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THE ROLE OF GENDER FACTOR IN POPULATION MORTALITY

The modern sciences more often use the gender factor in the interpretative procedure. Demographers also have chance to involve this factor in analysis. There are some indicators of gender gaps or inequalities in distribution of resources located in both microenvironment (households) and macroenvironment. Human capital formation and development also demonstrate gender inequalities in process.

Population mortality analysis usually uses *sex* variable in explanation of differences by age, time, causes of death, etc. We shall try to underline *particularly gender* factor in population mortality that is gender on social sense[1]. We are interested in how social roles, social relations, gender (social) behavior influence on gender overmortality. Thus, in this paper gender factor will means only social factor in opposite to sex factor like biological one. In modern literature definition of "gender overmortality" includes both social and biological factor of overmortality with stress on biological one. We would like to stress the social factor that is gender mortality is in opposite to sex overmortality. It is obviously that to make the clear frontier between social and biological factor of overmortality it is the difficult task. Moreover, we could not very often describe social factor of overmortality by the formal way. Most of the hypothesis on the gender (social) overmortality require further study in *different* countries before the conclusion can be reached.

We try to allot and describe social factor of overmortality by age. Who is in advantage in terms of survival: men or women? In which ages? In which time? Is there typical gender behavior influencing on gap in mortality? What are the discriminative practices which could be causes of gender overmortality?

We consider three "lines" of gender factor action: socio-historical "line" (epidemiological transition); behavioral "line" and "line" of discriminative practices. The last one plays significant role and could determine in particularly two others. (Table 1).

[1]Gender is social and cultural construct (determined by set of "male" and "female" characteristics, stereotypes, relations to "male" and "female" roles and features and relations between sexes) (1).

Table 1. Gender (Social) Factor of Overmortality

Gender/ Age	***Gender Factor*** *(or Gender/Sex Factor)* ***of Overmortality***		
	Epidemiological Transition	*Individual Behavior*	*Discriminative Practices*
Females/ Infants & Children	* Female infant mortality on the various stages		* Son preferences Immune selection, insufficient food and female child care
Females/ Working age	* Maternity mortality on the first (early) stages		* Reproductive rights infringement (non-official abortions)
Females/ Pension age			* Worn out "double roles" (worker & housewive)
Males/ Infants & Children	* Male infant mortality on the various stages	* Relatively more active & aggressive behavior	
Males/ Working age		* Harmful habits (alcoholism, imprudent driving, etc.)	* Gender competition on labor market & Renaissance of traditional (patriarchy) family roles
Males/ Pension age			* Loss of main role ("breadwinner" role)

Historical development of human society replaced the poles of gender overmortality. Relatively higher female (maternity) mortality was observed at the early stages of the epidemiological transition (2). In modern developed countries male overmortality has been considerably increasing during the 20th century.

The sanitary progress, medical services development, living standard increasing improved health situation for all population, however, women were the

first in advantages in the first turn due to gynecological services improvement and decreasing of maternity mortality.

Increasing female infant benefits (or narrowing the gap between male and female mortality) in historical retrospective permits us to conclude that this tendency is result of decreasing of female social discrimination. We could propose that female disadvantage may be masked by biological factor that trend to favor girls.

As we said making of the clear frontier between social and biological factor of overmortality it is the difficult task. In the most inevitable cases we do not stress gender factor and present gender/sex factor (gray color). It means that infant overmortality by gender on the various stages of epidemiological transition is under both biological and social factor. Infants of both sexes got benefit in epidemiological transition. More clear presentation of advantages and disadvantages by gender requires the investigations of causes and timing of deaths on different stages of epidemiological transition in different countries. Biological factor is more steady than social one. Dynamics of mortality could be explained by changing in social one.

Another example, male infant overmortality (from behavioral "line") is based on more active and aggressive male behavior than female one. However, such behavior could has either biological explanation (male hormones) or social explanation (social attitudes to "male" behavior). From our point of view social attitudes and stereotypes on what is it "male" or "female" type of behavior influence more stronger than biological factor on individual behavior.

