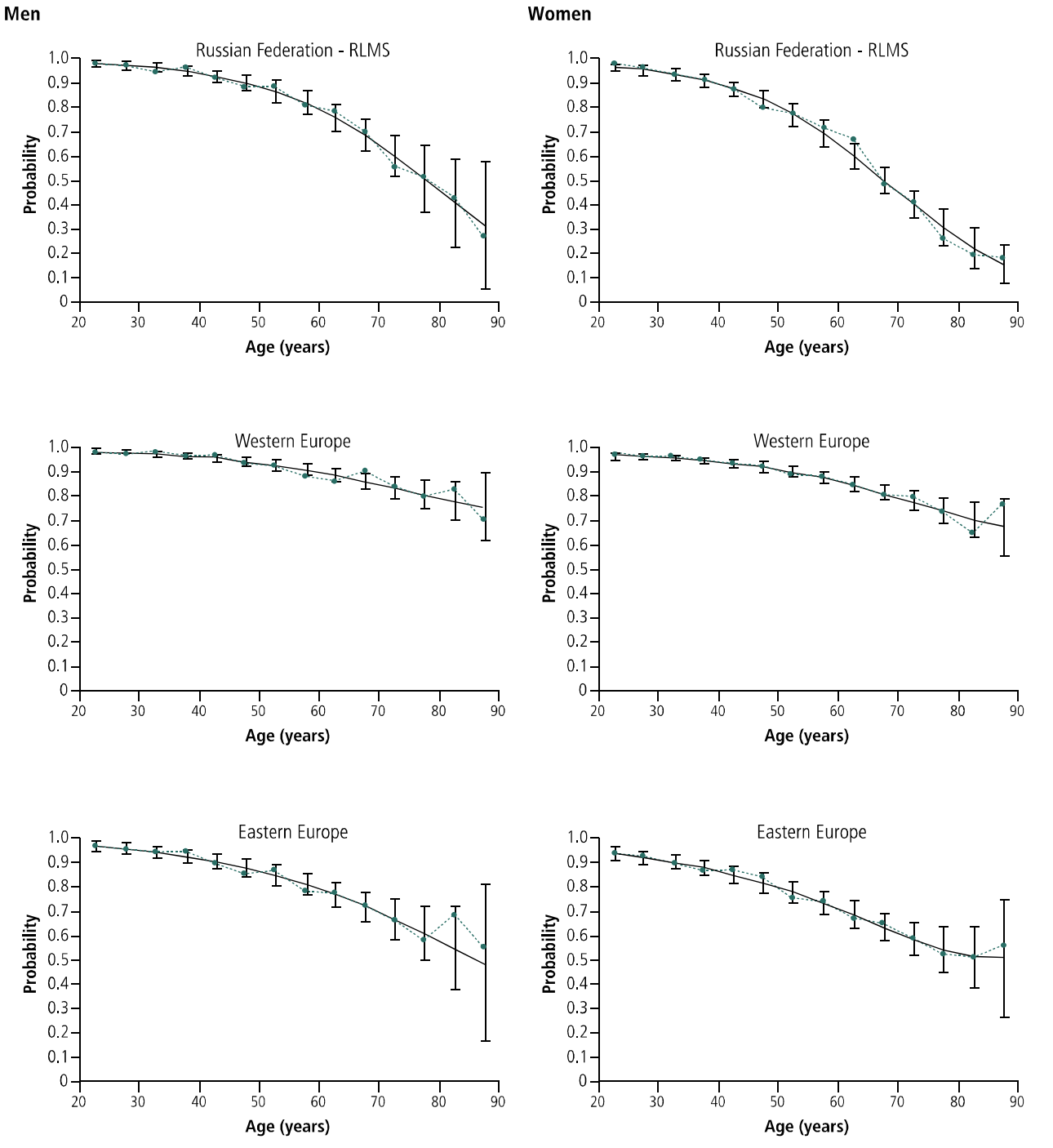
The consequences of these findings can be seen in Table

Table 1. **Data sets used in the analysis**

| Region | Country | Men | Women | Total |
|---|---|---|---|---|
| Russian Federation[a] | | 2 885 | 3 317 | 6 202 |
| Western Europe | Belgium, France, Ireland, Italy, Spain, Germany (former Federal Republic of Germany), United Kingdom | 7 054 | 7 642 | 14 696 |
| Eastern Europe | Bulgaria, Czech Republic, Hungary, Germany (former German Democratic Republic), Poland, Romania | 2 919 | 3 016 | 5 935 |

[a] From Russian Longitudinal Monitoring Survey.

