

Session: Health, morbidity and mortality

Determinants of high and increasing mortality in Eastern Europe

Patterns of Suicide Mortality in Russian Capitals: Influence of Megapolis.

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The main goal of the study is the comparison of suicide mortality between whole Russia and its capitals Moscow and Saint Petersburg. More than 10% of Russian population lives in these two regions. Of course, as capitals and as the biggest Russian cities, they have a considerable influence on the social development of the whole country.

I use for the analysis data on cause-specific mortality by Statistical Office of Russian Federation for the period 1989-2003. This investigation is based on the statistical methods of data analysis as well as on the comparative analysis of the death rates, the suicide rates and the rates of proportion suicide in total death.

Increase of mortality in Russia after the collapse of USSR culminated in 1994 (Figure 1). It was a highest level of mortality in the modern Russian history.

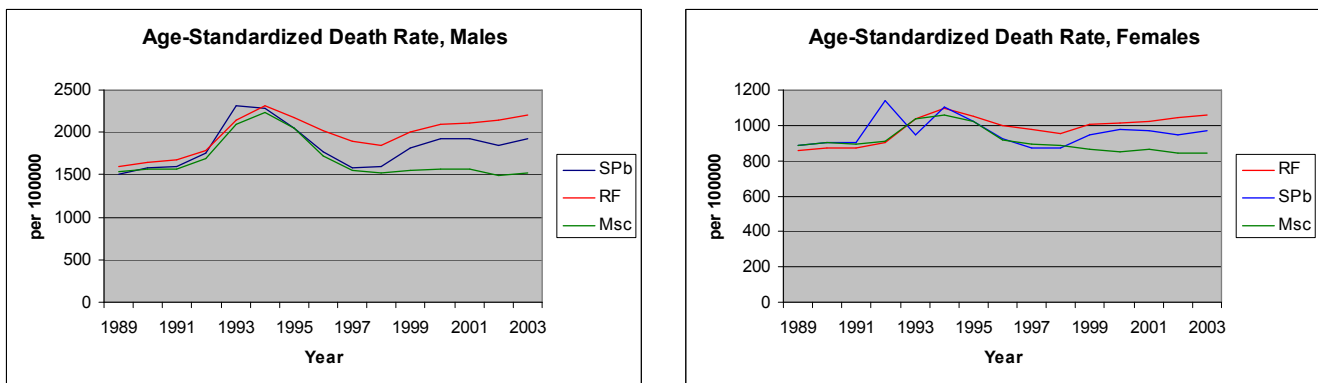


Figure 1. Age-Standardized Death Rates for Russian Federation (RF), Moscow (Msc) and St. Petersburg (SPb) in 1989-2003

Death rates had same trends for Russia and for two biggest Russian metropolises before the peak and differ afterwards. Decrease up to 1998 (up to 1997 for males in St. Petersburg) is observed for all

regions (Figure 1 and Table 1). However it was more notable in Megapolis. It should be also noted, that after 1998 Russian capital has specific trend of mortality, which is not similar to trend of Russian mortality. In contradictory to the mortality of Russia and St. Petersburg, the mortality in Moscow is decreasing. Increase of mortality from 1989 till 2003 in Russia is 1.6 times greater than in St. Petersburg for males and 2.5 times greater for females. In general, mortality trends are more positive in metropolis.

Table 1. Mortality Changes in Russia, St. Petersburg and Moscow in 1989-2003, Death Rate per 100000 (*years for St. Petersburg's males are in parentheses)

Year	Russian Federation		Saint Petersburg		Moscow	
	Males	Females	Males	Females	Males	Females
1989	1602.66	856.22	1532.86	887.87	1532.86	890.53
1994(1993)*	2311.97	1093.89	2311.81	1101.73	2239.24	1061.67
1998(1997)	1849.74	951.30	1553.32	871.66	1525.75	849.49
2003	2211.13	1060.65	1925.72	969.98	1523.72	844.14
Difference						
1989-1994(1993)	709,31	237,67	778,95	213,86	706,38	171,14
1994(1993)-1998(1987)	-462,23	-142,59	-758,49	-230,07	-713,49	-212,18
1998(1997)-2003	361,39	109,35	372,40	98,32	-2,03	-5,35
1989-2003	608,47	204,43	392,86	82,11	-9,14	-46,39

The analysis shows a lower suicide activity in these regions than average by country (Figure 2). However, in contrast to total, suicidal mortality has same trends for metropolis as for whole country. The difference between country and metropolis increases from year to year. It observed shift in one year before the peak in 1994 for males in Moscow and St. Petersburg. Woman's curves have same peak in 1993 in Russia and Moscow and in 1992 in St. Petersburg. Afterwards, in general, suicidal mortality is decreased.

