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CONTENTS

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LETTER FROM THE EDITOR-IN-CHIEF

Dear readers!

We are pleased to introduce the first English issue of our journal "Demographic Review. English selection 2014". It contains the translations of selected articles published in previous issues of the journal in Russian. The main goal of this edition is to make the results of population studies in Russia more accessible for our foreign colleagues and to widen the collaboration of Russian demographers with the international scientific demographic community.

We would be grateful for any feedback on this publication.

With warmest wishes.

Anatoly VISHNEVSKY

THE DEMOGRAPHIC REVOLUTION IS CHANGING THE REPRODUCTIVE STRATEGY OF *HOMO SAPIENS* *

ANATOLY VISHNEVSKY

The demographic revolution (demographic transition) is changing the reproductive strategy of the species Homo sapiens. The whole evolution of life on Earth, including social evolution since the beginning of human society, has led to this triumph of the K-strategy of reproduction. This universal revolution has a crucial importance for the present stage of human history. The cause-and-effect relationship between economic, social and demographic changes is discussed, the interpretation of changes in the mass reproductive or family behavior as primarily a direct consequence of economic, social or cultural shifts is contested. Such explanations are redundant since the main changes in demographic behavior are a response to the necessity of restoring the demographic equilibrium upset by an unprecedented decline in mortality. At the same time, such explanations lead to an underestimation of the impact of demographic change on economic, social and cultural dimensions of the development of modern societies.

The demographic transition theory in its present form hinders the vision of this transition as an integral stand-alone process that has its own internal determinants and at the same time has a powerful impact on all social processes, including processes at the global level. The global logic of demographic transition theory is opposed to the widespread local logic, according to which this theory must be justified by the experience of each state.

An attempt is made to overcome the current fragmentation in the description of the demographic transition and its splitting into multiple "transitions" and "revolutions", and to consider it as a cohesive process, that is, a sequence of inevitable major stages of a single global "chain reaction" initiated by an enormous decline in mortality.

Key words: *demographic revolution, demographic transition; second demographic transition; third demographic transition; epidemiologic transition; fertility; mortality; migration.*

THE MEANING OF DEMOGRAPHIC TRANSITION

Meaning the same as "demographic revolution", the term "demographic transition" is predominant in scientific literature, and we will use it in our article, although at the end of it we will state some considerations in favor of the first term.

For more than 100 years of development (if we start counting from Adolf Landry's article [Landry 1909]), the demographic transition theory has received very wide recognition. It is commonly used to explain and forecast demographic processes at all levels, from local to global, and despite the occasional criticism declaring it to be invalid, obsolete, etc. (see, for example, [Marchal 2008]), it is certainly one of the most respected social theories. Perhaps it is even broader than a middle-range theory suggested by D. Cowgill [1970: 633].

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TRANSLATED FROM: ДЕМОГРАФИЧЕСКОЕ ОБОЗРЕНИЕ. 2014, 1(1): 6–33. ORIGINAL TITLE: "ДЕМОГРАФИЧЕСКАЯ РЕВОЛЮЦИЯ МЕНЯЕТ РЕПРОДУКТИВНУЮ СТРАТЕГИЮ ВИДА *HOMO SAPIENS*" (HTTP://DEMREVIEW.HSE.RU/EN/2014--1/120991102.HTML).

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However, widespread recognition that can play nasty trick on a person can be pernicious for a theory as well. It leads to the theory's spreading in scope rather than in depth, to its trivialization and use to describe the observed facts rather than to understand them. This results in the underestimation of the heuristic capabilities of the theory even by its supporters, not to mention its superficial critics.

Most authors settle for the definition of demographic transition as a movement from equilibrium of high mortality and high fertility to equilibrium at a low level of both, and reduce the theory to a "model" describing different stages of this movement. Different authors name a different number of such stages (4, 5 or 6), discuss factors operating at each of them, fertility and mortality levels separating one stage from another, and concentrate on how and when different countries pass through these stages (the demographic transition is described in such a way, for example, in Wikipedia articles meant for general readers). Usually, such authors attach special importance to quantitative indicators of the transition.

All of this facilitates the orderly description of the observed facts and trends, but not an understanding of the deep changes behind them, which under such an approach commonly fall outside the field of view of researchers. In this article we are primarily interested in the qualitative changes making up the essence of the demographic transition and widening the range of its effects far beyond purely quantitative changes.

Unfortunately, an interest in the essence of qualitative changes can hardly be ascribed to the mainstream of research literature on the demographic transition, although that is not to say that it is completely absent from the literature. I could refer, in particular, to my own book published long ago and repeating within the title the title of A. Landry's book [Vishnevsky 1976] as well as to my earlier article with the same title [Vishnevsky 1973a[1]]. I wrote, *inter alia*, that "the most important thing in the demographic revolution is profound qualitative changes in the entire system of demographic control, and thus in the demographic process" [quot. from Vishnevsky 2005: 199]. Pointing to the transition from high fertility and mortality to low levels of both, I noted that "the human population reproduction rises to a higher qualitative level: it becomes much more rational, efficient, and cost-effective" [Vishnevsky 1973: 59]. But I like most the definition given by M. Livi Bacci: "The demographic transition can be characterized as a change in the system, as a transition from a "dissipative" system related to the loss of demographic power (high fertility and mortality) to a system "economizing" this energy (low fertility and mortality)" [Livi Bacci 1995: 451].

Adding just a few words, without significantly affecting the scope of the definition, turns it from a purely descriptive to an explanatory notion, because it points to the evolutionary inequality of the pre- and post-transition situations and thereby provides the definition with a universality similar to that of physical laws.

Conceived in such a way, the transition to a new type of demographic equilibrium is an unprecedented and unique event in history. In fact, it changes the conditions for the existence of humans as a species. Humans themselves are not changed in terms of biology, but undergo

[1] The article was also published in English, French and German (twice) [Vishnevsky 1973b, 1974a, 1974b, 1980].

fundamental changes in the reproduction characteristics of *human populations*, and these characteristics are also considered inherent properties of the species.

In 1967, American ecologists Robert MacArthur and Edward Wilson [MacArthur, Wilson 1967] proposed to distinguish between two fundamentally different strategies of population reproduction in nature: the ***r***-strategy and the ***K***-strategy (***r*** and ***K*** are parameters of Verhulst's logistic equation). Without going into details, the ***r***-strategy involves highly "wasteful" reproduction, a huge propagation of offspring, most of whom are doomed to an early death, so that only an insignificant part of them survives until the next reproduction cycle. On the contrary, the ***K***-strategy is economical; offspring are small in number, but characterized by much better survival. Fish spawn millions of eggs, while the offspring of mammals number in the dozens or even less. Yet, although the population size in nature varies over long periods, in total it does not change much, and the number of individuals surviving until their own procreation cycle remains more or less constant for each population, regardless of the species.

In reality, no population in nature adheres only to the ***K***-strategy; ***r***-strategy elements are always observed as well. Yet, in general, biological evolution is characterized by a tendency towards strengthening the ***K***-strategy. Species higher up on the evolutionary ladder are not highly dependent on external factors, because internal regulators of population dynamics play an increasingly important role. Their population size becomes more stable and the amplitude of its variation decreases. Their number may vary a few times over, but not by the hundreds, thousands or even millions of times that is characteristic for many insects and crustaceans.

The increasing role of internal regulators indicates an improvement in the efficiency of a species' reproduction, as well as a species' ability to use vital resources for other purposes than producing offspring. As a result, the organization and functioning of organisms and their communities becomes more complex.

With the appearance of human society, the protective mechanisms created by nature are supplemented with social protection mechanisms, and the "price" of population reproduction [Vishnevsky 2005: 184] decreases even further, which signifies a new step from the ***r***-strategy to the ***K***-strategy. This expands enormously the scope of freedom and the opportunities for the development of human society, serving as one of the main, if not *the* main, prerequisites for the appearance of human civilization.

For tens of thousands of years of human history, the protective mechanisms on which the reproductive ***K***-strategy of human population was based gradually improved, while not undergoing fundamental changes. Mortality of Europeans in the middle of the second millennium CE differed little from that of pre-Neolithic hunters and gatherers, and even less from that of representatives of ancient civilizations. The fundamental breakthrough began only at the end of the eighteenth century and meant the real triumph of the ***K***-strategy – a sharp increase in population reproduction efficiency to the highest possible level. The ***r***-strategy elements virtually disappeared.

THE CHICKEN OR THE EGG?

It is obvious that all these changes did not occur by themselves, but were the result of a thousand years of economic and social development of humankind. It is, however, quite possible that they became the *most important,* yet still unrecognized outcome. Historians and public opinion attach much more importance to political, economic or social changes of modern history, for instance, to global processes such as urbanization, industrial or technological revolution or the rise of post-industrial society, etc. Yet, only the new reproductive strategy of human populations, poorly seen in the background of all these other changes, affects the very foundations of the existence of the human species, and in this sense it is not just comparable to the greatest economic or political revolutions in its fundamental impact on the future, but most likely even exceeds them.

These demographic changes turned out to be so deep that they could not help but affect all aspects of people's lives, leaving a mark on all rules of human society, on the norms of social control and on culture. Everything must change and indeed does change, but recognizing the true causes of these changes is hard for theorists, due to their chronic underestimation of the independence of the demographic factor.

In the case of Russia, such underestimation was associated with the Marxist or rather pseudo-Marxist scientific tradition. As Engels wrote, "According to the materialistic conception, the determining factor in history is, in the final instance, the production and reproduction of the immediate essentials of life. This, again, is of a twofold character. On the one side, the production of the means of existence, of articles of food and clothing, dwellings, and of the tools necessary for that production; on the other side, the production of human beings themselves, the propagation of the species. The social organization under which the people of a particular historical epoch and a particular country live is determined by both kinds of production: by the stage of development of labor on the one hand and of the family on the other" [Engels, 1884]. Engels does not use the word "demography", which was little known at that time, but the fact that he puts "procreation" on a par with "production of the means of subsistence" can be interpreted as recognition of the independence and primary importance of what we now would call the demographic factor.

In the Soviet Union, despite the authority of Engels, this view was not popular. For some time, the above-given quotation of a "Marxist classic" was supplemented (rarest case) by a "corrective" editorial note: "Engels is not quite accurate here when equating the procreation and the production of the means of subsistence as causes contributing to the development of society and social orders" [Marx and Engels 1948: 160-161]. In fact, K. Kautsky's argument is repeated there without reference to the original source: "This is just a simple play on the word 'production' ... What Engels calls changes in the natural reproduction process – changes in forms of family and marriage – ... are results, rather than driving forces of social evolution. All this is caused by changes not in the reproduction technique, but in the production technique of the means of subsistence.... Changes in this kind of production are, ultimately, the only ones that cause all changes in social forms and predefine history" [Kautsky 1923: 119].

After Stalin's death the editorial note disappeared from Engels' works, but not from the heads of Soviet researchers, who continued to fight against the "misconceptions about the self-contained nature of demographic processes … whereas in fact, these are regular demographic changes under the influence of socio-economic development" [Guzevaty 1980: 30].

Although Western theorists of the demographic transition were not, as a rule, Marxists and most likely did not know anything about the intra-Marxist controversy, their opinion was surprisingly consistent with that of Kautsky. According to George Caldwell, his own research in Africa and Asia showed that the type of economy affected the culture, religion and demographic behavior of the population in these countries. "Clearly, this is akin to Karl Marx's use of "mode of production", a term which will also be used here" [Caldwell 2006: 6]. Meanwhile, he interprets the "production of material life" in line with Kautsky, not Engels, and considers everything related to demography to be part of the 'superstructure', not the 'foundation'.

The very fact that the "demographic transition" or "demographic revolution" is regarded as a special historical phenomenon suggests, of course, a recognition of its epochal importance, but not always a recognition of its independent internal logic. "This internal logic does not attract the attention of demographers, who interpret such changes only as a result of various social shifts, which are non-demographic in their nature" [Vishnevsky 1991: 267].

A good illustration of this approach is the opposition between "descriptive" and "explanatory" aspects of the demographic transition theory by J.-C. Chesnais. The descriptive aspect "refers to internal dynamics of the population: it concerns the impact of mortality on fertility", which, according to Chesnais, was noted as early as in the nineteenth century; thus, the idea of transition "existed in embryo even then", but it was nothing more than a statement of fact. The explanatory aspect, especially when it comes to reducing fertility, requires recourse to socio-economic, cultural, social, political, etc. determinants, which offer an "explanation" [Chesnais 1986: 6-8].

This view of the essence of the demographic transition has not been overcome even today. As is noted by David Reher in his recent article: "… Students of the demographic transition would want to see it as part of the larger process of economic and social modernization, with demographic change largely guided by social and economic change. Rather less attention has been given to the demographic transition specifically as a cause rather than as a consequence of this process of change. Ultimately, historians and social scientists tend to conceptualize demographic realities as determined by economic forces rather than the other way around. I argue here that in many ways demographic change can and should be seen as an essential factor of change. The demographic transition will be considered as a largely autonomous process that ended up having profound social, economic, and even psychological or ideational implications for society [Demeny 1972: 154]. Demography will be seen as an independent variable" [Reher 2011: 11-12].

Unfortunately, the current state of the demographic transition theory makes it difficult to view it as a complete, stand-alone process that has its own internal determination, and that actively influences all social processes, including those at the global level. With regards to understanding the true importance of the demographic transition as a fundamental shift in the reproductive strategy of humans as a species, as well as the inevitable consequences of this shift and its significance, there is still no sign of its existence.

This does not mean that the demographic transition theory has remained unchanged; over its hundred years of existence it has been subject to constant improvements and enrichments. However, this development has not been entirely organic. Rather, it has been comparable to

expanding a house by constantly making various additions, each of which considers itself as an independent building retaining some relation to the main house, but not as a part of the whole.

Among these additions we find the "epidemiologic transition", the "second demographic transition", the "third demographic transition", as well as the "contraceptive revolution", the "cardiovascular revolution", etc. In essence, the theory became subdivided into separate parts, thus losing its conceptual unity in the interpretation of observed facts. The "subdivision" of one demographic transition into many separate transitions leads to the fact that the analysis of each of them yields the development of independent arguments detached from the "parent" theory's roots.

THE EPIDEMIOLOGIC TRANSITION

This is what happened, in particular, with the epidemiologic transition theory of A. Omran. The theory is commonly perceived as explaining the mechanisms and characteristics of the mortality reduction over the past centuries, but Omran's idea was different. His main article is called "The Epidemiologic Transition: A Theory of the Epidemiology of Population Change" [Omran 1971]. He interpreted the term "epidemiologic" as indicating the nature of mass phenomena, and believed that "many epidemiologic techniques that have heretofore been limited to the examination of health and disease patterns can be profitably applied as well to the exploration of other mass phenomena, such as fertility control" [Omran 2005: 731].

It is quite possible that the use of the expression "epidemiologic transition" in the article's title was a successful "marketing" strategy that allowed Omran to link his name firmly with this concept, but, in fact, his article provides an analysis of that very demographic transition, and, moreover, it is very insightful and, in my opinion, underestimated. His name is rarely mentioned in reviews on the history of the general theory of demographic transition.

Omran's work differs from other articles focused on the demographic transition in its more careful attention to the mortality reduction and in its pioneering study of this component of demographic transition. Meanwhile, he states from the very beginning that the epidemiologic transition theory was stimulated by "recognition of the limitations of demographic transition theory and of the need for comprehensive approaches to population dynamics" [ibid.: 732]; he moreover states that mortality is important in this context, because "the theory of epidemiologic transition begins with the major premise that mortality is a fundamental factor in population dynamics" [ibid.: 733]. "The basic strategy is not only to describe and compare the mortality transitions of various societies, but more importantly, to lend theoretical perspective to the process of population change by relating mortality patterns to demographic and socioeconomic trends" [ibid.: 755].

Omran constantly returns to the effects of mortality decrease on fertility, emphasizing that "improved infant and childhood survival tends to undermine the complex social, economic and emotional rationale for high parity for individuals and hence high fertility for society as a whole. As couples become aware of the near certainty that their offspring, particularly a son, will survive them, the likelihood of practicing family limitation is enhanced" [ibid.: 749]. Omran distinguishes three stages of changes in mortality during the demographic transition and states that at the third (last) stage, which he calls *The age of degenerative and man-made diseases*, "Mortality continues

to decline and eventually approaches stability at a relatively low level. The average life expectancy at birth rises gradually until it exceeds 50 years. It is during this stage that fertility becomes the crucial factor in population growth" [ibid, p. 738].

The last phrase is more important than the previous two, but is commonly underestimated. Authors referring to the epidemiologic transition concept usually relate it to the study of mortality only. They pay tribute to A. Omran's conceptualization, which opened the way to rethinking the obvious fact of quantitative reduction in mortality in terms of the evolution in the composition of causes of death, as a result of which occurs "not only a shift from one dominant pathological structure to another", but simultaneously the "radical transformation process in ages at death" [Meslé, Vallin 2006: 247]. Moreover, they are trying to develop and modify the concept. Considering it to be related to the realities of the late 1960s and therefore to be obsolete, they propose to increase the number of stages [Olshansky 1986] or even principally change the approach to the classification, while at the same time changing the name of the concept in order "to include within the wider concept of health transition an initial phase (described by Omran) of life expectancy gains, attributed mainly to the decline in mortality due to infectious diseases, followed by a second phase dominated by the decline in cardiovascular diseases, leaving open the possibility of identifying later phases" [Ibid.: 250].

Whatever our attitude to all these proposals, it is evident that the stage at which "fertility becomes the crucial factor in population growth" remains where it was placed by Omran. In this sense, no subsequent shifts in mortality change anything fundamentally. Meanwhile, when it comes to "renaming" the epidemiologic transition, the question arises as to whether it is always justified to use concepts such as "transition" or "revolution". If any change is called a "revolution", then the concept of "evolution" loses its sense. Any transition or any revolution has a beginning and an end, but this does not mean that the end is not followed by further development. Is it right to put this unprecedented historical shift on a par with ordinary evolutionary changes, even if they are very important?

The concept of epidemiologic transition helps to understand the "anatomy" of historical changes in mortality as a key mechanism that triggers the entire demographic transition. In this sense, it is "embedded" in the general theory of demographic transition, becoming one of its parts. But, when taken outside the bounds of demographic transition analysis, it loses its heuristic power. There is no need of this concept to study subsequent changes in mortality.

At the same time one cannot deny that Omran's generalization contributes to a more structured approach to the study of mortality and its changes as a demographic phenomenon. It is obvious that these changes can be subdivided into stages, need periodization, and can be also characterized by their own "revolutions", etc. For example, Milton Terris distinguishes two epidemiologic revolutions [Terris 1985]. French demographers, as we have seen, emphasize the importance of the "cardiovascular revolution", while fertility researchers write about the "contraceptive revolution" [Leridon et al. 1987], etc. But these are "revolutions" of an absolutely different level. The attention given to them may be due to the general shift of demographic theory over the past half-century, noted by Caldwell, from a "grand theory" to a theory of short-term changes: "The times seemed to call for a theory applicable for the short-term rather than grand theory" [Caldwell 2006: 301].

There is no doubt that mortality researchers will understand by themselves what they can take from the epidemiologic transition theory and what they can omit. For our purposes, what is important is to recognize the epidemiologic transition as the key mechanism triggering a chain reaction of unprecedented changes in the reproductive strategy of humankind, as the first link in a single chain of transformations that make up the demographic transition.

THE FIRST DEMOGRAPHIC TRANSITION

In 1986, Lesthaeghe and van de Kaa formulated for the first time their concept of the "second demographic transition" [Lesthaeghe, van de Kaa 1986], which soon became widely known through a publication of D. van de Kaa's in the *Population Bulletin of the United Nations* in 1987 [van de Kaa 1987]. The second demographic transition will be discussed below, while now it is essential to explain what is meant by the "first" demographic transition, because no such concept existed until then.

As follows from van de Kaa's explanations at that time, as well as from Lesthaeghe's relatively recent article [Lesthaeghe 2010], the first demographic transition consists of a mortality reduction and a subsequent fertility decline to a level ensuring the zero population growth that occurred in Europe mainly before the Second World War [van de Kaa 1987: 4-5; Lesthaeghe 2010: 247]. (It should be noted that chronologically this roughly corresponds to what Omran called the third stage of the epidemiologic transition. However, he farsightedly did not mention "zero growth", merely stating that "during this stage fertility becomes the crucial factor in population growth").

But in addition to this purely descriptive characterization, which does not go beyond a mere statement of fact, van de Kaa's work also explains the mechanism of the "first transition to low fertility". Considering industrialization, urbanization, and secularization as "indirect determinants" of this transition, he states as follows: "The shift from family-based production to wage-paid labor that accompanied industrialization and urbanization reduced the economic utility of children. They could no longer serve as cheap labor for the parents' farm or business but instead required investment in schooling and training to give them a reasonable chance in life. As Australian demographer John Caldwell puts it, the "net flow of wealth" now favored children rather than parents. Moreover, a large number of children could mean the dissipation of family assets like land after the parents' death, so birth control became a sound strategy. Secularization reduced the influence of the churches and increased couples' willingness to practice family planning" [van de Kaa 1987: 5].

In this case, van de Kaa follows the established tradition. In another article [van de Kaa 2010] he gives an explanation of fertility decline as proposed by F. Notestein, one of the founders of the demographic transition theory, referring to his 1945 publication [Notestein 1945], which he calls "a classic article on the first demographic transition". According to Notestein, fertility started declining "in response to drastic changes in the social and economic setting that radically altered the motives and aims of people with respect to family size". These changes include "growing individualism", "rising levels of popular aspiration developed in urban industrial living", the function loss of the family, the expense of large families, the freedom from "older taboos", and

"promoting the health, education, and material welfare of the individual child". As a result, Notestein comes to the conclusion that "the reduction of fertility requires a shift in social goals from those directed toward the survival of the group to those directed toward the welfare and the development of the individual".

There is no doubt that all the factors stated by Notestein, van de Kaa and many other authors played a role in reducing fertility. However, in order to list them, no theory is needed; they can be listed, though not in full, by any "man on the street". In Aesop's fable, the Lioness, when asked how many sons she had at birth, laughed and said: "Why! I have only one; but that one is altogether a thoroughbred Lion" [Aesop's Fables]. Polybius wrote: "Our men becoming perverted to a passion for show and money and the pleasures of an idle life, and accordingly either not marrying at all, or, if they did marry, refusing to rear the children that were born, or at most one or two out of a great number, for the sake of leaving them well off or bringing them up in extravagant luxury" [Polybius 1889: 37.9]. Does this mean that Aesop or Polybius can be considered as forerunners of the demographic transition theory? The internal logic of the demographic transition theory consists of, and only of, the fact that when it comes to reducing fertility, it is regarded as an inevitable stage of the chain reaction initiated by the unprecedented and irreversible decline in mortality, that is, as a necessary response to the demographic disequilibrium within a certain territory caused by this reduction.

Temporary and local cases of such disequilibrium have been observed previously. History knows four regulators that restore equilibrium [Livi Bacci 1995: 453-455]: (1) mortality; (2) emigration; (3) nuptiality (in particular the European marriage pattern as the "Malthusian" solution); (4) fertility (modern birth control as the "neo-Malthusian" solution). All of these regulators have also been tried when the reduction in mortality had become general and irreversible, but then it turned out that only the "neo-Malthusian" regulator, the least used in the past, was able to give an adequate response to the new challenges and provide a real transition to a more effective reproductive strategy of *Homo sapiens*.

No other explanations for present-day low fertility are required, and it would seem that all demographers familiar with the demographic transition theory know this. But, paradoxically, quite often the obvious relation between the decline in fertility and decline in mortality is barely seen in their reasoning, because they are focused on identifying the economic and social determinants of fertility decline, which they see in "changes in the social and economic setting": urbanization, the spread of modern education, changes in the economic and social status of women, etc.

Changes in the economic and social environment do of course occur, but their relation to the decrease in fertility is not so clear and unidirectional. These changes would be impossible under the previous demographic conditions, and they are as much a cause of reduced fertility as its consequence. Meanwhile, once started, all these modernization processes create socio-cultural mechanisms that promote the reduction of fertility through a change in the *type* of procreative motivation of more and more people. Yet these mechanisms are not specific; they do not just affect procreative behavior, they fundamentally change the predominant motivation of human behavior, and it is still unknown what factors cause this change more: political and industrial revolution, urbanization or "demographic revolution" proper as an independent response to a historical imperative.

The main threshold separating controlled from uncontrolled fertility is precisely the *type* of motivation of human behavior, and the transition to controlled fertility *requires* a change in the type of motivation, but this very fact is constantly ignored by demographers. This can clearly be seen in the position, quite popular among demographers, of J. Caldwell, who is often referred to when explaining the causes of the reduction in fertility (as we saw, van de Kaa made such a reference). "In societies of every type and stage of development, fertility behavior is rational, and fertility is high or low as a result of economic benefit to individuals, couples, or families in its being so. Whether high or low fertility is economically rational is determined by social conditions: primarily by the direction of the intergenerational wealth flow. This flow has been from younger to older generations in all traditional societies" [Caldwell 1976: 355]. But then the compass needle turned 180 degrees, and the flow of wealth moved from parents to children, "Separating the earlier situation in which the net flow of wealth is toward parents and in which hence high fertility is rational and the later situation in which the flow is toward children and in which hence no fertility is rational" [ibid, p. 345].

How justified is such a universalization of economic rationality? Since the time of Max Weber there has been a distinction between two types of rational action: value-rational (*wertrational*) and instrumentally rational (goal-rational, *zweckrational*). In the first case we are dealing with "the actions of persons who, regardless of possible cost to themselves, act to put into practice their convictions of what seems to them to be required by duty, honor, the pursuit of beauty, a religious call, personal loyalty, or the importance of some "cause" no matter in what it consists. In our terminology, value-rational action always involves "commands" or "demands" which, in the actor's opinion, are binding on him" [Weber 1978: 25-26]. On the contrary, action is goal-rational "when the end, the means, and the secondary results are all rationally taken into account and weighed. This involves rational consideration of alternative means to the end, of the relations of the end to the secondary consequences, and finally of the relative importance of different possible ends" [Ibid].

The absolute predominance of value-rational motivation, characteristic of all pre-industrial societies, – following the canon, tradition, religious commandment – greatly restricted the freedom of individual choice in all fields. Unprecedented changes taking place in European societies, at least since the late eighteenth century, first required the general distribution of a different, goal-rational motivation, making free choice both possible and necessary. Most discussions of these changes point to their economic, social, political or cultural components, without which "fertility would have remained largely in the domain of the sacred instead of that of individual freedom of choice" [Lesthaeghe 1983: 412]. However, it is ironic that the demographic component proper is usually not included in this list. Yet this component is likely to be the most important, because it is related to the most widespread practice when almost each family has to make a choice.

The idea of conscious birth control appeared prior to the recognition of free individual choice in this area. The "European" marriage pattern – marriage that is late and not universal [Hajnal 1965] – became a tool of such regulation for a little while, and Malthus – its fervent propagandist precisely for reasons of limiting offspring – vigorously rejected free procreative choice. "If it were possible for each married couple to limit by a wish the number of their children, there is certainly reason to fear that the indolence of the human race would be very greatly

increased; and that neither the population of individual countries, nor of the whole earth, would ever reach its natural and proper extent" [Malthus 1826, App. II.14].

Over some time, the "European marriage pattern" recommended by Malthus (but not invented by him) seemed to be quite effective. In the late nineteenth century, fertility in Western Europe was much lower than, for example, in Russia, not familiar with the European marriage pattern, although birth control in most European countries was as uncommon as in Russia.

Yet, we should not forget that the first edition of Malthus's book appeared in the same year as the publication of Jenner's cowpox vaccination brochure (1798), when the unprecedented decline in mortality was just starting out. Further rapid progress in this direction forced European society to recognize that none of the three more or less familiar regulators – surges in mortality (beginning to disappear), late and non-universal marriage ("European marriage pattern"), and emigration – were able to restore the demographic equilibrium being increasingly distorted due to diminishing mortality. There remained a fourth possibility: the "neo-Malthusian" one.

Originally, neo-Malthusianism, not immediately so-named, combined a protest against late marriages with propaganda for birth control in marriage. Francis Place addressed his propaganda brochures to "spouses of both sexes", and surely did not mean to undermine the foundations of marriage and family of his day. On the contrary, he believed himself to be strengthening them by reducing the risk of extramarital affairs that were inevitable under the unnatural "moral abstinence" involved in late marriage. Robert Owen and other pioneers of birth control shared Francis Place's position.

However, could the family, once on the path of limiting its own procreation, remain the same as it was before? This is unlikely.

THE SECOND DEMOGRAPHIC TRANSITION

It is now clear that in the last hundred years the family has undergone truly enormous changes, which are apparently not yet completed. It is precisely on the transformation of the "classical" European family that the authors of the "second demographic transition" concept are focused. According to van de Kaa, the principal demographic feature of this "second" transition is the decline in fertility in European countries to a level well below replacement [van de Kaa 1987: 5]. Yet the focus is mainly on the changes accompanying this decline experienced by the family: cohabitation replacing traditional marriage; the center of family life being not the child's interests, but the interests of his or her parents ("shift from the era of child-king with parents to the era of royal couple with child"); contraception giving way to intentional conception as an element of parental self-fulfillment; and the unified standard form of family and household being replaced by pluralistic forms [ibid,: 11]. According to van de Kaa, the beginning of the "second demographic transition" can be dated from the mid-1960s; today, the list of changes can be significantly expanded and detailed. Yet, in this case, we are interested not in the indisputable fact of the transformation of family and family relations, but in its explanation.

If, when discussing the "first demographic transition", van de Kaa, as we have seen, connected it to industrialization, urbanization and secularization, then for the "second

demographic transition" he looks for *other* determinants, otherwise it's impossible to speak not only of the next stage of a developing process, but of a new, fairly independent phenomenon.

Hence, it is necessary to pinpoint the specific determinants of the "second" transition. Van de Kaa characterizes them as follows: "Rising incomes and the economic and political security which democratic welfare states offer their populations have helped to trigger a "silent revolution". …An individual's sexual preferences are accepted for what they are, and decisions on cohabitation, divorce, abortion, sterilization and voluntary childlessness are largely left to the discretion of the individuals and couples involved" [van de Kaa 1996: 425]. Lesthaeghe also notes that, starting with van de Kaa's publication in 1980, both van de Kaa and he – referring in particular to Philippe Ariès' article [Ariès 1980] – have pointed repeatedly to the changing motivation of having children; the "child-centered" family of the era of the first transition is being replaced by the family oriented towards the parents' self-realization [Lesthaeghe 2010: 213].

Thus, the "trigger" is found again in economic, social and political spheres, rather than in the chain of successive events defined by the demographic changes. It seems to me that if we start from the internal logic of the demographic transition theory, then the "trigger" should be sought in these very changes at the beginning of the chain, meaning it was pulled long before the 1960s, the date assumed to be the beginning of the "second demographic transition". Even if we do not talk about the epidemiologic transition which initially led to all the changes in the demographic behavior of people, then the transition to the "neo-Malthusian" birth control left no chance of preserving the traditional family unchanged.

There is an obvious correlation between changes in family morals, status and forms of marriage and family, social roles of parents, in all that can be called the "demographic behavior" of people, on the one hand, and the declining influence of religious norms, the growth of individualism, people's desire for self-realization, the distribution of "post-materialistic values", etc. on the other hand, as is written by the authors of the concept of the "second demographic transition". Yet the question is as follows: *what is the cause and what is the consequence of these changes?*

In order to explain why people trace their individual life trajectories in a different way now, no special economic or sociological arguments are needed; they are superfluous. Even without them, it follows from the basic postulate of the demographic transition theory on the changing type of demographic equilibrium that the previous rigid social requirements for such trajectories are losing their meaning in a quite natural way. The return to equilibrium is impossible without a complete reconstruction of the whole pattern of demographic behavior: "It is precisely the pattern of demographic behavior, as well as the pattern and methods of social control over it that underwent a genuine revolution, which led to the formation and establishment of a new type of fertility" [Vishnevsky 2005: 99].

For many centuries in pre-industrial Europe, and evidently in all mature agrarian societies, the cornerstone of family life and family morality was the inseparable unity of three kinds of behavior: sexual, matrimonial and procreative [ibid, p. 98-99]. It was of course a normative unity that was often violated in real life. Nevertheless, such violations were always treated as reprehensible exceptions to the rule, and as marginal forms of behavior condemned by the dominant culture; in general daily life, all social strata held to normative cultural guidelines.

The transition to family-controlled fertility made the preservation of this unity impossible and "the disconnection between marriage and procreation", which Lesthaeghe considers as a manifestation of the second demographic transition [Lesthaeghe 2010: 211], inevitable. The autonomization of procreative behavior is the very essence of the demographic transition at its neo-Malthusian stage; this autonomization naturally entails the separation of all three previously inseparable behaviors: sexual, marital and procreative. Having become relatively independent, these three kinds of behavior started to make their own paths in each individual biography, creating the possibility of infinite variability in individual life courses and, moreover, making this variability inevitable.

Hence, the "second demographic transition" is not a separate process with its own independent determinants, but only one of the natural stages of demographic transition, one of the phases of the chain reaction launched by the decrease in mortality.

Societies, which have reached this stage of the demographic transition, find themselves in a new historical situation. They are inevitably entering a period of searching, in which hundreds of millions or even billions of families over several generations are participating, gradually overcoming the inertia of the past, abandoning existing norms and developing new institutional forms and new cultural regulation of the individual, private and personal life of people and their individual life paths. Constantly and pervasively emerging attempts to resist such changes by appealing to the experience of the past are futile, because this past no longer exists.

The search is being conducted in the only possible way – through trial and error, that is, by testing a wide variety of possible adaptations to the new demographic and social realities in a search involving the socio-cultural selection of the most competitive, efficient forms and norms [Vishnevsky 1986: 239-242; Vishnevsky 1991: 267].

According to statistics and research data, European countries at least, the first to experience the demographic transition's effect, are seeing more frequent and earlier initiation of premarital sexual relationships in no way related to the intention of getting married. Along with the customary and only type of marriage that begins with a wedding and official registration and lasts until one of the spouses dies, we now see the spreading of cohabitations, "partnerships" that begin without registration and then either split up, are registered as a marriage, or continue without registration. There is an increase in remarriages after a formal divorce, whether the marriage was registered or after widowhood, or after termination of a previous officially unregistered cohabitation. Remarriages, even more often than first marriages, can remain unregistered, yet still be considered as marriages. Other "non-standard" forms of cohabitation are appearing as well. There is nothing new in any of these forms; almost all of them have existed at different times and in different cultures. The novelty lies in the fact that they exist simultaneously in the same society and receive cultural approbation.

Searches are carried out not only along the "marriage partners" axis, but also along the "parent-child" axis. What first draws attention is the low fertility, but in fact, the changes are much more diverse. People are looking for a more convenient time to have children, the number of single-parent families is increasing, the proportion of children born out of wedlock is growing rapidly, more and more children are appearing who seem to belong to several families at once, because their parents' divorce and remarriage are no longer considered a disaster, and children

keep contacts with both parents. The separation of biological from social parenthood is no longer exotic, and the concept of "parenthood" is blurred or transformed.

All this new diversity requires constant observation and study. The task of this article is only to emphasize the primordial demographic nature of these changes and their fundamental relation to the transition of humankind to a new reproductive strategy.

Fertility is decreasing around the world, and the family is being subjected to an unprecedented transformation, not because women have started to study and get jobs, nor because they are seeking self-realization, using modern contraceptives or refusing to tie themselves forever to untested partners. On the contrary, all that became possible owing to the fact that it is no longer necessary to ensure the continuous birth of children, a huge proportion of which did not survive. Carrying out one's "demographic duty" does not require nearly as much time and effort as in the past; individual freedom has sharply expanded. Unfettered by objective demographic requirements, each person has such a variety of choices for his or her life path as has never before been seen.

THE THIRD DEMOGRAPHIC TRANSITION

The relatively new concept of the "third demographic transition" is one more example of a self-proclaimed autonomous addition to the building of the theory of demographic transition. As with the "second demographic transition", it is not the term that raises doubts – in both cases it points to a very important specific stage of the unified demographic transition, thus contributing to its understanding – but its "isolated" interpretation.

According to David Coleman, the third demographic transition is, first of all, a change in the ethnic, cultural, etc. composition of the population of the host countries due to immigration. The prerequisites for such immigration arise due to the low fertility in the host countries, whose populations are not reproducing. Such countries have to compensate for the loss of population by accepting a large number of migrants, thus giving rise to the phenomenon of the "third demographic transition" [Coleman 2006].

Coleman emphasizes that, in contrast to the first one, the third demographic transition is not universal: it affects only developed countries with low fertility, and the resulting changes are not symmetrical. The population composition of the developed world will become similar to that of the developing world, but not vice versa [Coleman, 2006: 428]. Yet, he believes that this course of events is not inevitable, because the forecasts predicting a huge inflow of migrants are "not written in stone", and the right policy will help to avoid them [Coleman 2006: 417-419].

Of course, changes in ethnic composition in developed and developing countries due to migration from the "South" to the "North" will be asymmetrical, but the idea of the third demographic transition in its current form is asymmetrical as well. Although Coleman notes the incompleteness of the demographic transition in the "South" as one of the driving forces of the migration process on which the "third transition" concept is based, in general he pays very little attention to this "driving force". He is sure that the example of the authorities in the Netherlands or Denmark trying to constrain immigration into their countries shows a way of slowing down the

"third transition" and thus, evidently, believes that the "driving force" is not too significant. His whole concept reflects the understandable concern of the developed countries in relation to growing migration pressure from the developing world, but scarcely considers the global demographic situation making this pressure inevitable. But this situation, in turn, is a direct consequence of, or more precisely, a natural stage of the global demographic transition, that is, of a gigantic mutation of Humankind changing its reproductive strategy.

As is noted by Coleman, "Neither transition concept considers migration explicitly, or any consequent changes in the composition of populations, although van de Kaa (1999) assumes an increase in immigration to be a natural indirect consequence of the low fertility of the recipient countries. On the other side of that equation, emigration tends to be highest at the peak of population growth in the middle of the transition, as with Europe in the nineteenth century and the developing world today (Ortega 2005)" [Coleman 2006: 402].

We can agree that the demographic transition theory in its established form does not give much consideration to migration and focuses on the change in the fertility-mortality ratio. However, it does not "close the door" to including migration among the key variables of transition.

As was mentioned earlier, migration is one of the regulators activated by demographic disequilibrium. At the same time, it is one of the most important factors in human history which formed the current pattern of distribution of humans on Earth, including their racial, ethnic and linguistic diversity. Coleman knows the history of migrations very well. He refers to the "change in population composition … in Eurasia and elsewhere in the first millennium AD and earlier from Northern Europe, Central Asia and Arabia, with the expansion of Mongols and Ottomans as the last major examples" [ibid.: 419] as well as to the role of the migration regulator during the European population explosion of the nineteenth century, when overseas migrations simultaneously weakened the demographic tension in Europe and led to the populating of the United States and other new states with a population of European origin.

However, the situation found in the world today has no precedents either in the scale and speed at which the disequilibrium arose that led to the unprecedented population explosion, or in geographical coverage. In fact, we can speak of an almost instantaneous (in historical terms) globalization of the demographic transition. At this stage, the inclusion of the migration regulator, when other regulators are either unacceptable (increased mortality) or insufficient (decreased fertility), to restore equilibrium rapidly is quite natural, and in no way contradicts the logic of the demographic transition theory.

It is precisely in the globalization of the demographic transition that the new phase consists, a phase which could be called the "third demographic transition" but which should not be reduced to just the change in the population composition in the host countries, even though such a change can really be observed[2]. Its essence lies in the transformation of the world's population into a

[2]It is curious that this very fact, the "creolization of cultures", which the migration researchers write about [Okolski 1999: 28] is considered by van de Kaa as one of the manifestations of the *second* demographic transition [van de Kaa 2003: 32-33]; it is moreover quite logical, because ethnically and religiously mixed marriages and the multiple identities of children resulting from such marriages naturally fit the variegation found in individuals' private lives.

system of communicating vessels, where all demographic processes are interrelated and hardly understandable from the perspective of any one component of this system.

In Coleman's scheme, one of the main factors of immigration to Europe is a fertility falling below the replacement level in European countries. Both Coleman and, as we have seen, other theorists of the demographic transition seek to explain this fall in the economic, social and cultural changes occurring in these countries. Our objection is basically that such explanations are redundant, because the fertility decline is predetermined by the reduction in mortality and the need to restore demographic disequilibrium. Such an objection could always run up against the counterargument that the decline of fertility does not stop after reaching the replacement level, but falls below it. This argument is not only stated, but is occasionally interpreted as a sign of failure of the demographic transition theory [Vallin 2005; Marchal, 2008].

Such reasoning may seem convincing only within the framework of the logic which may be metaphorically described as "Westphalian", referring to the Westphalian system of international relations established in Europe in the eighteenth century and which became the triumph of state sovereignty principles. These principles are consistent with "state-centric" thinking demographers, who consider that the demographic transition theory should be justified within the framework of the national borders of different states or, in extreme cases, groups of states.

Meanwhile, no country should be regarded as a "closed system", within which the demographic transition can occur regardless of what is happening outside. Only the whole population of the Earth can be considered such a closed system. At a global scale, fertility is still significantly higher than the replacement level, and the disrupted equilibrium is still not restored. But even if the fertility-mortality equilibrium is restored at the global level – for example, by 2100, as is suggested by the more likely scenarios of the latest UN projections – this does not signify the restoration of equilibrium between the number of the Earth's inhabitants (assuming that it will reach 10-11 billion people by that time) and the life support resources of our planet. "From the standpoint of the self-protection of human civilization, it would be much better to arrive at a stage of population decline. If we rule out such a reduction due to a rise in mortality, then achieving fertility below replacement level is the only mechanism that can lead to such an evolution" [Vishnevsky 2004: 274].

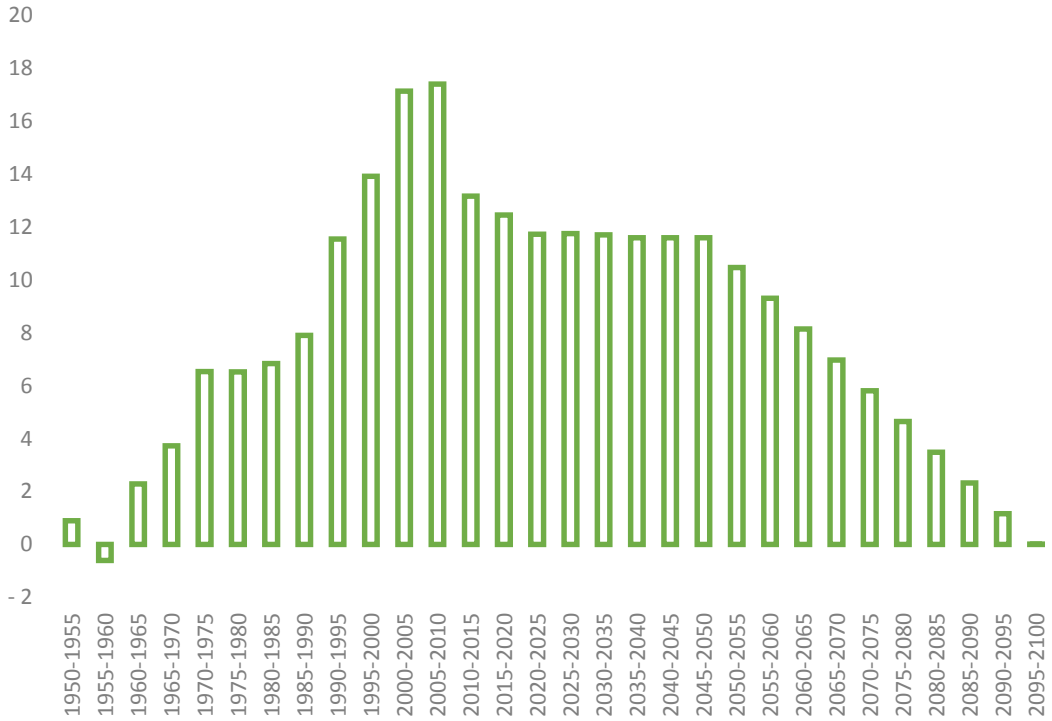
In the framework of this logic, which does not contradict the general logic of the demographic transition as a process of adaptation of the world demographic system to the new reproductive strategy of Humankind, the low fertility in the developed countries of the North and growing migration flows from the South to the North are interrelated not as cause and effect, but as juxtaposed links of a single chain at this stage of demographic development – that of the globalized demographic transition.

On the one hand, low "Western" fertility is not at all indicative of the decline and crisis of modern "Western" civilization, as is often thought; on the contrary, it is proof of its high adaptive capabilities. By paving the way for the unprecedented worldwide reduction in mortality, the developed countries are paving the way for low fertility as well, without which one of the greatest human achievements – low mortality – is becoming a serious threat to humanity" [Vishnevsky, 2008: 85]. Meanwhile, low fertility could be viewed quite negatively in developed countries, including Russia, and could indeed provoke serious problems for them (in particular, those which

Coleman writes about). But no country is in condition to fight against it, because "the implicit objective logic of global survival proves to be more important than an egoistic logic of individual nations. If this hypothesis is correct, the main determinants of the fertility decline below replacement level in all industrialized countries do not have their most profound roots in the specific life conditions of those countries. Such a decline is a part of a global demographic process that is being driven by its own inherent forces" [Vishnevsky 2004: 274]. Eventually, all countries follow the pioneers of low fertility. China was just the first case, and now is far from being the only one.

On the other hand, however, given the considerable time required to restore the global demographic equilibrium with the help of fertility decline, there will inevitably be a fairly long period during which international migration will play its usual historical role of a balancing redistribution mechanism.

Of course, this stage will not be easy. We know what impact "The Great Migrations" of the first millennium CE had on Europe's population make-up and history. Today it seems that those migrations were enormous, and they really *were* enormous for that time, when the world's population numbered about 200 million people. But in the early twenty-first century the rapidly growing number of international migrants already exceeded 200 million [UN 2013a: Table 1], and most likely this is just the beginning. According to UN estimates, net migration from developing to developed countries increased from 6.5 million in 1975-1980 to 17.4 million people in 2005-2010. [UN 2013b: fileMIGR/2]. How will events develop further? UN projections predicting a reduction in the population flow from developing to developed countries all the way up to its cessation by the end of the century (see diagram) seem utopian; nothing portends such a reduction yet. These projections are based more on the current state of public opinion in developed countries than on a real evaluation of the future.



Net migration from developing to developed countries, by UN estimates and projections, 1950-2100, millions

Source: [UN 2013b: file MIGR/2]

The depopulated countries of the "North" will always need an inflow of population, while the overpopulated "South" will always be ready to meet any demand for migrants. However, the demographic masses of the "North" and "South" are unequal: the migratory pressure from the "South" will always exceed the needs of the "North", as well as its ability to manage the increased supply, and the more time passes, the truer that will be. At present, it is hard to imagine the result of this collision, but that the current phase of the "globalized demographic transition" creates very serious problems for the world, and that their solution will be much more complex than both Coleman and the author of this article would like, can hardly be in doubt.

CONCLUSIONS

The main objective of this article is to emphasize the scope and independence of the demographic changes the world is facing. Adolphe Landry was the first to speak about these changes; he called them the "demographic revolution" [Landry 1933; Landry 1934; Landry 1987], thus implicitly pointing to the historical extent of these changes. By the 1940s, discussion of these changes had shifted to the United States, where the term "demographic transition" was introduced and, according to van de Kaa, "As a consequence, its historical depth and ideational dimension diminished, while the process of modernization and its economic aspects were emphasized more strongly". Eventually, the term "demographic transition" prevailed, although, according to van de Kaa, it is hard to say whether the term "revolution" was rejected consciously or the term 'transition' prevailed "because it had more international appeal and more scholars could more easily consult American rather than French demographic literature" [van de Kaa 2010].

It is hardly worth renewing the debate about the terms now, but it should be noted that the term "revolution" points to a deeper historical context. This suggestion is also confirmed by van de Kaa, who noted that the term was not chosen by Landry accidentally, and that he seemed to put this almost unnoticed revolution on a par with the French political revolution, marked by a number of spectacular events [ibid]. This fact has also been noticed by other authors, for example, by Zdenek Pavlik, who put the demographic revolution on a par with another great historical event: "The industrial revolution in economic development is consistent with the demographic revolution in population development" [Pavlik 1964: 38]. According to Pavlik, "The demographic revolution is a component of the complex historical process involving many facets, and, far from being their passive product, plays an independent and important role in this process" [Pavlik 1970: 51-52].

