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Russian Model of Epidemiologic Transition: Historical Peculiarities (Late XIX - First Half of the XX Centuries)

The theory of epidemiologic transition has received wide acclaim since it was first formulated by an American researcher A.R. Orman. There is no need to reproduce here its basic concepts. Let us just note that, according to many demographers, epidemiologic transition is a global, world-wide phenomenon. It occurs, to a lesser or greater extent, in all countries and continents, however, each country has its specifics.

The demographic trends in Russia have been characterized by the late start of epidemiologic transition as compared with countries of Western Europe. It is an important (but not the only and major) feature of the Russian model of epidemiologic transition. The State has always played an important role in Russian history. Therefore, major demographic trends of Russia's development were largely determined by governmental policies. In Russia epidemiological transition has been shaped not so much by endogenous demographic factors as by the factors that were exogenous to the demographic subsystem and explicitly political. In Russia due to the government's dominant role and the ensuing political factors epidemiological transition was a discontinuous, pulsed process with several false starts.

The first signs, albeit feeble, of epidemiologic transition were registered in demographic history of Russia in the late XIX century. In 1916 S.A. Novoselskiy, who is considered one of the founders of the Russian science of demography, published a book where he showed that the decline in mortality began in Russia in the late XIX century. Whereas in 1869-1873 the crude death rates for the Russian population were as high as 37.8 ‰, in 1909-1913 they fell to 28.4‰, provided that registration accuracy had significantly improved during that period.

A considerable decline in mortality could be explained only by the reduced number of deaths from infectious diseases. S.A. Novoselskiy showed that in the late XIX - early XX centuries Russia witnessed a significant decline in deaths caused by scarlet fever, diphtheritis, and measles. There was an especially sharp drop in mortality from such dangerous diseases as smallpox and typhoid fever.

Decrease in Deaths from Infectious Diseases in Russia in the Late XIX – Early XX Centuries

Years	Scarlet fever, diphtheria, measles, pertussis	Smallpox	All kinds of typhoid fever
1891-1895	404777	72703	112955
1901-1905	346719	41930	78378
1911-1914	284997	29063	60249
Decreased by	1.4 times	2.5 times	1.9 times

There is no evidence of changes that occurred in the structure of causes of death in the population of Russia at the end of the XIX century. However, we can assume that exogenous factors began to play a less important role in the cause-of-death structure. This suggests that there were signs of the onset of epidemiologic transition.

We argue, with high probability, that this could become a mainstream demographic trend, if it were stabilized. However, flagrant interference by the external, non-demographic factors radically changed the course of demographic history of Russia. The outbreak of World War I slowed down, if not stopped, the epidemiological transition. In 1914-1916 the death rate in Russia stabilized, it was neither decreasing nor increasing. In that period Russia did not experience large epidemics of infectious diseases, however, their incidence rates were high; the process was "suspended".

The next phase of radical changes in Russia's demography had started since 1917, when Russia entered a period of revolutions leading to the Civil war. The revolution's demolition of the state institutions, collapse of the health care system, sharp decline in the standards of living and famine resulted in numerous epidemics of infectious diseases. The most prevalent diseases were typhoid fever, cholera, dysentery, whooping cough, diphtheria. In 1918-1920 Russia reported a rising incidence of such a dangerous disease as smallpox. In 1918 Russia's population suffered greatly from influenza pandemic. All these diseases claimed at least several millions of lives. It is almost impossible to calculate even the crude death rates due to the total collapse of the death registration system. Statistical agencies remained only in several cities (Moscow, Petrograd, Saratov, Samara, Tomsk) where the estimated death rates were about 40-100%.