Male infant overmortality by genetic causes (X-linked and Y-linked genes) is observed in the most early ages. The effects of male hormones may contribute to sex differences in mortality due to respiratory distress, accidents and infectious diseases (lower level of immune components). Perinatal male overmortality (especially neonatal male overmortality) is connected with perinatal conditions including prematurity (more frequency in male case), respiratory distress syndrome, birth trauma, intrauterine hypoxia and birth asphyxia.

In Russia male overmortality at age under 7 days covers approximately 60% of total perinatal overmortality in all regions. (Chart 1)[2].

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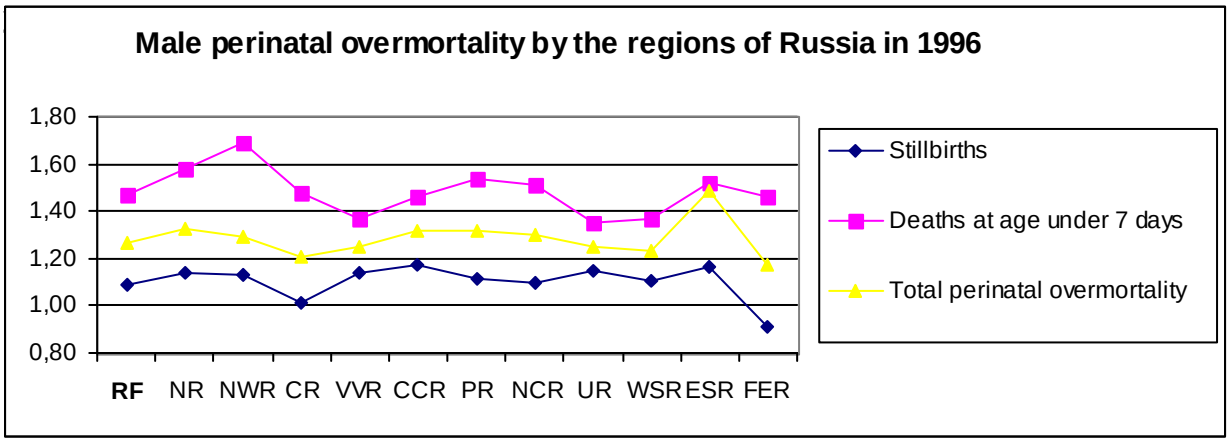
[2] *Initial statistic data using in author's calculation in this paper are from :1)*Demographic Yearbook of Russia. Moscow, 1997; 2)Demographic Yearbook of Russia. Moscow, 1999; 3)V. Shkol'nikov *et al*. Modern trends in mortality by causes in Russia 1965-1994. Paris, 1996; 4)A.Avdeev,.A.Monnier. Mouvement de la population de la Russie 1959 - 1994. INED, Paris, 1995.

Male Perinatal Overmortality in Russia in 1996. Chart 1[3].



Analysis of causes of deaths by gender permits us to understand the female and male disadvantage under male disadvantage in general. Accidents and other violence are the significant causes of male disadvantages (is it level of testosterone or socialization?). Examples for developing countries (3), risk of death from respiratory infectious is equal by gender, risk of death from diarrhea is higher for boys, from measles is higher for girls.

Male overmortality becomes insignificant in 1-4 ages (is it discrimination increasing to girls?). Historical analysis of mortality in Europe presents female disadvantage in the XIX century and in the beginning of XX century at 5-14 ages: more higher mortality from tuberculosis (4).

Discriminative practices in order to girls like as low nutritional status, selected immunization and insufficient care are decreasing now in the most parts of the world. Direct redistribution of home resources for boy's advantage could rests only several countries. However, in modern patriarchy society gender relations, attitudes and preferences depend on existing more "soft" discriminative practices. For instance female segregation in labor market, feminization of poverty or home violence in relation to women lead to son's preference in society and unequal inputs in human capital by gender (5) and in its turn to higher risk of girl's morbidity and mortality. Firstly, in son-oriented society parents will continue childbearing up to son bearing.