Fig. 1. **Trends in the probability of being healthy, by age, sex, and region** (RLMS = Russian Longitudinal Monitoring Survey)

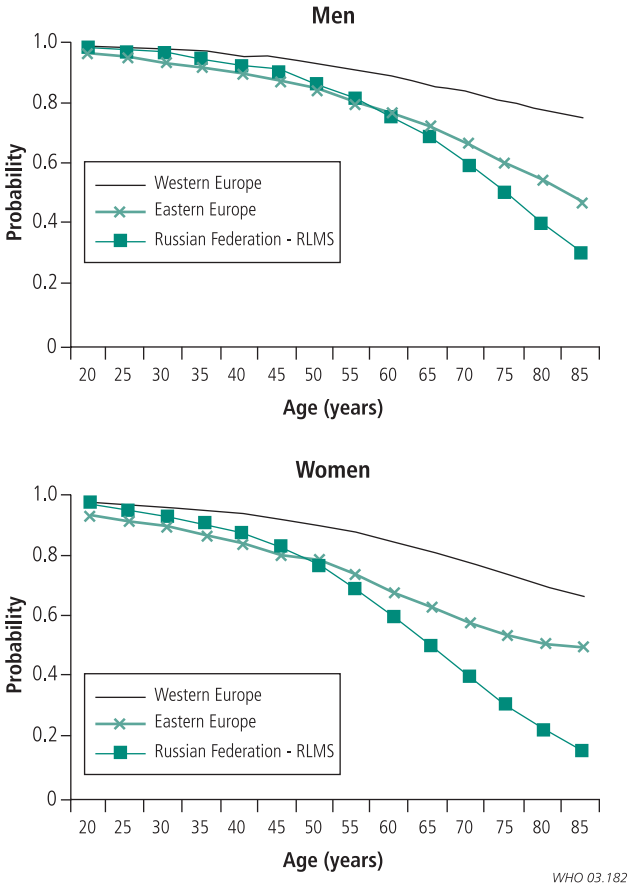



2, which shows life expectancy and healthy life expectancy at various ages. The large and well-known male–female gap in life expectancy in the Russian Federation is apparent, but what is striking is that the male disadvantage in healthy life expectancy is only slightly greater than in the West at younger ages, and at older ages it actually reverses, unlike in Western and other parts of Eastern Europe.

It might be argued that the very low expectancy of being healthy in the Russian Federation could reflect a general feeling of pessimism rather than a more objective assessment of actual health problems. This possibility cannot completely be excluded without the participants being given a detailed medical examination and their physical and cognitive performance tested. However, we did explore this issue further by comparing self-reported health estimates with others based on self-reported physical performance. These estimates can be obtained from RLMS questions asked of individuals aged 55 or older on ability to run, walk, rise after prolonged sitting, climb several flights of stairs, and lift 5 kg.

Arguably, the ability to run and walk is the most transparent measure of physical performance. It is addressed in a sequence of four questions asking about ability to run 1 km, walk 1 km, walk 200 m and walk across the room. We constructed a variable in which 1 equated to no difficulty in walking 200 m and 0 indicated otherwise. Although there was a high correlation between being in good or fair self-reported health and ability to

Fig. 2. **Probability of being healthy, by age, sex, and region** (RLMS = Russian Longitudinal Monitoring Survey)