It seems to me that the term "revolution" is more consistent with the absolutely special, fundamental role of the demographic transformation we are observing. If we recognize that it really marks the transition to a new reproductive strategy of *Homo sapiens*, then we should also recognize the fact that it is superior to any political or economic revolution in its universal significance, its consequences and the global risks it generates.

Yet, the problem is of course not in the term. The problem is in understanding and recognizing the unity and universality of this transformation, the predetermined nature and inevitability of its stages and of those truly unprecedented challenges to which it requires a response. Hence, there is one more objective in this article: comparing two views of the demographic transition (demographic revolution). This transition can be regarded as a self-developing "chain reaction" which, once started, becomes irreversible, passing through different stages, each of which is predetermined largely by the previous stage and predetermines the subsequent stage until the completion of the whole process. But it is also possible to regard the transition stages, as is commonly done, as a sequence of observed changes, each of which has its own "non-demographic" determinants (economic, social, etc.). Hence, these stages are not obligatory: they can be observed in some countries and be absent in others, be observed in Europe and be absent in Asia, etc.

Now researchers, and especially politicians, seem to be trying to ignore the unity of the powerful historical flow. Scientific consciousness alternates with conventional "common sense", focusing on certain areas of this flow, occasionally even on small and random branches of it, offering recipes whose only virtue lies in the fact that they are readily understood by "the man on the street" and can thus reduce his anxiety. Public opinion often does not see the relation between global demographic changes and the short-term problems of an individual family or a separate country. Meanwhile, history is doing its job.

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REGISTERING A MARRIAGE AND HAVING A CHILD IN RUSSIA: AN ANALYSIS OF INDIVIDUAL BIOGRAPHIES BASED ON VITAL STATISTICS DATA *

SVETLANA BIRYUKOVA, ALLA TYNDIK

The paper addresses the link between getting pregnant and getting married in Russia. The authors use 2010 data on current births in selected regions of Russia to analyze the relationship between marriage registration date and the date of conception, as well as age-related and regional features of this relationship. Special attention is given to the phenomenon of registering out-of-wedlock births based on parents' joint applications as well as to the association between this type of behavior and parents' age. Using individual data from the 2010 Census the authors examine the change of women's marital status during the first five years after birth of the first child. The results suggest that the widespread practice of registering marriages during the second trimester of pregnancies still persists in Russia. This is most typical for young people getting married for the first time. Together with the relatively high rates of dissolution of marital unions with children, this supports the interpretation of this kind of marriage as a marker of traditionalist demographic behavior.

***Key words**: fertility, premarital conceptions, out-of-wedlock births, birth statistics, registration of birth, registration of marriage, Population Census 2010, Russian Census 2010, Russia.*

INTRODUCTION

With the modernization of demographic behavior comes a weakening of the link between key events in the spheres of marriage and reproduction. In other words, the beginning of cohabitation and the registration of marriage can occur far apart in time. The official registration of marriage no longer leads rapidly to procreation, while pregnancy does not always prompt registering the marital union.

Data from Russian demographic surveys show increasing length of cohabitation before starting a registered union, growing number of couples not registering their marriage at all, and, accordingly, a significant proportion of out-of-wedlock births [Zvereva, Arkhangelsky 2011; Rosstat 2013]. At the same time, a weakening of the link between the official registration of marriage and starting a family can lead to another correlation: between the time of marriage and the onset of pregnancy (often planned). In this case, the registration has a predominantly legal purpose and is regarded by the couple as a rational step.

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Shotgun weddings, i.e. weddings arranged due to the occurrence of an unplanned pregnancy, have always been popular in Russia, with their heyday in the late Soviet period. The low age of first sex, coupled with the limited availability of efficient modern contraception and a complete lack of sexual education, caused frequent conceptions at young reproductive age. Social and, even more, institutional norms of the time made it necessary to look for a way out. The 1944 ordinance of the Presidium of the Supreme Soviet of the USSR prohibited the establishment of paternity of out-of-wedlock children who were deprived of the right to take the name of their biological fathers. According to experts, the introduction of this provision de facto reintroduced the concept of "illegitimacy". This had a significant impact on the status of women and children concerned, and led to a rise in the number of marriages registered after and as a result of pregnancy, so-called shotgun weddings.

In the years since the adoption of the post-perestroika family law, marital and family behaviors of Russians have changed significantly. Unregistered partnerships are by now a socially acceptable behavior; the beginning of partners' cohabitation is far from always tied to the official marriage registration; and marriage and family trajectories in general have become more diverse. A gradual development of contraceptive culture leads to a reduction in the number of abortions and, apparently, unplanned births. The shift in family policy towards the defense of children's rights, the fight against child poverty, and the overcoming of child abandonment have shaped the understanding that both parents can and should share the responsibility for the children born to them, regardless of whether they live in registered or unregistered unions. This is evidenced by the attempts to develop and implement such reforms as, for example, alimony laws. Thus, we can see a weakening of both social pressure and legal incentives for the registration of marriage, even when the partners have children. Have these changes affected such a widespread practice as shotgun weddings, and can we say that this phenomenon is disappearing, or has already disappeared, from the life of Russians?

The links between matrimonial and reproductive behaviors are actively discussed by Russian demographers, but little attention is paid to the topic of how conception affects the timing of official registration of marriage. Traditionally, research was focused on the prevalence of non-marital births, and then the factors influencing its dynamics. Thus, G. Bondarskaya noted the rapid increase in the prevalence of extramarital births in the 1990s (from 14.6% in 1990 to 25.3% in 1997), interpreting it as modernization of the family and demographic behaviors related, among other factors, to weakening of traditional social norms [Bondarskaya, Darskiy 1990; Bondarskaya 1999]. Conversely, M. Klupt showed a direct relationship between the prevalence of extramarital births in Russian regions and social disadvantages, as expressed in the low life expectancy and high levels of mortality among men of working age [Klupt 2010].

M. Tolts made the first attempt to use birth certificates to identify premarital conceptions [Tolts 1974]. In this paper based on 1966 data from Perm, the author found that up to 35% of all births to women aged 20-24 resulted from premarital conceptions. In a later study, he demonstrated growth of this proportion during the ensuing 15 years [Tolts, Oberg 1983], which was associated with the simplification of procedures for marriage and divorce resulting from changes in family law.

In recent decades only few papers on this subject have been published, all focusing on estimating the proportion of non-marital conceptions. M. Tolts, O. Antonova and E. Andreev have shown that, in the early 2000s, extramarital conceptions in Russia accounted for about half of all births and about two-thirds of first births, and this proportion varied across regions [Tolts, Antonova, Andreev 2005; 2006]. Analyzing birth statistics, E. Ivanova and S. Zakharov conclude that by the beginning of the 21st century growth of the share of premarital conceptions ceased and decline of the age at first marriage generated by this factor stopped [Zakharov, Ivanova 2001].

Finally, the latest publication of this type is the article by E. Churilova and V. Chumarina [2014] which came out as our text was being finalized. The results presented in the paper prove that, during the period between the last two population censuses, among the youngest group of women (aged under 18) the proportion of non-marital conceptions has remained virtually unchanged, remaining at 90% or more. Our data for 2010 confirm the conclusion of other authors [Churilova, Chumarina 2014; Tolts, Antonova, Andreev 2005] that, in the general population, the proportion of births of all orders arising from pre-marital conceptions (which is not the same as non-marital births) decreased for all births, from 54 to 44% in 2002-2010, and for first births, from 68 to 60% [Churilova, Chumarina 2014 – the author's data for 2010, and for 2002 data from Tolts, Antonova, Andreev 2005]. These authors interpret the continuing high prevalence of shotgun marriages as a conscious behavior of partners and choice of a strategy of "getting married only if pregnant" or rejecting contraception soon after deciding to get married. In this paper, we continue this discussion and give a number of arguments against this interpretation. Using an almost identical empirical base, namely, individual data from current registration of births, we dwell on several topics covered in the article by E. Churilova and E. Chumarina [2014]. Our method of data analysis and visualization makes it possible to go beyond a descriptive approach to the evaluation of premarital conception. We analyze regional and age characteristics of marriage registration as linked to the conception of a child. Due to the nature of the data, we do not consider partnership relations before marriage and, consequently, cannot assume that the birth was the result of a conscious decision by the parents. Nevertheless, an analysis of the demographic portrait of parental couples and a detailed study of the age profiles of men and women who follow different strategies of family formation lead us to somewhat different conclusions than in this previous study.

STATISTICAL DATABASE FOR THE RESEARCH

The calculations presented in this paper are based on anonymous individual data of current birth statistics.[1] We had access to 2010 records from registry offices in ten regions of the Russian Federation. From 1998 to the end of 2013, the federal regulation did not impose recording the child's birth order,[2] although in some regions registration by birth order continued. Yet within this

[1] Unless otherwise noted, all tables and figures represent the authors' calculations based on 2010 marriage and birth data from registries. "Unmarried women" in tables and graphs refers to women who are not in a registered marital union.

[2] To provide the data for the monitoring of the Russian President May Decrees (2012), the Decree of the Government of the Russian Federation N 1049 from 21 November 2013 approved the new Rules of reporting civil registration data by the offices of the Registry (ZAGS) to the Federal Service of State Statistics (Rosstat). These rules reintroduced the practice of collecting the data on the birth order of newborns. Moreover, the list of indicators was enlarged to include educational attainment and employment status of the mother.

research, we needed to separate first births from subsequent ones, which restricted the sample to regions with such data. As a result, our database was populated with data from the following seven regions of Russia: Primorsky Krai, Stavropol Krai, St. Petersburg and Leningrad Region, Moscow Region, Sverdlovsk Region and the Republic of Tatarstan. The dataset contains 301.3 thousand records of births made by official registries during 2010. These births occurred from late 2009 (0.7% of records) to the end of 2010 (99.3 % of records).[3]

In accordance with the Federal Law[4], a birth certificate includes the date of birth, the date of birth of the mother, the marital status of the mother, the date of marriage, the date of birth of the child's father, the ethnicities of the mother and father (optional), as well as some other information (single or multiple birth, live birth or stillbirth, administrative data). On the basis of these data, for each registered event we were able to calculate the age of the parents at the time of the child's birth, to determine the length of the marriage – if it had occurred – and to correlate the time of conception of the child with that of the official registration of the partnership.

Marriages and births certificates may be issued not only in the place of official residence, but in other localities as well. For example, in 2011 (similar data for 2010 are unavailable), an average of 97.7% of births in Russia were registered in the locality coinciding with the place of residence of the mother. This proportion is expectedly lower in large cities. For example, in St. Petersburg, this proportion comes down to 87.6%, with the remaining births being given by visitors arriving mostly from Leningrad region. Inasmuch as our work does not, with the exception of St. Petersburg and its region, analyze the data by type of locality, such a bias should not have a material impact on the results.

Special attention is given to information on the mother's ethnicity. Incorporation of these data into the study of the distinctive features of marriage and family behavior in modern Russia could, in our view, provide interesting results. Due to the fact that ethnic affiliation of parents is indicated on the birth certificate only at the request of the applicant, in many regions this line is often left blank. In particular, in 2010 the ethnicity was almost completely missing in birth certificates issued in Primorsky Krai, Stavropolsky Krai and Sverdlovsk region; even in Moscow region this section was often left blank (30.7% of all certificates). In our analysis, therefore, we opted to use the data on the mother's ethnicity only for the Republic of Tatarstan. In the birth registration dataset for this region, 30.8% of mothers are recorded as Russian, 45.6% as Tatar and another 5% as belonging to other ethnic groups; in 18.6% of cases, ethnicity is not specified. We assume that, between Russians and Tatars, there are significant differences in preferences regarding the timing of marriage registration, so in most cases we considered them separately.

In addition, we relied on census data on first births preceding the 2010 Population Census in the regions selected above. This allows the use of two sets of data on the same population: from

[3] We should also note that approximately 59% of births are registered during the first month after delivery, and 38% more births are registered during the second month after delivery (source: Rosstat data on timely registration of births). In other words, our datasets exclude no more than 3% of births that took place in January-November 2010 and about half of births that took place in December 2010.

[4] Federal Law «On Civil Status» N143 from 15 November 1997 as amended in 2010.

birth certificates and from census questionnaires Census data provided additional information on the marital status of women who were not officially married at the time of delivery.

FEATURES OF MARRIAGE AND FERTILITY IN SELECTED REGIONS

We start with a brief overview of the demographic portrait of the population under research. Despite the fact that, to date, we already have official aggregated statistics for 2011-2012 and sometimes even 2013, we analyze all indicators as of 2010, so as to be able to directly link them with the registry office data on which all our own calculations are based. The exception is information about the age at marriage, which was not processed by Rosstat for 2010 and therefore has been taken for the closest available year – 2012.

2010 marriage rates in the selected regions are close to the average level for Russia: about 11.5 marriages per 1,000 persons of marital age (16-69 years). The largest variation in this indicator is observed between St. Petersburg (13.3 per 1,000) and its province, Leningrad Region (8.3 per 1,000), which can be attributed to administrative reasons, that is, to the desire to register marriage in a big city. A similar difference is also apparent between Moscow and Moscow Region, though it is not considered in the present work.

The average age of brides and grooms has increased steadily since the early 1990s [Naselenie Rossii 2013]. This applies to second or subsequent marriages and even more so to first marriages. In the Republic of Tatarstan and Stavropol Krai, the highest proportion of brides are aged 18-24, while St. Petersburg has the highest percentage of women who marry between the ages of 25 and 34. Other regions show a fairly homogeneous distribution of grooms and brides by age. Age-specific marriage rates suggest that the only region with a relatively high marriage age is St. Petersburg (Figure 1).

The total fertility rate (TFR) at 1.116 children per woman is lowest in Leningrad region while current fertility is above the national average (1.567 children per woman in 2010) in Sverdlovsk region (1.668 children per woman) and the Republic of Tatarstan (1.601 children per woman). The TFR in other regions in the sample is low varying from 1.387 to 1.492. The oldest age profile of fertility (all births by order collapsed) among the observed regions is found in Stavropol region. Then come St. Petersburg and Moscow Region, while in the remaining regions the contributions of age groups 25-29 and 20-24 are almost identical (Figure 2).

The proportion of children born out of wedlock ranges from 20.4% in the Republic of Tatarstan to 30.7% in Primorsky Krai (Table 1). The specificity of Russia consists in that birth out of wedlock still remains a marker of adverse conditions and not of “modern” demographic behavior. In other words, the registration of births outside formal marriage in more than half of the cases suggests the absence of partnership. On the national level, 24.9% of all births occurred outside formal marriage in 2010; less than half (11.1% of all births) were registered by joint request of parents. At the same time, the highest proportion of births outside marriage is traditionally found in rural and economically backward regions (for example, in the Republic of Tuva or Magadan Region).

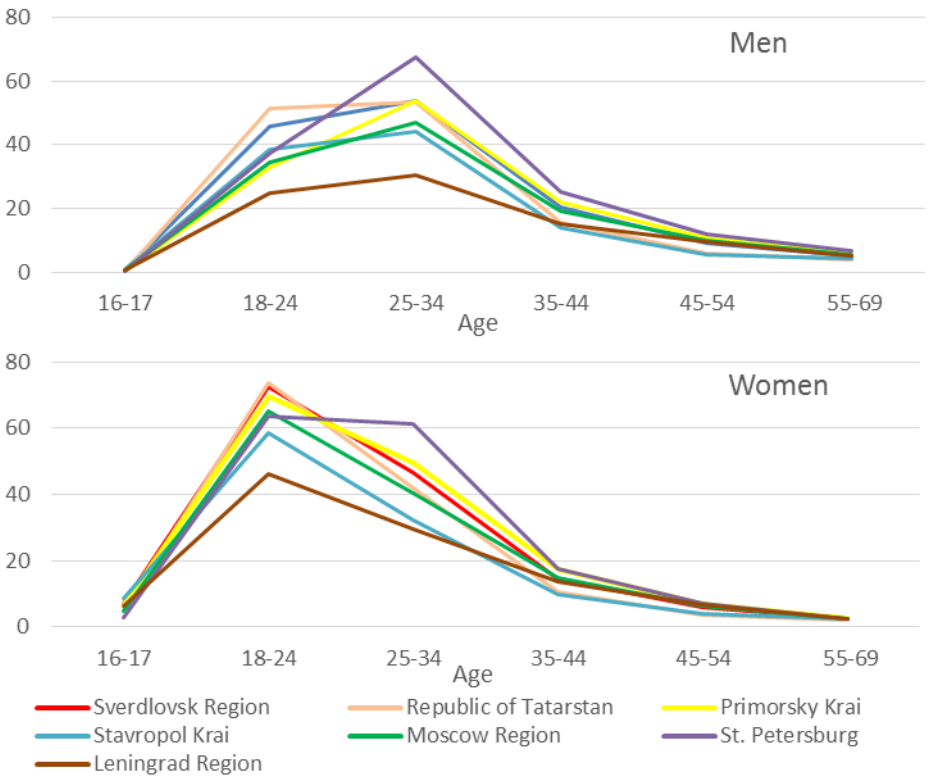

Figure 1. Age-specific marriage rates by gender in selected regions, 2012[5]

Source: Authors' calculations based on unpublished current statistics data of Rosstat.

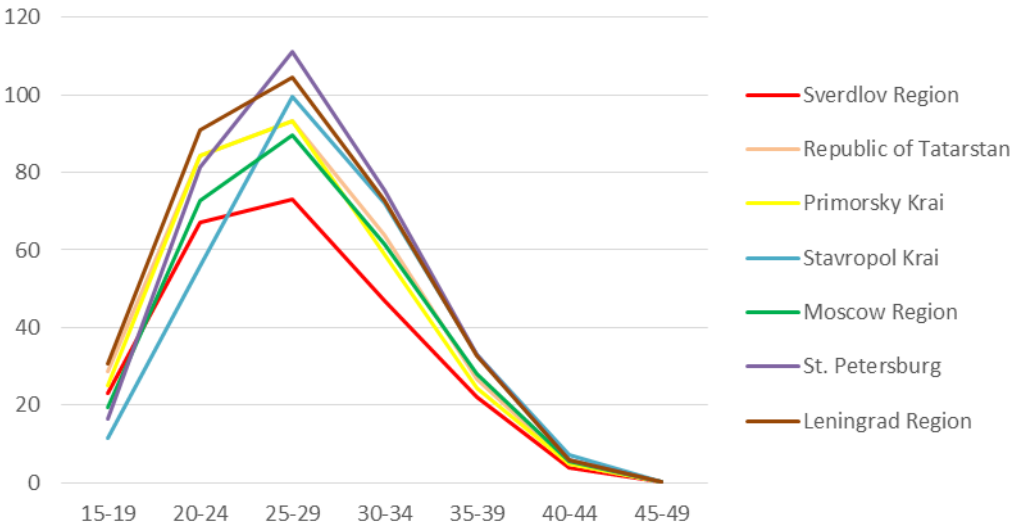

Figure 2. Age-specific fertility rates in selected regions, 2010

Source: [Rosstat 2012].

[5] The data on Moscow Region covers its new territory. Rosstat does not provide the number of marriages by age of bride and groom for 2010. Data on marriages by order are unavailable.

Table 1. Proportion of children born out of wedlock in selected regions, 2010, per cent

Region	Proportion
Sverdlovsk region	29.3
Republic of Tatarstan	20.4
Primorsky Krai	30.7
Stavropol Krai	24.4
Moscow region	21.6
St. Petersburg	22.3
Leningrad Region	26.6
Average for the Russian Federation	24.9

Source: [Rosstat 2012].

Thus, for all selected regions the macro indicators demonstrate the typical Russian model of population reproduction: low average number of children per woman, high proportion of first-parity mothers and concentration of childbearing between ages of 25 and 30.

DATA FROM CURRENT BIRTH RECORDS: A DESCRIPTIVE ANALYSIS

We now turn to a descriptive analysis of our data. The dataset contains 301.5 thousand birth records, of which 52.7% are on first births, 35.5% on second births and 11.8% on higher-order births. The proportion of first-borns varies from 46.1% among the group of women[6] from the Republic of Tatarstan who did not indicate their ethnicity to 59.4% among women from St. Petersburg (Table 2). Altogether, the data array contains records on 158.9 thousand firstborns.

73.6% of firstborns are born within wedlock. Traditionally, the highest proportion of children born out of wedlock is in the youngest age group, and the lowest in the age group of 25-29-year-olds (Table 3).

Among Tatar mothers, the proportion of children born out of wedlock is the lowest. The highest proportion of first births out of wedlock is observed in Primorsky Krai, where it reaches one-third (Table 4). Generally, we found that the information about the child's father for children born out of wedlock is often omitted in the data, and therefore it is difficult to evaluate the true proportion of births to mothers with no partner.

The age distribution of mothers of firstborns in St. Petersburg is significantly different from that in other regions (Figure 3) with peak fertility in the age group of 25-29-year-olds. The proportion of first children born to older mothers in St. Petersburg is also higher than in other regions, while the contribution of the youngest age group is lower and amounts to just 4.1%. Among the Tatars in the Republic of Tatarstan, women aged 20-24 contributed most to the total number of first births, while younger women contributed almost as few first births as those in St. Petersburg. Stavropol Region leads in the proportion of first births to mothers in the younger age groups. There the contribution 20-25-year-olds to the number of firstborns exceeds that of 25-29-year-olds by a factor of 1.6 – more than in any other region. Moscow Region is unique in that the contributions of these two age groups are virtually equal (37-38%).

[6] The inhabitants of the Republic of Tatarstan who did not indicate their ethnicity (21% of all records in the Republic) are excluded from further analysis.

Table 2. Distribution of births by birth order in selected regions, per cent

Region		1st child	2nd child	3rd child	4th child and more
Primorsky Krai		51,7	36.1	8.7	3.5
Stavropol Krai		47.1	36.5	11.5	5.0
St. Petersburg		59.4	32.3	6.5	1.9
Leningrad Region		52.3	36.7	8.0	3.0
Moscow Region		53.5	36.3	7.8	2.3
Sverdlovsk Region		51.7	33.9	8.6	5.8
Republic of Tatarstan,	Tatars	49.9	39.0	9.1	1.9
	Russians	51.8	37.8	7.9	2.5
	Ethnicity is not listed	46.1	37.7	11.9	4.1
On average for all regions/ethnic groups		52.7	35.5	8.4	3.4

Table 3. Proportion of births in wedlock, by age of mother, per cent

Mother's age at childbirth	1st child	2nd child	3rd child
15-19	50.1	43.0	34.5
20-24	75.3	73.3	54.5
25-29	80.6	84.4	71.8
30-34	69.5	83.2	79.1
35-39	59.3	76.8	78.8
40-44	55.2	70.8	74.0
On average	73.6	80.6	74.9

Table 4. Proportion of births in wedlock by birth order in selected regions, per cent

Region	1st child	2nd child	3rd child
Primorsky Krai	66.1	75.6	68.1
Stavropol Krai	74.1	80.7	74.8
St. Petersburg	76.0	81.6	77.3
Leningrad Region	70.8	78.4	73.3
Moscow Region	76.2	82.7	77.2
Sverdlovsk Region	68.1	76.2	69.6
Tatarstan, Tatars	82.7	88.3	85.3
Tatarstan, Russians	72.1	77.6	70.5

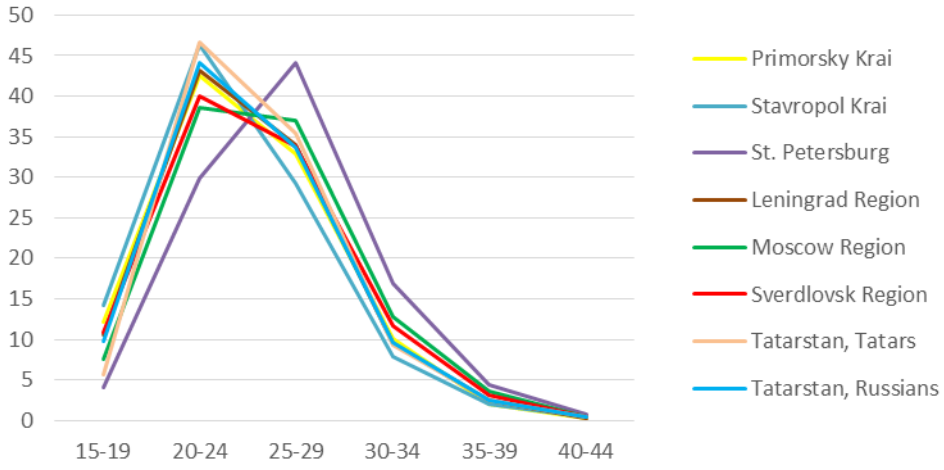

Figure 3. Distribution of first births by age of mother in selected regions, per cent

However, we must realize that we are dealing with period fertility indicators, which do not necessarily yield correct estimates of cohort fertility. Delaying first births and aging of subsequent

childbearing began in Russia in the 1970s and are currently unfolding. The age profile of fertility is changing gradually and fairly slowly. Currently fertility is relatively low, including the first-order birth rates as well as the rates at older ages and all parities. At the same time, the youngest cohorts will likely have higher fertility in their late reproductive years than we observe among 35-40-year-olds now. Similar processes may happen in the field of marriage and family behavior: the transformation of attitudes towards registered marriages and births out of wedlock may be slow. Period age-specific marriage indicators show that young women have already adopted the new model of behavior, while older women tend to follow the old behavioral stereotypes.

We'll begin our analysis of the interaction of such events as marriage, conception and childbirth in the life path of Russians by focusing on first births.

EVENT ANALYSIS OF MARRIAGE, CONCEPTION AND FIRST BIRTH

The nature of the data makes it inappropriate to use the calendar time-scale because all events are concentrated in too narrow a time interval of one year (2010). Therefore, we decided to use a relative scale. A distinctive feature of the data is that we do not consider childless marriages. The level of eventual childlessness in Russia is still low: in 2010, the proportion of childless women in the cohorts of women coming close to the end of reproductive age was about 6.5% [Biryukova, Tyndik 2014]. The proportion of "childless" marriages is likely to be different from the proportion of childless women, yet it is not possible to evaluate the former indicator. Such unions emerge and then dissolve without falling into the birth statistics, and their absence in the dataset shifts the estimates of interrelation between marriage and childbirth upward, that is towards stronger association.

As a reference point for the relative time-scale we have chosen the approximated date of conception of the firstborn child. On the charts below, this moment can be seen as a plateau between zero marks, the duration of which corresponds to one calendar month (i.e. the period from 8 to 9 full months before the exact date of birth of the child). This makes it possible to smooth out the impacts of differences in the duration of pregnancy. The observational countdown begins one year prior to conception and ends 9 months after conception, that is, in the first month after birth. Note that, in the initial data set, there were some cases of marriage which took place more than one month after the baby was born. In theory, these observations should not be included in the registry statistics, since the time period allotted by law for registering birth is exactly one month. All these cases happened in the same region and were excluded from the analysis.

We have considered only one (dummy) indicator of marital status: the woman is either in a registered marriage or she is not. Figure 4 shows the transition of women who in 2010 registered the birth of their first child from one marital status to another. Each curve represents the proportion of women in the region who are not in a registered marriage at each point in time. Accordingly, the proportion of women who are in a registered marriage is equal to 100% minus the proportion of those who are not. Time before conception is reflected as negative values on the x-axis while the duration of pregnancy has positive values.

The proportion of married women who are "one year prior to conception of their first child" is low in all the regions in the sample, and ranges from 16.2% in Primorsky Krai to 27.1% in St.

Petersburg. By the time of conception of the first child, the proportion of unmarried women gradually begins to decline. The greatest rates of decline are observed among Tatars in the Republic of Tatarstan. In this group, the timings of official registration and of conception are most closely connected. Moreover, as can be seen in Figure 4, this timing is rather traditional of the type "registration then conception." St. Petersburg shows the most modern model: in registered unions, the birth of the first child is often postponed, as evidenced by the lowest proportion of unmarried women in the entire period before conception. At the same time, the incidence of shotgun weddings remains similar in all selected regions.

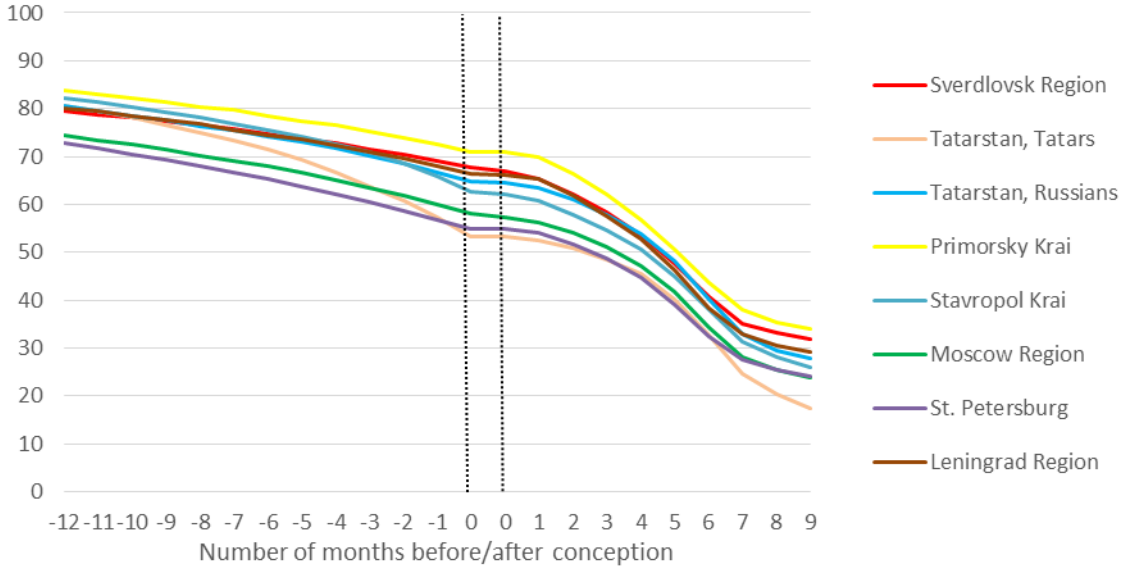

Figure 4. Proportion of unmarried women by the length of time (months) spent before and after conception of the firstborn in selected regions, per cent

By the third month of pregnancy, the registrations of unions begin to snowball, and their rates peak in the sixth month (among Tatar women at the seventh). On average, every sixth marriage "with children"[7] is registered after the fifth month of the bride's pregnancy. Note that, according to Russian legislation, the registration of the marriage takes place one month after submitting a marriage application to the registry office. Thus, the majority of shotgun weddings included in current statistics are likely to have been planned after pregnancy.

Altogether, 45% of all marriages under consideration take place when the woman is pregnant. On average for the selected regions, 26.4% of women are unmarried at the time of giving birth. There are, however, significant regional and national differences: among ethnic Tatars in the Republic of Tatarstan only 17.3% fall into this category, while among Russian women in the same region the figure is 27.9%. At the same time, 33.9% of women from Primorsky Krai give birth to their first child out of wedlock. As noted above, our data break off at this point, although it is likely that, in the first months after birth, more unions are registered.

Thus, it seems possible to identify three models of shotgun marriages that co-exist in Russia, while the dominant model varies from region to region. The modern model is characterized

[7] It should be emphasized that, here and below, all assertions concern only marriages with children. These estimates would be overstatements with respect to all marriages.

by a high proportion of marriages "registered in advance" and a moderate proportion of weddings celebrated during pregnancy. It can be assumed that such weddings occur often after prolonged cohabitation in an unregistered union. In our sample, this is most apparent in St. Petersburg where the age profile of fertility also corresponds to the modern type, with the creation of families being postponed until at least the age of 25.

In the Republic of Tatarstan, the traditional model is common, whereby conception often coincides with the registration of the union or occurs within the first year of marriage. Still, very few women are unmarried at the time of birth of their first child. Finally, Primorsky Krai is characterized by the so-called Soviet model, which is the most typical for shotgun marriages. They occur most frequently in the second trimester of pregnancy, while at the same time a relatively large number of women are unmarried at the time of giving birth.

AGE CHARACTERISTICS OF MARRIAGE AND BIRTH

A woman's age has a significant impact on how close is the connection between childbirth and marriage. Among the youngest women, practically none is married a year before conception (Figure 5). Only in Stavropol Krai and the Republic of Tatarstan (among Tatar women) does the proportion of married women in the 15-19-year-old group rise to 10% by the moment of conception (see Appendix Figures A-1 - A-5, which show the graphs for each age group by regions). It is even lower in other regions. After the start of pregnancy and until the eighth month, the rates of marriage registration among young people are very high (about 7 percentage points per month), and only in the last two months do they slow. Among Tatar women, 36% of the youngest women are unmarried at the time of first birth, while for the other regions the figures range from 46.7% to 57.7%. On average, and across all the regions herein considered, one in two young mothers is not married at the time of her first child's birth. The main reason for this is that pregnancies in the youngest age group are mostly unplanned.

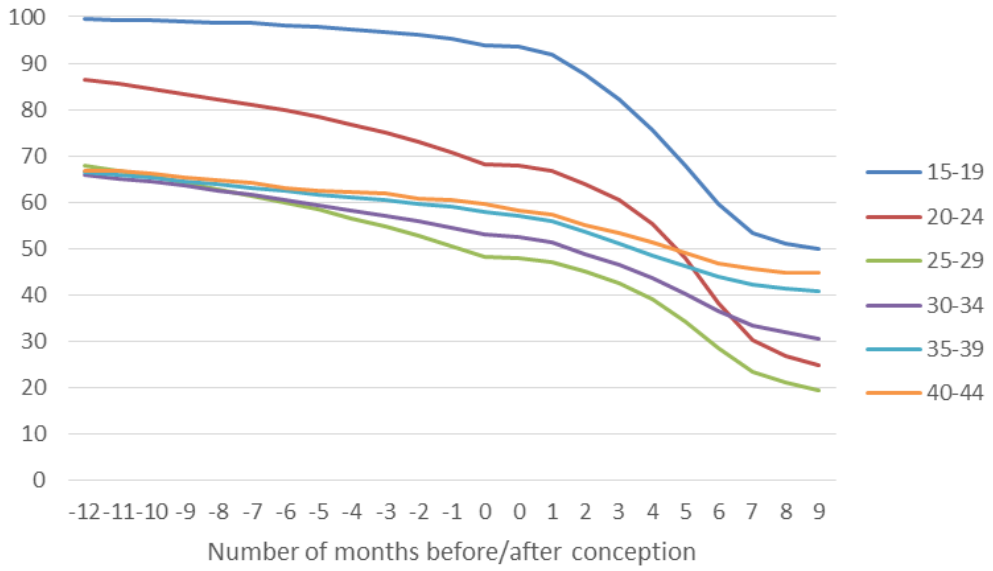

Figure 5. Proportion of unmarried women by time (in months) spent before and after conception of the first child, by age, per cent

Between the ages of 20 and 24, women get married most actively. Moreover, for many of them, conception occurs close to the official registration of marriage. During the year prior to the onset of pregnancy, the proportion of unmarried women falls by almost 20 percentage points (from 87 to 68%). After this follows an avalanche of marriages in the first seven months of pregnancy. Throughout this period all regions show roughly equal rates of reduction of the proportion of unmarried women (Figure 12 of the Appendix). Overall, during pregnancy the proportions of unmarried women fall, on average by 30-40 percentage points. At the time of first birth, one in four women aged 20-24 is not married.

The picture of marriage is different for women who become mothers between the ages of 25 and 29. Starting with this age group, already one third of women live in a registered partnership "a year before conception", and the frequency of shotgun weddings falls sharply. Among 25-29-year-olds, we still can see a gradual decline in the proportion of unmarried women in the year before conception, while in the older age groups it becomes virtually invisible. During pregnancy, approximately one in four mothers aged 25-29 gets married, while one in five women is unmarried by the time her child is born.

Table 5. Distribution of marriages by the length of time between registration of marriage and conception of the firstborn according to the mother's age at the birth of her first child, per cent

Marital status at the time of conception	Mother's age (years)					
	15-19	20-24	25-29	30-34	35-39	40-44
Marriage registered a year before conception or earlier	0.4	12.5	30.9	33.4	33.2	32.7
Marriage registered less than a year before conception	4.5	16.8	18.6	12.1	7.8	6.8
Simultaneous registration of marriage and conception	1.2	2.4	2.2	1.3	1.0	0.8
Marriage registered during pregnancy	44.0	43.5	28.9	22.6	17.3	14.9
Marriage at the time of birth is not registered	49.9	24.7	19.4	30.5	40.7	44.8

Table 5 summarizes the results of this analysis. In general, among many women the registration of marriage and first birth occur in rapid succession. In terms of the concept of life course, this means that marriage and childbearing still form the status passage. Among women who give birth to their first child before the age of 20, about half go through both events (marriage and birth) within one year. Among mothers aged 25-29, the proportion of such women increases to 63%, and in the older age group it falls back to 50%. In the life of women who become mothers after age 30, these two events are farther apart. Among them, only about one-third go through both events in the same year. If a woman gives birth to her first child after the age of 25, then in one out of three cases it is a result of postponement in an already officially registered marriage.

For the analysis of matrimonial behavior of women giving birth to their first child past the age of 30, there is an acute lack of data on the total number of respective marriages and partnerships. Many women are not in their first partnership at this age, and in it a relatively late, by Russian standards, birth of the first child may be a consequence of a change of partner. The observed pattern is contradictory. On the one hand, about 55% of mothers in this age group get pregnant in wedlock, which is evidence in favor of postponement of childbearing in stable unions. On the other hand, at the time of childbirth more of them are unmarried than among younger mothers. This could be either a birth in a stable unregistered union, or a pursuit of the strategy of "having a child for herself".

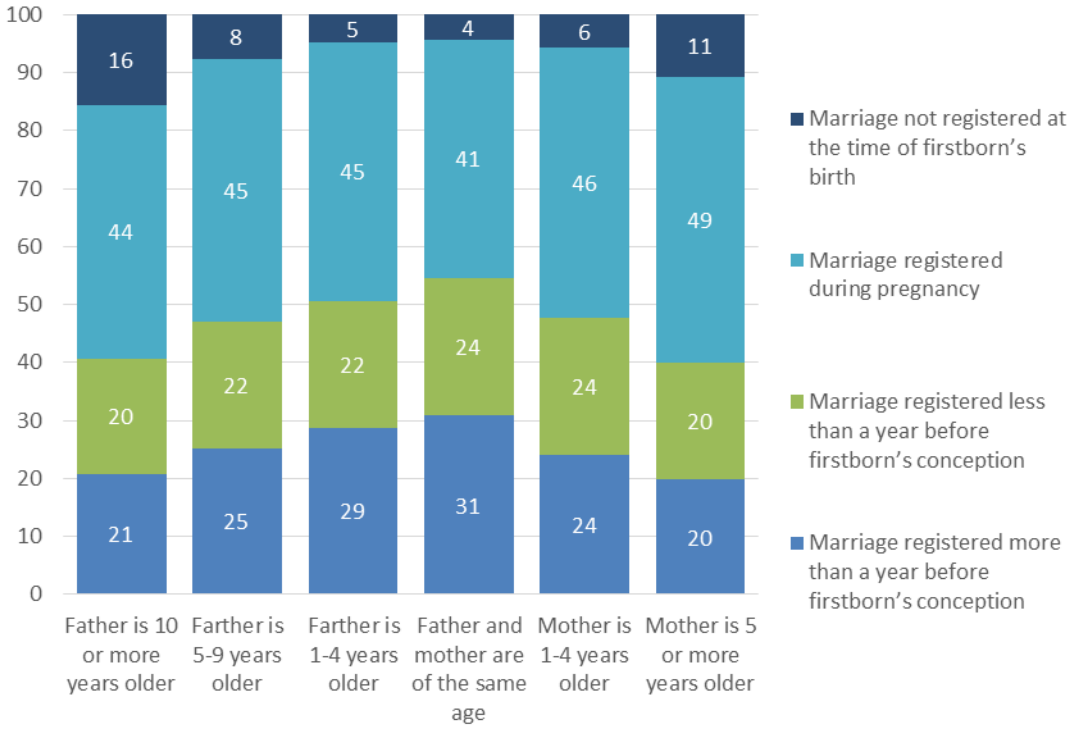

Figure 6. Distribution of parental couples by the difference in the age of spouses and intervals between conception of the firstborn and registration of marriage, per cent

Unfortunately, we cannot separate, with available data, first marriages from subsequent unions, which would have been of particular interest with respect to men. We use the only available way of establishing a typology of partnerships: from the perspective of the difference in age of the spouses (Figure 6). The proportion of marriages contracted after conception of the first child (the first-born of the woman) is lowest when partners are of the same age. However, selecting (from all partnerships) couples of the same age and grouping them by age intervals makes it apparent that the proportion of marriages registered after pregnancy gradually decreases with age (Table 6). Concurrently, there is a steady increase in the proportion of marriages concluded one year or less before conception. The turning point, when weddings after pregnancy become less popular than weddings taking place several years before the birth of the first child, occurs in the 25-29 age group.

Thus, among women under 25 who marry men of the same age, shotgun wedding strategy is extremely popular, even dominant. At older ages it is less common, perhaps due to the growth of autonomy and independence: the 23-25-year mark can also be linked to large numbers of women completing higher education, entering the job market, becoming independent of their parents and, consequently, being pressured less by the older generation. This is also to some extent reflected in the increased proportion of births occurring outside of wedlock in couples where the wife is over 30. In addition, it is explained by the registration of second or consequent marriages in this age group.

The lowest proportion of marriages in which pregnancy occurs one year after registration or later is observed among couples with the biggest difference in the age of spouses. At the same time, out of wedlock births occur in this group more often, as compared to others. It can be assumed

that a significant proportion of such unions are repeat marriages, at least for the older spouse, and to this is due their less traditional behavior.

Table 6. Distribution of marriages by time intervals between registration of marriage and conception of the firstborn in same-age couples by age groups, per cent

Marital status at the time of conception	Age (years)					
	15-19	20-24	25-29	30-34	35-39	40-44
Marriage registered a year before conception and earlier	-	12.6	40.4	53.5	59.0	64.4
Marriage registered less than a year before conception	4.2	24.9	26.3	16.8	11.6	6.8
Marriage registered during pregnancy	81.8	58.0	30.3	24.6	21.0	16.9
Marriage at the time of birth is not registered	14.1	4.5	3.0	5.2	8.3	11.9

The second wave of marriages in which the first child is born begins at the age of 40. For men this is seen more clearly: the proportion of unions formed more than two years before conception starts shrinking past age 39 (Figure 7). Among women of this age the proportion of such unions is stable, but this can be at least partly explained by the dropping out of women who have already given birth to a first child. Spouses remaining married for a long time and in principle intending to have a child are by the age of 35 usually no longer childless. Among men in older age groups we are seeing the growth of new marriages contracted 1-2 years ago, or even less than a year ago, which is obviously a marker of remarriage.

Shotgun weddings are peculiar primarily to first births. However, a second birth too may lead to the registration of a marriage, particularly when the child is the first-born in a new partnership (Table 7). In the youngest age group of women who have given birth to a second child, the proportions are higher both of those not married at the moment of birth and of those whose marriage was registered less than a year before conception (compared with those giving birth to a first child). At the same time, the proportion of those registering their union during pregnancy is significantly lower (14% versus 44% for the firstborn). At older ages, from half to two-thirds of women give birth to their second child in a stable marriage (concluded more than a year before conception). However, 11-13% register their marriage during pregnancy. After age 25, the proportion of second births outside marriage is lower than that of first births. At older ages the gap reaches 15-17 percentage points.

Thus, despite the increase in the contribution of remarriage to fertility, marriages triggered by the conception of a second child are not at all common.

Table 7. Distribution of marriages by length of time between registration of marriage and conception of the second child, by age of mothers, per cent

Marital status at the time of conception	Mother's age, (years)					
	15-19	20-24	25-29	30-34	35-39	40-44
Marriage registered a year before conception and earlier	13.3	50.3	66.5	66.8	58.7	51.0
Marriage registered less than a year before conception	15.4	8.9	5.6	4.9	5.1	5.9
Simultaneous registration of marriage and conception of firstborn	0.3	0.7	0.6	0.5	0.6	0.7
Marriage registered during pregnancy	14.0	13.4	11.7	10.9	12.3	13.2
Marriage not registered at the time of birth	57.0	26.7	15.6	16.8	23.2	29.2

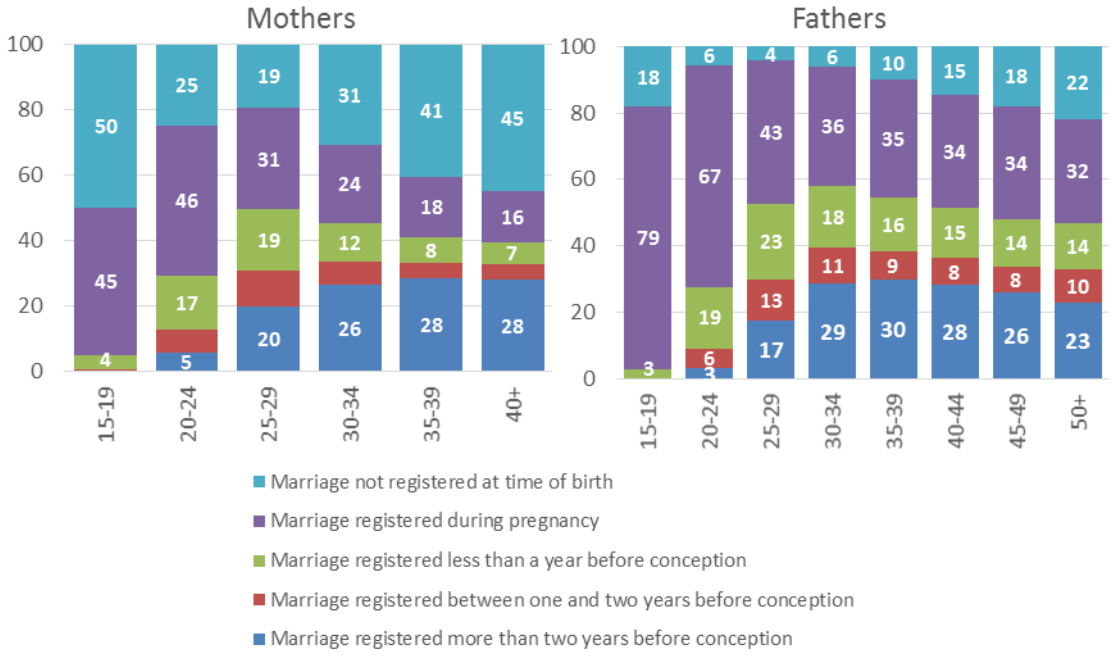

Figure 7. Distribution of marriages by their occurrence relative to conception of the first child, by age of mothers and fathers, per cent

REGISTERING BIRTHS OUT OF WEDLOCK WITH JOINT PARENTAL CONSENT

Indirect evidence of the presence of an unregistered union comes from the information regarding the father in the birth certificates[8] in cases when the woman is not officially married. Altogether, our data set for first births contains 7,555 such cases, all of which were documented in just three regions: Stavropol Krai, Moscow Region and the Republic of Tatarstan. On average, they make up 33% of the records in Moscow Region and 50% in Tatarstan.

The age profile of mothers who have provided information about the father of the child born out of wedlock does not support the hypothesis that this situation is typical mainly for older age groups (Figure 8). The age structure of the group of mothers providing such information resembles an inverted U-shaped curve: it is lowest among the youngest groups, and highest in the most fertile reproductive ages, i.e. between 25 and 29.

[8] Here we relied on information on the father's birthday.

