Applying the Method of Extinct Generations for Estimating Old-Age Population and Mortality in Moscow

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Official mortality statistics shows obvious distortions of mortality rates at older age in Russia and especially in Moscow. Emergence of these problems is usually caused by inaccurate data on population at advanced age, which is attributable mostly to population census errors (the double-counting of the population, the overestimation of the respondents age) and the incomplete registration of migration in the intercensus periods [1, 2].

The quality of the statistical data on advanced-age mortality is unsatisfactory not only in Russia, but also in the majority of developed countries [4, 5, 6]. The correction of data on the elderly population is the conventional approach used to address this problem. For instance, the HMD bases its estimates on the extinct generation method rather than official statistical data on the size of the population aged 80+ [5, 8]. The quality of statistical data on the population size and the mortality at old ages becomes especially important with the population aging. The accuracy of these data is an issue for researchers and policy-makers in planning the healthcare and pension systems, especially important for Russia at the regional level.

Moscow is the region with the highest life expectancy in Russia and contributes significantly to regional divergence of mortality in Russia [7]. Since 2003 life expectancy at old age in Moscow has been rapidly increasing, which was followed by the large decline in death rates in the oldest age groups (over 80 years), and less expressed decline in mortality at younger ages. These changes especially noticeable among men - the age-specific mortality rates for males in Moscow lower than in Sweden for age 80-82 and older. Since 2011 life expectancy at age 80 among males in Moscow is the highest compared to the countries presented in the Human Mortality Database, that contradicts higher mortality at younger age. The inaccuracy of the data on the old-mortality in Moscow is also shown in a significant excess of female mortality over male mortality.

The aim of our study is to estimate old-age mortality in Moscow using the data of civil registration office of Moscow on the registered deaths in each year by year of birth using the extinct generation method, and compare this estimates to the results obtained with the official mortality statistics. Comparison of the number of people 1912 and earlier years of birth in Moscow according to the results of the 2002 population census in Russia and the number of deaths registered in the civil registration office of Moscow in the period 2002-2016 shows a particularly significant overestimation of the number of men, increasing with age. Using official population counts, the survival rate in Moscow for men born in 1912 was 25% for the period 2002-2016 (in Sweden in the corresponding age range - 0.25%), born in 1906 - 34%, for generations born before 1905, this value is even higher. An overestimation of the population at advanced ages is an issue for a number of regions and cities of Russia, which should be taken into account in carrying out the analysis of mortality and decision-making policy. To make this possible it is necessary to develop an approach to dealing with poor quality data, in view of the regional specifics in Russia.

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