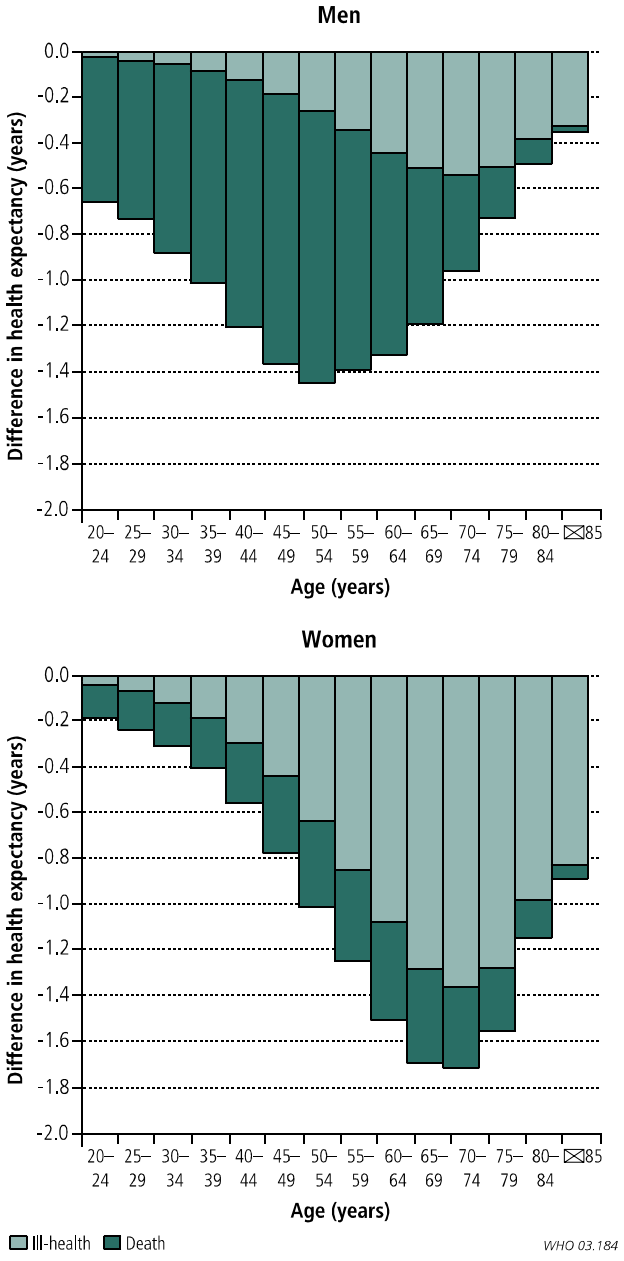

walk 200 m, in 24% of cases there was disagreement between the two variables, which indicates, as expected, that each participant considers some aspects of health more important than others. However, as Table 3 shows, expectation of healthy life with no difficulty in walking 200 m at age 60 is only 1 year and 1.5 years more, for men and women, respectively, than that based on self-reported good or fair health. An additional, more restrictive variable was constructed, in which 1 was the ability to walk 200 m, sit for 2 hours (to capture spinal problems), rise after prolonged sitting, climb several flights of stairs, and lift 5 kg. The expectation of life while able to do all of these at age 60 was very low — 5.7 years for men and 3.6 years for women.

Fig. 5 shows the survival curves for these additional measures from age 55. They support the finding from the analysis based on the question on self-reported health — namely, that older women in the Russian Federation have substantially worse health than men.

## Discussion

This study provides important new information on the nature of the health divide in Europe. It goes beyond what is already known about the premature mortality of Russian men, identifying the high frequency of poor health of Russian Federation women. It confirms that Eastern Europe lies in an intermediate position between the Russian Federation and Western Europe, although the decline in health with age is far less steep in this region than in the Russian Federation.

Fig. 4. **Contribution of ill-health and increased deaths to the gap in health expectancy between the Russian Federation and Western Europe**




Before considering the implications of these findings it is important to examine the limitations of the increasingly widely used approach employed in this study. First, given the complexity of the concepts of health and disability, the calculation of healthy life expectancy must depend on the choice of measure of health and the cut-off point used. A study in Finland examined differences in health expectancy by level of education and by gender using two cut-off points each on three scales of limiting long-standing illness, functional disability, and poor self-reported health (*34*). As expected, the precise figures for healthy life expectancy in each category varied but the pattern was consistent. In addition, self assessment of health seems to be robust in relation to the specific type of question asked, in terms of the number of response categories or whether respondents are asked to compare their health with others of the same age (*35*).

Table 2. **Life expectancy and healthy life expectancy of men and women at different ages**

| Sex | Region | Age (years) 20 $e_x$[a] | 20 $h_x$[b] | 40 $e_x$ | 40 $h_x$ | 65 $e_x$ | 65 $h_x$ |
|---|---|---|---|---|---|---|---|
| Men | Russian Federation | 41.9 | 36.7 | 22.4 | 17.3 | 11.4 | 6.7 |
| | Eastern Europe | 49.1 | 41.9 | 26.6 | 20.5 | 12.7 | 8.3 |
| | Western Europe | 54.5 | 50.4 | 31.2 | 27.6 | 15.0 | 12.5 |
| Women | Russian Federation | 54.2 | 40.6 | 31.1 | 18.5 | 15.2 | 5.8 |
| | Eastern Europe | 56.8 | 44.5 | 32.8 | 22.7 | 15.9 | 9.3 |
| | Western Europe | 60.2 | 53.7 | 36.0 | 30.3 | 18.1 | 14.0 |
| Female–male gap | Russian Federation | 12.3 | 3.9 | 8.7 | 1.2 | 3.9 | -0.9 |
| | Eastern Europe | 7.6 | 2.6 | 6.2 | 2.2 | 3.3 | 1.1 |
| | Western Europe | 5.7 | 3.3 | 4.8 | 2.7 | 3.1 | 1.5 |

[a] $e_x$ = life expectancy at age x.
[b] $h_x$ = healthy life expectancy at age x.