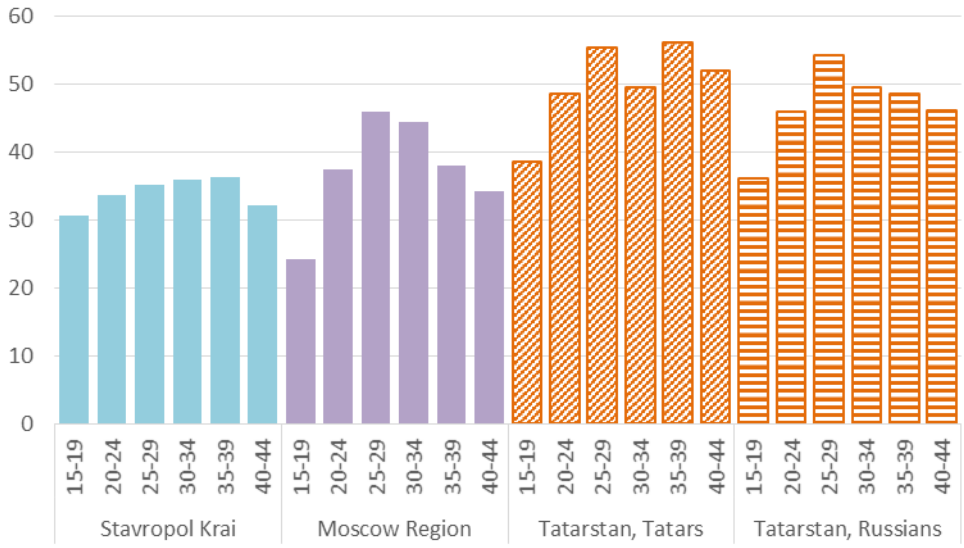

Figure 8. Proportion of mothers of children born out of wedlock who provide information to the registry on child's father, by age, selected regions, per cent

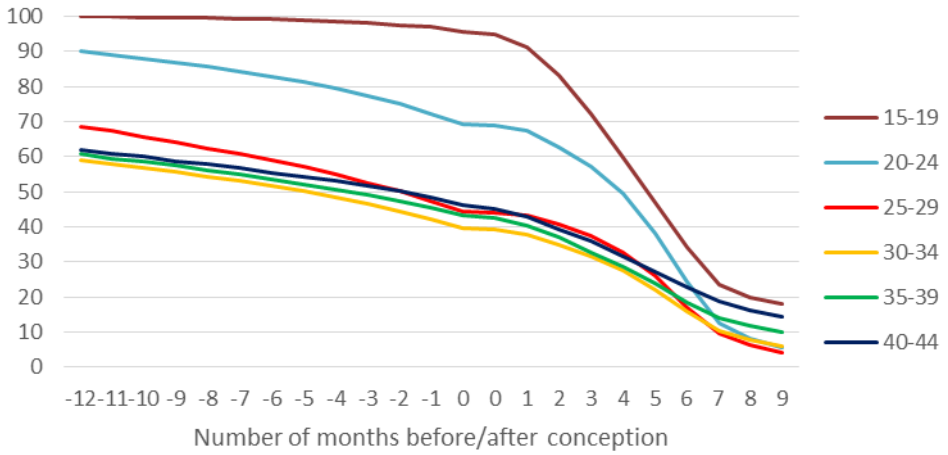

Figure 9. Proportion of unmarried women, by length of time (in months) before and after conception and by age of husband, per cent

The extent to which marriage and birth of the first child are connected is influenced by the age of both spouses, as well as by age difference between them. Figure 9 shows that the rate of registration of marriages after conception is higher among young men than among young women. In other words, if both parents are equally young, they are more likely to have a shotgun wedding. Also rushing to get married are young men aged 20-24 who exhibit two types of traditional behavior: either getting married and soon conceiving a child or legalizing the relationship while the bride is pregnant. The rates of registration of marriages among men of all other age groups are very similar.

From the records on the fathers of children born out of wedlock in their birth certificate (in 3 regions) we can analyze the age difference between the father and mother. The smaller the difference in age the higher the proportion of women in a registered marriage (Figure 10). The proportion of unmarried women is over 10% in those cases where the father is older than the mother by 10 years or more, and in those where the mother is older than the father by 6 years or

more. It is worth noting that the birth certificates do not contain information about the order of birth to the father (i.e. whether it is his first, second, third or a higher parity child).

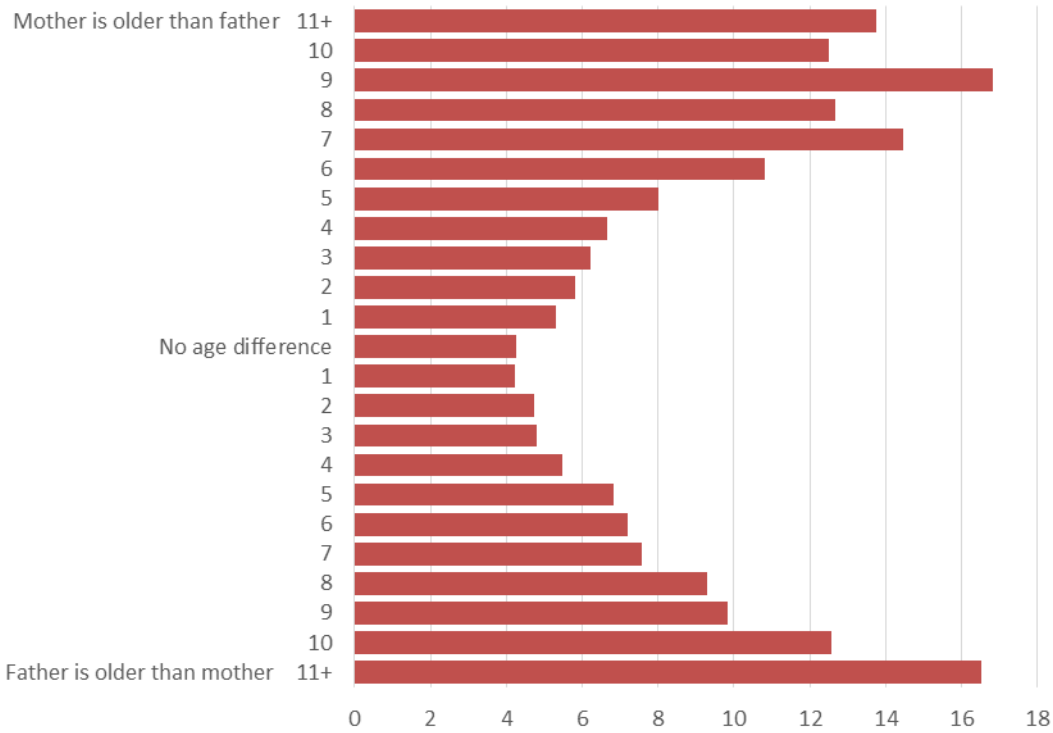

Figure 10. Proportion of unmarried mothers who provide information on the father to the registry, by age difference between parents, per cent

Thus, a shotgun wedding is most typical format of union formation for couples, in which both the man and the woman are under 20. It is also more common in regions with high fertility at younger ages. The greater the age difference between partners, the more often a child's conception does not lead to registration of the union.

DYNAMICS OF THE MARITAL STATUS OF WOMEN AFTER THE BIRTH OF THE FIRST CHILD

As noted, current records do not provide information on the duration of an unregistered partnership before conception. Macro data do not contain information about partnerships before their registration as official marriages. This lacuna can be filled only on the basis of sample sociological surveys, but even the largest sample sizes are not suitable for a detailed analysis of this phenomenon. Moreover, our experience working with the biographies of partners makes us critical of the reliability of the data in retrospective surveys on them.

Nevertheless, we still have the opportunity to look in more detail at the marital status of women who have recently given birth to their first child, and to evaluate the status's dynamics based on microdata from the 2010 Population Census. To compare them with the results outlined in the previous parts of this paper, we focus on census data in the same seven regions.

Since, prior to this, we worked with the current records from registries also for the year 2010, we actually can analyze the census data on some characteristics of the same women in the same families in the year of birth of the child. However, since the census was carried out in October, it contains the data on only 71.7% of first children born in 2010 and included in our dataset of current records.

The proportion of women in a registered marriage according to the census is in agreement with the proportion of births within marriage according to birth records (Table 8). The proportion of women recorded by the census as not being officially married is usually expected to underestimate the real share of unregistered partnerships. This is because the legal and factual concepts were mixed in the census question prompts, in particular, the very first question of the section used the term *marriage*, not *partnership*. However, in Moscow Region the proportion of women living in unregistered partnerships is higher according to census data than that of unmarried women who have left a record of the child's father (41% vs. 33%). In Stavropol Krai and in the Republic of Tatarstan, they are very close (38% and 42% in the former, 49% and 50% in the latter, respectively).

The level of education of women is closely related to their age and birth cohort. To illustrate the educational differences in marital status, we considered women aged 25-29 (Table 9). Less than 15% of women with higher education are not married in the year of birth of their first child. Unregistered marriages remain the prerogative of women with low levels of education, whose proportion is small in younger cohorts. Regional differences are small, and in particular, St. Petersburg does not show any deviation from this pattern. In other words, such a marker of the modern model of demographic behavior as unregistered marriages "with children" currently is not typical for Russia.

We can trace the changing marital status of women with census data. Among women who gave birth to their first child in 2006-2010, the proportion of those in unregistered marriages remained virtually unchanged at 11% during that five-year period. This suggests that, if the union is not registered by the time the baby is born, most likely it will not be registered at all. Within a five-year period, the proportion of separated and divorced women increased 4-fold — from 3 to 12%. The largest growth (from 2% to 14%) was revealed in the youngest age groups. In the oldest age group, the increase was about 5 percentage points (from 9.6% to 14.9%). Unfortunately, we cannot separate unions registered before and after conception and compare their stories.

Table 8. Distribution of first-parity women by marital status in selected regions, per cent

Marital status	Moscow Region	St. Petersburg	Leningrad Region	Stavropol Krai	Republic of Tatarstan	Primorsky Krai	Sverdlovsk Region
Marriage registered	76.9	75.7	73.3	75.2	78.1	66.8	69.3
Marriage is not registered	9.5	10.6	12.6	10.6	10.6	17.0	15.0
Widow	0.2	0.1	0.2	0.3	0.1	0.1	0.1
Never been married	10.2	9.3	11.2	10.2	8.8	12.9	13.3
Divorced	3.2	4.2	2.8	3.8	2.3	3.2	2,3

Source: Authors' calculations based on microdata from the 2010 Population Census.

Table 9. Distribution of first-parity women aged 25-29 by level education and marital status, per cent[9]

Level of education	Marriage registered	Marriage is not registered	Widow	Never married	Separated or divorced
Lower secondary or lower (ISCED 2 and lower)	49.3	25.1	0.5	20.6	4.5
Upper secondary (ISCED 3)	63.1	18.0	0.4	14.4	4.1
Basic post-secondary vocational (ISCED 4)	62.7	16.3	0.3	16.5	4.2
Professional post-secondary vocational (ISCED 5)	72.6	12.1	0.2	11.4	3.7
Incomplete higher education) (ISCED 5 or 6)	76.1	11.2	0.3	9.2	3.2
Higher professional (ISCED 6 or 7)	86.1	6.3	0.1	5.4	2.2
Postgraduate (ISCED 8)	85.8	6.3	0.2	5.6	2.1

Source: Authors' calculations based on microdata from the 2010 Population Census.

Earlier we mentioned that in stable informal partnerships registering marriage after conception might have mostly legal significance. However, the specific feature of the Russian society is that the importance of this factor is lower than in Western countries. In particular, this applies to divorce and to the fact that officially terminating a marital union does not provide any essential guarantees to either the father or the mother of the child. On the one hand, Russian judicial practice is biased against fathers and a child's custody is virtually always conferred to the mother. On the other hand, the widespread practice of child support (alimony) is based on verbal agreement rather than on a court decision. In other words, the settlement of disputes relating to the child after the dissolution of the union is often done informally rather than legally. In conjunction with other results of the analysis, this testifies to the fact that, in Russia, the registration of marriage during pregnancy plays mostly a traditional (ceremonial) role.

CONCLUSION

Shotgun weddings remain a significant aspect of Russian reality. Partnership and childbearing are also still highly correlated in other developed countries [Baizan et al. 2004; Musick 2007]. In Russia, this close relationship is typical for men and women of all ages, but most of all for young couples in which both partners are under 25. Record high rates of marriage are observed among couples where the groom and bride are under 20. If the first birth occurs after a woman turns 30 these events are further apart from each other in her life.

From one third to half of out-of-wedlock births are registered by mutual request of the parents. Most often, this occurs in the middle of the reproductive age, more rarely in the youngest and oldest reproductive-age groups, in which there is a higher proportion of registration of births by request of the mother only. The higher the education of the woman and the smaller the age difference between partners, the more likely they are to opt for a registered union.

[9] We provide ISCED 2011 codes for education categories in the table. Due to differences between Russian classification used in the census and the international one, some categories overlap in terms of ISCED codes.

Currently, slightly more than half of mothers under 30 go through both events (conception of the first child and marriage registration) within one year. But as the modernization of demographic behavior progresses, the relationship of the timing of marriage with that of conception weakens. The Russian Federation is extremely heterogeneous in its demography: some regions have just embarked on demographic modernization, while others have advanced fairly far. In the most advanced regions of our sample (St.-Petersburg) the birth of the first child is postponed in a registered union more often than in other regions, while at the same time the popularity of shotgun weddings remains at the average level. This is combined with the lowest birthrate among mothers under 20. Leaders in the prevalence of out-of-wedlock births are the regions of the Siberian and Far Eastern federal districts (in this case, Primorsky Krai).

How has the significance of premarital conceptions changed over the past decade? In modern Russia, an indicator such as the proportion of first-borns conceived before marriage and born within wedlock increased (Table 10). While in the late Soviet period their prevalence depressed the average age at marriage, now this impact vanished. In the past, cohabitation and sex outside wedlock were not socially accepted. Registration of marriage during pregnancy could be considered then as an inevitable and the only way to legitimize the partners' cohabitation. Under modern conditions, premarital partnership has moved into the category of social norms, and the cause-and-effect link between marriage and conception weakened.

In the traditional society, typical building of the first family consisted in the sequence of the following events: registration of marriage, living together, having intercourse and conceiving a child. In the late Soviet period an alternative model emerged whereby the couple first engaged in sexual activity not involving cohabitation but eventually leading to conception which was followed by marriage and start of marital cohabitation. Currently, this model often includes premarital cohabitation with one or, sequentially, several partners; the resulting conception leads to the registration of marriage. Fertility of the youngest women has declined so greatly that mothers under the age of 20 have become a virtually marginal group. At younger ages, conception still contributes to legitimizing extra-marital cohabitation. As fertility shifts to older ages, the number of shotgun weddings tends to decline, but this phenomenon is unlikely to disappear completely.

Premarital conception is not the same as unplanned pregnancy. There are four possible events, two of which are associated with contraceptive behavior. The first is contraceptive failure (unwanted pregnancy), the second is loose application of contraception sometimes associated with uncertain reproductive intentions of a couple. At present, the awareness of men and women of the effectiveness of contraceptives is significantly higher than in the Soviet era, and the frequency of contraceptive failure has decreased tremendously. The use of traditional methods of contraception and a loose adherence to the rules of application of modern methods are often the result of uncertain reproductive intentions. Qualitative sociological studies show that this is a fairly common behavioral tactic [Tyndik 2015]. Two other events imply planned childbearing by the couple or by either of the partners. It is not possible to evaluate the prevalence of these variants, but conceptions planned by the woman alone are clearly common [Ipatova, Tyndik 2015]. Finally, couples registering their marriage after a planned pregnancy may be more family-oriented than those who live in a childless marriage or who do not register the union even after the child is born.

To summarize, it is too early to say that in Russia premarital conception is the result of a conscious reproductive strategy of partners [Churilova, Chumarina 2014]. Clearly in opposition to this conclusion is the high prevalence in the younger age groups (where birth rates are now declining) of marriages registered after pregnancy. In addition, when family planning becomes widespread, one should expect a jump in marriage registrations just before conception, not after it (because this is a more rational behavior). In such a case, the difference from the traditional model would be that the couple cohabits for some time before registering marriage.

Table 10. Proportion of extra-marital births in selected regions, by age of mother, per cent

Region	Mother's age (years)				
	18-19	20-24	25-29	30-34	35 and over
Perm, 1966	46.5	28.0	19.7	20.4	25.9
Perm, 1981	65.5	36.7	26.1	28.6	24.0
Moscow, 1995	44.7	25.1	19.0	21.5	23.8
Primorsky Krai, 2010	90.9	66.3	43.2	36.1	34.3
Stavropol Krai, 2010	80.3	52.5	37.1	39.4	37.6
St. Petersburg, 2010	84.5	56.4	32.5	30.5	28.1
Leningrad Region, 2010	90.7	62.5	39.4	33.9	25.6
Moscow Region, 2010	87.1	55.9	34.1	31.8	28.4
Sverdlovsk Region, 2010	89.8	65.0	40.0	32.1	25.7
Tatarstan, Tatars, 2010	83.4	49.3	33.5	35.5	30.9
Tatarstan, Russians, 2010	91.3	59.2	37.4	35.6	25.5

Sources: For Moscow and Perm: E. Ivanova and M. Tolts, respectively, in [Demograficheskaja modernizacija… 2006].

At older ages, marriage registration prompted by conception has rational (legal) and ritual aspects. Now, social penalties for cohabiting without a marriage license and for terminating an official union are almost a thing of the past. However, there are no visible socio-economic advantages of registering a union: firstly, because family support measures are focused primarily on the mother and child; secondly, because when a registered marriage is dissolved, its official status does not help to resolve the disputed issues with respect to child custody. Under these conditions, the registration of marriage become more of a rite reflecting more stereotypical than rational elements of behavior. The strategy of "registration only in case of pregnancy" reflects a classic motive for a shotgun wedding. Thus, it is no exaggeration to say that the registration of marriage after the onset of pregnancy remains a bright marker of traditional demographic behavior; moreover, there are no signs yet of this changing.

ACKNOWLEDGEMENTS

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APPENDIX

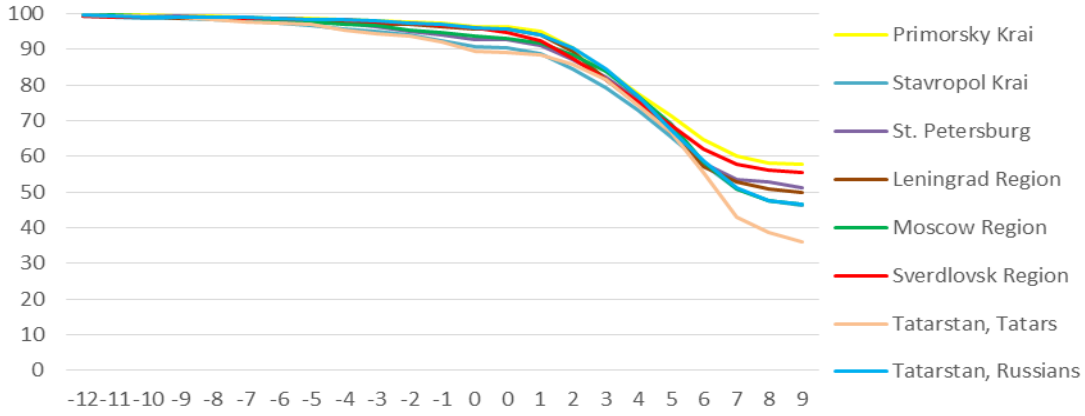

Figure A-1. Proportion of unmarried women aged 15-19, by the length of time (months) spent before and after conception of the firstborn, in selected regions, per cent

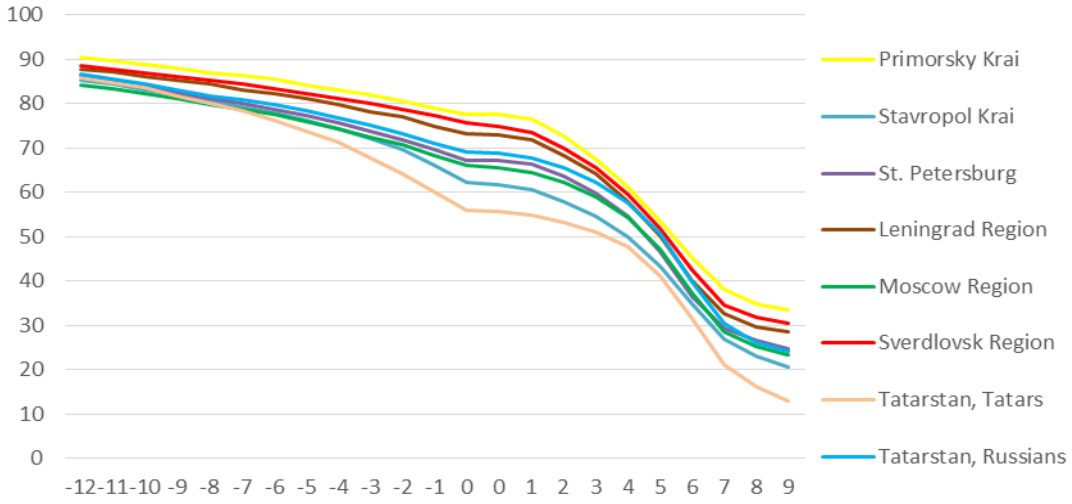

Figure A-2. Proportion of unmarried women aged 20-24, by the length of time (months) spent before and after conception of the firstborn, in selected regions, per cent

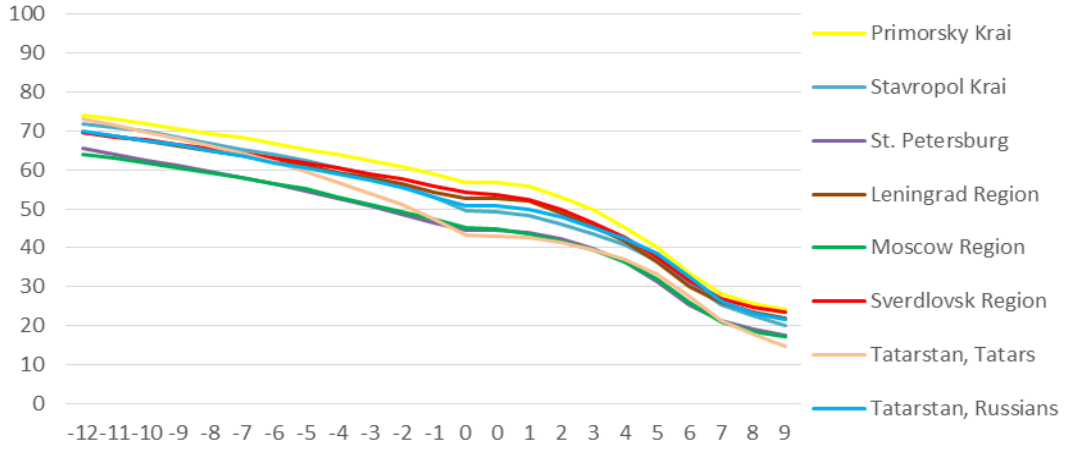

Figure A-3. Proportion of unmarried women aged 25-29, by the length of time (months) spent before and after conception of the firstborn, in selected regions, per cent

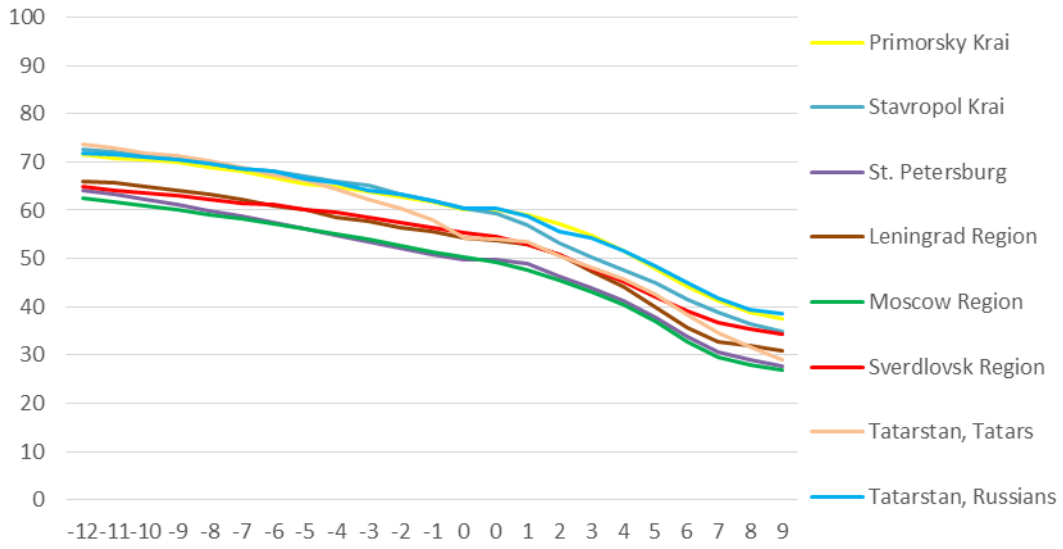

Figure A-4. Proportion of unmarried women aged 30-34, by the length of time (months) spent before and after conception of the firstborn, in selected regions, per cent

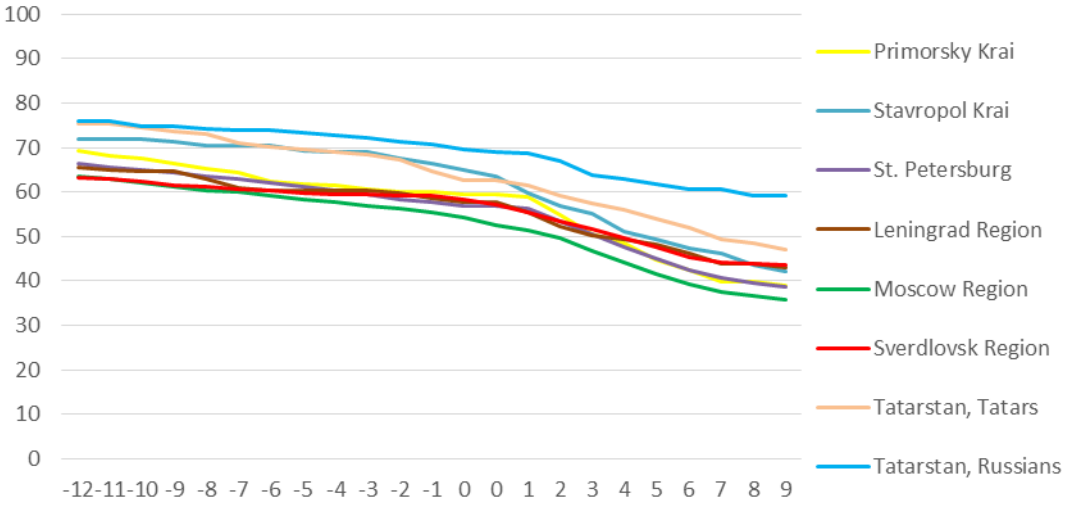

Figure A-5. Percentage of unmarried women aged 35-39, by the length of time (months) spent before and after conception of the firstborn, in selected regions, per cent

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ABORTION IN POST-SOVIET RUSSIA: IS THERE ANY REASON FOR OPTIMISM? *

BORIS DENISOV, VICTORIA SAKEVICH

This paper considers the problem of abortion in modern Russia. Using official statistics, we analyze the dynamics of abortion indicators since the early 1990s. On the basis of representative national sample surveys, we conclude that official statistics are complete and reliable. This in turn confirms the steady decline of abortions during the post-Soviet years.

A particularly rapid decline in abortions is seen among the youngest women. Modern teenagers have fewer abortions than their predecessors at this age. The current level of induced abortions in women under age 20 in Russia today is less than in France, Great Britain, Sweden, and a number of other developed countries of European culture.

The major differentiating factor for frequency of abortion is age. There are no clear correlations between the risks of abortion in Russia and such standard social characteristics as income, type of settlement and education. Despite the positive trend, Russia remains one of the countries with the highest abortion rates in the world.

The country's turn to traditional values and the allegedly growing role of religion are inadequate mechanisms to reduce abortions. Government support is given not to proven, evidence-based measures like the promotion of family planning, sex education, etc., but to repression and restrictions. During the past 10-15 years, a number of restrictive amendments have been introduced into legislation. The authors indicate the counterproductive effects of these restrictions on abortion as an instrument of a pronatalist population policy.

This article recommends paying more attention to improvements in the quality of abortion provision by the introduction of modern medical standards and protocols. In the conclusion, the authors suggest ways to improve the official statistics on abortions.

Key words: *pregnancy termination, abortion, birth control, family planning, reproductive health.*

Federal and regional legislative initiatives to limit access to abortions appear in Russia on an incredibly regular basis [Sakevich 2011; 2012]. A complete ban on abortion has often been proposed, an exception being made only for cases when pregnancy endangers the life or health of a woman [Sakevich 2013].

The question arises as to whether the abortion issue is really so acute in Russia today, and if so, whether the enhancement of abortion legislation can contribute to its solution and lead to a general improvement of the demographic situation. The authors aim at answering these questions with the help of official statistics and the results of a few representative national surveys.

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DYNAMICS OF ABORTIONS

In the Soviet Union, abortion played an important role in birth control. The USSR, with Russia as a constituent part, was the world's leader in the frequency of abortions [Avdeev, Blum, Troitskaja 1995; Vishnevsky, Sakevich 2006].

Since the late 1980s, the number of pregnancy terminations in Russia has been steadily declining (Figure 1). From 1988 to 2012, both the absolute number and the abortion rate (per 1,000 women of reproductive age) fell fourfold.

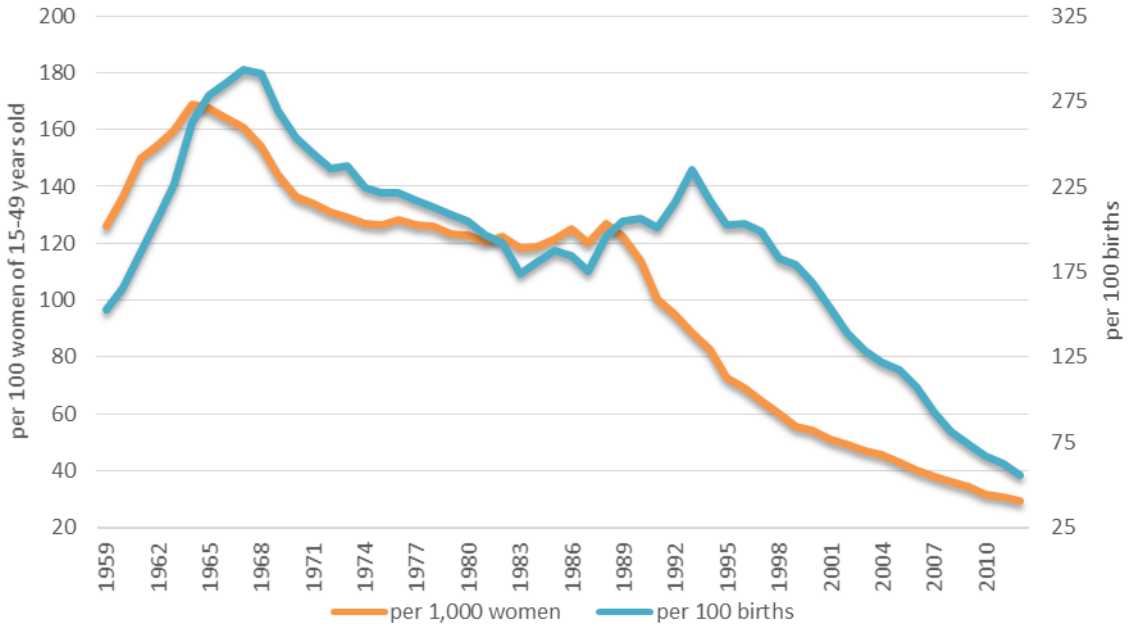

Figure 1. Abortions per 1,000 women of reproductive age and per 100 births in Russia, annual data, 1959-2012

Source: [Rosstat 2013b].

Official abortion statistics (Table 1) are published by both the Federal State Statistics Service (Rosstat) and the Ministry of Health. Rosstat accounting is more complete because Rosstat, along with abortions registered in medical facilities within the jurisdiction of the Ministry of Health, also takes into consideration abortions carried out in health facilities of other government ministries and departments, as well as in private health care facilities.

In 2012, the Federal State Statistics Service registered 1.06 million terminated pregnancies or 29.3 per 1,000 women of reproductive age, whereas in 1990, for example, over 4 million abortions (114 per 1,000 women) were carried out in Russia.

Most abortions in Russia are carried out in facilities under the jurisdiction of the Ministry of Health. In 2012, the Ministry of Health of the Russian Federation recorded 935.5 thousand abortions, or 88% of the total. The role of other organizations in providing abortions is relatively small. In 2012, the private health sector was involved in about 10% of all abortions, on average. This proportion varies by region, from zero in 15 Russian regions to more than a quarter in others. In 2012, the largest share of abortions performed in private clinics was registered in the Buryat

Republic (27%), Ulyanovsk (25%), Moscow (24%), Tambov (24%), Nizhny Novgorod (22%) and Omsk (22%) regions. The lowest share of abortions performed in private clinics was observed in the North Caucasus and Southern Federal Districts: 3% and 5% on average, respectively.

Table 1. The official statistics of abortions, Russia: 1990, 1995, 2000, and 2005-2012

Year	Number of abortions			
	Rosstat data			Data of the Ministry of Health, thousands
	Total, thousands	per 1,000 of 15-49 year old women	per 100 live births	
1990	4,103.4	113.9	206	3,920.3
1995	2,766.4	72.8	203	2,574.8
2000	2,138.8	54.2	169	1,961.5
2005	1,675.7	42.7	117	1,501.6
2006	1,582.4	40.3	107	1,407.0
2007	1,479.0	38.1	92	1,302.5
2008	1,385.6	36.1	81	1,236.4
2009	1,292.4	34.1	73	1,161.7
2010	1,186.1	31.7	66	1,054.8
2011	1,124.9	30.5	63	989.4
2012	1,064.0	29.3	56	935.5
1990 - 2012, -fold	3.9	3.9	3.7	4.2

Sources: [Rosstat 2013b; TsNIIOIZ 2013].

In 2007, for the first time in the observation period, the annual number of births in Russia exceeded the annual number of terminated pregnancies; in subsequent years, this gap widened largely due to a significantly rising number of births. By 2007, the abortion ratio had fallen to 92 per 100 live births, and by 2012, to 56 abortions per 100 births (Table 1). For a long time, two-thirds of pregnancies in Russia ended in abortions (assuming that the number of pregnancies equals the sum of births and recorded abortions). The ratio began to change after 2000, when the number of births began to grow, while the number of abortions continued to decline; in 2012, just over one-third of pregnancies ended in abortion. As is seen in Figure 2, the birth and abortion curves are not parallel. There was a time when both births and abortions decreased (in the 1990s); in recent years, the dynamics of abortions and births move in opposite directions, but there is no reason to say that the number of births is increasing *due to* the reduction of abortions.

The total abortion rate – an integral index which does not depend on the age structure of female populations – decreased from 3.39 abortions per woman of reproductive age in 1991 to 0.97 in 2012.

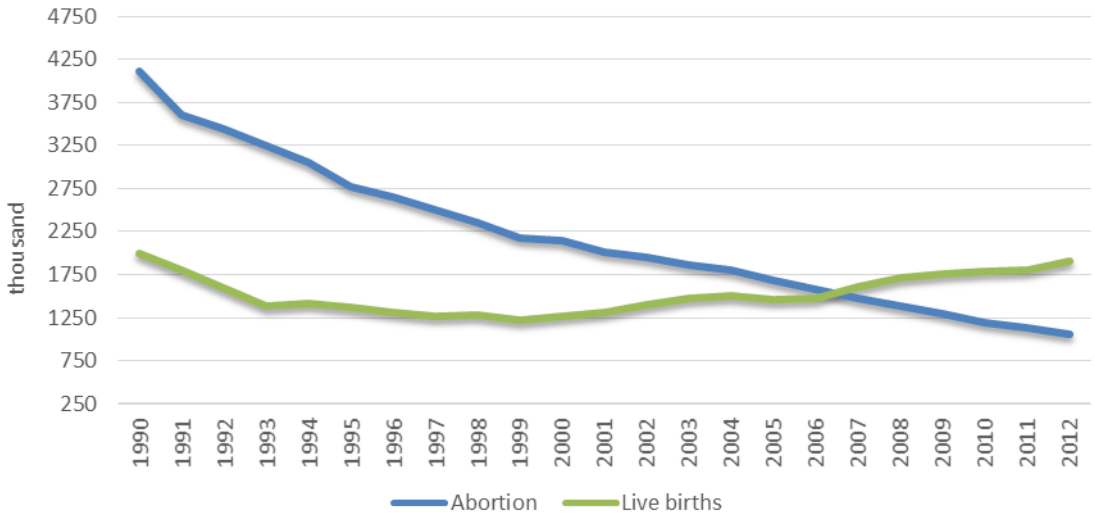

Figure 2. Annual number of live births and abortions in Russia, 1990-2012

Source: Rosstat

Despite favorable dynamics, Russia is still among the world's leaders in terms of the number of terminated pregnancies; the current Russian level is 2-4 times higher than in Belgium, Germany, the Netherlands and Switzerland [Sedgh et al. 2011]. The growing gap between Russia and neighboring Belarus is particularly impressive: in the early 1990s, the abortion rates were approximately similar in the two countries, while in 2012, the rate in Belarus was half the rate in Russia (Figure 3) [Denisov, Sakevich, Jasilioniene 2012].

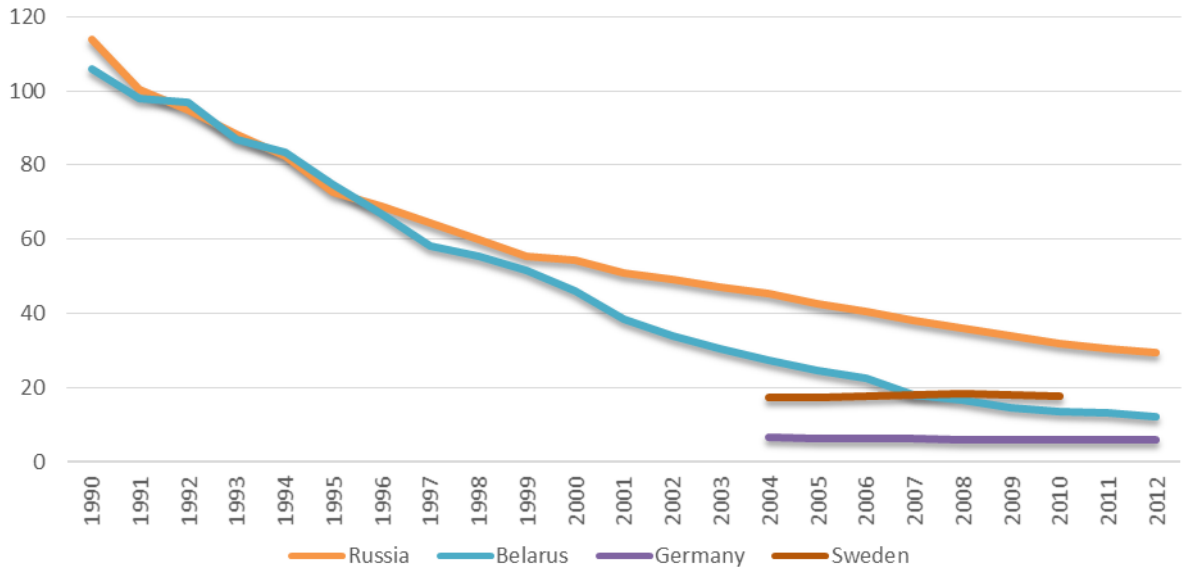

Figure 3. Number of abortions per 1,000 women of reproductive age (15-49) in Russia, Belarus, Germany and Sweden

Notes: Data on Russia and Belarus include spontaneous abortions.

Sources: [Rosstat 2013b; National Statistic… 2013; Eurostat Database 2014].

HOW RELIABLE ARE OFFICIAL STATISTICS?

Official abortion data is often questioned even by senior government officials. It is commonly suggested that the data is distorted by widespread private health services in the country.[1] In our opinion, the underestimation of abortions is exaggerated. Non-governmental organizations with a license for medical services (including abortion) are obliged to provide data on their work to local offices of the Federal State Statistics Service; when concealing any part of their activities, they violate the law and expose themselves to unnecessary risk.

The accuracy of the official statistics of abortions can be confirmed or refuted through sample population surveys. National surveys addressing the issue of pregnancy termination are not numerous, but they are available. The 19th wave of the Russian Longitudinal Monitoring Survey of the Higher School of Economics (RLMS-HSE)[2] (end of 2010) contained a special module related to women's reproductive health. Respondents aged 15-55 were asked whether they had had an abortion during the 12 months before the survey, and if so, how many abortions they had undergone. The abortion rate calculated on the basis of their responses reached 26.9 (confidence interval: 23.9-29.9) per 1,000 women of reproductive age,[3] while the official rate for 2010 was higher – 31.7 per 1,000 women. Yet, it should be taken into account that the official statistics of abortions in Russia include spontaneous abortions (miscarriages), which began outside a medical facility and led to hospitalization, as well as so-called "unspecified" out-of-hospital abortions, about which there is not sufficient information available to categorize them as either spontaneous or induced. If we exclude spontaneous abortions, then the official rate in 2010 will decrease from 31.7 to 27.1 per 1,000 women, and if we do not take into account miscarriages and unspecified abortions, then the abortion rate will reach 25.7 per 1,000 women of reproductive age. Hence, RLMS-HSE results (26.9: 23.9-29.9) and Rosstat data (25.7-27.1) are very close.

Moreover, according to the RLMS-HSE data, about 13% of abortions during the year prior to the survey were made in private clinics, which is quite consistent with the Rosstat data on the abortion providers.

In 2011, a national Sample Survey of Reproductive Health (SSRH) of women was carried out for the first time in Russian (and Soviet) history[4]; its data are not yet freely available for

[1] For example, Vice President of the Russian Academy of Medical Sciences A.A. Baranov states that the official figures underestimate the true number of abortions by a factor of at least two. [cited by: Radzinsky 2013: 6]. E. Mizulina (State Duma M.P.) claims that the annual number of abortions in Russia remains at 5 million (RIA Novosti News Agency, November 10, 2013, URL: http://ria.ru/society/20131110/975842743.html). Deputy Prime Minister O. Golodets, speaking at the Fifteenth International Scientific Conference of the Higher School of Economics, noted: "There is an ascending trend in the number of abortions, including in happy families" (URL: http://conf.hse.ru/2014/news/119037590.html). The Guttmacher Institute (USA), which regularly prepares a global review of abortions, considers Russia a country with incomplete abortion statistics. This incompleteness, in the opinion of review authors, is related to the rise of private clinics in Russia [Sedgh et al. 2011].

[2] "Russian Longitudinal Monitoring Survey of the Higher School of Economics is a series of annual, nationally representative household surveys based on probabilistic, stratified, multistage, areal selection. It is an international research project carried out by the Higher School of Economics, the Population Center of North Carolina University in Chapel Hill (USA) and the Institute of Sociology of the Russian Academy of Sciences (URL: http://www.hse.ru/rlms/).

[3] Here and below, the calculations of the authors are based on the RLMS-HSE database (URL: http://www.hse.ru/rlms/).

[4] The study was conducted by the Federal State Statistics Service (Rosstat) in cooperation with the Ministry of Health of the Russian Federation, and with the financial support of the United Nations Population Fund (UNFPA) and the

Russian researchers. According to SSRH, the abortion rate (including spontaneous abortions) during the three years preceding the survey reached 34 per 1,000 women aged 15-44 [Rosstat 2013a: 53], which is lower than the rate according to official statistics – 37.9, on average, per 1,000 women aged 15-44 in 2009-2011.

The similarity of survey data and abortion statistics of Rosstat was shown previously for regional studies [Philipov et al. 2004]. Hence, it can be concluded that there is no significant underestimation of the number of abortions in Russia, and that the significant decrease in abortions over the past two decades was real.

WHICH WOMEN ARE AT HIGHEST ABORTION RISK?

Russia differs from other countries not only in the level of abortions, but also in the age distribution of abortions (Figure 4). Russia drastically differs from Anglo-Saxon and Scandinavian countries, where abortion is an issue of concern primarily with respect to adolescents. In recent years, the proportion of 15-19-year-olds among the total number of women having abortions has reached 20% in the United Kingdom, 18% in Finland, and 17% in Denmark, Norway, Sweden and the United States, but only 8% in Russia.

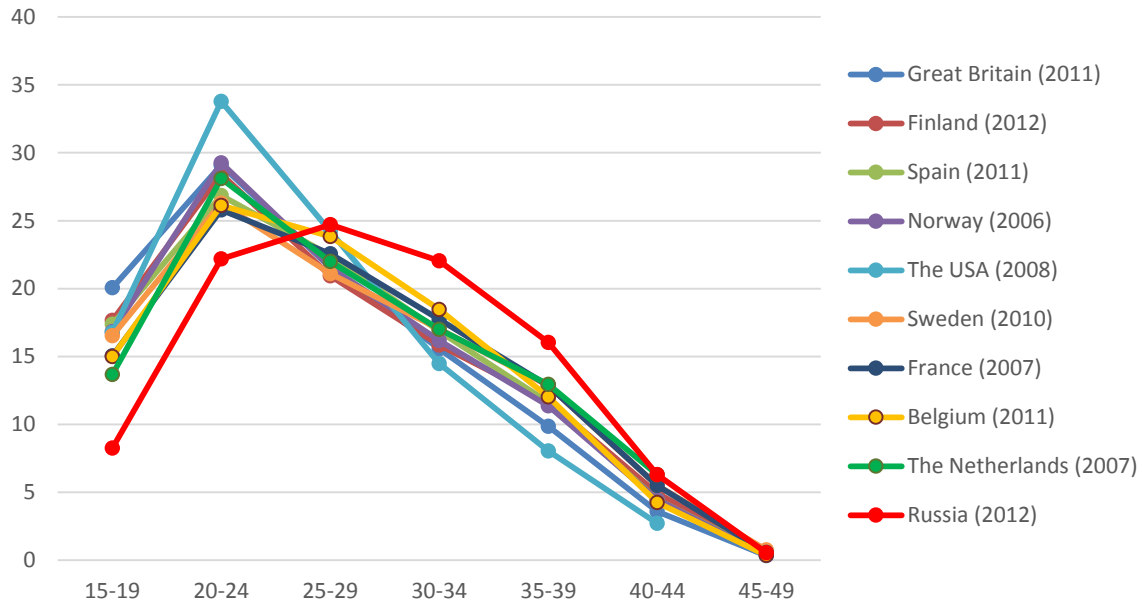

Figure 4. Age distribution of abortions in Russia and some other countries, % (in brackets – observation year)

Sources: Based on [Eurostat Database 2014].

The highest abortion rate in Russia (as well as the highest fertility rate) is observed in the age group 25-29 (Tables 2 and 3); a quarter of abortions occur in this age group. Women aged 20-

United States Agency for International Development (USAID). The field survey in 60 regions of Russia was carried out by the Information and Publishing Center "Statistics of Russia". Technical assistance in conducting the survey was provided by the Department of Reproductive Health of the Centers for Disease Control and Prevention (CDC), Atlanta, GA, USA. The survey was based on personal interviews with women of reproductive age (15-44) at their places of residence. 10,010 answers were received.

24 and 30-34 are characterized by roughly similar abortion rates, and their respective contributions to the total number of abortions are 22%.

Abortion in Russia aims at birth spacing or birth stopping by marital couples more often than at delaying an unmarried girl's first birth. The average age of women terminating pregnancy in 2012 was 29.37 years as compared with 28 years in 1996 when the data became available. Thus, we observe the "aging" of both fertility and abortion in Russia. Young people use modern contraception more often, thus making family planning among them more efficient [Sakevich 2009].

Abortion rates decreased in all age groups throughout the post-Soviet period (Table 2). From 1991 to 2012, the abortion rate was reduced by a factor of 4.4 among women under the age of 20, by a factor of 3.4 for women aged 20-34, and 3.3 for women aged 35 and older.

Over the last twenty years, the abortion rate in the age range of 20-34 years decreased almost linearly. The periods 1995-1999 and 2009-2012 were marked by a particularly rapid reduction (by 10% per year) in the number of abortions among women under 20, while in 2000-2008 the average annual rate of decline was 4%. In 2012, the abortion rate in the age group 15-19 almost equaled the abortion rate of those 35 and older, while in the mid-1990s it was 1.7 times higher. The first period of rapid decline in teenage abortions coincides with the Presidential Program "Family Planning"; subsequently, no special efforts have been made to promote responsible parenthood. Research under the auspices of the WHO Regional Office for Europe revealed a trend towards a reduction in sexual activity among Russian secondary school students [Currie et al. 2012]. But this is not enough to explain the irregularities in the reduction in abortions among adolescents; the issue requires further study. Yet the rapid decline in abortions among young women is encouraging: the "abortion culture", if it existed, is passing away among post-Soviet generations.

Russia left the group of world leaders in the frequency of induced abortions among adolescents, but it is still far from being among the most advanced countries (Figure 5). In recent years, the highest abortion rates in the 15-19 age group have been observed in the United States, Sweden, Estonia, Bulgaria, England and Wales and Romania. The success of Belarus is noteworthy as well: the level of teenage abortions has decreased to that of the Netherlands, a country that has been regarded for many years as an example of well-being in terms of reproductive health.

Official statistical sources do not provide much data on socio-demographic characteristics of women undergoing abortion: there is no segmentation into urban and rural residents, married and unmarried women, etc. This information can be obtained from sample surveys only. According to the results of the 19th wave of the RLMS-HSE, there is no significant difference between abortion rates in cities and those in the countryside. 39% of urban women and 36% of rural women of reproductive age (15-49 years) have had at least one abortion; the average number of abortions among those who have had at least one is 2.1 per woman in urban areas and 2.4 abortions per woman in rural areas.

