

ANATOLY VISHNEVSKY AND HIS DEMOGRAPHIC SYSTEM
VLADIMIR SHKOLNIKOV

EXCESS MORTALITY IN RUSSIA ON HOLIDAYS
ALEXANDER NEMTSOV
ANATOLY SIMONOV
TIMUR FATTAKHOV
ROMAN GRIDIN

IS LIFE EXPECTANCY AT BIRTH REALLY THE BEST MEASURE
OF MORTALITY IN A POPULATION?
EVGENY ANDREEV

THE ANTI-ABORTION AGENDA IN THE CONSERVATIVE
DISCOURSE IN RUSSIA: IDEOLOGICAL CAMPAIGNS, LEGAL
INITIATIVES AND REGIONAL PRACTICES
ZHANNA CHERNOVA
LARISA SHPAKOVSKAYA

SEX IMBALANCES IN LONG-TERM MIGRATION FLOWS IN
RUSSIA
NIKITA MKRTCHYAN

PREMATURE MALE MORTALITY AND THE ECONOMIC WELL-
BEING OF HOUSEHOLDS
POLINA KUZNETSOVA

DEMOGRAPHIC REVIEW

• **DEMOGRAPHIC REVIEW** •

EDITORIAL OFFICE:

Editor-in-Chief
Sergei V. ZAKHAROV

Deputy Editor-in-Chief
Sergey A. TIMONIN

Deputy Editor-in-Chief
Nikita V. MKRTCHYAN

Managing Editor
Anastasia I. PYANKOVA

Proofreader
Natalia S. ZHULEVA

Design and Making-up
Kirill V. RESHETNIKOV

EDITORIAL BOARD:

Victor AGADJANIAN
Evgeny ANDREEV
Mikhail DENISSENKO
Olga GAGAUZ
Olga ISUPOVA
Sergey IVANOV
Alla IVANOVA
Irina KALABIKHINA
Mikhail KLUPY
Nikita MKRTCHYAN

Anna MIKHEEVA
Vladimir MUKOMEL
Lilia OVCHAROVA
Pavel POLIAN
Anastasia PYANKOVA
Maria SAVOSKUL
Sergey TIMONIN
Andrey TREIVISCH
Vasily VLASSOV
Sergey ZAKHAROV

INTERNATIONAL EDITORIAL COUNCIL:

Barbara ANDERSON
Nicholas EBERSTADT
Irina ELISEEVA
Pavel GRIGOREV
Michel GUILLOT
Vladimir IONTSEV
Kazuhiro KUMO
David LEON
Ella LIBANOVA
Massimo LIVI BACCI
Tamara MAKSIMOVA

Tatyana MALEVA
France MESLE
Boris MIRONOV
Svetlana NIKITINA
Tomas SOBOTKA
Sergei SCHERBOV
Vladimir SHKOLNIKOV
Vlada STANKUNIENE
Mark TOLTS
Natalia ZUBAREVICH

FOUNDED BY ANATOLY G. VISHNEVSKY (1935-2021) IN 2014.

Released quarterly. Published since 2014.

All manuscripts are obligatory peer-reviewed.

Editorial office position does not necessarily coincide with the views of the authors.

Reproduction of any materials is possible only by agreement with the editorial office.

*The journal is registered on October 13, 2016 in the Federal Service for Supervision of Communications, Information Technology, and Mass Media.
Certificate of Mass Media Registration ЭЛ № ФС77-67362.
ISSN 2409-2274*

**Editorial
address**

Bolshoy Trekhsvyatitskiy lane 3, office 303, Moscow, 109028, Russia
Phone: 8-495-772-95-90 * 11864 / *11824
www.demreview.hse.ru
demreview@hse.ru

Original papers

Anatoly Vishnevsky and his demographic system

Vladimir Shkolnikov

THE ORIGINAL ARTICLE IN RUSSIAN WAS PUBLISHED IN DEMOGRAPHIC REVIEW IN 2021, 8(1), 6-15.

<https://doi.org/10.17323/demreview.v8i1.12391>

Excess mortality in Russia on holidays

Alexander Nemtsov, Anatoly Simonov, Timur Fattakhov, Roman Gridin

THE ORIGINAL ARTICLE IN RUSSIAN WAS PUBLISHED IN DEMOGRAPHIC REVIEW IN 2021, 8(1), 16-43.

<https://doi.org/10.17323/demreview.v8i1.12392>

Is life expectancy at birth really the best measure of mortality in a population?

Evgeny Andreev

THE ORIGINAL ARTICLE IN RUSSIAN WAS PUBLISHED IN DEMOGRAPHIC REVIEW IN 2021, 8(2), 6-26.

<https://doi.org/10.17323/demreview.v8i2.12780>

The anti-abortion agenda in the conservative discourse in Russia: ideological campaigns, legal initiatives and regional practices

Zhanna Chernova, Larisa Shpakovskaya

THE ORIGINAL ARTICLE IN RUSSIAN WAS PUBLISHED IN DEMOGRAPHIC REVIEW IN 2021, 8(2), 27-50.

<https://doi.org/10.17323/demreview.v8i2.12781>

Sex imbalances in long-term migration flows in Russia

Nikita Mkrtchyan

THE ORIGINAL ARTICLE IN RUSSIAN WAS PUBLISHED IN DEMOGRAPHIC REVIEW IN 2021, 8(3), 6-19.

<https://doi.org/10.17323/demreview.v8i3.13264>

Premature male mortality and the economic well-being of households

Polina Kuznetsova

THE ORIGINAL ARTICLE IN RUSSIAN WAS PUBLISHED IN DEMOGRAPHIC REVIEW IN 2021, 8(3), 96-123.

<https://doi.org/10.17323/demreview.v8i3.13268>

ANATOLY VISHNEVSKY AND HIS DEMOGRAPHIC SYSTEM

VLADIMIR SHKOLNIKOV

The article provides an overview of the scientific achievements and creative legacy of the outstanding Russian demographer A.G. Vishnevsky (1934-2021). Vishnevsky's works have become classics, linking within the framework of an integrated demographic theory a huge number of diverse and seemingly disparate facts of demographic history and modernity. The central provisions of Vishnevsky's Demographic System, consistently developed over half a century, took their complete form only by the mid-2010s. The article emphasizes what was new in A.G. Vishnevsky's theory of demographic transition, as well as his decisive role in the institutionalization of Russian demographic science. The article is based on both the works of A.G. Vishnevsky and on the personal experience of many years of creative cooperation with their author.

Key words: *Vishnevsky's demographic system, demographic transition, demographic growth, autonomy of demographic processes.*

It is still quite hard to accept the death of Anatoly Grigorievich Vishnevsky. The tragic event, the result of a sinister virus, is perceived more as an accident than as the inevitable result of an incurable disease. Until nearly the end it seemed all would be well, that the best physicians would be found and...so on. But no. He collapsed at the very last minute, just when it seemed things were improving.

It seems strange and unfair that the crude and primitive intervention of a virus could bring to an end the work of subtle, powerful, insightful and sophisticated intellect, one not only filled with an immense stock of knowledge in various fields but endowed with artistic imagination.

I had the good fortune to work under Anatoly Grigorievich from the end of 1988 until my departure for the Max Planck Institute for Demographic Research (Germany) in April 2000. Anatoly Grigorievich did much to determine my professional fate. In 1987, he was an opponent of my Ph.D. thesis. Then he invited me to the Department of Demography of the Institute of Population Problems of the USSR Academy of Sciences, gave me the opportunity to enter real academic science, and then initiated my participation in a long-term Russian-French project. In recent years, after the formation of the International Laboratory of Population and Health at the HSE, where I work as scientific director, our interaction was renewed.

THE MAN

He was a true intellectual and a man of the world. Delicate and thoughtful, he radiated an aura of confidence and calm. He had a tremendous capacity for work and the ability to motivate others. He always spoke quietly, but in such a way that any audience would instantly grow silent, not because of his great authority, but because they feared missing something interesting.

VLADIMIR M. SHKOLNIKOV (shkolnikov@demogr.mpg.de), MAX PLANCK INSTITUTE FOR DEMOGRAPHIC RESEARCH, GERMANY. NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS, RUSSIA.

THE ORIGINAL ARTICLE IN RUSSIAN WAS PUBLISHED IN DEMOGRAPHIC REVIEW IN 2021, 8(1), 6-15.
[HTTPS://DOI.ORG/10.17323/DEMREVIEW.V8I1.12391](https://doi.org/10.17323/DEMREVIEW.V8I1.12391)

He always knew how to understand and highlight the main thing at the moment, to offer the best way out of the most difficult and unexpected situations.

A.G. Vishnevsky did not take anything for granted. Everything was subjected to calm analysis. He was a positive person who was a pleasure to talk to. At the same time, we often argued with him. He always stood his ground quite firmly.

Everything that I will now say is based only to a small extent on information received from Anatoly Grigorievich himself. Of himself and how he created his science, he spoke very little, preferring to work alone. I knew only about what we did together and what he did with other colleagues. The rest I took from his books and/or figured out myself.

WORK EVERY DAY

For many decades, A.G. Vishnevsky oversaw all the current and organizational affairs of his research teams, first in the Departments of Demography of various academic institutions, his longest stay being at the Center for Human Demography and Ecology of the Institute of Economic Research of the Russian Academy of Sciences (1993-2006), and then at the Institute of Demography of the Higher School of Economics (2007-2021). Tirelessly and energetically he worked on journal articles, supervised graduate students, communicated science to the general public, engaged in journalistic activities (newspapers, television, radio), lectured to students and undergraduates, edited the popular scientific journal "Demoscope Weekly" and then the open access scientific journal "Demographic Review", published under his editorship every year a collective compilation, the demographic report "Population of Russia", organized the publication of a number of collective monographs, participated in official events, sought funding for science, went on many business trips and much, much more.

But most mysterious and incomprehensible of all, this was still not the most important thing in the scientific and intellectual life of Anatoly Grigorievich. The main thing was his scientific and artistic books. When did he manage to write them, taking into account the colossal workload? A mystery. Perhaps early in the morning and late in the evening. Perhaps at night. On weekends. In addition, he was very efficient in scheduling his time.

Anatoly Grigorievich Vishnevsky belonged to an extremely rare and vanishing type of real gurus, theorists, thinkers and moral authorities.

CONTRIBUTION TO SCIENCE

Of course, the main contribution is all his books on demography, from "The Demographic Revolution of 1976" (Vishnevsky 1976) to "The Demographic History and Demographic Theory of 2019" (Vishnevsky 2019). It is they that constitute the main ideological and theoretical body of modern Russian demography. These books and fundamental scientific articles by A.G. Vishnevsky became classics of social science. Although his books are strictly scientific, thanks to their figurative language they were and remain inspiring reading.

A.G. Vishnevsky, together with A.G. Volkov, E.M. Andreev, L.E. Darsky and their colleagues in the Department of Demography of the Research Institute of the Central Statistical Bureau of the USSR, is primarily responsible for the revival of Russian Demography in the 1970s and 1980s. This group of professionals of the highest class returned our Demography to the world level reached in the 1920s by S.A. Novoselsky, V.V. Paevsky, M.V. Ptukh and Yu.A. Korchak-Chepurkovsky.

When A.G. Vishnevsky came to Demography, the USSR was dominated by the "Soviet complex science of population", which was heavily influenced by ideology and prone to economic determinism, to a belief in the effectiveness of targeted macro-impact on demographic processes and, moreover, to hushing up real problems, such as an increase in mortality, the archaic nature of intrafamily birth control and others that had become glaringly obvious as early as the 1960s and 1970s. Contrary to the facts, the convergence of demographic processes in the USSR with those of other countries was denied. It cannot be said that A.G. Vishnevsky purposefully "battled" with this. But he did win the battle nonetheless, simply by sticking to his guns of objectivity and evidence, relying on facts, historical experience, the achievements of world demographic science and the use of modern methods of mathematics and statistics. And in the end, it was A.G. Vishnevsky's approach that triumphed in Russian demography, and he himself was rightfully recognized by the professional community as Russia's main demographer.

Largely due to the international authority of Anatoly Grigorievich and his special ties with French demographic science, one of the leading in the world, Russian demographers and their work have had the opportunity through cooperation and joint projects to merge into world demography and take a prominent place there.

Books by A.G. Vishnevsky, his lectures and public speeches influenced the formation of many of his younger colleagues, motivated many to engage in science.

A.G. Vishnevsky influenced the intellectual life of the whole country. Particularly significant in this respect was his book "The Sickle and the Ruble" (Vishnevsky 1998; 2010), which provides the key to understanding the driving forces of Russian history and Russian society. It was also well received abroad, which was facilitated by its translation into French.

THE SCIENTIFIC METHOD AND SCIENTIFIC PREFERENCES

A.G. Vishnevsky built his demography as an integral system in which everything is logical and interconnected. This is a very classic design. In constructing it, he was highly selective, using exclusively reliable, evidentiary and intuitively transparent facts, methodological tools that reveal cause-and-effect relationships, and refusing some less reliable, although (sometimes) fashionable and often cited approaches. For example, he was lukewarm about big science based on microdata from surveys of preferences and intentions, about microsimulation models and, in general, microlevel studies that draw inferences from statistical associations.

It seems to me that he was not much interested in the numerous, useful, but not very meaningful, scientific articles in which, for example, it was shown that Swedish doctors have a higher birth rate than representatives of other types of mental work. A.G. Vishnevsky himself was

the author and co-author of numerous empirical studies, for example, in the analysis of spatial patterns of mortality or fertility, but in their results he always looked not so much for interesting facts as for the manifestation of fundamental mechanisms that set demographic processes in motion.

A.G. Vishnevsky was focused on big tasks. He did not multiply essences unnecessarily, but extracted the maximum from the generalized theory of the demographic transition, bringing more and more empirical facts and statistical connections into its orbit.

Anatoly Grigorievich never dealt with so-called agent-based Demography. This is a direction in demography based on the analysis of demographic reality from the point of view of an agent (an individual living in this reality). In Russian demography, an example of such an approach is the book by B.Ts. Uralnis "A History of One Generation" (Uralnis 1968). It is noteworthy that A.G. Vishnevsky wrote on this subject not an academic monograph, but the novel "The Biography of Pyotr Stepanovich K" (Vishnevsky 2013), which even entered the short list of nominees for the Russian Booker award.

VISHNEVSKY'S DEMOGRAPHIC SYSTEM

As is known, the theory of the demographic revolution (or demographic transition) began with the works of Adolf Landry and Warren Thomson, Alexander Kulisher and some other scholars (see (Vishnevsky, Tolts 2015)) who, even before World War II, had formulated ideas about successive regimes of population reproduction. In the second half of the 1940s it was developed by researchers of Princeton University, primarily by Frank Notestein, who focused on the transition in fertility, later explored more deeply in the so-called "Princeton Project" under the direction of Ansley Cole. This theory made it possible to understand the internal mechanisms of the geographical diversity of fertility regimes and family structure observed at that time (Coale, Watkins 1986).

In the 1970s, the demographic transition theory was strengthened with respect to the long-term evolution of mortality (A. Omran's epidemiological transition (Omran 1971)) and to the reproduction regime of the population as a whole (Chenais 1986). Finally, the transition theory's orbit came to include the last component of population change: migration. (Zelensky 1971; Coleman 2006).

In the USSR, until the 1970s the theory of demographic transition remained almost unknown, was the object of superficial criticism as another "erroneous bourgeois theory." In 1973 Vishnevsky's famous article "The Demographic Revolution" (Vishnevsky 1973) was published, and in 1976 an even more famous book under the same title was published (Vishnevsky 1976), then republished in 2005. It had a huge impact on Russian demography and social science. A.G. Vishnevsky cites in it numerous new and eloquent facts and builds new logical links that transform already known ideas about changeable reproduction regimes into a truly coherent theory. The central concept is the line of historical types of population reproduction, developed using a systematic approach to a huge variety of isolated facts and observations. The book's powerful impact on minds was the result not only of its scientific content, but also of the liveliness of the text, of a style both logical and transparent, understandable to non-specialists. In 1982,

another important book by Vishnevsky, “Population Reproduction and Society”, was published, in which a more advanced system of concepts and methods was applied to the study of global historical and demographic processes (Vishnevsky 1982), followed a year later by a collective monograph, also receiving much attention, dedicated to demographic dynamics in the USSR and Russia (Vishnevsky, Volkov 1983). Much later, the same theoretical views on the history of the Russian population would be developed in a fundamental collective monograph edited by A.G. Vishnevsky, “Demographic Modernization of Russia, 1900-2000” (Vishnevsky 2006).

A.G. Vishnevsky continued to consistently develop the theory of the demographic transition as a change in the demographic system. In his works of the 2000s-2010s, new important aspects were added. Certain elements that were only outlined in the works of the 1970s-1980s were further developed. The most complete and comprehensive presentation of the theory of the demographic transition, as Anatoly Grigorievich saw it, can be found in his latest book (lecture course), “Demographic History and Demographic Theory”, published by the HSE in 2019 based on the course for the master's program “Demography” (Vishnevsky 2019).

The demographic transition is commonly understood as a transition from a regime of high fertility and high mortality to a regime of low fertility and low mortality, caused by the modernization of traditional agrarian societies and their transformation into modern industrial ones. This paradigm not only prevailed in the works of the Princeton demographers but was also evident in the first books by A.G. Vishnevsky. The decline in mortality was seen as an important, necessary, but not sufficient factor in reducing the birth rate. In his later works, Vishnevsky departs from such an understanding by establishing a rigid causal relationship between a decrease in mortality and a decrease in fertility. In particular, he points out that the decline in mortality began before the industrial revolution, and explains how the increase in child survival affected the decline in births within families.

A.G. Vishnevsky criticizes the theory of the “second demographic transition”, popular in the 1990s, for trying to explain changes in fertility and family patterns by non-demographic determinants taken from family economics, mass psychology, and cultural norms. In his opinion, there is no need to involve additional external factors in the explanation.

A.G. Vishnevsky critically rethinks the current stages of the epidemiological transition. In particular, he disputes the now widespread concept of the “cardiovascular revolution”, viewing the latest stage in the evolution of mortality as a continuation of a longer and more fundamental upward trend in the expected age of death within each of the main classes of causes of death (Vishnevsky 2020).

A.G. Vishnevsky substantiates the significant autonomy and internal conditioning of demographic processes, which are not secondary to socio-economic changes. Thus, demography appears in his view as an independent variable. Other subsystems of society are considered external to it. The demographic transition is not seen as a consequence of socio-economic changes, but rather as their cause. The demographic transition is a much more fundamental phenomenon than any socio-economic change, as it changes the reproduction of *Homo sapiens*.

The autonomy of the demographic system A.G. Vishnevsky links with its capacity for self-regulation. In response to the impacts of the natural environment or other subsystems of society

and its institutions, the demographic system adapts and thus maintains equilibrium. Even the shock effects of wars, epidemics and economic crises lead only to temporary deviations of the equilibrium parameters.

The ability of the demographic system to remain stable and to respond to external influences is related to an appropriate feedback mechanism. This is referred to as the concept of demographic homeostasis. At the present stage, homeostasis is provided by the mechanisms of goal-setting and free choice at the level of individuals and families. This micro-level regulation is much more flexible than the old mechanism related to religious and cultural restrictions. The sum of the variety of individual decisions results in rational population-level patterns.

CONCLUSION

There is nothing more practical than a good theory.

It is the theory of demographic transition that makes it possible to understand why, for example, the total fertility rate in our country cannot be raised today to the level of 3 or even 2.5 children per woman. The maternity capital and other measures of economic stimulation of births do not lead to the declared pro-natalist goal, though they can still be useful, since they provide support to families with children.

The same theory also shapes the correct understanding of the long-term increase in mortality in Russia, which lasted a whole 40 years, from 1965 to 2005. High mortality is the heaviest burden for the Russian population. The particularly high mortality rate in the 1990s and the early 2000s led some to think that our country was somehow doomed to losses from premature mortality and lagging behind other countries, and even motivated some authors to speculate about a “reverse” epidemiological transition in Russia. On the contrary, the theory of demographic transition interprets the Russian mortality reversal as a very long, but still temporary deviation from the expected global trend. In the 1970s-2000s, the absence of mortality decline was due to reasons that are well-studied today. In the mid-2000s, Russia embarked on the path of reducing mortality as soon as it abandoned the old Soviet/post-Soviet system of “residual” health care financing and undertook its modernization, and also adopted measures, well-known and well-tested in other countries, to regulate the production and sale of alcohol, restrict smoking and educate citizens on a healthy lifestyle.

Today our country and all mankind are facing serious challenges. The rapid growth of the world population continues and results in numerous crises. Increasing migration from the poor countries of the global South to the rich countries of the North is generating social tension and change in the composition of the populations in receiving countries. Although world food production has been growing faster than the population, there is no guarantee that this will continue in the future. Some regions face a shortage of critical resources, especially fresh water. So far, no fundamental solution has been found to environmental problems, for example, the accumulation of plastic and other hazardous waste in nature. Global warming continues and the frequency of weather anomalies is increasing. How will Vishnevsky's demographic system react to all these in the future?

Unfortunately, Anatoly Grigorievich himself will not be able to see, analyze and reflect on the dimensions of his views of the world and the world population. But in general, knowing his constructive and optimistic character, one can try to predict his reaction. Probably he would say that the demographic system will react, as always, rationally, and that humankind, as before, will manage to find a way out of a challenging situation. He would say simply: "We will handle it!".

REFERENCES

- Chesnais J.-C. (1986). *La transition démographique. Etapes, formes, implications économiques*. PUF
- Coale A.J., S.C. Watkins (Eds.) (1986). *The Decline of Fertility in Europe*. Princeton: Princeton University Press.
- Coleman D. (2006). Immigration and ethnic change in low-fertility countries: A third demographic transition. *Population and Development Review*, 32(3), 401–446.
- Omran A.R. (1971). The epidemiologic transition: a theory of the epidemiology of population change. *The Milbank Memorial Fund Quarterly*, 49(4, Pt. 1), 509–538.
- Vishnevsky A.G. (1973). Demograficheskaya revolyutsiya [Demographic revolution]. *Voprosy filosofii*, 2, 53–64. (In Russ.).
- Vishnevsky A.G. (1976). *Demograficheskaya revolyutsiya* [Demographic revolution]. Moscow: Statistika. (In Russ.).
- Vishnevsky A.G. (1982). *Vosproizvodstvo naselenia i obshchestvo. Istoria, sovremennost', vzglyad v budushee* [Human reproduction and society. History, modernity and a look into the future]. Moscow: Finansy i Statistika. (In Russ.).
- Vishnevsky A.G., Volkov A.G. (Eds.) (1983). *Vosproizvodstvo naselenia SSSR* [Population reproduction in the USSR]. Moscow: Finansy i Statistika. (In Russ.).
- Vishnevsky A.G. (1998). *Serp i Rubl. Konservativnaya modernizatsia v SSSR* [Sickle and ruble. Conservative modernization in the USSR]. Moscow: OGI. (In Russ.).
- Vishnevsky A.G. (Ed.) (2006). *Demograficheskaya modernizatsia Rossii, 1900–2000*. [Demographic Modernization in Russia, 1900–2000]. Moscow: Novoe izdatelstvo. (In Russ.).
- Vishnevsky A.G. (2010). *Serp i Rubl. Konservativnaya modernizatsia v SSSR* [Sickle and ruble. Conservative modernization in the USSR]. Moscow: Izdatelskii dom VSHE. (In Russ.).
- Vishnevsky A.G. (2013). *Zhizneopisanie Petra Stepanovicha K.* [Life history of Peter Stepanovich K.]. Moscow: «Znak». (In Russ.).
- Vishnevsky A.G., Tolts M.S. (2015). Nezamechennyi vklad v teoriu demograficheskogo perekhoda (An unnoticed contribution to demographic transition theory). *Demograficheskoye obozreniye* [Demographic Review], 2(4), 6–34. (In Russ.).
- Vishnevsky A.G. (2019). *Demograficheskaya istoria i demograficheskaya teoria* [Demographic history and demographic theory]. Moscow: Izdatelskii dom VSHE. (In Russ.).
- Vishnevsky A.G. (2020). Epidemiologicheskii perekhod i ego interpretatsia [Epidemiologic transition and its interpretation]. *Demograficheskoye obozreniye* [Demographic Review], 7(3), 6–50. (In Russ.).
- Urlanis B. Ts. (1968). *Istoria odnogo pokolenia (social'no-demograficheskii ocherk)* [History of one generation (socio-demographic profile)]. Moscow: Mysl'. (In Russ.).

Zelensky W. (1971). The hypothesis of the mobility transition. *Geographical Review*, 61(2), 219-249.

EXCESS MORTALITY IN RUSSIA ON HOLIDAYS

ALEXANDER NEMTSOV, ANATOLY SIMONOV,
TIMUR FATTAKHOV, ROMAN GRIDIN

Formulation of the problem. It is known that holidays are accompanied by an increase in morbidity and mortality. The aim of this study was to summarize the experience of previous studies examining the relationship between national holidays and the time of death, as well as to analyze the Russian characteristics of mortality during holidays. The article poses the following questions: 1) Is the risk of dying on holidays increasing in Russia? 2) If so, on which ones? 3) Is this related to alcohol abuse? 4) To what extent are men and women involved? 5) What is the estimate of excess deaths on holidays?

Methods. The study used daily data on the number of deaths in Russia from all causes and from alcohol poisoning, disaggregated by sex for 2000-2017. In total, 35.4 million people died during the period under review. We studied 9 public holidays in Russia. The LOWESS moving average, calculated for non-holidays and extrapolated to holidays, was taken as zero. We took into account holidays that exceeded the LOWESS confidence interval. To estimate losses on a birthday, linear regression and its confidence interval were taken as zero. We used data from Rosstat and Google Trends to indirectly estimate legal and illegal alcohol consumption as well.

Results. Five out of nine public holidays in Russia are accompanied by an increase in the number of deaths. The greatest increase is observed in connection with the New Year on January 1-15. At this time, the number of excess deaths amounted to 113.6 thousand people over 18 years, or 6.3 thousand people per year, with a maximum on January 1 (2.0 thousand per day). This is 14.0% more deaths than on weekdays. The number of excess deaths on holidays on February 23, March 8 and May 9 amounted to 1.7 thousand per year. 80.9% of excess deaths in January are of men. The all-cause mortality and mortality from alcohol poisoning coincide with the maximum on January 1. After 2005, when the duration of the New Year holidays increased, the maximum on January 1 and the subsequent dynamics of mortality did not change. The annual maximum sales of alcoholic beverages are in December. Birthdays are also accompanied by an increase in total mortality by 9.1 thousand per year, and this is also associated with alcoholism.

Conclusion. In Russia, on holidays, mainly on New Year's and birthdays, there is a significant increase in mortality, which is mainly due to alcohol abuse and does not depend on the duration of the holidays in January. This damage can be reduced by a decrease in the availability of strong alcohol, the maximum sales of which occur in December.

Key words: holidays, birthday, mortality, excessive mortality, alcohol poisoning, Russia, men, women.

ALEXANDER V. NEMTSOV (nemtssov33@gmail.com), NATIONAL NARCOLOGY CENTER, RUSSIA.

ANATOLY N. SIMONOV (anatoly.simonov@psychiatry.ru), MENTAL HEALTH RESEARCH CENTER, RUSSIA.

TIMUR A. FATTAKHOV (timur300385@mail.ru), NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS, RUSSIA.

ROMAN V. GRIDIN (rvgridin@gmail.com), CONSUMER MARKET DEVELOPMENT CENTER, SKOLKOVO BUSINESS SCHOOL, RUSSIA.

IN THE PAPER WE USED THE RESULTS OBTAINED UNDER THE PROGRAM OF BASIC RESEARCH OF THE HIGHER SCHOOL OF ECONOMICS

THE ORIGINAL ARTICLE IN RUSSIAN WAS PUBLISHED IN DEMOGRAPHIC REVIEW IN 2021, 8(1), 16-43.
[HTTPS://DOI.ORG/10.17323/DEMREVIEW.V8I1.12392](https://doi.org/10.17323/DEMREVIEW.V8I1.12392)

INTRODUCTION

Holidays are an important time in people's lives, a way to escape from everyday life, to change its usual rhythm. In many cultures, holidays are often associated with excessive consumption of alcohol, which is believed to help people relax and have fun. Indeed, such consumption does add to the fun, but sometimes the level and pattern of consumption become not only unhealthy, but even fatal. This phenomenon has been studied more than once.

Initial studies were based on monthly indicators, which revealed a maximum increase in mortality in December and January (Kloner, Poole, Perritt 1999: 1630). However, later more detailed data became available, which drew the attention of researchers to the New Year and Christmas holidays. It was shown that during and in connection with these holidays there is an increase in deaths from external causes, such as self-harm (non-fatal deliberate self-harm) (Bergen, Hawton 2007: 855), suicide and murder (Ajdacic-Gross et al 2012: 603). Non-violent causes of death have also been studied, such as cardiovascular disease (Kloner, Poole, Perritt 1999: 1630; Phillips et al. 2004: 3781) and respiratory diseases (Milne 2005: 849). In all these cases, there was an increase in mortality on holidays. In the US, deaths due to heart disease peaked around Christmas and New Year's Day, with declines in between (Phillips et al. 2004: 3781). In contrast to the US, in the UK deaths peaked on New Year's Day, but not Christmas or Easter (Milne 2005: 849). A more detailed study in the US confirmed that the largest peak in the number of deaths per year is around Christmas. This peak is followed, at some distance, by the New Year, and then, in decreasing order, Thanksgiving Day, Independence Day, Labor Day and Memorial Day. No increase in deaths was found on Presidents' Day (Phillips, Barker, Brewer 2010: 1463).

Overeating and alcoholism, a decrease in the quality of medical care, a decrease in the sense of danger in case of illness during this period (hence a delay in the seeking of medical help), as well as morbidity due to low temperature were all named as factors for increasing mortality during the New Year and Christmas holidays. The latter should be considered a coincidence of Christmas coming in the winter season, as in New Zealand, where these holidays occur during the summer (Southern Hemisphere), there is also an increase in the number of deaths on Christmas and New Year (Knight et al. 2016: e005098). It should be noted that in the materials of Western countries, the alcohol factor appears not as the main one, but as an equal among others.

Interestingly, in Kuwait (a Muslim country), the admission of patients to a large hospital increased by 1.5 times on the second day of Uraza Bayram, one of the two main Muslim holidays in the middle of summer (Zubaid, Thalib, Suresh 2006: 191).

Mortality in connection with another common celebration (a birthday) in Russia has been discussed only in the media, more often in the form of retellings of Western sources. The first studies of this problem abroad date back to the 1970s, when the so-called "birthday effect" was noted - the statistical phenomenon of the coinciding of an increase in mortality with the birth month in England and Wales (Anderson 1975: 151). This was later confirmed by daily data from Switzerland (Bovet, Spagnoli, Sudan 1997: 151), post-Soviet Ukraine (Vaiserman et al. 2003: 221) and the USA (Ajdacic-Gross et al. 2012: 603). The birthday effect sometimes appeared only in

men (Phillips, Van Voorhees, Todd 1992: 532), but more often without gender differences (Doblhammer 1999: 1; Medenwald and Kuss 2014: e004423). In the USA, it was also shown that the birthday effect is most often observed at the age of 20-39 years (51.0%), before this age - in 31.3% of cases, and after 39 years it sharply decreases (age 90+ - 4.3 %). At the same time, the coinciding of a birthday and a day off dramatically increases the risk of dying. In total, in the United States for 13 years (1998-2011) excess deaths per birthday amounted to 4,590 cases (Peña 2015: 59) or 353 per year. It has also been pointed out that this effect may be a statistical artifact due to accounting errors (Abel, Kruger 2009: 175; Phillips, Van Voorhees, Todd 1992: 532). Alcohol abuse, birthday stress, and suicide were commonly cited as factors in increasing birthday mortality.

It is important to note that birthday suicides are of particular interest in the foreign literature. For example, for Japan, a 1.5-fold increase in the number of suicides per birthday has been shown (Motohashi 2012: 1282). In Japan, it has also been shown that among men an increase in suicides occurs 5 days before and a week after the birthday, with a maximum on the day of birth, while for women this interval was wider. At the same time, the period of increased suicide risk depended on the age and social status of the deceased (Stickley et al. 2016: 259). In Germany (Bavaria), an increase in birthday suicides has not been found (Reulbach et al. 2007: 554), in contrast to the UK (Williams et al. 2011: 13). In the latter case, it was noted that the risk of suicide is higher in people who have recently sought psychiatric help.

As can be seen, in foreign publications the problem of the increase in mortality during the holidays has been studied quite actively. In Russia, despite the high level of alcohol consumption and its severe consequences, only once has there been registered an increase in holiday-related cardiovascular and general mortality, on January 2-5 in a limited geographical area (Kemerovo) (Barabash, Altarev, Fomina 2010: 35), or an increase in murders on New Year's Eve (Zhaksymbaev 2012).

PURPOSE OF THE STUDY

The purpose of this study was to generalize the experience of previous studies examining the link between national holidays and time of death, as well as to analyze the Russian characteristics of mortality on holidays. We posed the following questions: 1) In Russia, does the risk of dying increase on holidays?; 2) If yes, on which ones?; 3) Is this related to alcohol abuse?; 4) To what extent are men and women involved in this?; and 5) What is the estimate of the excess number of deaths on holidays?

MATERIALS AND METHODS

An epidemiological retrospective non-selective study was carried out. The work was carried out in several stages, depending on the nature of the holidays and the structure of the materials. At the first stage of the study, mortality on public holidays in Russia was analyzed based on the time series of daily mortality statistics for the period 2000-2017. Data on the daily number of deaths has been available since 2000 and was obtained using a special processing of anonymous

microdata collected by Rosstat from the complete registration of deaths. For the analysis, we used time series of daily numbers of deaths from all causes of death separately for men and women (a total of 18.5 and 16.9 million deaths over the period, respectively) and from accidental alcohol poisoning, which we defined as the sum of codes X45 (accidental alcohol poisoning) and Y15 (alcohol poisoning with uncertain intentions) of the ICD-10. In Russia in recent years there has been a sharp increase in deaths from Y15. This is probably due to the erroneous coding of some of the X45 deaths as Y15 deaths. In total, 501.5 thousand deaths from Y15 were detected during the analyzed period. Deaths without dates were excluded from the study (0.041%), as were those occurring on February 29 (5 days in 2000-2017).

In this part of the work, to estimate the excess number of deaths, the annual segments of the series of daily deaths in 2000-2017 were summarized. The series ($n=365$) included 7 major holidays in Russia: New Year (January 1), Orthodox Christmas (January 7), Old New Year (January 14), Defender of the Fatherland Day (February 23), International Women's Day (March 8), Spring and Labor Day (May 1), Victory Day (May 9), Russia Day (June 12) and National Unity Day (December 12).

Since the increase in the number of deaths on holidays lasted 2 or more days, the total number of days of increased mortality was 22 days. For two official holidays (Russia Day and National Unity Day), no increase in the number of deaths was found, hence for the study they were considered as weekdays.

At the first stage, from the daily indicators of total mortality and alcohol poisoning in 2000-2017, after summation ($n=365$), 2 rows were distinguished: deaths on holidays and deaths on weekdays, with the exception of holidays and artifacts of “the first and last of the month”. For mortality on weekdays, a trend was built, which was then extrapolated to holidays.

The weekday trend was described using the LOWESS method (LOcally WEighted Scatterplot Smoother) or locally weighted polynomial regression (Cleveland, Devlin 1988: 596). The accuracy of fitting the trend line to the observed data (fitting) was controlled using the smoothing parameter (bandwidth). A 95% confidence interval was constructed for the LOWESS trend. Additional mortality on holidays was defined as the difference between actually observed daily mortality and everyday mortality extrapolated to holidays on these days. Only those holidays that exceeded the confidence interval were taken into account.

Since the weekday trend line had gaps on the holidays of the month, these gaps had to be filled in. To fill in the missing points of the trend line and calculations, linear interpolation was used, connecting by a straight line the extreme points of the missing series.

The total mortality series had 11 primary recording defects from February to December (see discussion of results): a peak on the first day of the month and a minimum the day before. Sometimes these peaks extended to two days - a total of 35 days that were excluded from the number of weekdays (9.2% of deaths of the total), including the May 1 holiday. The gaps were filled in the same way as the holiday gaps. The minimum total mortality on December 31 did not fall outside the 95% confidence interval, and the series of deaths from accidental alcohol poisoning did not have such defects.

The second stage is the study of mortality in connection with a birthday. Those who died on January 1 were tentatively excluded, since the day of death of some of them was erroneously registered on that day. The following algorithm was used to analyze birthday mortality. The days of death and birth of each deceased were numbered according to the numbers of the days in the year (from 1 to 365/366). Next, the number of the day of death was subtracted from the number of the birthday. If the numbers of the day of birth (DR) and death (DS) coincided, the difference was equal to zero. If the difference between the number of the DR and DS fell within the interval of ± 182 , the differences retained the corresponding values with a + or - sign. If the difference went beyond ± 182 days, then an additional calculation was performed using the formula $365(366) - DS + DR$. As a result, the distribution of DS of all the deceased relative to their DR was obtained on a scale of ± 182 days.

The third stage is the study of alcohol consumption, both legal and illegal, using official Rosstat statistics on alcohol sales¹. An indirect indicator of illegal alcohol consumption was Internet searches for moonshine and vodka, obtained using the public tool Google Trends². This algorithm allows you to select a country, region, and arbitrary period of time since 2004 (days, months, years) and set a search query in the form of a word or a combination of words. In response, Google Trends returns results as a number series. The Google Trends algorithm automatically calculates the proportion of search queries from all queries on the Internet and thus normalizes queries over time and makes them independent of changes in the number of connections in a given period. Next, Google Trends determines the maximum number of search queries in the selected period and takes it for 100%; the remaining points of this period are automatically recalculated as a percentage of the maximum.

The following words and phrases were used as search queries: “moonshine” and “vodka” + “buy vodka”. The answer to the word “moonshine” includes all phrases with this word (for example, “moonshine still” and “moonshine recipe”). For this study, data were reported monthly or daily from January 2004 to February 2020.

RESULTS

A. Total mortality

Daily summaries of all deaths in 2000-2017 are shown in Figure 1.

The main trend in mortality is a progradient decrease in deaths by September and a return growth by December. This trend is complemented by irregular monthly fluctuations with maximum values in summer. Figure 1 also shows a number of regular peaks that occur on the first day of each month from February to December. Each such maximum is preceded by a minimum on the last day of the month. This is probably an artifact due to the arbitrary registration of some deaths occurring on the last day of the month as having occurred on the first day of the next month. It cannot be ruled out that the change in accounting occurs not in 2, but in 3 or 4 days. An equally

¹ URL: <https://www.fedstat.ru/indicator/57614>

² URL: <https://trends.google.com>

significant decrease in deaths was not observed on December 31 (Figure 1). It should be noted that the peaks in the first days of the months in the last 3 years are less pronounced (2015-2017). A similar phenomenon, but on a weekly basis, was observed in the USA and noted in a 1999 paper (Phillips, Christenfeld, Ryan 1999: 93). In the publications of D. Phillips and co-authors in 2004 and 2010, who worked on similar topics and with similar tasks, this was not noted (Phillips, Barker, Brewer 2010: 1463; Phillips et al. 2004: 3781). In addition to the peaks of such a technical property, Figure 1 shows peaks corresponding to January 1, February 23, March 8 and May 9. One can see additional peaks on January 7, 14 and 20, which are superimposed on the “tail” of the January 1 peak, as well as that the peak on May 1 differs in duration from other maxima in the first days of the month.

