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Review Article

The Riddles of Total Mortality in Russia: 1984-2018

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Abstract

Over the past 40 years in Russia there were mysterious fluctuations of total mortality. The range of amplitudes varied from 10.4‰ to 16.4‰. The number of excess victims reached 14 million people. The reasons for demographic zigzags left without understanding. The objective of the research is to identify the nature of mortality fluctuations in Russia. State demographic statistics served as the basic material for scientific research. There were used standard methods of mathematical analysis. No significant relationships were found between mortality amplitudes and traditional risk factors: smoking, hypertension, blood cholesterol, body mass index, physical inactivity, stress, poverty, and alcohol use. Therefor it was suggested an "X" factor as demographic determinant. Its properties were: high speed of synchronic propagation on vast territory, influence on most diseases, presence of positive and negative effects, age preference of middle-aged, gender selectivity in relation to men. Material agents do not have such symptoms. A hypothesis is put forward about the demographic significance of social atmosphere: aggressiveness, measured by homicide deaths, and depression, measured by suicide deaths. The correlation coefficient between them is 0,97. Half-sum of both is called the aggressive-depressive syndrome (ADS). Association of ADS with the rest of mortality had correlation coefficient 0.94 in the escalating death vector (1986-2003) and 0.96 in the descending death vector (2003-2017). This means, that at least 80% of total mortality fluctuations were caused by ADS waves of social atmosphere. Its properties correspond to the "X" factor. The sources of aggression and depression were the important socio-economic events, taken in the country. They generated the "contagious" meanings and emotions, spread through the mass media. It formed the streams of destructive or creative psychosomatic interactions. The short time between mental processes and somatic responses, including diseases, indicates the existence of ultra-rapid demographic reactions.

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- Psychosomatics

INTRODUCTION

Over the past 40 years the demographic situation in Russia has been characterized by mysterious fluctuations. At the beginning of "perestroika" (1985-87) the population's health unexpectedly improved: the frequency of new cases of major non-communicable and infectious diseases decreased [1], and mortality rate dropped from 11.6 ‰ to 10.4 ‰ (Figure 1) [2]. The reasons for this improvements remain unknown. Attempts to explain it by anti-alcohol measures were insufficient. In Eastern European countries where alcohol consumption was not restricted, the same reduction in mortality was observed [3].

After 1990 the health situation of the population began to deteriorate sharply. The incidence of diseases of the blood and hematopoietic organs increased by 86%, the genitourinary system -by 37%, the circulatory, digestive, and nervous systems -by 15-20%. The number of newly detected infectious patients increased by 25%, including tuberculosis patients -by 41% [4]. As a result, overall mortality increased by 50%, from 10.4‰ in the 1980s to 15.7‰ in 1994. (Figure 1) [2]. This incident was designated as "supermortality" [5], ranking it as the most amazing event in healthcare at the end of the twentieth century [6]. Special research was required to prove the objectivity of statistical data [7].

During 1995-98, in spite of the deterioration of socio-economic situation, the mortality rate suddenly decreased -from 15.5‰ to 13.5‰ (Figure 1) [2].

But in 1999-2003, when the rise of oil prices improved the welfare of population, the death rate began to grow up to 16.4‰ (Figure 1) [2].

On the contrary, after 2003, against the background of economic crises and going down the living conditions, the health of Russians began to improve continuously. Overall mortality decreased to 12.4‰ by 2018 (Figure 1) [2].

In total, if to compare with the death rate of 1980s (10.4‰), Russia lost more than 14 million excessively died people [8].

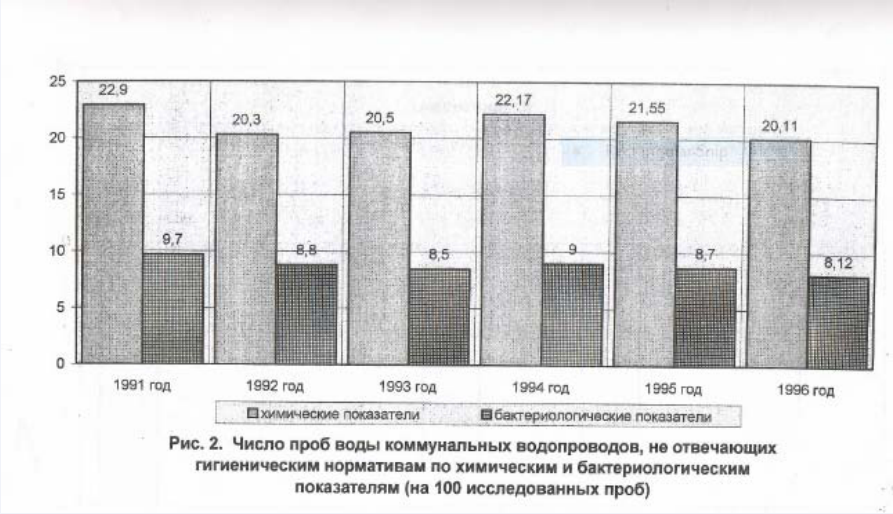

Figure 1 Dynamic of total mortality in Russia for 1980-2018.