Therefore, epidemiologic transition was interrupted, while Russia's demographic subsystem was apparently dominated by regressive trends taking the country and its population back to the Middle Ages. Demographic trends became positive only after the end of the Civil war when social and political stability was achieved. There was a tendency to overcome the consequences of the profound disaster. The new government, frightened of the powerful epidemics, did much to promote health and sanitation and to improve the standards of living of the people who had been reduced to indigence during the war. This led to the reduction of infectious disease incidence and, as a result, to the decline in death rate. By 1926 the crude death rate in Russia had dropped to 20, 7‰, while the life expectancy at birth increased. In 1896-1897 it was 31.3 years for males and 33.4 years for females; in 1926-1927 it was 41.9 and 46.8 years respectively. After a long break Russia resumed her attempts to start the epidemiologic transition, during which exogenous factors would be pushed aside to the periphery of cause-of-death structure.

Life Expectancy in Russia Number of Years of Future Lifetime for Newborns

Year	Males	Females
1896-1997	31.3	33.4
1926-1927	41.9	46.8

However, this attempt also proved to be a false start. In the early 1930s, in fact, the new Civil War was unleashed by Stalin's political decisions to accelerate the pace of industrialization and to carry out forced collectivization which led to another demographic catastrophe. A terrible famine swept Russia accompanied by massive epidemics of infectious diseases. Death rate rose, while life expectancy dropped and cause-of-death structure was dominated by exogenous factors – infectious, gastrointestinal and respiratory diseases. In terms of its demographic development Russia was again set back by many years.

**Causes of Death for Population in Russia
during the Famine of 1933, %. Both Genders**

Causes of Death	Share (%)
1. Infectious Diseases	21.4
In particular:	
Typhus (all types)	3.2
measles	3.6
diphtheria	1.0
tuberculosis	9.1.
2. Respiratory diseases	11.8
3. Gastrointestinal diseases	18.4
4. Other and not well defined diseases	48.4
Total	100

Growing number of deaths caused by the deteriorating living conditions led to a sharp increase in mortality rate, especially among men and children. In 1933 children younger than 5 years composed almost 25% of the total number of deaths. Males accounted for almost 58% of all deaths. This contributed to a drop in life expectancy at birth. In terms of its demographic development Russia was again set back by many years, and epidemiologic transition was interrupted.

Tendency towards the new start of epidemiologic transition manifested itself only in the second half of the 1930s, when Russia recovered from the catastrophe caused by the famine of 1932-1933. The incidence of infectious and gastrointestinal diseases gradually reduced, and it served as an underlying cause of the mortality decline. In 1940 the death rate of the Russian population stabilized at a level of 20.6‰, while the life expectancy increased. In 1938-1939 in the USSR it was 43.99 years for males and 44.69 years for females. For comparison, it is interesting to note that in 1940 in the countries of Western Europe and North America the life expectancy at birth for both sexes was 64.6 years. Russia apparently lagged behind because of the demographic impact of political decisions made by Stalin's government.

Estimate of Mortality Rate and Life Expectancy in Population of Russia in 1930s-1940

Year	Crude Mortality Rate (per 1000 population)	Life Expectancy at Birth	
		Males	Females
1930	27.3	34.6	38.7
1931	30.3	30.7	35.5
1932	29.8	30.5	35.7
1933	51.8	15.2	19.5

1934	26.1	30.5	35.7
1935	23.6	33.1	38.4
1936	26.2	30.4	35.7
1937	26.2	30.5	40.0
1938	25.6	31.7	42.5
1939	23.9	34.9	42.6
1940	23.2	35.7	41.9

Nevertheless, this attempt of epidemiologic transition also was a false start. The transition was interrupted when Russia entered World War II. However, the war's amazing demographic outcome was that since 1943 Russia had witnessed the first signs of demographic transition. It proved to be the most successful attempt.