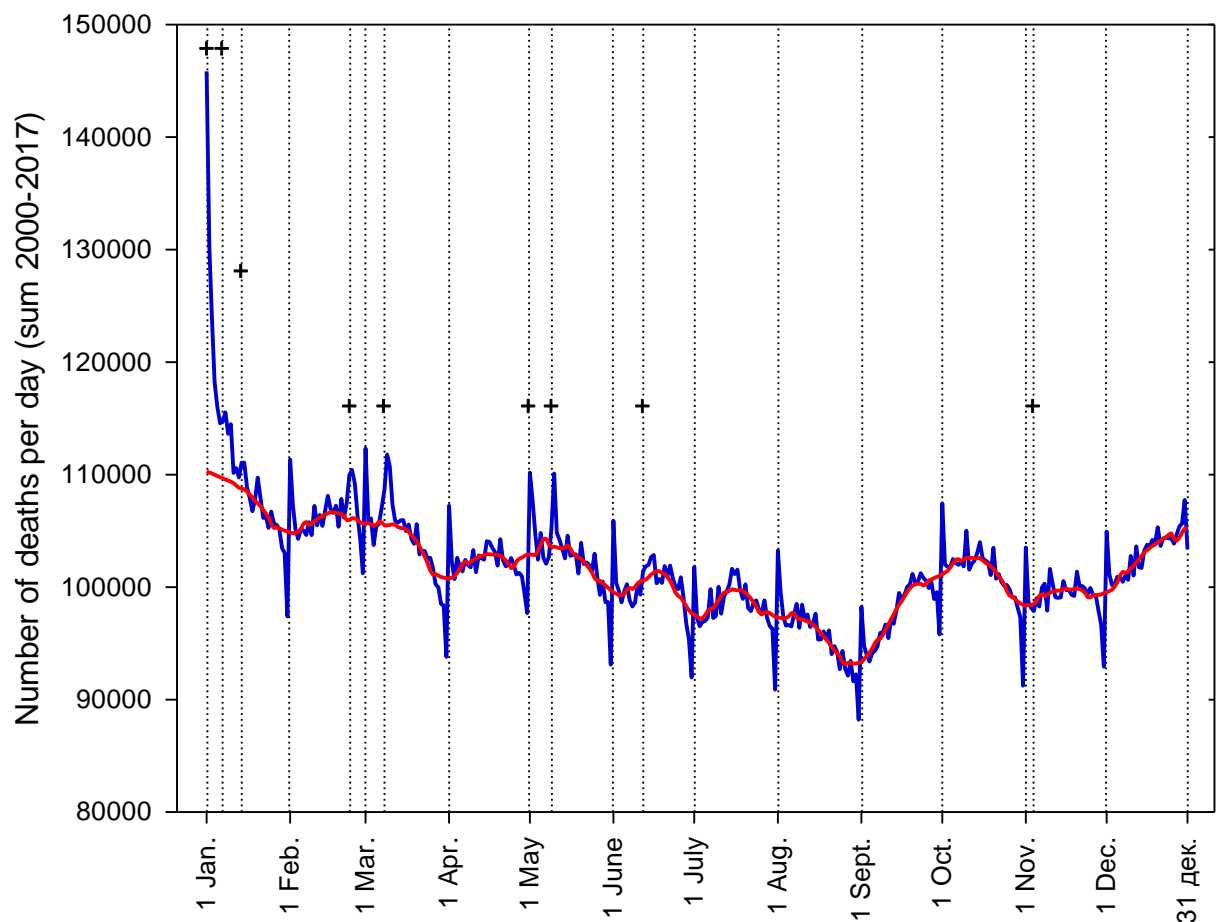


Figure 1. Distribution of the total number of deaths during the year for the period 2000-2017 in Russia

The red line is the LOWESS floating average for non-holidays, extrapolated to public holidays. The vertical dotted line is the first days of months and days of holidays; the crosses indicate, in order: January 1, 7 and 14, February 23, March 8, May 1 and 9, June 12 and November 4.

Source: Authors' calculations.

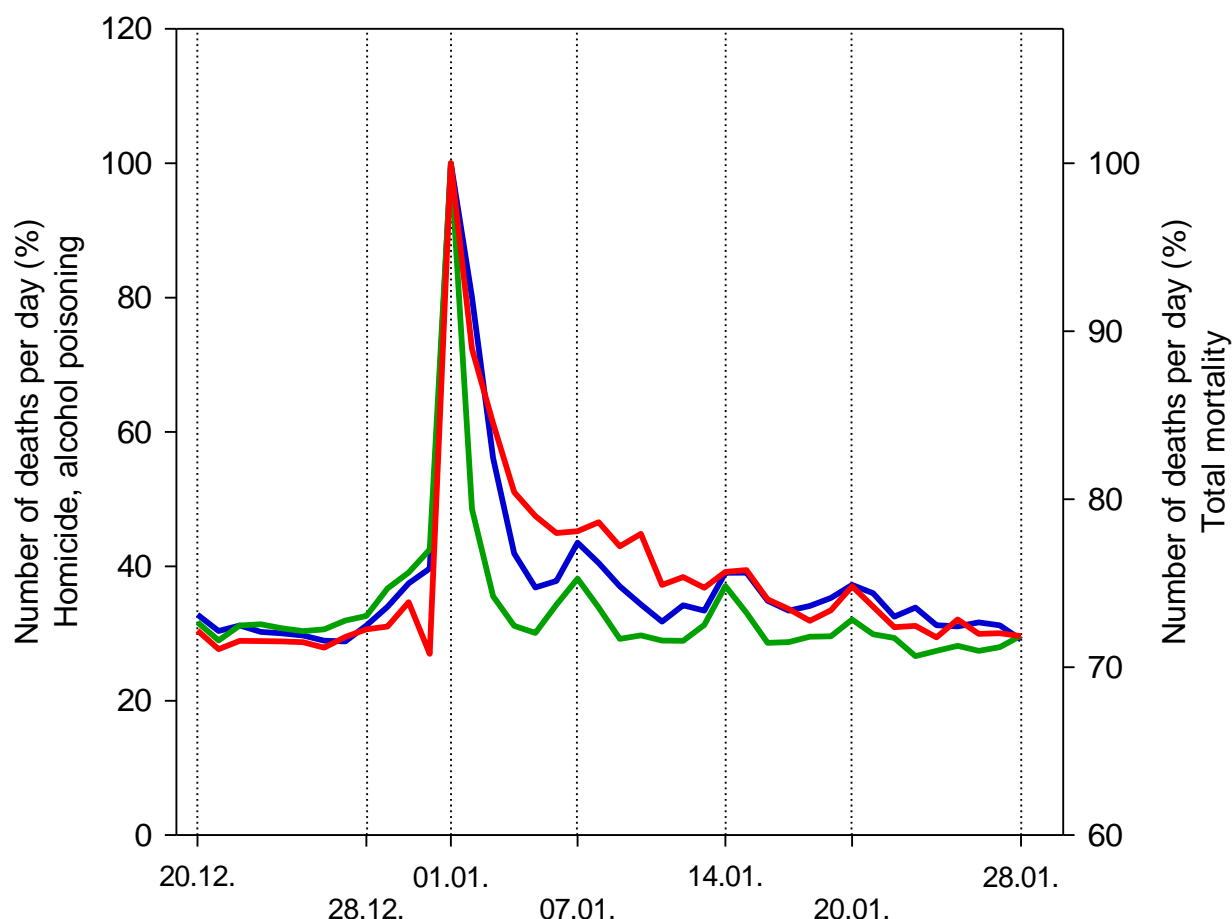


Figure 2. The ratio of the daily number of deaths from December 20 to January 28 to the maximum level recorded on January 1 (January 1 = 100%; indicators are averaged; 2000-2017).

The red line is the ratio of the daily total number of deaths to the maximum level recorded on January 1 (right axis), the blue line is deaths due to alcohol poisoning, the green line is homicides (left axis).

Source: Authors' calculations; murders - (Nemtsov 2019: 31).

The peak on January 1 is the largest among all peaks during the holidays (Figure 1). To calculate the additional number of deaths due to the New Year and other January holidays, days were selected that exceeded the confidence intervals of the floating average LOWESS for non-holiday days (gray line in Figure 1). To estimate the period of additional mortality on holidays, 2 options could be chosen: to consider as the end of the holiday increase in deaths the day when the mortality curve crosses either the 0.95 confidence interval or the LOWESS line. The first, more stringent method was chosen, in accordance with which losses from 1 to 14 were taken into account with the exception of January 10-13. In the second case, excess losses would have to be calculated until January 17, without exceptions on January 10-13. The dynamics of the number of deaths in January is shown in Figure 2; an estimate of additional excess deaths is in Table 1.

In November-December, the number of deaths generally increases, with some slowdown after December 20 (Figures 1, 2) and an increase after December 28. The decrease of 106 deaths on December 31 is within the LOWESS confidence interval. A significant increase in the number

of deaths was observed from 1 to 10 and 14-15 January and corresponds to the holidays of the New Year, Christmas and the Old New Year. The additional peak on January 20 following the feast of the Epiphany/Blessing of the Water on January 19 was insignificant.

Table 1. Estimated excess deaths due to holidays in January, 2000-2017 (missing January 11-13 - insignificant increase)

| Date | Number of deaths on the holidays | | | | | | | | | | | |
|--|----------------------------------|-------|-------|------|------|------|------|------|------|------|------|------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 14 | 15 |
| Sum of losses on individual days (persons) | 35558 | 20153 | 13833 | 8208 | 6172 | 4789 | 5068 | 5957 | 4155 | 5102 | 2285 | 2360 |
| Total | 113 640 | | | | | | | | | | | |
| Sum of losses on individual days (%) | 31.3 | 17.7 | 12.2 | 7.2 | 5.4 | 4.2 | 4.5 | 5.2 | 3.7 | 4.5 | 2.0 | 2.1 |

In 2000-2017 the number of excess deaths during the January holidays came to 113.6 thousand people (Table 1), or 6.3 thousand on average for the January holidays, with a maximum of 2 thousand people on January 1. This result should be considered more accurate than what was obtained previously based on monthly indicators (Nemtsov 2017b). The number of deaths on holidays is on average 14.0% more than on weekdays (mortality on weekdays was calculated on the basis of the floating average).

Excess losses in January varied from year to year and generally decreased as alcohol consumption decreased. Thus, in 2003, at the height of the last peak of mortality and consumption, an additional 17,827 deaths occurred, and in 2005, against the background of a decrease in these indicators – 8,513. However, the peak on January 1 remains unchanged throughout the study (Figure 3), amounting to 120- 130% of the December average. After 2012-2013 the decrease in mortality after the peak on January 1 became more gradual, reaching the December level only at the end of January. In some years this phenomenon was expressed especially sharply (Figure 3), but this did not affect the overall assessment of losses - this new phenomenon up to 2017 inclusive was reflected in the average values. Along the way, it is worth paying attention to how the peak of February 1 has grown in recent years.

The remaining 6 holidays, marked with crosses in Figure 1, were analyzed in the same way as in the case of the January holidays. However, the May 1 holiday fell out of the total mortality calculations due to accounting errors in the first days of the month. On the holidays of June 4 and November 12, no increase in mortality was found (Figure 1). Significant results are presented in Table 2.

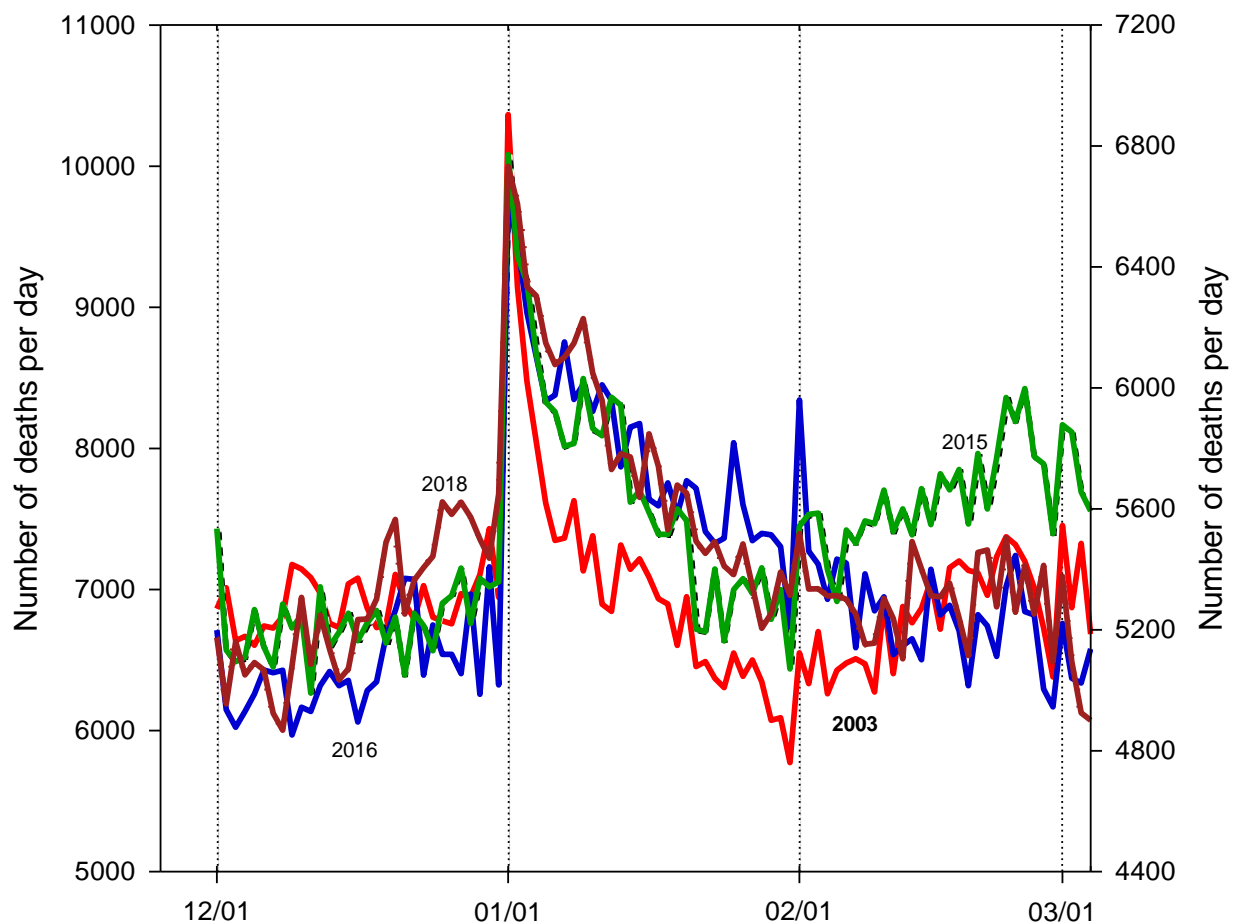


Figure 3. Dynamics of the number of deaths in Russia in different years from December 1 to March 1

Highs January 1, 2015, 2016, 2018 (green, blue and brown lines - axis on the right) are adjusted to the 2003 maximum (red line - axis on the left).

Source: Authors' calculations.

Table 2. Estimated excess deaths due to holidays in February, March and May (total for 2000-2017)

| Indicator | Days and months of holidays | | | | | | |
|-------------------------------------|-----------------------------|------|-------|-------|------|------|------|
| | February | | March | | | May | |
| | 23 | 24 | 8 | 9 | 10 | 9 | 10 |
| Number of excess deaths on holidays | 4004 | 4275 | 3168 | 6306 | 5211 | 1691 | 6502 |
| Monthly sum | 8279 | | | 14685 | | 8193 | |
| Total | | | | 31157 | | | |

As can be seen, the largest number of losses is associated with the March 8 holiday, and the total losses of the three holidays are 3.5 times less than in January. Thus, the total number of excess deaths due to holidays in 2000-2017 came to 144,797 or 8,044 per year (table 1 and 2).

B. Deaths due to alcohol poisoning

In 2000-2017 deaths from alcohol poisoning accounted for 1.42% of the total number of deaths. Both overall mortality and deaths due to alcohol poisoning are characterized by a decrease in the summer months with a minimum in early August (Figure 4). After that, return growth begins by

December. In addition, the figure reveals monthly fluctuations with a maximum in the middle of the month, which are more distinct compared to total mortality (Figures 4 and 1). It is noteworthy that the peaks of the end and beginning of the month are absent.

Figure 4 shows peaks on holidays: January 1, 7 and 14, February 28, March 8, May 1 and 9 turned out to be significant. Holiday peaks are more pronounced compared to total mortality (Figure 1); they correspond exactly to the peaks of total mortality but are shorter than the latter (Figure 2). The number of fatal poisonings on holidays is 41.5% more than on weekdays.

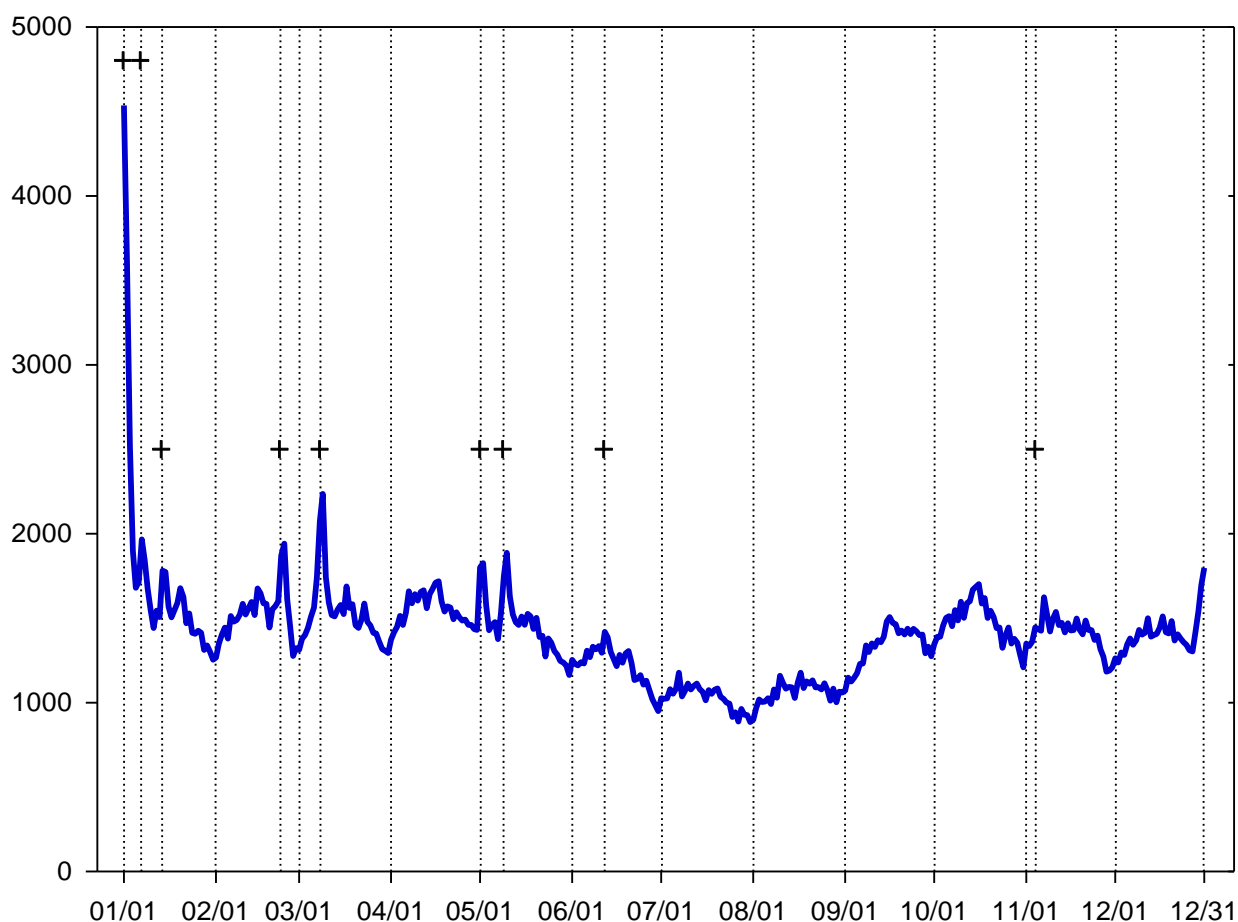


Figure 4. Distribution of the daily number of deaths during the year due to alcohol poisoning for the period 2000-2017 in Russia

The crosses indicate, in order: January 1, 7 and 14, February 23, March 8, May 1 and 9, June 12 and November 4.

Source: Authors' calculations.

The growth of poisonings begins on December 28, as does that of murders. Probably, the increase in overall mortality, distorted by the December 31 artifact, begins in the same way (Figure 2). During the January holidays, the proportion of deaths due to alcohol poisoning in the total mortality more than doubles (from 1.42 to 3.53%). The additional number of deaths due to alcohol poisoning in total in 2000-2017 is presented in Table 3 and comes to 14,682.

Table 3 Estimated excess deaths due to alcohol poisoning on holidays, 2000-2017; skipping January 10-13 – a slight increase

| Month | January | | | | | | | | | | | |
|-------------------------|----------|------|-------|------|-------|------|------|------|------|-----|-----|--|
| Dates | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 14 | 15 | |
| Number of excess deaths | 3236 | 2290 | 1207 | 577 | 349 | 379 | 622 | 490 | 315 | 393 | 380 | |
| Total | 10 238 | | | | | | | | | | | |
| % | 31.6 | 22.4 | 11.8 | 5.6 | 3.4 | 3.7 | 6.1 | 4.7 | 3.1 | 3.8 | 3.7 | |
| Month | February | | March | | May | | | | | | | |
| Dates | 23 | 24 | 8 | 9 | 1 | 2 | 9 | 10 | 11 | | | |
| Number of excess deaths | 381 | 452 | 590 | 755 | 457 | 485 | 434 | 573 | 317 | | | |
| Total | 833 | | 1345 | | 2 266 | | | | | | | |
| Amount | 4 444 | | | | | | | | | | | |
| % | 45.7 | 54.3 | 35.9 | 64.1 | 20.2 | 21.4 | 19.2 | 25.3 | 14.0 | | | |

Of interest is the ratio of total excess deaths to those from alcohol poisonings (Table 4). This ratio makes it possible to roughly estimate the excess total mortality on May 1, which could not be determined directly due to an accounting defect. Excess total mortality is on average 9.6 times greater than poisonings. It can be assumed that the losses on May 1 came to $942 \times 9.6 = 9,043$. This value, together with the total excess deaths on other holidays, will be 5.9%, which is close to the share of poisonings in their total amount (6.4%). From this we can make the assumption that total mortality for the May 1 holidays in 2000-2017 came to about 9 thousand deaths.

Table 4. The ratio of excess total mortality and alcohol poisonings on holidays

| Holidays | Excess deaths | | % of alcohol poisonings to their total | Ratio of total to alcohol poisonings |
|-------------|------------------------|--------|--|--------------------------------------|
| | From alcohol poisoning | Total | | |
| 1 January | 10238 | 113640 | 69.7 | 11.1 |
| 23 February | 830 | 8279 | 5.7 | 10.0 |
| 8 March | 1345 | 14685 | 9.2 | 10.9 |
| 1 May | 942 | - | 6.4 | - |
| 9 May | 1324 | 8193 | 9.0 | 6.2 |
| Average | | | | 9.6 |

C. DEATHS OF MEN AND WOMEN

Averaged data on the deaths of men and women separately in 2000-2017 are shown in Figure 5.

The main feature of the trend in women's deaths is a decrease by the middle of the year with a minimum in August-September, while for men this feature is less pronounced - they die more evenly throughout the year. From February to July, the average number of deaths for men fell by 3.2% and for women by 12.2%. Accordingly, in July the proportion of male deaths increased from 50.8% to 53.2%.

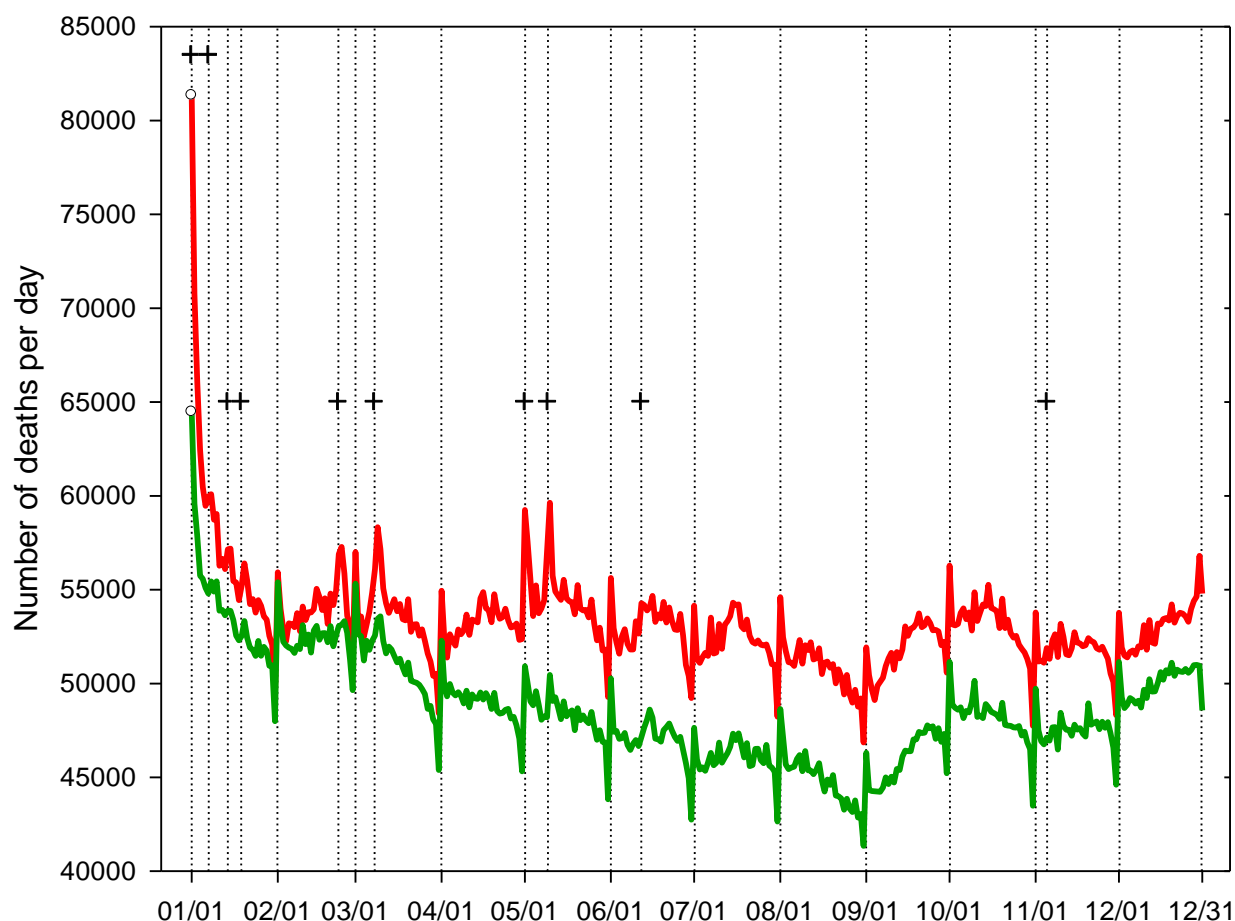


Figure 5. Distribution of the daily number of deaths of men (red line) and women (green line) during the year for the period 2000-2017 in Russia

Men are the red line, women the blue line. The circles indicate the maximums on January 1, the crosses indicate state and national holidays.

Source: Authors' calculations.

The artifacts of the last and first days of the month are expressed in the same way, with the exception of April 30 and December 31: there was no decrease in men.

The maximum number of deaths on January 1, among both men and women, is fairly high, but on this day, in absolute terms, 26.2% more men died than women (assuming that the total number of women in Russia in 2000-2016 was 10% more, the relative indicator differs even more); peaks on other holidays for women are either much smaller or non-existent. A detailed analysis of mortality in January showed that the New Year's increase in male deaths stretches until January 24 and comes to 6,554 deaths. For women, the increase in deaths ends on January 11 at 1,550 deaths. Excess losses of men in January came to 80.9% of the total. The combined excess deaths of men and women (8.1 thousand) is greater than overall excess mortality (8.0 thousand), which is most likely due to a more detailed determination of the duration of the loss period when assessing gender differences.

D. DURATION OF HOLIDAYS AS A FACTOR IN THE INCREASE IN MORTALITY IN JANUARY

One often cited behavioral factor for the increase in mortality in January is the long duration, up to 11 days, of the New Year and Christmas holidays, which combine New Year, Christmas and Old New Year. The increase in the duration of the January holidays began on January 1, 2005 (FZ-201 2004). Before this time, the New Year and Christmas holidays were separated by two or three working days and in total amounted to 4-5 days. It is possible to determine the effect of the duration of the holidays by comparing 2 five-year periods, before and after the approval of the Law (FZ-201 2004) (Figure 6).

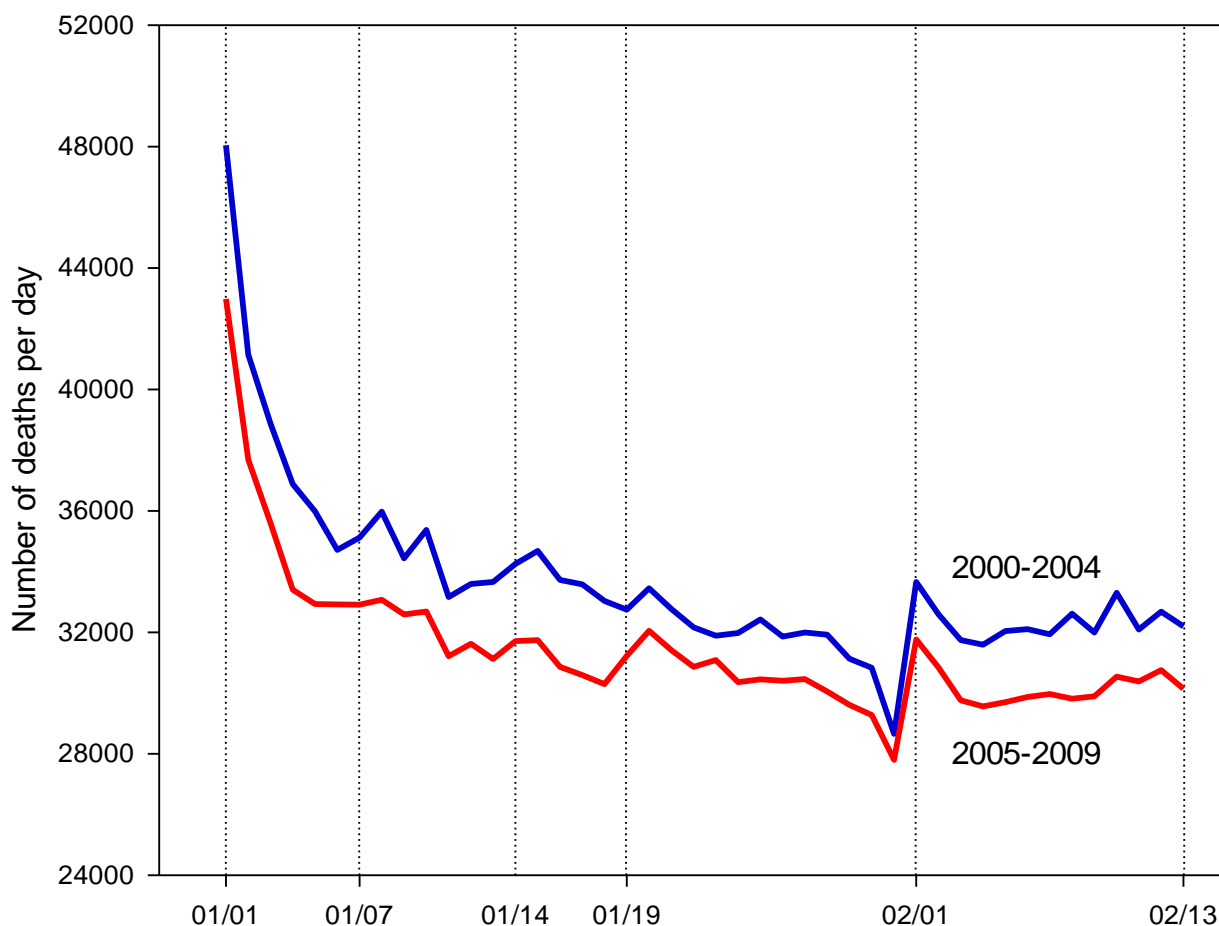


Figure 6. Distribution of deaths between January 1 and February 13 in 2000-2004 and 2005-2009

Blue line - 2000-2004, red line - 2005-2009. Vertical dotted line - state and national holidays, as well as February 1 and 13.

Source: Authors' calculations.

As can be seen in Figure 6, the distribution of deaths by years varies quantitatively: in 2000-2004 there were more deaths. This is due to the fact that during this period there was an increase in mortality, and in 2005-2009, a decrease. However, the form of distribution in 2005-2009 practically duplicates the distribution of 2000-2004. It should be noted that in 2004-2009 not

only the distribution of holidays is duplicated, but also the artifact of the beginning and end of the month (January 31-February 1).

E. ALCOHOL CONSUMPTION

In order to estimate excess deaths during the January holidays, it is important to investigate the nature of alcohol consumption in connection with the holiday. However, only legal sales, which make up the majority of consumption (about 70%)³, are available for analysis. The distribution of monthly sales of the main alcohol drinks (vodka and wine products) since January 2017 is shown in Figure 7.

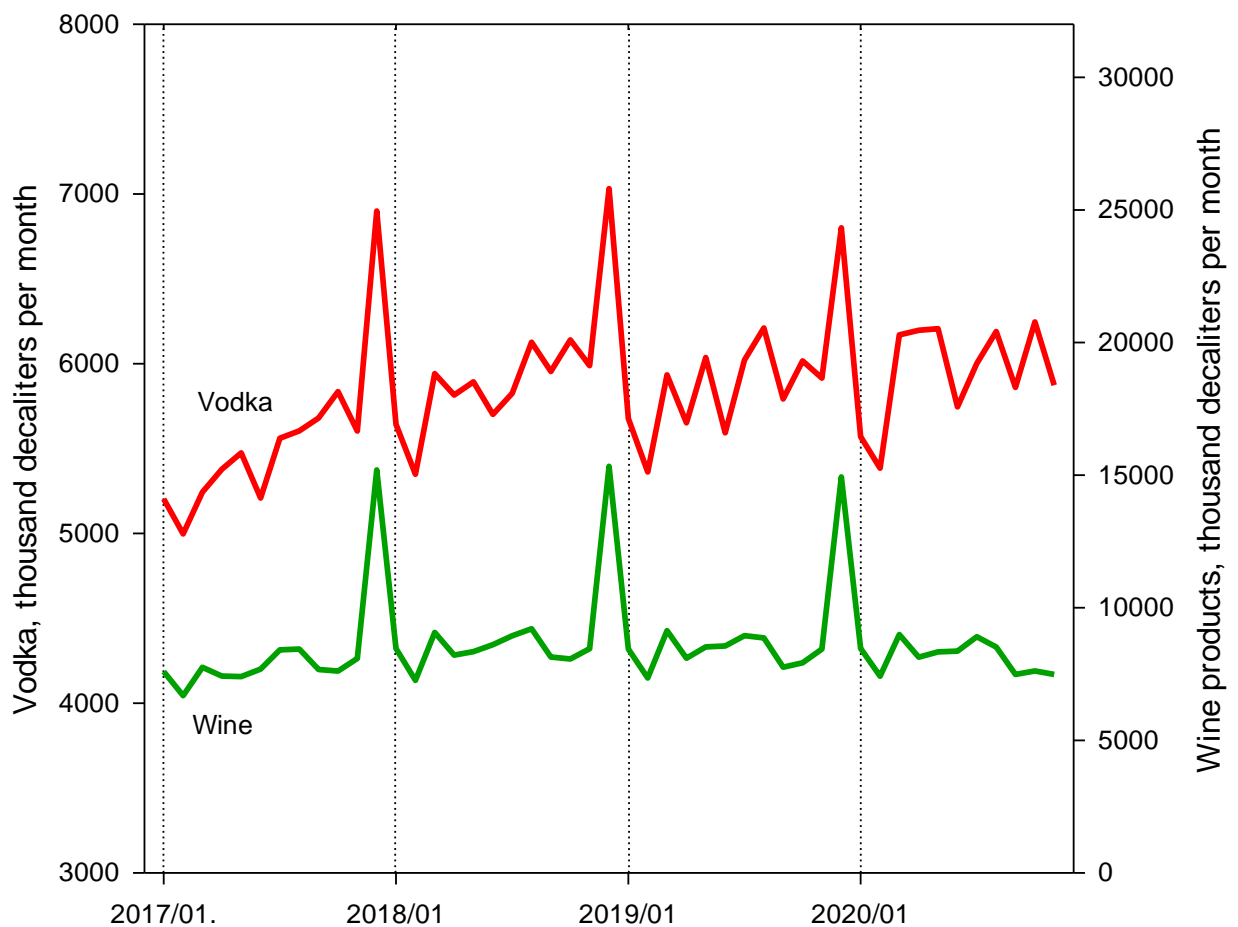


Figure 7. Distribution of sales of vodka and wine products (wine) by months from January 2017 to November 2020, thousand decaliters per month

Source: Rosstat RF data, authors' calculations.

Earlier data are not quite suitable for analysis, due to a change in the classification of wine products and the introduction of the EGAIS (Unified State Automated Information System), covering an increasing number of territories and thereby increasing the accuracy of sales

³ Ministry of Health of the Russian Federation. Order No. 575 dated July 30, 2019 "On approval of the methodology for assessing the average per capita alcohol consumption in the Russian Federation". Appendix to the order.

accounting. However, Figure 7 shows that both before 2017 and after, the annual sales peak occurs in December of each year.

An idea of the sales of illegal alcoholic beverages can be obtained indirectly based on the popularity of Internet requests for the delivery of alcoholic beverages (Figure 8).

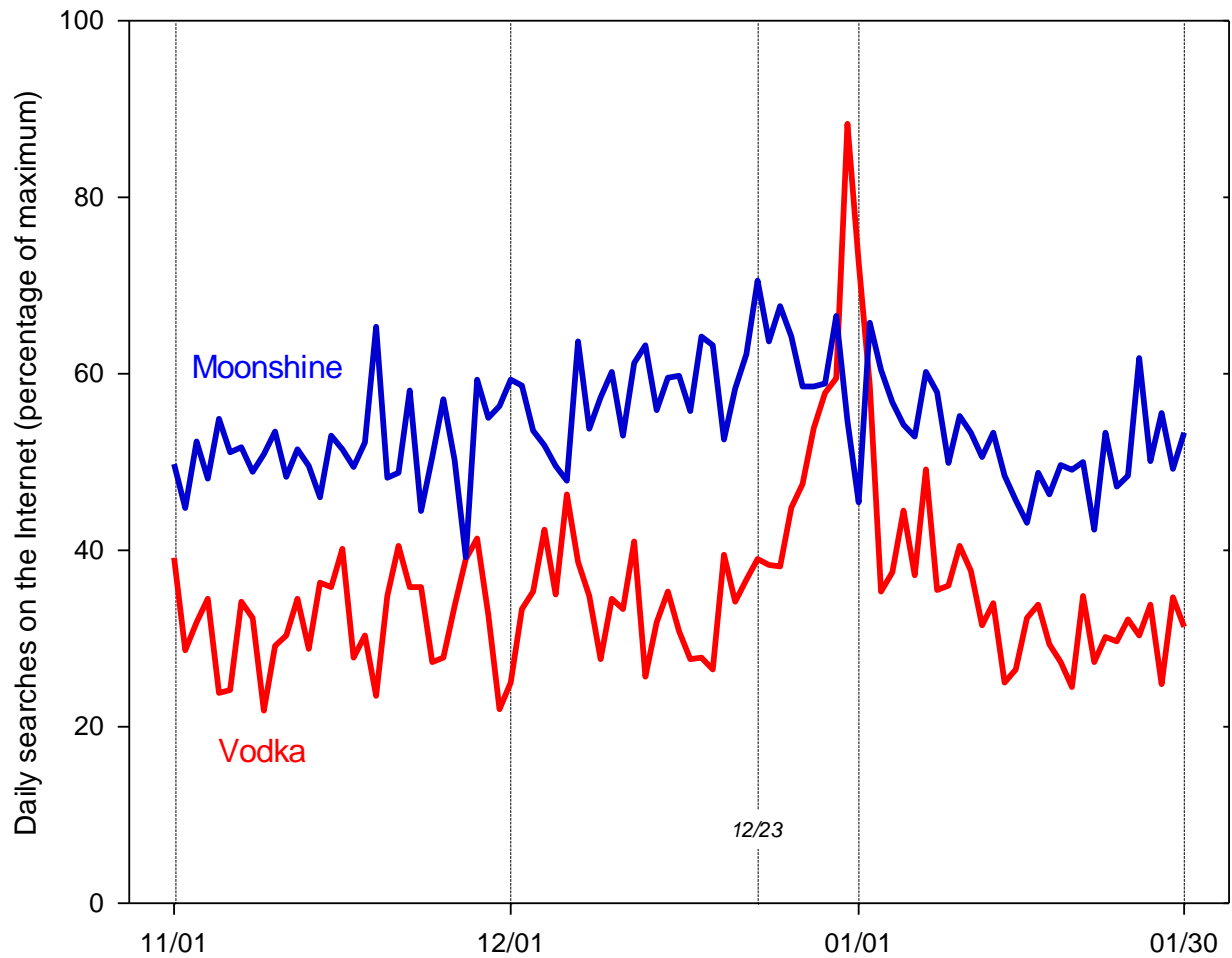


Figure 8. The ratio of the number of daily searches on the Internet for the phrase "vodka" + "buy vodka" (vodka) and "moonshine" from November 1 to January 30 (average value for 2007-2020), to the maximum

Source: Google Trends data of the Federal State Statistics Service of the Russian Federation, authors' calculations.