Table 3. **Expectations of healthy life at age 60 years based on different definitions of being healthy**

| Sex | Good or fair self-reported health | No difficulty at all in walking 200 m | No substantial difficulty in walking 200 m, sitting for 2 hours, standing up after sitting, climbing several flights of stairs, and lifting 5 kg |
|---|---|---|---|
| Men | 8.8 | 9.8 | 5.7 |
| Women | 8.3 | 9.8 | 3.6 |

A second issue is whether the measure of health or disability being used is interpreted in the same way by each group. This is a very difficult issue to resolve, as there is no gold standard against which to assess it. The ability of poor self-reported health to predict mortality is known to vary between countries. For example, it was less predictive of mortality in Lithuania than in the Netherlands (*36*). In the USA its predictive power among the Hispanic population was correlated with the degree of acculturation (*37*). However, research on ethnic groups in the USA has shown that a simple baseline comparison may underestimate predictive power because of different trajectories of illness over time (*38*). Thus, some disease processes, such as heart disease, may lead to ill-health over many years but others, such as death from violence, would not. Where the latter is a more common cause of death, clearly the ability to predict mortality will be reduced. Hence, the differing ability of self-reported health to predict mortality in Finland and Italy could be explained largely by differences in markers of disease (*39*).

## Self-reported health vs other measures

Of course, ability to predict mortality is only one criterion, and arguably one that is relatively less important here. Another approach is to compare self-reported health with other "objective" measures of health. Self-reported health was found to behave in the same way among different ethnic groups in the United Kingdom in relation to the presence of chronic disorders (*21*). In the present study the additional analyses in which self-reported health was replaced by "more objective" measures of health did not produce a substantial increase in estimates of healthy life expectancy. Indeed, the finding that the broadest definition of good health increased the relative disadvantage of women (*21*) was replicated in the present study.

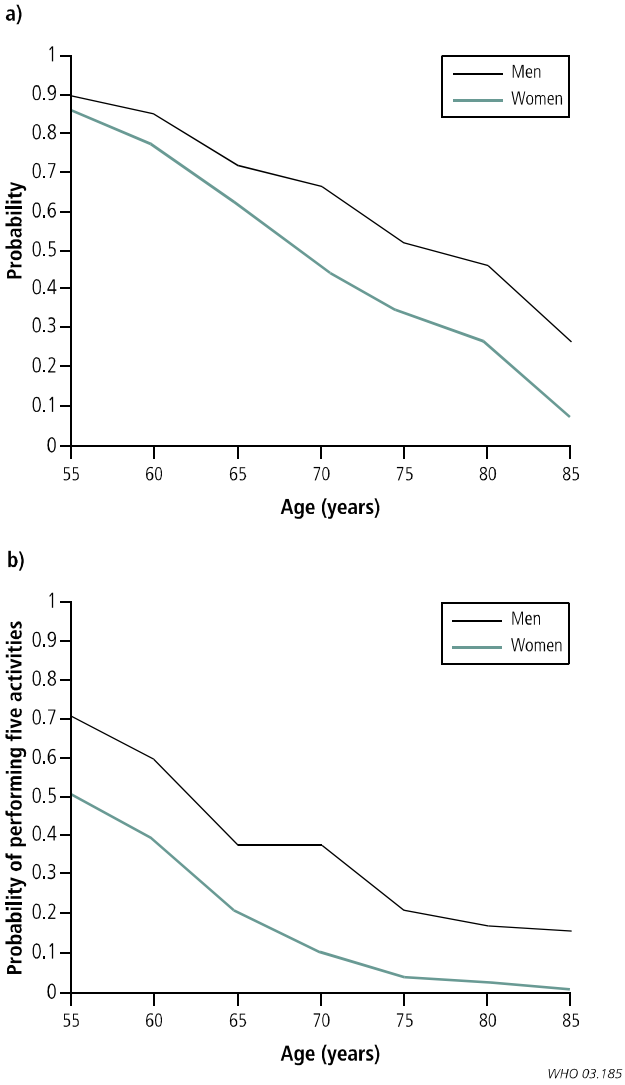
Taken together, this evidence suggests that poor self-reported health in the Russian Federation is not due simply to a difference in the way that people in the Russian Federation respond to the question on the state of their health compared with those in the West. However, there is a need for further research on this issue using objective physiological, cognitive, and physical performance testing.