[3] **RF – The Russian Federation**, NR – The North Region, NWR – The North West Region, CR – The Central Region, VVR – Volga-Vyatka Region, CCR – Central Chernozyem Region, PR – Povolzhye (Volga) Region, NCR – North-Caucasus Region, UR – The Ural Region, WSR – West Siberian Region, ESR – East Siberian Region, FER – Far East Region

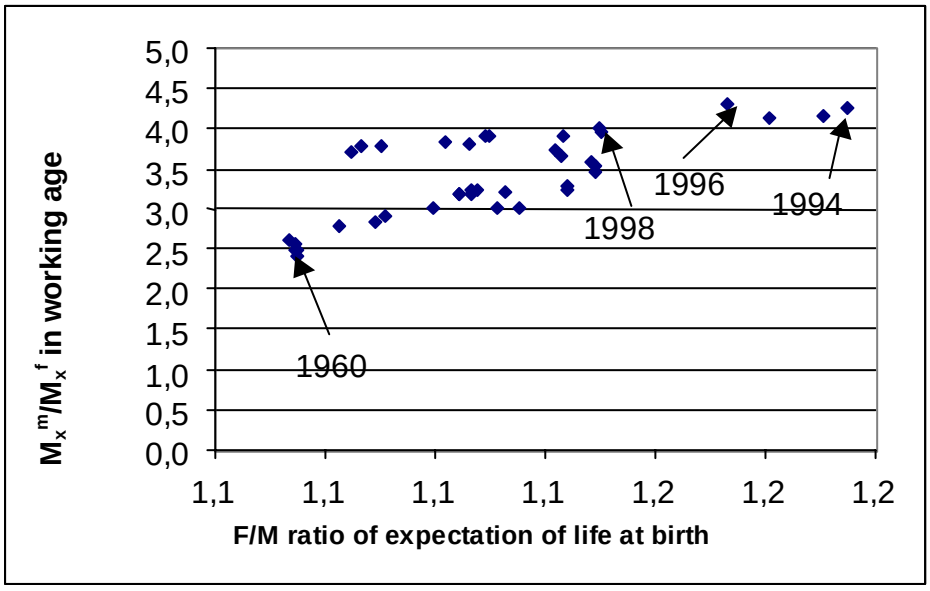
The risk for girl to live in family with more children (and less resources per everybody) will higher than for boy. Secondly, in case of girl bearing parents prefer to have another child relatively soon in the hope that the next child will be son. Children who experience a short interval to the birth of a younger sibling are known to be at higher risk of death than other children (6). Thirdly, sex composition of older siblings also influences on girl status in household. Parents, even in son-preferring societies, want one daughter but no more. Girls who have an older sister may be undervalued and more likely to die than girls with older brothers (7).

Discriminative practices in relation to working age women influence on female overmortality through reproductive rights infringement and propagating of non-official abortions. Many countries (including Russia) had such experiences.

High level of abortion in conditions of insufficient information and education programs on family planning, limited access to modern contraception and weak "male" participation in contraception choice are the indirect discrimination of women influencing on health and risk of death.

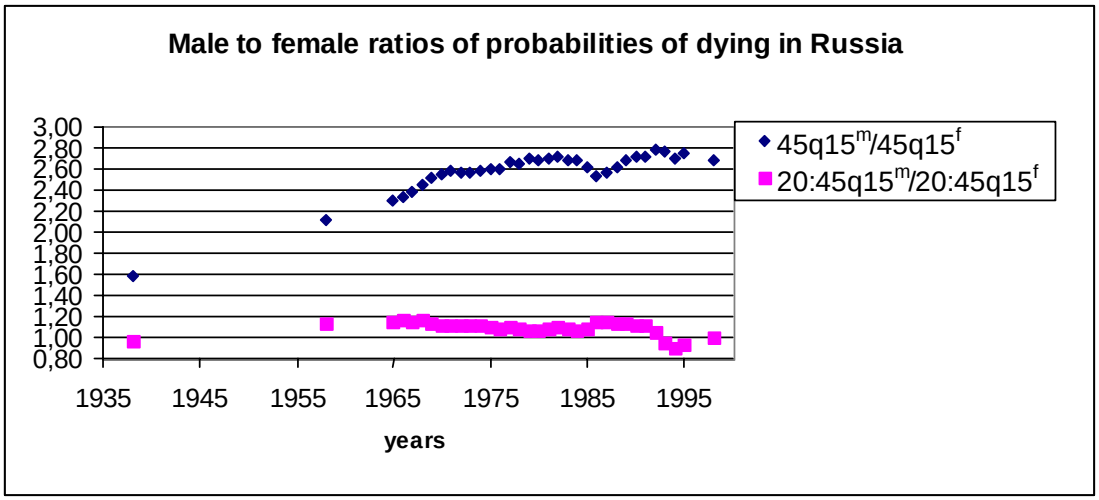
Male disadvantage in working ages is the obviously fact especially for post-socialist countries. Male overmortality in Russia was significantly growing in 90th, especially in working ages. Chart 2 presents the correlation between gender ratios of life expectation at birth and gender ratios of mortality rate in working ages. Male overmortality increases due to male mortality growth in working ages.