Searches for moonshine increase from May to December with a maximum on December 23, after which a decrease in the number of searches begins, especially sharp on January 1. Searches for vodka remains fairly even, with slight fluctuations from February to December 23, after which they begin to rise sharply, with a maximum on December 31 and then an even sharper decline on January 1-2.

F. BIRTHDAY DEATHS

The popularity of birthday celebrations is comparable to that of New Year's. However, unlike the New Year and other holidays, birthdays are dispersed throughout the year, which required a different method for identifying mortality associated with it: combining birthdays with 182 days before and after it (Figure 9).

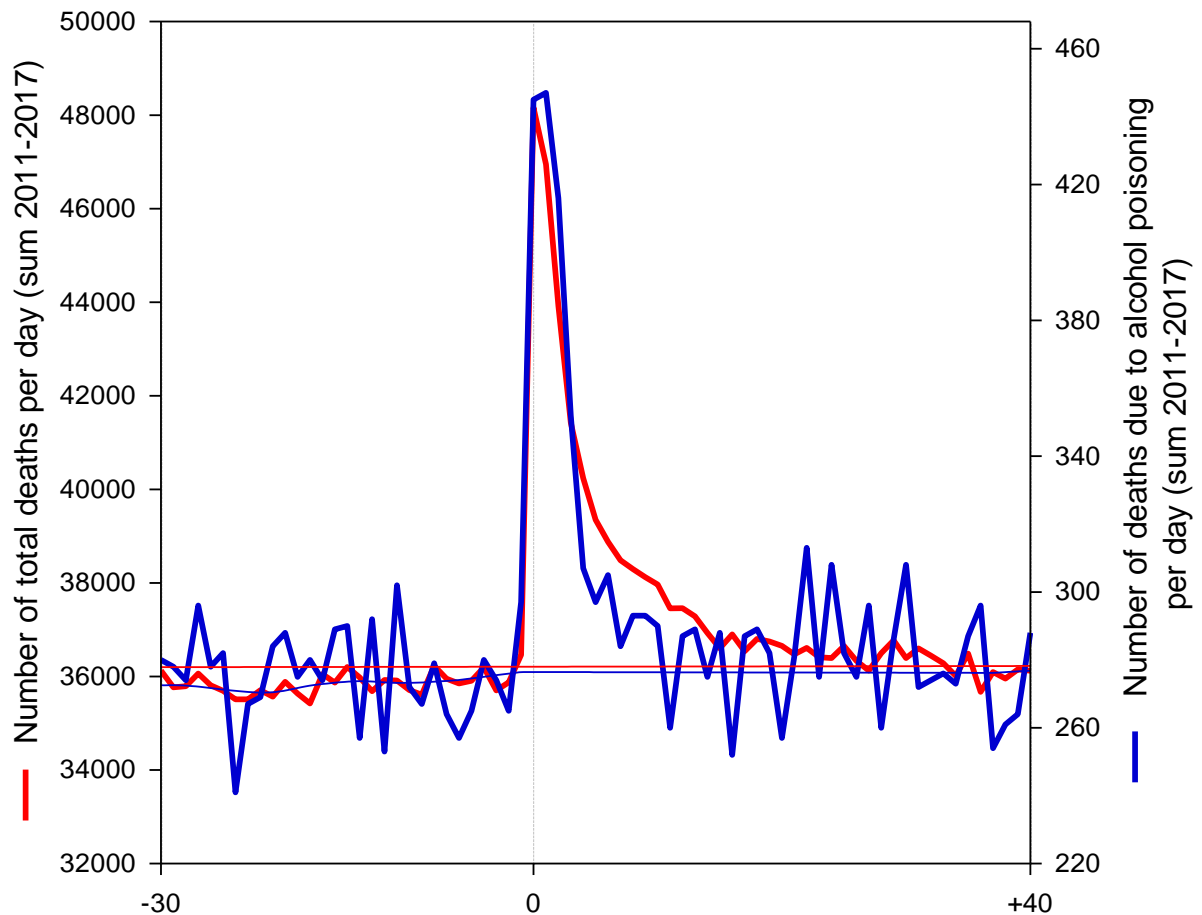


Figure 9. Distribution of the total number of deaths (red line - axis on the left) and alcohol poisoning (blue line - axis on the right) 30 days before and 40 days after a birthday

Horizontal lines are regressions of days outside a birthday: red line - total mortality, blue line - alcohol poisonings.

Source: Authors' calculations.

Figure 9 shows that in connection with a birthday there is a sharp increase in the number of deaths with a maximum on the birthday and a gradual decrease in mortality over 4 days for poisoning and 22 days for total mortality (the day of crossing the regression confidence interval for non-holiday days).

Table 5. Estimate of excess deaths linked to a birthday in 2011-2019

| Mortality | Average number of days | Average value per year | Total over 7 years | Minimum | Maximum |
|------------------------|------------------------|------------------------|--------------------|---------|---------|
| Total | 22 | 8.665.1 | 77.986 | 851 | 12.867 |
| From alcohol poisoning | 4 | 82.0 | 738 | 36 | 237 |

Over a period of 9 years (2011-2019), the excess number of deaths was 78.0 thousand, for alcohol poisoning - 0.7 thousand (Table 5; an average of 8.7 and 0.08 thousand per year, respectively). The ratio of total mortality losses and poisonings in the case of birthdays is described as 106:1, while this ratio for the January holidays is 11:1, with similar overall mortality for the two (8 and 9 thousand).

DISCUSSION OF RESULTS

An uneven distribution of deaths during the year, with a maximum in January, or more precisely, on the New Year and Christmas holidays, has been shown repeatedly. Judging by the number of deaths, it can be considered that in countries of Christian culture, Christmas and/or New Year are the main holidays of the year. To such countries now can be added Russia, where the maximum number of deaths during each year occurs on January 1 (Figure 1). An excess number of deaths due to the January holidays persists on average until January 15 (Table 1, Figure 2): for men until January 22 and for women until January 11. Over the 18 years from 2000 to 2017, an additional 113.6 thousand people died during this period of time (Table 1), or 6.3 thousand per year on average, of which 2 thousand deaths occurred on January 1. The maximum of excess deaths during the January holidays was observed in 2003 at the maximum of total mortality, when excess deaths in January amounted to 17.8 thousand people. In the following years, along with a decrease in overall mortality and alcohol consumption, there was a decrease in the January 1 peak; however, after 2012-2013 the decline in mortality has been flattening since January 2 (Figure 3), thus increasing the excess losses. This is likely due to the inclusion of new pathology categories and/or new age groups, which remains to be explored.

Adding January losses to losses on other holidays, we get total excess holiday losses in 2000-2017 of 144.8 thousand people, or 8.0 thousand deaths per year.

Is the death of 113.6 thousand people in 18 years a lot or a little? A comparison with the population of a large city, such as, for example, Obninsk (117.4 thousand, Kaluga region) or Kamyshin (109.9 thousand, Volgograd region), will help to answer the question. In other words, January losses alone over 18 years are comparable to the loss of the population of a large city over the same period. The quantification can be done differently by comparing with losses in other countries.

The most detailed quantitative study was carried out in the USA, where over 26 years (1979-2004) excess losses during the New Year and Christmas holidays came to 42,325 deaths, or 1.6 thousand per year on average (Phillips, Barker, Brewer 2010: 1463), versus 8.0 thousand per year in Russia – that is, Russia's excess losses were 5 times greater for a population half the size. One adjustment, however, is required for the calculations for the USA: estimates are made for

“natural” causes (mortality from natural causes spikes), which during this period accounted for 93% of all deaths, while external causes of death were not included in the calculations (Phillips, Barker, Brewer 2010: 1463).

With the exception of deaths due to alcohol poisoning, we did not study the diagnostic composition of deaths, but this composition has been studied in detail in foreign literature. It has been shown that there are 2 mortality maxima in the US, falling on December 25-26 (Christmas) and January 1. These peaks were determined by 93% "natural causes", such as diseases of the circulatory system, neoplasms, respiratory diseases, endocrine and metabolic diseases, and diseases of the digestive system. And this applied to all age groups except children (Phillips, Barker, Brewer 2010: 1463). Among the external causes of an increase in January mortality in the United States and Russia were homicides on New Year's Eve and/or Christmas (Bridges 2004: 723), suicides (Bergen and Hawton 2007: 855; Bridges 2004: 723), and alcohol or drug abuse (Phillips, Barker, Brewer 2010: 1463).

Significantly, in the western literature the alcohol factor in the growth of January mortality has been noted, but, as a rule, only in passing. It has been specifically studied only in one work known to us (Phillips, Barker, Brewer 2010: 1463), but even here its role is modest, no more important than a number of others. In our work, the study of alcohol poisoning is undertaken in order to understand the situation in Russia, which, during the study period, was one of the countries with the highest consumption of alcoholic beverages. Among all the pathogenic factors of New Year's losses in Russia, alcohol is probably one of the main ones. This is evidenced by the high peaks in New Year mortality and the similarity of the subsequent dynamics of the total number of deaths and deaths from alcohol poisoning (Figure 2), the maxima of which fall on January 1. The two types of mortality differ in the duration of their increase in January, and this, apparently, is due to the difference in thanatogenesis: shorter for alcohol poisoning and longer for general mortality, in which, as we saw in the USA, somatic pathology predominates (Phillips, Barker, Brewer 2010: 1463). It also predominated in Russia, in the city of Kemerovo (Barabash, Altarev, Fomina 2010: 35).

The period of excess mortality on holidays is shortest for murders (Nemtsov 2019: 317), longer for poisonings, and the longest for general mortality (Figure 2). In the same, but descending, order are these types of excess mortality during the New Year holidays compared to weekdays: during the holidays murders increase most of all (+206%, i.e. 3 times (Nemtsov 2019: 317)), poisonings less, and overall mortality (respectively + 41.5 and + 14.0%) even less. In the case of poisonings, such a gap between weekdays and holidays may be due to the fact that on New Year's Eve heavy drinking includes people with moderate addiction or with none at all, who are held back from abuse on weekdays by social restrictions. A connection between murders and alcohol consumption has been shown many times (for example, Ajdacic-Gross et al. 2012: 603; Phillips et al. 2004: 3781); this connection was also found on holidays (Phillips, Barker, Brewer 2010: 1463; Nemtsov 2019: 317) However, so far it has not been possible to find a convincing explanation for Russia's having such a large gap between weekday and holiday violence.

The significance of the alcohol factor for overall mortality in Russia is based on the similarity with alcohol poisoning in terms of their dynamics and the maximum on January 1. The significance of alcohol for overall mortality on New Year's Eve is also underscored by the

incidence of alcoholic psychosis, which was studied in Moscow and in six other large Russian cities (Nemtsov 2017a: 76; Nemtsov, Izarovskii, Sakharov 2014: 25). The difference between alcoholic psychoses and alcoholic mortality is that the maximum of psychoses falls on January 7th. This can be explained by the fact that every alcoholic psychosis is preceded by a binge, the duration of which is on average (mode) 7 days (Nemtsov, Loshakov 1997: 52). From this it follows that in the case of psychosis, the "alcohol punch" also falls on January 1st.

There is a persistent idea that the severity of the consequences of the New Year holidays is due to their duration. Hence the numerous proposals to shorten the duration of these holidays. But the reason is not in the duration: when comparing two periods (2000-2004 and 2005-2009) between which the duration of the holidays more than doubled, the period of excess mortality in the first and second periods was identical (Figure 6). Their difference is due to the fact that in Russia in 2004, i.e., in the second period, there began a decrease in alcohol consumption which continues to the present (World Health Organization 2018: 90). An important conclusion follows from this: the sale of strong drinks should be limited in December, when the annual maximum sales of both legal (Figure 7) and illegal alcohol (Figure 8) occur. The difficulty of solving this problem, even for the legal sector, is obvious: December is not only the peak of sales, but also the maximum of financial revenues to the budget from the alcohol market. However, the matter is complicated by the fact that since 2016 the formation of alcohol policy has been transferred to the Ministry of Finance of the Russian Federation. The main and, it seems, the only interest of this ministry is in collecting taxes on the alcohol market and combating the illegal production and sale of alcohol.

The excess deaths of women in connection with the New Year were 4 times less than those of men, and the increase ended earlier. Peaks were less pronounced on other holidays (Figure 5). This once again indicates that the male population bears the brunt of harm from alcohol. More interesting is this: the summer decrease in mortality occurs almost exclusively due to women (Figure 5). However, it was not possible to connect this phenomenon with the characteristics of male alcohol consumption: in the case of alcohol poisoning, seasonal fluctuations are expressed in the same way as evidence of a decrease in the consumption of hard alcohol in the summer. And the summer decrease in female mortality can be explained by the greater sensitivity of women to weather conditions in winter (Murphy, Luy, Torrisi 2019).

The multi-year trend of New Year's growth is generally in line with the downward trend in alcohol consumption that began in 2004 (World Health Organization 2018: 90). A deviation from this trend occurred in 2013-2014, after which the decline in mortality in January slowed down against the backdrop of a continuing decline in mortality in the remaining months of the year. This phenomenon can be explained by the fact that at that time the period of excess mortality expanded almost until the end of January (Figure 3). It can be assumed that this is due to the inclusion of new population groups in mortality (by age and/or by cause). Only a special study can solve this.

The results of the study of birthdays were unexpected: the losses associated with this turned out to be almost 2 times more than in January (8.0 thousand against 6.0 thousand per year), and the period of losses turned out to be longer (22 days against 15). At the same time, in January there are not 1, but 3 holidays. It is noteworthy that in the case of birthdays, the overall mortality was much higher than from alcohol poisoning (ratio 106:1) in comparison with what was in January

(11:1). Perhaps the peculiarity of this holiday is determined by the large participation of the elderly and / or the smaller participation of heavy drinkers, for whom “every day is a holiday”. It is possible that for this cohort of people the New Year holiday is more significant than a birthday: 20 days before the New Year, the incidence of alcoholic psychosis begins to decrease, with a minimum on January 1 (Nemtsov 2017b: 76), while there is no decrease in mortality from alcohol poisoning before a birthday (Figure 9).

One wonders why in Russia and other countries the New Year and Christmas holidays stand out for the severity of their consequences, sometimes even fatal. It might be put more broadly: they stand out for a special style of behavior (“On Christmas, everyone is a little magician.” I. Brodsky). No other holiday in Russia and in Western countries is preceded by such pre-holiday excitement and movement of people. It is difficult to observe this in the population before a birthday, due to the dispersal of these days in the year. However, in anticipation of January 1, even alcoholics reduce their alcohol consumption starting from mid-December, as a result of which the minimum incidence of alcoholic psychosis on holidays falls on January 1 (Nemtsov 2017b: 76).

Here it should be said that the structuring of time is a natural need, and this need is realized, in particular, by choosing a reference point. In “everyday time”, one of these points is a holiday (Volovikova, Tikhomirova, Borisova 2003). The rituals accompanying the holiday, in the broad sense of the word, reinforce the meaning of the holiday (Schneider 2019). Holidays and their rituals have other functions, but why among the holidays is such a special role played by the New Year, a birthday and / or Christmas?

It seems that this phenomenon is based on traditions formed by remnants of pagan psychology, which in the last 3-4 decades in Russia and the world have been expanding, even up to the emergence of neo-paganism as a religious practice (Krutous 2005: 90). In the everyday and broad manifestation of pagan psychology, there is little religiosity; it is more a matter of traditions. However, belief in signs and the evil eye is still common, as is belief in the pagan protection provided by amulets. But the pagan part of the psychology of modern man reveals itself especially brightly as Christmas or January 1st approaches. This is evidenced by the widespread New Year and Christmas “ritualism” in the form of oriental symbols and fetishization of the holiday. It turns out that in 2021 we entered the year of the metal bull, porcelain and other representations of which were quickly snatched up before the New Year in souvenir stalls. The pagan worldview is acutely manifested not only before January 1, but also on birthdays. This is most likely determined by the fact that these are milestone dates, the beginning of a new year or a new life cycle, and the cyclical nature of transformations is an important element of the pagan worldview. The second important feature of paganism is sacrifice for the sake of future well-being. In this context, the feast and alcohol take on another property - a ritual one: “As we party on New Year's Eve, so we will live the whole year”.

It is important to note the stability of the increase in mortality due to milestone holidays both in the United States and in Russia. In the USA, this phenomenon was observed during the entire study, i.e., for 26 years (1979-2004) (Phillips et al. 2004: 3781), and in Russia, since at least 1956, when records of monthly mortality rates began to be kept. The difference between the two countries was determined not only quantitatively, but also by the fact that the United States

suffered its main holiday losses on Christmas, and Russia on January 1. In both cases, the peak of annual mortality falls on these days. For the United States, several reasons for the New Year and Christmas losses were named, including alcohol (Phillips et al. 2004: 3781). In contrast, in Russia, the alcohol factor seems to predominate among others that have yet to be explored.

The time has come to carefully and without pathos compare such phenomena as the joy brought by the New Year holiday with the human losses at this time, and on this basis to determine the acceptability of certain measures to reduce the damage. The main thing here is to inform the population about the possible consequences of life-threatening and health-threatening behavior during the holidays. It seems that the information policy should be supplemented by a decrease in the availability of strong alcohol for our citizens in connection with the New Year. This should be done in December, especially in its last week, when there are maximum annual sales of alcoholic beverages, especially strong ones. Such a barrier may be in the form of a price policy and/or rationing of sales and/or a time limit on the sale of liquor.

The increase in mortality on New Year's Eve is only the tip of the iceberg. There is a much wider incidence of morbidity, which has yet to be studied, and in this regard, it is also necessary to prepare the health services specifically for this date. During a conference call on November 19, 2020, the Minister of Health M.A. Murashko had already warned regional leaders about the traditional increase in workload during the New Year holidays⁴.

Naturally, such efforts should not be made only once or limited to a short pre-New Year period. It is also necessary to persuade the Ministry of Finance to support restrictions on the sale of alcoholic products before the New Year.

RESEARCH LIMITATIONS

In contrast to the general idea of the article, the calculations in it should be treated with caution, as they depend on several attendant circumstances. The first one is the reliance on LOWESS calculations. This method has many advantages over the simple floating average and its other types, since it does not require a preliminary determination of the shape of the curve. But LOWESS is determined by the initial choice of estimation parameters. It is difficult to say whether this increases or underestimates the calculation results, but in both cases the error is small.

The second limitation, as noted above, concerns the interpretation of total excess mortality as alcohol-related, based on the similarity of the dynamics of total and alcohol mortality. It would be more correct to compare the number of deaths with alcohol in the blood before and after the holidays. However, these data are dispersed in local forensic medical examination bureaus, and even there they are presented in a summary, annual form, while our task requires their detailed distribution. However, in this case, only a selective study is possible: 35.4 million cases are still impossible to cover with such work.

The third limitation is associated with artifacts of registration of total mortality in the last and first days of the month, which were excluded from the calculations. This also forced us to

⁴ URL: <https://vrachirf.ru/company-announce-single/81862>

exclude deaths in connection with the May 1 holiday, and this artificially reduced the real damage on holidays. The artifact, apparently, is associated with errors or falsification of the primary record of the date of death. This phenomenon is not reproduced in alcohol poisoning (Figure 4) and murders (Nemtsov 2019: 31). The last 2 types of mortality carry socially significant information and therefore are under special control that does not allow falsification of the date of death.

There is also a fourth limitation. The main holiday damage occurs in January, the coldest month of the year. One might think that this damage depends on weather conditions in the form of influenza, SARS and pneumonia. It is impossible to completely exclude this factor, but it is also impossible to imagine that colds naturally heal by January 1.

From practice we know that the celebration of a birthday, and therefore fatal consequences, can be postponed for several days, but, as a rule, no more than a week. If this phenomenon were frequent and distributed randomly, that is, according to a normal or other distribution, we would have an additional peak or "step" of mortality on the descending branch after the maximum. But this is not revealed in Figure 9, which means that this phenomenon is infrequent and the error that delayed celebrations introduce is small.

It can be said more definitely that the results of holiday losses in the present work are somewhat underestimated. This is due first of all to the exclusion of May 1 holidays from the calculations, which, according to indirect data, could come to about 9 thousand people over 18 years. The second thing that could underestimate the results is the determination of the end of the increment of deaths on holidays by the confidence interval, and not by LOWESS. From this it follows that the quantitative estimates of holiday losses obtained in the work should be interpreted as "not lower than".

ACKNOWLEDGMENTS

Thanks to Yevgeny Mikhailovich Andreev (International Laboratory for Population and Health Research, National Research University Higher School of Economics) for his unfailing assistance in the work.

REFERENCES

- Abel E., Kruger M. (2009). Mortality Salience of Birthdays on Day of Death in the Major Leagues. *Death Studies*, 33(2), 175-184. DOI: <https://doi.org/10.1080/07481180802138936>
- Ajdacic-Gross V., Knopfli D., Landolt K. et al. (2012). Death has a preference for birthdays – an analysis of death time series. *Annals of Epidemiology*, 22(8), 603–606. DOI: 10.1016/j.annepidem.2012.04.016.
- Alderson M. (1975). Relationship between month of birth and month of death in the elderly. *British Journal of Preventive & Social Medicine*, 29(3), 151-156. DOI: <https://doi.org/10.1136/jech.29.3.151>
- Barabash O.L., Altarev S.S., Fomina N.V. (2010). Unfavorable effect of the period of new year holidays on total and cardiovascular mortality. *Kardiologiya*, 50(11), 35-39. (In Russ.). URL: <https://pubmed.ncbi.nlm.nih.gov/21526562/>

- Bergen H., Hawton K. (2007). Variation in deliberate self-harm around Christmas and New Year. *Social Science & Medicine*, 65(5), 855-867. DOI: <https://doi.org/10.1016/j.socscimed.2007.04.004>
- Bovet J., Spagnoli J., Sudan C. (1997). Mortalité et anniversaire de naissance. *Soz Präventivmed*, 42(3), 155-161. DOI: <https://doi.org/10.1007/BF01300566>
- Bridges F. (2004). Rates of homicide and suicide on major national holidays. *Psychological Reports*, 94(2), 723-724. DOI: <https://doi.org/10.2466/pr0.94.2.723-724>
- Cleveland W., Devlin S. (1988). Locally Weighted Regression: An Approach to Regression Analysis by Local Fitting. *Journal of the American Statistical Association*, 83(403), 596-610. DOI: <https://doi.org/10.2307/2289282>
- Doblhammer G. (1999). Longevity and month of birth: Evidence from Austria and Denmark. *Demographic Research*, 1 (3), 1-22. DOI: <https://doi.org/10.4054/DemRes.1999.1.3>
- Kloner R., Poole W., Perritt R. (1999). When throughout the year is coronary death most likely to occur? A 12 year population based analysis of more than 220 000 cases. *Circulation*, 100(15), 1630-1634. DOI: <https://doi.org/10.1161/01.cir.100.15.1630>
- Knight J., Schilling C., Barnett A. et al. (2016). Revisiting the “Christmas Holiday Effect” in the Southern Hemisphere. *Journal of the American Heart Association*, 5(12), e005098. DOI: <https://doi.org/10.1161/JAHA.116.005098>
- Krutous V.P. (2005). Novoyazychestvo v kontekste kul'turnogo krizisa XX – nachala XXI veka. Traditsionnaya kul'tura: nauch. al'm. [Traditional culture: scientific almanac], 2, 90-98. (In Russ.)
- Medenwald D., Kuss O. (2014). Deaths and major biographical events: a study of all cancer deaths in Germany from 1995 to 2009. *BMJ Open*, 4(4), e004423. DOI: <https://doi.org/10.1136/bmjopen-2013-004423>
- Milne E. (2005). Mortality spike at New Year but not Christmas in North East England. *European Journal of Epidemiology*, 20(10), 849–854. DOI: <https://doi.org/10.1007/s10654-005-2147-8>
- Motohashi Y. (2012). Suicide in Japan. *The Lancet*, 9823, 1282-1283. DOI: [https://doi.org/10.1016/S0140-6736\(11\)61130-6](https://doi.org/10.1016/S0140-6736(11)61130-6)
- Murphy M., Luy M., Torrisi O. (2019). Mortality change in the United Kingdom and Europe. London, Social Policy Working Paper. Working Paper Series November 11-19. URL: <https://www.lse.ac.uk/social-policy/Assets/Documents/PDF/working-paper-series/11-19-Mike-Murphy.pdf>
- Nemtsov A.V. (2017a). Prazdnik – faktor riska alkogol'nykh psikhozov [Holiday is a risk factor for alcoholic psychoses]. *Journal of addiction problems*, 10, 76-88. (In Russ.)
- Nemtsov A.V. (2017b). January deaths in Russia, 2004-2016. *Electronic scientific journal "Social Aspects of Population Health"*, 58(6). (In Russ.) DOI: <https://doi.org/10.21045/2071-5021-2017-58-6-2>
- Nemtsov A.V. (2019). Alcoholic component of holiday homicides, Russia, 2000-2017. *Journal of addiction problems*, 176(5), 31-44. (In Russ.) DOI: https://doi.org/10.47877/0234-0623_2019_5_31
- Nemtsov A.V., Izarovskiy B.V., Sakharov A.V. (2014). One-year trend of alcoholic poisonings and alcohol psychoses. *Narcology*, 1, 25-29. (In Russ.) URL: <http://mniip-repo.ru/uploads/1410778899.pdf>

- Nemtsov A.V., Loshakov E.S. (1997). Kratkaya khronologiya alkogol'nykh psikhozov [Brief chronology of alcoholic psychoses]. *Sotsial'naya i klinicheskaya psikiatriya* [Social and Clinical Psychiatry], 7(1), 52-61. (In Russ.)
- Peña P. (2015). A not so happy day after all: Excess death rates on birthdays in the U.S. *Social Science & Medicine*, 126, 59–66. DOI: <https://doi.org/10.1016/j.socscimed.2014.12.014>
- Phillips D., Barker G., Brewer K. (2010). Christmas and New Year as risk factors for death. *Social Science & Medicine*, 71(8), 1463-1471. DOI: <https://doi.org/10.1016/j.socscimed.2010.07.024>
- Phillips D., Christenfeld N., Ryan N. (1999). An increase in the number of deaths in the united states in the first week of the month an association with substance abuse and other causes of death, *The New England Journal of Medicine*, 341, 93-98. DOI: <https://doi.org/10.1056/NEJM199907083410206>
- Phillips D., Jason R., Abramson I., Phillips R. (2004). Cardiac mortality is higher around Christmas and New Year's than at any other time the holidays as a risk factor for death. *Circulation*, 110(25), 3781-3788. DOI: <https://doi.org/10.1161/01.cir.0000151424.02045.f7>
- Phillips D., Van Voorhees C., Todd R. (1992). The Birthday: Lifeline or Deadline? *Psychosomatic Medicine*, 54(5), 532-542. DOI: <https://doi.org/10.1097/00006842-199209000-00001>
- Reulbach U., Biermann T., Markovic K., Bleich S. (2007). The myth of the birthday blues: a population-based study about the association between birthday and suicide. *Comprehensive Psychiatry*, 48(6), 554-557. DOI: <https://doi.org/10.1016/j.comppsy.2007.06.006>
- Shneyder L.B. (2019). Psikhologiya identichnosti [Identity psychology]. 2nd ed., Trans. and additional, Moscow: Izdatel'stvo Yurayt
- Stickley A., Sheng Ng C., Inoue Y., Yazawa A., Koyanagi A., Kodaka M., DeVlyder J., Watanabe Ch (2016). Birthdays are associated with an increased risk of suicide in Japan: Evidence from 27,007 deaths in Tokyo in 2001–2010. *Journal of Affective Disorders*, 200, 259-265. DOI: <https://doi.org/10.1016/j.jad.2016.04.028>
- Vaiserman A., Grigoryev P., Belaya I., Voitenko V. (2003). Variation of mortality rate during the individual annual cycle. *Biogerontology*, 4(4), 221-225. DOI: <https://doi.org/10.1023/A:1025168932058>
- Volovikova M.I., Tikhomirova S.V., Borisova A.M. (2003). Psychology and holiday: a holiday in human life. Moscow: PER SE. (In Russ.).
- Williams A., While D., Windfuhr K., Bickley H., Hunt I.M., Shaw J., Appleby L., Kapur N. (2011). Birthday Blues, Examining the Association Between Birthday and Suicide in a National Sample. *Crisis*, 32, 134-142. DOI: <https://doi.org/10.1027/0227-5910/a000067>
- World health organization (2018). *Global status report on alcohol and health 2018*. Retrieved from <https://www.who.int/publications/i/item/9789241565639>
- Zhaksymbayev M. Dinamika smertnosti ot ubiystv v Rossii [Dynamics of mortality from homicide in Russia]. *Demoscope Weekly*, 535-536. (In Russ.) Retrieved from <http://www.demoscope.ru/weekly/2012/0535/analit09.php>
- Zubaid M., Thalib L., Suresh C.G. (2006). Incidence of acute myocardial infarction during Islamic holiday seasons. *European Journal of Epidemiology*, 21(3), 191-195. DOI: <https://doi.org/10.1007/s10654-006-0008-8>

IS LIFE EXPECTANCY AT BIRTH REALLY THE BEST MEASURE OF MORTALITY IN A POPULATION?

EVGENY ANDREEV

It is generally considered that the most adequate indicator of mortality in any population in a certain calendar period is life expectancy at birth (LE). Yet this indicator has serious drawbacks, and its use leads to a number of unjustified difficulties. The main limitation is that the method for calculating life expectancy is still not unified and most likely never can be. As a result, LE for different countries and periods may not be comparable. The data of the international Human Life-Table Database makes it possible to demonstrate that in LE comparisons it is often impossible to use the first decimal digit.

Computation of LE requires the calculation of life tables for a hypothetical cohort corresponding to the calendar period under consideration. When mortality declines rapidly, as has been the case in most countries since the mid-20th century, life tables for a hypothetical cohort say little about the age patterns of cohort mortality, and instead form false impressions. Counting how many people in a hypothetical cohort survived or did not survive to a certain age has no relation to any real population.

The transition from age-specific mortality rates to life expectancy is described not by a formula but by a computational procedure. This creates serious difficulties when trying to assess the impact of mortality at certain ages from certain causes of death in certain regions and population groups.

All these drawbacks are not shared by the standardized death rate (SDR), the calculation of which becomes the only option as soon as the standard population is specified. Data from the Human Life-Table Database allowed us to show that mortality level estimations based on SDR almost coincide with those based on LE.

SDR is a linear function of age-specific mortality rates; therefore, it is not difficult to calculate the effect of mortality in certain ages, regions or population groups and from different causes of death on SDR.

Non-professionals perceive LE on an intuitive level as the duration of a human life, which is rather a drawback of the indicator. The use of SDR requires more explanation. But in practical research and in professional publications, focusing on SDR will facilitate the work and protect against unwarranted emotions.

Key words: mortality, life expectancy, standardized mortality rate, mortality rate.

INTRODUCTION

It is generally accepted that the most adequate characterization of the level of mortality in the population at a certain period of time is the indicator "life expectancy at birth" (LE).

The indicator is perceived as the life expectancy of a certain person, and due to this it is easily understood on an intuitive level. As evidenced by materials from the national projects "Demography" and "Healthcare", this indicator requires no comment, while the simpler indicator "total fertility rate" (TFR) does. However, in our opinion, a good understanding of the meaning of the indicator at an intuitive, everyday level often interferes with a correct interpretation. Of a person who lived 75 years it can be said that he lived a long life, but for a modern European country, LE of 75 years is considered to be low.

EVGENY ANDREEV (e.andreev@hse.ru), NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS, RUSSIA.

THE ORIGINAL ARTICLE IN RUSSIAN WAS PUBLISHED IN DEMOGRAPHIC REVIEW IN 2021, 8(2), 6-26.
[HTTPS://DOI.ORG/10.17323/DEMREVIEW.V8I2.12780](https://doi.org/10.17323/DEMREVIEW.V8I2.12780)

To determine LE in a certain time period, it is necessary to calculate a life table (survival table) for the population under study. With the use of modern computer technology, this is not at all difficult, but the difficulty is that the method for calculating such tables has not yet been unified, and there is no single correct method for calculating the life table. The list of calculation methods used since the Second World War would take up more than one page. In Russia, the method of calculating official life tables has changed at least 5 times over this period. The UN Population Division, WHO, and Eurostat use different tabulation methods, and these are for countries providing the complete demographic data required for the calculation.

In countries where mortality is analyzed by different research centers or groups of demographers, discrepancies in the results of LE calculations are common. And although the differences are small, they are sufficient to treat with caution not only the second decimal place in the LE value, but often the first one as well.

The calculation of LE sometimes gives results that contradict logic. In the late 1980s, when life tables for the republics of the USSR began to be published, it turned out that if the life tables for the entire, both urban and rural, population of a republic are calculated according to standard rules as for independent populations, then LE for the entire population can turn out to be more or less than for the urban and the rural populations, i.e. not a kind of average for the two subpopulations, which is contrary to logic.

It happens that a generally reliable method for calculating life tables has its own “skeleton in the closet”, which no one likes to talk about, but tries to get around. Thus, at present the most popular formula for converting from the age-specific mortality rate to the probability of death is the Chang formula (Chiang 1984). However, in the case of one-year age groups, this formula assumes that the death rate is no more than 1, and for a five-year interval no more than 0.2. In real statistics, the one-year rate may well be greater than 1. Usually such rates decrease in one way or another.

Even if the authors of the tables report which method they used to calculate the life table, this does not guarantee complete comparability of the results obtained by the "named" method. Even the use of the same software with the same data format, which also affects the result of the calculation, is not a guarantee of comparability. Data for one-year and five-year age groups may be used, and the series may extend beyond 100 years of age, but they may end in an open age group A years and older. It's good if $A = 100$, but in the history of Russia there have also been cases where $A = 70$. At that point, determining the life expectancy at age A becomes a rather difficult task, allowing many solutions.

When calculating the life table using the MortPak software package developed at the UN, at different beginnings of the open age interval (the package provides such an opportunity), you can get a different result.

The algorithm for calculating the life table may contain logical branches; the program itself decides what to do if the age-specific mortality rate is greater than the maximum that allows the use of the Chang formula, how to continue calculations if the denominator for calculating the mortality rate is zero, how if both the denominator and the numerator are equal to zero, and so on.

In this article we will try to:

1. convince the reader not to overestimate the accuracy of LE as a measure of mortality;
2. show that LE cannot serve as an exhaustive characteristic of the level of mortality in the period for which it is calculated;
3. demonstrate alternative, no less informative, but easier to calculate measures of mortality.

DATA

This article is based on two databases.

The first is the Human Life-Table Database (HLD) (Max Planck Institute... 2021), collected mainly by The Max Planck Institute for Demographic Research in Rostock (Germany). At the time of this writing, there were 10,903 pairs of male and female life tables that began at birth.

The collection includes both published, including official, life tables, and tables sent by their authors, as a rule, university research centers or well-known research groups. Many publications contain only part of the indicators of life tables. Only publications are used that make it possible to unambiguously restore the table, for example, those containing a number of age probabilities or mortality rates or survival numbers. A range of life expectancy for all ages is required.

The HLD uses the following procedure. Each life table is fully recalculated based on the selected, most informative series. The standard life table is supplemented by an original series of life expectancies for all ages. Such a table is entered in the database as a text file. In addition, a copy of the original life table is entered in the database, usually in PDF format.

The second database is The Human Mortality Database (HMD) (University of California ... 2021), which is the result of a collaboration between the staff of the University of California, Berkeley and the Max Planck Institute for Demographic Research. The database contains information on the mortality of countries for the years when these data are recognized as reliable. At the beginning of 2021, it contained mortality data for the population of 50 countries, their parts or population groups since 1750. The total number of {population, year} pairs was 4,769. For brevity, we will also refer to the {population, year} pair as an observation. For each observation, the database contains the average annual population by sex and age, the number of deaths by sex, age, and Lexis triangles, age-specific mortality rates, and life tables built on the basis of these indicators.

Calculation algorithms used in HLD and HMD are detailed on the database sites.

ON THE ACCURACY OF LE

To assess the accuracy of an LE value, we compared for the same tables the author's values for LE with the values calculated by us using a standardized algorithm.

Only in 3,374 (30.95%) men's tables and 3,079 (28.24%) women's tables does the author's LE coincide with the calculated one with an accuracy of two decimal places. In our opinion, this is a very good result.

On the other hand, it turns out that for 1,643 (15.07%) men's tables and 2,886 (26.47%) women's tables, the absolute difference between the two LE exceeds 0.2 years. Many problems are associated with estimating LE at the last, oldest age presented in the table. That is why the differences in women are more significant than in men.

Either way, the risk of error when comparing LEs seems to be very high.

WHAT THE CALENDAR PERIOD LIFE TABLES SAY

To determine LE for a certain calendar period, it is necessary to calculate the life table in some way. The table is a model of the change with age in the number of a certain generation of people who were born and lived their lives under the influence of mortality in the period under study. This generation is called hypothetical or conditional. Probably, if the model were to appear today, it would be called a virtual generation. The life table contains data on the decrease with age in the size of the conditional generation and on how many years the members of the generation still have to live at each age.

In the middle of the last century, the official name of life tables in Russia was "tables of mortality and average life span" (TsSU USSR 1962). The word "expected" replaced the word "average" only in the late 1980s.

The expanded name indicates that the determination of life expectancy was considered the main purpose of calculating the life tables of the calendar period. To what extent is this assumption correct?

For practical purposes, such as demographic projections or population estimates, one needs mortality rates and, based on them, easily calculated probabilities of death or survival and probabilities of surviving a calendar year. In Russia, this last indicator is called the survival rate and is described as the ratio of neighboring numbers of people living in a conditional generation at the age of $x+1$ and x . It allegedly follows from this that the scope of application of the numbers of the living is not only the calculation of LE. But there is a simple formula which for some reason is not found in Russian textbooks. The survival rate at age x is equal to $P_x = \frac{2 - M_{x+1}}{2 + M_x}$, where M_x is the death rate at this age.

The indicators of life tables are involved in the calculation of integral characteristics of reproduction, such as the net reproduction rate of the population, which have been rarely used lately.