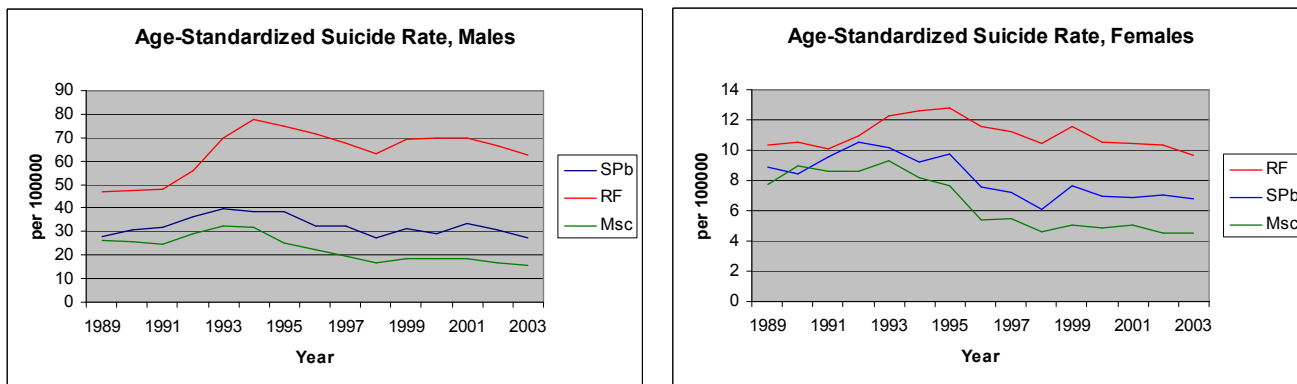


Figure 2. Age-Standardized Suicide Rates for Russian Federation, Moscow and St. Petersburg in 1989-2003

The suicide rate in St. Petersburg is higher than in Moscow. But response for the crisis was early in St Petersburg. It can be explained by specific mentality of Nordic society in St. Petersburg and its orientation to Europe.

Points of maximum and minimum are presented in the Table 2. Suicidal mortality during reviewed period increases only for men on the federal level. The highest decrease of suicidal mortality observes for Moscow's males. Comparing suicidal rates we can conclude that suicidal mortality decreases with increasing of population density. It is explained by higher social activity in big cities.

Table 2. Change of Suicidal Mortality in Russia, St. Petersburg and Moscow in 1989-2003, Death Rate per 100000 (*years for Moscow and St. Petersburg are in parentheses, (years for St. Petersburg are in parentheses)**

Year	males			females			Year
	RF	Petersburg	Moscow	RF	Petersburg	Moscow	
1989	46,77	27,94	26,32	10,31	8,86	7,75	1989
1991	47,83	32,06	24,53	12,22	10,55	9,32	1993(1992)*
1994(1993)*	77,69	39,66	32,29	12,78	9,77	7,66	1995
1998	62,99	27,43	16,99	10,45	6,07	4,63	1998
2001	69,93	33,69	18,59	11,53	7,64	5	1999
2003	62,74	27,56	15,55	9,63	6,75	4,55	2003
Difference							Difference
1989-91	1,06	4,12	-1,79	1,91	1,69	1,57	1989-93
1991-94	29,86	7,6	7,76	0,56	-0,78	-1,66	1993-95
1994-98	-14,7	-12,23	-15,3	-2,33	-3,7	-3,03	1995-98
1998-01	6,94	6,26	1,6	1,08	1,57	0,37	1998-99
2001-03	-7,19	-6,13	-3,04	-1,9	-0,89	-0,45	1999-03
1989-03	15,97	-0,38	-10,77	-0,68	-2,11	-3,2	1989-03

In general, proportion of suicide in total death is decreasing (Figure 3). Only for males in whole Russia we observe increase till 1998. It is related to economic crisis in country. But in contrast to whole country, habitants of metropolis get new opportunities and it allows avoiding such increase.