Correlation Between Female/Male Ratio of Life Expectation and Male Overmortality in Working Ages. Chart 2



To prove that male overmortality concentrates mainly in working age we can calculate ratios of probabilities to dying for 15-age males and females during 45 years ($45q15^m/45q15^f$) and ratios of probabilities to dying for 15-age males and females after they will 60 during 20 years ($20{:}45q15^m/20{:}45q15^f$). Ratios of probabilities to dying in working ages are growing and ratios of probabilities of dying in post-working ages are not growing in Russia (Chart 3).

Male to Female Ratios of Probabilities to Dying in Russia. Chart 3



Male overmortality was often explained by the more frequent male harmful habits like alcoholism, imprudent driving, tobacco smoking, etc. Moreover, there is a difference in attitude towards personal health that is women made a better use of sanitary progress than men. It is obviously not only for Eastern and the former USSR countries but also for Western countries (8).

What are the causes of male super overmortality in 90^{th} in Russia? We proposed that relatively fast changing in gender overmortality could be connected with social factors. Social factors in 90^{th} in Russia were decreasing of living standard, health services and quality of food and alcohol, etc.

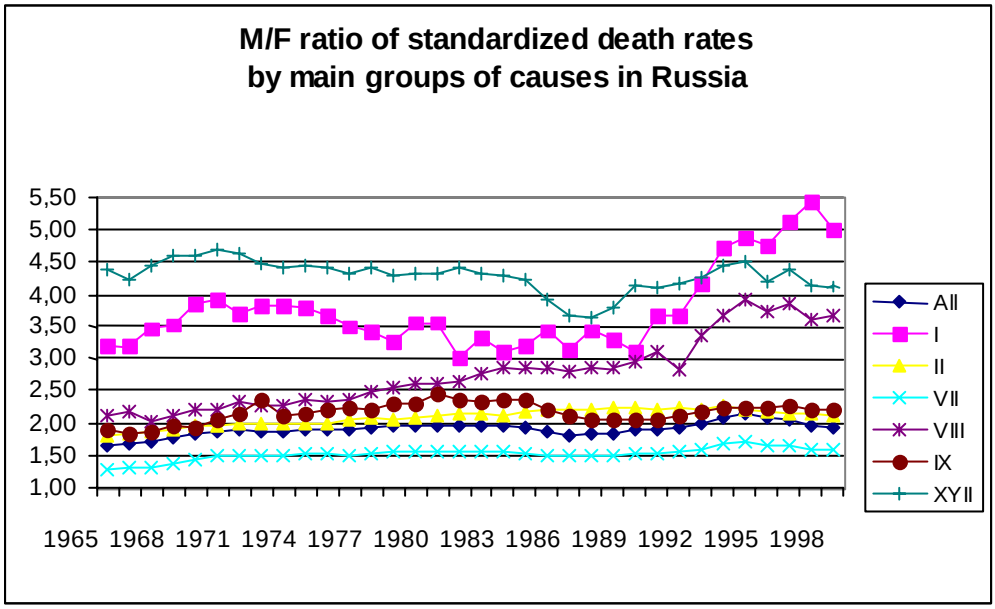
However, “additional” social factor in Russia was renaissance of traditional roles in family and destruction of state system of paternalism. The changing of stereotypes on gender roles influences on risk of death for males. Double-wages family was incentive in soviet period. Mass media and social climate in general transform this attitude to following: “man should be breadwinner, woman should be housewife”. Most of men could not adopt to this new attitude, could not reconstruct the patterns of employment and wages in short time, could not adopt to competition

on the labor market especially under the conditions of weak market infrastructure, devaluation of higher education and criminal environment. However, the requests of new role of breadwinner are keeping not only by mass media and advertises, but also by female labor segregation and withdrawing them from labor market, by government Family laws (increasing of maternity leave) and by female labor over activities.