Table 2. Age-specific abortion* rates and total abortion* rate, Russia: 1991, 1995, 2000, and 2010-2012.

Year	Abortions per 1,000 women by age group			Total abortion rate***
	15-19**	20-34	35 and older	
1991	69.7	152.5	50.5	3.39
1995	57.1	122.4	33.1	2.62
2000	36.0	97.6	23.8	2.00
2010	19.1	49.5	15.2	1.07
2011	17.2	47.1	15.2	1.02
2012	15.7	44.7	15.1	0.97
Decrease from 1991 to 2012, factor	4.4	3.4	3.3	

** Including spontaneous abortions.*

*** Including abortions among girls under 15 years of age.*

**** The average number of induced abortions a woman would have during her reproductive life, provided that age-specific abortion rates of the observation year remain unchanged.*

Notes: In 1991 – 2008, Rosstat published data on abortion by enlarged age groups. Since 2008, Rosstat has been publishing abortion rates by five-year age groups.

Source: Based on Rosstat data.

Table 3. Age-specific abortion indicators*, Russia: 2008-2012.

Year	15-19**	20-24	25-29	30-34	35-39	40-44	45-49***
Age-specific abortion rates per 1,000 women of the specified age group							
2008	25.3	57.9	62.6	52.7	37.0	13.8	1.2
2009	21.9	53.1	58.4	50.1	35.2	13.7	1.1
2010	19.1	48.1	53.8	46.5	33.0	12.9	1.1
2011	17.2	45.3	51.1	44.5	32.0	12.7	1.1
2012	15.7	42.7	48.2	42.8	31.2	12.4	1.1
Contribution of age groups to the total abortion rate, %							
2008	10.1	23.1	25.0	21.0	14.8	5.5	0.5
2009	9.4	22.7	25.0	21.5	15.1	5.9	0.5
2010	8.9	22.4	25.1	21.7	15.4	6.0	0.5
2011	8.4	22.2	25.1	21.8	15.7	6.2	0.5
2012	8.1	22.0	24.9	22.1	16.1	6.4	0.5

** Including spontaneous abortions.*

*** Including abortions among women under the age of 15.*

**** Including abortions among women over the age of 49.*

Source: Based on Rosstat data.

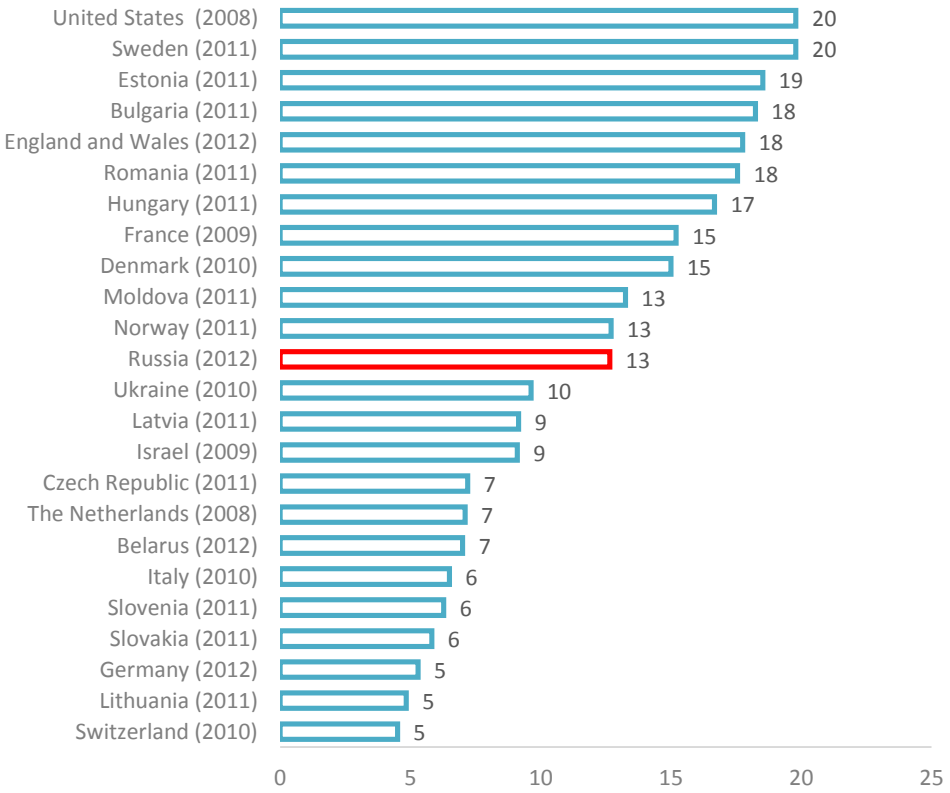

Figure 5. Abortion rate in age group 15-19 in Russia and selected countries, per 1,000 women

Notes: Data on Russia do not include spontaneous abortions.

Sources: [UNICEF 2013]; national statistical agencies, Guttmacher Institute (US data).

Abortion rates differ by level of education. According to the RLMS-HSE, more educated women are less likely to terminate their pregnancies: 41.8% of women aged 25-49 with tertiary education have had abortions, as opposed to 54.2% of women without a higher education diploma. But highly educated women are also characterized by a relatively high abortion rate: by the end of the reproductive period, 66% of women with higher education have had an abortion. Hence, the Russian population is relatively homogeneous with respect to abortion rates.

According to previous research, exposure to the risk of abortion in Russia is only loosely determined by such conventional social characteristics as type of settlement, income, and education [Denisov, Sakevich 2009].

ABORTIONS AND REPRODUCTIVE HEALTH

According to the WHO, when performed by skilled providers using correct medical techniques and drugs under hygienic conditions, induced abortion is a very safe medical procedure" [WHO 2013: 21]. Current research does not confirm negative impacts of (legal) abortions on subsequent pregnancies and risks of acquiring breast cancer. The same WHO report also states that the negative psychological effects of abortion were noted for few women, and most of them are more likely to be the continuation of preexisting conditions than the result of induced abortion [WHO

2013: 50]. The shorter the period between conception and abortion, the lower the likelihood of adverse effects on women's health.

Under Russian law, abortion is permitted at the woman's request with pregnancy duration of less than 12 weeks, for selected "social" reasons when the pregnancy does not exceed 22 weeks and for medical reasons – regardless of the length of pregnancy. The provision of abortion-related medical care (at any stage of pregnancy) is part of the state-guaranteed medical services provided to Russian citizens free of charge and included in the program for state-guaranteed free medical care to Russian citizens; in other words, such care should be provided free of charge in public health organizations. Russian legislation on abortion remains one of the most liberal in the world.

In the facilities supervised by the Ministry of Health, most abortions (96% in 2012)[5] are performed with a duration of pregnancy of less than 12 weeks.

Since 2012, Russia has applied the international definition of live birth, thus abortions in the 22nd-27th weeks of pregnancy were reclassified as "very early preterm births". In 2011, 16 thousand abortions in the 22nd-27th weeks of pregnancy had been registered. 2012 was marked by a slight increase in the number of 12th-21st week abortions (6.6 thousand), apparently due to a partial reclassification of late abortions performed after 21 weeks of pregnancy.

Another innovation deals with the registration of spontaneous abortions. Until 2010, this type of abortion was encoded in Russia as O03 according to ICD-10, and in 2011 an extended code O02-O03 including "missed spontaneous abortion" (O02.1) was introduced. This was done in order to emphasize the "high significance of miscarriage as an important reproductive and demographic issue" [Sukhanova 2013]. Spontaneous abortions (miscarriages), being a type of obstetric pathology, are direct indicators of women's reproductive health.

In one year (from 2011 to 2012), the number of spontaneous abortions in Russia increased from 176.6 to 222.9 thousand, or by 26%, and during pregnancies of less than 12 weeks the number increased from 147.2 to 199 thousand, or by 35%. Such a dramatic increase in the number of reported miscarriages was caused not by the drastic deterioration of reproductive health, but mainly by changes in registration rules. In Russia the transition to a new system of registering spontaneous abortions is probably uneven, in some regions the number of abortions barely changed in 2011-2012, while in others it almost doubled. Hence, a further increase in the number of registered spontaneous abortions nationwide can be expected. The inclusion of miscarriages in the abortion statistics distinguishes Russia from many other countries, and it would be advisable to publish two series of data: the total number of reported abortions and the number of induced abortions (except miscarriages).

The distribution of abortions according to statistical form No.13 for institutions of the Ministry of Health of the Russian Federation is given in Table 4. Most (69% in 2012) abortions are "medical (legal)" (part of ICD-10 code O04), i.e. hospital abortions performed at the woman's request within 12 weeks of pregnancy, including early abortions performed by vacuum aspiration and pharmaceutical methods (non-surgical method with the use of medicines). The rate (per 1,000

[5] No data on abortion distribution by gestation, abortions for medical reasons and abortion methods in institutions outside the system of the Ministry of Health of the Russian Federation.

women of reproductive age) of "medical (legal)" abortions in institutions of the Ministry of Health of the Russian Federation decreased 4.4 times: from 78.9 in 1992 to 17.8 in 2012.

The post-Soviet period is also characterized by a significant decrease of illegal abortions recorded in official statistics[6]: from 10,157 cases in 1992 to 264 cases in 2012, or equivalent to a 38.5-fold decline per 1,000 women of reproductive age. During the same period, the number of illegal abortions among adolescent girls aged 15-19 decreased from 1,725 to 12, or 144 times. This decrease immediately and positively affected maternal mortality from abortions: according to Rosstat data, in 1992 out-of-hospital abortions resulted in the deaths of 195 women, while in 2012 only 13 women died from that cause. Out-of-hospital abortions are not necessarily illegal, as they may begin spontaneously outside a medical institution. In other words, in Russia the reduction in abortions was accompanied by a significant decline in the risk of death from abortion. Deaths from abortion have been almost completely eliminated.

Table 4. Classification of abortions by the Ministry of Health of the Russian Federation, % of total number of recorded abortions in the system of the Ministry of Health

Abortion	1992	1995	2000	2005	2010	2011	2012
Spontaneous	6.32	7.23	8.87	11.20	16.36	17.85	23.83
Therapeutic	1.45	1.74	2.15	2.84	2.70	2.94	2.63
Illegal	0.31	0.20	0.13	0.10	0.09	0.07	0.03
Unspecified	3.46	3.73	4.28	4.84	4.93	4.81	4.56
For social reasons	0.79	1.22	2.23	0.18	0.04	0.03	0.01
Medical (legal)	87.67	85.86	82.34	80.84	75.88	74.30	68.93
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: [TsNIIOIZ 2013: 154].

In recent decades, the decline in the number of all types of abortions, except for spontaneous ones, has been accompanied by a redistribution of the contribution of different abortion types to the total number. In 2012, spontaneous abortions accounted for almost a quarter of all abortions in the Ministry of Health of the Russian Federation, while in 1992 their share was only 6%. It should be noted that the rate of spontaneous abortions per 1,000 women of reproductive age began to grow even before the change of registration rules, from about 2006; this was probably due to fertility growth in Russia, including in the older age groups, since the bigger the number of conceptions, the greater the risk of miscarriage.

The year 2006 was marked by a hard-to-explain jump in both the absolute and relative numbers of therapeutic abortions for medical reasons (when the continuation of pregnancy threatens the health of the mother and/or the child) in all age groups under 45. In 2007, the rate returned to the average values for the decade, while in 2008 it decreased significantly and has remained almost unchanged (Figure 6). The last decrease can be related to the 2007 decision on reducing the list of medical indications for abortion (Order of the Ministry of Health and Social Development of the Russian Federation dated December 3, 2007 No.736). Health service officials justified this step in the development of new technologies that make it possible to maintain pregnancy in those women for whom it was previously contraindicated.

[6] Criminal abortion is intervention to terminate pregnancy by a pregnant woman by herself or by other persons outside the medical institution.

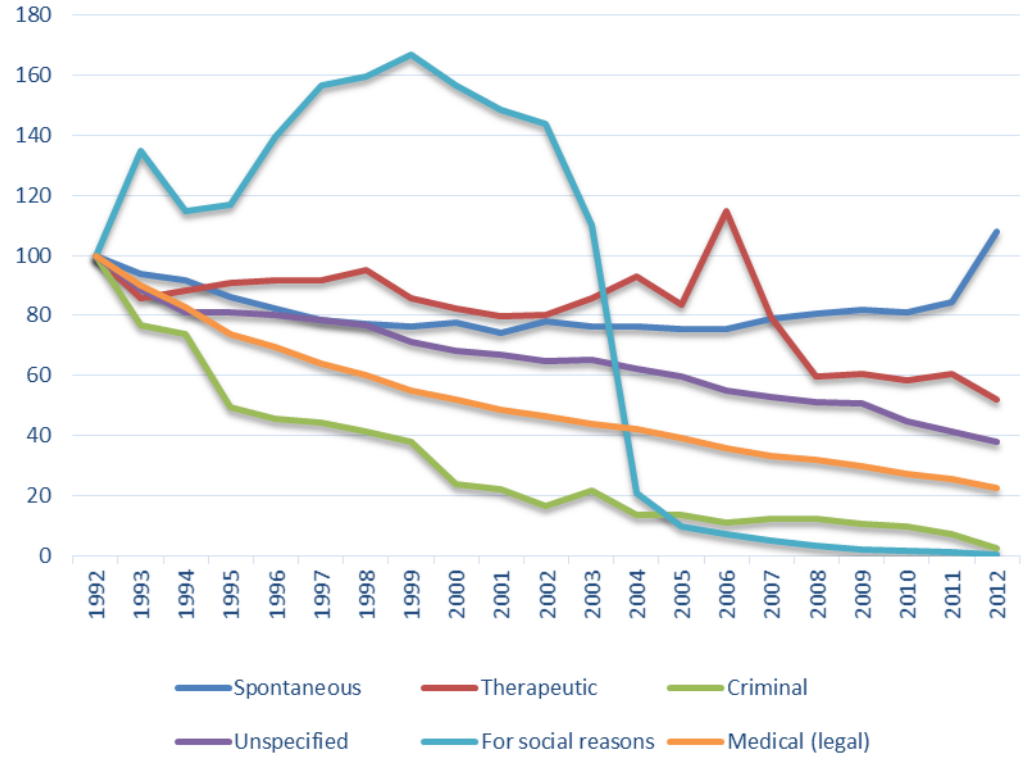

Figure 6. Abortion rate (per 1,000 women of reproductive age) dynamics, 1992=100

Source: Based on the data of the Ministry of Health of the Russian Federation.

The highest variations are typical for abortions performed for social reasons because of changes in the legislation. A broad list of 13 social indications for abortion (Decree of the Government of the Russian Federation dated May 8, 1996 No. 567) was approved in 1996. This measure was intended to eliminate illegal, out-of-hospital abortions amid the difficult socio-economic conditions of the transition period. In 2003, the Russian Government decided to drastically reduce the list of social indications for abortions to 4 items (Decree dated August 11, 2003 No. 485). Most likely, the transition period in the development of Russia was recognized as completed. In 2012, the Government of the Russian Federation once again reduced the list of social indications for abortion (Decree dated February 6, 2012 No. 98). Today, in the list there is only one item – a pregnancy resulting from a crime committed under Article 131 of the Criminal Code of the Russian Federation (i.e. rape). As a result of legislative reforms, almost no "social" abortions are observed today. In 2012, only 123 abortions for social reasons were recorded, while in 1999 there were 46.5 thousand abortions (maximum level).

According to the WHO, the safest abortion methods for women include vacuum aspiration and pharmaceutical abortion, which are applied in Russia at the early stages of pregnancy only. In 2012, in the public health sector, the proportion of abortions carried out by these safe methods at the early stages of pregnancy reached about one-third (32.6%) of all abortions carried out at the woman's request within the first 12 weeks of pregnancy, including 8% of cases when medical

drugs were used.[7] Most abortions in the facilities of the Ministry of Health are performed by surgical curettage, which is recognized by the WHO as an obsolete method that should be used in exceptional cases only [WHO 2013: 31].

According to SSRH (see footnote 4), the proportion of vacuum and pharmaceutical abortions is higher in 2006-2011 than according to the Ministry of Health of the Russian Federation: 33.8% and 7.7%, respectively. But in both cases, most (55%) pregnancies were terminated using the "obsolete" and more traumatic method of curettage [Rosstat 2013a: 59].

It is no wonder that Russian medical literature has been dominated by the view of abortion as a crippling operation. The consequences of abortion were described in the Soviet period as follows: "Almost one in three women suffers from complications after abortion, and in the case of a first pregnancy, almost one in two is affected. Abortion results in emotional stress which breaks the course of all mental and physical processes in the body, affects the course and outcome of subsequent pregnancies. Abortion has been found to be the main source of gynecological diseases. ...Scientific literature is full of data on the risk of female genitalia cancer rising parallel to the rate of induced abortions" [Shneyderman 1991: 60]. Today, medical doctors continue to insist on the disastrous results of legal abortions for women's health – a claim unproven by research. According to O.V. Sharapova (one-time Deputy Minister of Health of the Russian Federation), "The frequency of early, delayed and long-term complications after abortions... is in the range of 16-52%, and the late complications, mainly more disastrous, are considerably more numerous than the earlier ones..." [Sharapova, Baklaenko 2003]. The Order of the Ministry of Health and Social Development of the Russian Federation dated May 17, 2007 No. 335 recommends alerting women seeking abortion within 12 weeks of conception about possible long-term consequences of abortion such as infertility, ectopic pregnancy, premature birth, neuro-psychiatric disorders, etc. As was mentioned earlier, evidence-based medical science does not confirm the "horror stories" of health service officials, provided that the abortion is performed by qualified personnel complying with all required standards.

It is clear that the current objective of the Russian health service is to improve the safety and quality of abortion, as well as to introduce safe medical technologies. Does the "waiting week" introduced in 2012 by the new law "On Fundamental Healthcare Principles in the Russian Federation" (Law No. 323 dated November 21, 2011) at least somewhat contribute to such improvements? The "waiting week" is a specific period given to a woman to reconsider her decision to abort. The length of this period depends on the stage of pregnancy: at 4-7 weeks and 11-12 weeks after conception the abortion may be conducted no earlier than 48 hours after the first visit to the clinic; at 8-10 weeks after conception the abortion may be conducted no earlier than 7 days after visiting the clinic. During this time, it is recommended that the woman undergo a psychological consultation, the main purpose of which is to make the woman change her decision, maintain pregnancy and give birth. But due to the fact that gentle abortion methods are allowed only at very early stages of pregnancy, waiting too long can result in the impossibility of using them. As a result, safe and healthy methods of abortion are becoming even less available in Russia.

[7] In Russia, medicines for medical abortion are available in licensed medical institutions, including private clinics, but there are no published data on pharmaceutical abortions in private clinics.

ABORTION, CONTRACEPTION AND FERTILITY

Fertility is the product of proximate determinants such as fecundity, frequency of intercourse and conscious birth control. The decomposition of fertility into its proximate determinants was proposed by J. Bongaarts and was named the Bongaarts model [Bongaarts 1978; 1982]. The essence of this approach is that socio-economic and other factors affect fertility through these (proximate) variables. For example, one's level of education affects the number and timing of births indirectly, through getting (or not getting) married, using (or not using) contraception, and the acceptability of abortion. Bongaarts' approach makes it possible to distinguish family planning from birth control; the latter, in addition to contraception methods, includes the termination of pregnancy (abortion). The use of contraception to prevent unwanted conception and abortion to prevent an unwanted birth if conception has already occurred, are different ways to achieve a desired number of children in the family.

A general form of the model is as follows [Bongaarts 1978][8]:

$$F = C_m \cdot C_i \cdot C_a \cdot C_c \cdot F_p \quad (1)$$

Where fertility (F) is calculated through fecundability (F_p) dependent on four factors: exposure to risk of conception measured as proportion married C_m); the duration of postpartum infecundability caused by breastfeeding (C_i); frequency of abortion (C_a); use of contraception (C_c) which in turn can be subdivided into separate methods (hormonal, barrier, etc.). Later, a fifth index was added to the model – permanent sterility or infertility (C_s) [Bongaarts et al. 1984]. (C) indices range from 0 to 1; if the factor does not affect fertility, the index is equal to 1; the lower the value of the index, the greater the effect of the relevant factor on fertility deviation from potential fertility.

The application of Bongaarts' model to Russia was impeded by the unavailability of necessary data. The results of the 19th wave of RLMS-HSE (2010) made it possible to estimate the proximate determinants of fertility, as well as to check the adequacy of the survey data on birth control. In order to verify the rationality of the respondents' answers, we restated the problem: we did not calculate the birth rate based on proximate determinants, rather, we estimated the hypothetical potential fertility performance based on known fertility and calculated Bongaarts' indices. In other words, the formula (1) was transformed as follows: $F_p = \frac{F}{C_m \cdot C_i \cdot C_a \cdot C_c \cdot C_s}$.

[8] Indices are calculated with the following formulae: $C_m = \frac{\sum m(a) \cdot g(a)}{\sum g(a)}$, where $m(a)$ is the age-specific proportions of women in partnership, $g(a)$ is age-specific marital fertility; $C_i = \frac{20}{18.5+i}$, where i is the average duration of postpartum infecundability; $C_a = \frac{F}{F+0.4 \cdot (1+u) \cdot TAR}$, where u is the contraception prevalence (proportion of women in partnership who are fecund and using contraception), TAR is the total abortion rate; $C_c = 1 - 1{,}08 \cdot u \cdot e$, where e is the average efficiency of contraception; and $C_s = \frac{(7.63 - 0.11 \cdot s)}{7.3}$, where s is the proportion of childless women aged 45-49. In this case, we used a modified formula proposed by Stover [Stover 1998]: $C_s = 1 - f$, where f is the proportion of women of reproductive age who have fertility issues.

The calculation results are given in Table 5. Since obtaining indices requires a range of assumptions,[9] the ratios of indices, rather than the indices themselves, are important.

Table 5. Bongaarts' indices based on the 19th wave of RLMS-HSE (2010)

Total fertility of the synthetic cohort, children per woman, F	1.274
Index of proportion married, C_m	0.574
Postpartum infecundability index, C_i	0.841
Abortion index, C_a	0.665
Permanent sterility index, C_s	0.879
Contraception index, C_c	0.291
Fecundability, children per woman, F_p	15.503
Total marital fertility rate, children per woman, $TMFR$	2.116
Contraceptive prevalence, per woman, u	0.806
Efficiency of contraception, index, e	0.815
Total abortion rate, abortions per woman, TAR	0.887
Average duration of exclusive breastfeeding, months	5

Notes: The marital fertility rate for the age group of 15-19 was assumed to equal 30% of the marital fertility rate in the age group of 20-24. Contraception prevalence refers to sexually active women who do not plan to bear a child. The total abortion rate was increased by 15% to allow for spontaneous abortions. Data on the infertility prevalence (12.1%) were based on the survey "Parents and Children, Men and Women in Family and Society" conducted in 2007 [Sakevich 2009: 132-133].

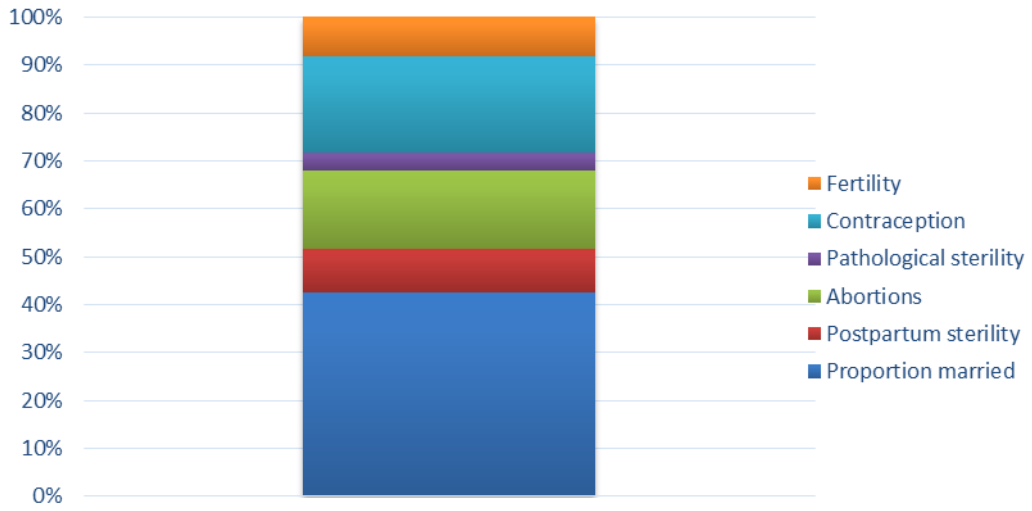

Figure 7. Bongaarts' proximate determinants of Russian fertility (% of total fecundability of 15.5 children per woman)

Source: Author's calculations based on the results of the 19th wave of RLMS-HSE (2010) (URL: http://www.hse.ru/rlms/).

As follows from Table 5 and Figure 7, sexual exposure is the single most important factor depressing fecundability into observed fertility. Since not all women of reproductive age are in a partnership throughout the reproductive period, the birth rate is less than the potential fertility performance by approximately 40%. Contraception and abortion significantly affect fertility in

[9] For example, following Bongaarts' logic, we excluded extramarital births and abortions from the calculation, although extra-marital conception is not uncommon today. Moreover, equating the status of married (including unregistered) women with the status of sexually active women is not correct.

marriage or partnership. Contraception has a greater effect than abortion. The role of abortion in birth control is decreasing. Thus, the abortion index calculated for the Russian population in the early 1990s was at 0.562 [Entwisle, Kozyreva 1997: 20], whereas in 2010 it reached 0.665. The effect of infertility on the total fertility rate is low.

Fecundability of Russian women equals 15.5 births, which is close to Bongaarts' estimate of fecundability – 15.3 births per woman on average (varying from 13 to 17). Thus, all components of the model based on our data – proximate determinants of fertility estimated on the basis of RLMS-HSE 2010 – are consistent among themselves and with observed fertility. This confirms the validity of the survey results and the appropriateness of using them to assess the reliability of official abortion statistics.

CONCLUSIONS

The number of abortions in Russia has decreased steadily throughout the post-Soviet years. This is confirmed by both official statistics and surveys. The rapid decline of abortion is particularly pronounced among young women. Russia lost its deplorable leadership in this domain and now has a lower frequency of teenage abortions than many Westerns countries. The "abortion culture", if it existed, belongs to the past. According to Bongaarts' model, the role of contraception as a method of birth control in present-day Russia is far superior to the role of induced abortions. The efficiency of family planning is improving.

Yet, in the 2000s, the rate of decline in the number of terminated pregnancies slowed down. Today, Russia lags behind neighboring countries, which in the Soviet period had the same rates as Russia but have considerably bypassed it in reducing the prevalence of abortion. As a result, Russia remains among the countries with the highest abortion rates in the world (this assessment is valid for countries with complete abortion statistics that constitute one-third of the total).

In addition to overcoming this lag, the current objectives of the Russian health care service are to improve the safety and quality of abortion services, introduce modern medical standards and, in particular, promulgate the use of safe methods such as pharmaceutical abortion.

Improving the quality of medical care implies, inter alia, increasing its availability. Meanwhile, in Russia, the last 10-15 years have been marked by a number of new legislative amendments limiting the availability of abortion, including at early pregnancy. These amendments include a reduction in the list of medical and social indications for abortion, the introduction of a "waiting week" – a mandatory waiting period between "applying" for an abortion and the procedure – and a ban on advertising abortion services. The exclusion of abortion from the basic program of compulsory health insurance is under active discussion.

Russia's lagging behind other countries in reducing the prevalence of abortion is apparently causing concern among health service officials, making them seek more effective methods to solve the abortion issue. But against the background of Russia's turn towards "traditional" principles and values, and of the strengthening of the role of the Church in society, repression and restrictions, rather than empirically well-founded, effective measures (e.g. promotion of family planning, sex education), are increasingly preferred.

Legislative restriction of abortion is regarded as a tool to increase fertility. This is periodically stated by officials who interpret the prevention of abortion as its outright rejection in favor of birth, even if the pregnancy is unwanted. One of the target indicators of the Russian State Program for Health Development (adopted by Order of the Government of the Russian Federation No. 2511-r dated December 24, 2012) is the proportion of women seeking abortion at a medical institution who were persuaded not to terminate the pregnancy. This proportion should increase to 15% by 2020, but the estimation method was not specified.

Demographers are well aware of the historical experience of countries where abortion has been outlawed (Nazi Germany, Communist Romania, Stalin's USSR, and present-day Poland). This measure was not characterized by positive demographic effects; on the contrary, it resulted in increased maternal mortality and even in a number of infanticides.

Hence, recent Russian legislative innovations are not contributing to a rapid decrease of the number of abortions (actually the decrease is slowing down, as noted above), and even may exert a negative effect on reproductive health.

Finally, the state of Russian abortion statistics should be considered. On the one hand, there is no reason to doubt its accuracy and completeness. On the other hand, the official statistics of terminated pregnancies need to be improved in terms of detailing the indicators. In contrast to most countries with official statistics on abortions, Russian statistics include miscarriages or spontaneous abortions; the data on the subdivision of abortions into induced abortions and miscarriages should be published and taken into account in international comparisons. One more disadvantage of official abortion statistics is the fact that they provide a limited number of socio-demographic characteristics of women undergoing abortion.

The last few years have been marked by the emergence of extensive sets of data on the reproductive behavior and health of Russians generated by national representative surveys. There is hope for significant progress in understanding the situation and its problems, including those related to overcoming Russia's "leadership" in abortion.

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MORTALITY OF CHILDREN UNDER ONE YEAR OF AGE IN RUSSIA: WHAT HAS CHANGED AFTER THE TRANSITION TO THE NEW DEFINITION OF LIVE BIRTH AND STILLBIRTH*

EKATERINA KVASHA

Infant mortality in Russia has been decreasing for several decades. In 2011, however, Russia's infant mortality rate reached a level (7.4 per 1000 live births) more than three times higher than in countries with minimal levels. In April 2012, Russia adopted new definitions of live births and stillbirths, which are much closer to the corresponding WHO definitions than those used before.

The transition to these new definitions was meant to increase the rates of perinatal, early neonatal and infant mortality in general for children weighing up to 1000 grams – those concerned by the changed definition.

This paper analyzes the changes in the structure and dynamics of death in children under one year of age since the transition to the new definitions of live births and stillbirths, according to birth weight and period of death based on official and medical statistics. It looks at the possibility of distortion of both infant and perinatal mortality and their components.

Particular attention is given to an analysis of the structure of infant mortality by age and cause of death in Russia in comparison with other countries. The regional aspect of changes in infant mortality for 2011-2012 is also studied herein.

The analysis is based on data from official and medical statistics.

***Key words**: stillbirth, early neonatal mortality, infant mortality, causes of death, definition of live births and stillbirths, infant weight.*

TRENDS IN INFANT MORTALITY

The reduction in mortality of children under one, in contrast to other age groups, occurred in Russia over several decades and is considered to be one of the most important achievements in the areas of medicine and socio-economics. But a closer analysis shows that this achievement is not so significant.

The infant mortality rate achieved in Russia by 2011 (7.4 per 1,000 live births) is over three times higher than in countries with its lowest levels (in 2011, 2.3‰ in Norway and 2.4‰ in Finland and Estonia [WHO 2014a]) and also much higher than in most of Europe, including Eastern Europe.

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* THE STUDY WAS IMPLEMENTED UNDER THE BASIC RESEARCH PROGRAM AT THE NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS (HSE) IN 2013-2014.

In the early 1980s, the infant mortality rate in Russia was approximately the same as in European countries with relatively high infant mortality (Figure 1). By the early 2010s, Russia still remained in this relatively compact group. Only Portugal had managed to radically change its ranking. In 1980, in Portugal the infant mortality rate was 2.3 ppm higher than in Russia, and by 2011 it had become 4.2 ppm, or 2.4 times, lower than in Russia. Bulgaria in 2009 and Ukraine in 2007 shifted to a definition of live births corresponding to WHO recommendations, and it is precisely this shift that caused significant variations in infant mortality rates in these countries. Previously, they had used the same definitions as in Russia, and infant mortality rates were lower than in our country.

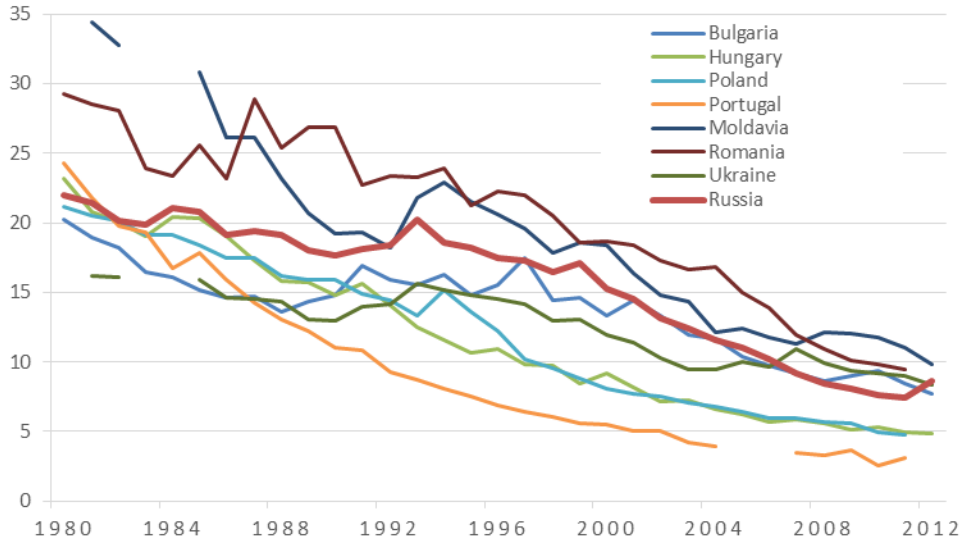

Figure 1. Infant mortality rate in selected European countries, 1980-2012, per 1,000 live births

Source: [WHO 2014a; Rosstat 2013].

CHANGES IN DEFINITION OF LIVE BIRTHS AND STILLBIRTHS SINCE 2012

In 2012, the infant mortality rate in Russia increased to 8.6 per 1,000 live births from7.4 per 1,000 live births in 2011. This increase was related to Russia's transition to the new definition of live birth since April 2012 and was quite predictable [Andreev, Kvasha and Kharkova 2013].

According to the WHO definition, a live birth is the result of the complete expulsion or extraction of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered live-born.

According to the WHO, all live-born infants should be registered and counted as such, irrespective of gestational age or whether alive or dead at the time of registration, and if they die at any time following birth they should also be registered and counted as dead.

In Russia, before 1993 a child was considered to be live-born if he or she was born after 28 weeks or more of gestation, was 1,000 g or more in weight, 35 cm or more in body length, and

was breathing after birth. Children born at a shorter gestation, with a smaller body weight or length, were included in the number of those live-born only if they managed to live for seven full days (168 hours).

Order No. 318 of the Ministry of Health of the Russian Federation dated 04.12.1992 and Decision No. 190 of the Russian State Statistics Service dated 04.12.1992 introduced new definitions of live births and stillbirths which were closer to WHO criteria. But only medical statistics adopted these definitions. The civil registration offices still recorded those infants who were born with a weight of 1,000 g or over and, if the weight was unknown, then with a body length of 35 cm and over or with a period of gestation exceeding 28 weeks, as well as live-born children weighing less than 1,000 g at multiple births, and all those who were born with a body weight of 500-999 g, if they survived more than 168 hours (i.e. 1 week).

In fact, compared with the situation until 1993, the following infants were considered as live-births:

- babies who did not breathe, but had other signs of life such as beating of the heart, pulsation of the umbilical cord or movement of voluntary muscles;
- babies with a body weight of 500-1000 g born at multiple birth and who died in the early neonatal period.

On March 23, 2012, Russian newspaper «Rossijskaya Gazeta» published Order No. 1687n of the Ministry of Health and Social Development of the Russian Federation (Russian Health Ministry) dated 27.12.11 "On Medical Birth Criteria, the Birth Certificate Form and the Procedure for issuing it", which specified new live birth and stillbirth criteria. According to this order, a live birth is the moment when the fetus is separated from the mother's body by means of childbirth at a gestation of 22 weeks or more and the newborn's weight is 500 g or more (or less than 500 g in the case of multiple births), or, if the child's weight at birth is unknown, with a body length of 25 cm or more, and with signs of live birth (breathing, beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles – whether or not the umbilical cord has been cut or the placenta is attached).[1] Order No. 1687n of the Russian Health Ministry dated 16.01.13 "On Amending Appendices 1 and 3 to Order of the Russian Health Ministry dated 27.12.2011 'On Medical Birth Criteria, the Birth Certificate Form and the Procedure for issuing it'" specified the list of medical criteria of infant live birth. According to it, the birth criterion is a gestation of less than 22 weeks or the child's weight at birth of less than 500 g, or, if the body weight is unknown, a body length of less than 25 cm at a life duration of more than 168 hours (7 days) after the birth.[2]

Accordingly, stillbirth criteria were also expanded. According to the Order of the Russian Ministry of Health, "A stillbirth is the moment when the fetus is separated from the mother's body by means of childbirth after a gestation period of 22 weeks or more with a body weight of 500 g or more (or less than 500 g in the case of multiple births), or, if the infant's weight at birth is unknown, with a body length of 25cm and more, and with no signs of live birth."[3]

[1] http://www.rg.ru/2012/03/23/kriterii-rozhd-dok.html.
[2] http://www.rg.ru/2013/04/03/rozhdenie-dok.html.
[3] Ibid.

Such expansion of the live birth and stillbirth criteria has brought Russia closer to the relevant WHO criteria. However, differences still remain. According to the WHO, all conception products should be taken into account regardless of the pregnancy duration and child's weight, whereas in Russia there are limitations on the pregnancy duration and child's birth weight.

Russia is not the only country that uses incomplete WHO definitions of live births and stillbirths. For example, in Bulgaria, if the weight of a newborn is less than 600 grams and/or the duration of pregnancy is less than 22 weeks, the infant is considered live born if he or she survived for at least three days after delivery. In the Czech Republic, if the fetus weighs 500 grams or less, it is recorded as a live birth upon the condition that he or she survives 24 hours. In Ukraine, children born alive or dead with a weight of 500 g or more or at gestation of 22 weeks or more are subject to civil registration.

The changes of the live birth criteria also led to changes in the abortion structure. Abortions at a late stage of pregnancy virtually disappeared. According to Order No. 1661n of the Russian Ministry of Health dated 27.12.11 "On Amending Order No. 736 of the Russian Ministry of Health dated December 3, 2007 'On Approving the List of Medical Indications for Abortion'",[4] abortion after gestation of 22 weeks or more of a child with congenital anomalies (birth defects), deformations and chromosomal abnormalities is permitted only after approval by a council of physicians. In other words, there was a change in the interpretation of the concept of "late abortion": previously, if abortion at a late stage of pregnancy (22-27 weeks) was considered to be a "late abortion", now it is termed a "very early preterm birth" [Sukhanova 2013]. All these changes in the definitions were meant to affect and did affect perinatal mortality rates and the structure of births and deaths of children by weight. So what happened to the perinatal mortality rate in Russia and what changes occurred in 2012?

TRENDS IN PERINATAL MORTALITY

It was expected that the transition to the new definitions of live births and stillbirths would increase the number of infants who died in the first week of life by including in early neonatal mortality infants weighing less than 1,000g at birth and having lived less than 168 hours, since until 2012 these were considered to be stillborn. The number of stillbirths was also expected to increase, although not as significantly as early neonatal mortality: the number of stillbirths was supposed to increase due to late abortions, as well as to decrease due to the transition of babies considered stillborn to the group of children who had died in the first week of life. In fact, early neonatal mortality (as a part of perinatal mortality) in 2012 relative to that in 2011 increased by 36%, and stillbirths by 41%; overall, perinatal mortality increased by 39%.

Let's consider these changes against the dynamics of previous years. From 1993 (the year of the previous changes in definitions of live births and stillbirths) to 2011, perinatal mortality in Russia (according to state statistics) decreased 2.4 times (infant mortality – 2.7 times). This decline was mainly due to an early neonatal component, which decreased 3.6 times, while stillbirths decreased only 1.7 times. In 1998, the curves corresponding to the two components of early

[4] http://www.rg.ru/2012/02/17/abort-dok.html.

neonatal mortality crossed (Figure 2), and the contribution of stillbirths to perinatal mortality became higher than its early neonatal component. Overall, from 1993 to 2011, the proportion of stillbirths increased from 44.8% to 62.7%.

If official statistics started only since 2012 to account for infants with a weight of 500g or more and a gestation period of 22 weeks or more in perinatal mortality, then, as was already noted, medical statistics should have been doing so since 1993.

The changes in perinatal mortality, according to the medical statistics at our disposal (Form 32 "Information on Medical Care for Pregnant Women, Birthing Mothers and New Mothers", Federal Statistical Observation), are demonstrated in Figure 3. Changes in the perinatal mortality rate and its components for children born with a weight of 500 g or more in 2004-2012 can be characterized as a moderately rapid decline (Figure 3, left panel). In Health Ministry institutions, perinatal mortality of newborns with a weight of 500 g decreased 2 times over 8 years, stillbirths decreased 2 times and early neonatal mortality decreased 1.7 times. Accordingly, the change in perinatal mortality was caused largely by the reduction in stillbirths. In 2004-2011, the proportion of stillbirths in perinatal mortality remained almost unchanged at 75% of all perinatal deaths. Only in 2012 did the proportion of stillbirths drop, to 69%. Meanwhile, in 2012, during the transition of state statistics to the new definition of live births and stillbirths, medical statistics recorded a sharp decline in perinatal mortality largely due to stillbirth.

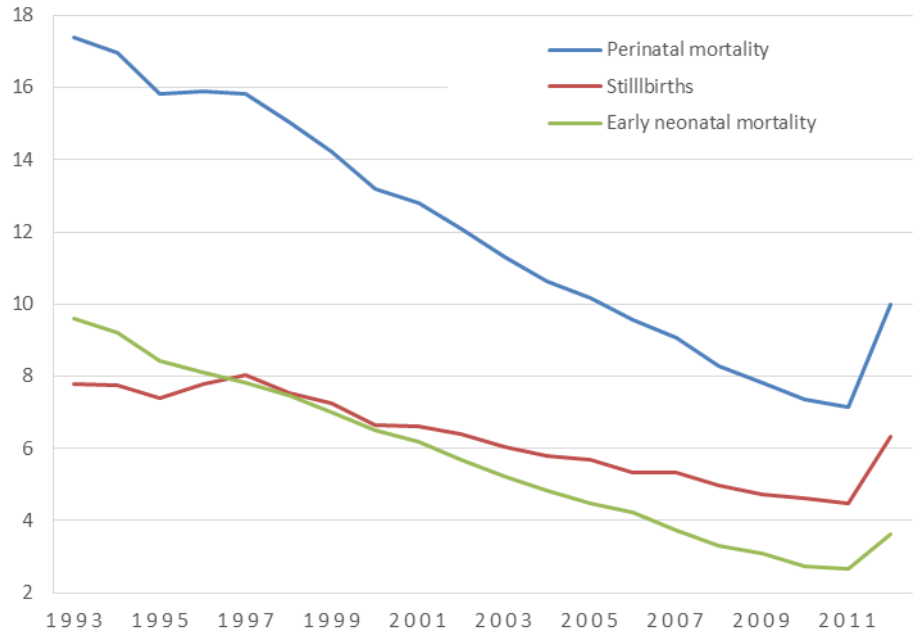

Figure 2. Perinatal mortality and its components in Russia, 1993-2012, per 1,000 live births and stillbirths

Source: [Rosstat 2013].

The right panel of Figure 3 shows changes in perinatal mortality according to medical statistics for children born with a weight of more than 1,000 g, i.e. according to criteria similar to those used in official statistics until 2012. Hence, the overall pattern, except for 2012, is similar to what is shown by official statistics. But stillbirth rates are lower in the official statistics, while early neonatal and perinatal mortality are considerably higher. In 2012, the stillbirth rate slightly

increased relative to 2011, while early neonatal mortality decreased. By 2012, and relative to 2004, the perinatal mortality rate for children with a body weight at birth of 1,000 g or more decreased by 29%, while the stillbirth rate decreased only by 19% and the early neonatal mortality rate decreased by 45%.

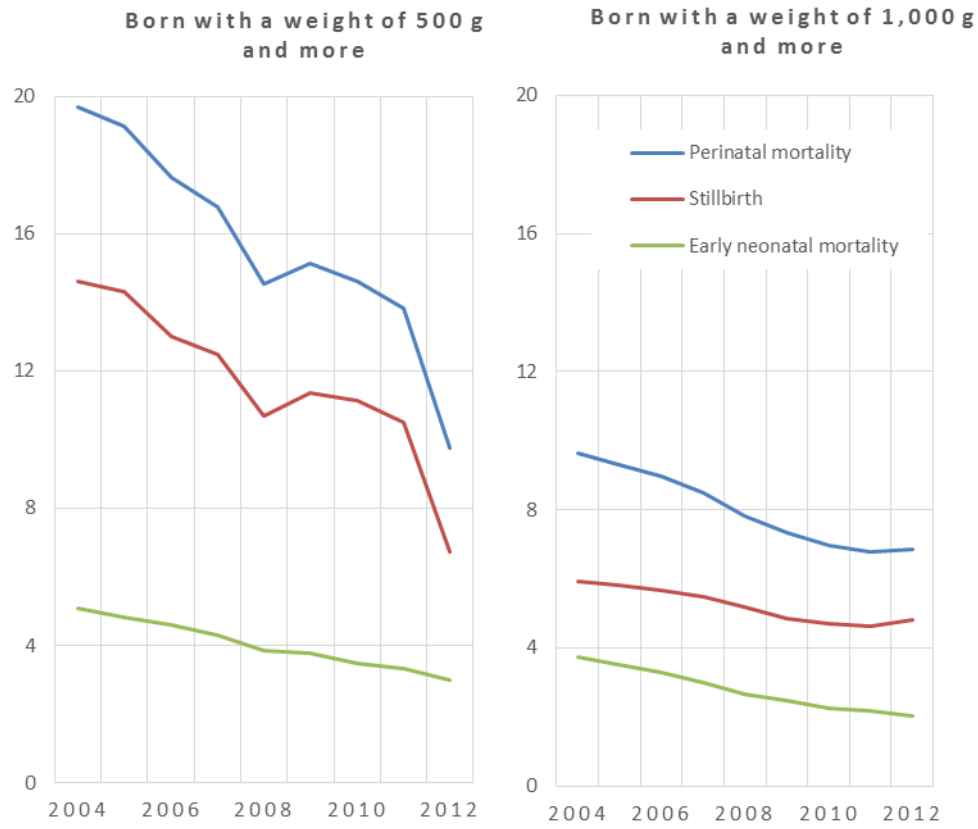

Figure 3. Perinatal mortality and its components in Russia, 2004-2012, per 1,000 live births and stillbirths (medical statistics)

Source: Based on the Federal observation Form 32 "Information on medical care for pregnant women, women in labor and puerperal women".

Let us consider the changes in infant deaths in the perinatal period, according to the medical statistics for 2011-2012.[5] To compare dynamics in live births and stillbirths, we used the Table "Distribution of live births and stillbirths by birth weight (2245) from the Federal observation Form 32 'Information on medical care for pregnant women, women in labor and puerperal women, Federal Statistical Observation[6] for 2011 and 2012'". According to this table, the total number of children born with extremely low birth weight (ELBW) of 500-999 g decreased by 36%from 2011 to 2012, while the number of live births increased by 25% during that time. Accordingly, the number of stillbirths decreased by 65%. In other words, the general decline was due to stillbirths. In the weight group of 500-749 g, the total number of births decreased by 46% and, in the weight

[5]Since 2011, the Federal State Statistics Service has collected data on live births and stillbirths not only by infant weight, but also by mother's age – Tables R247 and C06 in statistics. Unfortunately, in 2011, the tables were poorly filled in, and most children were put into the categories of "unknown weight" and "unknown age".
[6]Forms for these years are approved by Rosstat Order No. 154dated 29.07.2009 and Rosstat Order No. 520 dated 29.12.2011.

group 750-999 g, by 27% (Table 1). The number of live births increased by 66%in the first group and 11% in the second group, while stillbirths decreased by 67% and 63%, respectively. This reduction in the number of stillbirths of infants with a weight of up to 1,000 g at birth resulted in a decrease in the total number of stillbirths (32%). The number of infants in this weight group who died in the early neonatal period fell by 12%. This decrease was due to the 29% decline of deaths among infants weighing 750-999 g at birth, while mortality among infants in the lowest weight at birth (500-749 g) increased by 17%. In combination, from 2011 to 2012 these trends led to a slight decrease (4.2%) in the total number of deaths in the first 168 hours.