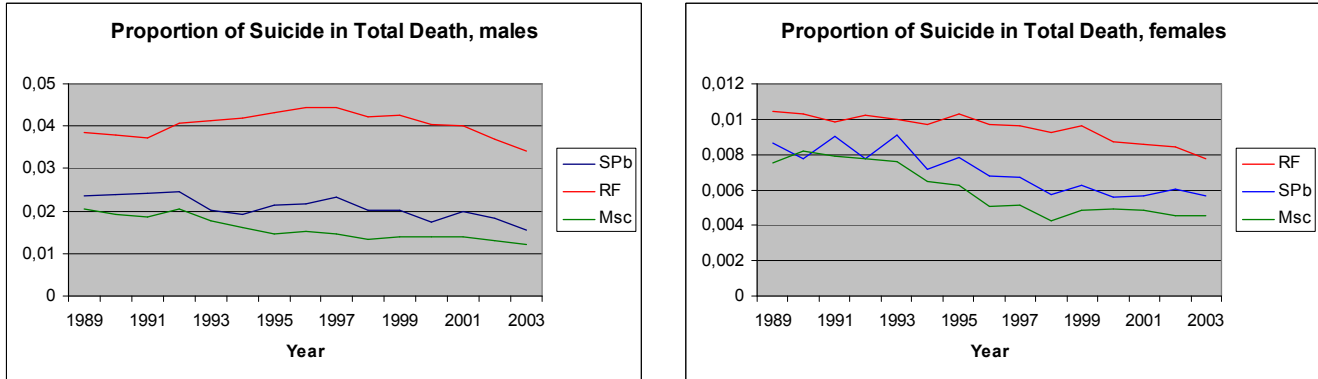


Figure 3. Proportion of Suicide in Total Death for Russian Federation, Moscow and St. Petersburg in 1989-2003

The comparison with Russia allows getting an estimate of influence of megapolis on suicide activity. Thus, the increasing of suicidal activity after economical and political crises in these two regions has one-year shifts forth. Also peaks in proportion of suicide in total death (risk groups) shifts to older ages during the crises in Megapolis (Figure 4). At the country level these shifts do not appear.

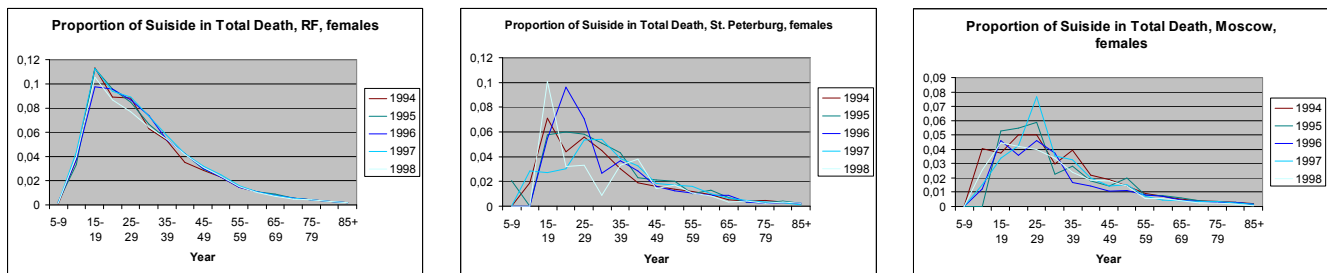


Figure 4. Proportion of Suicide in Total Death for Russian Federation, Moscow and St. Petersburg in 1994-1998

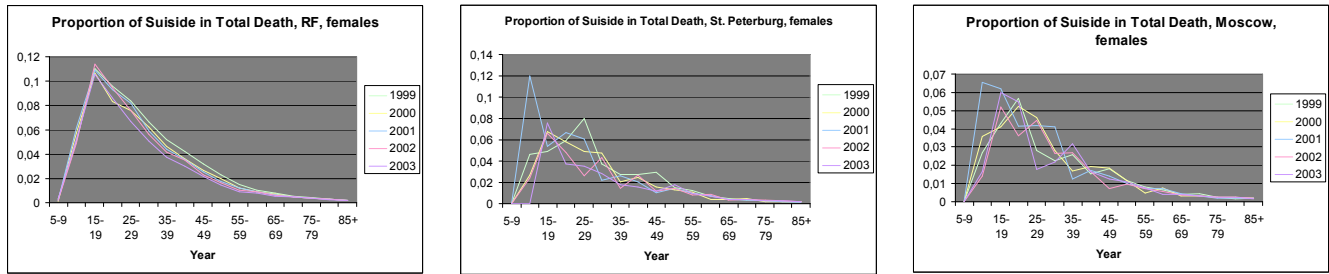


Figure 5. Proportion of Suicide in Total Death for Russian Federation, Moscow and St. Petersburg in 1999-2003

In 2001 Russian mass media published many articles about teenager’s suicides. It did not influence on all-Russian statistics. Nevertheless, in Moscow and in St. Petersburg the proportion of suicide was considerable increased in young ages (Figure 5). It shows an extremely important role of mass media, especially in modern Megapolis with its high level of informatization.

