

## THE DRAMATIC INCREASE IN HIV/AIDS MORTALITY IN RUSSIA. WHAT DO VITAL STATISTICS TELL US?

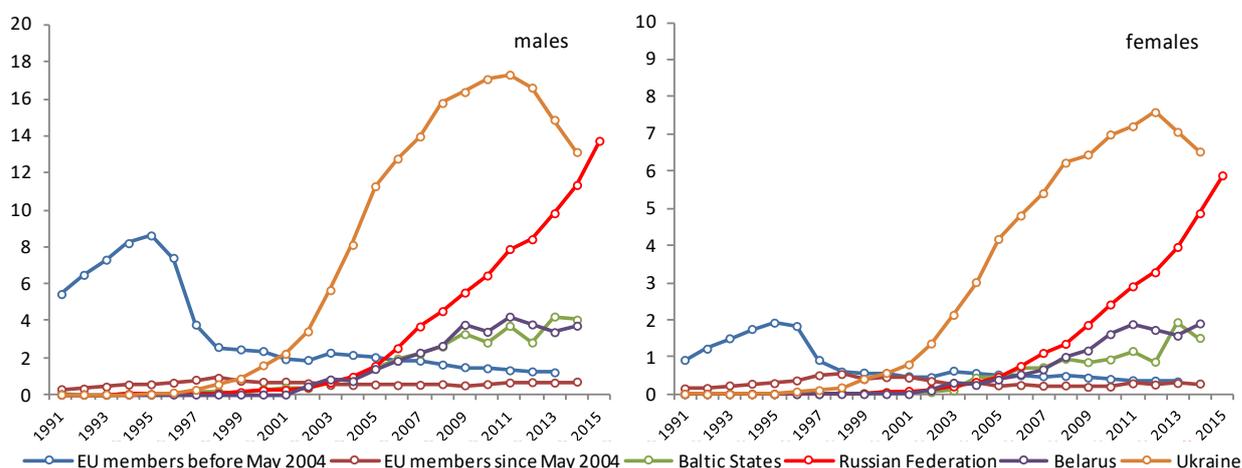
### Introduction

For the first time, deaths from HIV/AIDS were officially recorded in Russia in 1990. Since then, the annual number of HIV/AIDS deaths has been constantly increasing, and it amounted to 16.8 thousand deaths in 2017. It constitutes 60% of all deaths from infectious diseases with tuberculosis ranking next (6.5k deaths in 2017).

In contrast to most of the western European countries, mortality from HIV/AIDS remained very low in Russia over the 1990s, but began to grow steadily in 2000. In 2000-2007, the annual increase of the standardized death rate (SDR) was 54% and 69% on average for men and women, respectively. Since 2008, SDR has stabilized at a growth rate of 20% per year. For example, if the current trends remain unchanged until 2031, the number of deaths from HIV/AIDS will exceed the number of cancer cases in Russia.

HIV/AIDS mortality trends in Russia are opposed to those observed in Western and Central Europe. There was a huge increase in mortality in some European countries, particularly in Spain, Portugal, France, Italy, and Romania, in the beginning of 1990s. However, the introduction of the new antiretroviral therapies in the mid-1990s and their subsequent wide distribution substantially decreased deaths caused by HIV/AIDS in those countries. HIV/AIDS mortality rates in the European part of the former Soviet Union began to increase at the same time as in Russia (late 1990s and early 2000s). The most unfavorable situation took place in Ukraine, followed by Russia. But the mortality rate from HIV/AIDS has been finally decreasing in Ukraine since 2011, while it continues to increase constantly in Russia. As a result, Russia maintains the highest and an ever-increasing HIV/AIDS mortality rate among all other developed countries (Figure 1).

Despite the obvious importance of this topic, we were unable to find any serious attempts to examine the demographic statistics on mortality from HIV/AIDS in Russia. This could be due to certain limitations of the vital statistics and/or to the lack of awareness of this emerging problem.



**Figure 1. Standardized death rates from HIV/AIDS in selected countries and country groups, by sex, 1991-2015**

Source: European mortality database, Rosstat.