In spite of difficulties to estimate the level of influence of this factor on male overmortality we should take into account the existing of this influence on male mortality growth caused by diseases of the circulatory system, infectious and parasitic diseases and diseases of the respiratory system. We could see links "new attitudes – stress – higher risk to die". Chart 4 presents gender ratio of standardized death rates by main groups of causes in Russia.

Male overmortality increasing from all causes, especially from diseases of the circulatory system, infectious and parasitic diseases and diseases of the respiratory system (by 1,5 times); it is stable higher from accidents, poisonings and injuries.

Male/Female Ratio of Standardized Death Rates by Main Groups of Causes in Russia. Chart 4[4]



The relative differences between male and female mortality can be calculated also as the ratio of the male to female probability of dying by age:

$$Q_x = q_{xm}/q_{xf}$$

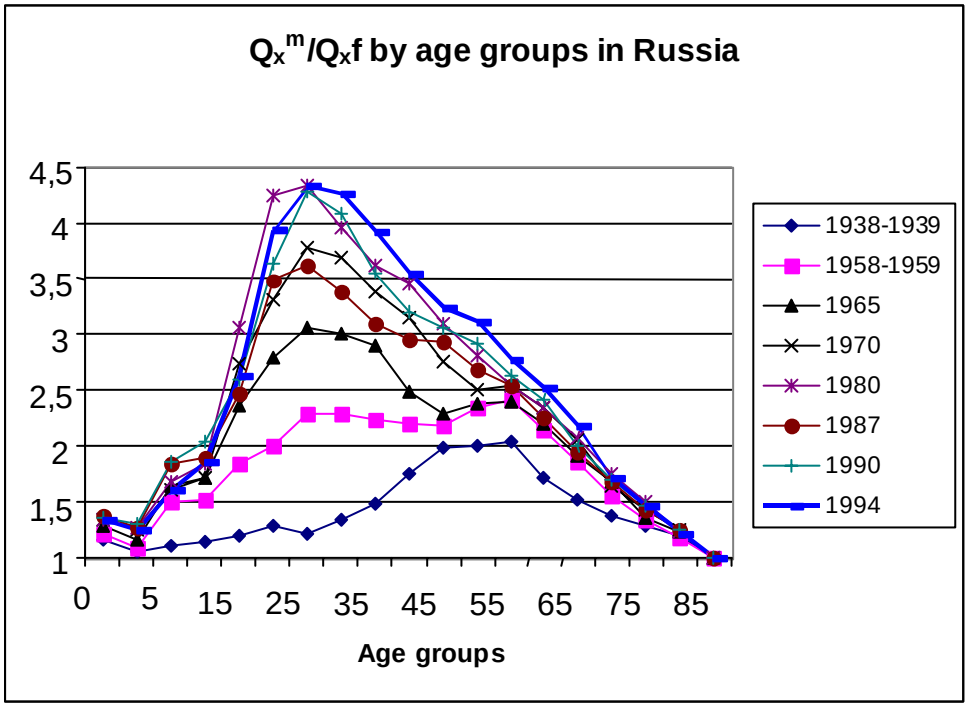
[4] All – Deaths from all causes. I – Infectious and parasitic diseases (Codes 001-139). II – Neoplasms (Codes 140-239). VII – Diseases of the circulatory system (Codes 390-459). VIII – Diseases of the respiratory system (codes

Which is the most commonly used indicator. When it is greater than 1, it indicates the existence of excess male mortality or male overmortality.

Let consider two charts to estimate the dynamics of male overmortality in Russia Chart 5 and Chart 6. In Chart 5 we make choice of some "bright" years to answer question "What ages for the most high male overmortality?".

From the post-war year (1958-1959) when maternity mortality was decreased, we could see two age "peaks" of male overmortality: "25-30 ages" and "60 ages". Men are in the stage of active socialization, finding working and family status when they are 25-30. Behavioral factor and gender roles factor could lead to higher risk of dying. Loss of "maim role of breadwinner" could lead to stress in pension and pre-pension ages.

Male Overmortality by Age Groups in Russia. Chart 5



In 1987 we see the decreasing of male overmortality due to short-term positive result of anti-alcohol law. In 1980 male overmortality shows the consequences of Afghanistan war (excess in 18-20 ages).