The group of infants with a very low birth weight (VLBW), i.e. with a weight of 1,000-1,499 g at birth, is characterized by a reverse dynamic: a growth in the total number of births by 21%, including a growth by 17% in live births and 49%in stillbirths. The number of babies who died in the first 168 hours of life, in contrast to the lower birth weight group, increased by 19%. In this case, the number of deaths in the early neonatal period for children born with a weight of 1,500-1,999 g also decreased by 19%. In other words, when comparing perinatal mortality and its components by weight in 2011-2012, we observe a considerable improvement in these indicators for children with ELBW and some improvements for children with VLBW.

All these changes led to a change in the coefficients of perinatal mortality and its components (Table 1). Perinatal mortality decreased by 210 points per thousand in children born with the lowest weight (500-749 g). The decrease was due to stillbirth (-327 points per thousand in 2011-2012). Early neonatal mortality increased by 117 ppm. The 750-999 g weight group was marked by a decrease in perinatal mortality (-260 points per thousand) again due to stillbirth (-256 points per thousand). Correspondingly, there was a slight decrease in early neonatal mortality (-4 points per thousand). Meanwhile, the weight group with VLBW (1,000-1,499 g) not affected by changes in the definition of live birth was characterized by a slight increase in perinatal mortality (+24 points per thousand). Again, these changes were due to stillbirths (+25 points per thousand).

All recorded changes in perinatal mortality cannot be explained only by the introduction of new criteria of live births and stillbirths. Logically, the change in live birth criteria should have resulted in increasing births and deaths due to children born with ELBW. But the medical statistical evidence indicates that this did not happen. As noted above, the number of children born alive who died in the early neonatal period increased in the 500-749 g weight group, while the number of stillbirths drastically decreased. In the 750-999 g weight group, the number of live births increased, while the number of stillbirths and deaths in the early neonatal period decreased. There was also an increase in the number of births, deaths in the early neonatal period and stillbirths among children born with VLBW. Did something happen that affected only children with this weight? It is unlikely, given that in recent years the number of births and deaths in this weight group, according to the same Table 2245/Form 32, have changed only slightly.

One more specific feature is the fact that, for the first time since 2004, the number of deaths in the first 7 days of life in children weighing 1,500-1,999 g was lower than that in children born with a weight of 1,000-1,499 g.

Table 1. Perinatal mortality by birth weight in Russia in 2011-2012

	Birth weight, g									Total
	500-749	750-999	1,000-1,499	1,500-1,999	2,000-2,499	2,500-2,999	3,000-3,499	3,500-3,999	4,000 and over	
2011										
Live births, pers.	1,239	3,867	10,167	23,032	66,410	273,424	675,331	539,262	174,870	1,767,602
Died in the first 168 hours, pers.	788	1,318	738	764	565	549	594	455	161	5,932
Stillbirths, pers.	6,482	4,104	1,180	1,469	1,522	1,486	1,411	764	349	18,767
Total births, pers.	7,721	7,971	11,347	24,501	67,932	274,910	676,742	540,026	175,219	1,786,369
Proportion of perinatal deaths with specified birth weight, %	29.4	22.0	7.8	9.0	8.4	8.2	8.1	4.9	2.1	100.0
Proportion of stillbirths with specified birth weight, %	34.5	21.9	6.3	7.8	8.1	7.9	7.5	4.1	1.9	100
Proportion of deaths in the first 168 hours with specified birth weight, %	13.3	22.2	12.4	12.9	9.5	9.3	10.0	7.7	2.7	100
Perinatal mortality rate, per thousand	941.6	680.2	169.0	91.1	30.7	7.4	3.0	2.3	2.9	13.8
Stillbirth rate, per thousand	839.5	514.9	104.0	60.0	22.4	5.4	2.1	1.4	2.0	10.5
Early neonatal mortality rate, per thousand	102.1	165.3	65.0	31.2	8.3	2.0	0.9	0.8	0.9	3.3
2012										
Live births, pers.	2,054	4,308	11,917	24,612	70,867	282,616	705,304	576,488	193,071	1,871,237
Died in the first 168 hours, pers.	923	937	878	620	579	540	603	428	172	5,680
Stillbirths, pers.	2,153	1,506	1,759	1,646	1,557	1,518	1,378	775	387	12,679
Total births, pers.	4,207	5,814	13,676	26,258	72,424	284,134	706,682	577,263	193,458	1,883,916
Proportion of perinatal deaths with specified birth weight, %	16.8	13.3	14.4	12.3	11.6	11.2	10.8	6.6	3.0	100.0
Proportion of stillbirths with specified birth weight, %	17.0	11.9	13.9	13.0	12.3	12.0	10.9	6.1	3.1	100.0
Proportion of deaths in the first 168 hours with specified birth weight, %	16.3	16.5	15.5	10.9	10.2	9.5	10.6	7.5	3.0	100.0
Perinatal mortality rate, per thousand	731.2	420.2	192.8	86.3	29.5	7.2	2.8	2.1	2.9	9.7
Stillbirth rate, per thousand	511.8	259.0	128.6	62.7	21.5	5.3	1.9	1.3	2.0	6.7
Early neonatal mortality, per thousand	219.4	161.2	64.2	23.6	8.0	1.9	0.9	0.7	0.9	3.0
Increase/decrease from 2011 to 2012										
in percent										
Live births, pers.	65.8	11.4	17.2	6.9	6.7	3.4	4.4	6.9	10.4	5.9
Dead in the first 168 hours, pers	17.1	-28.9	19.0	-18.8	2.5	-1.6	1.5	-5.9	6.8	-4.2
Stillbirths	-66.8	-63.3	49.1	12.0	2.3	2.2	-2.3	1.4	10.9	-32.4
Total births	-45.5	-27.1	20.5	7.2	6.6	3.4	4.4	6.9	10.4	5.5
in points per thousand										
Perinatal mortality rate	-210.4	-260.0	23.8	-4.8	-1.2	-0.2	-0.2	-0.2	0.0	-4.1
Stillbirth rate	-327.8	-255.8	24.6	2.7	-0.9	-0.1	-0.1	-0.1	0.0	-3.8
Early neonatal mortality rate	117.3	-4.2	-0.8	-7.6	-0.3	-0.1	0.0	-0.1	0.0	-0.3

Source: Based on Form 32 "Information on medical care for pregnant women, women in labor and puerperal women", Federal Statistical Observation.

In our view, these changes support the opinion of many experts that stillbirths and deaths of infants weighing slightly more than 1,000g in the early neonatal period were underreported by underestimating their weight and, accordingly, classifying the dead infant as a stillborn or even a product of a late miscarriage. With the change in live birth criteria with respect to infants with VLBW, this practice lost meaning (since it requires a significant misstatement of birth weight), and their proportion in perinatal deaths increased. Today, infants with VLBW are subject to a more complete recording, and infants whose birth weight is slightly over 1,000 g are registered with their actual birth weight. On the other hand, the drastic decrease in the number of stillbirths in the lowest weight category and the increase in the number of abortions within 21 weeks (20%) are

indicative of the fact that the practice of underreporting the body weight did not disappear and is applied to infants with ELBW. Underreporting and switching numbers of infants with ELBW between categories are indirectly confirmed by the fact that the number of stillbirths in Form 32 (12,679) is higher than that in official statistics (12,142) [Sukhanova 2013].[7]

A comparison of Figures 2 and 3 (right panel) presenting data on the same populations through 2011 makes apparent the differences in indicator values and their rates of change between the Ministry of Health and Rosstat. Rosstat data on perinatal mortality are based on medical certificates of stillbirth and perinatal death filled out in the same medical institution. Rosstat data also include births and deaths occurred outside the Ministry of Health medical institutions, but their number is not sufficiently large to explain the observed differences in indicator values. Hence, it is logical to conclude that some children included in the medical statistics are for some reason not included in the statistics agency's data or are included in different categories.

On the whole, and all else being equal, perinatal mortality and its structure are indicative of the quality of medical care rendered to pregnant women, puerperal women and newborns, as well as of the quality of medical records. Unfortunately, this criterion is not independent. Perinatal and especially early neonatal mortality are used in the evaluation of work of these medical institutions. The infant mortality rate in the region is also taken into account when assessing the work of the regional administration in general. Hence, deterioration in indicators does not benefit anyone, and the real picture of perinatal mortality and its components in the region may be distorted.

INFANT MORTALITY COMPONENTS

Changes in the definition of live births and stillbirths affect primarily the perinatal period of a child's life. But they also affect the mortality rate of children aged 7-28 days (late neonatal mortality), and infant mortality in general.

As was already mentioned, the infant mortality rate increased in Russia from 7.4 per thousand in 2011 to 8.6 per thousand in 2012. The main growth (78%) concerned the early neonatal component of infant mortality. But late neonatal mortality grew as well (23% of total growth). Meanwhile, post-neonatal mortality decreased, and its contribution to the change in infant mortality reached 1%. Late neonatal mortality started rising in 2011, and in 2012 the growth rate tripled (Figure 4). This growth can be related to two phenomena whose impacts run in opposite directions. Developed medicine fights for the life of newborns till the last breath; as a result, deaths which previously occurred in the first days and hours of life is now postponed [Andreev, Kingkade 2011]. Yet the growth can also be related to insufficient attention of the health system to saved children after signing out from an obstetric institution.

Figure 4 shows one more specific feature of the infant mortality rate structure in Russia, a rather slow reduction in recent years of post-neonatal mortality, which is still very high in Russia and remains an important reserve for the reduction of infant mortality. In the period 1991-2011,

[7]The same situation was noted for 2013 – the number of stillbirths in the medical statistics (12,300 persons) is higher than in Rosstat data (12,226 persons), which is indicative of the fact that the difference in 2012 was not accidental.

infant mortality decreased by 10.5 per 1,000 live births (excluding the impact of changes in the definition of live births) Early neonatal mortality accounts for 58% of this decline, post-neonatal mortality for 36%, and late neonatal mortality for only 6%. If we consider the period of 1991-2012, then the infant mortality rate decreased by 9.2 per 1,000 live births. Fifty-five percent of this decline was due to early neonatal mortality, 42% due to post-neonatal mortality, and less than 3%due to the late neonatal component of infant mortality.

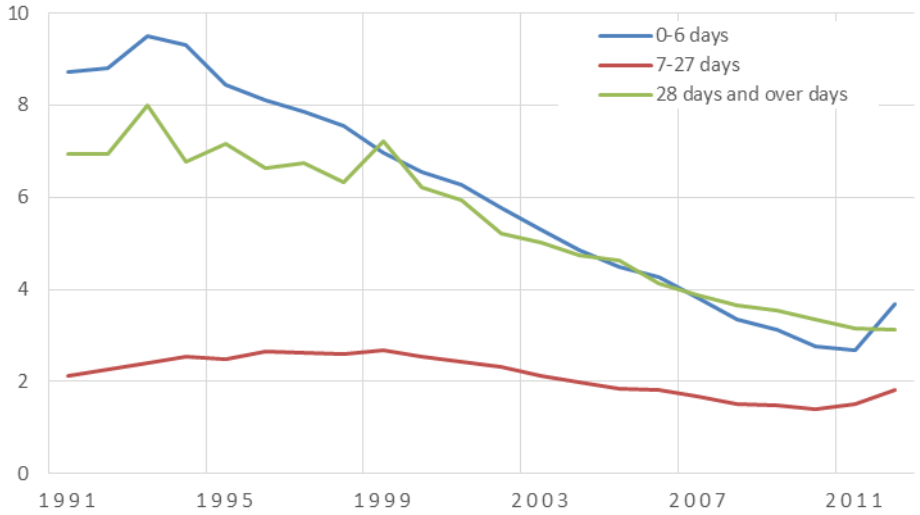

Figure 4. Components of infant mortality in Russia, 1991-2012, per 1,000 live births

Source: Authors' computations based on national statistics.

As post-neonatal mortality decreases, the attention of many international organizations is increasingly focused not on the infant mortality rate, but on stillbirth, neonatal mortality and its components, as well as on the mortality of children under 5 years of age. The European Perinatal Health Report for 2010 provides data on early and late neonatal mortality and post-neonatal mortality in the countries of the European Union and Norway [Euro-Peristat 2013]. We are interested in the report due to the fact that it contains data on the gestational age of 22 weeks and over that can be compared to Russian data.

Figure 5 (left panel) shows the data on neonatal mortality in some European countries in 2010 and in Russia in 2010 and 2012 (i.e. before and after the changes in the definition of live birth) and on the proportion of early neonatal mortality in neonatal mortality in these countries (right panel). By neonatal mortality in 2012, Russia ranked at the bottom of the distribution of countries covered by the report, and in 2010 it was better only than Romania. Hence, the situation with infant mortality in Russia is not encouraging; this is confirmed by the aforementioned increase in post-neonatal mortality.

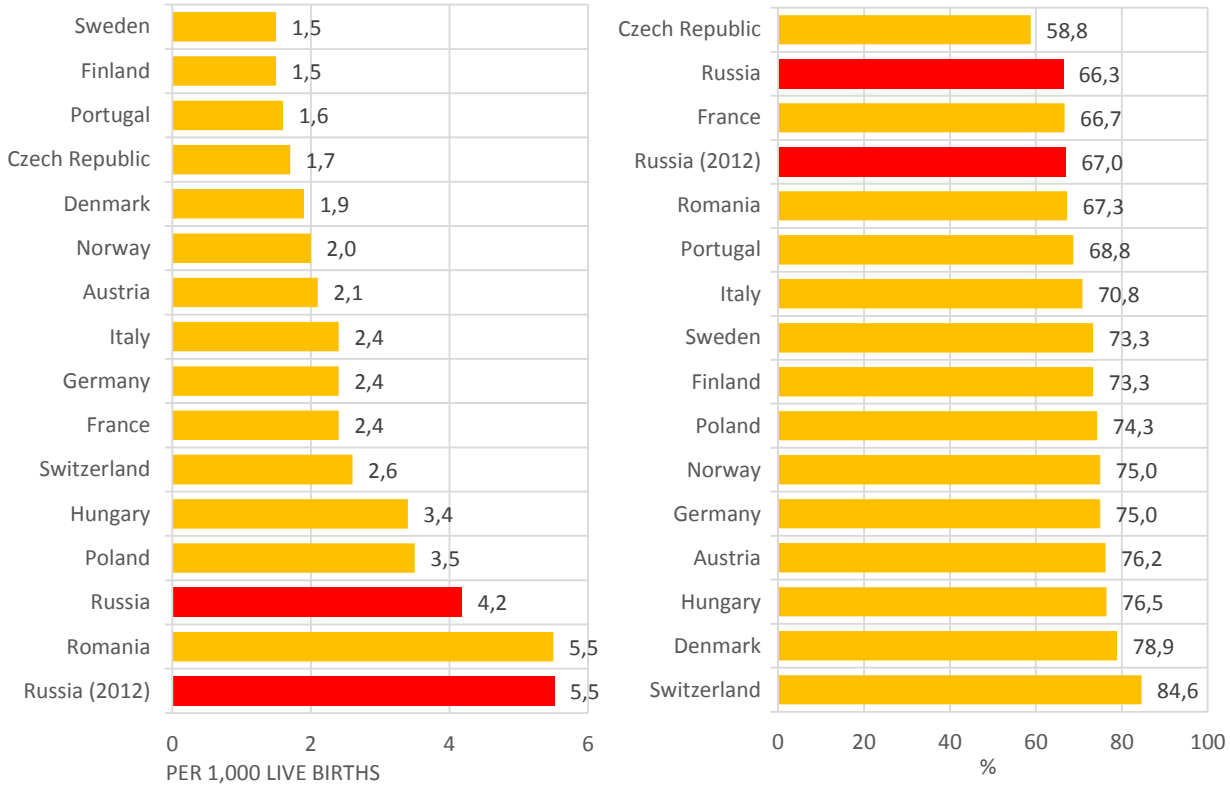

Figure 5. Neonatal mortality and the proportion of early neonatal component in it in Russia (2010 and 2012) and in several European countries in 2010.

Source: [Euro-Peristat 2013; Rosstat 2013].

THE REGIONAL ASPECT OF CHANGES IN INFANT MORTALITY IN 2011-2012

Russian infant and perinatal mortality rates, as well as their components, include and balance changes in the administrative regions of the country. As noted above, Russia has long been characterized by a steady downward trend in infant mortality. Yet the speed of decline in these rates has varied by regions. The transition to a new definition of live birth in 2012 affected the recorded levels of infant mortality in the regions differently. The new definitions and criteria of live birth were published in the official daily Rossijskaya Gazeta on April 3, 2012 and became effective on the same day. But an increase in infant mortality was observed in some regions from the very start of the year and proceeded at different rates throughout the year [Andreev, Kvasha 2013]. As a result, the infant mortality rate decreased rather than increased in nine regions by the end of the year (Figure 6). The greatest decrease was noted in the Ivanovo Region, over 25%.

In 13 regions, infant mortality increased by no more than 10%, but in 29 regions the rise was over 30%.

As before, in 2012 the regions with minimum infant mortality were the Tambov Region and the City of St. Petersburg (4.1 and 4.5 per thousand, respectively), and the regions with maximum infant mortality were the Chechen Republic and the Chukotka Autonomous District

(21.9 and 21.2 per thousand respectively). Interregional variation in infant mortality increased from 14.2% to 17.8‰ over the year.

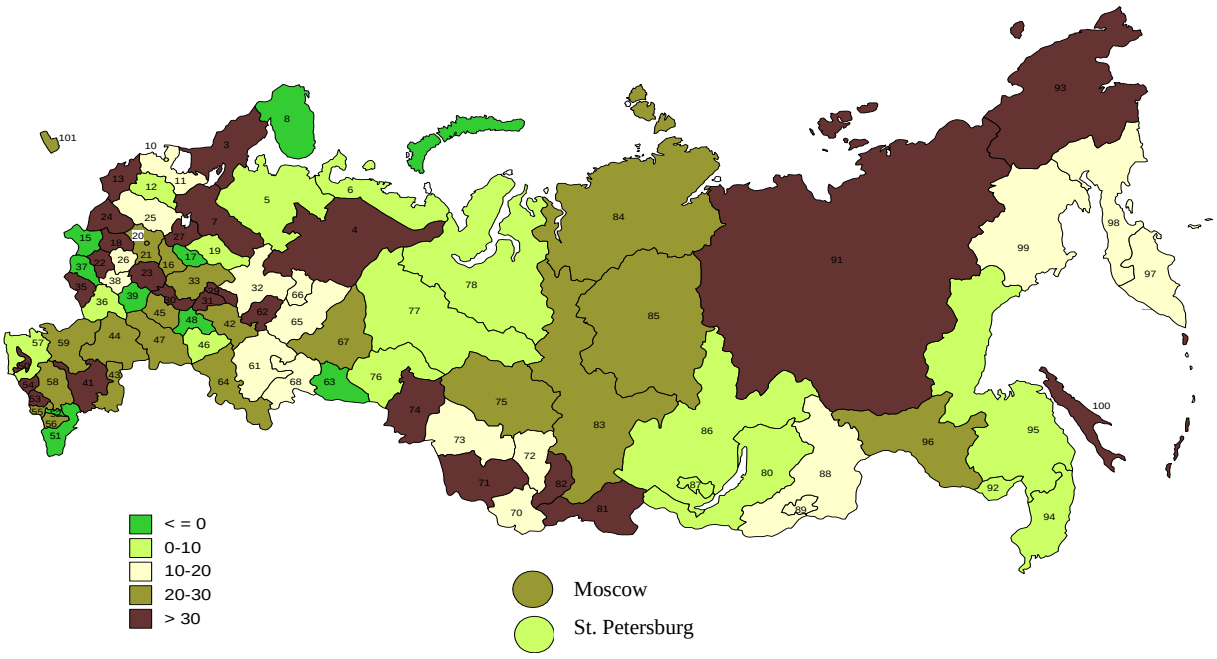

Figure 6. Change in infant mortality in Russia from 2011 to 2012, %

Source: [Rosstat 2013].

Previously articulated doubts with respect to how correctly the birth weight was reflected in some medical documents were based on unexpected changes in the distribution of births and infant death by birth weight. This approach is not applicable in most regions, because the numbers of all deaths, stillbirths and births of children with ELBW and VLBW are very low. Such doubts can be refuted or confirmed only by checking the primary medical documents in the regions.

In recent years, 22 perinatal centers have been put into operation in accordance with Order No. 1734-p of the Government of the Russian Federation dated 04.12.07. Order No. 2302-p of the Government of the Russian Federation dated 09.12.13 approved the construction of another 32 perinatal centers in 30 federal entities. Tens of billions of rubles have been allocated for this purpose. The perinatal centers were constructed taking into account the transition, starting in 2011, to a three-level system of medical care for pregnant women and newborns. These measures, along with others, aimed at decreasing infant mortality in the country as a whole, though more specifically in regions with new perinatal centers.

Most perinatal centers became operational in the period of late 2010 to late 2012, so it is now possible to make only preliminary conclusions on the relation between the enlargement of their network and changes in stillbirths, early neonatal mortality and infant mortality. The data show that the commissioning of most perinatal centers has led to a reduction in perinatal mortality, but in three regions (Tver, Kemerovo and Volgograd) perinatal mortality increased in the year following the commissioning. In some regions with new centers, infant mortality also rose in the year following the commissioning. Meanwhile, in some regions where new centers were not established, both perinatal and infant mortality decreased. In 2012, most regions with perinatal

centers were characterized by increasing perinatal mortality rates (in our opinion, this reflects the responsible work of both medical personnel and medical statisticians in these centers).

According to the Appendix to Form 32 of 2012, 77% of live births (51% of newborns with ELBW and 55% with VLBW) and 70% of stillbirths (60% with ELBW and 68% with VLBW) were delivered in low-level and middle-level medical institutions. Apparently, in spite of the effectiveness of perinatal centers, in our country – with its vast territory and underdeveloped transportation networks – they are not able to reduce infant mortality significantly, and it is essential to develop a low-level health care system throughout the country.

RUSSIA GETTING CLOSER TO THE DEVELOPED COUNTRIES BY STRUCTURE OF INFANT MORTALITY BY CAUSES OF DEATH

Initially, the decline in infant mortality in Russia, as well as throughout the world, was mainly due to exogenous causes such as infectious and parasitic diseases, respiratory diseases, and diseases of the digestive system. Endogenous causes (e.g. congenital anomalies and some conditions originating in the perinatal period) started contributing to the reduction in infant mortality only in the last quarter of the twentieth century (previously, increases of infant mortality from these causes had been observed), but now they increasingly predetermine the decrease or increase in mortality of children under age 1 (Table 2).

In general, in 2012, as in previous years, the leading cause of infant mortality in Russia was certain conditions originating in the perinatal period (which, in our opinion, is occasionally related to poor work in the obstetric care system); the second most important cause is congenital anomalies; and the third one, since 2009, is external causes, which have overtaken respiratory diseases, which occupied this place earlier (Table 2). In the class of external causes, accidental inhalation and injury with an undetermined intention are major contributors to infant mortality.

Until 2009, in Russia infant mortality increased due to diseases of the circulatory system. These include pulmonary heart disease, intracerebral and other intracranial hemorrhages and, above all, the aggregate cause "other heart diseases" that can contain any disease of the circulatory system. It is interesting that many infant deaths due to diseases of the circulatory system happen in the post-neonatal period of life. Although the contribution of this group of causes of death to overall mortality is low, it should be taken into account. Also worrying is the still high mortality due to infectious and parasitic diseases, especially relative to developed countries (Table 3). As for changes in the period of 2011-2012, there was a marked increase in mortality due to certain conditions originating in the perinatal period (the proportion of these causes exceeded 50%) and congenital anomalies. This was predictable. But 2012, like the previous three years, was also characterized by continued growth in mortality from infectious and parasitic diseases. This is a wake-up call, because mortality due to these causes is indicative of the conditions in medical facilities and the quality of health care for women and children.

In all developed countries, the structure of causes of infant mortality in the early twenty-first century is dominated by selected conditions originating in the perinatal period and congenital anomalies, i.e. by causes mainly endogenous in nature (Table 3). In Russia, especially after the

transition to a new definition of live birth, this proportion has become almost the same as in many developed countries.

Table 2. Infant mortality by causes of death and contribution of death causes to mortality of children under one year of age in Russia, 1993-2012

Causes	1993	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012
Infant mortality rates, per10,000 live births											
Certain infectious and parasitic diseases	14.2	12.7	9.2	5.0	4.1	3.8	3.0	2.8	3.0	2.7	3.1
Diseases of the circulatory system	1.3	1.3	1.2	1.1	1.1	1.3	1.0	1.6	1.3	0.9	0.6
Diseases of the respiratory system	30.9	24.2	16.5	8.3	7.8	6.9	6.1	5.4	4.6	4.5	4.1
Diseases of the digestive system	1.5	1.1	0.9	0.7	0.7	0.6	0.4	0.5	0.5	0.5	0.5
Congenital anomalies	40.7	41.8	35.5	26.9	24.5	22.7	20.6	20.3	18.2	18.0	18.5
Certain conditions originating in the perinatal period	88.0	78.5	67.7	49.1	47.3	42.9	39.3	36.7	34.5	34.9	48.1
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	5.7	5.6	7.3	7.0	5.7	5.2	5.5	4.7	4.4	4.3	4.1
Other diseases	6.7	5.9	5.3	4.0	4.3	3.7	3.5	3.6	3.9	3.1	3.1
External causes	9.8	10.1	9.7	7.6	6.7	6.4	5.9	5.7	4.7	4.6	4.3
Total	198.8	181.2	153.3	109.7	102.2	93.6	85.2	81.4	75.1	73.5	86.4
Contribution of causes of death to infant mortality, % of the total											
Certain infectious and parasitic diseases	7.1	7.0	6.0	4.5	4.1	4.0	3.5	3.5	4.1	3.7	3.6
Diseases of the circulatory system	0.7	0.7	0.8	1.0	1.1	1.4	1.1	1.9	1.8	1.2	0.7
Diseases of the respiratory system	15.5	13.4	10.7	7.5	7.6	7.4	7.1	6.6	6.2	6.1	4.7
Diseases of the digestive system	0.8	0.6	0.6	0.6	0.7	0.7	0.5	0.6	0.6	0.7	0.6
Congenital anomalies	20.5	23.1	23.1	24.6	24.0	24.3	24.1	25.0	24.2	24.5	21.4
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	44.3	43.3	44.2	44.8	46.3	45.8	46.1	45.2	45.9	47.5	55.7
Certain conditions originating in the perinatal period	2.8	3.1	4.8	6.4	5.5	5.6	6.5	5.8	5.8	5.8	4.7
Other diseases	3.4	3.3	3.5	3.7	4.2	3.9	4.1	4.4	5.2	4.2	3.5
External causes	4.9	5.6	6.3	6.9	6.6	6.8	6.9	7.1	6.3	6.3	5.0
Total	100	100	100	100	100	100	100	100	100	100	100

Source: Author's calculations based on state statistical data.

Nevertheless, differences remain. The proportion of external causes of death is still quite high in Russia, as well as in some other former communist countries and Japan; most deaths (45% in Japan and 54% in Russia) of children under one year of age are due to accidental inhalation. The countries of the former Soviet Union and Japan are also characterized by a greater proportion of deaths due to infectious and parasitic diseases.

Table 3. Contribution of various causes of death to infant mortality in selected countries, % of the total

Country, year	Infectious diseases	Neoplasms	Diseases of the circulatory system	Diseases of the respiratory system	Diseases of the digestive system	Congenital anomalies	Certain conditions originating in the perinatal period	Symptoms, signs and abnormal clinical conditions	External causes of death	Other causes	Infant mortality rate (per1,000 live births)
Belarus, 2009	5.3	1.2	1.4	2.7	0.8	41.1	26.8	6.8	6.5	7.4	4.7
Bulgaria, 2012	4.1	0.6	6.2	14.2	0.9	17.9	44.2	5.2	3.0	3.7	7.8
United Kingdom, 2010	1.9	0.7	1.4	1.6	0.6	24.7	53.5	8.4	1.7	5.5	4.3
Hungary, 2012	0.7	1.6	0.5	0.5	0.0	24.9	62.1	3.9	2.7	3.2	4.9
Germany, 2012	1.1	1.4	1.3	0.9	0.6	27.0	51.2	9.4	2.4	4.7	3.3
Italy, 2010	1.9	1.0	2.8	1.5	1.9	23.5	58.3	3.5	1.1	4.3	3.3
Kazakhstan, 2010	3.2	0.4	1.0	9.0	0.6	59.7	17.5	1.9	4.0	2.8	16.5
Kyrgyzstan, 2012	4.7	0.0	0.0	13.7	0.4	13.6	63.4	0.5	2.5	1.2	20.0
Moldavia, 2012	2.3	1.6	0.0	9.6	1.0	36.4	38.0	2.6	7.2	1.3	9.8
The Netherlands, 2011	1.4	0.8	0.9	0.6	0.8	30.3	53.1	3.8	2.4	6.0	3.6
Poland, 2011	2.0	1.1	0.6	2.6	0.1	34.4	51.8	4.2	1.9	1.2	4.7
Russia, 2012	3.6	0.6	0.7	4.7	0.6	21.4	55.7	5.0	4.7	2.9	8.6
Romania, 2011	2.7	0.6	0.6	27.8	1.9	23.6	35.5	1.0	3.6	2.6	9.4
United States, 2010	2.8	0.4	2.1	2.3	0.8	20.8	48.8	12.4	6.3	3.2	6.2
Ukraine, 2012	2.7	1.0	1.7	3.0	0.3	52.9	24.2	3.6	5.5	5.1	8.4
Czech Republic, 2012	2.8	0.0	1.8	1.8	1.4	22.8	53.0	5.6	4.6	6.3	2.6
Japan, 2011	3.8	1.3	2.8	5.3	2.3	35.0	25.2	12.1	9.0	3.3	2.3

Source: [WHO 2014b; Nacional'nyj statisticheskij… 2013].

Countries are ranked in Russian alphabetical order.

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MORTALITY FROM EXTERNAL CAUSES IN RUSSIA OVER HALF A CENTURY *

EKATERINA KVASHA, TATYANA KHARKOVA, VALERIY YUMAGUZIN

The article discusses long-term mortality trends (since 1956) from external causes of death in Russia. Russia has long lagged behind developed countries in this domain. The level of mortality from external causes of death remains high and its structure is still archaic with large contribution of homicides, alcohol poisoning and injuries of undetermined intent.

Excess number of deaths from life tables of Russia and Western European countries is compared. It is shown that in Russia the greatest excess losses are associated with mortality from poisonings among both sexes, suicide among men and homicide among women.

Mortality from external causes, along with mortality from diseases of the circulatory system, has had a significant impact on life expectancy. In general, over the period 1956-2012 the increase in mortality from external causes in the 15-64 age group reduced life expectancy by 2.6 years for males and 0.7 years for females.

The decline, starting in 2003, of mortality from external causes of death has slightly reduced the gap between Russia and developed countries, bringing the current Russian level closer to those levels reached in Russia in the mid-1960s and 1980s. However, given the fluctuations of mortality from external causes, it is premature to say whether the current decline in mortality is robust.

Key words: *mortality in Russia, external causes of death, excess mortality, life expectancy.*

MORTALITY FROM EXTERNAL CAUSES AGAINST THE BACKGROUND OF OVERALL MORTALITY

Regular statistics of mortality from external causes in Russia have been kept since 1956 [Bogoyavlensky 2001]. They became available to researchers in the early 1990s, but then their use was hampered by the violation of the comparability of continuous time series when changing from one revision of the International Classification of Causes of Death to another. For years, a group of French and Russian demographers worked painstakingly on the reclassification of data from one nomenclature of causes of death to the other, in order to ensure the comparability of the continuous series of data.

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The first results of this work on Russia were published in 1996 and relate to the period 1965-1994 [Meslé et al. 1996]. The time series includes 175 comparable causes of death as coded in the Soviet nomenclature in use since 1988. A few years later, the same group of authors, joined by E.M. Andreev, continued the work [Meslé et al. 2003], and constructed a continuous series of data beginning in 1959 [RosBRiS 2014]. As a complement to official Rosstat data for the years 1956-1958 and from the late 1990s, these data provide a reliable basis for the analysis of mortality from external causes for a period of more than half a century. The following analysis is largely based on these data.

Using previously unpublished or archived data on the pre-revolutionary period, D.D. Bogoyavlensky reconstructed a continuous time series of indicators of deaths from violence in 1870-1914 for 50 provinces of European Russia. Combining these data with those for all of Russia since 1956 shows, notwithstanding incomplete geographical overlap, the dynamics of mortality from external causes in Russia for nearly half a century (Figure 1).

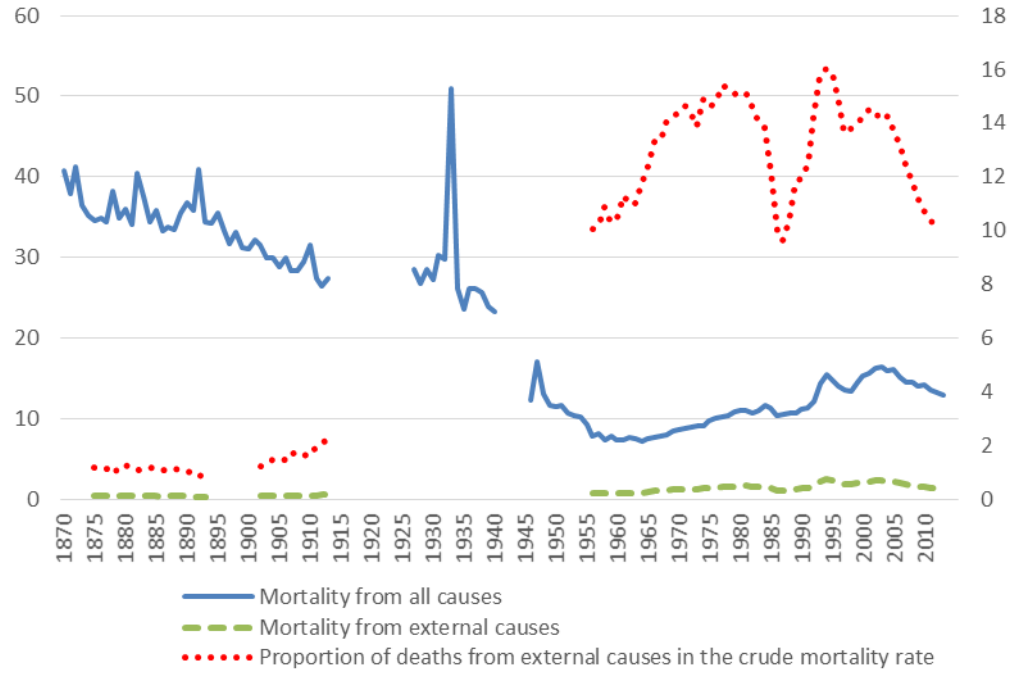

Figure 1. Crude death rate from all causes of death and from external causes (deaths per 1000) and the proportion of deaths from external causes in the crude mortality rate (right scale, percent), 50 European provinces of the Russian Empire and the Russian Federation, 1870-2012

Source: Calculated from [Bogoyavlensky 2001; Rosstat 2013].

Commenting on his graph, D.D. Bogoyavlensky draws attention to the constantly growing role of mortality from external causes. "While the crude mortality rate in Russia declined gradually and intermittently over a hundred years, the mortality rate from external causes grew continuously, and this growth continued when the crude mortality rate began to rise. Moreover, it is precisely the growth of violent deaths which made a very large contribution to the overall increase in mortality in Russia in the last third of the twentieth century" [Bogoyavlensky 2001].

Over the entire period from 1956 to 2013, for which there are continuous data, 12.1 million people died from this class of causes in Russia (or more than 13% of all deaths). From 1956 to the mid-1980s the number of deaths from external causes grew steadily, then went down for a short time during Perestroika (i.e. the anti-alcohol campaign) and then again resumed growth, reaching a historic high in 1994 (Figure 2).

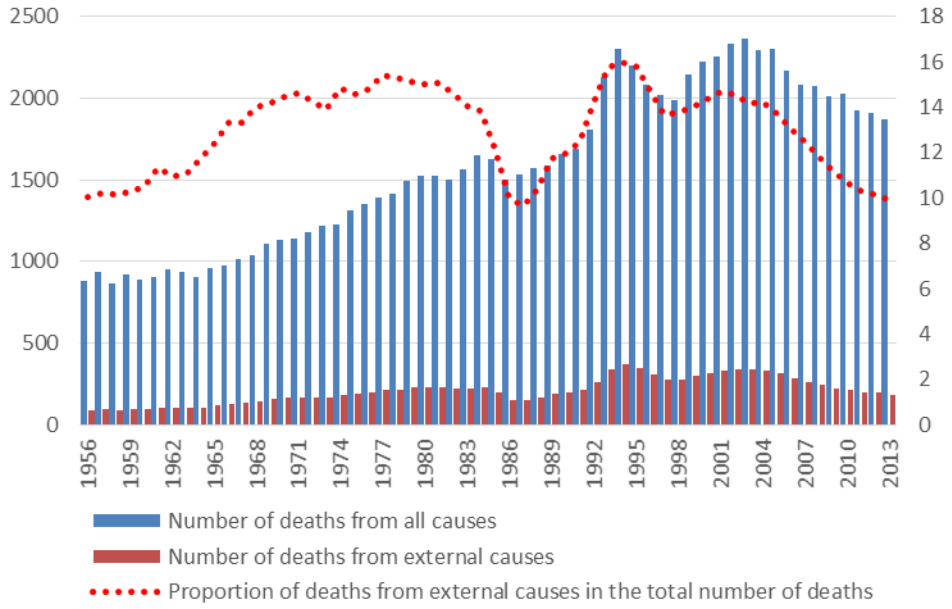

Figure 2: Number of deaths from all causes and from external causes (bars, left scale, thousands) and the proportion of deaths from external causes in the total number of deaths (line, right scale, percent), Russia, 1956-2013

Source: Calculated from [RosBRiS 2014].

This hike was followed by a short-lived decrease and after 1998, a new rise which peaked in 2003. Since then, the decline has continued with small fluctuations until now. In 2011, the number of deaths from external causes fell below 200,000 for the first time since 1990, and in 2012 – below the level of 1998.

As shown on Figure 2, the reduction in the number of deaths from external causes is accompanied by the decrease of their share in the total number of deaths. Yet it remains very high. In a country where the contribution of external factors to the overall mortality was once 1-2%, after 1956 it fell several times, declining close to 10% in the best of years, but often jumping upwards of 15%. After peaking in 1994, when the proportion of deaths from external causes reached a maximum (16%), it fell to 10.2% in 2012 and to 9.9% in 2013. However, in most European countries this share is much lower (Figure 3). In the United States, a country with a population 2.2 times larger than in Russia, in 2012 external causes claimed 190 thousand lives [NCHS 2014] versus 194 thousand in Russia.

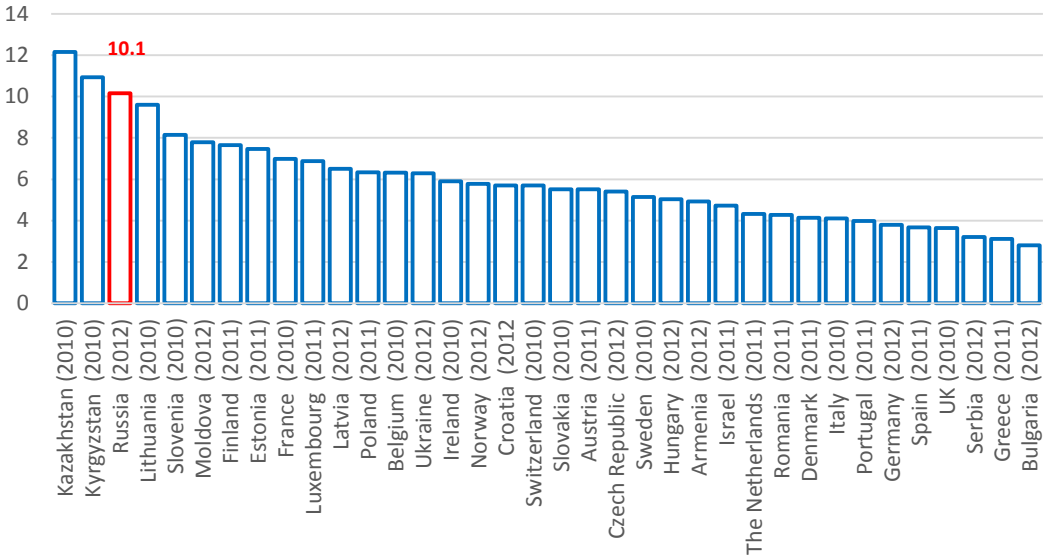

Figure 3. Proportion of deaths from external causes in the total number of deaths in Russia and some countries of the world, 2010-2012, %

Source: Calculated from [Rosstat 2013; WHO DMDB 2014].

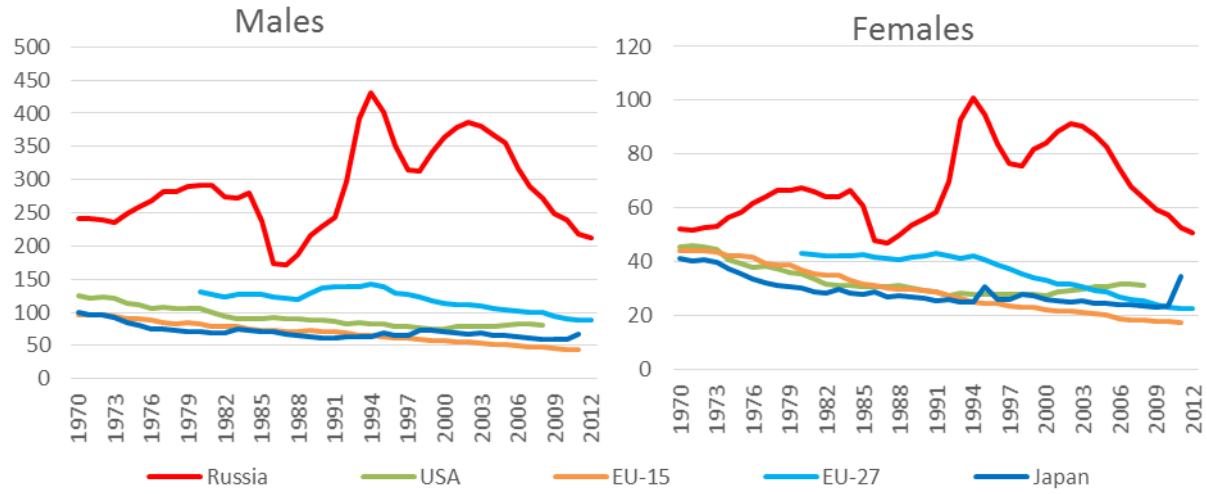

Figure 4. Standardized mortality rate from external causes in Russia, the average for the European Union (EU-15[1] and EU-27[2]), the United States and Japan, by sex, 1970-2012, per 100 thousand persons

Note: WHO European standard is used for computations.

Source: Calculated from [Rosstat 2013, WHO MDB 2014; WHO HFA 2014].

Russia's huge gap with other developed countries is also seen in the standardized rate of mortality from external causes. Even in the early 1970s, when the gap was narrower than it is now, this coefficient for men in Russia was two to three times higher than in the West, with a somewhat

[1] Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.
[2] Countries listed in footnote 1 plus Bulgaria, Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia.

smaller, but significant, excess for women. Further reduction of mortality from external causes in Western countries and its concurrent growth in Russia sharply increased the gap: in some years, this coefficient surpassed the typical Western levels for men by the factor of 7 or even 8, and for women by the factors of 4 or 5. In recent years, there has been some convergence, but very large differences persist (Figure 4).

Similarly to the absolute number of deaths, the standardized rate of mortality from external causes has been declining recently, but up to now it only restored the level of the early 1990s, which also was very high. Moreover, the gap between Russia and some other developed countries is even increasing. The contribution of deaths from external causes to the standardized mortality rate is very large. Although in some European countries with overall mortality below Russia's level the contribution of external causes of death is similar to Russia's, these countries are few. On average, this contribution is twice as high in Russia as in the European Union (either EU-15 or EU-25) (Figure 5).

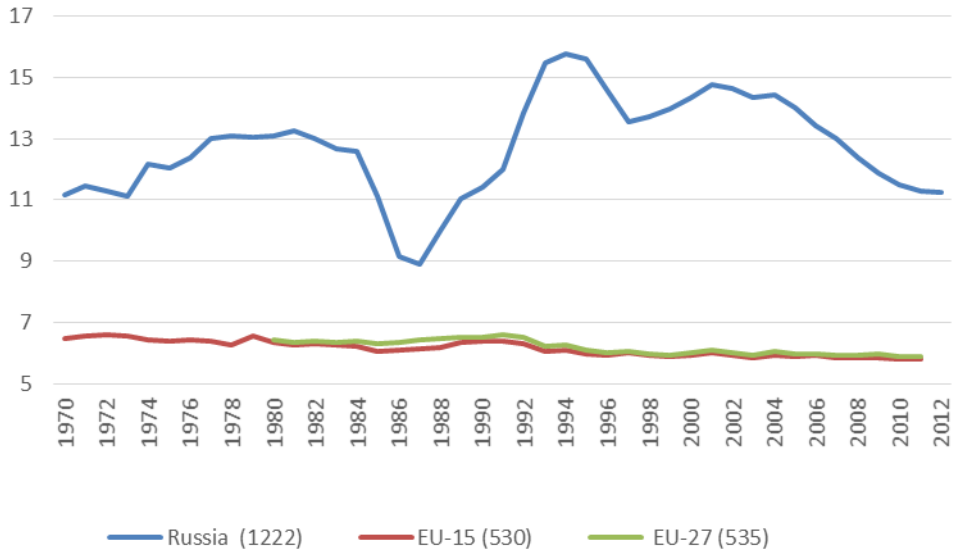

Figure 5. The share of external causes in the standardized mortality rate from all causes in Russia and EU countries, both sexes combined, 1970-2012, %

Note: In parentheses - standardized death rate from all causes in 2010, per 100 thousand persons.

Source: Calculated from [WHO HFA 2014; RosBRiS 2014].

In countries with low mortality, external causes are usually ranked fourth among all causes of death – after cardiovascular diseases, neoplasms and respiratory diseases. In Russia, where the first epidemiologic revolution has not yet been completed, these four classes of causes of death are joined by digestive diseases, which sometimes even compete with respiratory diseases. But in Russia there is no competition between respiratory diseases and external causes of death; external causes are firmly in third place, and sometimes in second (Figure 6). Their contribution to the total number of deaths is comparable with the contribution of neoplasms and even sometimes surpassing it, which is not at all proper to countries with high life expectancy (Figure 7).

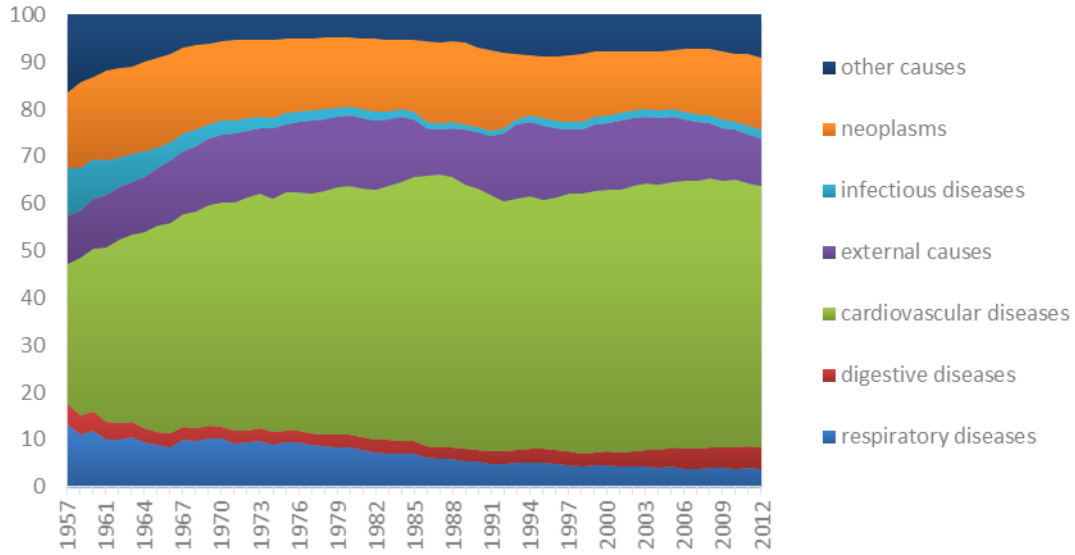

Figure 6. Distribution of the absolute numbers of deaths by major causes of death in Russia, 1956-2012, percent

Source: Calculated from [RosBRiS 2014].