Table indicators can be useful when comparing mortality in two calendar periods. In particular, a number of indicators are used to assess the contribution of age intervals to a change in LE (Andreev 1982). Demographers know how to use these indicators for various useful calculations. But the problem is that all indicators covering any long age interval have nothing to

do with reality. Their usefulness is that they help to describe changes in mortality in a "broad stroke", so to speak. However, since all age-specific mortality rates are intergenerational, the results may well be unstable over time. Analyzing data on mortality in Russia in recent years, we have repeatedly found that the contribution of individual age intervals to the change in life expectancy varies markedly from year to year. In addition, such a calculation can be made without life tables only on the basis of age-specific coefficients.

The idea of a conditional generation arose in the 19th century, when mortality changed slowly, and it seemed that there was no difference between conditional and real generations. When carefully reading the book by S.A. Novoselsky (1916), you suddenly realize that the author is comparing countries outside of time; the period for which the life table is calculated seems to him insignificant. At that time, no one sought to distinguish between age-related changes in mortality in conditional and real generations.

In the second half of the 20th century, when the mortality rate in most developed countries was declining extremely rapidly, the series of age-related mortality intensities of conditional and real cohorts did not lose their similarities, but the differences between them became obvious. In Figure 1, we compared the curve of age-specific mortality rates for the generation born in 1946 in England and Wales with similar curves for three conditional generations of 1951, 1981 and 2011. The cohort curve reflects 2 processes: the change in mortality with age and the decrease with time. It seems to pierce the curves for calendar years.

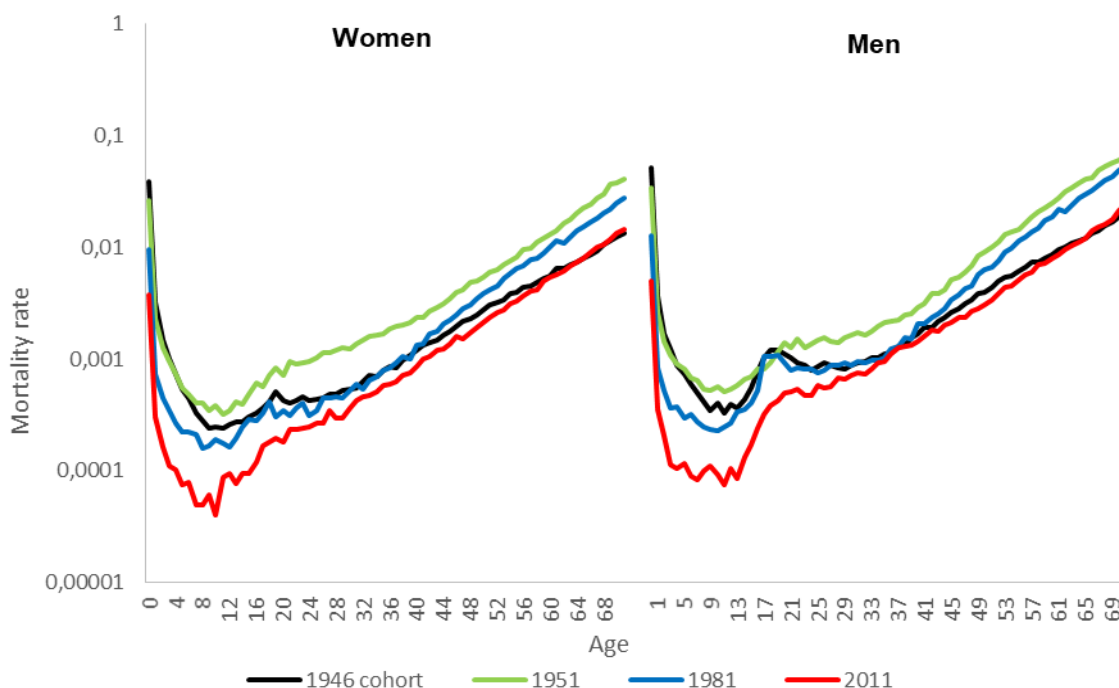


Figure 1. Comparison of age-specific mortality curves of the 1946 cohort and conditional generations of 1951, 1981 and 2011, England and Wales, general population. Semi-log scale.

Source: (University of California... 2021).

In Russia, sufficiently reliable data exist only after 1959, so the curves in Figure 2 are approximate estimates of the author. Since the decrease in mortality at older ages in Russia began much later than in Western Europe, the lines for real and conditional generations after 50 years lie closer to each other. However, Figures 1 and 2 show that in both cases there is hardly any possibility you can use tables for conditional generations to estimate the chances of the average person surviving to retirement age.

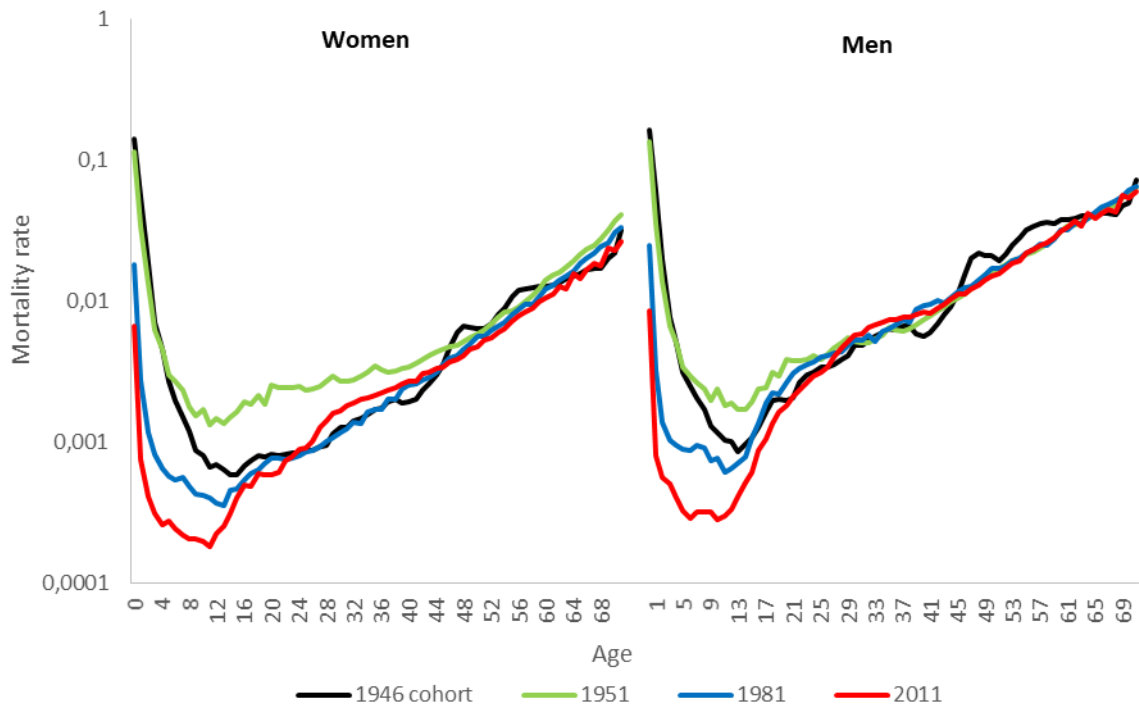


Figure 2. Comparison of age curves of mortality of the 1946 cohort and conditional generations of 1951, 1981 and 2011. Russian Federation. Semi-log scale.

Source: Calculated based on (Andreev, Darsky, Kharkova 1997) and data (Russian School of Economics 2021).

Another justification for the usefulness of calculating life tables is based on the fact that they allow one to judge the patterns of mortality in real generations. Undoubtedly, the performance curves for the conditional generation are similar to those for the real generation. But this is a very superficial similarity.

It is known that the dependence of the intensity of mortality on age is well described by the Gompertz curve. About forty years ago, Russian demography survived attempts to explain this with the help of aging models (Gavrilov, Gavrilova 1979; Shukailo 1979) (see also (Streler 1964)). Everywhere in the explanations it was about the accumulation of various kinds of malfunctions in the human body with age and how this affects the mortality of a generation. But the curve could be selected only for indicators of conditional generations. It does not work in real cohorts. The habit of calculating tables for conditional generations made them more real than real ones.

Typical life tables (Coale and Demeny 1966; United Nations 1982) suggest that LE can be used to predict the age-related mortality curve. If this is indeed true, it is only for conditional generations, for which typical tables are calculated.

Figure 3 shows the age-specific mortality rates of the real cohort born in 1920 and conditional generations with the same LE. For women, this is the conditional generation born in 1939. LE in the female cohort was 66.91, and in the conditional - 66.24. For men, the conditional generation of 1932 was taken; LE in both cases was 59.01.

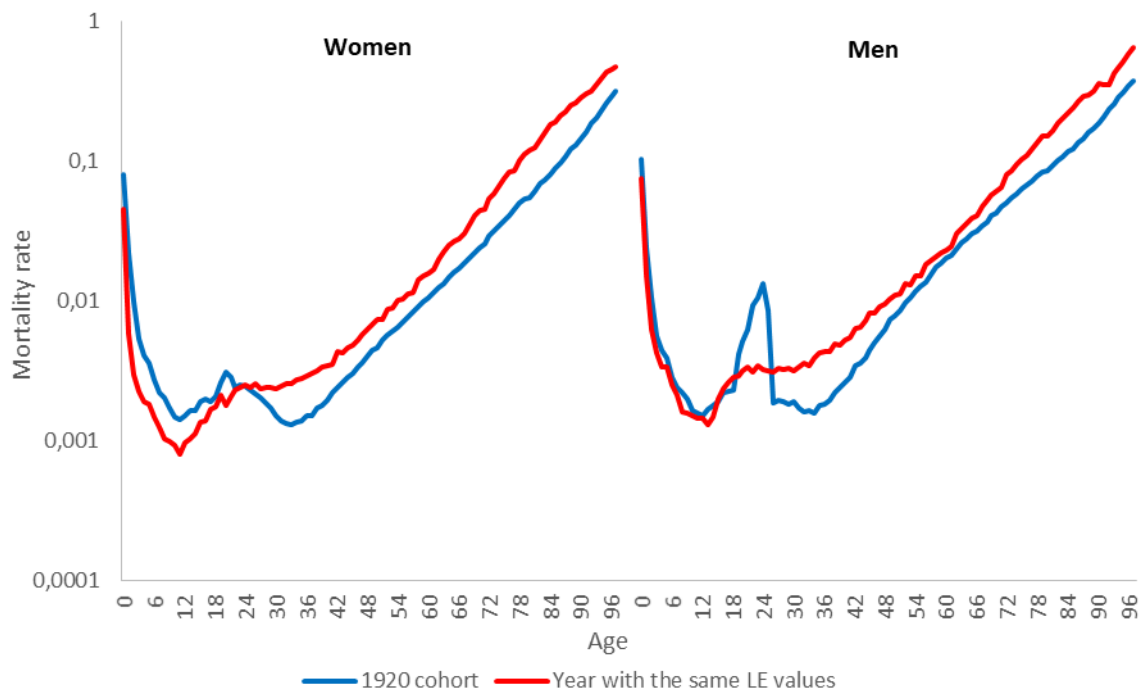


Figure 3. Comparison of age-specific mortality curves for the 1920 cohort and conditional generations with the same LE. England and Wales, the entire population. Semi-log scale.

Source: (University of California... 2021).

We will not argue if the reader considers this example "not entirely fair", since the generation of 1920 survived the war. Unfortunately, however, it is impossible to calculate LE for generations born after the war. Of course, the consequences of the war cannot be compared with the consequences of a flu epidemic, summer heat or COVID-19. But using the example of pre-war cohorts, it is easier to see the main differences between the tables for real and conditional generations. In conditional generations, mortality changes simultaneously at all ages, in real generations, in a small range of ages.

Our analysis suggests that the main reason for the systematic calculation of life tables, which is carried out by the statistical offices of all developed countries, international organizations and individual researchers, is precisely the need to determine LE as an integral characteristic of the population.

AN ALTERNATIVE TO LE

J. Graunt's life table published on 27 February 1661 did not include an LE indicator or an equivalent. An indicator of this type appeared only several decades later, in the works of H. Huygens, who used the Graunt table in studies on probability theory and introduced the concept

of mathematical expectation (LE as the mathematical expectation of a death event).

We were unable to find out who introduced the concept of the mortality rate as the ratio of the number of deaths in a period to the number of person-years lived in that period. This indicator is fundamentally different from the probability of death, which is the ratio of the number of deaths to the number at the beginning of the time interval. Note that Graunt did not correlate the number of dead and living, but considered the distribution of the dead by age.

It seems that by the end of the 18th century no one was comparing the number of deaths regardless of the population. But, obviously, the crude mortality rate equally depends on the level of age-specific mortality and on the age composition of the population. If the researcher is interested in mortality, then this indicator does not suit him. In the middle of the 19th century, W. Farr developed a method for standardizing general mortality rates. Now this method in textbooks is called the direct method of standardization.

So, in the middle of the 19th century there appeared a second integral indicator of the level of mortality - the standardized death rate (SDR). This took about 150 years from the moment the mathematical understanding of the phenomenon began.

By itself, the crude mortality rate cannot be considered as an integral characteristic of the mortality rate, since it equally depends on the age-specific mortality rates and the age composition of the population. It measures the average risk of death in a particular population. In our opinion, this indicator is not as useless as it seems. It follows that in order to reduce the risk of death in the "old" population, it is necessary to take care of the mortality of the elderly, and in the "young" population - of infant mortality.

SDR, like LE, can be associated with the demographic model, but with the model not of the generation, but of the population, in which the age structure is constant and corresponds to the standard, and the age-related mortality is the same as in the studied population. The SDR is the crude mortality rate in this model population.

Indirect and inverse methods of standardization of mortality rates are used mainly in the absence of complete information about the population: indirect if the age distribution of deaths is unknown, inverse in the absence of information about the age composition of the population. The indirect method appeared simultaneously with the direct method, while the inverse method appeared much later, in the middle of the 20th century. For both methods, it is required to determine the standard function of age-specific mortality.

With the indirect method, the total number of deaths is calculated with a known age composition of the living and some theoretical age-specific mortality. The ratio of the known total number of deaths to the result of the calculation is called the standardized mortality index.

In the inverse method, by dividing the age-specific number of deaths by the age-specific mortality rate we obtain the population that could give a given series of age-distributed deaths with standard age-specific mortality. The ratio of the actual total number to the calculated one also gives the mortality index.

Before determining LE, it is necessary to choose an algorithm for calculating the life table based on this or that transformation of age-specific mortality rates. The crude death rate

standardization algorithm is determined by the standard population. You can choose one of the well-known standards, or you can use your own. In order for the publication not to displease the reader, it is enough to publish this standard.

Currently, the 1976 WHO European Standard and the 2013 Eurostat standard are the most commonly used (Eurostat 2013). The 1976 standard is certainly outdated, as it provides for an open age interval of 85 years and older, while the reduction in mortality after 85 years of age is becoming an increasingly important factor in reducing mortality.

Unlike LE, SDR is additive in terms of causes of death, so it is easy to assess the contribution of individual causes of death to its change. It is somewhat more difficult to estimate the contribution of individual age groups, since it is necessary to take into account their shares in the standard population. But nothing similar to the method of decomposition of differences in LE (Andreev 1982) will be required.

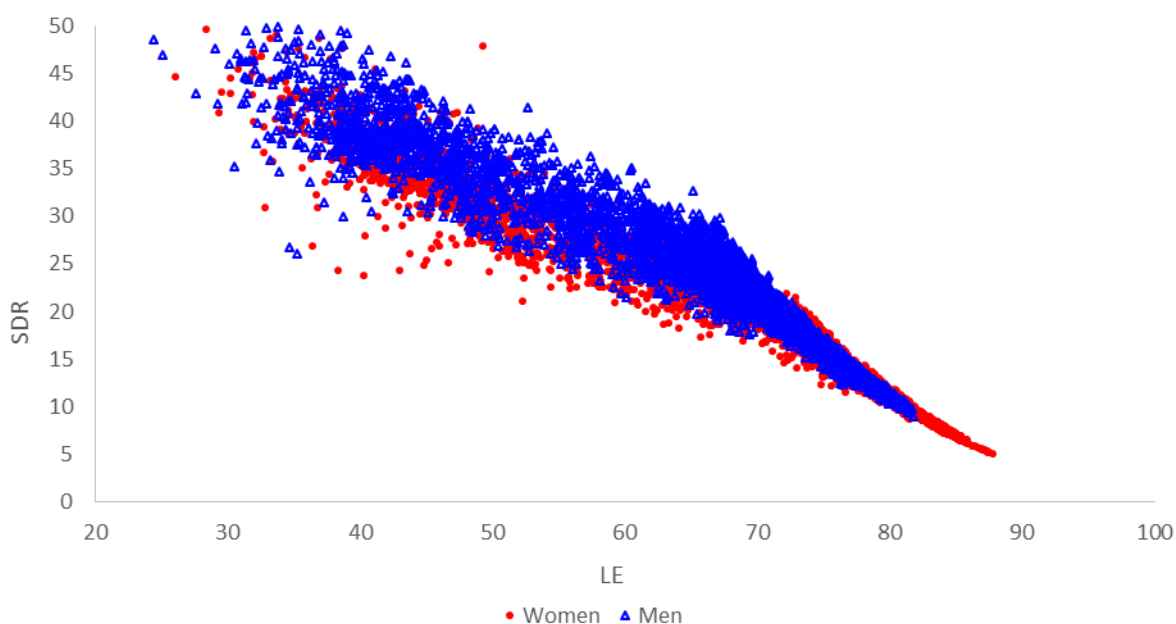


Figure 4. The ratio of the standardized death rate based on the 2013 European standard and LE for men and women according to HMD (University of California 2021) (4,769 observations)

Source: Author's calculations.

Unfortunately, mortality indices calculated both indirectly and inversely do not possess these properties. It is impossible, knowing the indices of mortality from individual causes, to evaluate their contribution to the overall index.

We used the HMD data to try and compare the 2 cumulative scores. We are interested in the question of the extent to which the estimates of the mortality rate obtained with their help are consistent.

Figure 4 shows the ratio of SDR and LE in all pairs {population, year} for men and women. The 2013 European Standard Population was used.

The figure shows that the connection, apparently, does not depend on gender and is clearly visible in the vast majority of cases. This relationship is obviously non-linear, which is especially clearly manifested at high LE and low SDR, since an infinite life expectancy would correspond to zero SDR.

The relationship between SDR and LE is still clear enough that for each value of one indicator it is possible to calculate the average value of the other. According to our calculations, a LE of 78 years, which Russia, according to the national doctrine, aims to achieve by 2030, corresponds to an average SDR of 12.4 per 1000 (if we take the European standard population of 2013), with a range of values from 11.4 to 13.3.

To assess the consistency of various mortality characteristics, it is useful to use Kendall's non-parametric rank correlation coefficient τ_b , based on the rank coincidence count (Table 1).

In our case, it would be ideal if the ranks were in reverse order. The calculation, including data for men and women, showed that the coefficient is -0.89, which is a very high absolute value for the Kendall coefficient. A similar calculation on the indicators for the two sexes together gave almost the same result - 0.90 (Table 2).

Table 1. Kendall's rank correlation coefficient τ_b for an array of 9,538 observations, men or women

| | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|------------------------------------|--------|--------|--------|--------|--------|--------|
| 1 | LE | 1 | -0.941 | -0.887 | -0.837 | -0.876 | -0.622 |
| 2 | SDR, HMD-21 standard | -0.941 | 1 | 0.944 | 0.826 | 0.840 | 0.633 |
| 3 | SDR, 2013 European standard | -0.887 | 0.944 | 1 | 0.798 | 0.799 | 0.625 |
| 4 | Mortality index by indirect method | -0.837 | 0.826 | 0.798 | 1 | 0.893 | 0.673 |
| 5 | Mortality index by inverse method | -0.876 | 0.840 | 0.799 | 0.893 | 1 | 0.641 |
| 6 | Crude mortality rate | -0.622 | 0.633 | 0.625 | 0.673 | 0.641 | 1 |

Note. The correlation is significant below 0.01.

Table 2. Kendall's rank correlation coefficient τ_b for the two sexes together for 4,769 observations

| | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|------------------------------------|--------|--------|--------|--------|--------|--------|
| 1 | LE | 1 | -0.949 | -0.900 | -0.913 | -0.905 | -0.625 |
| 2 | SDR, HMD-21 standard | -0.949 | 1 | 0.950 | 0.929 | 0.881 | 0.634 |
| 3 | SDR, 2013 European standard | -0.900 | 0.950 | 1 | 0.908 | 0.843 | 0.628 |
| 4 | Mortality index by indirect method | -0.913 | 0.929 | 0.908 | 1 | 0.897 | 0.696 |
| 5 | Mortality index by inverse method | -0.905 | 0.881 | 0.843 | 0.897 | 1 | 0.661 |
| 6 | Crude mortality rate | -0.625 | 0.634 | 0.628 | 0.696 | 0.661 | 1 |

Note. The correlation is significant below 0.01.

Although the distributions of observations based on SDR and LE give very close representations of what demographers perceive as "mortality rates", there is a fundamental difference between the two ways of classifying observations. LE, like any indicator of life expectancy, is sensitive to the age of the deceased. The younger the deceased, the more his death reduces life expectancy. We are not sure that this property is useful for an indicator that characterizes the mortality rate of a population in a certain year. The response to age of SDR

depends on the selected standard population. The 2013 European standard makes little distinction between ages under 65.

It is known that at the end of the 19th century European Russia was distinguished by a terrifyingly high infant mortality rate. According to the tables of mortality of the population of European Russia within the borders of the RSFSR in the late 1920s, in 1896-97 303 out of 1000 newborns did not live up to 1 year. To a large extent, this is why LE was 30.5 years (mortality and life expectancy ... 1930). According to our calculations based on these life tables, the SDR was 36.0 per 1000. We found 272 cases in HMD with SDRs from 35 to 37 per 1000. The average SDR in this population is equal to the Russian one, while life expectancy is 43.3 years. This value of the SDR was recorded in France in 1944 (the entire national population). At the same time, LE in France for the same year was 55.8 years. This ratio of LE and SDR results from the fact that the SDR better captured the high mortality of the adult population. Thus, LE as a measure of the level of mortality of the population, as it were, overestimates the role of child mortality and underestimates the role of adult mortality. However, this problem deserves special consideration.

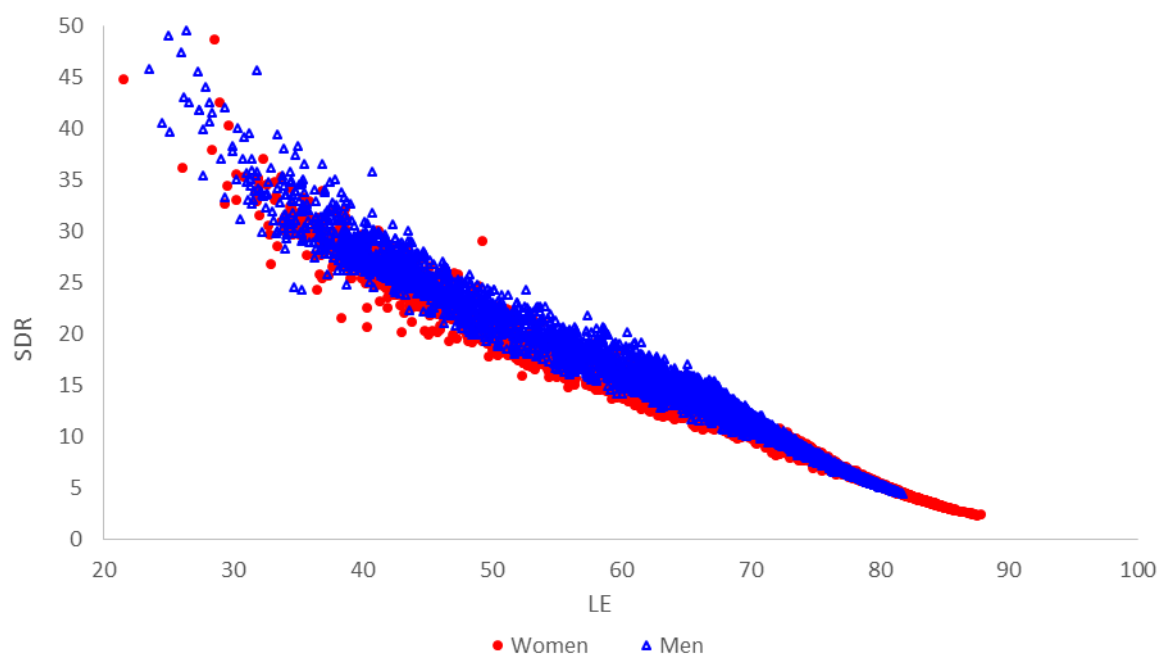


Figure 5. Ratio of the standardized death rate using the HMD average age structure at the beginning of 2021 (HMD-21) and LE for men and women according to HMD data (4769 observations)

Source: Author's calculations.

We must not forget that Eurostat, when developing the standard population, was guided by the population structures of the developed countries of Europe. The nonmonotonicity of the age structure suggests that it was supposed to be revised in 5-10 years. In any case, the standard was not intended to apply to such a wide range of countries. We decided to take as a standard the average age structure for the two sexes together over the entire list of 4769 persons and years. To somehow distinguish this standard, we called it HMD-21. The HMD-21 standard is presented in Appendix Table A1.

When using the HMD-21 standard, the Kendell rank correlation coefficient of the two indicators - LE and SDR - is -0.94 when combining indicators determined independently for men and women into one data array (Table 1) and -0.95 when calculating indicators for the two sexes combined (Table 2).

Figure 5 shows that when using the average age structure of HMD-21 as a standard, the relationship between LE and SDR looks clearer than when using the 2013 European population standard (cf. Figs. 4 and 5).

To calculate mortality indices by indirect and inverse methods, we calculated a standard series of age-specific mortality rates for the two sexes together as an average over all population-years. A short series of HMD age indicators was used with an open interval of 95 years or more (Table A2 of the Appendix). The Kendell coefficient for the indices shows their very high consistency with LE, although it is lower than that of both SDRs.

ROUGH ESTIMATES

The low, compared with others, indicators in the last row and column of tables 1 and 2 make it clear once again that the crude death rate cannot replace LE as an integral characteristic of the mortality rate. Still, Kendell's tau_b correlation scores are quite high. Hence the idea arose to use the crude rates for rough estimates.

The age structure of the population at five-year age groups, as a rule, changes rather slowly. Therefore, it can be assumed that, over a short time interval, changes in the SDR are proportional to changes in the crude death rate. We attempted to verify this.

In this case, we took the HMD-21 standard as the standard for calculating the SDR. From the HMD data we selected all such cases where data on some population are available for two consecutive years. There were 4,718 such cases. We calculated the SDR for the second of the two years, assuming that changes in the SDR are proportional to changes in the crude rate, and then compared the estimate with the “correct” indicator and calculated the relative error of the estimate. The result is encouraging: in 90% of all cases, the error lies in the range of $\pm 3\%$. This is true for both men and women separately, as well as for the two sexes together.

You might expect that the probability of not making a mistake is high, but this is not always the case. Errors above 10% or below -10% occur for the period before 1920 and also for Iceland or New Zealand (Maori only).

On the contrary, our attempts to evaluate a change in LE based only on a change in the crude death rate or the total number of deaths were unsuccessful. The rank correlation coefficient between changes in LE and the crude rate for the same number of observations was -0.77 (significance level 0.01). Pearson's correlation coefficient (-0.91) also turned out to be very high in absolute value. Further analysis showed that only a linear model is possible. But the accuracy of the model is completely unsatisfactory. The average absolute deviation of the predicted LE from the actual one is 0.34 years; in a third of all observations the deviation is more than a quarter of a year.

SOME RESULTS

To determine LE in the population in a certain period, it is necessary to calculate the life table for the conditional generation of this period. The result of the calculation depends on the format of the available data on the population by age and on the age-specific numbers of the deceased, as well as on the chosen calculation algorithm. The data format is determined by the state of population statistics and the position of the national statistical office. The more detailed the data, the more noticeable their defects. To avoid possible criticism, statistical offices often publish only aggregated data.

The calculation method depends both on the available data and on the subjective preferences and knowledge of the authors of the calculation. In Russia, for example, the method of the American statistician Greville (Greville 1943) is still popular, but few people are familiar with the methods used by the Centers for Disease Control and Prevention in the USA in modern tables (Anderson 1999).

Using the HLD, we have demonstrated that the decimal places in LE depend significantly on the method of calculation. Thus, LE is not the most accurate measure of mortality.

We have shown that conditional generations of the 20th and 21st centuries bear little resemblance to real generations. Therefore, it is impossible to draw any conclusions about real generations based on the life tables of the calendar period. It seems that it is much easier to predict the life expectancy of young cohorts (Shkolnikov et al. 2014) than the remaining life expectancy of cohorts whose childhood and youth took place in the 1940s-1950s. It is known that mortality from many diseases in the elderly depends on the conditions of life in childhood and adolescence. It is impossible to predict the overall effect of this relationship, but references to data from conditional generations are hardly justified.

Our conclusion: obtaining the life expectancy value is the main, and possibly the only purpose of calculating the life tables of a conditional generation.

The relationship between LE and age-specific mortality rates is described by very complex relationships, so it is rather difficult to say how certain changes in age-specific mortality in general and from individual causes of death affect life expectancy.

In the minds of non-professionals, the LE indicator is perceived as the expected life span of specific people. They refer to it when they propose to increase the retirement age or, on the contrary, prove the illegality of such a step. The calculation of the number of people in a conditional generation who live or do not live to a certain age has nothing to do with any real population.

In the early 1970s, the leadership of the USSR came to the conclusion that life expectancy in the country should not fall below 70 years (Andreev 2011), and this indicator was repeated in international statistical publications. Starting in 1973, the United Nations Demographic Yearbooks published life expectancies in 1971-1972 in the USSR of 64 years for men and 74 for women, in Ukraine, 68 and 76, respectively, and in Belarus, 67 and 74. Only for Belarus was life expectancy over 70 for both sexes (71 years for both men and women). It was only in 1989 that the USSR

State Statistics Committee published actual life tables for the period from 1970 to 1987. In the early 2010s, LE in Russia exceeded 70 years, and this again seemed like a great achievement.

If a standard population is chosen and the structure is made public, and age-specific mortality rates are calculated, then no forces can affect the value of the SDR. The calculation of age-specific mortality rates contains some uncertainty. There are different possibilities for distributing by age the dead of unknown age, and several ways to calculate the population at risk, but all these uncertainties also arise when calculating LE.

SDR is a linear function of age-specific mortality rates. Therefore, it is extremely easy to assess the impact on the change in SDR of individual causes of death. The formula for estimating the contribution of individual age groups to the change in the SDR looks a little more complicated. A more complex expression describes the contribution of individual parts or social groups to a change in the SDR for the country as a whole. For example, it is possible to make a routine procedure of analysis of the contribution of regions to the mortality dynamics in Russia using the SDR, similar to that presented in our joint work (Timonin et al. 2017).

It is possible to calculate the SDR not for the entire scale of ages, but for individual intervals, for example, for adults, working, and retirement ages.

As for the possibility of comparing with other populations, other periods, and so on, international databases make it possible to calculate perfectly comparable SDRs. In addition to HMD, we might mention the Human Cause-of-Death Database (Institute for Demographic ... 2021) and the WHO Mortality Database (World Health Organization 2021).

We will not be able to calculate the SDR for countries where adequate demographic statistics are lacking and the published LE indicators are the result of various kinds of indirect estimates, but in our opinion this is for the best.

Using the SDR frees us from the mystical “lifelong” contained in the definition of the conditional generation. To explain what SDR is, we can say that this is the number of deaths per 1000 (or 100 thousand) people of the population under study if it had the same age structure as in the standard population or, conversely, the number of deaths in the standard population if it had the same mortality rate as the population under study.

Of course, it will not be possible to abandon the use of life expectancy for a calendar period overnight. But it is quite realistic to use only SDR when analyzing the dynamics of mortality or preparing articles designed for a demographic reader.

When the article was ready, the latest statistical publications forced another short addition. Preliminary results for 2020 in Europe and Russia show that life expectancy is a very mild indicator. Thus, in Russia, the number of deaths and the crude death rate in 2020 in the context of the COVID-19 pandemic increased by more than 18% compared to 2019, while LE decreased, according to preliminary estimates, by 1.8 years or only by 2.5% (Rosstat 2021a, b, c).

REFERENCES

- Anderson R.N. (1999). Method for constructing complete annual U.S. life tables. In *Vital and health statistics, Series 2, Data evaluation and methods research*, no. 129.
- Andreev E.M., Darskiy L.E., Kharkova T.L. (1997). *Demograficheskaya istoriya Rossii: 1927-1959* [Demographic History of Russia: 1927-1959]. Moscow: Informatika.
- Andreyev E.M. (1982). Metod komponent v analize prodolzhitel'nosti zhizni [Component method in life expectancy analysis]. *Vestnik statistiki*, (9), 42–47.
- Andreyev E.M. (2011). Ozhidayemaya prodolzhitel'nost' zhizni 70 let, ili déjà vu otechestvennoy demografii [Life expectancy of 70 years, or déjà vu of domestic demography]. *Demoskope Weekly*, 487- 488.
- Chiang C.L. (1984). *The Life Table and its Applications*. Malabar: Florida.
- Coale A., Demeny P. (1966). *Regional Model Life Tables and Stable Populations*. Princeton: Princeton University Press.
- Eurostat (2013). *Revision of the European Standard Population - Report of Eurostat's task force edition*.
- Gavrilov L.A., Gavrilova N.S. (1979). Issledovaniye kineticheskikh zakonomernostey smertnosti lyudey v istoricheskom aspekte [Life expectancy of 70 years, or déjà vu of domestic demography]. *DAN SSSR*, 245(4), 1017-1020.
- Greville T. (1943). Some methods of constructing abridged life tables, Records of the. *American Institute of Actuaries*, 32, 29–43.
- Institute for Demographic Studies (INED), Max Planck Institute for Demographic Research (2021). *The Human Cause-of-Death Database (HCD)*. URL: <https://www.causesofdeath.org/cgi-bin/main.php>
- Max Planck Institute for Demographic Research (2021). *Human Life Table Database*. Retrieved from <https://www.lifetable.de/cgi-bin/data.php> (data downloaded on 05.02.2021).
- New Economic School (2021). *The Russian Fertility and Mortality database*. Retrieved from http://www.demogr.nes.ru/index.php/en/demogr_indicat/data (data downloaded on 05.02.2021).
- Novosel'skiy S.A. (1916). *Smertnost' i prodolzhitel'nost' zhizni v Rossii* [Mortality and Life Expectancy in Russia]. Petrograd: Tipografiya Ministerstva Vnutrennikh Del.
- Rosstat (2021a). *Yestestvennoye dvizheniye naseleniya v razreze sub'yektov Rossiyskoy Federatsii po mesyatsam. 2020 god*. [Vital statistics data on regions of the Russian Federation by months. 2020 year]. URL: <https://rosstat.gov.ru/folder/12781> (data downloaded on 08.02.2021).
- Rosstat (2021b). *Otsenka chislennosti postoyannogo naseleniya na 1 yanvarya 2021 g. i v srednem za 2020 g.* [Estimated resident population as of January 1, 2021 and on average for 2020]. URL: <https://rosstat.gov.ru/folder/12781> (data downloaded on 19.03.2021).
- Rosstat (2021c). *Predvaritel'naya otsenka ozhidayemoy prodolzhitel'nosti zhizni pri rozhdenii po sub'yektam Rossiyskoy Federatsii za 2020 god* [Preliminary estimate of life expectancy at birth for the subjects of the Russian Federation for 2020]. URL: <https://rosstat.gov.ru/folder/12781> (data downloaded on 19.03.2021).
- Shkolnikov V.M., Jdanov D.A., Andreev E. M., Vaupel J.W. (2014). Rapid increase in maximal country specific life expectancy across cohorts. *Advances in Gerontology*, 27(2), 229-235.

- Shukaylo V.F. (1979). O printsipakh matem. otobrazheniya sushchnosti protsessov smernosti [On the principles of mat. displaying the essence of mortality processes]. In *Prodolzhitel'nost' zhizni: analiz i modelirovaniye* (pp. 104-123). Moscow.
- Smernost' i prodolzhitel'nost' zhizni naseleniia SSSR 1926-1927 gg.* [Mortality and life expectancy of the USSR 1926-1927] (1930). *Tablitsy smernosti*. Moscow – Leningrad.
- Strehler B. (1964). *Vremya, kletki i starenie* [Time, cells, and aging]. Moscow.
- Timonin S., Danilova I., Andreev E. M., Shkolnikov V. (2017). Recent mortality improvement in Russia: are regions following the same tempo? *European Journal of Population*, 33(5), 733-763.
- TSSU SSSR (1962). *Tablitsy smernosti i sredney prodolzhitel'nosti zhizni naseleniya SSSR. 1958-59* [Life tables and life expectancy of the population of the USSR. 1958-59]. Moscow: Gosstatizdat.
- United Nations (1982). *Model Life Tables for Developing Countries* (United Nations publication, Sales No. E.81.XIII.7).
- University of California, Berkeley, and Max Planck Institute for Demographic Research (2021). *The Human Mortality Database. U.K., United Kingdom Total Population*. Retrieved from https://www.mortality.org/cgi-bin/hmd/country.php?cntr=GBR_NP&level=1 (data downloaded on 05.02.2021).
- World Health Organization (2021). *WHO Mortality Database*. URL: <https://www.who.int/data/data-collection-tools/who-mortality-database>

APPENDIX

Table A1. Average age structure for both sexes together of the population at risk for all of the Human Mortality Database at the beginning of 2021, 4769 observations

| | | | | | | | |
|-------|---------|---------|--------|----------|--------|--------|--------|
| Age | 0 | 1-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 |
| Share | 181757 | 687900 | 834378 | 819342 | 799294 | 771576 | 744360 |
| Age | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 |
| Share | 714884 | 681483 | 643165 | 600511 | 552383 | 495744 | 433179 |
| Age | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90-94 | 95-99 |
| Share | 362419 | 283185 | 198846 | 119115 | 54967 | 17649 | 3465 |
| Age | 100-104 | 105-109 | 110+ | Total | | | |
| Share | 373 | 23 | 2 | 10000000 | | | |

Note: Download date: 05.02.2021.

Table A2. Average age-specific mortality rates per 1 million for both sexes together for all of the Human Mortality Database at the beginning of 2021, 4769 observations

| | | | | | | | |
|------|-------|-------|-------|--------|--------|--------|--------|
| Age | 0 | 1-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 |
| Rate | 59441 | 8126 | 2225 | 1417 | 2171 | 3064 | 3209 |
| Age | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 |
| Rate | 3528 | 4191 | 5275 | 6935 | 9773 | 13935 | 21115 |
| Age | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90-94 | 95+ |
| Rate | 31939 | 50400 | 79487 | 124212 | 190442 | 276548 | 405034 |

Note: Download date: 05.02.2021.

THE ANTI-ABORTION AGENDA IN THE CONSERVATIVE DISCOURSE IN RUSSIA: IDEOLOGICAL CAMPAIGNS, LEGAL INITIATIVES AND REGIONAL PRACTICES

ZHANNA CHERNOVA, LARISA SHPAKOVSKAYA

The article examines the processes of conservative mobilization in Russia in 2000-2010s as a deployment of ideological propaganda campaigns using the conservative rhetoric of the traditional family, traditional values, and traditional gender roles in order to solve “demographic problems”, above all the increase of fertility. The main focus of the article is the discourse on abortion. State anti-abortion propaganda is viewed as a “litmus test” of the ongoing processes of retraditionalization of state ideology and of instruments for regulating reproduction and sexuality. In analyzing the legislative and regional initiatives of the period under study, the authors describe the main public actors of the regional and federal levels, as well as the rhetoric they use. The article shows that since the 2000s one of the leading actors working for the adoption of anti-abortion legislation has been the Russian Orthodox Church. At the same time, there have been public actors at the federal level who have held back the adoption of anti-abortion legislation and have been consistently critical of anti-abortion rhetoric. Also at the same time, on the regional level, pro-conservative mobilization actors have effectively used state support, without encountering noticeable criticism. Substantively anti-abortion rhetoric is inscribed in the discourse on demographic problems and population decline as a threat to national security. It is aimed at regulating people’s intimate behavior, their bodies, and morality, thus representing a variant of biopolitics in the terms of Michel Foucault. In this sense, the ultimate goal of conservative mobilization is to create docile citizens indoctrinated with the ideology of a traditional family lifestyle and large families.