### Data and methods

Our analysis is based on the official vital statistics on the underlying cause of death (human immunodeficiency virus [HIV] disease, B20-B24 according to ICD-10). It is important to keep in

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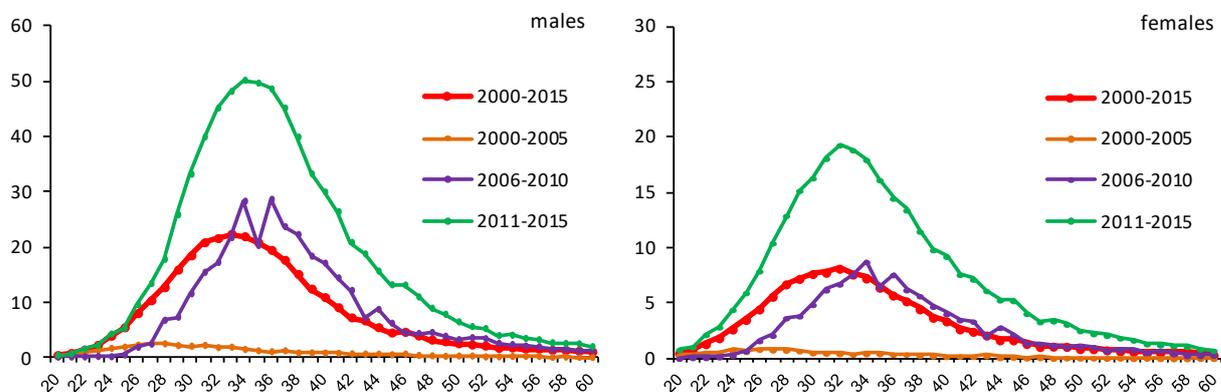
mind that HIV is not always the main cause of death among HIV-positive people, and the number of deaths from HIV/AIDS is always lower than the total number of deaths among HIV-infected population (approximately by 2.5 times in 2015 in Russia).

We analyze the trends in age and sex-specific HIV/AIDS death rates in Russia in 2000-2015, as well as cohort mortality indicators for generations born in 1955-1990. Finally, we examine the spatiotemporal patterns of HIV/AIDS mortality in Russia, applying mapping techniques and hierarchical cluster analysis to identify groups of regions with similar mortality trends.

## Preliminary results

### *Age and sex mortality patterns from HIV/AIDS in 2000-2015*

Our analysis shows that the deaths from HIV/AIDS in Russia almost entirely fall within the 20 to 59-year age range (Figure. 2). The mortality curves have bell shapes and demonstrate no signs of shifting towards older ages over time. Within the whole period, the modal age at death is 33 and 32 years for males and females, respectively. For comparison, in the United States, where the HIV/AIDS death rate has been considerably reduced, the maximum mortality falls within the age interval of 40-45 years, and it does not decrease to zero at the end of the age scale. There are no significant gender differences between the shapes of the mortality curves.



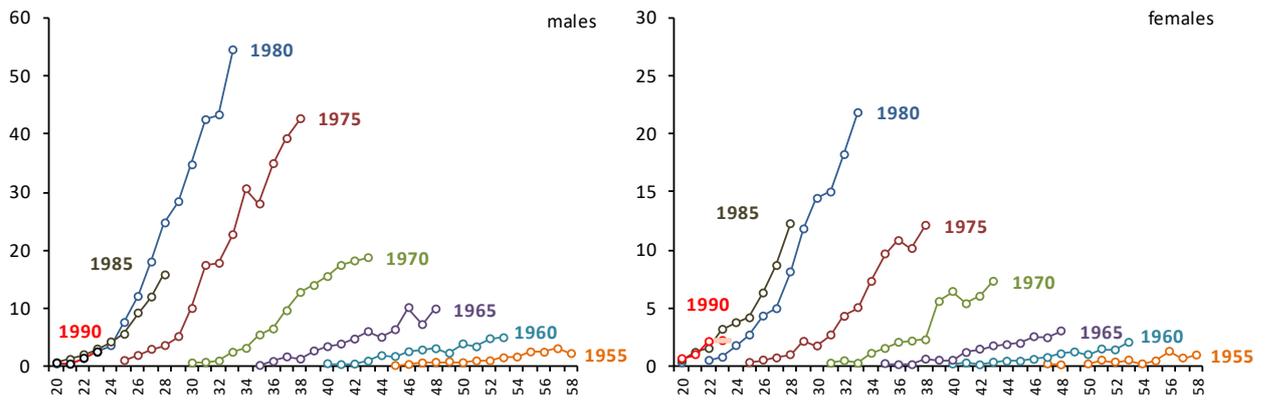
**Figure. 2. Age-and sex-specific mortality profiles for HIV/AIDS in Russia, by 5-year periods and average for 2000-2015**

Source: Rosstat, authors' calculations

Average sex ratio of the standardized death rates from HIV/AIDS was 0.34 over 2001-2015. The ratio was relatively stable up to 2008 at the level of 0.32 with the further increase from 0.31 to 0.45 up to 2015. This means that in 2008-2015, the female mortality from HIV/AIDS grew slightly faster than the level of male mortality. Indeed, SDR increased by 3.0 and 4.4 times for males and females respectively in 2008-2015.