## Gender and self-reported health

The situation in relation to gender is inevitably complex. In many populations, women report poorer health but live longer than men, although this depends, to some extent, on the particular measure of ill-health used; a few measures, especially those that relate to particular diseases, yield poorer scores among men (*40*). The pattern observed in the present study is, however, consistent with the results of another survey of self-reported health in the Ukraine (*41*), where patterns of self-reported health are, in many ways, similar to those in the Russian Federation.

The difference in health between men and women may reflect differential vulnerability, with differential exposure to stressors playing a relatively minor role (*42*). Subsequent research has argued, however, that it is the nature of the stressors, and not just their quantity, that is important. A study of how various measures of health, including self-reported health, varied according to different factors among men and women in the United Kingdom found similar levels of inequality among men and women when studied according to social class but inconsistencies in male–female inequalities with measures based on education (*43*). However, further analysis also showed that self-

Fig. 5. **Probability of being able to a) walk 200 m with no difficulty or to b) walk, sit for 2 hours, rise from chair, climb stairs, and lift 5 kg**




reported health was, perhaps intuitively, influenced more by job insecurity in men and by age at first child among women. Others have argued that the stressors to which women are exposed are more likely to be chronic and long standing (*42*).

In summary, whether questions on self-reported health measure precisely the same thing in different populations has not been fully resolved, and indeed perhaps it cannot be resolved. Nonetheless, where self-reported health has been studied it has behaved in ways that, while sometimes appearing superficially inconsistent, can often be explained by further examination of other factors such as specific co-existing illnesses or the pattern of causes of mortality, each acting over different time periods, in a population.

## Presentation of findings

Another issue is how to present the findings. It is increasingly common to combine health and mortality to produce a summary measure, as is done with disability-adjusted life expectancy, for example (*3*). This involves assigning weights to the various states of health. Because this remains the subject of extensive methodological debate that, in our view, has yet to be resolved satisfactorily (*44–46*), we have chosen explicitly only to use weights of 0 and 1 as appropriate for the various states of health.

## Ill-health and Russian women

Our findings remind us of the importance of looking beyond mortality when assessing population health. Elsewhere, we have highlighted the health crisis affecting Russian men, drawing on our research on mortality data (*47*). This study suggests that there is also a large, but so far poorly recognized burden of ill-health among Russian women, especially at older ages. In some ways this is hardly surprising in the light of even a superficial consideration of the events through which these women have lived. The Soviet Union experienced much devastation during the Second World War and which suffered prolonged austerity as resources were diverted to post-war industrialization and the military industrial complex. Although the idea of equality of the sexes was promoted, Soviet imagery encouraged a strict demarcation, with men as leaders and women as home-makers, supporting the men who were building socialism (*48*). In reality, women faced a double burden, as they were expected to work and bring up children (*49*). However, the jobs they could take were limited by regulations based on perceived dangers to reproductive health, even though few of these regulations had any reasoned basis and served primarily to keep them in lower status jobs — for example, cleaning metro stations but not driving trains (*50*). There was widespread sexual stereotyping — for example, the production of two corresponding but different volumes of an encyclopaedia for boys and for girls. Even in occupations where there was, in theory, equal access for the sexes — for example, in medicine — in reality there was a clear hierarchy, with a high proportion of women working in the least attractive jobs. In 1994, over a quarter of women aged over 65 had never completed primary education compared with 9% of men of the same age (*51*).

Russian women continue to be especially disadvantaged in old age. For example, older Russian Federation women are three times as likely as men of the same age to live alone and are more likely to live in poverty. This reflects the pattern of male mortality, both from the prevalent causes of mortality and the legacy of the Second World War.