Key words: anti-abortion rhetoric, conservatism, fertility, traditional family values, discourse analysis

INTRODUCTION

Since the mid-2000s there has been a distinct strengthening of the conservative trend in Russian political discourse, especially noticeable in the politicization of issues of marriage and reproductive behavior (Zakharov 2012; Sakevich, Denisov, Rivkin-Fish 2016).

Expressed in terms of “reviving traditions” and “preserving traditional family values”, it is associated with criticism of liberal gender discourse and is clearly anti-Western in nature. Examples are the propaganda campaigns aimed at restricting women's reproductive rights, preventing the introduction of juvenile justice, and banning homosexual propaganda (Muravyova 2014).

ZHANNA CHERNOVA (chernova30@mail.ru), THE SOCIOLOGICAL INSTITUTE OF THE RAS – BRANCH OF THE FEDERAL CENTER OF THEORETICAL AND APPLIED SOCIOLOGY OF THE RUSSIAN ACADEMY OF SCIENCES, RUSSIA.

LARISA SHPAKOVSKAYA (slarisalarisa@gmail.com), THE SOCIOLOGICAL INSTITUTE OF THE RAS – BRANCH OF THE FEDERAL CENTER OF THEORETICAL AND APPLIED SOCIOLOGY OF THE RUSSIAN ACADEMY OF SCIENCES, RUSSIA.

THE ORIGINAL ARTICLE IN RUSSIAN WAS PUBLISHED IN DEMOGRAPHIC REVIEW IN 2021, 8(2), 27-50.
[HTTPS://DOI.ORG/10.17323/DEMREVIEW.V8I2.12781](https://doi.org/10.17323/DEMREVIEW.V8I2.12781)

The conservative turn in modern societies in recent years has both a global and a local dimension and is a complexly organized phenomenon. On the one hand, it is taking place in a broader context of individualization and pluralization of gender relations and biographies. These changes are conceptualized by theories such as the theory of reflexive modernization (Giddens 1991), the risk society (Bek 2000), and the second demographic transition (Van de Kaa 1987). They postulate the strengthening of individualization and of the role of choice and reflexivity in modern societies. In other words, they draw attention to the fact that all aspects of a human biography are becoming a matter of individual choice, not tradition. In the case of marriage and reproduction, this means transforming their meaning, acquiring the properties of personal, planned and conscious decisions and choices (Giddens 2004). Social theorists also draw attention to the growing importance of political discourse, expert knowledge and the media in shaping social reflexivity through the definition of normative patterns of behavior, including in the area of family and reproduction (Giddens 1991; Illouz 2008).

On the other hand, traditional gender ideology and the actors promoting this agenda are becoming more influential in the field of public policy. Conservative discourse in a variety of contexts is built around the need to tighten control over female reproduction and make women responsible for the reproduction of the nation (Yuval-Davis 1997; Roche 2016; Graff, Ratna, Walters 2019). Heterosexual marriage, which is considered a condition for high fertility, becomes the rallying point of the conservative gender order. The establishment of a conservative family and demographic agenda implies not only the normalization of heterosexual marriage as the normative model of the family, but also the accumulation of various types of resources by actors who are actively involved in conservative mobilization (regional executive authorities, the ROC (Russian Orthodox Church), GONGOs (Government-Organized Non-Governmental Organizations)). The question of how conservative mobilization is occurring in modern Russian society, how the local scenario fits into global trends, needs to be studied more carefully.

In this article, we analyze the processes of conservative mobilization as a set of propaganda ideological campaigns aimed at solving demographic problems and, above all, at increasing the birth rate, using the conservative rhetoric of the “traditional family”, “traditional family values” and traditional gender roles. We are also interested in how the anti-abortion rhetoric fits into the discourse of conservative mobilization.

To study conservative mobilization, we analyze publications in regional and federal media for 2000-2010. Publications were selected using the INTEGRUM electronic database, using the keywords “abortion”, “anti-abortion”, “against abortion”, “the right to have an abortion”. At the first stage, all publications were automatically selected according to these keywords, available in the electronic archive of the most authoritative Russian media INTEGRUM. Then, from the array of articles found by the database, the researchers removed publications that were not related to the discourse of power. That is, the sample included only publications describing the actions of representatives of regional and federal authorities and of the Russian Orthodox Church, as well as broadcast statements and speeches of representatives of authorities at all levels. In addition, the database of empirical materials included only articles for which the issue of abortion is central in meaning. The database of materials for discursive analysis was supplemented with legislative documents related to demography and health (document search was carried out using the

Consultant+ database). In addition, our database of materials includes publications representing expert discourse in the field of social sciences and demography on the problem of fertility. Discourse analysis was carried out using the thematic analysis method (Flick 2006).

CONSERVATIVE MOBILIZATION IN RUSSIAN POLITICAL DISCOURSE

Conservative mobilization in Russia in the field of family and reproduction is justified by the demographic situation that modern Russian society is experiencing (Vishnevsky 2012a, b; Vishnevsky, Zakharov 2019; Vishnevsky, Sakevich, Denisov 2018; Rivkin-Fish 2013). The institutional design and instruments of family policy in modern Russia focus mainly on monetary support for parenthood, paying less attention to the development of infrastructure for caring for children and leaving on the periphery of the state's attention the social and economic problems of parents, such as socialization in a new parental role, the social isolation of women during active motherhood, and the reduced competitiveness of young mothers in the labor market (Chernova 2012a; Chernova 2012b; Shpakovskaya 2012, 2013; Yarskaya-Smirnova 2010). The conservative ideology aimed at creating and maintaining the myth of a prosperous large family is at odds with the model of professional, family and reproductive behavior of women that developed over decades of Soviet power: a small number of children, a high level of participation of women in paid employment, high divorce rates and, as a result, a large number of maternal families, where the woman is the sole breadwinner (Zdravomyslova and Temkina 2003; Rotkirch and Temkina 2007; Pecherskaya 2012).

Conservative mobilization in its current form became possible thanks to those social, political and cultural transformations of late Soviet society in the 1980s, which in essence represented a "conservative revolution" (Magun 2010). The growing importance of conservative discourse in the domestic policy of the state was associated with the discussion of demographic problems (Sakevich, Denisov, Rivkin-Fish 2016). In 2006, President of the Russian Federation V.V. Putin, in his message to the Federal Assembly, stated that the demographic problems in society associated with a decrease in the birth rate are the result of the spread of non-family values among young people¹. This thesis justified the need to revive "traditional family values" and the "traditional family" as a necessary condition for increasing the birth rate. The concept of state policy in relation to the young family defines as the goal of family policy the popularization in society, especially among the youth, of "spiritual and moral values of the pre-revolutionary family".² A landmark event for the promotion of conservative mobilization was the establishment in 2008 of the Day of Family, Love and Fidelity (July 8) under the auspices of Peter and Fevronia, the canonized symbols of Christian marriage.

In addition to the symbolic strengthening of the traditional family, the state has made attempts to support this normative model through economic measures. For example, in 2012, additions were made to the Law on State Social Assistance, making available for "poor citizens,

¹ Message of the President of the Russian Federation to the Federal Assembly of the Russian Federation from 10.05.2006 (2006). ConsultantPlus. URL: <http://base.consultant.ru/cons/cgi/online.cgi?req=doc;base=LAW;n=60109>

² The concept of state policy in relation to the young family, approved on May 8, 2007 by the Ministry of Education and Science of the Russian Federation. URL: http://www.consultant.ru/document/cons_doc_LAW_98438/

families with many children, families raising children with disabilities...”³ grants for the organization of a family business. According to this law, for a family to be eligible for such a grant the parents must be legally married and have at least two children. In the Concept of State Family Policy in the Russian Federation until 2025⁴, the emphasis is on the economic well-being of parents as the basis for a stable family and social stability in general. Such rhetoric clearly demonstrates that, from the state’s perspective, parents (primarily mothers) are not the subject of politics, but its tool, which, if used correctly, should help maintain the effective implementation of state tasks to ensure the economic and social stability of society. State instrumentalism in relation to the family is also manifested in public discussions of the possibility of introducing such disciplinary measures as raising the divorce tax, imposing a tax on childless couples who do not have children but are able to, and reducing indications for social abortions.

ANTI-ABORTION RHETORIC⁵ AS A SYMBOLIC INDICATOR OF RUSSIAN CONSERVATISM

The gradual growth of conservative tendencies in Russian society begins in the 2000s with the active participation of the Russian Orthodox Church, which sets the framework for the discussion of moral issues, acting as the main conveyer of traditional views on relations between the sexes. The modern reading of traditional family values is essentially synonymous with the anti-abortion position. The problem of abortion is a litmus test of ongoing processes of retraditionalization of the state ideology and tools for regulating sexuality.

With the active support of the leadership of the ROC, such a measure as the “week of silence” was introduced, which has been observed since 2011. At the same time, the Law “On the Fundamentals of Protecting the Health of Citizens of the Russian Federation”⁶ was adopted, which, in particular, regulates the procedure for abortions. Women who choose to have an abortion are asked to wait between two and seven days, depending on the length of their pregnancy. During this time, they must be examined by a gynecologist, shown the fetus on an ultrasound scan, made to listen to its heartbeat, and consulted by a psychologist. The introduction of this measure provoked a controversial reaction from society. Feminist organizations opposed the use of such pressure on women, considering it a way of forcing them to make a decision to have the child⁷. Despite these protests, the “week of silence” began to be actively used in state medical institutions.

³ Federal Law «On State Social Assistance» from 17.07.1999 178-FZ. *KonsultantPlus*. URL: http://www.consultant.ru/document/cons_doc_LAW_23735/

⁴ Order of the Government of the Russian Federation from 25.08.2014 1618-r «On approval of the Concept of the State Family Policy in the Russian Federation for the period up to 2025». URL: http://www.consultant.ru/document/cons_doc_LAW_167897/

⁵ By anti-abortion rhetoric, we mean a system of interpretations arguing a total prohibition or substantial restriction of a woman’s right to a medical procedure for the termination of pregnancy.

⁶ Federal Law «On Fundamentals of Health Protection of Citizens of the Russian Federation» from 20.11.2011 323-FZ. URL: http://www.consultant.ru/document/cons_doc_LAW_121895/

⁷ Radulova N. (2011). My body is my business. *Ogoniok*, 36, 52. URL: <https://ww.kommersant.ru/doc/1763592>

Since about the beginning of the 2010s, there has been an active political discussion about restricting access to abortions (Sakevich, Denisov, Ryvki-Fish 2016). The leadership of the Russian Orthodox Church has repeatedly spoken out in favor of withdrawing abortions from the mandatory health insurance system. It regularly appeals to representatives of the federal government with a demand to restrict the reproductive rights of women, leaving the possibility of abortion only on a paid basis. This position is supported by a number of conservative officials. The most striking example is the position of the Commissioner for Children's Rights, A. Kuznetsova: *"I dream of a time when not a single woman intends to or even thinks of having an abortion."*⁸ For this, in her opinion, it is necessary to provide more help to women in crisis and planning to have an abortion. In addition to a helpline and legal and psychological assistance to women, the children's ombudsman has ensured the inclusion of lessons on family happiness (the "Family Studies" course in general education schools) in the Plan for the Decade of Childhood, which is being implemented in Russia from 2018 to 2027.

A more moderate position, not supporting a complete ban on abortion, is taken by representatives of the Ministry of Health and the medical community, who fear that the ban will lead to an increase in the number of criminal abortions and negative consequences: a rise in maternal and infant mortality⁹. Moreover, the economic feasibility of a ban, which the conservatives insist on, is denied by the leadership of the Ministry of Health.

In September 2018, the Investigative Committee (IC) of the Russian Federation took the initiative to introduce the term "human fetus" into Article 124.1 of the Criminal Code of the Russian Federation in order to criminalize the death of a child before birth. In the current version of the Criminal Code of the Russian Federation, such a term does not exist and the human fetus is not a subject of criminal law. The position of the Investigative Committee of the Russian Federation is based on the fact that *"recently we have received many complaints, and we are beginning criminal procedures and procedural checks on the fact of death of a fetus, including during childbirth. Often, forensic experts establish a direct causal relationship between the actions of doctors and the death of the fetus. But since the fetus is not yet separated from the mother, then, according to the law, death before the moment of birth does not fall under the articles of the Criminal Code, and we cannot hold doctors accountable for improper provision of assistance during obstetrics and are forced to stop criminal prosecution"*¹⁰. The professional medical community strongly criticized this proposal, citing the possibility of unreasonable criminal prosecution of doctors. Despite the fact that, officially, the proposal of the IC to make the human fetus a subject of criminal law is associated with attempts to introduce punishment for the negligence of doctors and is not connected with anti-abortion rhetoric, in practice, the introduction of this legal norm can be used by opponents of abortion as a mechanism for putting pressure on doctors and forcing them to renounce this medical procedure.

⁸ Anna Kuznetsova told about plans to solve the problem of abortion in Russia (2019). RIA Novosti, 10.01.2019. URL: https://ria.ru/20190110/1549193777.html?fbclid=IwAR3hCNCJix0FJas1jcHjc1_xaBugG8XiVHjAgZsB-Hvi_i21MIXQ

⁹ Veronica Skvortsova: in our country there is already a negative experience of a complete ban on abortion. TASS. Interview. 3.10.2016. <https://tass.ru/interviews/3672086> (Date of circulation 01.07.2021)

¹⁰ The Investigative Committee on the defense of rights. *Med Novosti*, September 13, 2018 <https://medportal.ru/mednovosti/sledstvennyy-komit-et-na-zaschite-prav-ploda/> (Address date 26.03.2021).

In August 2018, a deputy of the Legislative Assembly of St. Petersburg, A. Tsivilev, submitted a proposal to the Ministry of Health of the Russian Federation to prohibit unmarried women from using the IVF procedure. The deputy believes that this procedure should be available only to those women who are in an officially registered or civil marriage. At the moment, the Ministry of Health is considering this proposal. Despite the fact that this initiative is not directly related to a ban on abortion, it nevertheless also illustrates the conservative approach in modern Russian family policy, the purpose of which is not just to increase the birth rate, but to support the birth of children from the "correct" parents from the point of view of the state.

On January 25, 2019, State Duma deputy V. Milonov took the initiative to equate abortion with murder and introduce criminal punishment for it: *"We mustn't hide behind neutral terms like "termination of pregnancy" or "unwanted fetus." This is the murder of a person in the womb, period"*¹¹.

According to statistics, there has been a decrease in the number of abortions. In 2010, 1,186,100 thousand abortions were registered in Russia, and in 2019 the number was already down to 621,700 (including miscarriages)¹². Deputy Minister of Health T. Yakovleva stated that informing women had had an impact on the situation with abortions: centers for psychological and social support for pregnant women were organized in each antenatal clinic^{13, 14}. Demographers, however, cite the spread of modern contraception among Russians as the main reason for the decline in the number of abortions (Vishnevsky, Denisov, Sakevich 2017).

On February 13, 2019, a working group headed by P. Tolstoy was created in the State Duma of the Russian Federation to discuss legislative initiatives proposed by the Russian Orthodox Church. One of the key issues is the proposal to withdraw abortions from the mandatory health insurance system, which the leadership of the Russian Orthodox Church regularly submits to the authorities. The rhetoric of the head of the Russian Orthodox Church is built around legal (the right of an unborn child to life) and economic (the use of taxpayers' funds) arguments. During the opening of the Christmas parliamentary meetings in the State Duma of the Russian Federation, the head of the Russian Orthodox Church called paying for abortions for non-medical reasons (a figure of 5 billion rubles a year was named) a problem for taxpayers¹⁵. In this regard, he noted that the right to life of an unborn child should be recognized: "Let me remind you that the right to life, guaranteed by the Constitution of Russia, should imply its protection from the moment of

¹¹ Milonov proposes to equate abortion with murder (2019). RIA Novosti, 25.01.2019 URL: <https://ria.ru/ria.ru/20190125/1549887529.html?fbclid=IwAR1Ktf5pIc4-REqvoI-abn4CzMZCbgbrbvvWmFGILVPK0vjCP8pIA>

¹² Unified Interdepartmental Information and Statistical System (EMISS). URL: <https://fedstat.ru/indicator/31595>

¹³ In the Ministry of Health opposition to the prohibition of abortion (2019). Pravmir, 15.02.2019. URL: <https://www.pravmir.ru/v-minzdrave-vyistupili-protiv-zapreta-abortov/?fbclid=IwAR3mDsIWBM-czxPx63WNf5bYb24OXcfTEtKECjGmLmWMMMMMMMEb5c>

¹⁴ In the Ministry of Health opposition to the prohibition of abortion (2019). Pravmir, 15.02.2019. URL: <https://www.pravmir.ru/v-minzdrave-vyistupili-protiv-zapreta-abortov/?fbclid=IwAR3mDsIWBM-czxPx63WNf5bYb24OXcfTEtKECjGmLmWMMMMMMMEb5c>

¹⁵ The speech of His Holiness Patriarch Kirill at the opening of the VI Christmas parliamentary meetings in the Federation Council (2016). International Christmas Educational Readings, 29.01.2016. URL: <https://mroc.pravobraz.ru/slovo-svyatejshego-patriarxa-kirillana--otkrytiiv-rozhdestskix-parlamentskix-Slamentskix-Trech/Trechvversecofederacii/>

conception. Any form of encroachment on a person's life, including abortion, is a violation of this rule.” The head of the Russian Orthodox Church regularly makes proposals to remove from mandatory health insurance abortions not performed for medical reasons. So, for example, in his speech at the opening of the Christmas parliamentary meetings in the State Duma of the Russian Federation on January 30, 2019, he said: *“I have to say that there have been no legislative changes in this matter. The taxpayer still pays for something that is not and cannot be medical care: for getting rid of an unwanted child for free”*¹⁶.

Responding to a request from the conservative lobby, the Ministry of Health has revised the list of indications for late abortion under mandatory health insurance. In December 2020, a draft order “On approval of the list of medical indications for artificial termination of pregnancy” was posted on the Federal Bills Portal, which reduced the list of such indications in terms of both the woman’s health and fetal disorders. This draft was submitted for public discussion and drew criticism from feminist-oriented public figures and organizations¹⁷, while medical experts argued that significant changes had not been made to the pre-existing list of indications (adopted in 2007)¹⁸.

The success and effectiveness of the ROC as a “developer” of conservative ideology is due to the status of this actor in the modern context of state policy, which gives it access to institutional tools for the (re)production of a new tradition, primarily through the ability to influence the position of federal and regional authorities. At the same time, the marginalization of the feminist agenda in the official ideology and the weak position of feminist organizations opposing the restriction of women's reproductive rights significantly reduce the ability of these organizations to win in the public policy struggle to define tradition. In this situation, representatives of the medical professional community, as well as the Ministry of Health, who take a more moderate position and do not support a complete ban on abortion, act as a deterrent. Their argumentation is not related to moral categories and does not pretend to redefine the semantic meanings of this reproductive choice. The expert position is related to the fear that a complete ban will lead to an increase in the number of criminal abortions and their negative consequences for women's health.

GOVERNMENT-SPONSORED NON-GOVERNMENTAL ORGANIZATIONS (GONGOS) AS PROMOTERS OF THE ANTI-ABORTION AGENDA

The position of the state as the most significant political actor with a large amount of various resources is the key to setting the agenda, forming and regulating the activities of NGOs in the field of birth control. In the 1990s and early 2000s, state support at the ideological, institutional

¹⁶ Patriarch Kirill responds to opponents of the withdrawal of abortion from MHC (2019). *Regnum.ru*, 30.01.2019. URL: <https://regnum.ru/news/society/2562701.html>

¹⁷ «Biopolitics»: Oksana Pushkina criticizes draft order of the Ministry of Health on restriction of women’s rights to abortion by a list of pathologies (2020). *Novaya Gazeta*, 14.12.2020.

URL: <https://novayagazeta.ru/news/2020/12/14/166411-biopolitika-oksana-pushkina-raskritikovala-proekt-prikaza-minzdrava-ob-ogranichenii-prav-zhensna-abortychm>

¹⁸ MOH: Draft Order on List of Medical Indications for Abortion does not abolish termination of pregnancy at the woman’s request (2020). *Novaya Gazeta*, 14.12.2020.

URL: <https://novayagazeta.ru/news/2020/12/14/166431-minzdravproekt--prikazaýo----perechne-meditinskih-pokazaniyydlya-aborta-Rotmenyaetyvani-beremennyzhostshiny chiny>

and financial levels made it possible to create a network of family planning centers and to develop programs for sexual education of adolescents and youth. During this period, NGOs supported by foreign foundations were also involved in addressing the high abortion rate.

Since the mid-2000s, the legal framework for regulating and financing the activities of NGOs (for example, the organization of the Presidential Grants Fund), primarily in the social sphere, has changed (Owen, Bindman 2017: 100). Along with this, sanctions were imposed for receiving funding from a number of foreign sources, which led to a situation where affiliation with the state and the Russian Orthodox Church and financing from state and oligarchic funds became the only possible strategy for maintaining the activities of NGOs. As shown above, anti-abortion rhetoric as one of the key tools for promoting traditional values and the “traditional family model” gives impetus to the development of a number of conservatively oriented organizations and initiatives. In the scientific literature, the abbreviation GONGO is used to refer to such public organizations created on the initiative and at the expense of the state (Hasmath, Hildebrandt, Hsu 2019).

One of the largest and most influential GONGOs that openly declare their anti-abortion position is the Saint Andrew the First-Called Foundation, which has been implementing the Sanctity of Motherhood¹⁹ program since 2006. Under its auspices, regular forums are held (“The Sanctity of Motherhood”, “Large Family and the Future of Humanity”) in which representatives of the federal and regional authorities, leading religious denominations and NGOs that support traditional family values take part. Close cooperation with the authorities allows the program staff to participate in the development of political documents in the field of family policy, for example, to introduce initiatives into the concept of family policy in the Russian Federation, to lobby for the introduction of the Family Studies program into the educational standards of secondary schools.

One of the priority projects implemented by the foundation is the You Are Not Alone program, which is focused on supporting women who, “due to life difficulties, find themselves in a situation of reproductive choice.” This project is focused not only on working with women; its task is to ensure the inclusion of psychologists in obstetric institutions. Since 2016, together with the Ministry of Health of the Russian Federation, the foundation has also been holding the All-Russian competition “The Sanctity of Motherhood”, which is aimed at professionals - health workers, psychologists and social workers who oppose abortion. At the end of each year, the results of the work are summed up and the winners of the competition are awarded: specialists who were able to dissuade the largest number of women from having abortions. Thus, 300 people from 60 regions took part in the 2018 competition. One of the nominations was won by a social worker from the perinatal center in the city of Tobolsk, who was awarded the “Sanctity of motherhood” medal for being able to persuade 40 women who applied to the center to decide to keep their pregnancy²⁰.

¹⁹ Holiness of Motherhood. Foundation of Apostle Andrew the First Named <http://fap.ru/programs/svyatost-materinstva/> (date of address 16.06.2021).

²⁰ Inga Yagunova, from Tobolsk, over 1.5 years dissuaded 40 women from abortion (2018). Ural meridian. URL: https://ural-meridian.ru/news/89338/?fbclid=IwAR04epZ9VCXwtn5mm-4LDV9W0gZM_9Nwc_uWdWT5A7m7GYW_U6LkHSAj70

The Fund for Social and Cultural Initiatives (President of the Fund - Svetlana Medvedeva), which has significant financial and administrative resources, has for some years been holding the "Give Me Life!"²¹ event, which not only holds educational events that talk about the dangers of abortion, but supports regional initiatives to introduce a moratorium on abortions. The moratorium, as a rule, is timed to coincide with the Day of Family, Love and Fidelity, which has been celebrated in Russia since 2008. This action is supported by the Ministry of Health of the Russian Federation.

Another example of a GONGO is the all-Russian public movement "For Life!", which was created around the festival of the same name and has been held since the early 2010s²². Geographically, the movement covers 103 regions and includes representatives of the Russian Federation, Ukraine, Belarus and Serbia. The main goal of the movement is the protection of "life" and "family values", which is understood as the fight against abortion by means of propaganda. The movement is actively involved in the development and promotion of bills to protect the "life of children from the moment of conception." An important direction of the movement's work is anti-abortion counseling: persuading women to refuse abortion, training specialists who support the anti-abortion position, and disseminating visual materials about the dangers of abortion.

A major propaganda campaign of this movement was the collection of signatures in support of a petition to ban abortion (February 9, 2016, Initiative No. 87F21245). The organizers claim that they were able to collect 1 million signatures, including the approval of the head of the Russian Orthodox Church²³, which allows them to use the Decree of the President of the Russian Federation of March 4, 2013 No. 183 "On the consideration of public initiatives sent by citizens of the Russian Federation using the Internet resource "Russian Public Initiative"²⁴. According to the Decree, such petitions (provided that they were posted on the website of the Russian Public Initiative) should be considered by special expert groups, who then recommend them for consideration by the relevant authority, including the State Duma. However, on the website of the Russian Public Initiative, where this petition is published, it is indicated that 100,192 votes "for" and 2,972 votes "against" were collected²⁵, as a result of which government experts deemed it inadvisable, even though they approved the idea of reducing the number of abortions.

Another example of advancing the anti-abortion agenda with the participation of a GONGO is the establishment by the Women for Life Charitable Foundation in December 2018 of the Ambassador for Life Before Birth Award²⁶. This is an award in the form of a badge presented to those who oppose abortion. One of the activities of the foundation is the project "Saved": *"A single word can save a life. Every day we conduct Internet monitoring and find women who are thinking about having an abortion. Under the guidance of perinatal psychologists, volunteers talk to such*

²¹ Give Me Life. Foundation of socio-cultural initiatives. URL: <http://www.fondsci.ru/projects/social/367/>

²² Russian Public Movement «For Life». URL: <https://rusprolife.ru>

²³ Petition for the protection of children before birth. All-Russian public movement «For life». URL: <https://rusprolife.ru/petitsiya-za-zapret-abortov/>

²⁴ Decree of the President of the Russian Federation dated March 4, 2013. 183 «On consideration of public initiatives directed by citizens of the Russian Federation using the Internet resource "Russian Public Initiative". URL: <http://base.garant.ru/70326884/#ixzz6xwgVCXUj>

²⁵ Payment by the state of abortion only on medical grounds. *Russian social initiative*. URL: <https://www.roi.ru/21245/>

²⁶ Foundation award. *Charity fund «Women for life»*. URL: <https://womenprolife.ru/projects/17>

women, trying to persuade them to keep the child. If targeted assistance is needed, the Fund tries to provide it. The victories of our volunteers are decisions in favor of life. We publish screenshots with good news in our social networks”²⁷. There is no information on the foundation's website about how the women are found and monitored, or what kind of work is done with them; however, reports on the work are regularly published, where you can find out that: “46 babies were saved in May. A total of 2186 saved (June 2021)”, and users can also share “their story” about how women kept their child thanks to the fund.

The promotional video “We defeated the fascists! Let's beat the abortionists!”²⁸, released in the fall of 2018 by the “Family and Demography Foundation in the Name of Saints Peter and Fevronia” (its first head was the now deceased Archpriest Dmitry Smirnov), is a good example of an anti-abortion propaganda initiative. This video is interesting for two characteristic features. First, in social advertising promoting fertility (for example, posters in the Moscow metro reading “The country needs your records”), the only parent is the mother. The figure of the father is not presented either on the poster or in the video. In essence, it is a modern version of the Soviet gender contract, when motherhood was a woman's social duty. Secondly, there is the ad's slogan, as well as a symbolic reference to the Immortal Regiment campaign, which takes place annually on May 9 in all cities of the country. The use of the symbols of the most important official holiday of modern Russia - Victory Day - as well as the comparison of abortion supporters with the Nazis, reflects the position of the authorities (state and church) on demographic problems as a national security problem, the threat of which is equated with the threat of losing the country during World War II.

Thus, anti-abortion rhetoric begins to flourish with the help of NGOs whose activities are legitimized and supported by the state and the Russian Orthodox Church. GONGOs act as conductors of a conservative ideology, which allows them to accumulate ideological and material support, involving women in their initiatives and creating the appearance of support for traditional family values by the population. In their propaganda campaigns, they use war mobilization rhetoric, urging women to refuse abortion in order to “save the nation” and “advance the national interest.”

INSTITUTIONAL NETWORKS TO SUPPORT ANTI-ABORTION POLICY AT THE REGIONAL LEVEL

In this section, we will show how institutional networks for supporting anti-abortion policy are being formed at the regional level as an indicator of the conservative mobilization actively deployed in recent years at the national level. For regional authorities, improvement of priority demographic indicators is one measure of the effectiveness of their activities. The cooperation of executive authorities with conservatively oriented actors, primarily the ROC, allows the regions not only to pursue a family policy that does not contradict the priorities set at the national level,

²⁷ Save the person inside you. *Charity fund "Women for life"*. URL: <https://womenprolife.ru>

²⁸ We defeated the fascists! We'll defeat the abortionists! *Youtube*. URL: <https://www.youtube.com/watch?v=aqnSOL1rrzY>

but also to accumulate additional resources for the implementation of such projects. To understand how conservative mobilization is developing in modern Russian society, how anti-abortion rhetoric is built, and which actors are involved in shaping and promoting the anti-abortion agenda, we analyze a number of regional initiatives that seem to be the most significant in terms of creating forms of cooperation between state and religious bodies.

Local authorities have taken a creative approach to the development of measures for the practical implementation of the decisions of the Ministry of Health on the prevention of abortion. For example, in the Volgograd region, a mobile abortion prevention service was created under the Volgograd diocese, which included a priest and representatives of the regional committees for social protection of the population and health care. The purpose of the service was to assist in the promotion of family values, the prevention of abortion and the organization of pre-abortion counseling. It was assumed that the employees of the service would meet with the heads of medical institutions, including antenatal clinics and maternity hospitals, as well as families who had decided to have an abortion, in order to dissuade (primarily women) from performing this medical procedure. The question of where the employees of the mobile service receive information about specific families that decide to terminate a pregnancy is not discussed²⁹.

In the Far East, increasing the birth rate and preventing abortions are priority areas for regional demographic policy. In the region of Khabarovsk, the number of women who refused abortions increased by 22% over the year of operation, an experience assessed as successful, hence which should be extended to other regions. Work on the prevention of abortion, according to O. Ponomareva, an expert of the Committee on Family, Women and Children of the State Duma of the Russian Federation, involves, firstly, counseling of women, including online (webinars), by family psychologists and other specialists, and secondly, *“monitoring among the health workers of the region, who make decisions on population policy to one degree or another. I am sure that among them there are many who maintain a high level of tolerance for abortion. If they believe that this is acceptable, then this opinion is extrapolated to other specialists. We need to actively work here to prevent this from happening. We are ready to help, and I am sure that in a year we will already see positive results”*³⁰.

In 2018, a four-day moratorium (temporary ban) on abortions was introduced in three regions of Russia³¹: in Primorsky Krai from July 31 to August 3, and in Yakutia and the Ryazan region from July 9 to 15. A similar initiative was held as part of the Give Me Life! campaign, organized by the Svetlana Medvedeva Foundation for Social and Cultural Initiatives together with the Ministry of Health of the Russian Federation.

In Krasnoyarsk, antenatal clinics are implementing the Doctors for Life project, which is also aimed at preventing abortions. In March 2018, Krasnoyarsk Maternity Hospital No. 4 received

²⁹ Lopatin V. (2019). In the Volgograd diocese, a mobile service for the prevention of abortion is created. *NovostiVolgograd.ru*, 04.02.2019. URL: <https://novostivolgograda.ru/news/society/04-02-2019/v-volgogradskoy-eparhii--sozdali-mobilyu-sluzhbu-pootvrovabortionov>

³⁰ The number of abortions on Kolyma will be reduced through webinars and medical supervision (2018). *MagadanMedia*, 10.12.2018. URL: <https://magadanmedia.ru/news/768149/?fbclid=IwAR3-ugVFlyW-910SGoBbmQW8-kL4y0i2HKwoA8ZmzP1fWmXk22NSY8>

³¹ Mishina V. (2018). Moratorium on abortion is announced for educational purposes. *Kommersant*, 138. URL: <https://www.kommersant.ru/doc/3706048>

a grant to conduct seminars aimed at saving lives as part of the Orthodox Initiative 2017-2018 competition, held under the auspices of the Russian Orthodox Church. At the end of December, the regional Ministry of Health awarded the winners of the competition - doctors from 15 antenatal clinics who had dissuaded the women who turned to them from having an abortion - with an angel of beads made by schoolchildren. The number of awards corresponded to the number of "lives saved"³².

Starting December 1, 2018, in the Penza region, women applying for a referral for an abortion under mandatory health insurance must go before a "commission" consisting of the head of the district, the deputy for social issues, the head physician, a psychologist, and representatives of women's organizations. The result of the work of the commission should be the decision of the woman to keep her child. The regional authorities consider this as work aimed at preventing abortions and refer to the "successful" experience of the Nizhnelomovsky district of the Penza region, where, in 2018, of 50 women who had decided to terminate their pregnancy, 20 refused to have an abortion after the work of the commission.

At the end of January 2019, the governor of the Penza region, Ivan Belozertsev, threatened to dismiss the heads of municipalities if they refused to hold personal meetings with women wanting to have an abortion. According to him, officials are obliged to find out the reason for such a decision: *"Every woman who has announced her decision to terminate a pregnancy should meet and talk with the head physician of the antenatal clinic, a psychologist, representatives of the active women's community and, without fail, the head of the municipality in order to find out the reasons for such a decision. If it is a question of a difficult financial situation or poor living conditions, help to find a way out"*³³.

In 2019, a campaign was begun in Izhevsk to open anti-abortion offices based on state medical institutions. This form of work with women who have decided to have an abortion was developed with the support of the Ministry of Health of Udmurtia and the Udmurt diocese. After contacting a doctor, a woman should undergo a consultation in an anti-abortion office, where consulting doctors will select, depending on the woman's particular life situation, the appropriate forms and method of assistance to keep the child: humanitarian, legal, psychological, temporary shelter or employment³⁴.

Similar anti-abortion campaigns can be found in almost all Russian regions. Their analysis shows that, at the regional level, representatives of state authorities closely cooperate with the Russian Orthodox Church, implementing joint anti-abortion initiatives. At the same time, the ROC acts here as a partner of local authorities and the ideological curator of medical institutions. In contrast to the federal level, where the ideological landscape is more diverse, at the regional

³² Organizers of the project «Doctors for Life» award the best doctors who motivate women to remain pregnant (2018). *Ministry of Health of the Krasnoyarsk Krai*, 21.12.2018.

URL: <https://kraszdraz.ru/news/7016>

³³ Governor of Penza orders officials to dissuade women from abortion (2019). Interfax, 21.01.2019. URL: <https://www.interfax.ru/russia/647023> (Date of circulation 26.03.2021).

³⁴ Izhevsk opens first anti-abortion counseling office (2019). *Udm-info.fu*, 06.03.2019. URL: <https://udm-info.ru/news/society/06-03-2019/v-izhevskotkrylsya-pervyy-kabinet-protivoabortnogo-konsultirovaniya>

level criticism of the conservative position of the ROC in relation to reproduction and the family by NGOs and activists is little noticed.

ATTEMPTS AT SCIENTIFIC LEGITIMIZATION OF ANTI-ABORTION POLICY

In general, in the Russian academic discourse it is basically possible to distinguish two main points of view on reproduction issues, which are inscribed in a broader context for assessing the current state and prospects for the development of the family. These can be called the “alarmist” and the modernization points of view, and are presented mainly in the works of such authors as the sociologist of the family A. Antonov and the demographer A. Vishnevsky, respectively. The “alarmist” position is based on the idea that the family is in a state of deep crisis. According to Antonov, the transformation of the family that has taken place in the country is a particular expression of the global crisis of the social institution of the family, which is seen as *“the vices of the social organization of the market-industrial type”* (Antonov 2005: 579). The crisis of the family, one of the most striking indicators of which is a decrease in the birth rate, among other reasons as a result of abortions, is associated with a weakening of the social and normative regulation of the family, a transformation of cultural symbols and patterns, and a decrease in the value of marriage, of a family with children and intra-family unity. The “modernization” position, on the contrary, asserts that the transformation of marital and reproductive behavior is carried out within the framework of a broader process of family modernization and reproduction, of *“a crisis in its traditional form”, a transition to a new type of family* (Vishnevsky 2006: 239). A. Vishnevsky believes that there are no special grounds for dramatizing the current “family” situation in Russia. There are no extraordinary changes in the mass demographic behavior of people; the frequency of marriages and divorces and the birth rate remain within the range of fluctuations that have been observed for more than a decade, while the number of abortions, on the contrary, tends to decrease.

The most striking example of the academic legitimization of anti-abortion policy, presented as a tool for achieving national security, is the article “Abortion Legislation: World Trends and National Interests”, published in 2018 in the scientific journal Sociological Research (Zhukov 2018) by Academician of the Russian Academy of Sciences V. Zhukov. The publication of this article caused quite a stir in the professional community, which called into question the legitimacy of a scientific journal publishing such an odious text on its pages. Critical remarks about the author of the article and the editors of the journal concerned the low scientific quality of the text and its frank ideological bias, as well as the very fact of publishing such a statement on the pages of a scientific publication. However, the text of the article itself (its title and content) is an extremely revealing example of how the “pro-life” position is articulated in academic discourse, of the kind of rhetoric in which the problem of banning abortions in modern Russia is framed: as a protection of national interests.

The main pathos of this article is that abortion is infanticide, the great evil of the 21st century. The author criticizes the liberal legislation in the field of women's reproductive rights in force in the Russian Federation and tries to prove that a ban on abortions will lead to unambiguously positive effects in all areas of the socio-political and economic life of society. Moreover, V. Zhukov argues that “further liberalization of legislation can bring significant damage

to the socio-political, financial, economic, demographic, and intellectual development of the country and affect the *electoral behavior of the population* (italics - Zh.Ch., L.Sh.)” (Zhukov 2018: 113). In this regard, not only does the argumentation rely on the demographic indicators traditional for supporters of the ban on abortion, but it also emphasizes the applied nature of the problem: to gain control over the behavior of citizens, the loss of which is viewed as negatively impacting the ability of the authorities to manipulate public opinion and preserve the ruling regime’s social support base.

In an attempt to provide an analysis of international and Russian legislation, the author of this article unequivocally defends his anti-abortion position, making unsubstantiated allegations and providing baseless statistical data (Timoshenko 2019: 173). In particular, Zhukov claims: *“More than 50 million abortions are performed in the world every year. In other words, the same number of people are killed in the wombs of potential mothers every year as in the 6 years of World War II”* (Zhukov 2018: 113). Thus, the author introduces a new interpretation of the beginning of a human life, of the status of the embryo, and tries to justify the lack of a woman's right to make a reproductive choice.