It is surprising that over the past decades there has not been any meeting of the Russian Academy of Sciences and WHO to investigate the roots of demographic tragedy.

OBJECTIVE

To substantiate the possible causes of paradoxical total mortality fluctuations in Russia.

MATERIAL AND METHODS

State demographic statistics served as the basic material for scientific research. The method of aggregated risk (ecological study), was applied, when the objects of observation are not people, but populations (collectives, cities, countries). Standard methods of complex mathematical analysis were used.

RESULTS AND DISCUSSION

In 1990-94 during the mortality growth the State health care system maintained proper stability. Treatment of hypertension was not worsened. Due to pronounced inflation, consumption of containing cholesterol products decreased: meat - by 17%, milk - by 19%, eggs - by 12%. The content of bread, potatoes, and vegetables in food has increased, which is considered to be a healthier diet [9]. According to the prevalence of smoking habits, Russia was not the most “smoking” country [10,11]. The level of motor activity increased, as many people began to work two or three jobs, and a mass shuttle business appeared. According to the epidemiological register in Novosibirsk, the population began to lead a healthier lifestyle: the prevalence of arterial hypertension, overweight, smoking, high plasma cholesterol, and hypodynamia decreased [12].

As for alcohol factor, in 1993 in Russia the per capita consumption of alcoholic beverages (in terms of ethanol) was 5.9 liters, while in France -11.5, Germany -10.4, Austria -10.1, Spain -9.9, Denmark-9.7, Great Britain -7.4, USA -6.7, Japan -6.6, Canada -6.2 liters [13].

The environmental situation has improved due to a twofold reduction in industrial production and the curtailment of agricultural chemicalization. The share of samples exceeding the maximum permissible concentrations of harmful substances decreased in 1991-1996: in terms of atmospheric content in urban settlements-by 25%; water supply systems by chemical and bacteriological indicators-by 13% and 20%; soil in residential areas-by 36%, etc. The content of pesticides in food products decreased by 9 times [14].

The standard of living of most people has fallen to the levels of the 1960s. But in 1964, the death rate in the USSR was the lowest among the developed countries of the world -6.9%, in Austria -12.7%; England -11.5%; Germany -11.4%; France -11.4%; Sweden -10.0%; USA -9.5% [15].

Severe economic stress was a sharp general impoverishment. But under the same stress during the Second world war, the death rate in the rear increased by only 17% by 1942, and in 1943 it became lower than the pre-war level [16].

The failure of modern medicine to explain the listed paradoxes leads to the conclusion about the existence of unknown factor ”X”. Its properties are [8]:

- high speed of spread over a vast territory, when in a year the majority of former USSR republics and Eastern Europe countries were captured with the mortality rise;

- action on many diseases, both infectious and non-infectious;

- synchronic actions at distances of thousands kilometers, for example, parallel mortality trends in the west Kaliningrad region and in the east Primorsky territory;

- presence of both negative (increase in mortality) and positive (decrease in mortality) vectors;

- age selectivity: no effect on children, weak influence on the elderly, the biggest jump of mortality in 20-44 years;

- gender preference: life expectancy decreased by six years for men and three years for women.

No any material factor has such properties. The search for an

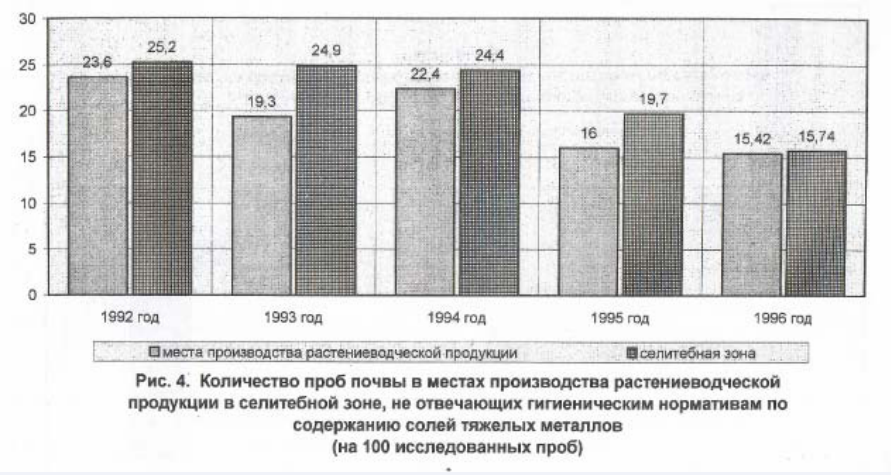

Рис. 4. Количество проб почвы в местах производства растениеводческой продукции в селитебной зоне, не отвечающих гигиеническим нормативам по содержанию солей тяжелых металлов (на 100 исследованных проб)

Figure 2 Synchronicity of homicide and suicide death trajectories in Russia for 1985-2018.