## Summary

In the Russian Federation people have been subjected to extremely adverse circumstances over many years. It is already known that men had suffered greatly, as shown by their high premature mortality. What this study adds is to show that women also appear to have suffered, but that they have responded in different ways. Aneshensel et al have argued that adverse life events affect men and women differently; men react to stress with hostility and anger, which is often accompanied by substance abuse, whereas women are more likely to respond with affective or anxiety disorders (*52*). This certainly seems true in the Russian Federation, where hostility and anger are especially likely to lead to premature death (*53*).

What is now needed is further research using more objective measures to understand more precisely the reasons for the apparent poor health of Russian women and, in particular, whether there are interventions that might be able to alleviate it in some way. ■

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**Conflicts of interest:** none declared.

## Résumé

### Espérance de santé en Fédération de Russie : nouvelle perspective sur la fracture sanitaire en Europe

**Objectif** Comparer l'espérance de vie et l'espérance de vie en bonne santé en Fédération de Russie et dans les pays d'Europe orientale et occidentale.

**Méthodes** Les données de l'OMS sur la mortalité, celles indiquées par les sujets eux-mêmes sur leur propre santé dans la World Values Survey et l'enquête longitudinale russe de surveillance ont été utilisées pour comparer ces trois régions. L'espérance de vie a été calculée à l'aide de la méthode Sullivan, séparant les années de vie en bonne santé de celles en mauvaise santé. L'écart entre la Fédération de Russie et l'Europe occidentale pour l'espérance de vie en bonne santé a été examiné en fonction du sexe et de l'âge.

**Résultats** La probabilité de rester en vie et en bonne santé baisse plus vite en Fédération de Russie qu'en Europe occidentale ; par ailleurs, l'écart entre l'Europe orientale et la Fédération de Russie s'élargit chez les personnes âgées. En Fédération de Russie, cette baisse rapide est due principalement à la forte probabilité de mourir pour les hommes et d'être en mauvaise santé pour les femmes.

**Conclusion** Si l'on constate une forte mortalité prématurée chez les hommes en Fédération de Russie, on observe également une charge importante de la morbidité chez les femmes. Comme dans d'autres pays, hommes et femmes réagissent différemment face à l'adversité, ce qui entraîne des décès prématurés pour les hommes et la survie en mauvaise santé pour les femmes. Les études épidémiologiques comportant des mesures objectives de la santé aideraient les responsables politiques à estimer plus précisément l'ampleur et la nature du problème. Les décideurs doivent reconnaître que, pour les hommes comme pour les femmes, l'espérance de santé est réduite en Fédération de Russie.

## Resumen

### Esperanza de vida sana en la Federación de Rusia: una nueva perspectiva sobre la brecha de salud en Europa

**Objetivo** Comparar la esperanza de vida y la esperanza de vida sana en la Federación de Rusia y en países de Europa occidental y Europa oriental.

**Métodos** Para comparar las tres regiones se utilizaron los datos de la OMS sobre la mortalidad y los datos de las evaluaciones de salud realizadas por los propios pacientes que participaron en los estudios *World Values Survey* y *Russian Longitudinal Monitoring Survey*. La esperanza de vida sana se calculó con el método de Sullivan, y los años vividos se dividieron en años con salud y sin salud. La diferencia entre la Federación de Rusia y Europa occidental con respecto a la esperanza de vida sana se analizó en función del sexo y de la edad.

**Resultados** La probabilidad de seguir vivo y sano disminuyó más rápidamente en la Federación de Rusia que en Europa occidental; la diferencia entre Europa oriental y la Federación de Rusia aumentó a edades más avanzadas. Esta disminución rápida en la Federación de Rusia se debe principalmente a la elevada probabilidad de muerte en los hombres, y de mala salud en las mujeres.

**Conclusión** En la Federación de Rusia hay una gran mortalidad prematura en los hombres, pero también parece haber una considerable carga de mala salud en las mujeres. Como ocurre en otros países, los hombres y las mujeres presentan respuestas diferentes frente a la adversidad, que a ellos los conducen a la muerte prematura, y a ellas a la supervivencia con mala salud. Los estudios epidemiológicos con medidas objetivas de la salud podrían ayudar a las instancias decisorias a estimar con mayor precisión la escala y naturaleza de este problema. Las instancias decisorias deben reconocer que la esperanza de vida sana está disminuida en la Federación de Rusia, tanto en los hombres como en las mujeres.