The very comparison of data on the number of abortions with the number of victims of the Second World War is extremely revealing for understanding how the problem of abortion is framed in modern Russian discourse. Since the 2000s, demographic problems have been viewed by supporters of the alarmist position in terms of a national catastrophe, the extinction of the Russian nation, which is typical of the official discourse of the state³⁵. However, relatively recently, the decline in the birth rate, which is seen by the supporters of this position solely as a consequence of abortion, began to be viewed through an appeal to the Great Patriotic War, the construction of the memory of which is the foundation of the ideological myth of Putin's ideology. Stalin's abortion ban policy is assessed by the author of the article as unambiguously positive, to have led to victory over fascist Germany: *“Goebbels once concluded that Germany would never defeat a people in which 90% of the women retain their virginity before marriage. In Soviet times, a significant part of family traditions were preserved, the pregnancy of schoolgirls was extremely rare and was perceived as an emergency by the family, the school, and the public”* (Zhukov 2018: 115). It should be noted that the comparison of supporters of the right to abortion with fascists is a fairly common rhetorical device used in official discourse, in speeches by traditionalists and the promotion of traditional family values (the social ad video “We defeated the fascists, we will defeat the abortionists”). In January 2019, at a meeting with employees and students of medical universities, the head of the Russian Orthodox Church compared women who had an abortion for medical reasons with the Nazis: *“By killing a fetus that is somehow defective, we are killing a disabled person. Only Hitler did this – for him only the healthy were meant to live.*

³⁵ Thus, in the Address of the President of the Russian Federation to the Federal Assembly in 2000, it was stated: We, the citizens of Russia, are becoming fewer each year. The country’s population has been declining by 750,000 on average every year for several years. And according to the projections, and the projections are based on real work, real work of people who are proficient in this, who have devoted their whole life to it, in 15 years Russians there may be 22 million fewer Russians. I ask that you think about this figure: one seventh of the population. If the current trend continues, *the survival of the nation will be threatened* (cursive - Zh.C., L.S.). We are really in danger of becoming a decrepit nation. Today’s demographic situation is alarming» (Message from the President of the Russian Federation to the Federal Assembly from 15.01.2020 (2020). *ConsultantPlus*. URL: http://ww.tant.ru/document/_consc_LAW_342959/#dst0).

Tweaking the human race just because the embryo doesn't make a good acrobat is a crime against humanity.³⁶

When arguing his anti-abortion position and the need for legislative tightening of reproductive rights, Zhukov is trying to rhetorically "play on the legal field" by referring to the articles of the Constitution of the Russian Federation. Thus, Art. 28 guarantees citizens freedom of conscience, including the right to freely have religious and other beliefs and act in accordance with them. But according to the author, this constitutional right is systematically violated in the case of gynecologists: *"However, recommending and performing abortions is a job requirement of gynecologists (...) training and working in "obstetrics and gynecology" becomes impossible for people whose beliefs do not allow abortion for moral, religious, scientific and other convictions, because such persons are not able to fully exercise their constitutional right to freely dispose of their abilities to work, freely choose their occupation and profession, as guaranteed by Art. 37 of the Constitution of the Russian Federation"* (Zhukov 2018: 120).

V. Zhukov believes that it is the state that should take measures to tighten access to the abortion procedure. At the same time, the rhetoric used by the author remains within the framework of paternalistic family policy and the etocratic gender order of the Soviet period. His position regarding women is highly instrumental: they are a demographic resource of the country, whose mobilization will once again make it possible to overcome the negative demographic situation in Russia: *"If the Government of Russia, the media and society take the measures necessary to strengthen and consolidate the authority of the woman-mother at the legislative level, show state care for her offspring, assume responsibility for raising a child born to a woman and educate him in the spirit of respect for the mother, take a number of measures to reduce maternal and infant mortality, then the number of abortions can be reduced by 2-3 times. Further, the arithmetic is simple: if you save the lives of at least 1.5–2 million people by persuading women to refuse abortion, and add to this 1.5–1.9 million babies born annually, then Russia will get out of the demographic hole, population growth will acquire a sustainable character, and by 2025 165 million people will live in the country"* (Zhukov 2018: 122). This concluding paragraph of the article is indicative of the articulation of the conservative position as presented by an expert and reflected in the official rhetoric of the state regarding demographic problems in general. The author sees the state as the main actor capable of determining the reproductive choice of women. Achieving quantitative indicators (the population required for the state) is possible only through state care for the woman-mother.

In general, there is a polarization of views on marital and reproductive behavior in academic discourse. The conservative-alarmist approach is not dominant. At the same time, its conceptual and ideological coinciding with the conservative official discourse conveyed by the state and the Russian Orthodox Church is noticeable. The ideological campaign to revive traditional family values and fight against abortion, homosexuality and feminism has recently not only gained momentum, but is also supported by relevant expert statements by scientists that demonize these phenomena and consider them dangerous for Russian society.

³⁶ «Only Hitler killed the disabled!»: The Patriarch condemns abortion due to physical defects (2019). *Komsomolskaya Pravda*, 29.01.2019. URL: <https://www.kp.ru/daily/26933/3983819/>

CONCLUSION

Thus, conservative mobilization begins with federal legislation and statements by representatives of the central government. In essence, these initiatives are linked to the declaration that demographic problems and population decline are a threat to national security. They are aimed at regulating citizens' intimate behavior, their physicality and "moral character". According to M. Foucault, the interest of political power in health, reproduction and demographic characteristics of the population is associated with the transformation of forms of power and control in modern societies. The conductors of this power are experts, the media and various forms of local self-government. Foucault calls these forms of control biopower. Biopower refers to techniques to normalize and monitor human bodies to make them more docile and productive (Foucault 2003). Governance through the media, social policy, education and health care has an implicit interest in the formation of individuals of a special type (Lawler 2000: 2). Such individuals do not act on the basis of external directive control, but can control their behavior independently, focusing on given patterns of normality. In this sense, the ultimate goal of conservative mobilization is controlled Russian citizens, indoctrinated by the ideology of a family lifestyle and having many children. At the same time, the main pathos of the discourse of conservative mobilization associated with the issue of abortion is directed at women. This discourse presents women as responsible for fertility rates, the reproduction of the nation and national security (Rivkin-Fish 2010). It aims to control women's physicality and sexuality by turning them into "moral subjects" who subordinate their behavior to the national interest (Paxon 2004). Since these interests are formulated in terms of safety and protection of the interests of the nation, i.e., use militaristic terminology, the discourse on the right to abortion becomes essentially a form of ideological production of the patriarchal gender order (Connell 1987).

The change in the position of the state regarding abortion is most clearly seen starting from the mid-2000s, when conservative rhetoric becomes dominant, and is also reinforced by changes in legislation regulating various areas: family policy, child protection, health care, and the conditions for the activities of NGOs. At the same time, the main ideological debate at the federal level is around the preservation/exclusion of medical abortion procedures from the mandatory health insurance plan. Numerous legislative initiatives of the State Duma, with which representatives of the Russian Orthodox Church and Orthodox-oriented experts agree in their public statements (for example, statements by urologist and reproductive health specialist, Corresponding Member of the Russian Academy of Sciences, Professor O. Apolikhin), do not find support from the Ministry of Health and are rejected. Nevertheless, the entire set of statements, initiatives, and regional campaigns can be viewed as a conservative mobilization aimed at overcoming the "problem of low fertility" by promoting traditional family values and reducing tolerance for abortion. Various actors (representatives of the federal and regional authorities, specialized NGOs, representatives of the Russian Orthodox Church) are actively involved in promoting the anti-abortion agenda, which allows them to be included in institutionalized support networks and gain access to funding under relevant programs (for example, a program aimed at reducing the number of abortions within the framework of the Decade of Childhood). Thus, conservative mobilization presupposes not only the formation of an ideological framework, but also the development of institutional mechanisms for its implementation.

ACKNOWLEDGMENTS

We would like to express our gratitude to anonymous reviewers for careful reading of the text, as well as valuable remarks and comments which allowed us to significantly improve the article. This work was inspired to a large extent by the works of A.G. Vishnevsky, by his scientific and personal position in relation to the issues under study.

REFERENCES

- Antonov A. (Red.) (2005). *Sotsiologiya sem'i: Uchebnik*. 2-e izd., pererab. i dop. Moscow: Infra-M. (In Russ.).
- Bek U. (2000). *Obshchestvo riska. Na puti k drugomu modernu*. MOSCOW: Progress-Traditsiya. (In Russ.).
- Chernova Zh. (2012a). New Pronatalism? Family Policy in Post-Soviet Russia. *REGION: Regional Studies of Russia, Eastern Europe, and Central Asia*, 1(1), 75–92. (In Russ.).
- Chernova Zh. (2012b). Balans sem'i i raboty: politika i individual'nyye strategii materey. *Zhurnal issledovaniy sotsial'noy politiki*, 10(3), 295–308.
- Connell R. (1987). *Gender and power: society, the person and sexual politics*. Stanford: Stanford University Press.
- Flick U. (2006). *An Introduction to Qualitative Research*. London: Sage Publications.
- Foucault M. (2003). The Birth of Biopolitics. In *The Essential Foucault: Selections from Essential Works of Foucault 1954–1984* (pp. 202–207). London: The New Press.
- Giddens A. (1991). *Modernity and Self-Identity: Self and Society in Late Modern Age*. Cambridge: Polity Press.
- Giddens A. (2004). *Transformatsiya intimnosti. Seksual'nost', lyubov' i erotizm v sovremennykh obshchestvakh*. Saint-Petersburg: Piter. (In Russ.).
- Graff A., Ratna K., Walters S. (2019). Introduction: Gender and the Rise of the Global Right. *Signs: Journal of Women in Culture and Society*, 44(3), 541–60.
- Hasmath R., Hildebrandt T., Hsu J. (2019). Conceptualizing government-organized non-governmental organizations. *Journal of civil society*, 15(3), 267–284.
- Illouz E. (2008). *Saving the Modern Soul: Therapy, Emotions, and the Culture of Self-Help*. Oakland: University of California Press.
- Lawler St. (2000). *Mothering the Self: Mothers, Daughters, Subjects*. London: Routledge.
- Magun A. (2010). Perestroyka kak konservativnaya revolyutsiya? *Neprikosnovennyy zapas*, 6(74). (In Russ.). URL: <https://magazines.gorky.media/nz/2010/6/perestrojka-kak-konservativnaya-revoljucziya.html>
- Murav'yova M. (2014). Traditsionnyye tsennosti i sovremennyye sem'i: pravovyye podkhody k traditsii i modernu v sovremennoy Rossii. *The Journal of Social Policy Studies*, 12(4), 625–638. (In Russ.).
- Owen C., Bindman E. (2017). Civic Participation in a Hybrid Regime: Limited Pluralism in Policymaking and Delivery in Contemporary Russia. *Government and Opposition*, 54(1), 98–120.

- Paxon H. (2004). *Making modern mothers: ethic and family planning in urban Greece*. Berkley, Los Angeles: University of California Press.
- Pecherskaya N. (2012). Mifologiya roditel'stva: analiz diskursivnogo proizvodstva ideal'noi sem'i. *Zhurnal issledovaniĭ sotsial'noi politiki*, 10(3), 323–342. (In Russ.).
- Rivkin-Fish M. (2010). Pronatalism, Gender Politics, and the Renewal of Family Support in Russia: Towards a Feminist Anthropology of 'Maternity Capital'. *Slavic Review*, 69(3), 701–724.
- Rivkin-Fish M. (2013). Conceptualizing Feminist Strategies for Russian Reproductive Politics: Abortion, Surrogate Motherhood, and Family Support After Socialism. *SIGNS*, 38(3), 569–593.
- Roche S. (2016). A Sound Family for a Healthy Nation: Motherhood in Tajik National Politics and Society. *Nationalities Papers*, 44(2), 207–224. doi:10.1080/00905992.2015.1087486
- Rotkirkh A., Temkina A. (2007). Sovetskiye gendernyye kontrakty i ikh transformatsiya v sovremennoi Rossii. In Zdravomyslova E., Temkina A. (Red.) *Rossiĭskiiĭ gendernyiĭ poryadok: sotsiologicheskiiĭ podkhod* (pp. 169–200). Saint-Petersburg: Izd-vo Evropeĭskogo universiteta v Sankt-Peterburge. (In Russ.).
- Sakevich V., Denisov B., Rivkin-Fish M. (2016). Neposledovatel'naya politika v oblasti kontrolya rozhdayemosti i dinamika urovnya abortov v Rossii. *Zhurnal issledovaniĭ sotsial'noy politiki*, 14(4), 461–478. (In Russ.).
- Shpakovskaya L.L. (2013). Diskursivnyye praktiki roditel'stva: politicheskiye vyzovy i aktual'nyye problemy. *Vestnik Tomskogo gosudarstvennogo universiteta. Filosofiya. Sotsiologiya. Politologiya*, 1, 236–249. (In Russ.).
- Shpakovskaya L.L. (2012). Politika institutsializatsii i praktiki privatizatsii semeynoy zhizni: partnerstvo i brak v Rossii. *Zhurnal issledovaniĭ sotsial'noy politiki*, 10(3), 309–323. (In Russ.).
- Timoshenko A. (2019). Pis'mo v redaktsiyu. *Sotsiologicheskkiye issledovaniya*, 4, 173–174. (In Russ.).
- Van de Kaa D.J. (1987). Europe's Second Demographic Transition. *Population Bulletin*, 42, 1–59.
- Vishnevskiy A. (Red.) (2006). *Demograficheskaya modernizatsiya Rossii, 1900–2000*. Moscow: Novoye izdatel'stvo. (In Russ.).
- Vishnevskiy A. (2012a). Demograficheskiy proryv ili dvizheniye po krugu? Chast' pervaya. *Demoskop Weekly*, 533–534. (In Russ.).URL: <http://demoscope.ru/weekly/2012/0533/tema01.php>
- Vishnevskiy A. (2012b). Demograficheskiy proryv ili dvizheniye po krugu? Chast' vtoraya. *Demoskop Weekly*, 535–536. (In Russ.).URL: <http://demoscope.ru/weekly/2012/0535/tema01.php>
- Vishnevskiy A.G., Denisov B.P., Sakevich V.I. (2017). Kontratseptivnaya revolyutsiya v Rossii. *Demograficheskoye obozreniye*, 1, 6–34. (In Russ.).
- Vishnevsky A., Sakevich V., Denisov B. (2018). The contraceptive revolution in Russia. *Demographicheskoe obozrenie*, Vol. English selections 2017, 86–108.

- Vishnevskiy A., Zakharov S. (2019). Zaklyucheniye. V Zakharov S. (Ed.), *Naseleniye Rossii 2017: dvadtsat' pyatyy ezhegodnyy demograficheskiy doklad* (pp. 459-477). Moscow : Izdatel'skiy dom NIU VShE. (In Russ.).
- Yarskaya-Smirnova E. (2010). «Da-da, ya vas pomnyu, vy zhe u nas neblagopoluchnaya sem'ya!» Diskursivnoye oformleniye sovremennoy rossiyskoy politiki. *Zhenshchina v rossiyskom obshchestve*, 2, 14–25. (In Russ.).
- Yuval-Davis N. (1997). *Gender and Nation*. London: Thousand Oaks: Sage.
- Zakharov S. (2012). Kakoï budet rozhdayemost' v Rossii? *Demoskop Weekly*, 495–496. (In Russ.). URL: <http://demoscope.ru/weekly/2012/0495/tema01.php>
- Zdravomyslova E., Temkina A. (2003). Sovetskii etakratcheskii gendernyi poryadok, V: Pushkareva N.M., (Ed.), *Sotsial'naya istoriya. Sotsial'naya istoriya ezhegodnik. Zhenskaya i gendernaya istoriya* (pp. 436–463). Moscow: ROSSPEN. (In Russ.).
- Zhukov V. (2018). Zakonodatel'stvo ob abortakh: mirovyie trendy i natsional'nyie interesy. *Sotsiologicheskie issledovaniya*, 3, 113-123. (In Russ.).

SEX IMBALANCES IN LONG-TERM MIGRATION FLOWS IN RUSSIA

NIKITA MKRTCHYAN

Based on Rosstat data, the distribution of long-term migration flows in Russia by sex was analyzed for the period from 2004 to 2020, taking into account differences in individual age groups. There is a clear predominance of men of working age in international migration in Russia. Disproportions grew after the change in the record-keeping methodology in 2007 and especially after 2011, leading not only to a change in the scale of recorded long-term migration, but also to a radical change in its sex and age structure.

By the end of the period under review, the disparities persisted, but their scale decreased significantly. Overall, intracountry migrations do not show sex disparity. However, at young ages, women are more active, especially in the flow of intraregional migration. The change in approaches to recording internal long-term migrants in 2011, which led to a change in their age profile, had virtually no effect on their sex distribution. Attempts have been made to explain the unequal participation of men and women in migration, but these features require further study. Given their significance, the dynamics of the age and sex composition of migrants must be taken into account in a timely manner in forecasting, along with regular adjustments of general forecast hypotheses.

Key words: population migration, migration statistics, international migration, internal migration, intraregional migration, age and sex structure of migrants.

Structural features of migration, of key importance for the demographic development of Russia, have been poorly studied. While age aspects of migration have been looked at in a few publications (Karachurina, Mkrtchyan 2017), researchers have paid undeservedly little attention to the distribution of migrants by sex. Meanwhile, as statistical data show, sex ratios in selected migration flows are far from normal; there are many imbalances that can affect the population of both the country as a whole and its individual regions.

Selectivity by sex and age in both international (Belanger and Rahman 2013) and domestic (Corbett 2007) flows is an intrinsic feature of migration. The resulting sex and age disparities in the populations of selected territories are most acute in developing countries, which are on the path of urban development and experiencing urban sprawl as a result of migration from rural areas (Rodriguez-Vignoli, Rowe 2018), and in countries that take in large flows of international migrants. Thus, immediately after the reunification of Germany, the outflow of young women from eastern to western lands caused a serious shortage of young women in the east, especially in rural communities (Krohnert, Vollmer 2012). The exodus of women from rural areas threatens the sustainability of local communities (Martin 2009).

NIKITA MKRTCHYAN (nmkrtchyan@hse.ru), NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS, THE RUSSIAN PRESIDENTIAL ACADEMY OF NATIONAL ECONOMY AND PUBLIC ADMINISTRATION, RUSSIA.

THE ARTICLE WAS WRITTEN ON THE BASIS OF THE RANEPA STATE ASSIGNMENT RESEARCH PROGRAMME.

THE ORIGINAL ARTICLE IN RUSSIAN WAS PUBLISHED IN DEMOGRAPHIC REVIEW IN 2021, 8(3), 6-19.
[HTTPS://DOI.ORG/10.17323/DEMREVIEW.V8I3.13264](https://doi.org/10.17323/DEMREVIEW.V8I3.13264)

The purpose of this article is to consider the most general features of the distribution of long-term international and internal migrants in Russia by sex, including in certain age groups. To do this, Rosstat data for 2004-2020 are analyzed, taking into account changes in the methodology for migration record-keeping in the years under consideration. In Russia, as in many countries, the sex ratio is numerically biased in favor of women. This results, first of all, from the difference in mortality between men and women, due to which by middle age the numerical predominance of men among children and young people is replaced by the predominance of women. In Russia, there are already more women by the age of just over 30 years. Sex disproportions level out extremely slowly, and at some ages even increase (Vishnevsky 2013), and this despite the fact that the consequences of the Second World War, which determined the most acute disproportions in the sex ratio in older ages at the end of the 20th century, no longer have a significant impact on it.

In general, women also predominate in long-term migration, primarily due to their overall predominance in the population. However, as shown by the simplest calculations, the sex ratio in migration does not have a linear relationship with women's share in the population, and in some flows it changes abruptly in favor of men (Table 1). Particularly strong disproportions are noted in international migration.

Table 1. Sex ratio in the population of Russia and in migration flows, number of men per 1000 women, 2004-2020

| Year | Population of Russia at the beginning of the year | Migration | | | | | | |
|------|---|-----------|---------------|----------------|----------------|---------------|----------|------------|
| | | total | Within Russia | | | International | | |
| | | | total | intra-regional | inter-regional | turnover | arrivals | departures |
| 2004 | 866.6 | 891.5 | 893.5 | 848.0 | 958.4 | 872.4 | 862.7 | 887.0 |
| 2005 | 863.4 | 865.9 | 869.2 | 824.3 | 933.0 | 841.2 | 826.4 | 879.9 |
| 2006 | 860.9 | 870.2 | 868.2 | 824.5 | 928.5 | 885.8 | 892.5 | 863.1 |
| 2007 | 859.7 | 887.9 | 867.0 | 822.3 | 929.5 | 1023.2 | 1059.2 | 827.9 |
| 2008 | 859.3 | 895.2 | 872.1 | 828.9 | 928.7 | 1047.3 | 1077.3 | 856.5 |
| 2009 | 859.3 | 918.9 | 885.9 | 838.2 | 947.8 | 1122.2 | 1155.5 | 872.6 |
| 2010 | 859.6 | 887.8 | 859.6 | 815.0 | 915.4 | 1166.8 | 1228.1 | 872.9 |
| 2011 | 860.3 | 936.5 | 881.4 | 829.5 | 951.2 | 1508.6 | 1574.9 | 1007.2 |
| 2012 | 861.3 | 964.6 | 883.7 | 831.8 | 947.2 | 1808.9 | 1683.0 | 2342.9 |
| 2013 | 862.4 | 988.6 | 886.9 | 836.2 | 945.9 | 1941.4 | 1757.8 | 2553.4 |
| 2014 | 863.1 | 992.5 | 870.3 | 827.9 | 916.7 | 1839.2 | 1634.0 | 2325.0 |
| 2015 | 863.3 | 965.3 | 870.3 | 832.4 | 909.2 | 1522.4 | 1253.4 | 2162.2 |
| 2016 | 863.6 | 939.5 | 875.0 | 837.6 | 913.1 | 1308.4 | 1223.5 | 1482.3 |
| 2017 | 864.4 | 942.6 | 874.3 | 836.5 | 910.5 | 1306.4 | 1293.8 | 1326.3 |
| 2018 | 865.2 | 937.2 | 868.9 | 834.4 | 901.1 | 1300.2 | 1261.6 | 1351.7 |
| 2019 | 865.9 | 962.2 | 877.9 | 851.6 | 903.2 | 1343.2 | 1341.9 | 1345.5 |
| 2020 | 866.3 | 962.3 | 866.7 | 837.6 | 893.9 | 1355.7 | 1271.1 | 1467.7 |

Source: Author's calculations based on Rosstat data.

The All-Russian population census of 2002 had already shown that in large cities (primarily Moscow) the sex proportions are greatly in favor of men in certain ethnic groups - Azerbaijanis, Uzbeks, Georgians and Armenians (Zayonchkovskaya 2009). However, this migration remained

largely invisible to current records, which did not include many migrants who had de facto lived in Russia for a long time.

The first significant change in the ratio of men and women in recorded migration flows is associated with a sharp increase in the share of men in the flow of *international migrants* arriving in 2007. It was in this year that the migration record-keeping system changed to record as arriving (long-term) migrants those receiving temporary residence in Russia for the first time. Prior to this, only those who received registration at the place of residence were subject to such recording; according to experts, record-keeping of migration in these years was in a critical state (Chudinovskikh 2004). The system of registration of international migration in place since 2007 did not completely solve this problem, but it did, apparently, make it possible to include significant contingents of long-term migrants in statistical analysis and, to a certain extent, bring their recording closer to reality.

Table 2. Sex ratio in the flow of international migration in the 2000s, arrivals, number of men per 1000 women

| | 2004-2006 | 2007-2010 |
|---------------------------------|-----------|-----------|
| International migration - total | 860.5 | 1119.3 |
| CIS and Baltic countries | 847.1 | 1104.0 |
| Azerbaijan | 1223.1 | 1774.7 |
| Armenia | 1028.6 | 1144.1 |
| Belarus | 820.3 | 898.1 |
| Georgia | 876.5 | 978.8 |
| Kazakhstan | 799.7 | 874.4 |
| Kirgizia | 865.6 | 950.7 |
| Latvia | 784.6 | 982.0 |
| Lithuania | 903.9 | 1059.5 |
| Moldavia | 985.5 | 1094.0 |
| Tajikistan | 1306.1 | 2800.5 |
| Turkmenia | 738.9 | 855.1 |
| Uzbekistan | 822.9 | 1088.1 |
| Ukraine | 753.5 | 833.7 |
| Estonia | 1076.3 | 1010.2 |
| Countries of the far-abroad | 1200.5 | 1548.8 |

Source: Author's calculations based on Rosstat data.

The dynamics of arrivals of migrants by country in 2007 compared with previous years showed that the most significant increase in the number and proportion of men in the flow was in the countries of Transcaucasia (although Georgia did so only in 2007, since starting in 2008, after events in South Ossetia and the subsequent sharp deterioration in relations between Russia and Georgia, the number of migrants from there began to decline), Tajikistan, Uzbekistan and Kirgizia. It is from these countries that in the second half of the 2000s the flow of temporary labor migrants to Russia increased. The influx also increased from Ukraine, which has always been Russia's main migration donor.

On the whole, after 2007 men began to predominate in the flow of arrivals of long-term international migrants to Russia. But if we consider Russia's main migration donors,

which include, above all, the post-Soviet states, the disproportions affected the flow from Tajikistan and Azerbaijan most strongly (Table 2), and to a lesser extent those from Armenia and Uzbekistan. Among non-CIS countries, the most significant predominance of men was noted in the flow of permanent migration from China. In traditional societies, whose significant role remains strong in a number of post-Soviet countries, women are still not as independent as men, as reflected in their lesser involvement in the processes of international migration (Tyuryukanova 2011).

The sex ratio has a pronounced age specificity; people of different ages participate in migration with different degrees of intensity. The change in the proportions of men and women in the flow of international migration has affected certain age groups in different ways. After 2007, the greatest predominance of men was noted in young and middle working ages (Figure 1). At the same time, in the flow of arrivals from Tajikistan aged 20-24 there were 4.4 times more men than women, and for those aged 25-29 - 4.3 times. For migration from Ukraine and Kazakhstan, despite a general increase in the proportion of men in the flow, such sharp disproportions were not noted. In the flow of arrivals from non-CIS countries, as well as the Baltic countries, men most clearly predominated at the age of 40-49 years. At this age, highly skilled labor migrants came to Russia more often, and not always along with their family. However, this migration flow to Russia even in the aughts was small and largely latent, i.e., was not taken into account in the statistics of long-term migration.

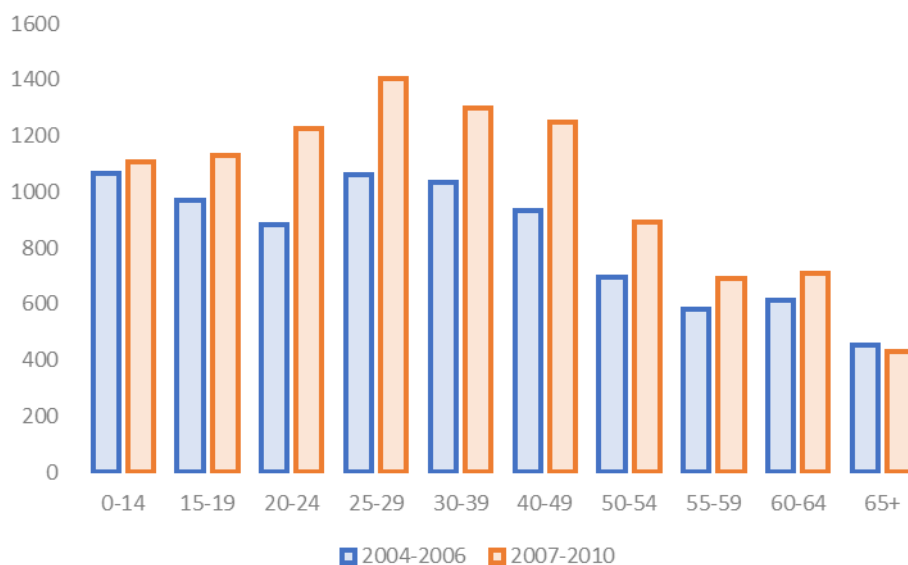


Figure 1. Sex ratio in the flow of international migration by certain age groups, arrivals, number of men per 1000 women

Source: Author's calculations based on Rosstat data.

It turns out that already by the late 2000s the age and sex distribution of international migrants in Russia had changed. The balanced age and sex structure characteristic of family and repatriation migration had undergone major changes. A new structure of migration had emerged, no longer hidden but explicit, with a clear predominance of young men, though still not as clear as in temporary labor migration in those years (Tyuryukanova 2011).

A fundamental revision of the method of statistical recording of migration in Russia in 2011, which affected both international and domestic migration, led to a further change in the sex ratios of migrants. Recall that starting in 2011, not only those registered at their place of residence, but also those registered at their place of stay for a period of 9 months or more began to be considered long-term. As soon as the registration period comes to an end, the migrant is automatically considered to have left for his place of permanent residence, which in the case of international migration means to the country from which he arrived, where until that time he permanently resided - even if he resettles within Russia.

Formally, taking into account the fact that certain categories of migrants could legally stay in Russia for up to 90 days without registration, the new criterion began to closely correspond to the UN recommendations on long-term stay in a new place of residence for 1 year or more. Despite the justified criticism of the new methodology, which distorts both the real volumes of long-term migration (Chudinovskikh 2019) and individual structural characteristics of migrants (level of education, reasons for migration, etc.) (Mkrtchyan 2020), it allows us to get an idea of previously latent or semi-latent categories of migrants, for example, those who move in connection with higher education (Kashnitsky 2017), as well as the general scale of migration. The unchanging characteristics of migrants, such as sex, as well as those that can be automatically recalculated (age), are not distorted by the new methodology.

The peculiarity of the new recording method is that it changed the scale and characteristics of arrivals immediately, while the change in the characteristics of departures occurred with a time lag. Only at the end of 2011 did the first persons appear whose registration at the place of residence had expired, and the system began to work in a completely new way by the mid-2010s. Hence the lag in the dynamics of the structural characteristics of migratory flows.

As mentioned above, the sex ratio of arriving international migrants had already changed by 2010, but after the 2011 reform the disproportions increased sharply, especially in the youngest working ages (Figure 2). The sex disproportions of those who left began to change only after 2011, but were sharper than for those who arrived. In the flow of arrivals by 2015, the share of those registered at the place of residence (according to the old method) was 28%, while in the flow of those who left, it was only 6%. Unfortunately, Rosstat data do not allow us to estimate the age and sex structure of international migrants using the old and new methods separately. But from the above figures it is clear that while the new recording system affected most arrivals, it did not affect all of them, and the flow of departures began to consist almost entirely of those whose temporary (by place of stay) registration had ended.

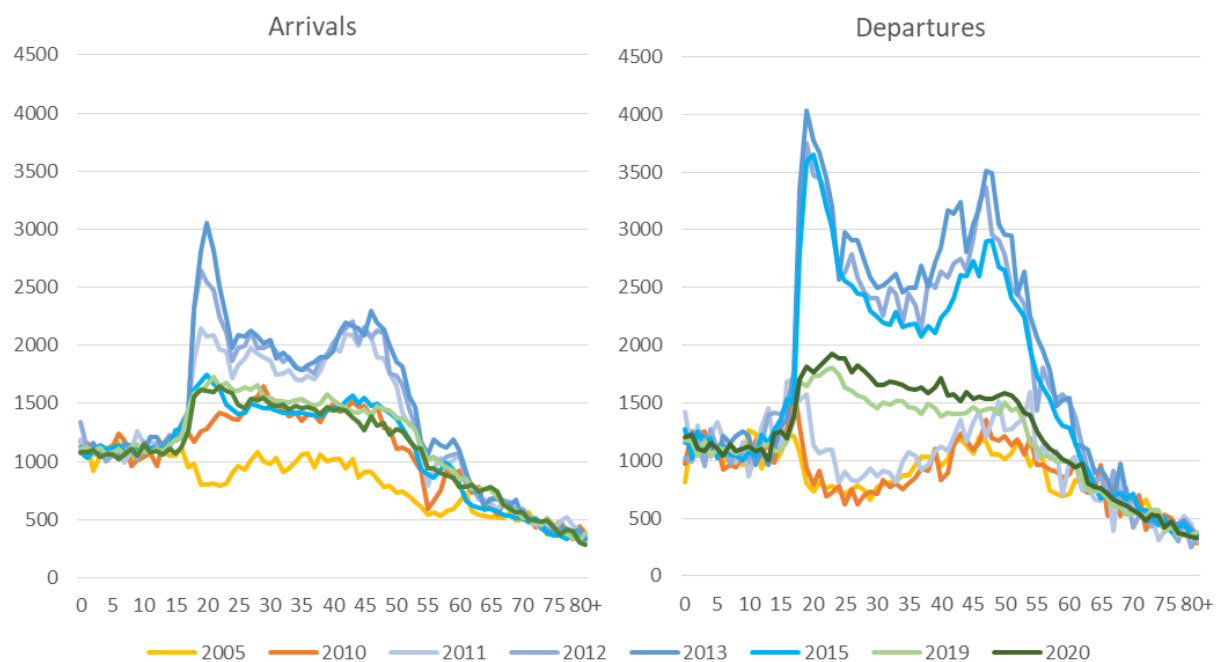


Figure 2. Sex ratio in the flow of international migration by 1-year age groups, number of men per 1000 women

Source: Author's calculations based on Rosstat data.

Figure 2 also shows that in the second half of the 2010s the sex disproportions of both arrivals and departures were significantly smoothed out. This was influenced by:

1. a change in the structure of countries who are Russia's main migration donors. The decline in the role of the countries of Central Asia in long-term migration was offset by an increase in migration from Ukraine, in the flow of which there were no such strong sex disparities;
2. an increase in the structure of long-term migration of the repatriation component, stimulated by participation in the State Program for Assistance in Resettlement to Russia of Foreign Compatriots and Members of Their Families. This again strengthened the role of family migration, which partially replaced the migration of singles, most often represented by men;
3. a sharp decrease in sex disproportions among arrivals at young and middle ages from all countries who are Russia's main migration donors. The reasons for these changes are not clear, or rather, we do not know the reasons for such a sharp and simultaneous exacerbation of sex disparities among international migrants in the early 2010s. Perhaps this is due to the fact that male migrants had more incentives to register at the place of stay for a period of 9 months or more, while women either made do with short-term registration, or did not register at all. More frequent registration of male migrants could be associated with less tolerance towards them on the part of law enforcement agencies.

The sharp predominance of men in the flow of international migration at the beginning of the 2010s obscures the current sex disproportions, which reach 1.5-2 times in working age. International migration "feeds" the population of Russia mainly by men, which brings economic

benefits in the short and medium term, but is less valuable from the standpoint of demographic development.

In *intra-country migration*, there is no such pronounced predominance of men in flows as in international migration. At ages when sex disparities in the population are not yet pronounced, there were until recent years 600-1250 men per 1000 women participating in migration (Figure 3). The new methodology for registering migration in 2011 (changes in 2007 did not affect intra-country migration) did not, as happened for international migration, result in a sharp change in the sex ratio in 2011-2012, in either the overall flow or individual ages. The significant predominance of middle-aged men in internal Russian migration had faded by the end of the 2010s, when the methodology for recording migration underwent no changes. In the case of international migration, the disproportions grew larger precisely in the first post-reform years; in internal migration, there were no changes in the ratio of men and women participating in migration at certain ages in 2011-2012.

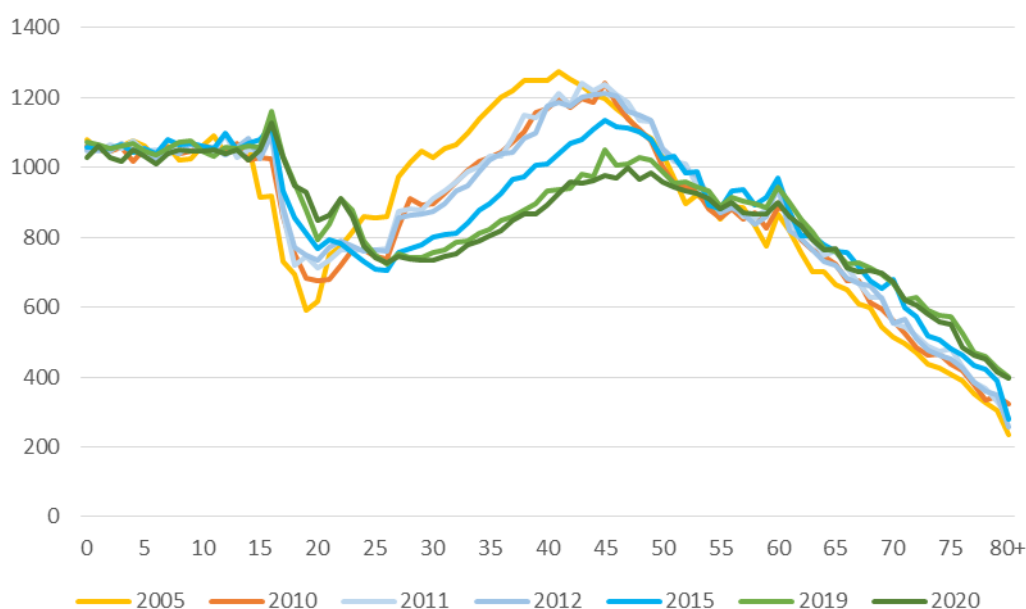


Figure 3. The sex ratio in the flow of internal Russian migration (arrivals) by 1-year age groups, number of men per 1000 women

Source: Author's calculations based on Rosstat data.

In childhood, the sex ratio in migration is close to natural, with a small “peak” of male predominance by the time they finish 9th grade, possibly because at this age some young men move in order to receive vocational education. At younger working ages, women participate in intra-country migration more often than men, but the proportions level off at older ages. In middle age, men predominate in migration flows; afterwards, the sex ratio among migrants is close to that in the general population.

In all years, men participated, if only slightly, more actively in inter-regional migration, and women in intra-regional migration (Figure 4). This feature did not change in any way even when the number of recorded long-term migrants more than doubled after the reform of the

registration system in 2011 and the proportions of these flows changed in favor of interregional ones.

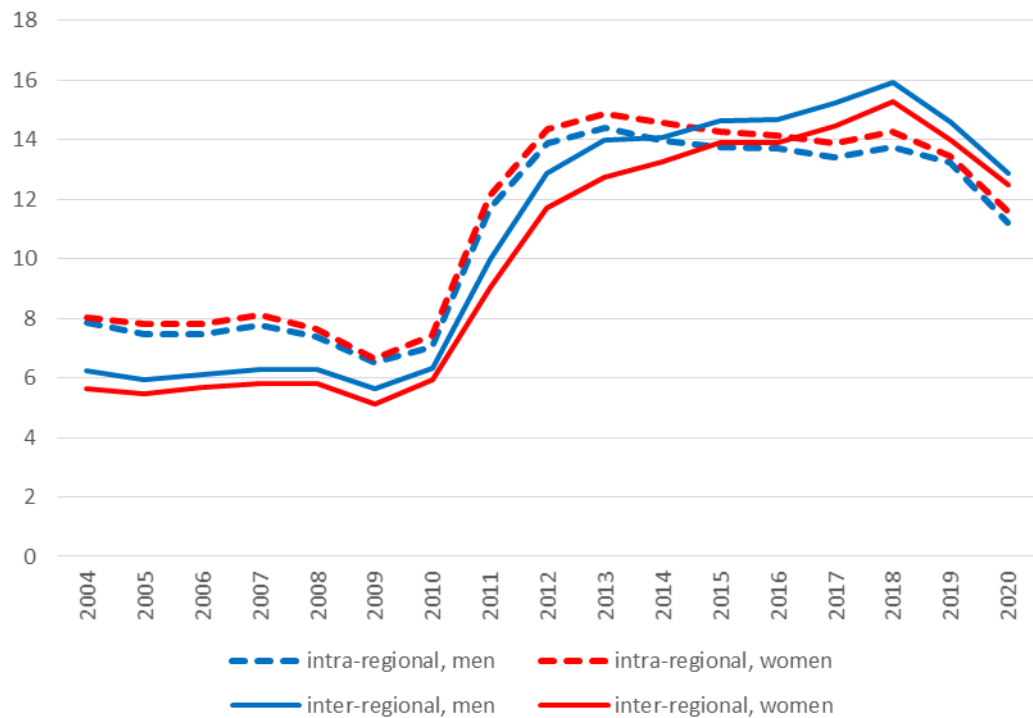


Figure 4. Intra-regional and inter-regional migration by sex, per 1000 persons

Source: Author's calculations based on Rosstat data.