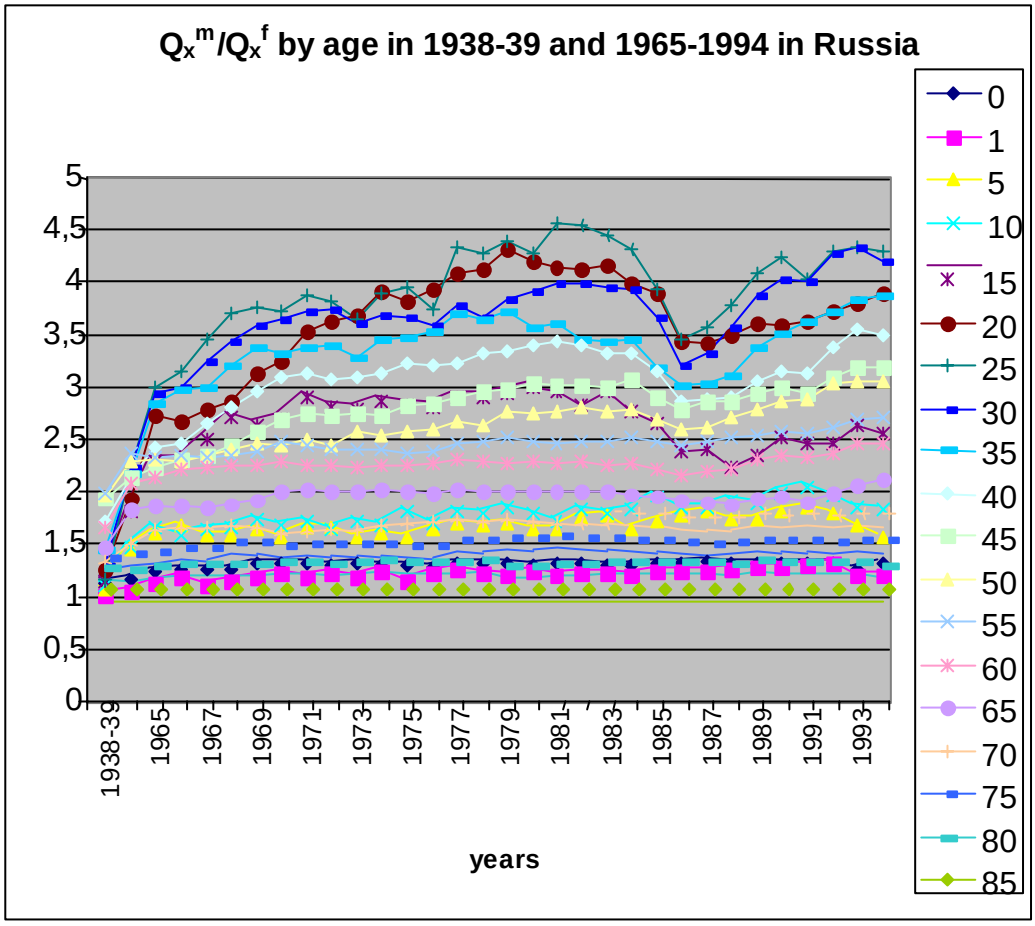
In 1994 the level of male overmortality was the most high (1994-line covers other lines). The first peak (25-30 ages) became more wide, the "boarders" became inevitable. It may be, in particularly, result of gender role changing and new attitudes

460-519). IX – Diseases of digestive system (Codes 520-579). XYII – Accidents, poisonings and injuries (Codes

toward “breadwinner” roles. Moreover, “wave” of male overmortality in 45-55 ages is caused by the following phenomenon. They are generations of 60th who, from the one side, were not be successful in soviet social hierarchy caused by high age limits in soviet period, and, from the other side, who are not successful in modern competitive labor market. They waited to be older but the conditions were changed.

Chart 6 show us the dynamics of male overmortality by age in Russia in 1938-1939 and in 1965-1994 years. The most significant changes are observed in 20-40 age groups.