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## Commentary

# Towards valid and comparable measurement of population health

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In the past two decades, considerable international effort has been put into the development of summary measures of population health that integrate information of mortality and non-fatal health outcomes (*1*). During the past 20 years, disability-free life expectancy (DFLE) and related measures have been calculated for many countries using self-report survey data on disability and health status (*2*). In this issue of the *Bulletin* (pp. 778–787), Andreev et al. compare DFLE for Russian men and women and also compare DFLE estimates for the Russian Federation with other Eastern European countries. Their results are dominated by a phenomenon seen in many developed countries: women generally report worse health than men. Thus, the large male–female gap in life expectancy in the Russian Federation is offset by worse reported health status in women.

The reporting by women of worse health, generally, than men has been seen in health surveys across many developed countries (*2*). Can we conclude that the health status of Russian Federation women is worse than that of Russian Federation men? Several paradoxical findings have been reported in analyses of population health surveys, suggesting that self-reported health measures may give misleading results if differences in the way people use question responses are not taken into account (*3*–*6*). This evidence has been ignored by many who use self-report-survey measures of health status to report on population health, health inequalities, or intervention outcomes. Indeed, there is substantial literature arguing that within-group correlations of self-reported health measures with other observed or measured health indicators, or with mortality risk, show the validity and comparability of such measures across groups (*7*–*12*).

Although there are, undoubtedly, correlations between self-reported health status measures and other health indicators, and there is no doubt that health status influences self-report, this does not ensure comparability of self-report measures across groups. Several studies have reported significant correlations between perceived health (with response categories such as excellent, good, fair, poor) and mortality risk within groups such as men and women, or groups defined by socioeconomic or ethnic characteristics (*8*, *9*, *12*), and argued that these correlations provide evidence that self-perceived health is a valid measure of health status. Similar arguments are made for within-group correlations with observed or measured functional indicators, with morbidity and health service utilization (*7*, *10*, *11*).

However, it is possible to have consistent associations of perceived health with survival within groups without such associations holding across groups (*6*). This is illustrated in Fig. 1, where survival is lower for worse perceived health in both men and women, while at the same time the survival of women with worst perceived health is better than that of men with excellent perceived health. Suppose that a population survey found most women reporting worse health than men for a population with the associations shown in Fig. 1. It would clearly be fallacious to deduce that women have worse survival (or health) than men: the indicator is not comparable across groups because women are using the response categories differently to men.

Survey developers have emphasized the importance of establishing the validity of instruments and their reliability, but until recently, little attention had been paid to the issue of cross-population comparability (*6*). The latter relates fundamentally to unmeasured differences in expectations and norms for health, so that the meaning that different populations attach to the labels used for response categories in self-reported questions, such as mild, moderate, or severe, can vary greatly. Recent developments in survey methodology using measured tests and anchoring vignettes to calibrate self-report health questions hold considerable promise in addressing this problem (*13*).

Anchoring vignettes are short descriptions that mark fixed levels of ability (e.g. for people with different levels of mobility such as a paraplegic person or an athlete who runs 4 km each day). Survey respondents are asked to rate the vignettes for a health domain using the same question and response categories as for their self-report on their own

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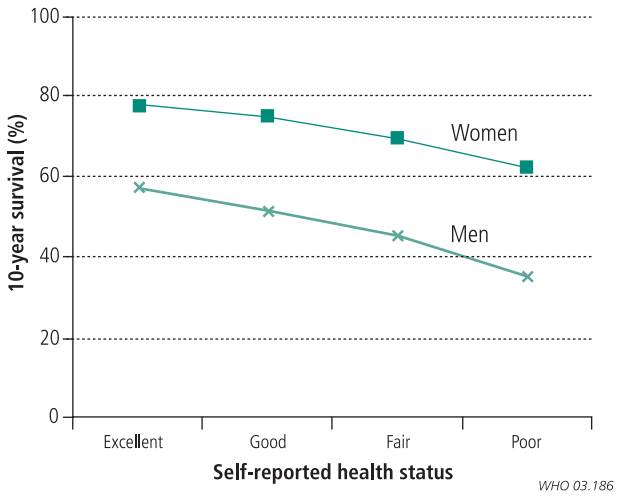
Fig. 1. **Plots showing that within-group correlation of self-reported health status with other health indicators does not provide evidence for cross-group correlations**




level of health, allowing the calibration and comparison of the self-report responses. Results from the WHO Multi-country Survey Study (MCSS) carried out in 2000 and 2001 in 61 countries provides clear evidence that different populations, and groups within populations, use response categories differently to describe the same health states (*14*). Although the MCSS found that overall, women have somewhat worse health than men, this difference was much smaller than that reported here for the Russian Federation by Andreev et al. based on unadjusted self-report data.