By age, the intensity of migration of men and women shows similarities and differences (Figure 5). At younger ages, women are clearly more active in intra-regional migration; starting from the age of 35, men take the lead. Differences are especially pronounced at the age of graduation from school (18 years): apparently, women move more often in connection with their education, and do so within the region. The 2015 micro-census showed that women were more likely than men to be absent from the household due to study (Population micro-census 2015). But these are the most general assumptions, which do not explain the strong differences in the sex ratio at young ages. In inter-regional migration at this age, women move only slightly more often. At the age of 18 in the mid-2010s, 13% of women and 11% of men participated in intra-country migration. It is not surprising that the peak in the age of graduation from vocational education, which manifested itself after the appearance of “pseudo-return” migration (Mkrtchyan 2020) in the second half of the 2010s, is also more pronounced in women.

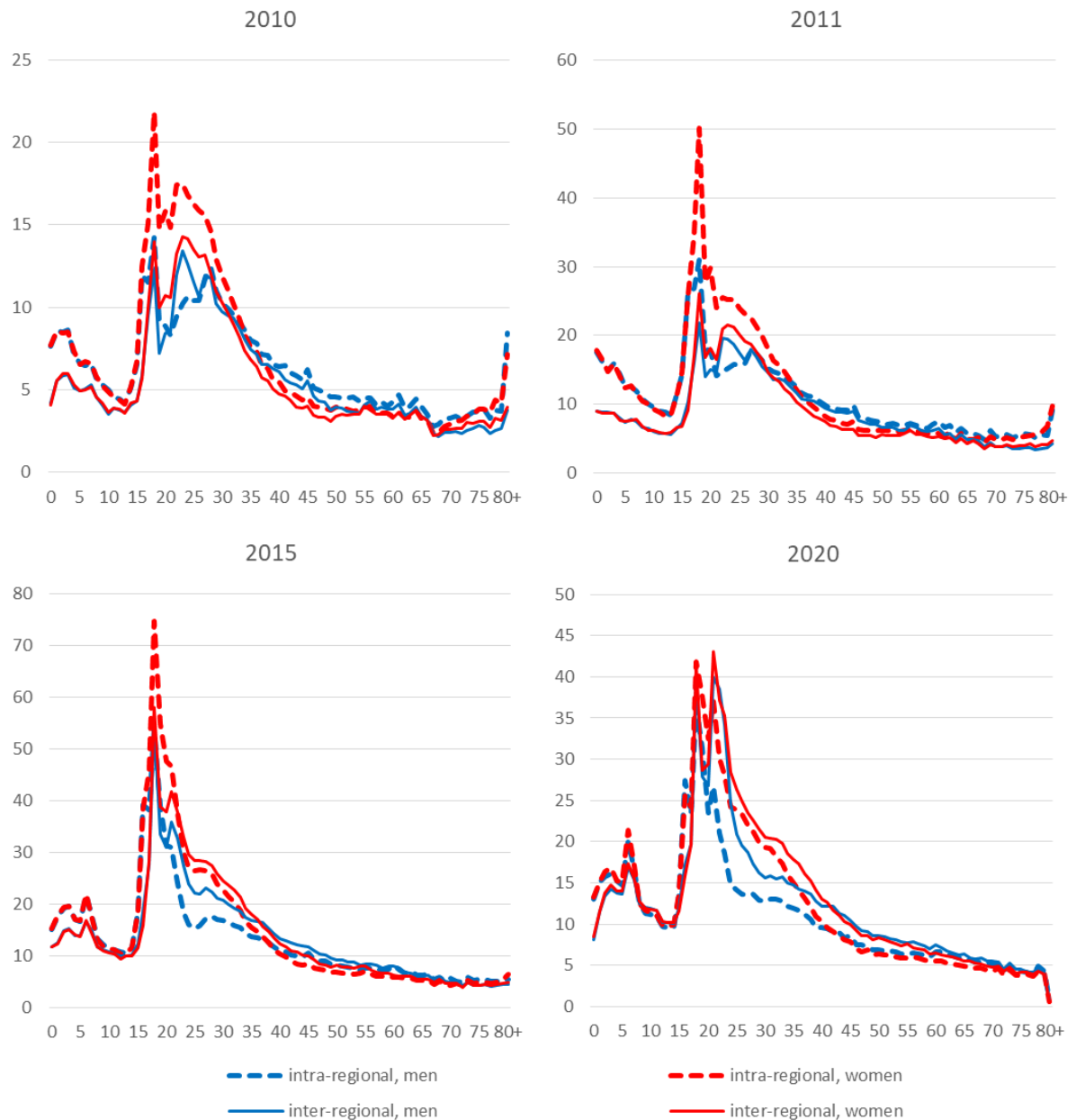


Figure 5. Intra-regional and inter-regional migration by sex and age, per 1000 population

Source: Author's calculations based on Rosstat data.

We believe that the high activity of women in intra- and inter-regional migration in young reproductive ages is explained by:

1. their earlier marriage and adulthood in general, and the likelihood of moving due to these events. Studies of internal migration show that age profiles of migration coincide with the transition to adulthood for both sexes, but this applies to women to a greater extent (Bernard, Bell, Charles-Edwards 2014);
2. their non-participation in conscription (Russian statistics do not take into account movements for this purpose). Despite the fact that conscription in the army is not now as widespread as, for example, in the late Soviet period, it still takes a significant number of young people out of ordinary life;

3. the more frequent need for women to be registered at the place of residence and stay in another region or locality. Registration may be required when a child is enrolled in a preschool or school (Mkrtchyan et al. 2020), and if the whole family cannot obtain registration, the choice most often falls on the woman - the man does not register;
4. the fact that at young working ages men are much more likely than women to participate in temporary labor (rotational) migration, and regular travel to work does not require registration. The issue of “replacing” long-term (settlement) migration with other forms of spatial mobility has been repeatedly raised by researchers (Moiseenko 2004; Mkrtchyan 2009), especially when trying to explain its decline in the 1990s;
5. the fact that, perhaps, the experience of educational migration, of living during that time in another region or settlement, often leads to a subsequent change of residence after real or pseudo-return migration. Therefore, at the age of 25-30, women are more likely than men to move.

After 35-40 years of age and up to the most advanced years, men are more active in both flows of internal migration. The differences are not as great as they are stable, including over time. We believe that they are explained by the later onset of many life course events among men related to their changing place of residence and to their more frequent mobility after a divorce. There are, however, studies showing that divorce often leads to a change of residence, but not of region (Clark 2013). At this age, women are more likely than men to be deterred from migrating by the need to care for elderly parents. Noteworthy is the absence of migration peaks associated with retirement age, which in Russia is different for men and women.

CONCLUSION

This article attempts to comprehensively analyze the distribution of long-term migrants in Russia by sex. It shows that the emerging disproportions are more characteristic of international migration and are associated with a sharp predominance of men in the flow at young and middle ages. The sex ratio in this flow was influenced by changes in the methodology for recording migration; apparently, categories of migrants were introduced into the statistical “turnover” that differed significantly in the forms and purposes of the move. Repatriation migration, which was characterized by a fairly even representation of men and women participating in it, by the 2010s ceased to dominate in international long-term migration in Russia. The new composition of migrants with a clear predominance of men in working age is not normal; such migration is quasi-long-term. It cannot be considered sustainable, which makes it difficult to predict migration for the medium and long term.

In contrast to inter-country migration, the sex structure of internal migration is more balanced, although the sex ratio differs significantly in certain age groups. But despite the fact that in general they are not so large and practically do not depend on changes in recording methods, explaining the differences that arise is difficult without more in-depth research. There are too few detailed statistics from sample surveys to answer many of the questions raised by the study.

Sex and age characteristics of migration in Russia must be taken into account in demographic forecasts. Since the sex ratio in the flows is changing quite dynamically, the patterns

of migrants should be reviewed as often as the predictive hypotheses. At the same time, in the medium and long term, sex disproportions need to be smoothed out, since the structural features of migration in the 2010s seem to be extremely unstable.

REFERENCES

- Belanger D., Rahman M. (2013). Migrating against all the odds: International labour migration of Bangladeshi women. *Current Sociology*, 61(3), 356 – 373. DOI: 10.1177/0011392113484453
- Bernard A., Bell M., Charles-Edwards E. (2014). Life-course transitions and the age profile of internal migration. *Population and Development Review*, 40(2), 213-239. DOI: 10.1111/j.1728-4457.2014.00671.x
- Choudinovskikh O.S. (2004). O kriticheskom sostoyanii ucheta migratsii v Rossii [On the critical state of migration monitoring in Russia]. *Voprosy statistiki* [Issues in statistics], 10, 27–36. (In Russ.)
- Choudinovskikh O.S. (2019). O peresmotre Rekomendacij OON 1998 g. po statistike migratsii v rossijskom kontekste [On Revision of the UN Recommendations of Statistics of Migration (1998) in the Russian Context]. *Voprosy statistiki* [Issues in statistics], 8, 61-76. (In Russ.). Retrieved from <https://doi.org/10.34023/2313-6383-2019-26-8-61-76>.
- Clark W.A.V. (2013). Life course events and residential change: Unpacking age effects on the probability of moving. *Journal of Population Research*, 30(4), 319-334.
- Corbett M. (2007). All kinds of potential: Women and out-migration in an Atlantic Canadian coastal community. *Journal of Rural Studies*, 23(4), 430-442. DOI: <https://doi.org/10.1016/j.jrurstud.2006.12.001>
- Karachurina L., Mkrtchyan N. (2017). Interregional Migration in Russia: Age Characteristics. *Demograficheskoye Obozreniye* [Demographic Review], 3(4), 47-65. DOI: <https://doi.org/10.17323/demreview.v3i4.3205>
- Kasnitsky I. (2017). Vliyanie izmenenij v pravilah ucheta migratsii v 2011 g. na ocenku intensivnosti migratsii molodjozhi: kogortno-komponentnyj analiz [The Effect of the 2011 [Statistics Reform on the Estimations of Youth Migration Intensity: A Cohort-Component Analysis]. *Demograficheskoye obozreniye*, 4, 83-97. (In Russ.). DOI: <https://doi.org/10.17323/demreview.v4i1.6989>
- Krohnert S., Vollmer S. (2012). Sex-specific migration from eastern to Western Germany: Where have all the young women gone? *International Migration*, 5(50), 95-112. DOI: 10.1111/j.1468-2435.2012.00750.x
- Martin S. (2009). The effects of female out-migration on Alaska villages. *Polar Geography*, 32(1-2), 61-67. DOI: 10.1080/10889370903000455
- Mikroperepis' naseleniya 2015* [Microcensus 2015] (2015). Razdel XI. Kharakteristika vremenno otsutstvuyushchego naseleniya [Section XI. Characteristics of the temporarily absent population]. (In Russ.). URL: https://gks.ru/free_doc/new_site/population/demo/micro-perepis/finish/micro-perepis.html
- Mkrtchyan N. (2009). Migratsionnaya mobil'nost' v Rossii: otsenki i problemy analiza [Migration mobility in Russia: estimates and problems of analysis]. *SPERO*, 11, 149-164. (In Russ.).

- Mkrtchyan N. (2020). Problemy v statistike vnutrirossiyskoy migratsii, porozhdennyye izmeneniyem metodiki ucheta v 2011 g. [Problems in the Statistics of Internal Russian Migration Caused by Changes in Accounting Methods in 2011]. *Demograficheskoe obozrenie*, 7(1), 83-99. (In Russ.). DOI: <https://doi.org/10.17323/demreview.v7i1.10821>
- Mkrtchyan N.V., Florinskaya Y.F., Kazenin K.I. (2020). *Vnutrennyaya migratsiya kak resurs razvitiya Rossii: sotsial'no-ekonomicheskiye efekty, izderzhki i ogranicheniya* [Internal migration as a resource for the development of Russia. Socio-economic effects, costs and constraints] (Doklad dlya Gaydarovskogo foruma - 2020). Moscow: Izdatel'skiy dom «Delo» RANKhiGS. (In Russ.).
- Moiseenco V.M. (2004). *Vnutrennyaya migratsiya naseleniya* [Internal migration of the population]. Moscow: TEIS. (In Russ.).
- Rodriguez-Vignoli J., Rowe F. (2018). Correction to: How is internal migration reshaping metropolitan populations in Latin America? A new method and new evidence. *Population Studies*, 72(2), 253-273. DOI: 10.1080/00324728.2017.1416155
- Tjurjukanova E. (Ed.) (2011). *Zhenshchiny-migranty iz stran SNG v Rossii* [Women migrants from CIS countries in Russia]. Moscow: MAKSPress. (In Russ.).
- Vishnevsky A.G. (Ed.) (2013). *Naseleniye Rossii 2010-2011. Vosemnadtsatyy-devyatnadtsatyy ezhegodnyy demograficheskiy doklad* [Population of Russia 2010-2011. Eighteenth to Nineteenth Annual Demographic Report]. Moscow: Izd. dom Vysshey shkoly ekonomiki. (In Russ.).
- Zayonchkovskaya Z. (Ed.) (2009). *Immigranty v Moskve* [Immigrants in Moscow]. Moscow: Tri kvadrata. (In Russ.).

PREMATURE MALE MORTALITY AND THE ECONOMIC WELL-BEING OF HOUSEHOLDS

POLINA KUZNETSOVA

The paper examines the impact of the death of family members, including men of working age, on the economic well-being of their households. It is shown that the data from the Russian Monitoring of Economic Condition and Health (RLMS) can, despite a certain systematic error in registering the deaths of respondents, be used to assess the mortality rate of men and people of working age.

The RLMS data showed that in the year when a family member dies, the average real per capita household income grows. That is, the effect of a decrease in family size turns out to be stronger than the effect of a drop in total income. The fact is that the economic problems of the household associated with the loss of family members do not begin in the year of death, but much earlier. Therefore, a wider time range was considered, from five years before the death of a family member to five years after it. Regression analysis of the processes of getting into and out of poverty showed that the death of family members has a negative impact on the well-being of other members of the household. If a man of working age dies, the risks of falling into poverty increase for 1-5 years before and 1-5 years after this event.

Key words: mortality, panel data, poverty, survival analysis, household structure, RLMS..

INTRODUCTION

The paper examines the relationship between male mortality in working age and the well-being of Russian households. The phenomenon of high male mortality in Russia is widely known and well-studied (Shkolnikov et al. 2013; Grigoriev et al. 2020). Premature male mortality and a large gender gap in life expectancy are largely explained by the greater prevalence of irrational behaviors among men, such as smoking, alcohol consumption, and insufficient attention to their own health (Andreev 2001; Kossova et al. 2020; Denisova 2010).

Being very common in working age, male mortality has a direct impact on the structure of households, increasing the share in it of single-parent families with children (Zakharov, Churilova 2013) and households with single women. Single-parent families with underage children are traditionally among the most vulnerable in terms of both income poverty and deprivation (Grishina 2018). The answer to the question of how the death of a family member affects the well-being of households without minor children is less obvious.

POLINA KUZNETSOVA (polina.kuznetsova29@gmail.com), RUSSIAN PRESIDENTIAL ACADEMY OF NATIONAL ECONOMY AND PUBLIC ADMINISTRATION, RUSSIA.

THIS ARTICLE WAS PREPARED AS PART OF THE RESEARCH WORK OF THE STATE ASSIGNMENT OF THE RANEPa.

THE ORIGINAL ARTICLE IN RUSSIAN WAS PUBLISHED IN DEMOGRAPHIC REVIEW IN 2021, 8(3), 96-123.
[HTTPS://DOI.ORG/10.17323/DEMREVIEW.V8I3.13268](https://doi.org/10.17323/DEMREVIEW.V8I3.13268)

Negative events in the life of households, which include, along with divorce, the death of a family member, play an important role in poverty formation (Anikin, Tikhonova 2014). Information on the extent to which the contribution of working-age men determines the income of the households in which they live is presented in table 1. As the size of the family grows, the contribution of working-age men to income becomes larger compared to other members of the household. For example, in 2019, for households of two people, the contribution of men to the income of the households in which they lived was approximately the same as that of women. At the same time, for a family of four, the income share of men aged 15-59 was 57% of family income, which is noticeably higher than for women aged 15-54 and elderly household members.

Table 1. Contribution of family members to household income by sex and age (for households where family members of the corresponding sex and age live), % of household income

| | 1 person | 2 people | 3 people | 4 people | 5 and more people |
|--|-------------|-------------|-------------|-------------|----------------------|
| Income share of men aged 15-59 | 100 | 56 | 56 | 57 | 53 |
| Income share of women aged 15-54 | 100 | 56 | 46 | 39 | 36 |
| Income share of men aged 60 and over | 100 | 53 | 40 | 32 | 23 |
| Income share of women aged 55 and over | 100 | 55 | 43 | 34 | 23 |

This study presents an attempt by the author to look at the impact that the death of a family member has on the well-being of the remaining members of the household. In contrast to the work by Denisova (Denisova 2010), which considers the death of a respondent as a dependent variable and identifies the factors influencing it, we will study this relationship in the opposite direction: the focus of this work is the well-being of households, which is affected (or perhaps not affected) by the death of one of the adult family members - men and women of different ages.

The basis of the empirical study was RLMS retrospective data from 2001 through 2019. The article is structured as follows. First, a review of the literature and a discussion of the problems that arise in the analysis of mortality using sociological survey data are presented. Then the data and research methodology are described. Next, the results of a regression analysis of the relationship between mortality and the economic well-being of households are presented. Finally, brief conclusions are drawn.

LITERATURE REVIEW

Hypotheses about events that influence getting into and out of poverty are based on the theory of human capital by G. Becker and J. Mincer (Becker 2009a; Mincer 1993) and the theory of demand for children by G. Becker (Becker 2009b). These two theories define the main factors of household income and size that make up per capita income, including gender, age, family members' human capital levels, and family demographics (McKernan and Ratcliffe 2005).

There is a wealth of empirical research examining the drivers of poverty. The most common approach to the study of poverty involves the use of data for a specific moment, for a given time slice, to estimate the extent of poverty. In such an econometric model, the probability of poverty at a given point in time is considered as a function of the current values of various individual and household characteristics (i.e., without taking into account the change in factors over time).

This intuitively and methodically simple approach makes it possible to answer a number of fundamentally important questions, including what is the prevalence of poverty among various socio-demographic groups. However, this method does not take into account changes that occur over time. This requires a dynamic analysis of poverty using panel data.

The modern scientific literature presents a wide range of methods for quantifying the relationship between mortality and well-being over time. To identify the consequences of events in the life of a household (divorce, death of a family member), one can use, among others, such methods as the analysis of survival in a certain state at the onset of events (survival analysis), first applied to the study of poverty at work (Bane, Ellwood 1986); linear panel regression with fixed effects, including observations several years before and after an experimental event, such as the death of a spouse, divorce, separation, etc. (Leopold 2018); probit or logit models for finding factors in the probability of being poor, the conditional probability of the poor being chronically poor, and the probability of getting into and out of poverty (Lindquist, Lindquist 2012); an improved method taking into account the aging of the data panel (Cappellari, Jenkins 2002; Fusco, Islam 2012), etc.

The results of empirical studies in various countries suggest that poverty is a heterogeneous phenomenon. In developed countries, episodic poverty is more common, when households experience income deficit for only a very short time, as is typical, for example, of young people (Bane and Ellwood 1986; Lindquist and Lindquist 2012; Fusco and Islam 2012; Jenkins and Van Kerm 2014). However, some groups, including children and members of ethnic and national minorities, are more likely to remain in poverty for a long time (Cappellari and Jenkins 2002). In developing countries, it is more difficult to get out of poverty, and therefore chronic poverty is the most common (Haq, Arif 2004; Ozdamar, Giovanis 2017; Yamauchi, Buthelezi, Velia 2006).

In countries with a high level of social development, children are usually protected economically from such serious events as the illness or death of a parent/parents. For example, in Sweden, children who have lost their parents are entitled to a generous pension from the state social security system; in addition, private life insurance is widespread, covering 2/3 of the country's population (Lindquist, Lindquist 2012). As a result, the breakdown of the family or the loss of a job by parents contributes much more to falling into poverty than mortality or morbidity.

In this study, we are interested in how mortality affects well-being. However, as follows from the theory of demand for health by M. Grossman (Grossman 1972), the relationship between health and income and, as a result, between mortality and income, is two-way. There is a possibility of an inverse relationship between income and mortality, when the deterioration in the well-being of the household has a negative impact on the health of family members and subsequently becomes the cause of death. Duleep (1986) shows, using American data, that low income significantly increases the risk of male mortality, and the presence of an additional influence of income on the risks of ill health and disability contributes to this negative relationship. This duality is mentioned in (Jusot 2006), which examines the nature of the relationship between income and mortality in France. The results show that the risk of death is strongly correlated with income level regardless of occupational status.

At the same time, a number of empirical studies have shown that the impact of income on mortality, in contrast to the impact of income on health, is at the least not great (Snyder and Evans

2006; Evans and Moore 2011; Ahammer, Horvath, Winter-Ebmer 2015). How can this be explained? The presence and extent of the socio-economic gradient in health and mortality depend on the effectiveness of different areas of national health systems. In the case of mortality, the socioeconomic gradient is driven more by the effectiveness of acute health care, while the relationship between income and health is driven mainly by disease prevention and early diagnosis (Adams et al. 2003).

Another area of research closely related to this work is the analysis of the well-being of widows. The bulk of the work in this area has been carried out on the basis of data from developed countries and, therefore, is focused on the problems of older people (65 years and older). This topic was most popular in the last quarter of the twentieth century, when the problem of poverty of widows in Western countries was much more acute. Beginning in the 1990s, the poverty rate among widows began to decrease sharply, facilitated by an increase in the level of education of women, an increase in their work experience, a change in the structure of marriage (women with higher socioeconomic status were more likely to be married than women with lower status) and an increase in social support (Munnell, Eschtruth 2018; Munnell, Sanzenbacher, Zulkarnain 2019).

A number of studies on the well-being of widows have been carried out using data from African countries, where widowhood is caused by premature male mortality, primarily as a result of the HIV epidemic. The death of a breadwinner reduces the chances of children, especially girls, to continue their education (Yamauchi, Buthelezi, Velia 2006). Widowed women are more likely to go to work, which in turn can lead to reduced time for housework and child rearing, thus worsening the conditions for human capital formation in orphaned children (Mather 2011).

This study differs from most studies on the topic of mortality and income. We are studying the event of a death in the household, which in itself is a rare object of study. The Russian specificity of the consequences of the death of one of the family members also plays an important role. In developed countries, the overwhelming majority of widows of deceased men are elderly; accordingly, the focus of research on the topic is shifted towards pensions, social security and other problems of the elderly. We, however, due to the peculiarities of the analysis of mortality based on sociological survey data, are more interested in the consequences of the death of family members of working age. In the poorest developing countries, widowed women are significantly younger than in the developed countries of the West, but nevertheless, the problems they face are significantly different from those of Russian households that have experienced the death of a man of working age.

For this study, the most methodologically close works are two by Irina Denisova, devoted to the analysis of factors of male mortality (Denisova 2010) and to the identification of characteristics that contribute to households moving into and out of poverty (Denisova 2007). Both studies were performed on panel data from the Russian Monitoring of the Economic Situation and Health of the Population (RLMS); duration analysis was used for regression estimates. The work (Denisova 2010) also presents detailed arguments in favor of using data from a longitudinal sociological survey to study mortality.

Based on the results of the literature review, a list of potential factors for use in econometric analysis was identified. Along with the socio-demographic characteristics of the household used in the work of I. Denisova (listed in Table 2 below), these are variables containing information on

the time before and after the death of family members. Following the German study of the short and long-term consequences of divorce (Leopold 2018), we consider 5 time intervals: 1) 5–3 years before the death of a family member; 2) 2–1 years before death; 3) the year of death; 4) 1–2 years after death; 5) 3–5 years after death.

THE ANALYSIS OF MORTALITY USING RLMS DATA: MAIN PROBLEMS AND LIMITATIONS

In order to answer the main question of the study (how the death of a family member affects the well-being of the household), specific mortality data are needed. Aggregated data of official statistics provide detailed information about its age structure, the contribution of various causes of death, the regional component, and so on, but do not allow us to find out what kind of family the deceased lived in and how the family and immediate relatives of the deceased lived before and after their death.

The hypotheses of the study involve connecting information about the individual characteristics of the deceased and their family members to the mortality data. Official data on mortality in this case cannot be used, since they contain very little information about the deceased (sex, age, type of locality and cause of death). The information of interest to us about individuals and the households in which they live is contained in the nationally representative RLMS survey, but when using data from sociological surveys, the question arises of how reliable the mortality estimates obtained from them are.

Can RLMS data be used for mortality analysis? How accurately is the death of a respondent recorded in the survey? Generally speaking, the answers to these questions are not obvious. In international research practice, the analysis of mortality actively uses individual characteristics of the deceased, but also additional data sources to clarify mortality, for example, the National Death Index in the United States (Mehta, House, Elliott 2015) or data from the national death register in Sweden (Syden and Landberg 2017). In the RLMS, mortality in households that disappeared from the sample is not specified, which leads to a systematic error (Denisova 2010; Chernysheva and Furmanov 2013). This study also attempts to answer the question of whether the RLMS data can be used to analyze the mortality of the population as a whole and of specific sex and age groups.

Earlier works suggest that this is possible. Thus, in (Perlman, Bobak 2008) it is noted without further clarification that the mortality rates according to the RLMS data generally correspond to official indicators. A more detailed comparison of mortality rates according to the RLMS data and according to the official statistics of Rosstat is presented in the study of microfactors of mortality (Denisova 2010). According to the author's estimates, it is mostly single respondents who disappear from the field of view of RLMS interviewers, most of whom are elderly people, in connection with which the mortality rates calculated according to RLMS data in 1994–2007 were 25–30% lower than the official ones.

We compared the RLMS mortality rates with official statistics (Figure 1). As can be seen, the RLMS noticeably underestimates the mortality of men and women of all ages (Figure 1, graphs

in the first row). If we limit ourselves only to respondents of working age (Figure 1, bottom row of graphs), then the level of differences is significantly reduced.

Figure 1 also clearly distinguishes periods of gradual increase in mortality, measured on the basis of RLMS data, corresponding to the aging of the base, followed by periods of its sharp decrease, caused by the replenishment of the base, when new households are included in the sample. It should also be noted that recently the mortality curves according to Rosstat and mortality calculated according to the RLMS data have been converging.

An important limitation of the RLMS is the systematic error in estimating the mortality of single respondents. Since information about the death of a family member is collected from the words of other household members, “deaths of household members in households consisting of one or two people (especially if they are headed by elderly people) are not included in the regular survey procedure, since household data are not found by address” (Denisova 2010: 341)). The effect of such an underestimation of mortality is clearly visible in Figure 1. The underestimation of female mortality in general, despite the good quality of similar estimates at working age, suggests that the main discrepancies occur at older ages. It can be assumed that the majority of small-sized households that “disappeared” from the coverage area of the survey as a result of the death of respondents are single women of older ages.

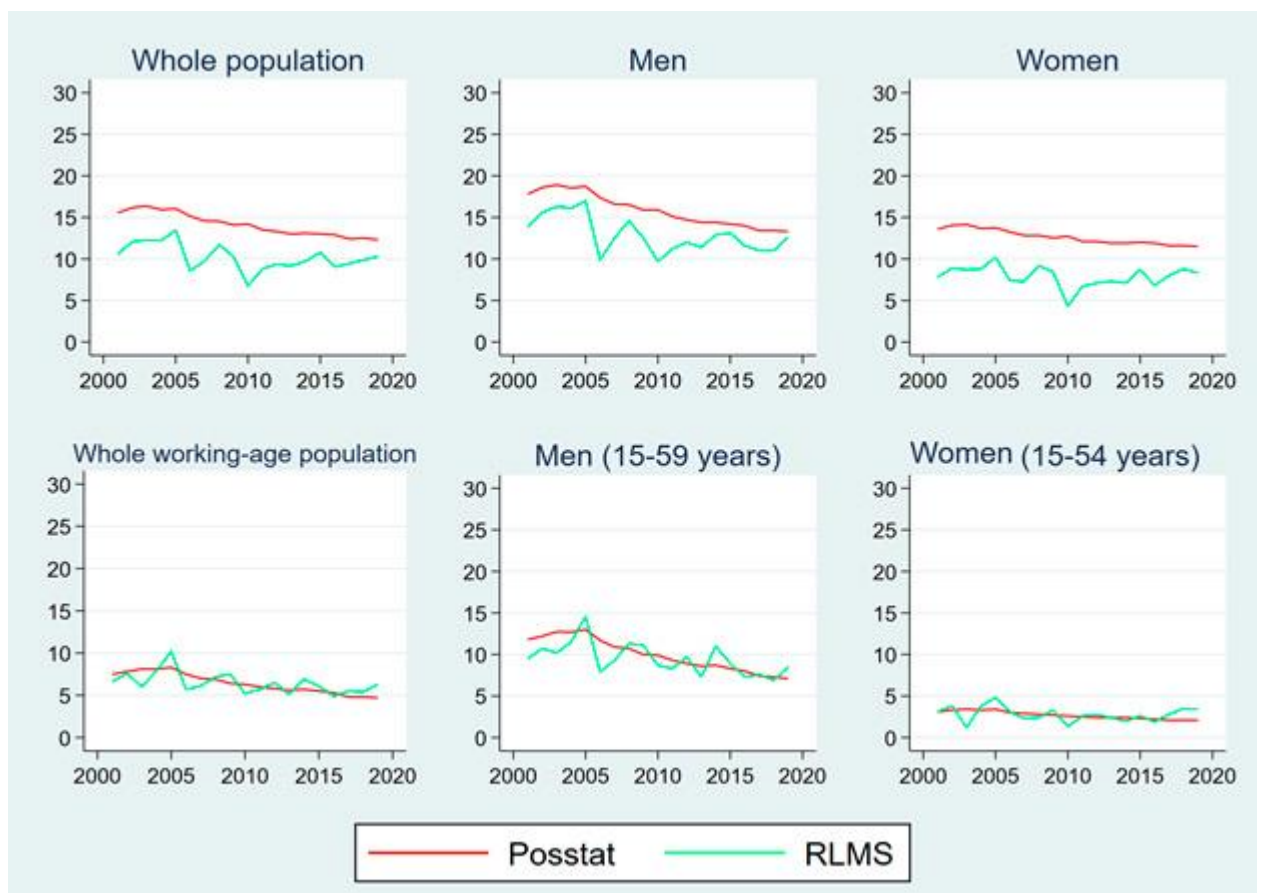


Figure 1. Mortality rates (official statistics and calculations based on RLMS data) for different age groups, 2001–2019

Source: Author's calculations based on RLMS data and official statistics.

Taking into account the peculiarities of collecting data on the death of respondents in the RLMS, significant improvement in the accuracy of mortality estimates can be achieved through a certain limitation of the sample. First, it seems rational to include data in the samples starting from 2001, when the variable with information about the reason for the absence of a household member in the current round was significantly refined. In addition, the shift to consideration of working ages also significantly brings the RLMS mortality estimates closer to official statistics.

DATA AND METHODOLOGY

As an empirical basis for the study, data from the Russian Monitoring of the Economic Situation and Health of the Population (RLMS NRU HSE) were used. We used data from an unbalanced panel of 2001-2019, and in order to take into account differences in the last two decades, we separately considered samples for 2001-2009 and 2011-2019. The use of these three samples allows one to get an idea of the dynamics of the well-being of households of various types in different economic periods: rapid economic growth in the early and mid-2000s, the global crisis of 2008 and post-crisis adaptation of 2009-2013, as well as the consequences of the events of 2014, expressed, in particular, in the decline and stagnation of real incomes of the population.

The variable “Death of a household member” is presented in the RLMS using three variables, including: 1) 4 response options (1995–2000); 2) about 70 response options, most of which specify the cause of death (2001–2008); 3) about 100 meaningful response options, most of which specify the cause of death (2009–2018). The calculations used RLMS data starting from 2001, i.e., for the second and third variants of the variable.

In order to take into account differences in regional prices, we used a correction factor equal to the ratio of regional subsistence minimums and the subsistence minimum in the reference region. A region with a living wage close to the median (Saratov region) was chosen as a reference. To switch to real prices in the panel sample (we considered the period from 2001 to 2019), we used the inflation coefficient obtained on the basis of the dynamics of the subsistence minimum in the reference region.

The movement of households into and out of poverty was determined using the indicator of income poverty. A household was considered poor if its average per capita income was below the regional subsistence minimum for the third quarter of the year under review.

Several groups of characteristics of the demographic composition of the family, the quality of the human capital of household members and their status in the labor market, as well as the individual characteristics of the head of the family were considered as independent variables explaining the change in the level of household well-being in the regression analysis. Respondents' health was determined on the basis of a question about their self-assessment. We considered that the respondent had poor health if the answer to the question “Tell me, please, how do you assess your health?” was “Bad” or “Very bad”.

To determine the relationship between family well-being and the event of death of one of the household members, variables containing information on the immediate event of death and on the time periods before and after it were included in the regression analysis.

The RLMS data contain detailed information on the family ties of the respondents, which makes it possible to use various typologies of households in calculations (Abanokova 2015; Denisova 2007). In the course of the regression analysis, we used the typology of households based on the gender and age characteristics of the head of the family. We considered 4 types of households, namely those headed by: 1) a man of working age; 2) a woman of working age; 3) a man of retirement age; 4) a woman of retirement age. The head of the family is the respondent with the highest individual income. In the absence of information on income, the reference household member is considered the head of the household - the person who is most aware of the composition and budget of the household, on whose words the answers to the household survey questionnaire are based. Households headed by men of working age were considered as a reference category.

Regression analysis of the processes of moving into and out of poverty was carried out using a semi-parametric Cox model in discrete time (Cox 1972; Klein, Moeschberger 2003). For a discrete random variable T , reflecting the duration of the state of poverty or non-poverty, the risk function λ is defined as follows:

$$\lambda(t) = P(T=t | T \geq t) \quad (1)$$

For a state that lasted t years, this function reflects the probability of its termination within the next year. The discrete Cox model defines the functional form of the relationship between risk and explanatory variables as follows (Klein, Moeschberger 2003: 259):

$$\frac{\lambda(t, X, \beta)}{1 - \lambda(t, X, \beta)} = \frac{\lambda_0(t)}{1 - \lambda_0(t)} \exp(\beta' X), \quad (2)$$

where X is the vector of explanatory variables, β the estimated coefficients, $\lambda_0(t)$ the basic risk function (reflecting the risk in the absence of the impact of explanatory variables, i.e. when $\beta' X = 0$). The vector X contains information about the socio-demographic composition of the household, as well as information about the time of death of family members of different ages.

The RLMS data on poverty dynamics are incomplete due to truncation on the left, interval censoring, and censoring on the right. Truncation on the left occurs when households were already in a state of non-poverty/poverty at the time they were included in the sample. Censoring on the right is observed for incomplete episodes of transition into poverty/non-poverty, when the household has remained non-poor/poor. The use of duration analysis methods makes it possible to solve the problem of estimate bias, which arises both as a result of truncation on the left and censoring on the right (Ratnikova, Furmanov 2014). Interval censoring occurs because in some cases there are gaps in household observations, due to which it is not possible to understand at what exact moment the event of interest to us occurred. A small number of missing observations have been removed.

When modeling households falling into poverty, we calculate the time from the moment when the household is at risk of the event under study. This corresponds to the moment when the value of the variable “the household is poor” turns out to be 0. The transition to poverty, corresponding to the end of the episode of non-poverty, occurs when the value of the variable changes from 0 to 1. The exit from poverty was modeled similarly.

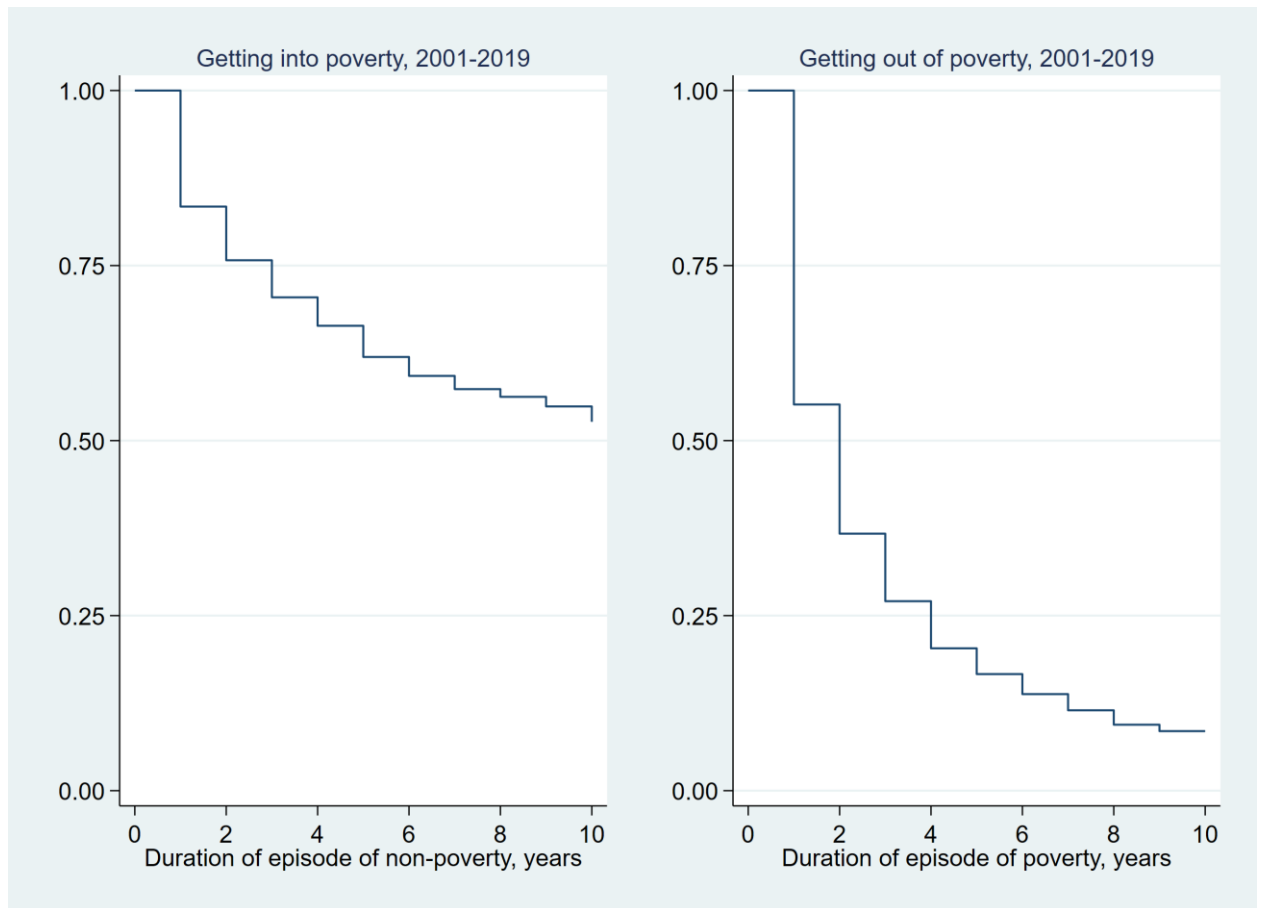


Figure 2 Estimated survival function for getting into and out of poverty, 2001-2019

Source: Author's calculations based on RLMS data

For each of the three time periods (2001-2010, 2011-2019, and 2001-2019), two samples were considered: for getting into poverty and for getting out of it. To take into account multiple transitions into and out of poverty, we split the series of observations of such households into several (according to the number of transitions). The sample for falling into poverty in 2001-2019 contains 20,547 households, of which 5,848 were transitioning from non-poverty to poverty. The moving-out-of-poverty sample contains 11,964 households, of which 8,253 households have already moved out of poverty. Information on the number of samples for 2001-2010 and 2011-2019 is given in the Appendix (tables A1 and A2).

To include in the analysis information about the periods before and after the death of a family member, 5 time periods were considered: 1) 5–3 years before the death of a family member; 2) 2–1 years before death; 3) the year of death; 4) 1–2 years after death; 5) 3–5 years after death.