Dynamic of Male Overmortality by Age in Russia. Chart 6

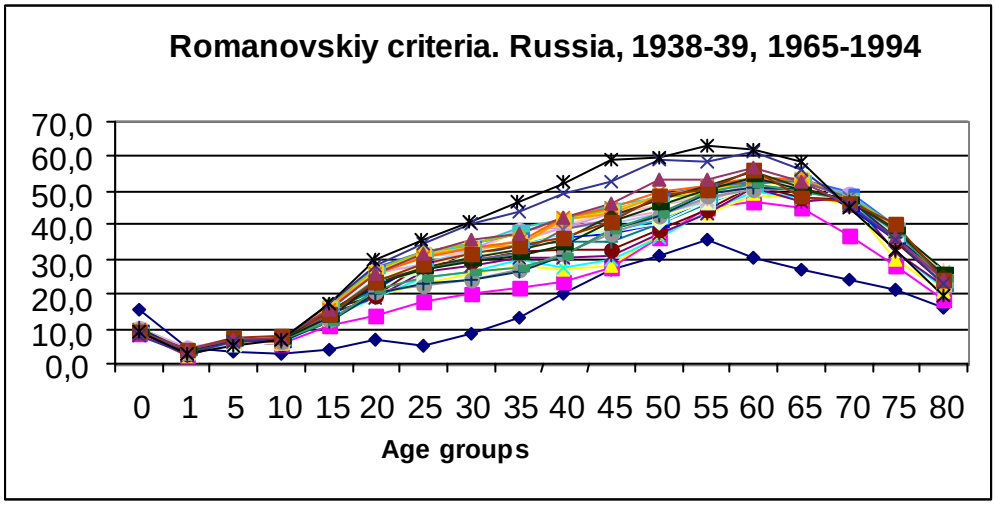


Criteria by Romanovskiy also permits to estimate level of male overmortality. According to Romanovskiy if the difference between probabilities to dying of male and female is more than “probabilities’ error” times by three that male overmortality will be significant (9). Chart 7 shows that male overmortality is non-significant only

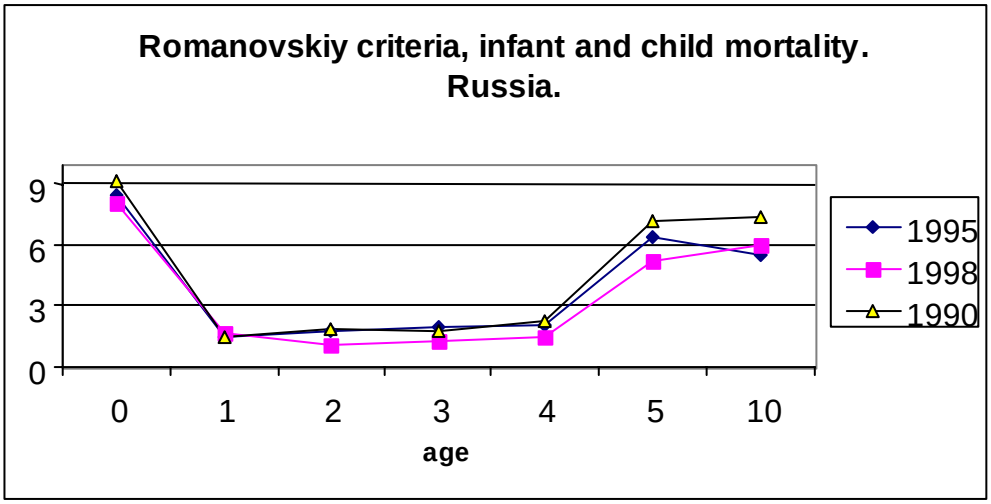
E800-E999, 800-999). International Statistical Classification 1975.

from 1 to 5 ages. Blue line of 1938-1939 years in contrast demonstrates narrower gap between male and female mortality in older ages (relatively higher female mortality). Chart 8 in more accurate way shows significance of male infant mortality. It is non-significant in 1, 2, 3, 4 ages.

Significance of Probabilities to Dying in Russia by Age. Chart 7



Significance of Probabilities to Dying in Russia in Childhood. Chart 8



In conclusion we would stress that in spite of difficulties to make the clear frontier between social and biological factor of gender overmortality it is very important to allot and describe social factor of overmortality by age which includes three “lines” of gender (social) factor action: socio-historical “line” (epidemiological transition); behavioral “line” and “line” of discriminative practices.

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