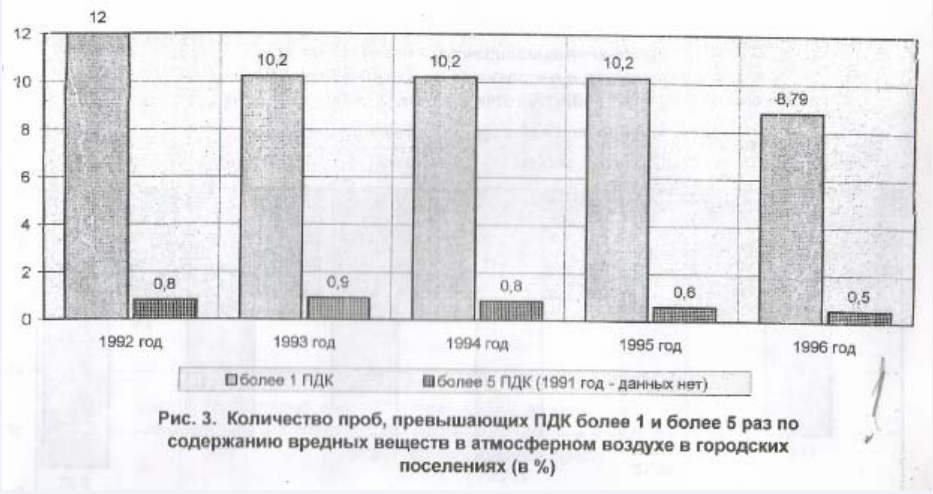

Рис. 3. Количество проб, превышающих ПДК более 1 и более 5 раз по содержанию вредных веществ в атмосферном воздухе в городских поселениях (в %)

Figure 3 The relationship between the half-sum of homicide and suicide deaths and total mortality (without ADS) in Russia for 1984-2018.

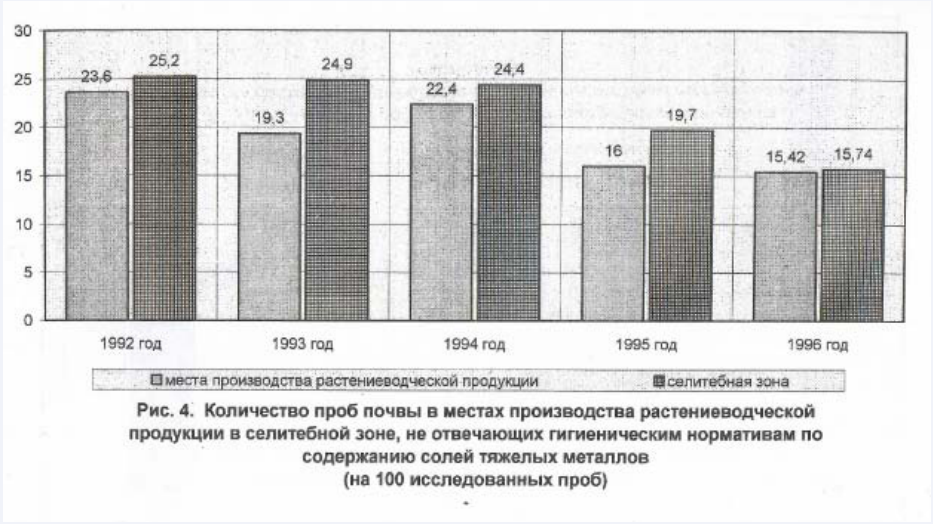

Рис. 4. Количество проб почвы в местах производства растениеводческой продукции в селитебной зоне, не отвечающих гигиеническим нормативам по содержанию солей тяжелых металлов (на 100 исследованных проб)

Figure 4 The relationship between the half-sum of homicide and suicide deaths and total mortality (without ADS) in Russia for 1984-2018.

answer forced to turn to the psychic life -the social atmosphere. Social atmosphere is an immaterial reality in the form of dominant meanings and emotions, which unites people for joint actions. Existing in heads as a product of brain activity, it becomes by interactions the controlling people force. The higher the speed of information exchange, the stronger its influence. This is how the social atmosphere differs from public knowledge -simple awareness of the population about something.