Kaplan-Meier diagrams give an idea of the dependent variables of our study - the duration of periods of poverty and non-poverty. Figure 2 shows the survival functions for entering and exiting poverty in 2001-2019. According to the data presented, the probability of falling into poverty after the 1st year out of poverty (Figure 2, diagram on the left) is 17%, after the 2nd year - 24%, after the 3rd year - 30%. Over half of all households (53%) in the 2001-2019 sample never fell into poverty.

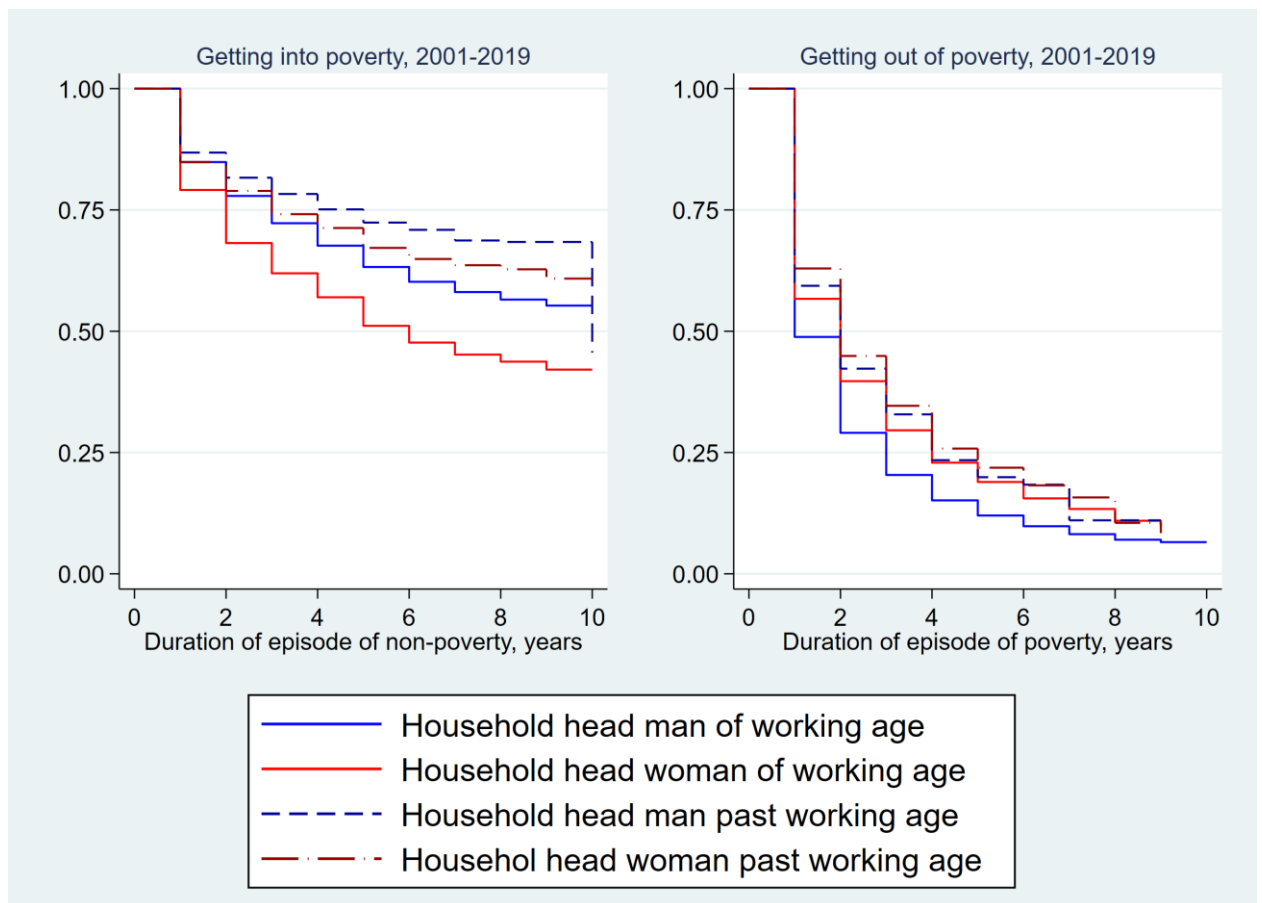


Figure 3 Estimated survival function for getting into and out of poverty by type of household, 2001-2019

Source: Author's calculations based on RLMS data.

By contrast, the chance of moving out of poverty is significantly higher, as shown by the rapidly declining survival curve (Figure 2, diagram on the right). The probability of ceasing to be poor after 1 year of being in poverty is 45%, after 2 years - 63%, after 3 - 73%.

Figures 3 and 4 illustrate the survival functions of households according to the type of household and whether they experienced the death of an adult family member during the observation period. Households headed by women of working age are most at risk of falling into poverty. Similar risks for households headed by working-age men are comparable to the probability of falling into poverty for households in which the head of the family is a pensioner. At the same time, male-headed households are significantly more likely to get out of poverty than other households.

Households that experienced the death of an adult family member during the observation period show greater risks of falling into poverty and are also less likely to quickly (after 1 or 2 years of poverty) move out of it.

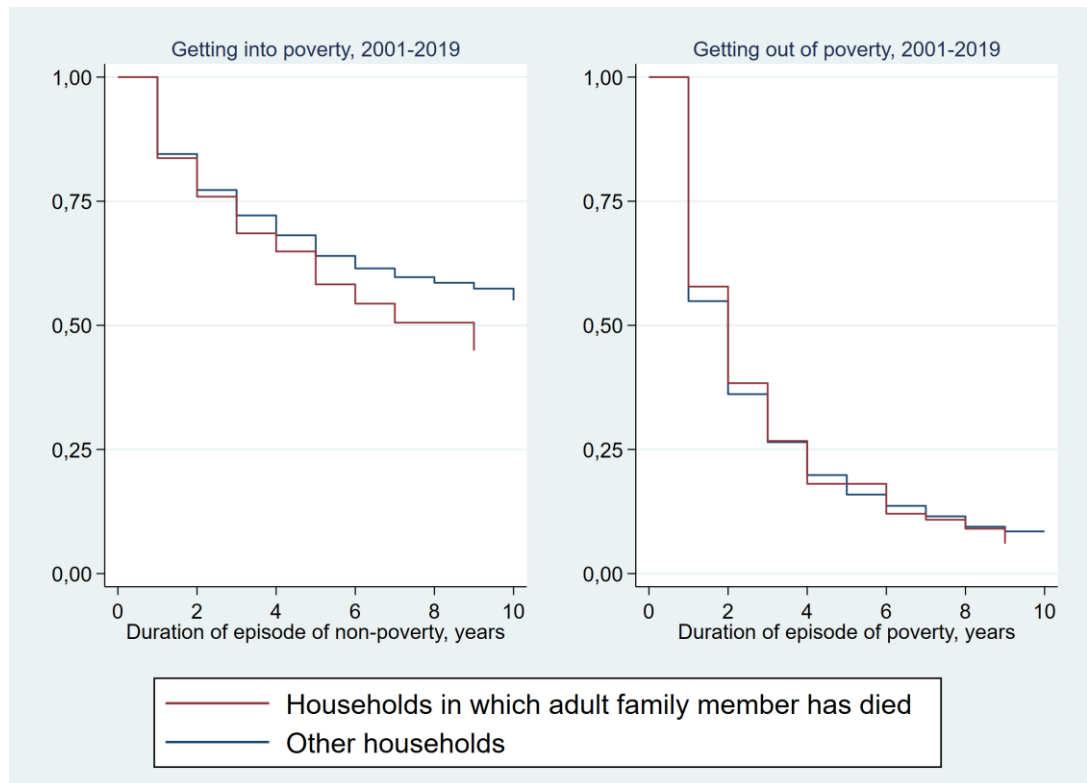


Figure 4. Estimate of the survival function for getting into and out of poverty, depending on whether the death of a family member occurred in the household, 2001-2019

Source: Author's calculations based on RLMS data.

Table 2 presents the sample means for the variables included in the regression analysis. Average time spent in non-poverty at the time of falling into poverty for the 2001-2019 sample is 2.75 years, which is noticeably longer than the average duration of poverty at the exit from it (1.83 years).

Table 2. Sample means of variables included in the regression analysis, 2001-2019

| Variable | Getting into poverty | Getting out of poverty |
|--|----------------------|------------------------|
| Length of stay in non-poverty, years | 2.75 | |
| Length of stay in poverty, years | | 1.83 |
| Household size, persons | 2.76 | 3.07 |
| Number of children under age 7, persons | 0.22 | 0.28 |
| Number of children aged 7 to 18, persons | 0.31 | 0.45 |
| Head of family woman of working age | 0.28 | 0.32 |
| Head of family woman past working age | 0.25 | 0.20 |
| Head of family man past working age | 0.10 | 0.08 |
| Head of family man of working age (missing variable) | 0.37 | 0.40 |
| Share of employed persons | 0.38 | 0.34 |
| Share of unemployed persons | 0.03 | 0.04 |
| Share of persons with higher education | 0.20 | 0.12 |
| Share of pensioners | 0.44 | 0.33 |
| Share of household members with poor health | 0.14 | 0.14 |
| Household lives in the city | 0.73 | 0.60 |
| 3-5 years before the death of a man aged 21-60 | 0.002 | 0.004 |
| 1-2 years before the death of a man aged 21-60 | 0.004 | 0.006 |
| Year of death of a man aged 21-60 | 0.006 | 0.01 |
| 1-2 years after the death of a man aged 21-60 | 0.008 | 0.011 |
| 3-5 years after the death of a man aged 21-60 | 0.007 | 0.005 |

| Variable | Getting into poverty | Getting out of poverty |
|---|----------------------|------------------------|
| 3-5 years before the death of a household member past working age | 0.005 | 0.009 |
| 1-2 years before the death of a household member past working age | 0.007 | 0.013 |
| Year of death of a household member past working age | 0.020 | 0.024 |
| 1-2 years after the death of a household member past working age | 0.026 | 0.028 |
| 3-5 years after the death of a household member past working age | 0.019 | 0.015 |
| Number of observations | 20547 | 11964 |
| Number of censored observations | 14699 | 3711 |

Source: Author's calculations based on RLMS data.

RESULTS

The impact of the death of family members on the well-being of households of various types

How does the death of men and women of different ages affect the well-being of the remaining members of households? To find an answer to this question, one can look at the dynamics of real income and poverty of the household in which the deceased lived during the 5 years before and after his death.

Figure 5 graphically presents information on the dynamics of the poverty level among households that survived the death of a man of working age. Real incomes of households in the year of death of one of the family members, regardless of the sex and age of the deceased, grow. This is most likely due to the low income of this person shortly before death, and therefore in the year of death, due to a decrease in family size, per capita income increases. We should also note the low number of a series of events of interest to us, primarily the deaths of women of working age. In general, from 2001 through 2019 there are 192 such cases in the sample, no more than 15 cases per year.



Figure 5. Dynamics of average real per capita income of households after the death of a family member, 2001-2019

Source: Author's calculations based on RLMS data.



Figure 6. Poverty dynamics among households after the death of a family member, 2001-2019

Source: Author's calculations based on RLMS data.

The relationship between the death of family members and the poverty of the households in which they lived is graphically presented in Figure 6. In the 2010s, the poverty rate of households that had lost a family member is significantly lower than in the previous decade, but this does not change the pattern of the impact of death on poverty. The effect of reducing

poverty directly in the year of death of a family member is observed in almost all cases, regardless of the observation period or of the sex and age of the deceased. The only exception is families where a pensioner died; for the period 2011-2019 they showed a slight increase in poverty.

As we can see, the dynamics of per capita income and poverty in households that survived the death of one of the family members indicate that the effect of a decrease in family size prevails over the effect of a decrease in income. This is most likely due to the fact that the well-being of households deteriorates not in the year of a person's death, but earlier. How fair this assumption is can be judged by the results of the analysis of poverty or income factors, taking into account the heterogeneity of individuals and households included in the sample. This was done using regression analysis.

REGRESSION ANALYSIS OF THE IMPACT OF THE DEATH OF FAMILY MEMBERS ON HOUSEHOLD POVERTY

In the duration regression model, we estimate the chances of the event under study, i.e., getting into or out of poverty, depending on the duration of the episode of non-poverty (poverty) that preceded such a transition. To do this, we consider observations with completed episodes, i.e., those cases where the state of non-poverty at some point ended in a transition to poverty. For them, the risk of falling into poverty is estimated as the conditional probability that the survival period will end at time t , provided that it does not end earlier. At the same time, we evaluate survival functions for unfinished episodes. The calculations used a semi-parametric Cox model - a proportional hazard model where the hazard function is the product of the baseline hazard function and the hazard ratio, which shifts the baseline hazard depending on the characteristics of the observed household. The results of assessing the factors of falling into poverty are presented graphically (Figure 7) and in tabular form (Table A1 of the Appendix). The results are represented by a regression coefficient (the logarithm of the odds ratio), so they can be either positive or negative. Significant factors are those for which the regression coefficient lies on one side of the red line of zero. Regression models were evaluated for 3 time periods: the full sample of 2001-2019, as well as subsamples of 2001-2010 and 2011-2019.

In Figure 7, the results of the survival analysis for the risk of falling into poverty are presented graphically. The points correspond to the values of the logarithm of the hazard ratio, and the segments passing through them correspond to 90% confidence intervals. For factors that significantly increase the risk of a household falling into poverty, the values of the coefficients are positive (located on the right side of each of the graphs in Figure 7), and the confidence interval does not cross the zero line.

According to the calculations, the demographic characteristics of a household have a significant impact on the risks of falling into poverty. Thus, as the size of the household grows, the probability of becoming poor for the 2011-2019 subsample increases significantly. Presence in the household of minor children also increases the likelihood of falling into poverty.

Households headed by women of both working age and retirement age have significantly higher risks of poverty compared to the reference category (men of working age). However, the risks of poverty for women of retirement age are mitigated by the influence of the variable

"proportion of persons of retirement age in the family", and the net effect of the fact that a household is headed by a woman of retirement age contributes to a decrease in the likelihood of falling into poverty.

An expectedly important factor in poverty is the status of household members in the labor market: the risk of poverty increases with an increase in the proportion of unemployed and a decrease in the proportion of employed family members. The presence of higher education among family members reduces the likelihood of falling into poverty. No significant influence on the risk of falling into poverty was found for the factor of poor health of family members. Living in an urban area reduces the risk of falling into poverty.

Of greatest interest in this study are the variables associated with the death of the respondents. Due to the small number of deaths of women of working age in the RLMS sample, information on such deaths was not included in the model. When information about the year of death of one of the household members is added to the model, practically nothing changes: only the death of family members of retirement age due to the loss of a guaranteed income by the household, the pension of the deceased, significantly contributes to an increase of poverty. The coefficients for the year of death of men of working age turned out to be insignificant for all versions of the model.

It can be assumed that the risks of falling into poverty increase not at the time of death of a not yet old person, but earlier, at the moment when he has significant health problems. The inclusion in the model of variables for the periods before and after the death of household members (3–5 years and 1–2 years before and after death) makes it possible to test this hypothesis. Figure 7 clearly shows the impact of the death of men of working age on poverty: increased risks of falling into poverty 1-5 years before death and 1-5 years after it. For families in which a family member of retirement age has died, the risks of falling into poverty are also highest 3-5 years and 1-2 years before the death.

It can also be assumed that the risks of falling into poverty after the death of men of working age are somewhat underestimated due to the fact that in such households its type is highly likely to change - from a household headed by a man of working age to a household headed by a woman.

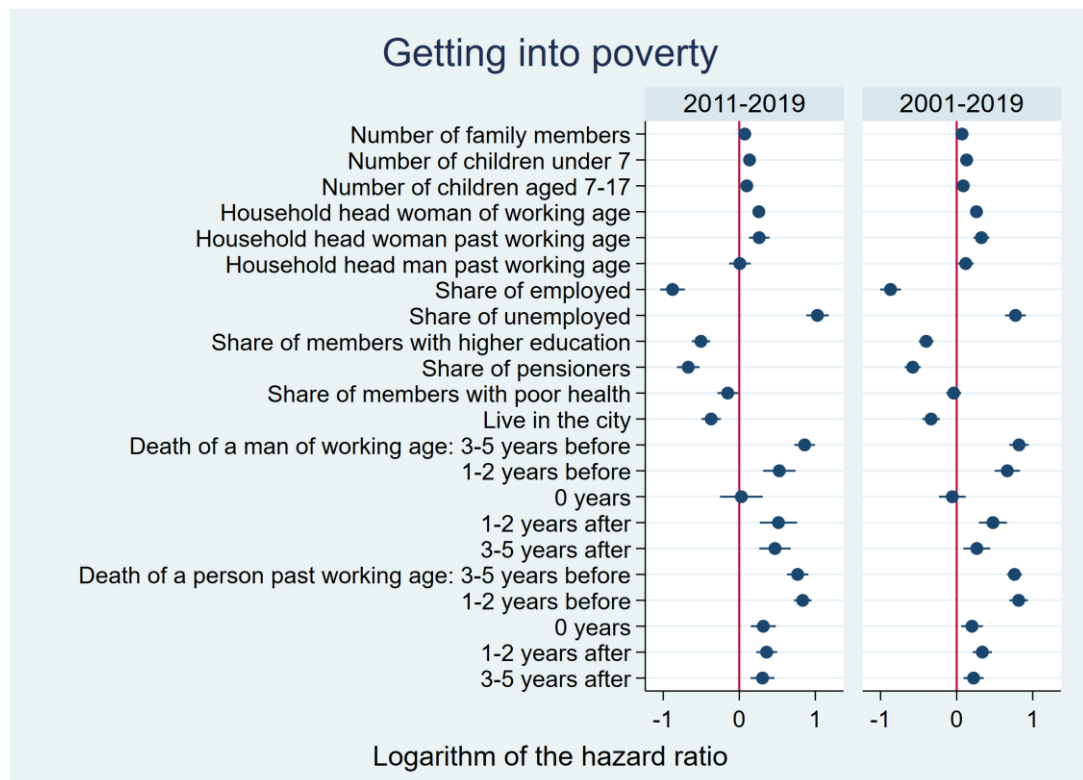


Figure 7. Results of the analysis of the length of stay in non-poverty, 2011-2019 and 2001-2019

Source: Author's calculations based on RLMS data.

The analysis of the process of a household getting out of poverty examined the same set of factors as the analysis of getting into it; however, the relationships found are not always a mirror image of earlier results. The results of the proportional risk model for households moving out of poverty are presented in Appendix Table A2 and Figure 8.

The influence of family composition factors is predictable: the chances of getting out of poverty are significantly reduced for families with a large number of minor children, the unemployed and people with low self-assessment of health, while, on the contrary, they increase if there are more working people, pensioners and family members with higher education in the family. Households headed by men of working age have a higher chance of moving out of poverty than all other types of households. It should also be noted that the absolute value of the impact of these factors on the chances of getting out of poverty is generally noticeably lower than for the chances of falling into poverty.

An interesting and somewhat unexpected effect of the death of an adult family member is observed 3-5 years and 1-2 years before the event of his death. The probability of getting out of poverty at this moment increases, and this effect is observed in the case of the death of both pensioners and men of working age. This may be due to an increase in income due to the start of disability benefits, although the effect of the variable "proportion of household members in poor health" for all three samples was insignificant (there is empirical evidence that self-reported health correlates significantly with objective indicators of health status, which include having a disability (Wu et al. 2013)).

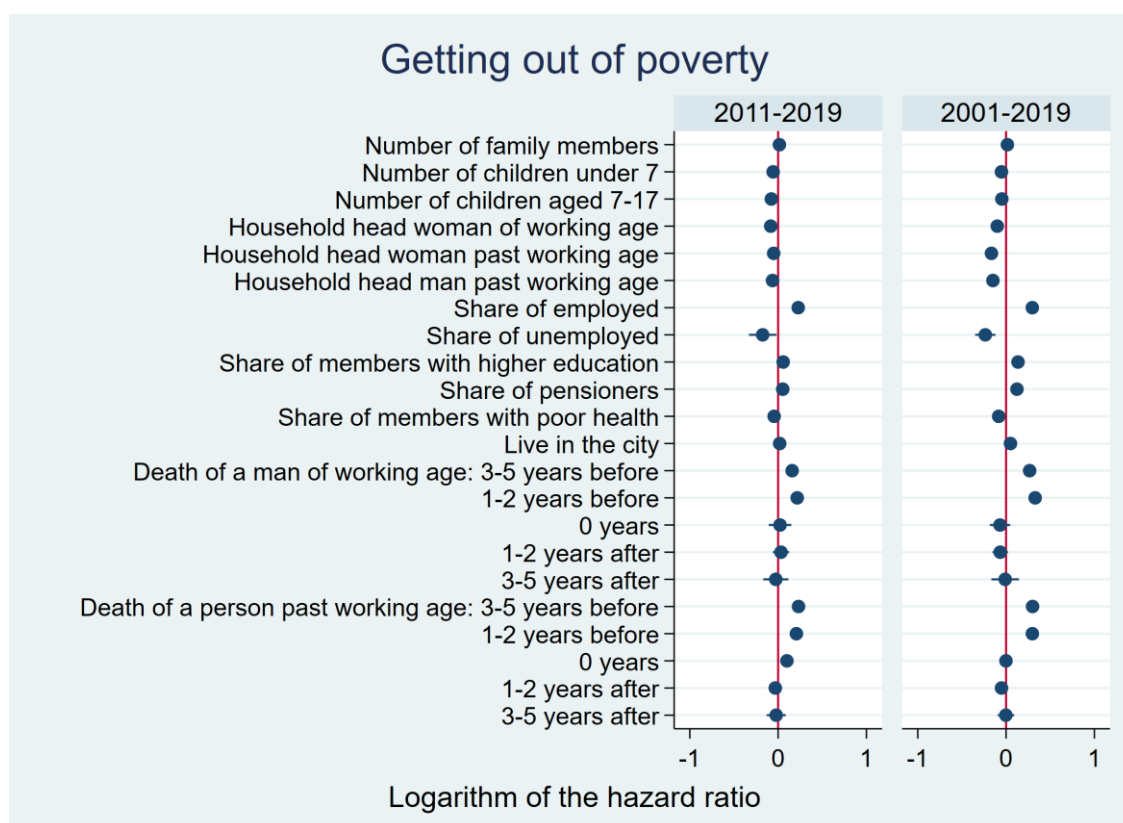


Figure 8. Results of the analysis of the length of stay in poverty, 2011-2019 and 2001-2019

Source: Author's calculations based on RLMS data.

CONCLUSION

Empirical analysis of the relationship between mortality and well-being requires the use of data from a panel of a representative sociological survey. In Russia, there is only one source of such data: the Russian Monitoring of the Economic Situation and Health of the Population of the National Research University Higher School of Economics (RLMS). The study showed that the error in estimating mortality using RLMS data is systematic and is mainly concentrated in certain (older) age groups.

Regression analysis of duration applied to the RLMS data for 2001-2019 made it possible to identify factors influencing the probability of households getting into and out of poverty. According to the calculations, the risks of falling into poverty are lower if there are employed persons, pensioners, and persons with higher education in the household. The risks of falling into poverty are higher if the household has unemployed persons or minor children, or if the head of the household is a woman. The absolute effect of the impact of factors on getting out of poverty turned out to be noticeably smaller than for the risks of falling into it.

We studied separately the impact on poverty and household income of the death of family members depending on their gender and age (men of working age, as well as people older than working age). It was shown that the death of men of working age has a significant impact on poverty: there are increased risks of falling into poverty 1-5 years before death and 1-5 years after it.

Thus, it was possible to prove that the death of men of working age negatively affects the well-being of households. Generally speaking, this conclusion is not obvious. It was shown that in the year of the death of a family member of working age, the per capita income of the rest of the household members increases, and the risks of poverty decrease, i.e., the effect of a decrease in the size of a household prevails over the effect of a decrease in its income. However, a study of household well-being not only in the year of death of a family member, but also for 5 years before and after this event, shows a noticeable increase in the risk of falling into poverty for households in which a man of working age dies.

The results obtained in the course of the study can be used in the development of social policy measures. It has been shown that a decrease in household size in the year of death of a family member does not suggest a deterioration in the financial situation of the remaining household; however, just before the death, and for several years after, such families face increased risks of falling into poverty. For families facing the loss or serious illness of loved ones, the fall into poverty could be prevented by social support measures, both material and non-material (psychological assistance, provision of long-term care services, assistance in finding a job, etc.).

ACKNOWLEDGEMENTS

The author is grateful to two anonymous reviewers for their careful reading of the text and valuable comments.

REFERENCES

- Adams P., Hurd M. D., McFadden D., Merrill A., Ribeiro T. (2003). Healthy, wealthy, and wise? Tests for direct causal paths between health and socioeconomic status. *Journal of econometrics*, 112(1), 3-56.
- Abanokova K.R. (2015). Changes in the structure of Russian households in 1994-2013 (statistical analysis). *Demographic Review*, 2(1), 125-147. (In Russ.) DOI: <https://doi.org/10.17323/demreview.v2i1.1791>
- Ahammer A., Horvath T. A., Winter-Ebmer R. (2015). The effect of income on mortality: new evidence for the absence of a causal link. *IZA Discussion Paper*, 9176.
- Andreev E.M. Mortality of men in Russia. (2001). *Voprosy statistiki*, 7, 27-33. (In Russ.)
- Anikin V., Tikhonova N. (2014). Framing Contemporary Russian Poverty in the Context of Different Nations. *Universe of Russia*, 23(4), 59-94. (In Russ.)
- Bane M. J., Ellwood D. T. (1986). Slipping into and out of Poverty: the Dynamics of Spells. *Journal of Human Resources*, 20(1), 1-23.
- Becker G.S. (2009a). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago press.
- Becker G. S. (2009b). *A Treatise on the Family*. Harvard university press.
- Cappellari L., Jenkins S. P. (2002). Who stays poor? Who becomes poor? Evidence from the British household panel survey. *The Economic Journal*, 112(478), 60-C67. <https://doi.org/10.1111/1468-0297.00028>

- Chernysheva I.K., Furmanov K.K. (2013). Russian monitoring of the economic situation and health of the population as a source of data on mortality: opportunities and limitations. *Demoscope Weekly*, № 567-568. (In Russ.).
- Cox D.R. (1972). Regression models and life-tables. *Journal of the Royal Statistical Society: Series B (Methodological)*, 34(2), 187-202.
- Evans W. N., Moore T. J. (2011). The short-term mortality consequences of income receipt. *Journal of Public Economics*, 95 (11-12), 1410-1424
- Denisova I. (2007). Entry to and exit from poverty in Russia: Evidence from longitudinal data. *Working Papers w0098, New Economic School (NES)*.
- Denisova I. (2010). Adult mortality in Russia. *Economics of Transition*, 18(2), 333-363.
- Duleep H.O. (1986). Measuring the effect of income on adult mortality using longitudinal administrative record data. *Journal of Human Resources*, 238-251.
- Evans W. N., Moore T. J. (2011). The short-term mortality consequences of income receipt. *Journal of Public Economics*, 95 (11-12), 1410-1424
- Fusco A., Islam N. (2012). Chapter 14 Understanding the Drivers of Low-Income Transitions in Luxembourg. In J.A. Bishop, J.A., R.Salas (Eds.) *Inequality, Mobility and Segregation: Essays in Honor of Jacques Silber (Research on Economic Inequality, Vol. 20)* (pp. 367-391). Emerald Group Publishing Limited, Bingley. DOI: [https://doi.org/10.1108/S1049-2585\(2012\)0000020017](https://doi.org/10.1108/S1049-2585(2012)0000020017).
- Grigoriev P., Jasilionis D., Klüsener S., Timonin S., Andreev E., Meslé F., Vallin J. (2020). Spatial patterns of male alcohol-related mortality in Belarus, Lithuania, Poland and Russia. *Drug and alcohol review*, 39(7), 835-845.
- Grishina E.E. (2018). Different Aspects of Poverty among Families with children. *ECO Journal*, 525(3), 7-26. (In Russ.)
- Grossman M. *The demand for health: a theoretical and empirical investigation*. Columbia University Press, 1972.
- Haq R., Arif G.M. (2004). Transition of Poverty in Pakistan: Evidence from the Longitudinal Data. *The Pakistan Development Review*, Pakistan Institute of Development Economics, 43(4), 895-909.
- Jenkins S.P., Van Kerm P. (2014). The relationship between EU indicators of persistent and current poverty. *Social indicators research*, 116(2), 611-638. DOI: <https://doi.org/10.1007/s11205-013-0282-2>
- Jusot F. (2006). The shape of the relationship between mortality and income in France. *Annales d'Economie et de Statistique*, 89-122.
- Klein J. P., Moeschberger M. L. (2003). *Survival analysis: techniques for censored and truncated data* (Vol. 1230). New York: Springer.
- Kossova T., Kossova E., Sheluntcova M. (2020). Gender gap in life expectancy in Russia: The role of alcohol consumption. *Social Policy and Society*, 19(1), 37-53.
- Leopold T. (2018). Gender differences in the consequences of divorce: A study of multiple outcomes. *Demography*, 55(3), 769-797. <https://doi.org/10.1007/s13524-018-0667-6>
- Lindquist M.J., Lindquist G.S. (2012). The dynamics of child poverty in Sweden. *Journal of Population Economics*, 25(4), 1423-1450.

- Mather D. (2011). Working-age Adult Mortality, Orphan Status, and Child Schooling in Rural Mozambique. *Food Security International Development Working Papers 119320*, Michigan State University, Department of Agricultural, Food, and Resource Economics.
- McKernan S.M., Ratcliffe C. (2005). Events that trigger poverty entries and exits. *Social Science Quarterly*, 86, 1146-1169. DOI: <https://doi.org/10.1111/j.0038-4941.2005.00340.x>
- Mehta N.K., House J.S., Elliott M.R. (2015). Dynamics of health behaviours and socioeconomic differences in mortality in the USA. *J Epidemiol Community Health*, 69(5), 416-422. DOI: <https://dx.doi.org/10.1136%2Fjech-2014-204248>
- Mincer J. (1993). *Studies in human capital* (Vol. 1). Edward Elgar Publishing.
- Munnell A. H., Eschtruth A. D. (2018). Modernizing Social Security: Widow benefits. *Center for Retirement Research at Boston College, Issue in Brief, No. 18-17*, Chestnut Hill, Mass.: September 2018. <http://hdl.handle.net/2345/bc-ir:108142>
- Munnell A. H., Sanzenbacher G., Zulkarnain A. (2019). Why has poverty declined for widows? *Center for Retirement Research at Boston College, Issue in Brief, No. 19-4*, Chestnut Hill, Mass.: February 2019. <http://hdl.handle.net/2345/bc-ir:108360>
- Ozdamar O., Giovanis E. (2017). The causal effects of survivors' benefits on health status and poverty of widows in Turkey: Evidence from Bayesian Networks. *Economic Analysis and Policy*, 53, 46-61. DOI: <https://doi.org/10.1016/j.eap.2016.11.001>
- Perlman F., Bobak M. (2008). Determinants of self rated health and mortality in Russia—are they the same? *International Journal for Equity in Health*, 7(1), 19. DOI: <https://doi.org/10.1186/1475-9276-7-19>
- Ratnikova T., Furmanov K. (2014). *Panel data and duration analysis*. Moscow: HSE. (In Russ.)
- Shkolnikov V.M., Andreev E.M., McKee M., Leon D.A. (2013). Components and possible determinants of the decrease in Russian mortality in 2004-2010. *Demographic research*, 28, 917-950. DOI: <https://dx.doi.org/10.4054/DemRes.2013.28.32>
- Snyder S. E., Evans W. N. (2006). The effect of income on mortality: evidence from the Social Security notch. *Review of Economics and Statistics*, 88 (3), 482-495.
- Sydén L., Landberg J. (2017). The contribution of alcohol use and other lifestyle factors to socioeconomic differences in all-cause mortality in a Swedish cohort. *Drug and alcohol review*, 36(5), 691-700. DOI: <https://doi.org/10.1111/dar.12472>
- Yamauchi F., Buthelezi T., Velia M. (2006). Gender, labor, and prime-age adult mortality: evidence from South Africa. FCND discussion papers 208, International Food Policy Research Institute (IFPRI).
- Wu S., Wang R., Zhao Y., Ma X., Wu M., Yan X., He J. (2013). The relationship between self-rated health and objective health status: A population-based study. *BMC public health*, 13(1), 1-9. DOI: <https://doi.org/10.1186/1471-2458-13-320>
- Zakharov S.V., Churilova E.V. (2013). Single Motherhood in Russia: Statistical and Demographic Analysis of its Prevalence and Formation Patterns. *Universe of Russia. Sociology. Ethnology*, 22(4), 86-117. (In Russ.)

APPENDIX

**Table A1. Factors contributing to a household getting into poverty
(Cox semiparameter regression)**

| | Model 1 (2001-2010) | Model 2 (2011-2019) | Model 3 (2001-2019) |
|---|------------------------|------------------------|------------------------|
| Size of household | 0.078*** [0.019] | 0.072*** [0.015] | 0.070*** [0.013] |
| Number of children under age 7 | 0.058 [0.040] | 0.136*** [0.042] | 0.132*** [0.035] |
| Number of children aged 7-18 | 0.029 [0.031] | 0.099*** [0.038] | 0.088*** [0.030] |
| <i>Sex and age of head of household (omitted variable: head of household male of working age)</i> | | | |
| Head of family woman of working age | 0.284*** [0.051] | 0.258*** [0.039] | 0.260*** [0.033] |
| Head of family woman past working age | 0.241*** [0.062] | 0.262*** [0.082] | 0.326*** [0.063] |
| Head of family man past working age | 0.324*** [0.075] | 0.008 [0.086] | 0.120* [0.064] |
| Share of employed persons | -0.903 [0.093] | -0.878*** [0.098] | -0.869*** [0.083] |
| Share of unemployed persons | 0.473*** [0.015] | 1.027*** [0.090] | 0.774*** [0.083] |
| Share of persons with higher education | -0.301** [0.070] | -0.504*** [0.074] | -0.401*** [0.057] |
| Share of family members of retirement age | -0.511*** [0.085] | -0.671*** [0.090] | -0.577*** [0.065] |
| Share of household members with poor health | 0.078 [0.074] | -0.151* [0.082] | -0.039 [0.057] |
| Live in the city | -0.231*** [0.089] | -0.369*** [0.077] | -0.336*** [0.071] |
| 3-5 years before the death of a man aged 21-60 | 0.171 [0.274] | 0.0859*** [0.082] | 0.820*** [0.077] |
| 1-2 years before the death of a man aged 21-60 | 0.841*** [0.106] | 0.527*** [0.129] | 0.666*** [0.102] |
| Year of death of a man aged 21-60 | -0.029 [0.162] | 0.027 [0.171] | -0.057 [0.107] |
| 1-2 years after the death of a man aged 21-60 | 0.399** [0.186] | 0.0516*** [0.148] | 0.477*** [0.112] |
| 3-5 years after the death of a man aged 21-60 | -0.405 [0.390] | 0.470*** [0.126] | 0.265** [0.107] |
| 3-5 years before the death of a family member of retirement age | 0.0530** [0.208] | 0.768*** [0.085] | 0.760*** [0.059] |
| 1-2 years before the death of a family member of retirement age | 0.631*** [0.136] | 0.0834*** [0.070] | 0.815*** [0.074] |
| Year of death of a family member past working age | 0.037 [0.143] | 0.316*** [0.100] | 0.202** [0.086] |
| 1-2 years after death of a family member of retirement age | 0.338** [0.135] | 0.360*** [0.083] | 0.338*** [0.077] |

| | Model 1 (2001-2010) | Model 2 (2011-2019) | Model 3 (2001-2019) |
|--|------------------------|------------------------|------------------------|
| 3-5 years after the death of a family member of retirement age | 0.196 [0.203] | 0.306*** [0.095] | 0.223*** [0.080] |
| Number of observations | 7355 | 12242 | 20547 |
| Number of subjects | 7355 | 12242 | 20547 |
| Number of transitions to poverty | 2084 | 3310 | 5848 |
| Pseudo-maximum likelihood logarithm | -16567.70 | -25080.73 | -48856.26 |

Source: Author's calculations based on 2001 RLMS data.

Notes: *, **, *** - value at 10, 5 and 1% level, standard errors are given in parentheses

**Table A2. Factors contributing to a household getting out of poverty
(Cox semiparameter regression)**

| | Model 1 (2001-2010) | Model 2 (2011-2019) | Model 3 (2001-2019) |
|--|------------------------|------------------------|------------------------|
| Size of household | 0.009 [0.010] | 0.014** [0.007] | 0.015** [0.006] |
| Number of children under age 7 | -0.093*** [0.031] | -0.056*** [0.019] | -0.051*** [0.019] |
| Number of children aged 7-18 | -0.038** [0.019] | -0.077*** [0.015] | -0.047*** [0.011] |
| <i>Sex and age of head of family (missing variable: head of family man of working age)</i> | | | |
| Head of family woman of working age | -0.101*** [0.018] | -0.084*** [0.019] | -0.099*** [0.011] |
| Head of family woman past working age | -0.268*** [0.041] | -0.050* [0.029] | -0.166*** [0.027] |
| Head of family man past working age | -0.201*** [0.050] | -0.063* [0.039] | -0.149*** [0.039] |
| Share of employed persons | 0.373*** [0.047] | 0.228*** [0.036] | 0.297** [0.033] |
| Share of unemployed persons | -0.256*** [0.095] | -0.175* [0.094] | -0.235*** [0.070] |
| Share of persons with higher education | 0.196*** [0.040] | 0.057** [0.026] | 0.136*** [0.026] |
| Share of family members of retirement age | 0.188*** [0.037] | 0.052* [0.028] | 0.123** [0.022] |
| Share of household members with poor health | -0.030 [0.032] | -0.045 [0.034] | -0.083*** [0.026] |
| Live in the city | 0.117** [0.057] | 0.018 [0.021] | 0.050 [0.033] |
| 3-5 years before the death of a man aged 21-60 | 0.243*** [0.092] | 0.159*** [0.030] | 0.267*** [0.045] |
| 1-2 years before the death of a man aged 21-60 | 0.361*** [0.042] | 0.216*** [0.035] | 0.330*** [0.032] |
| Year of death of a man aged 21-60 | -0.193 [0.128] | 0.021 [0.077] | -0.068 [0.070] |
| 1-2 years after the death of a man aged 21-60 | -0.213* [0.121] | 0.033 [0.058] | -0.066 [0.053] |
| 3-5 years after the death of a man aged 21-60 | -0.166 | -0.027 | -0.010 |

| | Model 1 (2001-2010) | Model 2 (2011-2019) | Model 3 (2001-2019) |
|---|------------------------|------------------------|------------------------|
| | [0.099] | [0.087] | [0.095] |
| 3-5 years before the death of a family member of retirement age | 0.0245*** | 0.231*** | 0.300*** |
| | [0.070] | [0.018] | [0.026] |
| 1-2 years before the death of a family member of retirement age | 0.351*** | 0.207*** | 0.298*** |
| | [0.041] | [0.019] | [0.026] |
| Year of death of a family member past working age | 0.005 | 0.100*** | -0.001 |
| | [0.052] | [0.037] | 0.035 |
| 1-2 years after the death of a family member of retirement age | 0.094 | -0.032 | 0.051 |
| | [0.083] | [0.046] | [0.041] |
| 3-5 years after the death of a family member of retirement age | -0.029 | -0.022 | 0.002 |
| | [0.111] | [0.066] | [0.057] |
| Number of observations | 6525 | 4786 | 11964 |
| Number of subjects | 6525 | 4786 | 11964 |
| Number of transitions to non-poverty | 4035 | 3638 | 8253 |
| Pseudo-maximum likelihood logarithm | -31182.49 | -27029.19 | -68603.83 |

Source: Author's calculations based on 2001 RLMS data.

*Notes: *, **, *** - value at 10, 5 and 1% level, standard errors are given in parentheses*