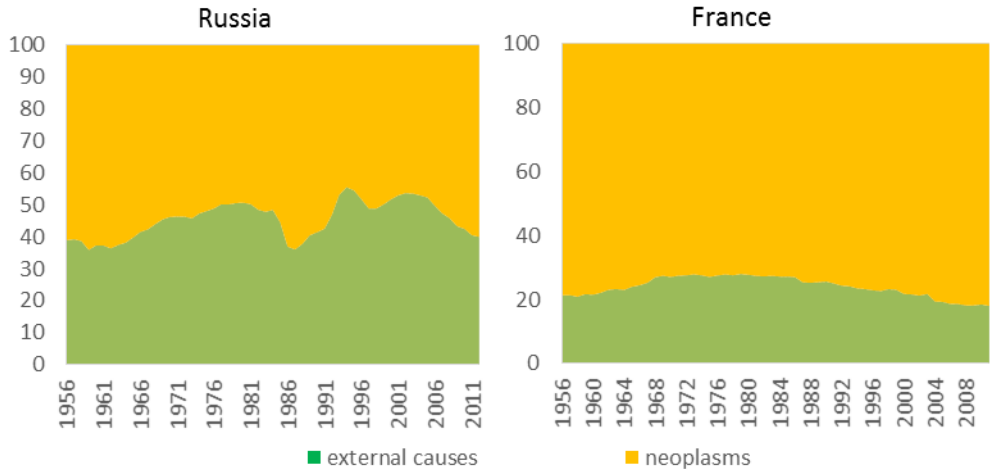

Figure 7. Ratio of the absolute number of deaths from external causes and neoplasms in Russia and France, 1956-2012, percent

Source: Calculated from [RosBRiS 2014; WHO MDB 2014].

In addition, external causes lead to increasing number of persons who have been injured and lost the ability to work, a number which is far greater than the number of deaths. This is evidenced by international experience. The 2006 Report on the WHO European region indicates that nearly 2,000 people are killed every day as a result of external causes, 60 thousand are taken to the hospital and 600 thousand are forced to seek emergency outpatient care [WHO 2006].

MORTALITY FROM EXTERNAL CAUSES BY AGE AND SEX

Despite the usual third or fourth places in the overall ranking of causes of deaths, mortality from external causes always ranks first among the causes of *premature* death because "children, youth and adults under the age of 45 are far more likely to die from injury than from illness" [Demograficheskaja modernizacija… 2006: 338]. Mortality from external causes in Russia demonstrates both differences by sex and age common to all countries, as well as particular country-specific features.

Although deaths from external causes everywhere hit males disproportionately, in Russia the gender gap is particularly large. The standardized female mortality rate from external causes in Russia is comparable to the male rate in Western Europe, while Russian male rate in Russia is 4-4.5 times higher than the female rate, as compared with 2.5 times in EU-15 (Figure 8).

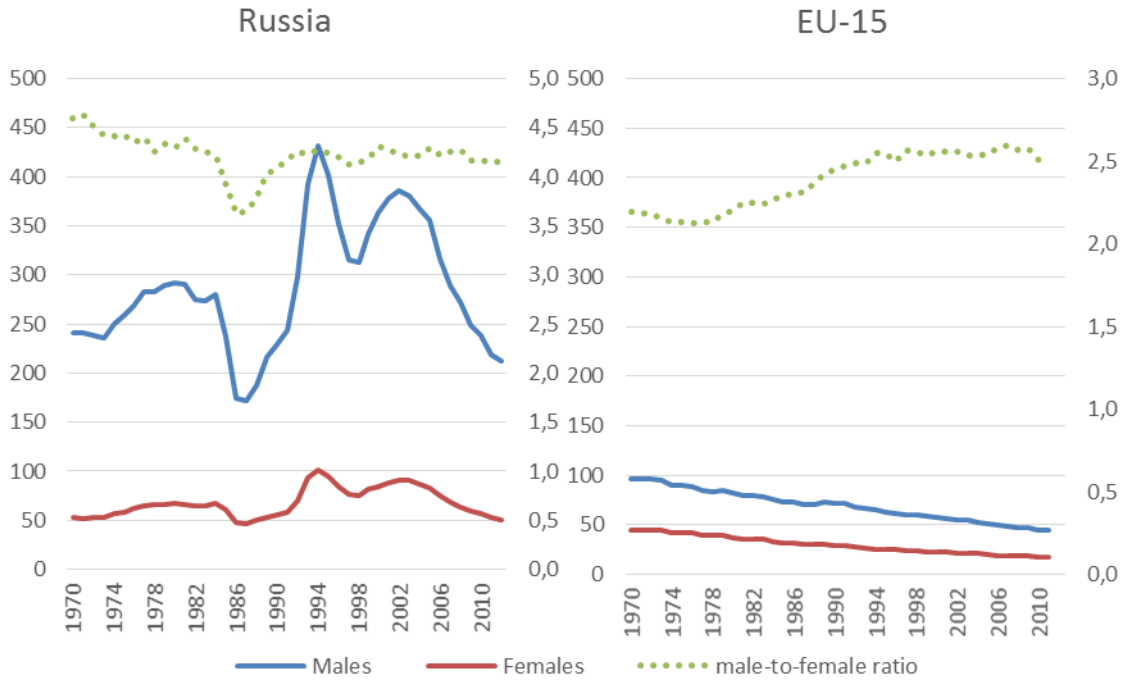

Figure 8. Standardized mortality rate from external causes by sex (left scale, per 100 thousand persons) and male-to-female ratio of rates (right scale, times-fold) in Russia and the EU-15, 1970-2012

Source: Calculated from [RosBRiS 2014; WHO HFA 2014].

Mortality from external causes is particularly noticeable in youth, when other causes of death are still weak. In 2012, the proportion of deaths due to external causes in all deaths among men and women is highest in age group 15-19 (Figure 9).

Although the contribution of external causes to overall mortality at different ages varies from year to year, the fluctuations are not very significant. For a long time, the largest contribution of external causes to overall male mortality was in age group 20-24. By this measure, age group 15-19 became the most affected since 1999. Among women the maximum contribution remains steadily in the 15-19 age group (Figure 10).

The reduction of the proportion of deaths from external causes, after reaching its maximum rates among those aged 15-25, results from mortality from other causes, increasing with age rather than by age-related decreases in mortality from external causes. Concurrently, the level of mortality due to external causes in an age group may increase. This is precisely what is happening in Russia: age-specific death rates from external causes reach their highest values among men and women of working age (20 to 60), then fall and resume growing in older age (70 and older). This age pattern looks like an "injury mortality hump" on Figure 11. This hump was especially pronounced in 1993-1995 when indicators of mortality from external causes among middle-aged men were higher than, and among women were similar to mortality in the oldest age groups. The hump is characteristic not only of the whole category of external causes of death, but also of the most specific causes. It is particularly pronounced for traffic accidents, suicides, assaults and injuries with uncertain intentions, and is much more prominent among men.

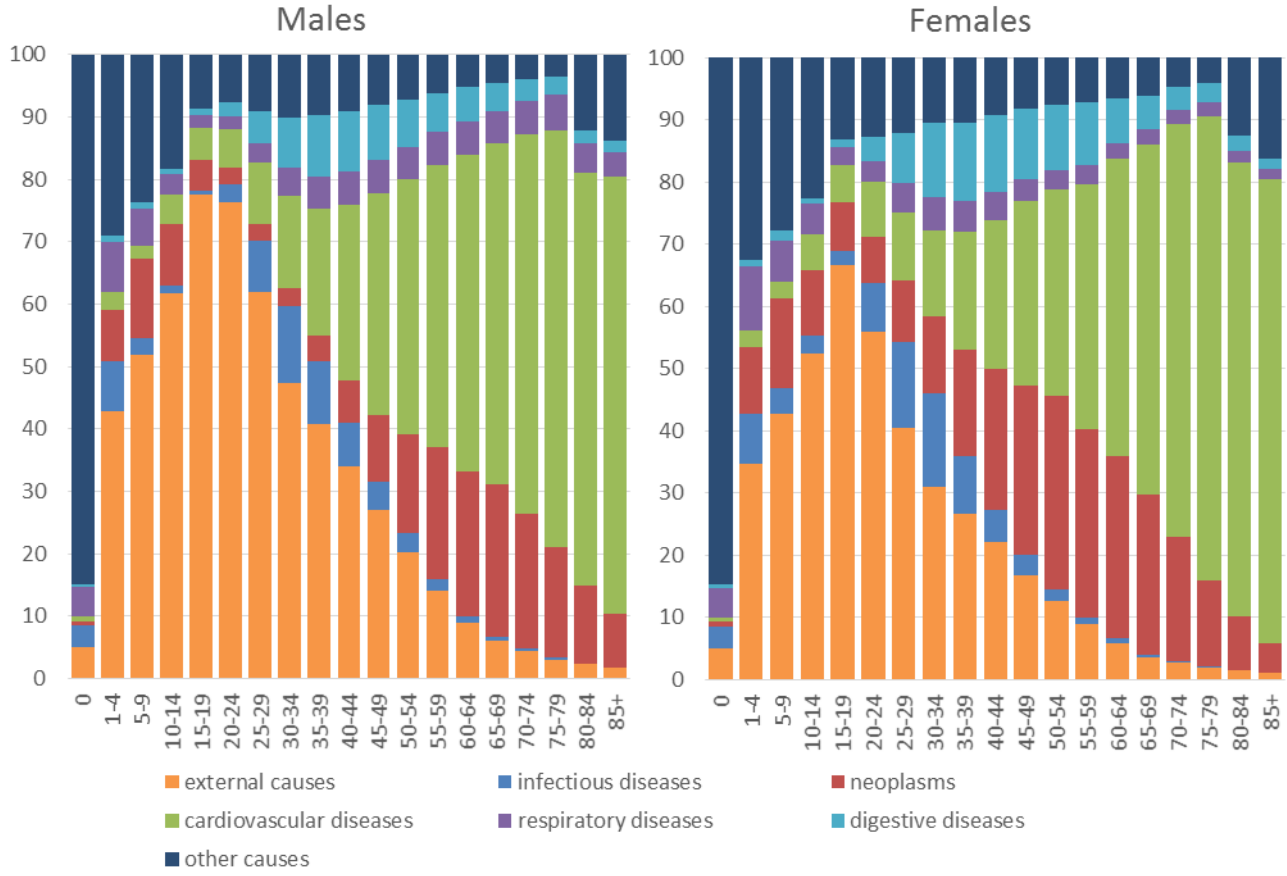

Figure 9. Distribution of deaths by main causes of death at different ages in Russia, 2012, men and women, percent

Source: Calculated from [RosBRiS 2014].

This age-related "injury mortality hump", observed in main working ages, in Russia leads to huge losses of life. In Western countries, mortality from external causes increases smoothly with age, particularly in countries with lower mortality (Figure 12).

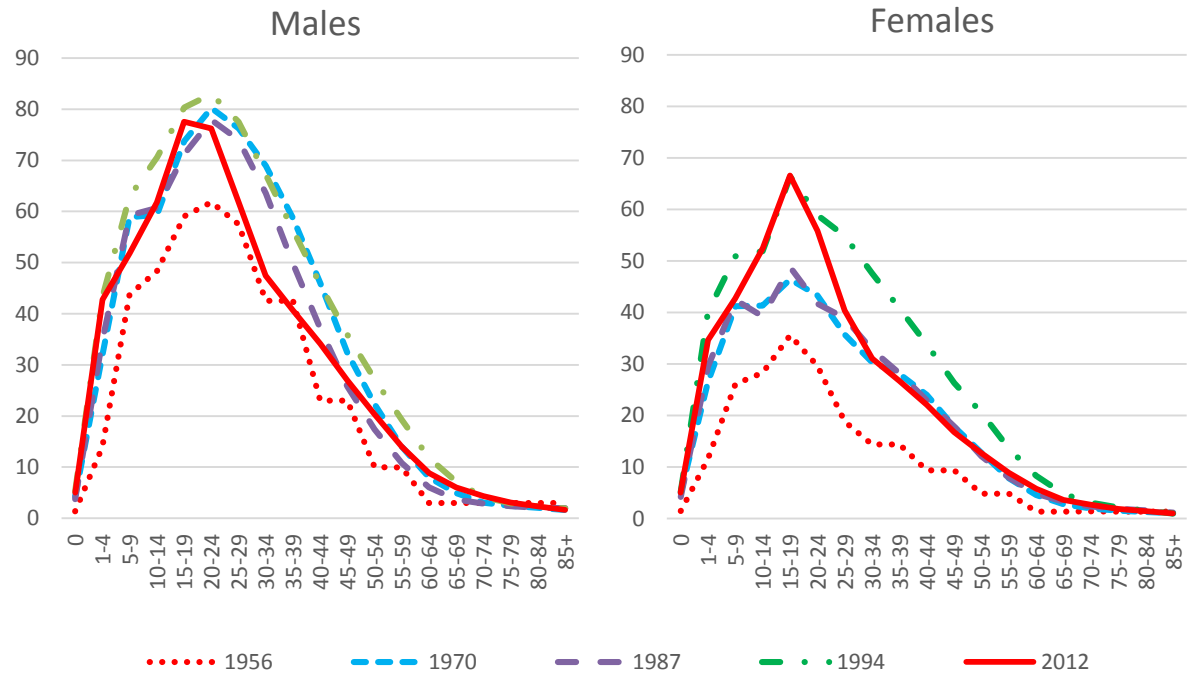

Figure 10. Percentage of deaths from external causes among all deaths, by age and sex, Russia, 1956, 1970, 1987, 1994 and 2012

Source: Calculated from [RosBRiS 2014].

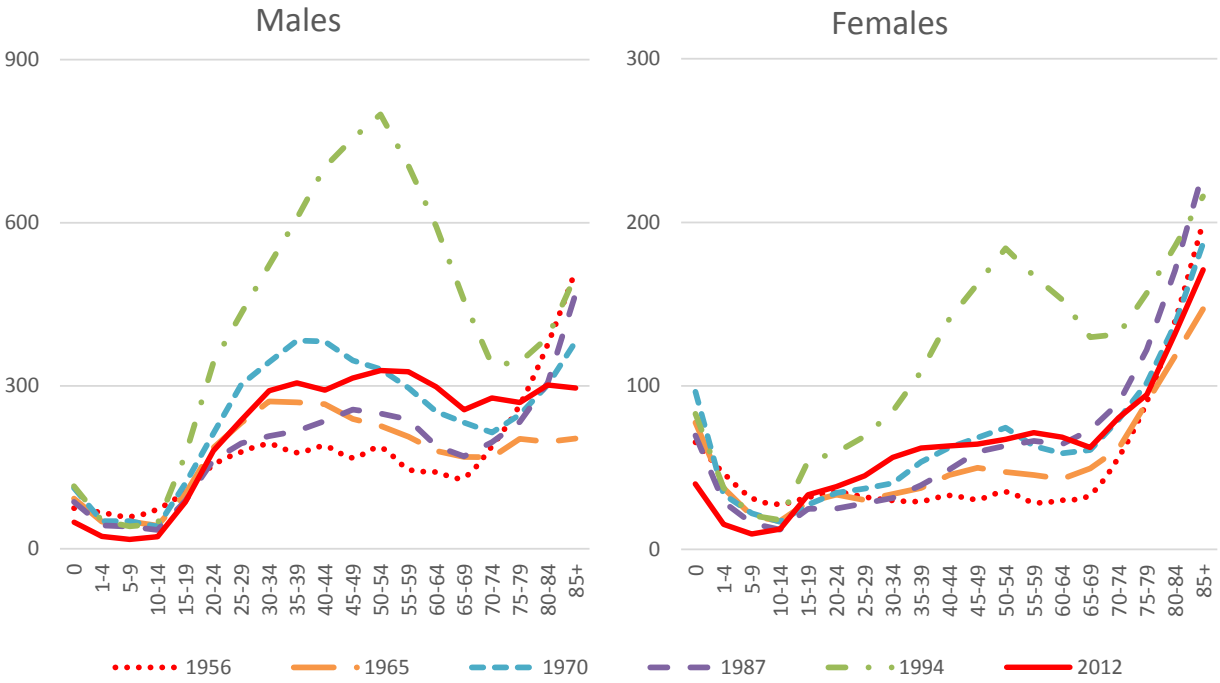

Figure 11. Age-specific mortality rates from external causes in Russia, 1956, 1965, 1970, 1987, 1994 and 2012, men and women, per 100 thousand persons

Source: Calculated from [RosBRiS 2014].

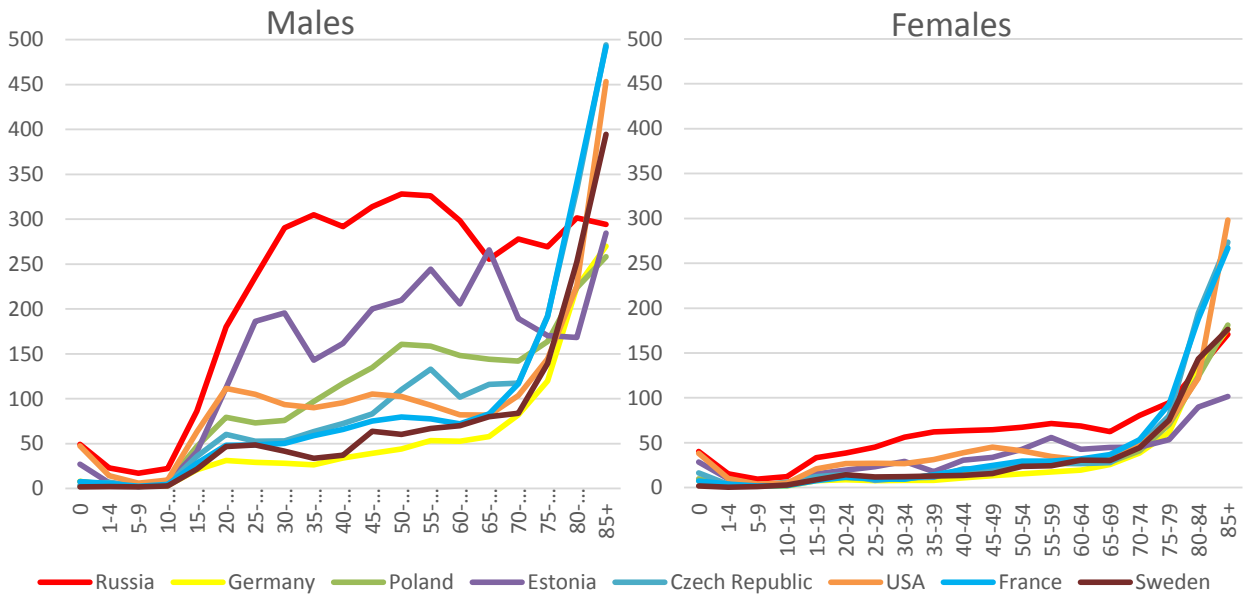

Figure 12. Age-specific death rates from external causes in Russia and some Western countries in 2010, per 100 thousand persons of the corresponding sex and age

Source: Calculated from [RosBRiS 2014; WHO MDB 2014].

MORTALITY OF MEN AND WOMEN FROM MAIN GROUPS OF EXTERNAL CAUSES OF DEATH

An exhaustive nomenclature of external causes of deaths would be voluminous. The international classification includes many relatively rare causes, such as a volley of fireworks, contact with a venomous snake or lizard and lightning strike. However, the vast majority of deaths from external causes result few groups of main causes, which the International Classification groups into rather groups. In the Tenth Revision of the International Classification of Diseases, the external causes of death include:

- transport accidents (V01-V99);
- intentional self-harm/suicide (X60-X84);
- assault/homicide (X85-Y09);
- injury with uncertain intentions (Y10-Y34);
- accidental poisoning and exposure to noxious substances (X40-X49), including accidental poisoning by and exposure to alcohol (X45);
- accidental falls (W00-W19);
- accidental drowning (W65-W74).

The list of the most important groups of external causes singled out for analysis may vary somewhat, but in general it is fairly stable. Causes of death not falling into one of these groups are

collapsed into the group of "other accidents" [3].

In the Russian structure of external causes of death, the greatest mortality in men is associated with factors such as self-harm (more than 1.8 million deaths in 1956-2012); transport accidents, including traffic accidents (1.4 million deaths); accidental alcohol poisoning (more than 1 million deaths); injuries with uncertain intentions (about 895 thousand deaths); and assaults (about 843 thousand deaths).

Among women, the largest number of deaths in 1956-2012 resulted from the same causes as for men, but with some differences in ranks. As among men, the first and the second ranks belong to self-harm (about 450 thousand deaths for the entire period) and transport accidents (about 426 thousand deaths); attacks (about 299 thousand deaths) came third, followed by accidental poisoning by alcohol (about 286 thousand deaths) and injuries with uncertain intentions (about 252 thousand deaths). Altogether, for both sexes these five causes accounted for about 65% of deaths from external causes in 1956-2012 (Figure 13).

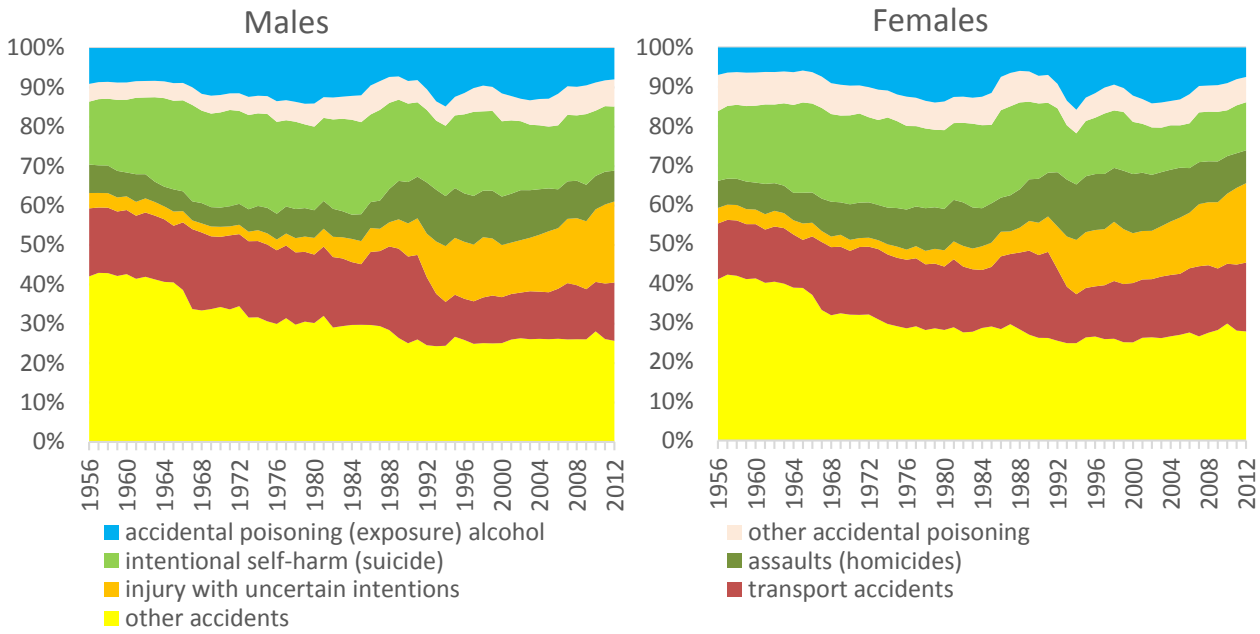

Figure 13. Distribution of deaths from external causes by main groups of external causes of death in Russia, 1956-2012, %

Source: Calculated from [RosBRiS 2014].

Note: Accidental falls and accidental drowning are included in other accidents

The structure of external causes of death has not remained unchanged. Particularly revealing is the steady growth, in 1960-2012, of the share of injuries with uncertain intentions and the significant reduction of the proportion of deaths from accidental drowning and "other accidents", both and among men and women. Also, the share of deaths from suicide decreased among women. The shares of other causes changed less or even marginally. If they did change,

[3] For brevity, the following names of major causes of death are used in tables and figures below: transport accidents, intentional self-harm (suicide), assaults (homicides), accidental poisoning (exposure) alcohol, other accidental poisoning, injury with uncertain intentions, other accidents.

they did not change particularly significantly – sometimes moving in different directions for the periods 1960-1990 and 1990-2012. Thus, the proportion of deaths from attacks, self-harm injuries and traffic accidents had increased between 1960 and 1990, but by 2012 shrank, as a result of which the ratio of shares over the last six decades has not changed much. For example, from 1960 to 1990 the proportion of male deaths from traffic accidents increased by nearly 6 percentage points, and then by 2012 it went down by more than 7 points (from 22 to 15%); in other words, from 1960 to 2012 the proportion of deaths from this cause altogether shrank by only 1.5 percentage points (Table 1 and Figure 14).

Table 1. Distribution of deaths from external causes of death for men and women, 1960, 1990 and 2012

Cause of death	Proportion of all deaths due to external causes, percent			Increase (decrease) in share, percentage points		
	1960	1990	2012	1960-1990	1990-2012	1960-2012
Males						
Accidental poisoning (exposure) alcohol	8.7	8.4	8.0	-0.4	-0.4	-0.8
Other accidental poisoning	4.4	5.8	6.9	1.4	1.1	2.5
Accidental falls	1.8	3.1	4.2	1.2	1.1	2.3
Accidental drowning	14.7	6.4	4.6	-8.3	-1.8	-10.1
Injury with uncertain intentions	3.5	8.4	20.6	4.9	12.2	17.1
Assault (homicide)	6.1	10.5	7.8	4.5	-2.7	1.8
Intentional self-harm (suicide)	18.5	19.9	16.3	1.4	-3.6	-2.2
Transport accidents, including traffic accidents	16.3	22.0	14.8	5.7	-7.2	-1.5
Other accidents	26.0	15.6	16.9	-10.4	1.3	-9.1
Total	100.0	100.0	100.0			
Females						
Accidental poisoning (exposure) alcohol	6.4	7.2	7.5	0.8	0.3	1.1
Other accidental poisoning	8.4	7.0	6.4	-1.4	-0.6	-2.0
Accidental falls	2.2	6.1	5.6	3.9	-0.4	3.5
Accidental drowning	11.9	3.8	2.8	-8.2	-0.9	-9.1
Injury with uncertain intentions	3.7	8.2	20.2	4.5	12.0	16.5
Assault (homicide)	6.9	11.2	8.4	4.3	-2.8	1.5
Intentional self-harm (suicide)	19.6	19.2	12.2	-0.4	-6.9	-7.4
Transport accidents, including traffic accidents	13.8	21.1	17.5	7.3	-3.5	3.7
Other accidents	27.2	16.3	19.3	-10.9	3.0	-7.9
Total	100.0	100.0	100.0			

Source: Calculated from [RosBRiS 2014].

Note: Colored cells in a column indicate highest (red), second highest (yellow) and third highest (green) proportions.

The distribution of external causes of death in 2012 is presented in Figure 14.

By 2012, in comparison with 1990, the share of attacks in the total number of deaths from external causes declined from 11% to 8% for both sexes and the share of self-harm declined among men from 20% to 16% and among women from 19% to 12%. These trends may be assessed as positive. However, the decrease of the proportions of deaths from assaults and self-harm injuries is accompanied by a growth in the share of injury with uncertain intentions. Most likely, a significant portion of violent deaths belongs to the latter category which requires collapsing the three categories together. Their total share does not show a positive dynamic: from 1960 to 2012 it increased from 28% to 45% for men and from 30% to 41% for women.

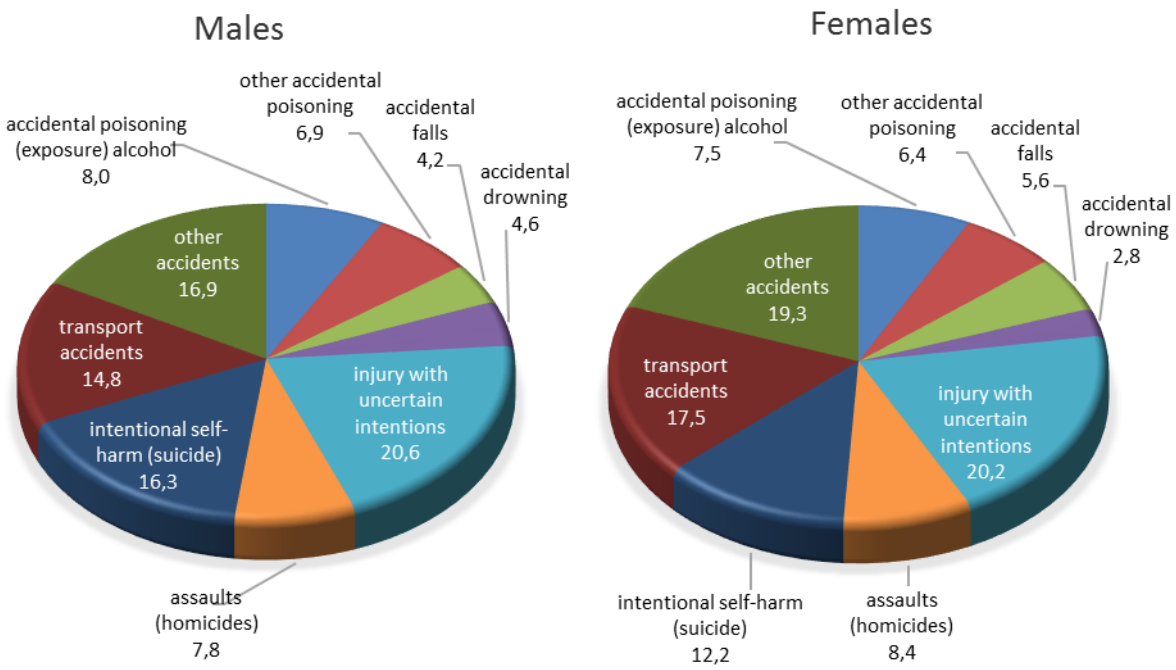

Figure 14. Distribution of deaths from external causes of death in Russia by groups of causes in 2012, %

Source: Calculated from [Rosstat 2013].

When comparing the structure of Russia's standardized mortality rate due to external causes, what is striking among both men and women is the high proportion of injuries with uncertain intentions, although by the total share of the three causes (injuries with uncertain intentions, attacks and suicide) Russia is close to such countries as Germany and Sweden, though of course with different levels of deaths from each of these causes.

Ignoring "other external causes", suicide becomes the strongest external cause of death in Western countries. In all countries presented in Figure 15, its share among men and women is larger than in Russia. In contrast, Russia is second only to the United States with respect to the share of external male deaths from homicide, and to Estonia with respect to female deaths from homicide.

In all countries, the largest contribution to the standardized rate of mortality from external causes is provided by the group "other external causes" (all causes, except those highlighted in Figure 15), although in Russia this contribution is smaller than in other countries.

The structure of "other external causes" varies greatly from country to country. For example, in the United States there is an unusually high proportion of accidental poisonings not linked to alcohol (arguably narcotic drugs); in Germany, Poland and Sweden accidental falls play an important role. Compared with other countries, Russia is characterized by the high proportion of deaths from exposure to smoke, fire and flames, as well as from accidental drowning (Figure 16).

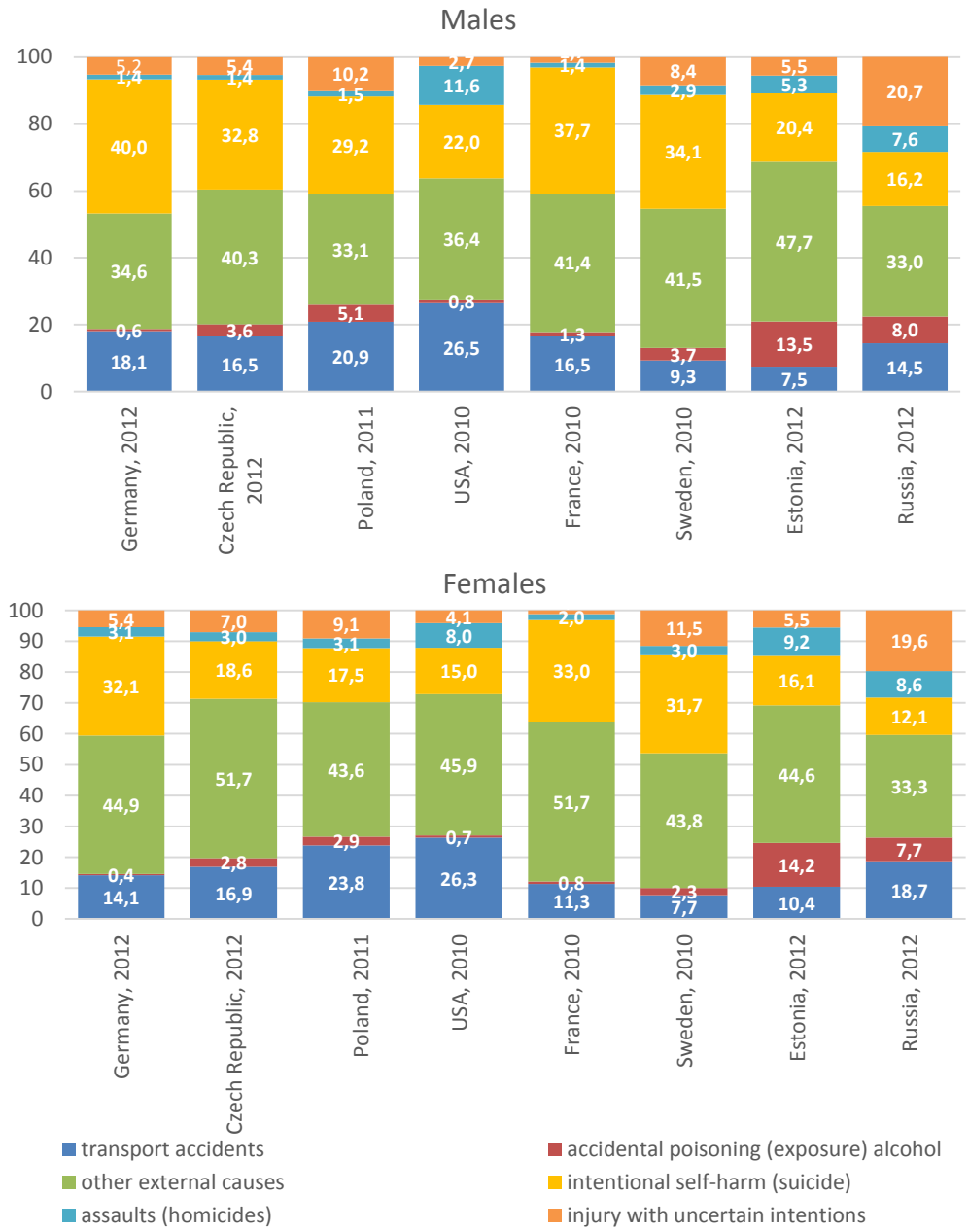

Figure 15. Structure of standardized mortality rates from external causes in Czech Republic, Estonia, Germany, France, Poland, Russia, Sweden and the United States, per 100 thousand males and females

Source: Calculated from [RosBRiS 2014; WHO MDB 2014].

Regardless of similarities or differences in the structure of mortality from external causes in Russia and other developed countries, these comparisons have only a limited value because Russia lags far behind these countries in terms of the overall level of mortality from external causes, as well as mortality from most constituent groups. As has been repeatedly noted, high mortality rates from virtually all external causes demonstrate that the Russians are poorly protected from carelessness, negligence or violence [Vishnevsky, Shkolnikov 1997]. Yet one also should not ignore structural differences, which often help with understanding the root causes of Russia's backwardness.

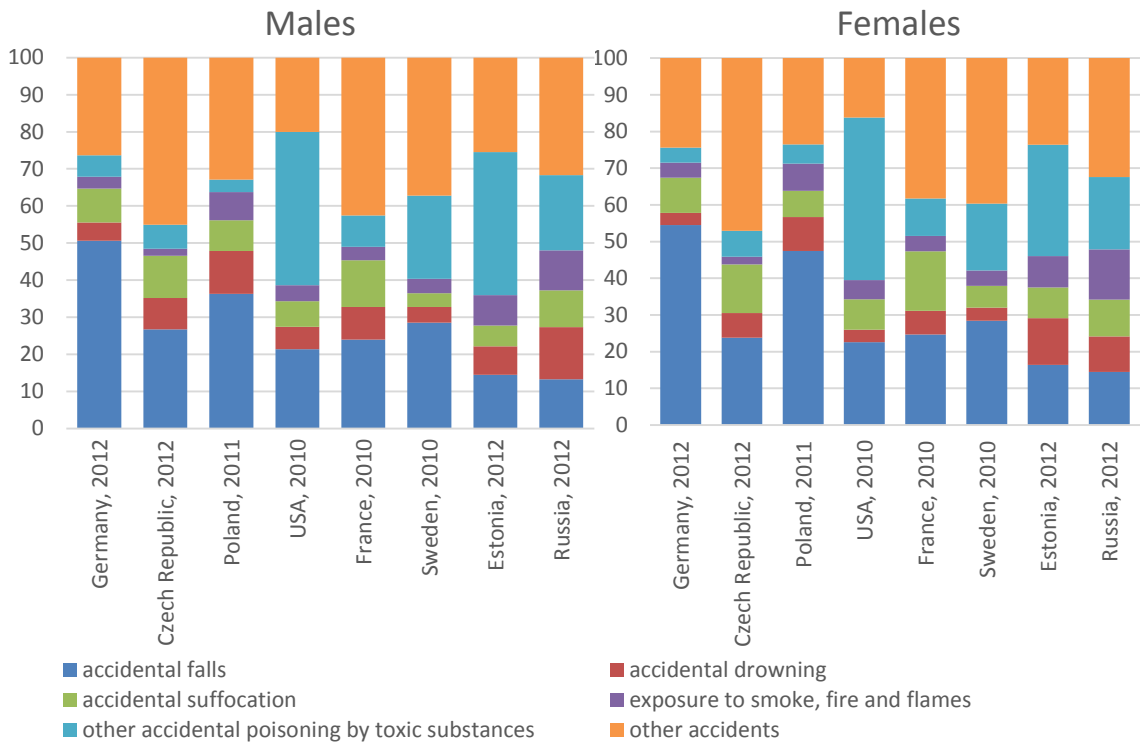

Figure 16. Structure of standardized mortality rates from "other external causes" in Czech Republic, Estonia, Germany, France, Poland, Russia, Sweden and the United States, per 100 thousand persons of the corresponding sex

Source: Calculated from [RosBRiS 2014; WHO MDB 2014].

AGE-RELATED FEATURES OF THE MAIN TYPES OF MORTALITY FROM EXTERNAL CAUSES

It was demonstrated that overall mortality from external causes is characterized by age-related peculiarities, which makes such mortality ever different from mortality from other causes. There are also distinctive age-related features of mortality from each cause or group of external causes. A correct understanding of these features can arise from the analysis of $\boldsymbol{d_{xi}}$ (where $\boldsymbol{d}$ is the number of deaths in the life table by causes of death, x is the age and i the cause of death.

These numbers provide the opportunity for a comparative analysis of their typical distributions for Russia and other countries. Tables 2 and 3 show the life table differences in mortality from varied groups of external causes by age group up to the age of 70 in Russia and, on average, in the EU-15. The difference (d_{xi}^{R} - d_{xi}^{EU-15}), if positive, is interpreted as the age-specific and cause-specific excess number of deaths in Russia.

Table 2. Excess male life table deaths from external causes up to age 70 (d_{xi}^{R}-d_{xi}^{EU-15}) in Russia with respect to the EU-15, per 100 thousand male deaths, at all ages and from all causes, 2010

Age	Transportation accidents	Intentional self-harm (suicide)	Attacks (homicides)	Poisoning (including alcohol poisoning)	Injury with uncertain intentions	Other external causes	External causes - all
0	3	0	9	2	11	71	**97**
1-4	17	0	6	26	11	95	**154**
5-9	41	2	6	11	7	93	**160**
10-14	35	28	10	7	13	78	**171**
15-19	92	147	85	83	86	192	**685**
20-24	224	321	214	288	219	337	**1603**
25-29	223	339	281	322	238	340	**1744**
30-34	210	321	304	299	236	382	**1752**
35-39	195	301	301	369	248	431	**1845**
40-44	181	304	290	443	279	493	**1991**
45-49	160	293	273	478	294	514	**2013**
50-54	128	255	232	423	288	481	**1806**
55-59	105	198	176	347	239	409	**1474**
60-64	80	115	113	247	169	270	**994**
65-70	39	101	61	129	86	118	**534**
Total	**1734**	**2726**	**2361**	**3476**	**2424**	**4303**	**17023**

The number of excess deaths:	**300-500**	**100-300**	**50-100**	**Less than 50**

Source: Calculated from [RosBRiS 2014; WHO MDB 2014].

Table 3. Excess female life table deaths from external causes up to age 70 (d_{xi}^{R}-d_{xi}^{EU-15}) in Russia with respect to the EU-15, per 100 thousand female deaths, at all ages and from all causes, 2010

Age	Transportation accidents	Intentional self-harm (suicide)	Attacks (homicides)	Poisoning (including alcohol poisoning)	Injury with uncertain intentions	Other external causes	External causes - all
0	2	0	11	3	9	58	**83**
1-4	14	0	6	19	8	62	**109**
5-9	20	0	5	8	5	35	**72**
10-14	19	7	9	3	5	26	**70**
15-19	56	32	38	31	24	35	**216**
20-24	58	30	60	51	39	47	**285**
25-29	57	34	72	45	40	53	**300**
30-34	48	32	78	56	45	61	**320**
35-39	53	28	75	82	51	73	**362**
40-44	49	28	80	106	58	87	**408**
45-49	49	27	82	132	66	109	**466**
50-54	53	27	78	145	75	126	**504**
55-59	51	23	74	157	75	128	**506**
60-64	45	23	56	106	56	94	**380**
65-70	49	31	46	76	40	69	**312**
Total	**622**	**322**	**772**	**1020**	**596**	**1061**	**4393**

The number of excess deaths:	**100-300**	**50-100**	**Less than 50**

The differences are especially large for men. Suppose mortality rates from age-sensitive external causes were similar in the Russian 2010 hypothetical cohort and in the EU-15. Then more than 17 thousand deaths from external causes among people under age 70 out of every 100 thousand actually registered male deaths would have been postponed beyond age 70. The gaps increase with age (until age 50), and are greatest in the age range from 20 to 50 years. The largest contribution to this growth of excess deaths is provided by suicides in the age interval 20-45, attacks between the ages of 30 and 40, and especially poisoning and "other external causes" at all ages older than 20.

The differences in mortality from external causes among women between Russia and EU-15 are also noticeable, but are much smaller than among men: excess number of deaths from external causes under age 70 (about 4,400 per 100 thousand deaths) is approximately 4 times smaller. The differences increase with age up to age 60 and are particularly significant after age 40, with poisonings making the largest contribution to mortality from external causes after age 40 and "other external causes" doing so after age 45.

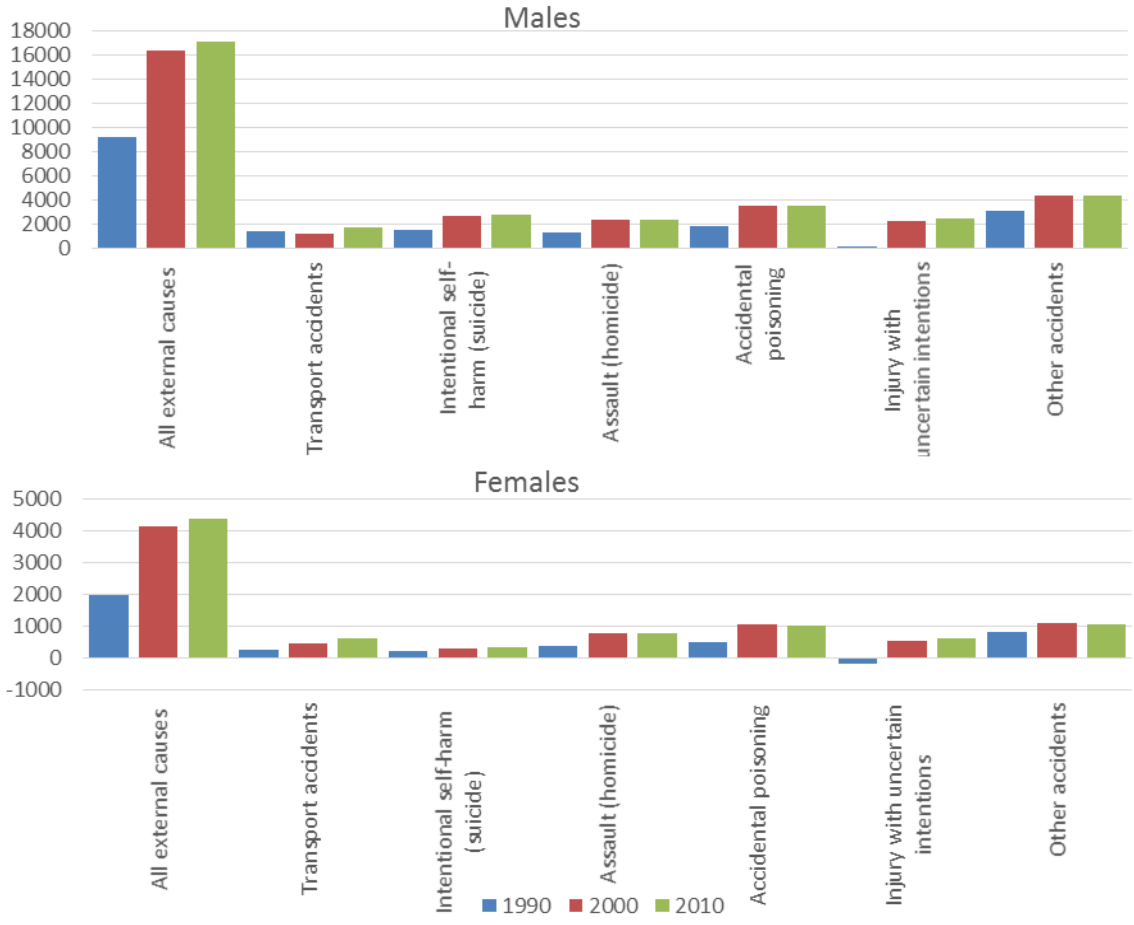

Figure 17. Excess life table deaths from external causes up to age 70 (d_{xi}^{R}-d_{xi}^{EU-15}) in Russia with respect to the EU-15, per 100 thousand deaths, from all causes, 1990, 2000 and 2010

Source: Calculated from [RosBRiS 2014; WHO MDB 2014].

Excess numbers of deaths were also calculated for other hypothetical cohorts. They are not presented here, but the graph in Figure 17, made with the estimates of the total number of excess

deaths for 1990, 2000 and 2010, shows the stability of the hierarchy of causes of death that determine Russia/EU-15 differences. The largest contribution is provided by "other external causes", the second-largest is provided by poisonings (probably due to the high incidence of alcohol poisoning in Russia); suicides among men and homicides among women make the third-largest contribution. This hierarchy can be considered for determining policy priorities aimed at reducing mortality from external causes.

MORTALITY FROM EXTERNAL CAUSES AND LIFE EXPECTANCY

External causes constitute one of the two main causes of death determining the gap in life expectancy between Russia and the West.

The long-term dynamics of this indicator in Russia looks like waves. The period of 1956-1964 was characterized by increasing life expectancy. During the following 20 years life expectancy had fallen by 3.6 years for men and 0.8 years for women. Starting in 1985, in just 3-4 years of the anti-alcohol campaign, virtually all previous losses of male life expectancy were recovered (it increased by 3.3 years), and the growth of female life expectancy by 1.6 years overcompensated for its previous decline. The anti-alcohol campaign was short-lived and after its abandonment the decline of life expectancy resumed. In 1989-1994, life expectancy collapsed unprecedentedly having lost more than 7.5 years for men and 3.5 years for women. In 1995-1998, the indicator rose again by 3.8 years for men and 2.1 years for women, but this equaled only half of the preceding decline. The 1998 economic crisis led to a new reduction of life expectancy in 1999-2003, by 2.7 and 1.3 years for men and women, respectively. Finally, from 2004 to 2012 the indicator grew by 6.1 years for men and 4.2 years for women. In 2012, life expectancy was 64.6 years for men and 76 years for women. These values were only 2.7 and 5.4 years higher than those recorded in 1956, and roughly corresponded to the level of the mid-1960s for men and only slightly exceeded this level for women (Figure 18).