Valid, reliable, and comparable measures of the health states of individuals are essential components of the evidence base for health policy. They are crucial for the measurement of health outcomes in clinical trials and the development of summary measures of population health. A strategy of including vignettes in national health surveys and clinical research may contribute to improving the interpersonal and cross-population comparability of these measures. ■

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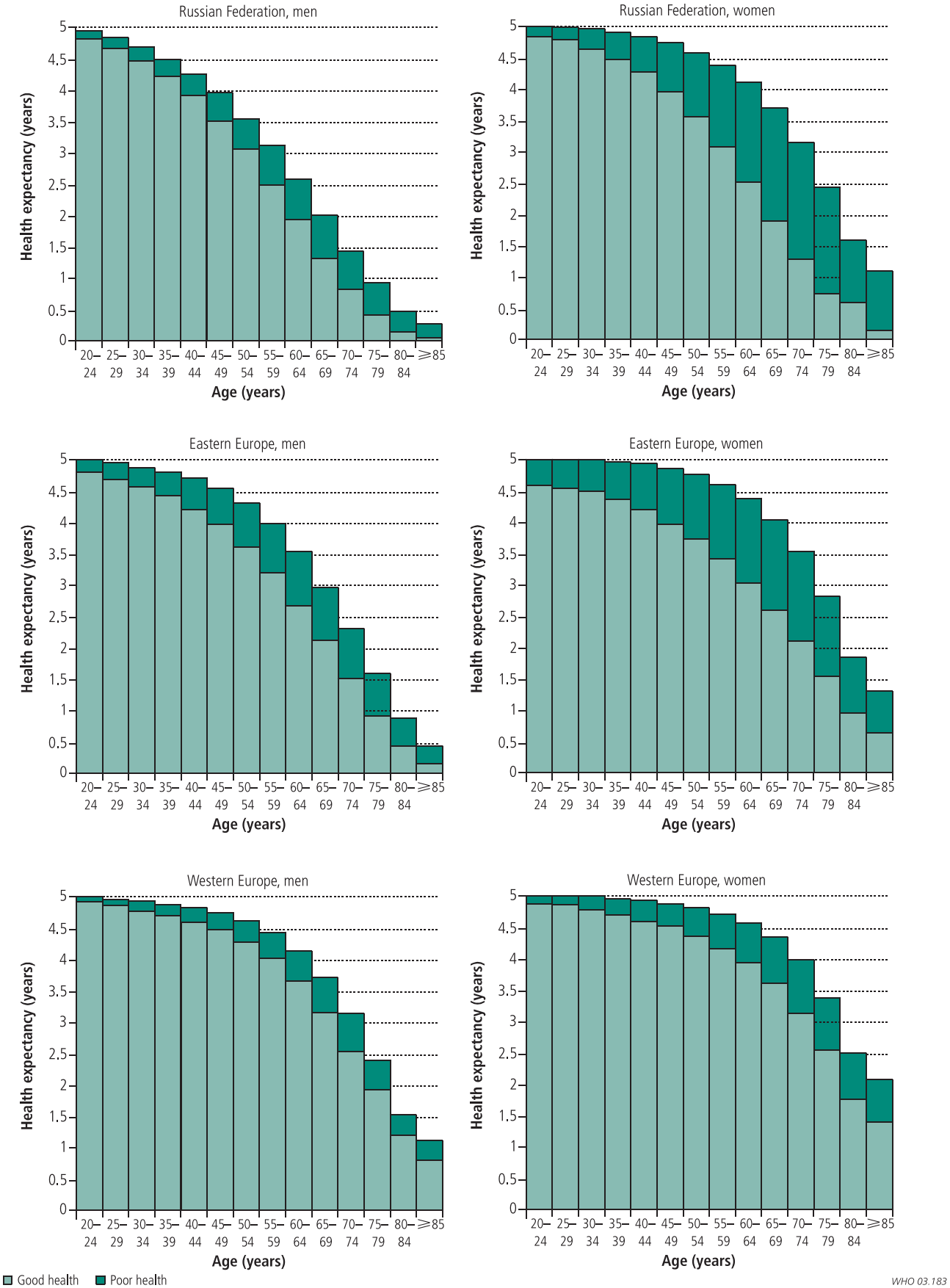
Fig. 3. **Years of health expectancy, by age, sex, and region**

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