The fact, that bad immaterial atmosphere participates in the etiology of material diseases, is the highest speed of mortality from mental disorders, as well as murder and suicide, which, according to the theory of E. Durkheim [17], are the results of abnormal psychosocial relationships (Table 1). Next are skin diseases and infections that are highly dependent on the emotional state of the person [calculated from 2]. Malignant neoplasms had the least reactivity, which corresponds to the literature data (Table 1) [18].

Among different meanings and emotions some may be favorable to life, while others may be harmful. The study of their etiological role for bodily diseases was begun in 19th century by Russian hygienists Jacobia A.: "Happiness from the point of view of hygiene", "On the influence of a person's state of mind on the origin, course and outcome of diseases " and Skvortsov I.:"On education from a hygienic point of view". There was founded a psychohygiene as a new medical science [by 19].

Since the 1980-90s research has been increased on the impact of depression (hopelessness, despondency) and aggressiveness (bitterness, cynicism) on physical health, accompanied by an increase in mortality [20-22]. In this field homicides and suicides can be used as material indicators to assess the immaterial aggressiveness and hopelessness in the social atmosphere. On the statistical data of Russia there was found a close direct relationship between them with a correlation coefficient of 0.97.

Figure 2 synchronicity of long independent zigzag trajectories means the presence of a "controlling" them factor. This "grey cardinal" can be a social atmosphere in form of aggression and despair waves. Their half-sum is designated as an aggressive-depressive syndrome (ADS).

Table 1: The growth of mortality rates (per 100 000) from various diseases in Russia in 1990-1994.

The cause of death	Years		
	1990	1994	1994/1990 (%)
Total	1117	1566	140
Mental disorders	2.5	9.6	384
Murders	14.3	32.6	326
Suicides	26.4	42.1	228
Diseases of skin	0.7	1.2	171
Infectious diseases	12.2	20.2	166
Diseases of nervous system	7.0	11.1	159
Diseases of endocrine system	7.2	11.1	154
Diseases of digestive system	28.7	44.1	154
Respiratory diseases	59.3	80.8	136
Cardiovascular diseases	617	837	136
Malignant neoplasms	194.0	206.6	107

The relationship of ADS with overall mortality (excluding homicide and suicide deaths) was studied (Figure 3). The fluctuating mortality growth in 1984-2003 had the correlation coefficient with the ADS +0.94. The steady mortality decline in 2003-2018 had the correlation coefficient with the ADS +0.96. In total the correlation coefficient between mortality and ADS was +0.68.

Figure 3 the relationship between the half-sum of homicide and suicide deaths and total mortality (without ADS) in Russia for 1984-2018

- Zigzags of ADS closely followed the important socio-economic events in Russia:1985-87 - the beginning of "perestroika" stimulated a powerful emotional and spiritual uplift associated with the hope for more just life;
- 1988-91 -the second half of "perestroika" was characterized by the displacement of traditional collectivist mentality and its replacement with an alien ideology of individualism;
- 1991-1994 -the continuation of liberal reforms aggravated the destructive mental processes;
- 1994-98 -a part of the society became interested in market activity; the "old Russians" began to fight with the "new Russians", etc.;
- 1998-2003 -the unexpected default caused stress and destabilization of social atmosphere;
- 2003 was the boundary year, when the violent reforms lost their activity. So the collective subconscious reacted to this with satisfaction.

The similar interpretation of the demographic crises roots in Russia gives the American economist and demographer Eberstadt N.: "... Russian illness is psychological in nature ... it is a question of mental health" [23].

The psychogenic demographic hypothesis explains the properties of the factor "X":

- large speed of the dissemination for pathogenic meanings and emotions is carried out through the media;
- information can be positive or negative;
- children are not sensitive to social issues; the elderly are provided by the life experience;
- predominant defeat of men is caused by the fact that their social role as breadwinners has suffered more than that of women-keepers of the home;
- synchronicity of vibrations in remote areas is provided by the instantaneous linking activity of radio and television;
- effect on many diseases is due to non-specific health reserves that provide the effect of cross-resistance.

The process of supermortality is epidemic in nature. "Contagious" ideas or emotions were transmitted from person

to person. Transmitters of "infection" were the mass media, interpersonal contacts. People who are "infected" with the contaminated ideas and emotions become their repeaters, generating destructive or creative psychosomatic interactions. The short time between mental exposure and material illness indicates the ultra-rapid demographic reactions -the subject of the new science of "psychodemography". As for the mechanisms of transition of mental processes into the bodily physiological and pathological reactions, they have been studied for a long time in the framework of psychosomatic medicine.

CONCLUSION

The psychodemographic interactions explain more than 80% of the excessive mortality fluctuations in Russia. The etiology of the Russian's extinction has the spiritual and emotional roots. The influence of non-material mental processes on material bodily status allows to form a new approaches for managing the population health.

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