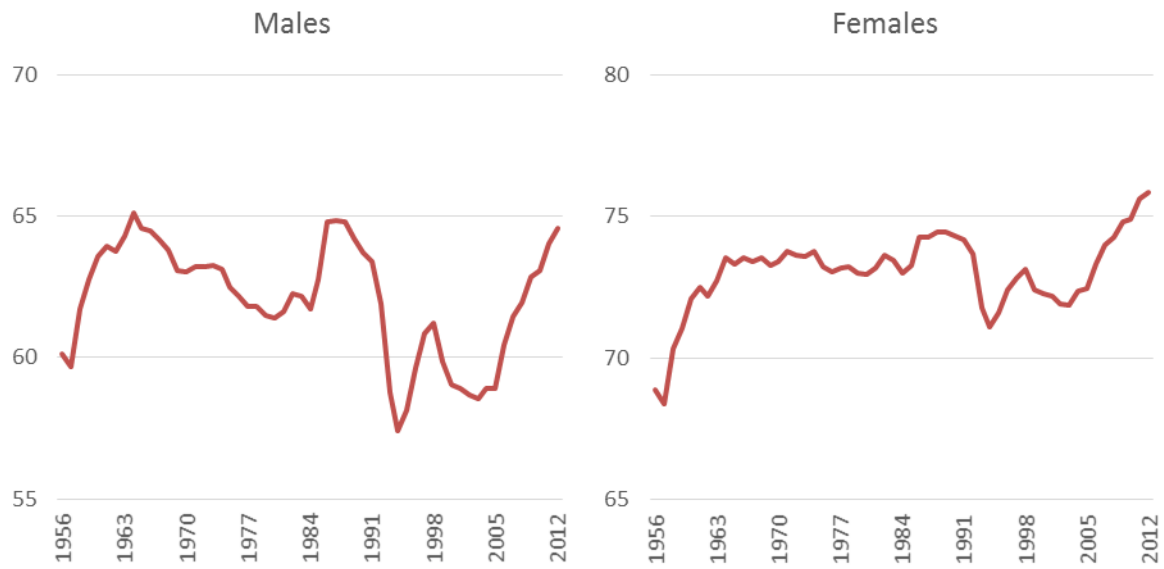

Figure 18. Life expectancy of men and women in Russia, 1956-2012, years

Source: Calculated from [Rosstat 2013].

In other words, over the entire period from 1956 to 2012, despite all – sometimes sharp - fluctuations, Russia has lived through more than half a century of stagnation in life expectancy. How, throughout this time, did the changes in mortality from external causes of death affect the level and dynamics of life expectancy?

As follows from Figure 19, the contribution of dynamics in external causes of death to changes in life expectancy was quite significant, especially among men.

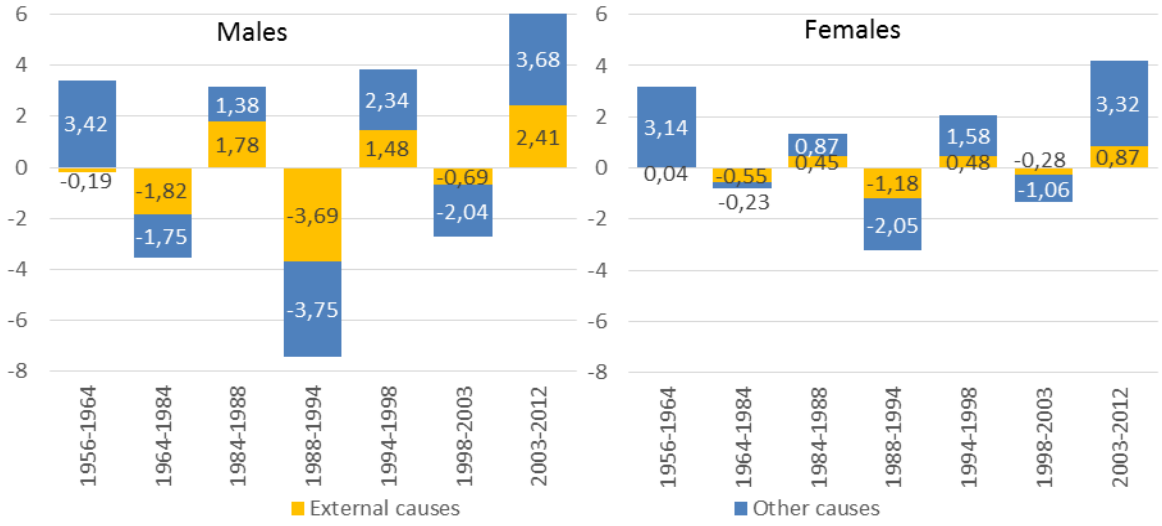

Figure 19. Contribution of changes in mortality from external causes to changes in life expectancy at birth, 1956-2012, years

Source: Calculated from [RosBRiS 2014].

Both at the stages of growth and of decline of life expectancy, this contribution was markedly age-specific. In the younger and older age groups, it was relatively small, and at younger ages it was more often positive. The decisive impact on the ups and downs of life expectancy resulted from the changes in mortality from external causes among 15-64-year-olds. (Figure 20). As the positive and negative impacts of fluctuations in mortality from external causes on life expectancy were virtually symmetrical, the overall effect over the period of 57 years was insignificant, even though these fluctuations eventually reduced male life expectancy by one year.

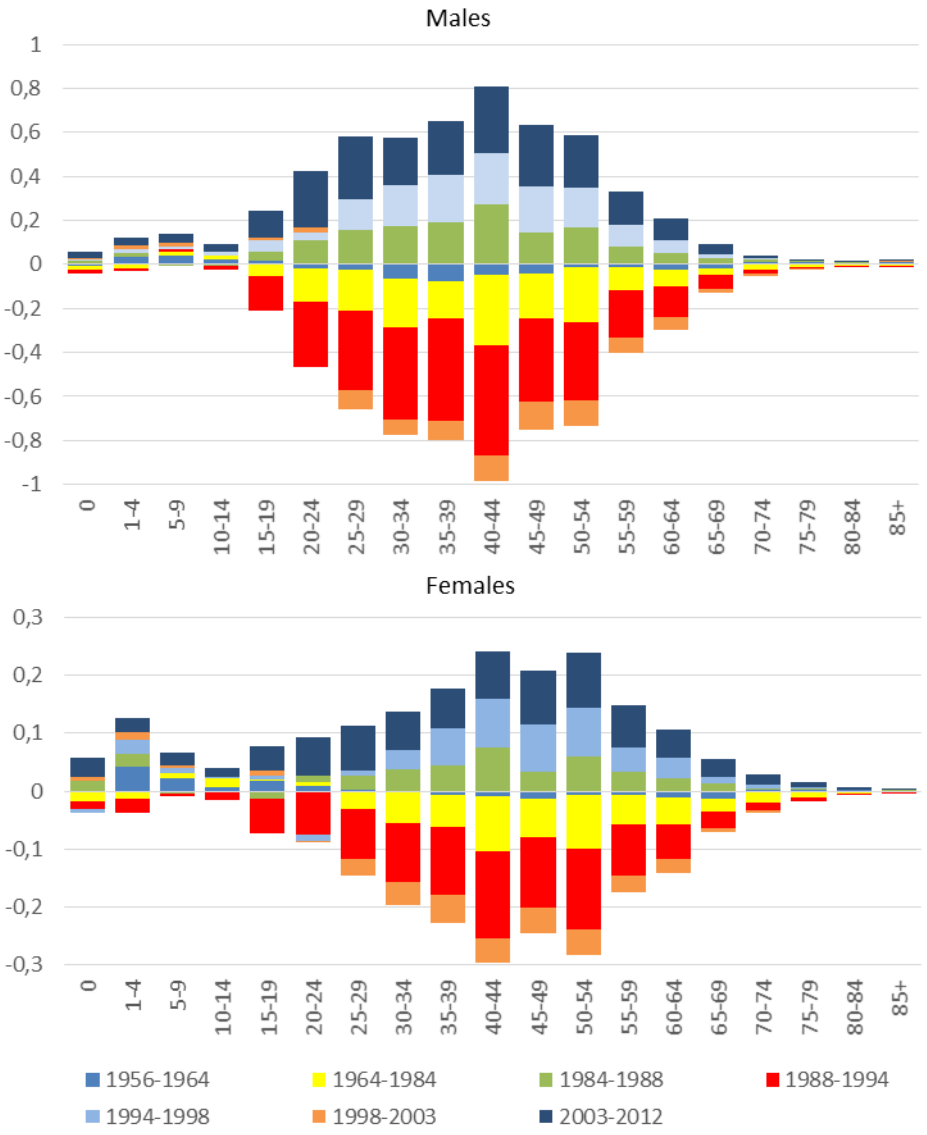

Figure 20. Contribution of changes in mortality from external causes to changes in life expectancy of men and women, by age groups and periods, 1956-2012, years

Source: Calculated from [RosBRiS 2014].

Of particular interest is the impact of changes in mortality from each group of external causes between the ages of 15 and 64 on life expectancy during 1956-2012. If we take as a starting point life expectancy at birth in Russia in 1956 (then a relatively low 62 years for men and 70 years for women), then the growth or reduction of this indicator due to changes in mortality from each class of causes between the ages of 15 and 65 makes it possible to judge which classes of causes of death were the most important in terms of the formation of the life expectancy of Russians and its dynamics during the period under review.

As follows from Figure 21, throughout this period the reduction in mortality from infectious diseases made the major positive contribution to the increase in life expectancy for both men and women, although the magnitude of this contribution varied from period to period.

Among women, a consistently positive contribution to the increase of life expectancy since 1956 was provided by a mortality decrease from "other diseases" and tumors. In men, the effect of these two types of improvement was less pronounced and less stable. Beginning in the 1990s, the negative contribution to life expectancy of the rise in adult mortality from diseases of the digestive system begins to look anomalous.

But the most striking adverse impact on the dynamics of life expectancy was produced by the increases in mortality from cardiovascular diseases and, in particular, from external causes.

By the end of the 1970s, increased mortality from external causes between the ages of 15 and 64 lowered life expectancy at birth by 2.3 years for men and 0.5 years for women from the 1956 level. By 1994, the decline had reached its maximum values of 4.1 years for men and 1.2 years for women. The fluctuations of curves on Figure 21 that reflect the impact of diseases of the circulatory system on life expectancy closely mirror the fluctuations of curves for external causes of death, yet the losses from the latter were smaller. Since the mid-1980s, for the third time both lines have been moving towards the positive half-plane, but so far only diseases of the circulatory system, and only among women, briefly went through this transition (in 1986-1991, as well as starting from 2011) . The curve of the accumulated contribution of external causes of death to the change in life expectancy is the only one that never left the negative half-plane. By 2012, mortality from external causes in the age interval 15-64, which still remains higher than it had been in 1956, has led to losses of life expectancy of about 1.2 years for men and 0.4 years for women.

Increased mortality (between the ages of 15 and 64) from diseases of the circulatory system provided the largest contribution to that decline (-1.2 years, or 48% of the total). Increased mortality from external causes also lead to a very substantial change (-1 year, or 38% of the total decline in life expectancy). Diseases of the digestive system ranked third among the culprits (-0.4 years, or 15%). Due to the summary effect of all causes of death, male life expectancy at birth would have declined by 2.6 years in 1956-2012. Mortality from all other causes receded and provided the collective positive input into life expectancy of the order of 1.1 years, so the net effect was the decline in male life expectancy by 1.5 years (Figure 22).

The dynamics of external causes of death and digestive diseases negatively affected life expectancy of women (-0.4 years and -0.3 years, respectively), providing 54% and 46% of the overall negative impact). However, the positive contribution of the decrease in mortality from other causes added 1.4 years to life expectancy resulting into the net increase of 0.7 years over the period 1956-2012.

Life expectancy of men and women is now higher than it was in 1956, but this is primarily due (especially for men) to reduced child mortality. For both sexes under the age of 15, mortality between 1956 and 2012 decreased from all major causes of death, including external ones (among men the contribution to the reduction in mortality from external causes was 0.3 years of the total increase of 4.2 years, or 8% of life expectancy at the age of 15, and among women 0.2 years of the total of 4.1, or 5%).

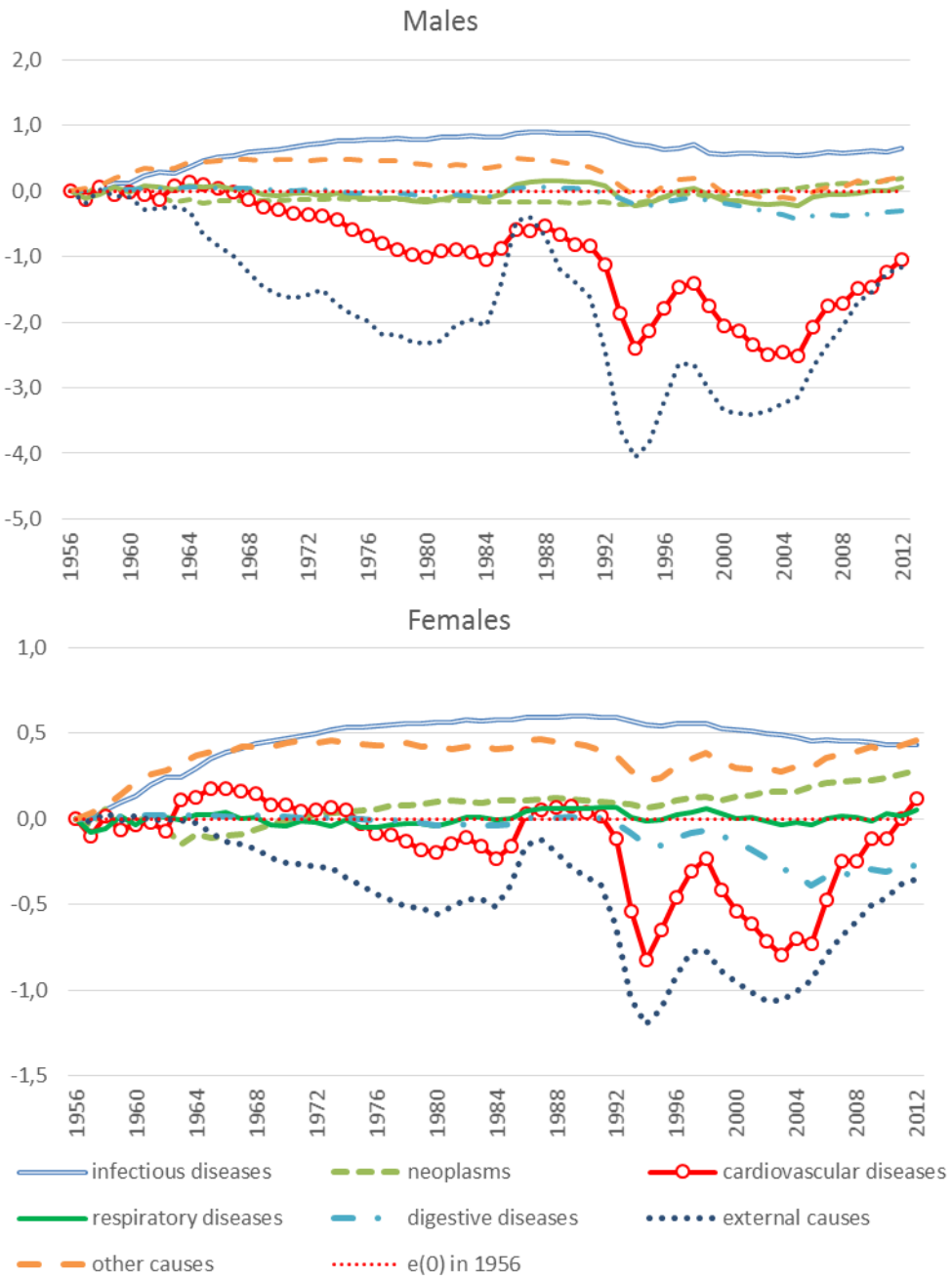

Figure 21. The gain or decline in life expectancy due to changes in mortality from main classes of causes of death between the ages of 15 and 64, 1956-2012, years

Source: Calculated from [RosBRiS 2014].

Note: 1956 is a reference year

The increase in life expectancy of older people – those 65 and older – is observed only among women, and it is small. The reduction of mortality from external causes is too small to provide a discernable positive contribution to life expectancy.

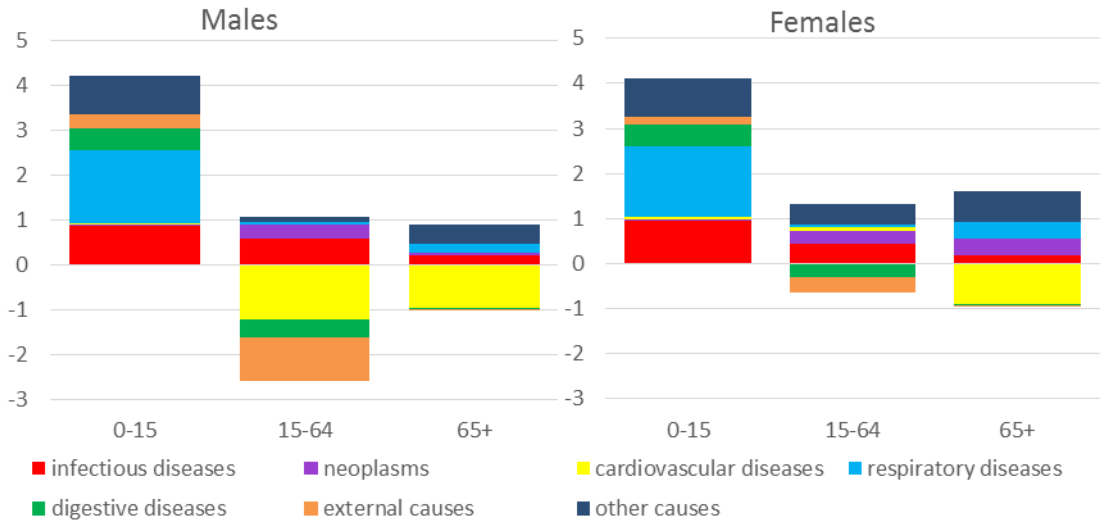

Figure 22. Decomposition of changes in life expectancy due to changes in mortality from major age groups and classes of causes of death, 1956-2012, years

Source: Calculated from [RosBRiS 2014].

Thus, the increase in mortality from external causes of death in the 15-64 age group group for both sexes had a significant negative impact on the changes in life expectancy. Among men of this age group this impact was almost comparable to the negative impact of the increases in mortality from cardiovascular diseases, and among women it competed with that of the increase in deaths from diseases of the digestive system. Concurrently, the changes in mortality from diseases of the circulatory system period provided, in the long run, a positive contribution to the change in life expectancy of women.

In 2012, Russia's life expectancy at birth of both sexes combined has finally surpassed 70 years, but life expectancy for men, especially at the age of 15, was still lower than in the mid-1960s or during the anti-alcohol campaign. Life expectancy of 15-year-old women surpassed the maximum reached during the period 1960-1988 by only 0.5 years. The population of Russia lived, in the last decade, not so much through an increase in life expectancy than through recuperation of the losses incurred previously. The country still lags behind the developed countries. Taking into account the unstable nature of mortality from external causes, it is difficult to foresee future trends.

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DEMOGRAPHIC RESULTS IN RUSSIA, 2013: SUMMARY REPORT *

INSTITUTE OF DEMOGRAPHY, HIGHER SCHOOL OF ECONOMICS

The Institute of Demography of the HSE annually prepares a detailed research report on the demographic development of the country in the previous year. However, due to the fact that work on the full report and its publication take a fairly long time, in this issue we publish a short, express version of the report, which gives an indication of the main results of the demographic development of Russia in 2013.

***Keywords**: Russia, demographic results, population, age composition, fertility, mortality, internal migration, international migration.*

1. THE SIZE AND AGE COMPOSITION OF THE POPULATION

In 2013, Russia's positive demographic trends of the last few years mostly continued. The major success of this year was the appearance, for the first time since 1991, of a positive natural population increase (of 24 thousand people). The total increase of the population, taking into account migration, was 319,800. As a result, by the beginning of 2014 the population of Russia had reached 143.7 million people, surpassing the minimum population of the year 2009 by 1763 thousand people. At the same time, it is still below the maximum population of 1993 by 4.9 million.[1]

The main source of growth of the Russian population is the influx of migrants, which has made a positive contribution since the mid-1970s (before which Russia's migration balance was negative), but then, as a rule, provided no more than a quarter of the total increase. Since 1992, in conditions of a natural population decrease, immigration has been the only source of population growth, but usually insufficient to compensate for the natural decrease (Figure 1). In 21 years of natural population decline in Russia (1992-2012), it amounted to 13.2 million people. The total size of the migration increase over the same period was 8.4 million, which compensated 63% of the natural decrease of population during this period.

The reduction in the natural decrease of Russia's population observed in recent years is a positive phenomenon, but apparently a temporary one as well, due to transitory factors that are almost impossible to influence.

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TRANSLATED FROM: ДЕМОГРАФИЧЕСКОЕ ОБОЗРЕНИЕ. 2014, 1(3): 5–32. ORIGINAL TITLE: "НАСЕЛЕНИЕ РОССИИ: ДЕМОГРАФИЧЕСКИЕ ИТОГИ 2013 ГОДА. КРАТКИЙ ДОКЛАД" (HTTP://DEMREVIEW.HSE.RU/EN/2014--3/143746230.HTML).

* THE STUDY WAS IMPLEMENTED UNDER THE BASIC RESEARCH PROGRAM AT THE NATIONAL RESEARCH UNIVERSITY, HIGHER SCHOOL OF ECONOMICS (HSE) IN 2014.

[1] Unless otherwise noted, this indicates the data in the article is from Rosstat.

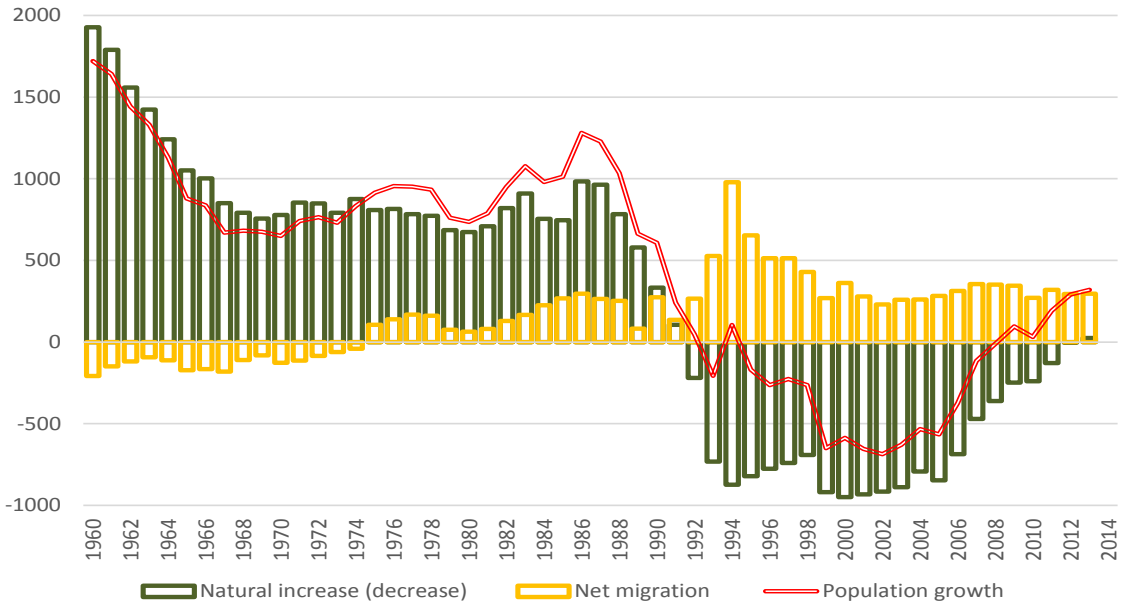

Figure 1. Components of population growth in Russia, 1960-2013

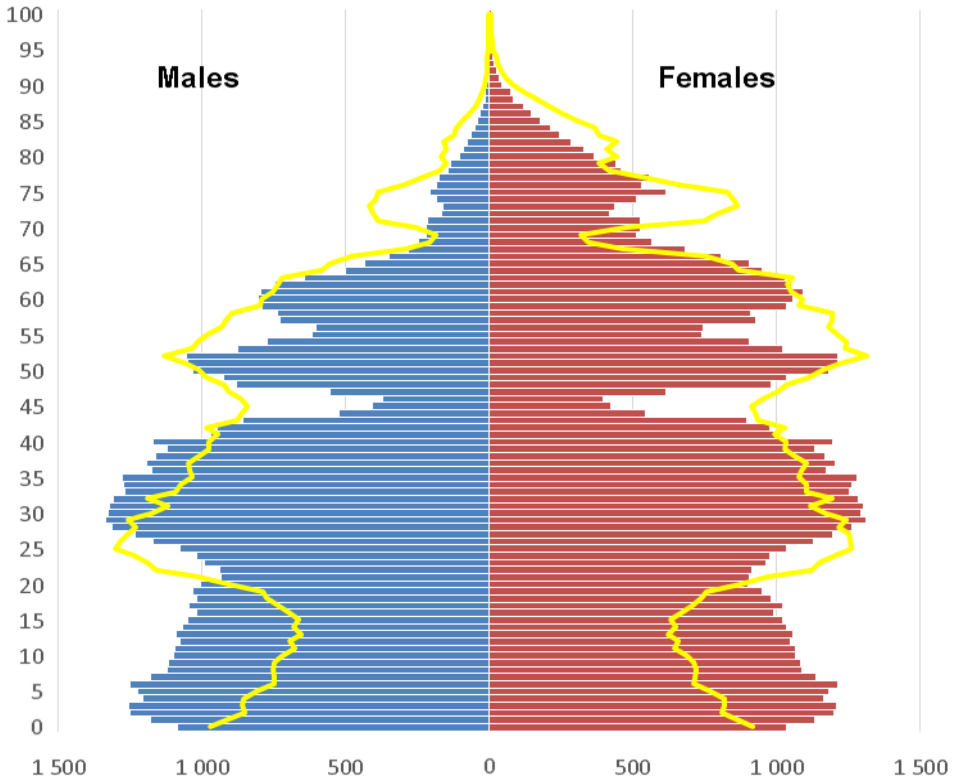

Figure 2. Age pyramid of the population of Russia in 1990 (bars) and in 2013 (solid line), thousands

Chief among them is the existing age composition of the population. The general vector of its change has set in motion an irreversible process of population aging, but is also subject to wavelike fluctuations resulting from the historical upheavals of the past. The comparison in Fig. 2 of the age pyramids in 2013 and 1990 gives an idea of the total transformation of the population's age structure between these two dates.

In 1990-2013, the wavelike changes in the age composition had an appreciable effect on the ratios of age groups, which had noticeable economic and demographic consequences. In the early 1990s, these consequences were favorable. In particular, Russia entered a phase of receiving a so-called “demographic dividend” which was quite beneficial for the economy.

At this stage, Russia reached its historical maximum of the number of people of working age (20-64) and of their share in the total population (Fig. 3). A particularly large increase (5.1 million people) occurred between 2005 and 2011, 4.2 million of whom were added in 2007-2010, when the large cohorts born between 1987 and 1990 crossed the threshold of 20 years of age while the small cohorts born between 1942 and 1945 retired at age 65 and left working age.

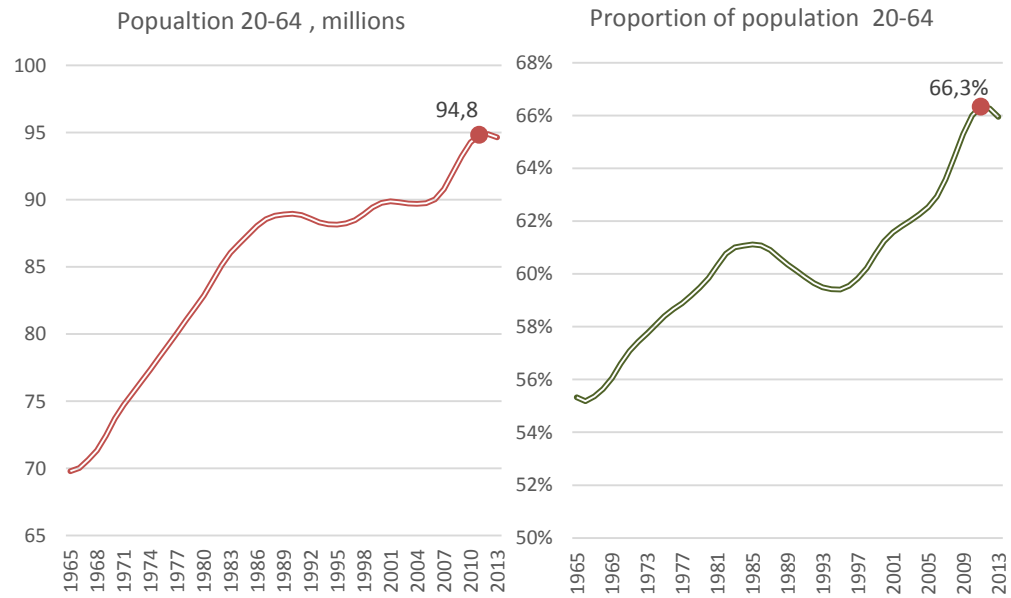

Figure 3. Size and percentage of the population of working age (20-64 years), 1965 - 2013

As follows from Fig. 4, despite some fluctuations, on the whole Russia lived in conditions of a declining total dependency ratio. The elderly dependency ratio gradually increased, but this increase was offset, sometimes more than offset, by a reduction in the youth dependency ratio. In 2011, the total dependency ratio reached a record low, and then began to rise.

This indicated that the era of reduction in the dependency ratio had ended, that Russia had entered a period of rapid growth of both the elderly and the youth dependency ratios. All the projections predict such a growth, and a significant one at that. By the mid-2010s the dependency ratio will return to the level of the early 1990s and will continue to rise, inevitably leading to an increase in unmet demand in the labor market and, consequently, an increase in the demand for labor migrants.

At the same time, it is necessary to pay attention to a seemingly paradoxical, but crucial fact for policy: the more favorable the demographic indicators – that is, the more children are born and the lower the mortality of the adult and elderly population – the faster the dependency ratio will grow.

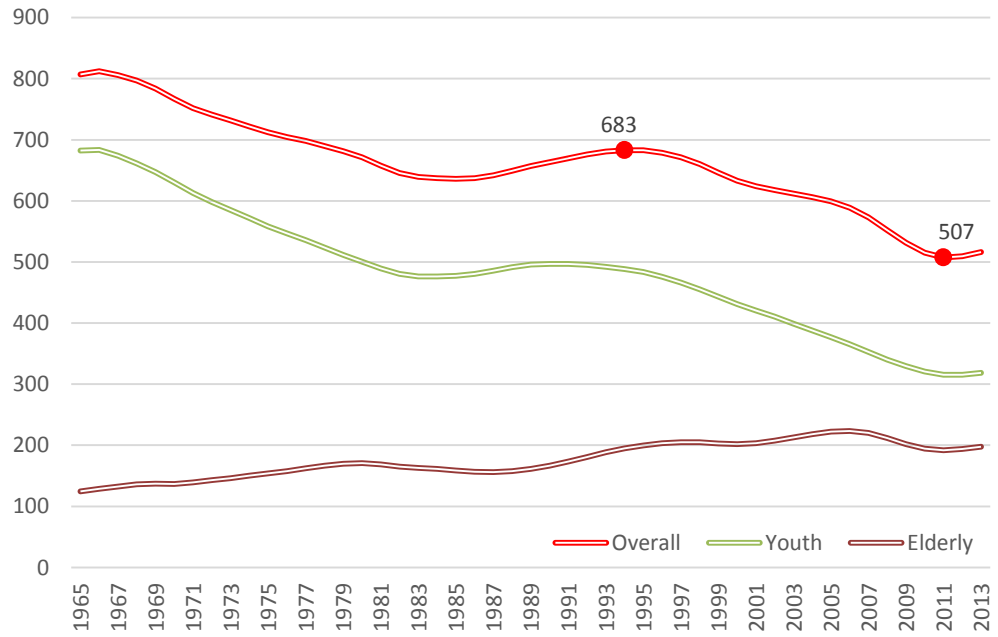

Figure 4. Youth and elderly dependency ratios per 1000 persons aged 20-64

Despite the importance of the economic impact of changes in the age structure of the population of Russia, perhaps even more important is the influence they have on demographic processes.

2. FERTILITY

One of these processes is fertility. Changes in the age structure have had and continue to have a very strong but ambiguous impact on the dynamics of fertility in the country. In the 1990s, the number of women of reproductive age (15-49 years) was increasing. In 2003 it reached a historic high, exceeding 40 million (27% of the total population). It should have boosted the number of births, but in reality the number of births decreased to a historic low in 1999 (Fig. 5).

Such a discrepancy in trends seems paradoxical if one does not take into account the differing population dynamics of age groups of women in the broad category 15-49. The overall increase in the number of women of reproductive age in the 1990s was provided by the age groups 15-19, 20-24, but especially by the two older groups (40-44 and 45-49) who have little impact on fertility levels. At the same time, the number of women aged 25-29 in the first half of the 1990s decreased, and that of those aged 30-34 decreased throughout the 1990s (Fig. 7, left panel).

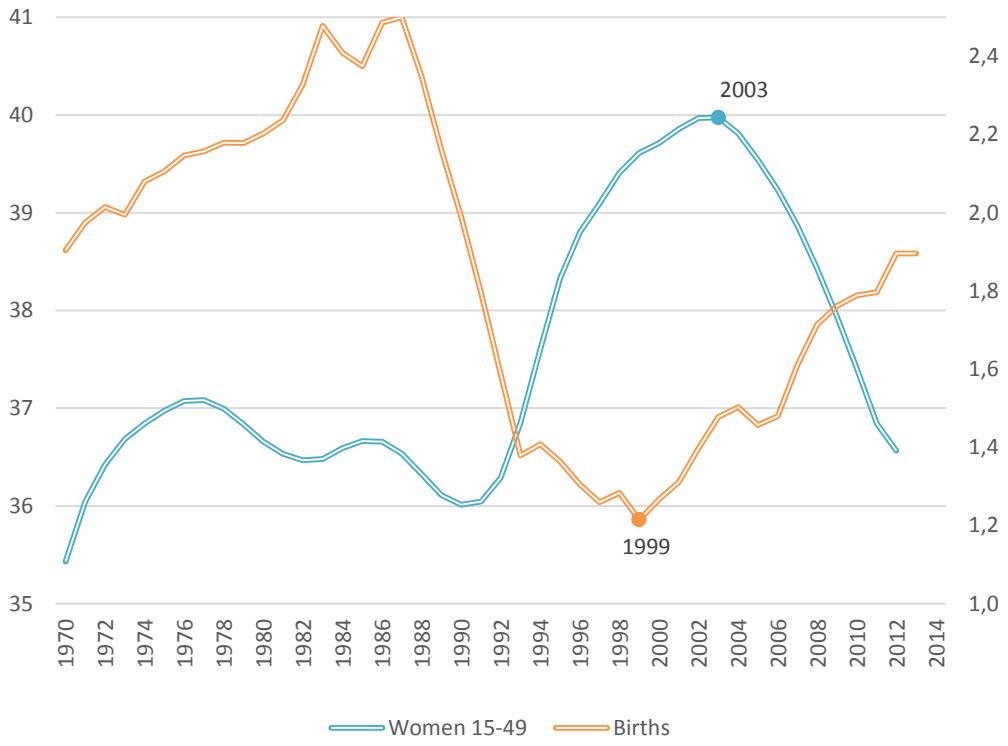

Figure 5. Number of women of reproductive age (left scale) and the number of births (right scale), millions

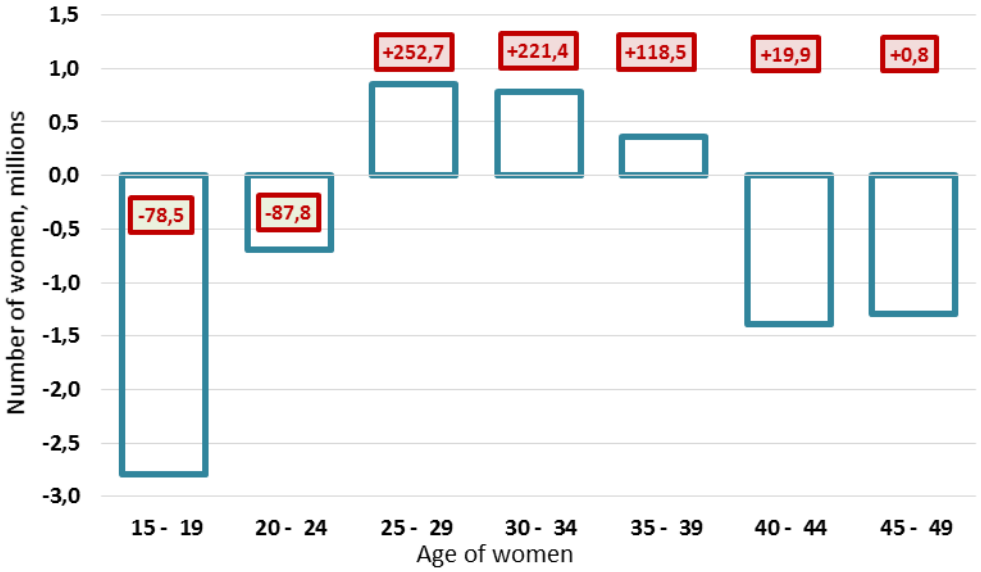

Figure 6. The increase or decline in the number of women in millions (blue columns), and the number of births in thousands (red-framed figures), by age of women, 2004-2013

But in the 2000s the situation changed. With the overall reduction in the number of women aged 15-49 (which since 2004 has already dropped by more than 4 million), the number of women in most important maternal ages increased and keeps growing. Starting from 2000, over 85% of all births, and since 2009 more than 90% of all births, have been accounted for by four age groups of women (20-24, 25-29, 30-34 and 35-39). Among them, only the number of 20-24-year-olds fell

and their number of births fell correspondingly. The increase in the number of births in 2004-2013 was provided mainly by those age groups in which the number of women continued to grow (Fig. 6). The number of women aged 25-29 (born in 1971-1987) increased in the years 2000-2012 by about 1 million (women born from 1971 to 1987), and the number of 30-34-year-olds (born from 1966 to 1982) increased by about 850 thousand.

Both the increase and the decrease of the number of births were not proportional to the increase and the decrease of the number of women, since there was at the same time a change in the intensity of fertility at different ages. This is explained by the long-term rapid changes in the age pattern of fertility. It has been "getting older", which corresponds to a global trend that emerged in the 1970s, although Russia was somewhat slow in joining the trend. In Russia women aged 20-24 had the highest fertility for a long time. But in the 1990s, when the number of women of this age increased, their fertility decreased rapidly. On the other hand, from the mid-1990s began a steady increase in fertility of women 30-34 years old, followed since the 2000s by fertility rise among women aged 25-29. Fertility of the age group 25-29 exceeded fertility of the 20-24 age group for the first time in 2008, and the gap between them began to widen. It is hard to link this dynamic to measures of demographic policy. On the right panel of Fig. 7 it can be seen that the increase in the birth rate in the 2000s was observed only in women aged 25-29, 30-34 and, to a lesser degree, 35-39, but this growth began long before the introduction of measures in 2007. The curve of the total fertility rate (TFR) simply repeats the curve paths of the three age groups.

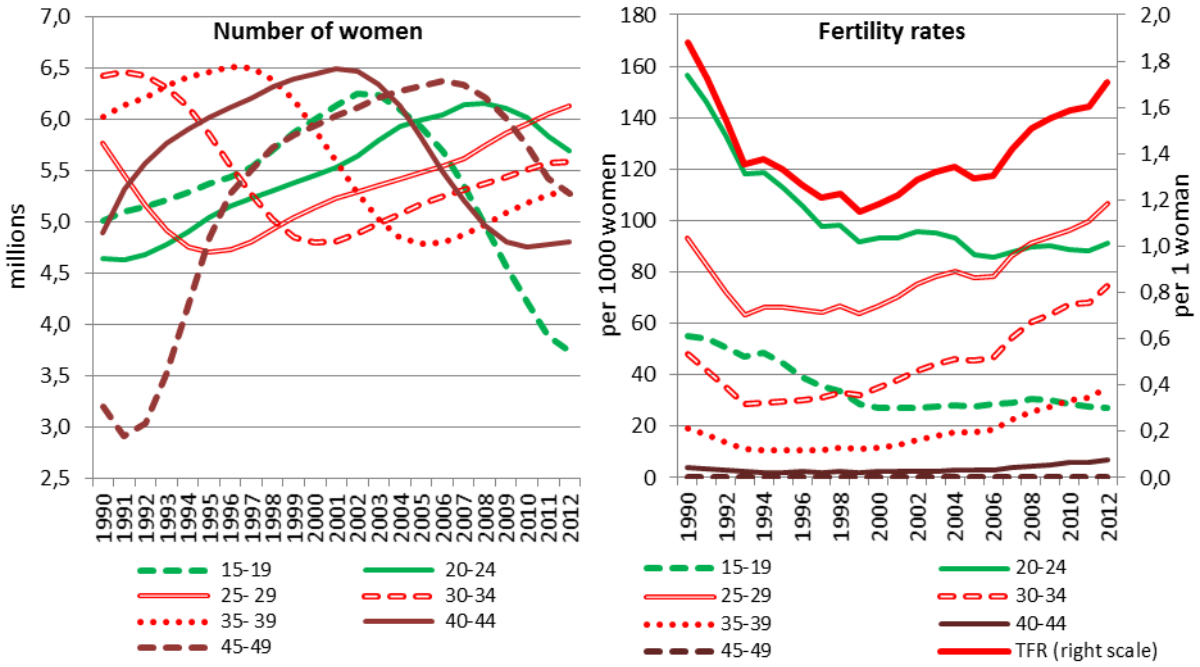

Figure 7. Number of women, age-specific fertility rates by five-year age groups and total fertility rate

The dual increase in the number of potential mothers aged 25 and older and the intensity of fertility at these ages fueled the growth of the number of births from 2000 to 2013. This growth was achieved mainly by women aged 25 years and older, while the contribution of younger women to the change in the total number of births during this period was negative. Compared with 2000, the number of births in 2013 increased by 629 thousand. That, coupled with a decrease in the

number of deaths by 353.5 thousand, made it possible to overcome the natural decline of the population in 2013 (in 2000 it was largest at 958.5 thousand).

But now the growth of female age groups with increasing fertility has come to an end. The number of women in the key group of ages 25-29 reached its maximum in 2012, after which it started to decline. Already by 2017 it will decrease by more than 1 million and will become smaller than it has been in 2000. For the 30-34-year-olds the turning point will come in 2018. Maintaining the current number of births with such a reduction in the number of potential mothers will be hardly possible.

As for fertility level proper – i.e. not the number of births in a given calendar year, which depends on a complex and changeable combination of the number of women of different ages and changes in the age profile of fertility, but the final number of births per woman over her lifetime (completed cohort fertility) – there has been little change. Starting with the cohorts born in the second half of the 1960s, this number has fluctuated around the value of 1.6. For younger cohorts, the expected value is slightly higher, close to 1.7 children per woman. An increase of completed fertility of the order of 0.07 per woman between the cohorts born in 1975-1979 and those born in 1985-1989 is the most optimistic scenario, under the assumption that current age–specific fertility rates do not change.

It should also be kept in mind that, despite the government's active policy-making to increase the birth rate, childlessness in Russia is growing. In 1970-1980, no more than 7% of women aged 50 had no experience of motherhood. By the early 1990s, this figure grew to 10%. According to the latest estimates based on special fertility probability tables, we can expect that, at the current level of fertility, 16% of women will remain permanently childless. Less than half of the prevalence of childlessness is due to biological and medical impediments (female and male infertility). Substituting abortions with modern, safe contraceptives, a process which has arisen in Russia since the end of the 1980s, as well as various auxiliary reproductive technologies, which have also become more and more widespread, limits childlessness somewhat, but does not eliminate it.

Of greater importance is the creation of equal conditions for childbearing in all types of partnerships, be they officially registered marriages or informal (consensual) unions. In the last quarter of the 20th century, official marriages in Russia have not only begun taking place significantly later (the average age of marriage has risen by more than three years), but have lost the dominant position as the initial form of joint matrimonial life for men and women - more than half of those born in the 1980s and 1990s acquire their first experience of living together without registering their relationship. Thus, in Russia, as in all developed countries, the overall level of fertility depends not only on the behavior of partners who have registered their marriage, but also, to a large extent, on the reproductive decisions of those couples who, for whatever reason, do not register their union. At the same time, current Russian family policy apparently sends stimulatory signals only for traditional marriages.

Estimates made on the basis of current registration of births, as well as the Microcensus of 1994 and the National Population Censuses of 2002 and 2010, indicate that if, in the early 2000s, an increase in the intensity of births within wedlock was accompanied by an increase in births out of wedlock, then in the second half of the 2000s the rise in births outside a registered marriage

practically stopped. There were 0.65 births per woman not in a registered marriage in 1993-1994, 0.74 in 2002-2003 and 0.75 in 2011-2012. This halting of the growth of out-of-wedlock births and the increase of in-wedlock births have led to a decline in recent years in the proportion of children born out of wedlock in the total number of births: in 1980 the proportion was 11%, in 1990 15%, in 2000 28%, in 2005 30%, in 2010 25%, in 2012 24% and in 2013 23%. It must be noted that the currently increased fertility is observed, first of all, in those developed countries where the number of out-of-wedlock births is large (about one live birth per woman or even more) and their contribution to total fertility is high (close to 50% or even higher).

Even with the positive developments of recent years, the net reproduction rate of 0.813 observed in 2013 indicates that, taking into account mortality, the current level of fertility provides only an 81% replacement of the current generation of mothers. Practically, this means that if, over the next two or three decades, the currently observed patterns of period fertility and female mortality do not change, each subsequent generation will be 20% smaller than the previous one.

In Russia, fertility level among different ethnic groups varies, although the differences are gradually being smoothed out. Fig. 8 shows the number of children born to women aged at the time of the 2010 Census 25-29 years and 30-34 years for the 20 largest ethnic groups accounting for more than 92% of Russia's population.

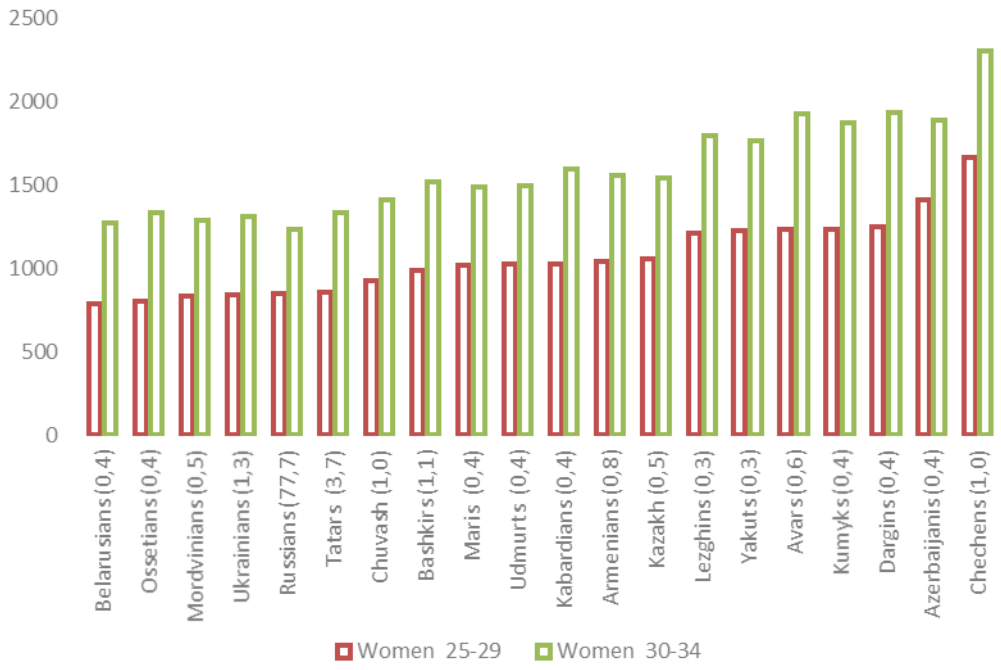

Figure 8. Number of births to 25-29 and 30-34-year-old women of the 20 largest ethnic groups (columns, per 1000 women) and proportion of respective groups in Russia's population (in parentheses, percent)

Source: Rosstat (2010). 2010 All-Russia Population Census. URL: http://www.gks.ru/free_doc/new_site/perepis2010/croc/perepis_itogi1612.htm (accessed: 08.08.2014)

Recent positive developments include a steady reduction in the number of abortions in Russia over the last 20 years (Fig. 9), which more and more are being replaced by modern methods of birth control. From 1988 to 2013, both absolute numbers and abortion rates (per 1,000 women

of reproductive age) declined by 4.5 times. The average annual decline in the abortion rate was 6%, while in the 1990s this figure decreased faster than in the 2000s. Since 2010, its decline has slowed even more, although the abortion rate is still much higher than in most European countries. In Russia there are 53 abortions per 100 births (2013), as compared with the average of 27 abortions in 53 countries of the WHO European Region (2012) and 22 abortions in the European Union (2012). The abortion rates in Belgium, Germany, the Netherlands and Switzerland are 3.5-4 times lower than in Russia.