Table 3 presents the results of the Poisson regression for the suicide rate. The results confirm some of the prior observations. Deviations of the suicide rates are significantly associated with region, sex, and time periods. Nevertheless, the relations with some years for females are statistically insignificant. This is consequence of relative stable trend in females’ suicidal mortality. The incidence rate ratio (IRR) increases with age. The standard error is higher at old ages and in the age group 10-14 due to small absolute numbers of suicides in these age groups. For regions, the relation goes into expected direction. The effect of the city is positive and has greater values for males rather than females.

Table 3. Outcomes of the Poisson regression for the suicide rate for Moscow, St-Petersburg, and whole Russia in 1989-2003. Statistically insignificant coefficients ($p>0.05$) are in italic

Year	Males			Females		
	Coefficients	Std. Err.	IRR	Coefficients	Std. Err.	IRR
1989	0	0	1	0	0	1
1990	0.022	0.008	1.022	<i>0.016</i>	<i>0.015</i>	<i>1.016</i>
1991	0.032	0.008	1.032	<i>-0.025</i>	<i>0.015</i>	<i>0.975</i>
1992	0.204	0.008	1.226	0.047	0.015	1.048
1993	0.420	0.007	1.522	0.152	0.015	1.165
1994	0.522	0.007	1.685	0.178	0.015	1.195
1995	0.489	0.007	1.631	0.195	0.015	1.215
1996	0.437	0.007	1.549	0.095	0.015	1.100
1997	0.375	0.007	1.455	0.069	0.015	1.071
1998	0.304	0.007	1.356	<i>0.004</i>	<i>0.015</i>	<i>1.004</i>
1999	0.400	0.007	1.492	0.097	0.015	1.102

	2000	0.404	0.007	1.499	0.007	0.015	1.007
	2001	0.413	0.007	1.511	-0.009	0.015	0.991
	2002	0.366	0.007	1.442	-0.009	0.015	0.991
	2003	0.298	0.007	1.347	-0.081	0.015	0.922
Age	10-14	-2.428	0.015	0.088	-1.868	0.032	0.154
	15-19	-0.662	0.007	0.516	-0.115	0.017	0.891
	20-24	0	0	1	0	0	1
	25-29	0.168	0.006	1.183	0.060	0.017	1.062
	30-34	0.267	0.006	1.305	0.118	0.016	1.125
	35-39	0.319	0.006	1.376	0.232	0.016	1.261
	40-44	0.383	0.006	1.467	0.387	0.015	1.472
	45-49	0.446	0.006	1.562	0.513	0.016	1.670
	50-54	0.494	0.006	1.639	0.605	0.016	1.832
	55-59	0.422	0.006	1.524	0.570	0.016	1.768
	60-64	0.276	0.007	1.317	0.659	0.015	1.934
	65-69	0.317	0.007	1.373	0.779	0.015	2.179
	70-74	0.329	0.008	1.390	0.920	0.016	2.510
	75-79	0.352	0.011	1.422	1.141	0.016	3.130
	80-84	0.525	0.013	1.690	1.345	0.017	3.837
85+	0.696	0.017	2.006	1.500	0.018	4.480	
City	Russia¹	0	0	1	0	0	1
	Moscow	-1.090	0.008	0.336	-0.537	0.013	0.585
	St.-Petersburg	-0.694	0.010	0.500	-0.310	0.016	0.734
	constant	-7.704	0.007		-9.346	0.016	

¹Without Moscow and St.-Petersburg

One can see also that Moscow gives more “protection” (0.34 vs. 0.5 for males and 0.59 vs. 0.73 for females) from suicide than St.-Petersburg. It should be also noted that this “protection effect” has more influence on males.

In general, both death and suicide rates are lower in Megapolis. It is explained above all by higher level of development of economic and medicine. However, megapolis have own trends in suicidal mortality, because opportunities in social sphere have influence on suicidal dynamics. At the same time population of Metropolis is more sensitive to social and economic development. Changes in their mortality can be used as markers of following changes on the country level.