Reproduction of Population in Russia during World War II

Year	Per 1000 population		
	Deaths	Births	Increase
1940	33.6	21.0	+12.6
1941	33.3	24.4	+11.9
1942	20.2	27.6	-7.4
1943	12.0	20.2	-8.2
1944	12.9	16.2	-3.3
1945	16.0	11.8	+4.2

This raises a number of questions, which, so far, remain unanswered. It is unclear whether sharp fluctuations in the birth rate and death rate were caused by exogenous, situational wartime factors without any profound changes in the demographic subsystem of the society, or whether they marked the process that launched fundamental shifts in the demographic subsystem and could be considered as the onset of demographic transition? It is unclear, whether the postwar phenomenon of demographic transition in the USSR had its roots in the war period or whether it emerged only in the 1950s as a new phenomenon in the history of Russia's population? The present paper is aimed at answering these questions. This research aims at finding answers to these questions.

The authors used civil registration records as sources for analysis. It is generally considered that failure to register deaths and births during the World War II, especially in 1941-1944, was so profound that it is impossible even to identify main demographic trends. Analysis of archival documents has shown that registry offices functioned throughout the war in those Soviet territories that had not been under Nazi occupation. Their performance even improved. Central and regional statistics offices regularly estimated population size; they also gathered medical statistics on causes of death as well as age and sex distribution of the deceased. Therefore, if we exclude those killed in combat taking into account only demographics of the civilian population in the rear areas, we have sufficient data for analysis.

During the war population dynamics seemed paradoxical and unusual. Beginning in late 1942-early 1943 in the USSR there was a tendency towards lower mortality (especially for infant mortality). Male death rate decreased. The age structure of mortality changed – old-age share would be higher, while the young-age share increased. Whereas in 1940 deaths concentrated in the 0-4 age

group, in 1944 deaths were evenly spread among all age groups.

Infant Mortality Rate in the RSFSR during the World War II

Year	Number of deaths of infants younger than 1 year of age per 1000 live births		
	Boys	Girls	Both Genders
1940	227.9	200.9	214.3
1941	181.4	160.8	171.4
1942	328.5	298.1	313.7
1943	171.4	153.4	162.7
1944	118.3	104.6	111.6
1945	91.7	78.1	85.1

The seasonal indices of death rate also changed – summer “peaks” flattened, if not disappeared. The cause-of-death structure transformed. As a result of reduction in deaths from exogenous causes (acute infections, gastrointestinal and respiratory diseases) the age-sex structure of dead individuals changed towards a higher old-age share.

Causes of Death for Urban Population in the RSFSR, 1940-1941 (Percentage of the total; according to the official classification of the causes of deaths)

Causes of Death	1940 (Data of the USSR Central Statistical Agency)		1944 (Data of the RSFSR Central Statistical Agency)	
	Males	Females	Males	Females
Acute infectious diseases	16.2	17.8	5.7	6.9
Chronic infectuous diseases	12.6	9.8	16.9	12.4
Traumas and intoxications	4.2	0.7	6.5	4.5
Cancer and benign neoplasms	4.1	5.2	3.4	5.4
Arteriosclerosis, intracerebral hemorrhage and other diseases of nervous system	3.0	4.1	3.1	4.6
Stenocardia and other cardiac	7.1	9.8	13.6	18.8

diseases				
Pneumonia and other respiratory diseases	19.2	17.8	12.4	11.2
Toxic dyspepsia	8.4	8.8	1.4	1.6
Gastroenterocolitis	6.8	6.9	2.5	2.6
Diseases during pregnancy and delivery	-*	1.1	-*	0.9
Neonatal diseases	5.3	4.7	1.8	1.8
Senility	0.6	1.7	1.2	3.8
Other and not well defined diseases	12.2	11.6	31.5	25.5
Total	100.0	100.0	100.0	100.0

- **- Phenomenon did not exist.**

After the end of World War II it turned out that the life expectancy in Russia was higher than before the war. In 1939 it was 34.9 years for males and 42.9 – for females, while in 1946 – 46.6 and 55.3 years. Therefore, epidemiologic transition in Russia was a discontinuous, pulsating process and was interrupted several times. But its greatest paradox was that the epidemiologic transition started and developed during the World War II, from late 1941/early 1942 onwards.