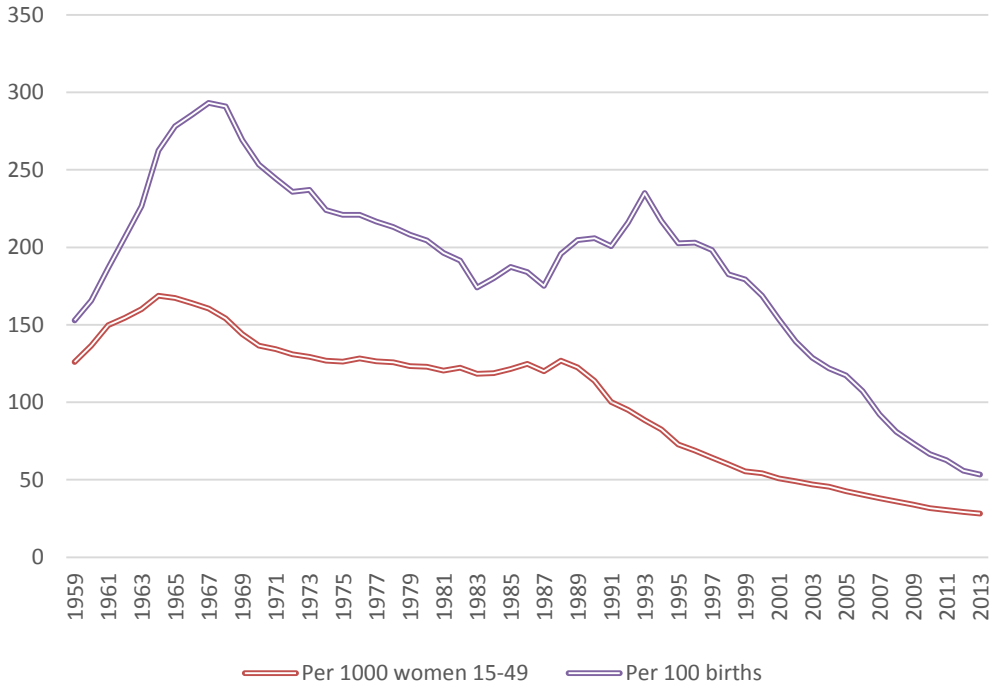

Figure 9. Annual number of abortions per 1,000 women of reproductive age and per 100 births

3. MORTALITY AND LIFE EXPECTANCY

Another important positive trend of recent years is the reduction in mortality and the consequent decrease in the absolute number of deaths, which has also contributed to the restoration of the natural increase of population of Russia. That contribution could have been even greater if not for the changes in the age and sex composition of the population of Russia, which in the last 10 years, in terms of the dynamics of deaths, have been unfavorable. If the population, age and sex composition in 2013 were the same as in 2003, the reduction in the number of deaths would have been not the actual 494 thousand, but 748.5 thousand, or 1.5 times bigger.

In the future, the adverse impact of the age composition on the number of deaths, regardless of the dynamics of age-specific mortality rates, will increase. In the 2000s, Russia has experienced an unusual suspension of aging and even a reduction in the number of older people with higher mortality, which has slowed down the increase in the number of deaths. Starting in 2001, those turning 60 belonged to small generations born in 1941 and subsequent years. As a result, the number of elderly people aged 60 and older dropped during 2002-2005 from 27.1 to 24.5 million

people, or by 9.6%. However, these favorable short-term changes are transient and, in the long term, cannot compensate for structural effects of aging that promotes growth in the number of deaths. Since 2006, the number of elderly has been increasing, reaching 27.2 million people by 2013, and this growth will continue.

A more complete understanding of the dynamics of mortality is given by an analysis of changes in life expectancy which are independent of the age structure (Fig. 10). Life expectancy has been growing continuously since 2004; in 2013, it was higher than in 2003 by 6.61 years for men, 4.46 years for women and 5.93 years for both sexes combined.

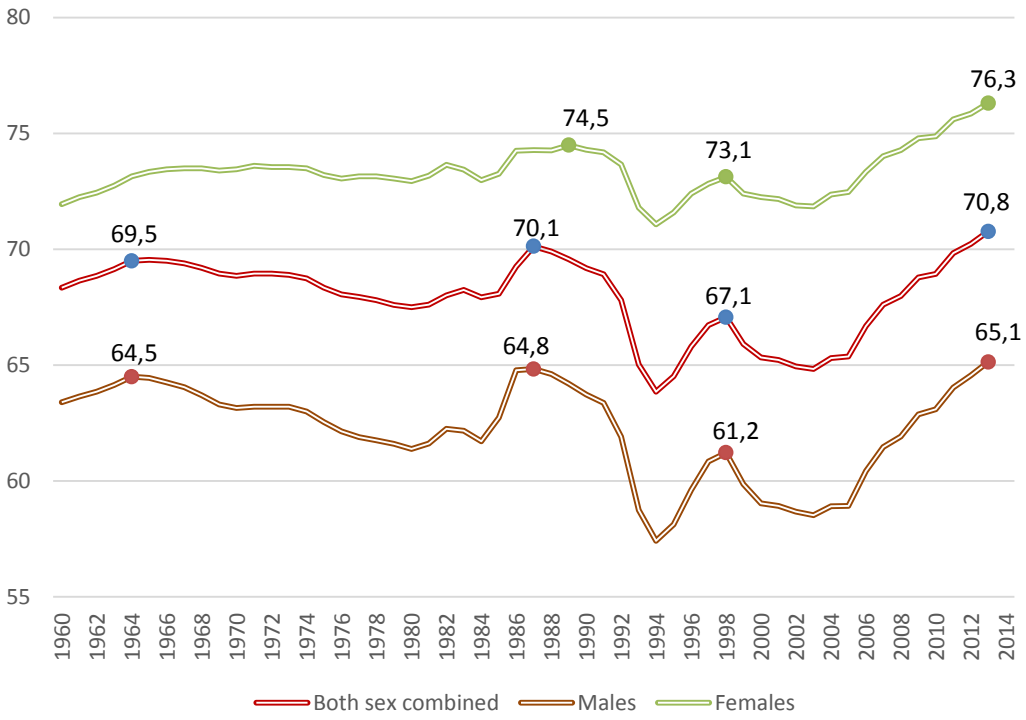

Figure 10. Life expectancy at birth, years

In assessing the achievements in the growth of life expectancy of Russians over the past decade, it should be kept in mind that this indicator has been subject to strong fluctuations over a lengthy period of time. For half a century, Russia has been unable to solve the problem of a sustainable return to its own best achievement, of the mid-1960s. This achievement was repeated and even somewhat surpassed only once, and for only a very short time, in the late 1980s, after which it again fell sharply. The current growth in the life expectancy comes on the heels of a deep fall and has, in essence, a restorative character.

As a result of this growth, the previous high (attained in 1989) was exceeded in 2009 for the first time for women, and in 2012 the previous maximum (reached in 1987) was exceeded for both sexes combined; in 2013, life expectancy of men for the first time exceeded 65 years, surpassing the previous maximum of 1987.

Overall, the growth in life expectancy since 2003 can be characterized as a recovery or reversal, and there is hope that in the next few years it will finally become possible to break away

from the level that has been reached three times over the past 50 years, but which has never been maintained.

This level in itself is quite low. In terms of life expectancy Russia lags behind all developed countries, and this gap is growing, with respect to some countries exceeding 10 or, for men, even 15 years (Fig. 11).

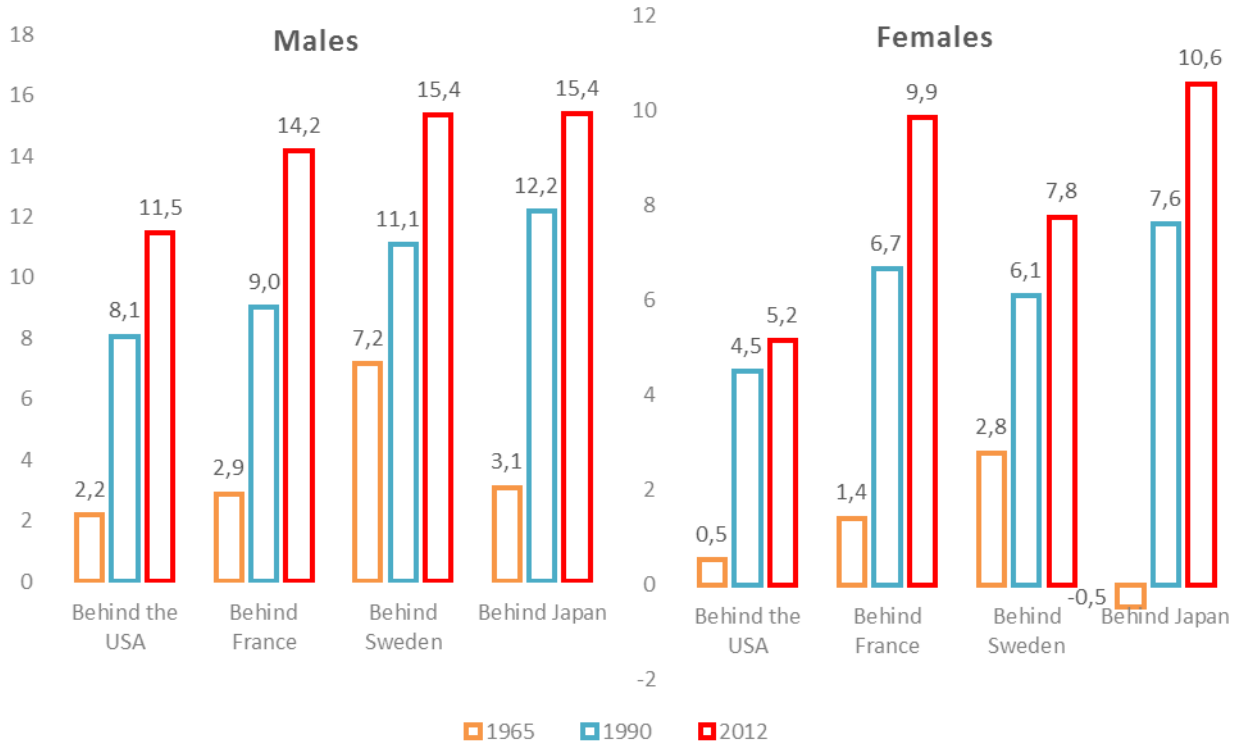

Figure 11. Lag in Russian life expectancy at birth behind the United States, France, Sweden and Japan in 1965, 1990 and 2012 (for the United States and France - 2011), years

During the entire period after 2003, there was a reduction in mortality at all ages and from almost all causes of death. But both of these favorable trends also point to the restorative nature of the favorable changes of the last ten years.

As follows from Fig. 12, for the whole period from 1990 to 2013 the contribution of the *decline* in mortality to the *increase* in life expectancy, disaggregated by major age groups, was very close in size to the contribution of the *increase* in mortality in the same age groups to the *decline* in life expectancy, particularly among men; in other words, there was to a large degree simply compensation for what had been lost. A clear increase among both men and women could be seen only in the children's group (under age 15) and, to a lesser extent, among the elderly (aged 65 years and older). In the key group of 15-44 years, neither for men nor women was there success even in compensating for the years lost during the periods in which life expectancy had fallen.

A similar picture is given by the disaggregation of the contributions of the increase and decrease of mortality from the major causes of death to changes in life expectancy (Fig. 13). In good years, the decrease of mortality from specific causes positively affected life expectancy, but

these positive developments only compensated for previous losses of life expectancy due to increased mortality from the same causes. The situation is noticeably better among women, where there was a clear gain from the reduction of mortality from diseases of the circulatory system. But in general, even when there is a gain, it is very small.

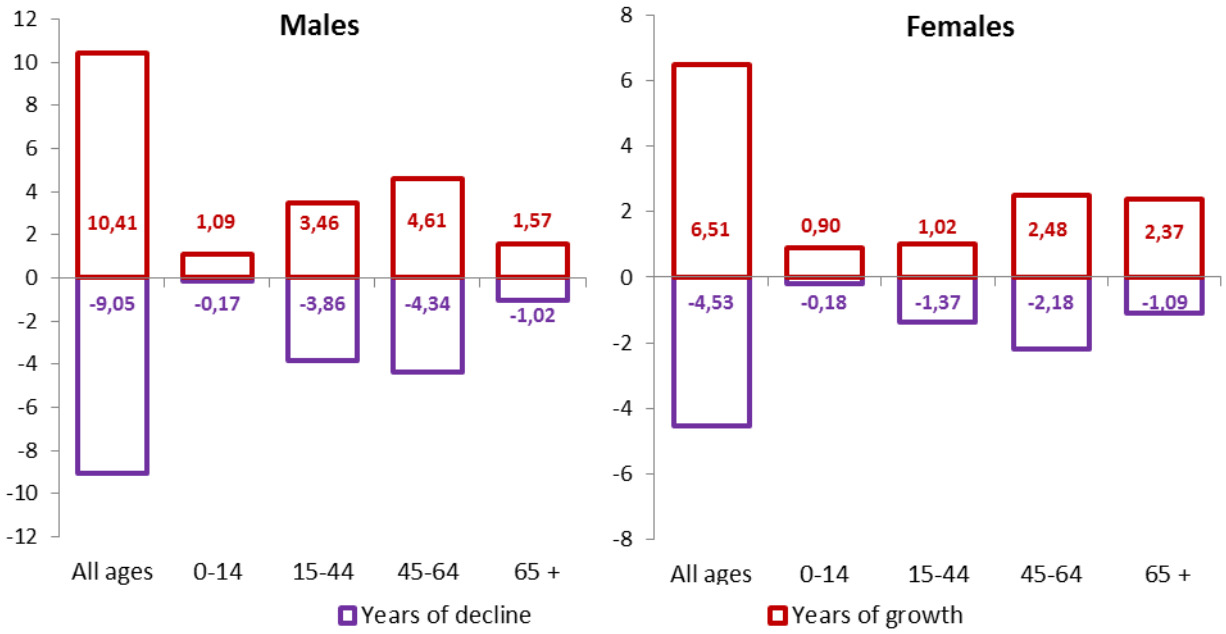

Figure 12. Contribution of major age groups to the fall and rise of life expectancy in 1990-2013, years

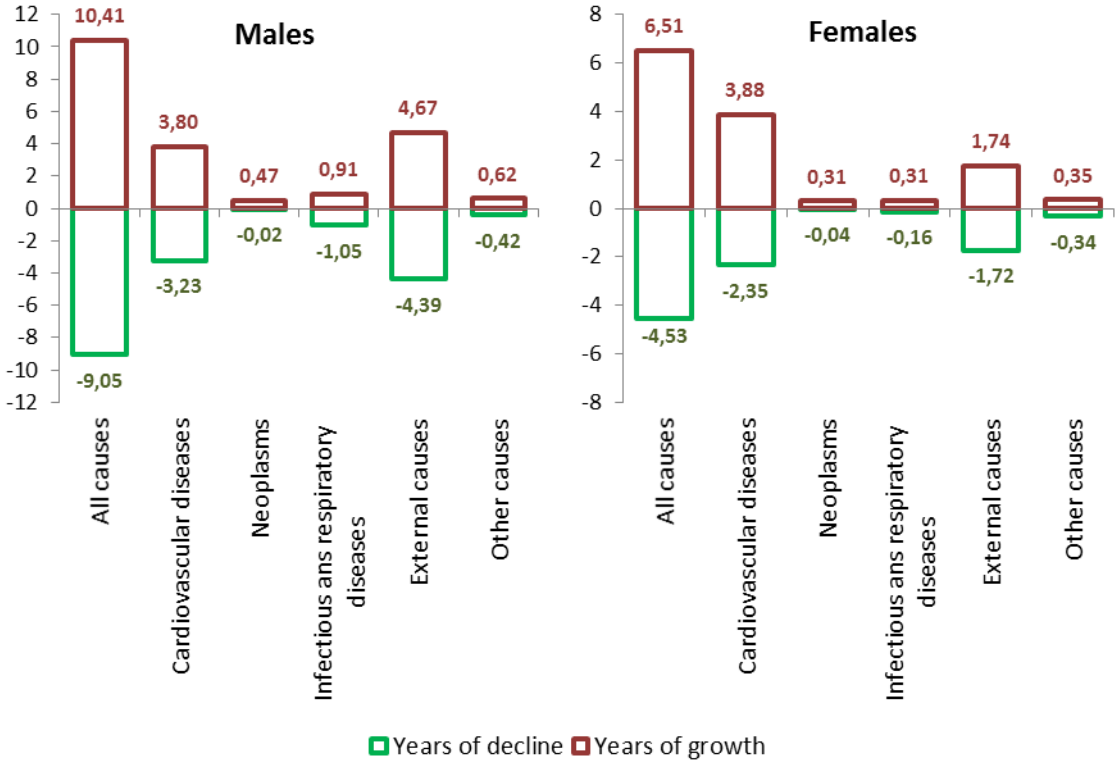

Figure 13. Contribution of major causes of death to the fall and the rise in life expectancy in 1990-2013, years

Thus, the decline in mortality over the last decade has allowed a return to the previously achieved milestones, from which the country can move ahead in reducing the huge accumulated gap between Russia and most developed countries.

4. POPULATION DISTRIBUTION AND INTERNAL MIGRATION

Russia's population is very unevenly distributed across the territory of the country (Table. 1). The Asian part of the country, which occupies nearly 3/4 of its territory, is home to only one out of five Russians. In the Central Federal District, which occupies less than 4% of the territory, lives 27% of the population. The most densely populated areas are the historical core of Russia and the North Caucasus, but even here the population density is at most half that in the European Union (116 inhabitants per km^2), roughly corresponding to the density of Northern Europe (55 inhabitants per km^2). In terms of population density, the European part of the country is comparable to the United States (33 inhabitants per 1 km^2), while its Asian part is closer to Australia and Canada (about 3 inhabitants per km^2).

Table 1. Permanent population and territory of the Federal Districts of the Russian Federation at the beginning of 2014

	Population		Territory		Population density, inhabitants / km^2
	Thousands	Percentage	Thousands km^2	Percentage	
Russian Federation	143666,9	100	17 098,2	100	8,4
Federal Districts:					
Central	38819,9	27,0	650,2	3,8	59,7
North-western	13800,7	9,6	1 687,0	9,9	8,2
Southern	13963,9	9,7	420,9	2,5	33,2
North Caucasian	9590,1	6,7	170,4	1,0	56,3
Volga	29738,8	20,7	1 037,0	6,1	28,7
Ural	12234,2	8,5	1 818,5	10,6	6,7
Siberian	19292,7	13,4	5 145,0	30,1	3,7
Far Eastern	6226,6	4,3	6 169,3	36,1	1,0
European part of Russia	114601,2	79,8	4 319,8	25,3	26,5
Asian part of Russia	29065,7	20,2	12 778,5	74,7	2,3

Source: Rosstat (2014). Population Size and Migration in the Russian Federation in 2013. Statistical Bulletin.

The uneven distribution of the population of the country is partly due to climatic conditions – about 70% of the territory of Russia lies in the Far North and comparable regions ill-suited for permanent living. But there is an additional impact of limited demographic resources. The population of Russia, though in itself not small, is still not big enough to populate such a huge territory. Lately, the situation has been worsened by unfavorable trends in inter-regional migration.

Throughout the 20th century, the dominant trend of settlement was a regulated – sometimes using very harsh measures – population shift to the north and the east and, to a lesser degree, to the south. The share of Russians living in the Asian part of the country grew, from 13.3% in 1926 to 21.8% in 1989. In the 1990s and 2000s, a reverse trend has prevailed – a displacement of the population from the northeastern regions of the country towards the southwest. Overall, in the period between the censuses of 1989 and 2010 the populations of the Asian and European parts of Russia decreased by almost 10% and 0.9%, respectively As a result, the share of the Asian part in the population of Russia fell to 20.3%.

The general thrust of internal migration flows over the past two decades has been dubbed "westward drift". Its scale reached its maximum in the mid-1990s. According to current registration data, the eastern regions of the country were losing about 150 thousand people annually. As a result, some regions lost a significant proportion of their inhabitants: the population of Chukotka fell by more than half, the population of the Magadan region fell by 40%, and in a number of other regions the losses came to a few dozen percentage points. The departure of the population was stimulated not only by economic reasons; a large role was also played, for example, by the reduction of the army in the east of the country.

The reduction of the westward drift in the 2000s was associated with a decrease in the migration potential of the Far East; Siberia continued to lose population. At the same time, the need for migrants in the largest metropolitan areas of the European part of the country increased, which led to a growing outflow from the Volga region and to a redistribution of the population within the Western part of the country. There remain only few regions that can "hold" the population (with "zero" or positive balance of internal migration flows), even in the European part of the country.

The weakening of the "westward drift" in the 2000s occurred primarily due to the reduction in the exodus from the Far East (Table. 2), but judging by the indicators in the last three years, it is again increasing. Data from the 2002 and 2010 censuses show that the extent of the westward drift is underestimated by current records. The apparent increase in the statistically recorded population outflow from Siberia and the Far East is due to a better recording of inter-regional migration rather than to a real new wave from the east.

Table 2. Western drift in the years 1991-2013, annual average, thousands of persons

Period	Migratory increase (decrease) of:					
	Districts of the European part in exchange with districts of the Asian part of the country	Ural District in exchange with districts of the European part of the country	Siberia in Urals district in exchange with districts of the Asian part of the country	Siberian to the European part	Siberian in exchange with the Far East	The Far East in exchange with districts of the European and Asian parts of the country
1991-2000	92,9	-14,2	6,8	-29,5	10,9	-67,0
2001-2010	56,3	-8,6	4,5	-28,9	2,1	-25,4
2011	73,6	-6,2	8,1	-43,2	2,5	-32,4
2012	80,4	-5,4	7,1	-39,6	3,1	-36,0
2013	107,8	-21	4,6	-54,9	2,8	-39,3

Source: Rosstat (2014). Population Size and Migration in the Russian Federation in 2013. Statistical Bulletin.

Note: Central, North-Western, Southern, North Caucasus, Volga*
*** Ural, Siberian, Far East*

A two-fold increase in the redistribution of the population between the Federal Districts – 268 thousand people in 2013 versus 134 thousand on average per year for the years 2001-2010 –

occurred as the result of a more than two-fold growth in the scale of counter-migrations between large parts of the country. In 2010, 74.4 thousand people moved from the European part of the country to the Asian part, whereas in 2013 it was 170.9 thousand – that is, the flow increased by 2.3 times. 139.3 thousand people moved in 2010 from the Asian part to the European part, while in 2013 the flow reached 278.7 thousand. Similarly, the counter-flows between all the federal districts doubled.

As a result, the statistically recorded flow of migrants from the Asian to the European part of Russia, which had shrunk in the 2000s, in 2013 returned to the 1990 level (Fig. 14), but the simultaneous flow in the opposite direction is only 78% of the level in 1990. This casts doubt on the possibility of stopping the outflow of population from the regions of Siberia and the Far East, as was expected to happen by the end of the second phase (2021) of the implementation of the Concept of the National Migration Policy in the Russian Federation[2]. Formally, the migration balance of Siberia and the Far East can be reduced to zero, but more likely due to the influx of international migrants compensating for the departure of the population to the west of the country.

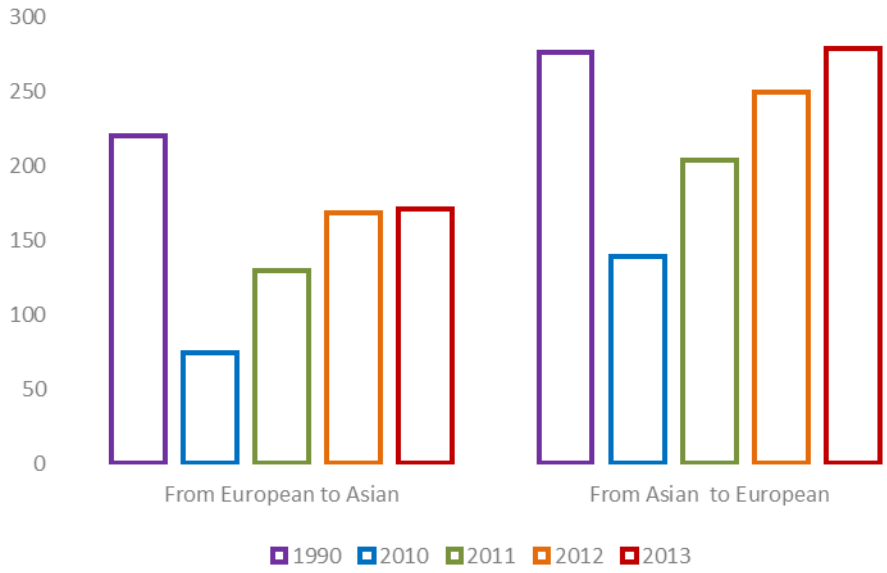

Figure 14. Number of in-migrants to the European and Asian parts of the country, thousands

The main center of attraction for internal migrants in Russia is Moscow and the Moscow Region (the capital region), forming a single labor and housing market. The population growth in this region due to internal migration, according to the census data of 2002 and 2010, comes to nearly 4 million persons since the beginning of the 1990s. If these trends are maintained – a possibility suggested by current trends as well as by plans for developing the territory of Moscow – then within the present decade the inflow of population will reach at least 1.5 million people. The capital region attracts people from all across the country, but most intensively from its European part.

With respect to internal migration, the second center of prime national importance, lagging though far behind the Moscow Region, consists of the city of St. Petersburg and the Leningrad

[2] Approved by the President's Decree from 13 June 2012.

region, where the total increment can be estimated at approximately 700 thousand people over two decades. The "Second Capital" also attracts people from all over Russia, but almost a third of migration increase is provided by the northwestern regions and another 40% by the eastern regions.

A stable center of attraction of migration is the Krasnodar Region, which has boosted its population since the early 1990s by about 0.5 million people due to the influx of migrants from other parts of the country – primarily from its Asian part, as well as from the North Caucasus.

Other centers of attraction of migrants are less important (Table. 3). In recent years, the Tyumen and Sverdlovsk regions in particular stand out as centers of attraction.

Table 3. Main centers of attraction of migration in Russia, 1991-2012

Centers	Increase due to internal migrations, thousand persons (estimate)			
	1991-2000	2001-2010	1991-2010	2011-2012
Moscow and Moscow Region	1860	1890	3750	305
St. Petersburg and Leningrad Region	200	500	700	101
Krasnodar region	300	200	500	54
Novosibirsk Region	25	25	50	19
Belgorod region	75	55	130	7
Tatarstan	50	35	85	6
Kaliningrad Region	30	15	45	5
Nizhny Novgorod Region	20	10	30	2
Samara Region	70	40	110	0
Stavropol Region	165	50	215	-3

Source: estimates based on current records of the population and 1989, 2002 and 2010 population censuses.

Due to internal migrations, the population of largest and large cities and their agglomerations is growing, while rural areas and small and medium-sized cities are losing population. As a result, not only the structure of the population is changing in the outflow areas, but the basis for its further reproduction is shrinking. In contrast, large cities and regional urban centers, including the most attractive ones for migrants, are receiving additional boosts from young people coming from the periphery.

Migration involving relocation (change of place of permanent residence), data for which is included in Russian official statistics, is closely linked with temporary migratory moves occurring mainly for labor purposes. Estimates of the magnitude of temporary labor migration vary. According to some estimates, in modern Russia regular migrant labor ('*otkhodnichestvo*') supports 15-20 million families, and there are areas where up to 80% of the population engage in such work [Plyusnin 2012]. According to the Employment Survey,[3] in 2012 the number of people working outside their region attained 2.3 million. If we exclude from consideration daily commuting, the number of temporary migrant workers reached 1,563,000, 19% of whom returned home once a week, 39% 1-2 times a month, and 42% less than 1 time per month. A similar number of migrants working outside their regions of permanent residence is shown by the results of the 2010 census. According to this (conservative) estimate, 1.4% of the Russian population aged 15-72 years old, or 2.2% of the employed population, has been involved in labor migration.

[3] In accordance with the requirements of the International Labour Organization, Rosstat conducts quarterly household surveys.

Unlike long-term migration, whose flows are balanced in terms of gender, temporary labor migration mostly involves men. According to the Employment Survey, among labor migrants in Russia 83% are men and 17% are women. The maximum proportion of migrant workers in the total employed population is in the 20-24 and 25-29 age groups, where it is 5.1% and 4.5%, respectively. The predominance of men in the flows of migrant workers is particularly pronounced at the mean working ages, when women bear the main burden of housework and childrearing. Among migrant workers there are more people aged 30-50 than among those who change their place of permanent residence.

Among migrants, the proportion of people with higher education is smaller than in the general population, while the proportion of those with a primary and general secondary education is higher. Forty percent of migrant workers are employed in construction, a significant proportion in mining, and there are lots of guards. Migrant women are particularly noticeable in retail trade, hotel and restaurant services, as well as in construction. At the same time, migrant workers are few in such industries as agriculture and manufacturing, government, education and healthcare. Russian migrant workers, in comparison with other Russian workers, are less often found in management positions and in positions not requiring qualifications such as "cleaners". Apparently, this last niche is occupied by foreign migrants, because of, among other things, low wages.

5. EXTERNAL MIGRATION

Despite the importance of today's internal migrations in Russia, they have not for a long time played the key role they had in the middle of the twentieth century, when the country was experiencing rapid urbanization and developing new regions, giving rise to new points of growth and attraction for migrants. Tens of millions of people went on the move. In contrast, external migration, if meant as including the exchange of populations between Russia and the former Soviet republics, after the collapse of the Soviet Union acquired a meaning for Russia which it had never had before.

International migration is a multidimensional phenomenon with serious economic, social and political importance, but the analysis of these aspects falls outside the scope of this report, which is devoted to the evolution of the demographic situation in the country and views migration primarily as an important means of replenishing the demographic resources of Russia. This is a new role of international migration for our country, which came to the fore in the last two decades, during which the influx of migrants has played an important stabilizing role in terms of the dynamics of Russia's population.

This role of migration is likely to continue in the foreseeable future. For demographic reasons, Russia will hardly be able to refuse to accept migrants. Besides, this will be impossible also for economic considerations tied, in particular, to the features of the population age structure discussed above.

5.1. IMMIGRATION

Migratory movement consists of two counter-flows: immigration and emigration. Currently, immigration gets the most attention in Russia. We have already mentioned its important contribution to the mitigation of the consequences of natural population decline. At the same time, when evaluating the present and future of external migration it is necessary to take into account the specificity of migrations of the last two decades which are in many respects unique.

Above all, the uneven distribution of net migration by stages in the period under consideration should be noted. Of the 8.4 million people making up the net positive migration during 1990-2013, 3.6 million (43%) came from the migration spike of 1993-1998. In the following years net migration fluctuated, but was generally substantially smaller.

In addition, the immigration of the 1990s, and to a large extent of the 2000s, consisted essentially of "return migrants" or, in other words, of repatriation of "compatriots". This characterization can be confirmed by the ethnic composition of migrants, which has been recorded until 2007. Among the migrants who moved to Russia in the 1990s and 2000s, most were natives of Russia or their descendants. This began to change noticeably only in the second half of the 2000s. If in 1997 they accounted for 70% (including 62% of ethnic Russians), in 2007 the figure was only 37% (30%).

During the first post-Soviet decade, foreign populations of ethnic Russias provided the large potential for in-migration and balanced the natural population decline. Consequently, this potential shrank abruptly. In the future, maintaining such migration inflow will be much harder, since new generations of in-migrants will, in the process of integration, have to overcome a much greater cultural gap than in the past.

Yet the situation is somewhat mitigated by the fact that, despite the changing ethnic composition of migrants, the vast majority of them still come from former republics of the USSR (Table 4).

Some migration from the CIS countries was implemented as part of a government program to promote resettlement of compatriots. Altogether, in 2013 35 thousand people came to the Russian Federation within the framework of this program (in 2012 – 55 thousand.). The total number of participants in the program since its inception in 2007 increased to almost 150 thousand, which is considerably lower than expected.

All of the above applies to permanent (long-term) migration, which is factored in the size of the resident population. But Russia's international migration exchange consists of two components: permanent migration and temporary displacements presuming the return of migrants to their country of origin. Temporary migration is not included in the balance sheet of movements of Russia's permanent population. However, temporary labor migration has a significant impact on socio-economic development, and many problems that emerged in Russia in connection with the influx of migrants are due to this particular part of the migratory flow.

There are serious unresolved problems of keeping records of both permanent and temporary migrants, and of comparability of time series arising from changes in the criteria of attribution to different migrant categories, etc. Therefore, official estimates of Rosstat, which are

generally used in this report, are not free of drawbacks. This especially concerns, as will be shown later, estimates of emigration to the countries outside the former Soviet Union (Germany, Israel, the US and other countries.). Yet these estimates nonetheless give an idea of the main directions and composition of migration flows, and of some important characteristics of migrants.

A summary indicator of migratory movements is provided by net migration, which is the difference between the flows of immigrants and emigrants. In the calculation of net migration, it is assumed that the fluctuations in the statistics for each of the two streams, caused by changes in the rules of recording migrants, are eliminated.

Table 4. International migration in Russia in 2011-2013, persons

	2011			2012			2013		
	Immigration	Emigration	Net migration	Immigration	Emigration	Net migration	Immigration	Emigration	Net migration
Total Russia	***356 535***	***36 774***	***319 761***	***417 681***	***122 751***	***294 930***	***482 241***	***186 382***	***295 859***
CIS countries	***310 549***	***22 568***	***287 981***	***363 955***	***95 572***	***268 383***	***422 738***	***147 853***	***274 885***
Azerbaijan	22 316	1 255	21 061	22 287	4 185	18 102	23 453	6 207	17 246
Armenia	32 747	1 000	31 747	36 978	4 980	31 998	42 361	10 182	32 179
Belarus	10 182	2 622	7 560	16 564	6 315	10 249	15 748	12 031	3 717
Kazakhstan	36 474	6 176	30 298	45 506	8 843	36 663	51 958	11 802	40 156
Kyrgyzstan	41 562	976	40 586	34 597	10 489	24 108	30 388	10 576	19 812
Moldova	19 578	771	18 807	23 594	4 949	18 645	28 666	8 038	20 628
Tajikistan	35 087	1 070	34 017	41 674	10 281	31 393	51 011	17 362	33 649
Turkmenistan	4 524	191	4 333	5 442	1 555	3 887	5 986	2 165	3 821
Uzbekistan	64 493	2 207	62 286	87 902	31 559	56 343	118 130	50 864	67 266
Ukraine	43 586	6 300	37 286	49 411	12 416	36 995	55 037	18 626	36 411
Other countries	***45 986***	***14 206***	***31 780***	***53 726***	***27 179***	***26 547***	***59 503***	***38 529***	***20 974***
Including:									
Abkhazia	2 429	175	2 254	2 487	951	1 536	3 001	992	2 009
Vietnam	3 294	95	3 199	3 653	1 258	2 395	3 852	2 355	1 497
Germany	4 520	3 815	705	4 239	3 781	458	4166	3979	187
Georgia	7 325	416	6 909	7 728	801	6 927	7 665	1 553	6 112
Israel	1 240	977	263	1 091	1 104	-13	1132	1090	42
India	1 390	43	1 347	1 068	931	137	1451	1146	305
China	7 063	507	6 556	8 547	4 358	4 189	8 149	7 527	622
North Korea	1 948	152	1 796	4 168	1 603	2 565	5 023	3 891	1 132
Latvia	1 350	181	1 169	1 427	431	996	1484	556	928
USA	947	1 422	-475	1 122	1 561	-439	954	1485	-531
Turkey	1 832	252	1 580	2 252	1 037	1 215	2 755	1 494	1 261
Estonia	1 588	266	1 322	1 537	613	924	1475	726	749
The rest of the world	11060	5905	5155	14407	8750	5657	18396	11735	6661

Source: Rosstat (2014). Population Size and Migration in the Russian Federation in 2013. Statistical Bulletin.

However, the problem of the quality of record-keeping when shifting to an index of net migration has not been fully resolved. This can be seen from the significant discrepancies between the estimates of net migration from current registration and population censuses.. Net migration for the period between the censuses of 1989 and 2002, calculated on the basis of census data, exceeded net migration based on data from current records by more than 1.5 million people. For the period of 2003-2010, the total stood at 1.2 million people.

Fig. 15 shows the number of those leaving Russia and arriving in Russia for a long period of time, according to an official assessment by Rosstat, taking into account post-census corrections.

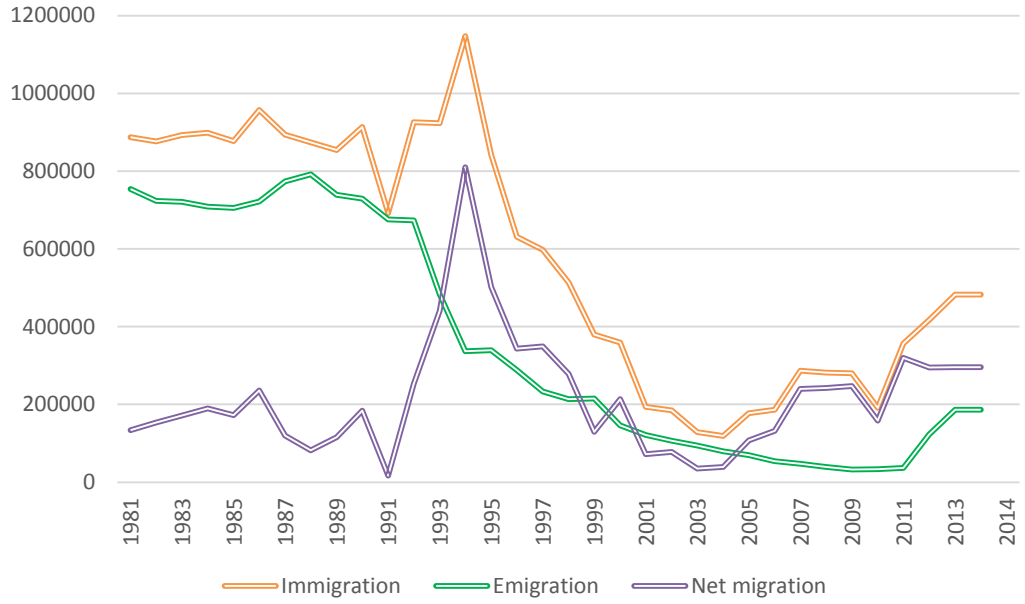

Figure 15. Immigration, emigration and net migration, Russia 1980-2014, thousands

As noted, former Soviet republics remain the main source of population inflow into Russia. In the 1990s, the proportion of immigrants from the former Soviet space in the overall flow of immigrants was, as a rule, in the interval of 96-97%. Now it has diminished somewhat, but has never dropped below 90%. Fig. 16 presents the data on annual arrivals in Russia according to year and, beginning in 1997, from largest source countries.

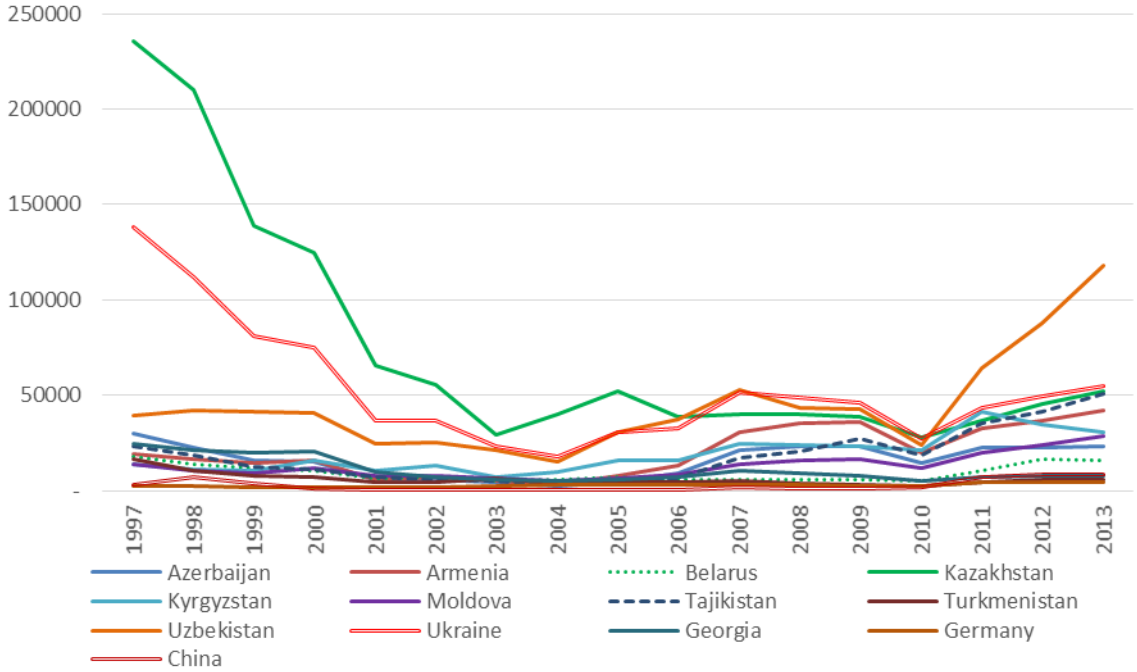

Figure 16. Immigration from countries with which Russia has the most intense migration exchange, 1997-2013, thousands

Temporary migration to Russia may have various causes (e.g. education, medical treatment, tourism, etc.), but its main streams are work-related.

In 2013, the Russian migration authorities issued about 3 million work permits for nationals from 141 countries (Table 5). But even greater was the number of foreigners working without such permission, i.e. illegally. According to some experts and executives of the Federal Migration Service, there were 3-5 million such people.

Table 5. Main indicators of recorded international labor migration to Russia in 2010-2013, thousands

Category	2010	2011	2012	2013
Annual quota	1944	1746	1746	1746
Total work permits issued	863.0	1219.8	1403.6	1368.3
Including:				
Foreigners requiring an entry visa	203.7	204.7	220.3	204.7
Foreigners not requiring an entry visa	659.4	1015.1	1183.4	1163.5
Skilled specialists	-	-	44.1	129.4
Highly skilled specialists	3.1	11.3	11.8	26.3
Work licenses issued	156.9	862.4	1283.4	1537.8
Total number of documents giving the right to work	1330.0	2093.5	2698.8	2932.4

Source: Russian Federal Migration Service (FMS).

Most migrant workers are citizens of CIS countries with visa-free entry into Russia. Their share among those receiving ordinary work permits in 2013 increased to 85% (in 2007 – 72%). The share of work permits received by citizens from visa-free countries came to about 93%, including licenses to seek work in private households. Citizens of 12 countries, listed in Table 6, accounted for nearly 97% of the total in-flow of migrants with work permits. The undisputed leader is Uzbekistan, whose share in 2013 accounted for about 44% of all work permits issued. Since 2010, the number of migrant workers from that country has increased three-fold. At the same time, the number of migrants from China, Vietnam, Turkey and Azerbaijan since 2008 decreased by a factor of 2 or more.

Table 6. Number of foreign nationals who received ordinary work permits in Russia, 2008-2013, thousands

Country	2008	2009	2010	2011	2012	2013
Total	1353.9	1060.2	864.2	1220.0	1403.6	1368.3
including:						
Uzbekistan	390.3	320.7	289.7	472.3	588.6	600.8
Tajikistan	213.0	171.2	134.6	199.6	218.1	197.0
Ukraine	117.8	101.6	86.8	127.8	151.2	152.0
Kyrgyzstan	105.5	71.8	58.5	82.7	91.5	95.1
China	168.8	128.8	117.8	93.2	97.0	87.5
Moldova	60.5	48.1	34.9	54.6	60.0	57.3
Armenia	51.0	37.3	30.7	45.9	46.1	40.6
Turkey	67.1	30.8	25.1	25.5	36.6	36.1
North Korea	17.7	18.6	19.8	21.6	26.3	29.9
Azerbaijan	38.8	28.0	19.1	26.46	26.54	19.7
Vietnam	48.7	44.2	17.8	14.7	14.8	12.1
Serbia			6.5	7.5	10.2	12.1
Other	74.7	59.1	22.9	48.14	36.66	28.1

Source: Russian Federal Migration Service (FMS).

In recent years, the proportion of men and persons of working age, which was probably due to the general change in the character of migration. Instead of the repatriation of the 1990s, with its strong family component, comes the economic migration of young workers. The

proportion of working-age persons among migrants is almost a quarter higher than in the population of Russia (tab. 7).

Table 7. The age and sex composition of immigrants in Russia (as % of the total number of migrants)

Age	1994	2002	2010	2013	Population of Russia. 2013
Total	100.0	100.0	100.0	100.0	100.0
Under working-age	23.4	16.0	10.5	7.4	16.8
Working-age	66.1	65.6	79.6	84.3	60.1
Over working-age	10.5	18.4	9.9	8.3	23.1
Men total	…	46.9	55.1	63.7	46.3
Under working-age	…	8.3	5.5	3.9	8.6
Working-age	…	33.1	46.9	57.4	31.1
Over working-age	…	5.5	2.7	2.4	6.6
Women total	…	53.1	44.9	36.3	53.7
Under working-age	…	7.8	5.0	3.5	8.2
Working-age	…	32.4	32.6	26.9	29.0
Over working-age	…	12.9	7.2	5.9	16.5

Source: Rosstat (2014). Population Size and Migration in the Russian Federation in 2013. Statistical Bulletin.

Under the influence of the same factors, the educational composition of migrants is also changing. Compared with the beginning of the 2000s, the proportion of people with higher and secondary professional education decreased, but the proportion of persons with general secondary and basic vocational education increased. If in the 1990s and early 2000s the level of education of migrants was, on average, higher than among the population of Russia, recently the situation has changed, and the level of education of migrants is lower than of Russians.

5.2. EMIGRATION

A new phenomenon of the post-Soviet decades has been large-scale emigration from Russia, mainly to countries beyond the CIS. Unfortunately, the quality of record-keeping for emigration in Russia is even worse than for immigration. Russian emigration statistics are imperfect, Russian data on emigrants differ significantly from estimates obtained on the basis of foreign sources, which testifies to a considerable underestimation of the scale of emigration by Russian statistics. Thus, in 2011-2012 the total outflow from Russia according to national data of 11 countries was 9 times higher than that according to Russian statistics (Table 8). In addition, Russian data do not fully reflect the geography of modern emigration. In particular, they do not show the noticeable increase in such centers of attraction for Russians as Spain, Italy, Austria, Switzerland, France, the United Kingdom and the Czech Republic.

In addition to permanent emigration, there is also temporary labor migration of Russians to foreign countries. According to Federal Migration Service of Russia (FMS) data, in 2012 65 thousand Russian citizens found jobs abroad. However, these data are likely incomplete. Most Russian citizens employed abroad find work on their own, without the help of organizations reporting to the FMS, and are far from consistently included in its records.

Table 8. Emigration from Russia according to Russian and foreign sources, 2011-2012, thousands

Countries	Number of emigrants according to Rosstat	Immigration from Russia according to foreign data	Ratio: Col. 3/ Col. 2
Austria	0.2	8.4	42
Canada	1.0	3.8	3.8
Denmark, Norway, Sweden	0.7	10.1	14.4
Finland	1.1	13.4	12.2
Germany	7.6	40.4	5.3
Israel	2.1	7	3.3
Italy	0.7	11.9	17
Netherlands	0.1	4.7	47
Spain	0.8	31.4	39.3
Switzerland	0.2	6.7	33.5
United States of America	3.0	20.3	6.8
Total	17.5	158.1	9

Source: Federal State Statistics Service (Rosstat); National statistical offices.

* * *

In general, despite a number of positive trends in recent years, the demographic situation in Russia remains acute and contains a number of potential risks. Although some of the challenges facing the country in this regard can, in principle, be met by further improvement of demographic indicators – particularly mortality and life expectancy – by more flexible immigration policy, the dynamics of population size and age composition in the next few decades will hardy be favorable. This should be taken into account when formulating the objectives of economic and social policy in the coming years.

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