### *HIV/AIDS mortality for cohorts born in 1955-1990*

We have computed HIV/AIDS mortality rates for generations born in 1955-1990 for the period 2000-2015. Age-specific death rates start increasing when the generations cross both the year 2000 and the age 20. Age-specific death rates in cohorts grow rapidly with age: the average annual growth rate increased from 0.2 to 0.4 with a marginal increase in the year of birth. The cohort curves have similar shapes and do not depend on the year of birth, or whether mortality began to increase at age 20 or older (Figure 3).



**Figure 3. Age-and sex-specific death rates from HIV/AIDS in Russia, by selected cohorts**  
Source: Rosstat, authors' calculations

Figure 3 shows that cohorts born in 1975 and later are mostly affected by HIV/AIDS mortality. Stabilization of the cohort probability of dying at 20-29 years of age does not mean an overall reduction in mortality. Most likely, it indicates mortality slowly shifting towards older ages.

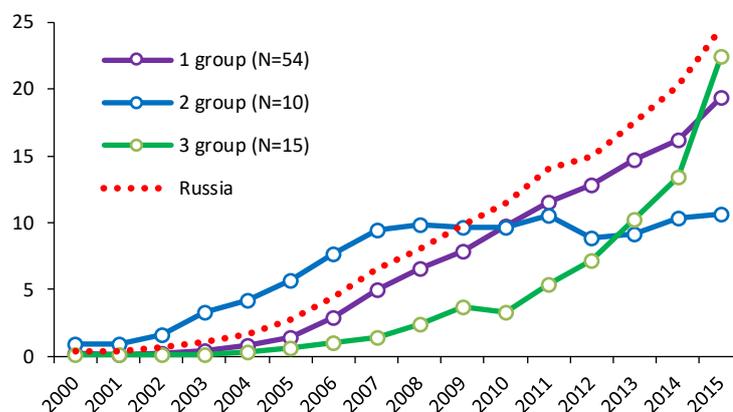
#### *Regional patterns of HIV/AIDS mortality*

The distribution of the regions of Russia by HIV/AIDS mortality rates is highly unequal, but several clusters of high mortality that have been constantly expanding over time can be defined (Figure 4):

- Middle Volga and Ural region;
- South-West Siberia;
- Baikal region.

A relatively high level of HIV/AIDS mortality is also observed in the Crimean Federal District, St. Petersburg and the Leningrad region.

Hierarchical cluster analysis of time trends in regional mortality allowed us to identify three groups of regions with similar patterns of mortality change in 2000-2015 (Fig. 4). Most of the regions (group 1) show time trends similar to those observed in Russia as a whole: a constant increase in mortality since 2000. The second group consists of regions that experienced a rapid increase in HIV/AIDS mortality in the first half of the 2000s, followed by stabilization. In the third group of regions, however, mortality began to grow only at the end of 2000s, albeit with a higher rate of increase.



**Figure 4. Average standardized mortality rates for 3 groups of regions and Russia as a whole, males, 20-59 years old, 2000-2015**

## **Discussion**

Russia faced the problem of HIV/AIDS when new methods of prevention and treatment were already known. However, as opposed to most developed countries, the situation in Russia tended towards a worst-case scenario. Unfortunately, measures that are actively introduced in Europe for preventing HIV transmission still seem to be unacceptable in Russia due to conservatism of public opinion supported by the authorities. Some of them are as follows: (1) wide promotion of individual means of protection against sexually transmitted infections; (2) needle exchange programs and opioid substitution therapy; (3) liberalization of attitudes towards homosexual contacts.

Free antiretroviral therapies and social support for those who need it seem to be approved. However, their implementation sorely lacks funding. The idea that providing medical care to patients helps to protect the healthy part of the population does not seem manifest. Therefore, the prospects to fight the HIV epidemic currently remain unclear.