

Population Association of America Annual Meeting, April 2010, Dallas
Session 121:
Ethnicity, Health and Mortality in Russia and Former Soviet Republics

Health Status of Russian Minorities in Former Soviet Republics

George Groenewold and Jeroen van Ginneken
Netherlands Interdisciplinary Demographic Institute (NIDI)

Abstract

Ethnic Russians constitute sizable minorities in most former Soviet Republics. After the dismantling of the USSR, by the end of 1991, their socio-political position significantly weakened. Some argue that this resulted in a deterioration of the socioeconomic living conditions of many ethnic Russians and this may have led to a lower health status and higher mortality rates as compared to the national majority population. However, others point to the importance of ethnic group-specific health risk behaviour and illness control in explaining the lower health status of ethnic minorities in former Soviet Republics. In this paper we used nationally representative WHO World Health Survey data collected in 2001-2003 to examine the role of both types of contributing factors in the explanation of differences in health status of Russian minority and national majority populations in the Newly Independent States of Estonia, Latvia, Ukraine and Kazakhstan. In these four former Soviet Republics about one in five persons is identified as ethnic Russian. One of the main findings is that health status differences do exist in Estonia, Ukraine and Kazakhstan but that differences are not large. We also found that higher levels of material wealth, educational attainment and physical activity are associated with a higher overall health status. The associations of these variables with health status were often stronger than those of ethnic group membership with health status. The Health Status Index (HSI) that we employed in combination with results of Multiple Classification Analysis is useful for the profiling of population groups with different health status levels.

Introduction

The adoption by the Central Committee of the Communist Party (CCCP) in June 1987 of Mikhail Gorbatsjov's economic (*perestrojka*), political and cultural reforms (*glasnost*) marked the beginning of a process leading to the dismantling of the USSR and, by the end of 1991, to the emergence of 15 Newly Independent States¹. One of the enduring characteristics of Communist rule during its almost 75 year existence was its policy of large scale migration or forced relocation of large numbers of ethnic Russians² from the Russian Republic to other Soviet Republics. For example, after World War II, USSR President Nikita Khrushchev launched his "Virgin Lands Campaign" to open new agricultural lands in Kazakhstan, resulting in large numbers of migrants moving from the Ukraine and Russia into Kazakhstan. In a number of Soviet Republics they occupied privileged positions in government and industry or they were part of extensive socio-economic and political networks (Commercio & Sil, 2005). Not surprisingly, shortly before independence of the first Soviet Republics in 1989, ethnic Russians comprised a sizeable share of the total population in several of the Soviet Republics, such as in Kazakhstan (38 per cent of 16 million people), Latvia (34 per cent of 2.7 million people), Estonia (30 per cent of 1.6 million people), and Ukraine (22 per cent of 52 million people) (CISSTAT, 1994).

After independence in 1991, the status of ethnic Russians remaining in the Newly Independent States changed profoundly: from local representatives of an imperial ethnic group to one of an ethnic minority (Pettai & Hallik, 2002). As a result, millions of ethnic Russians relocated to the Russian Federation because of socio-political (Estonia, Latvia) and economic reasons (Kazakhstan). In spite of the large volume of return migration, ethnic Russians continued to comprise sizeable minorities in the above mentioned four countries: between 17 per cent in the Ukraine and 30 per cent in Latvia and Kazakhstan. In the other Newly Independent States shares of ethnic Russians dropped to less than 10 per cent (in 1994). The map in annex 1 illustrates areas of concentration of ethnic Russians in the region, a few years after independence (University of Texas (UT), 2010).

¹ Based on common geographic, cultural and political history features, the 15 Newly Independent States comprise five groups of countries, including the Russian Federation (Russia), the Baltic states (Estonia, Latvia, Lithuania), the Eastern European states (Belarus, Moldavia, Ukraine), the Caucasian states (Armenia, Azerbaijan, Georgia), and Central Asian states (Tajikistan, Kazakhstan, Turkmenistan, Kyrgyzstan, Uzbekistan).

² These are ethnic Russians who migrated (or are descendants of such migrants) from the Russian heartland (approximately the area of the current Russian Federation (Russia) to other former Soviet Republics. In this study, respondents were asked with which ethnic group they identify and maintain feelings of belonging. Most often these are people who would identify themselves as being 'Russkiye', even if they are born in one of the former Soviet Republics.

The documentation compiled by the Minorities at Risk Project (Minorities at Risk Project (MRP), 2010) reveals that ethnic Russians remaining in former Soviet Republics continue to occupy a disadvantaged socio-political position. However, because the extent of ‘Russification’ in former Soviet Republics varied, measures to marginalize ethnic Russians differ leading to different inter-ethnic relations. For instance, the Central Asian state of Kyrgyzstan and the Baltic states of Estonia and Latvia pursued quite different policies towards their Russian minority populations. Estonia and Latvia adopted strict citizenship policies by granting it only to those demonstrating that their family resided in the country prior to the Soviet annexation. Furthermore, citizenship could only be obtained after passing tests in Latvian language and history. The use of Russian language was actively discouraged. In contrast, Kyrgyzstan granted citizenship automatically to those living within its borders upon independence and the government seeks to preserve the use of Russian culture and language. Furthermore, while only Latvia had official policies that disadvantaged ethnic Russians in the job market, informal discrimination against ethnic Russians applying for jobs in the private and public sector has been observed in several of the Newly Independent States (Commercio & Sil, 2005; Commercio, 2004; Fowkes, 2002). In other countries too, (Ukraine, Kazakhstan) similar laws were implemented. Exceptional situations do exist, such as on the Ukrainian peninsula Crimea (see annex 1). The Crimea is an autonomic region within the Ukraine territory where ethnic Russians constitute the majority population and where they are more in control over their living conditions.

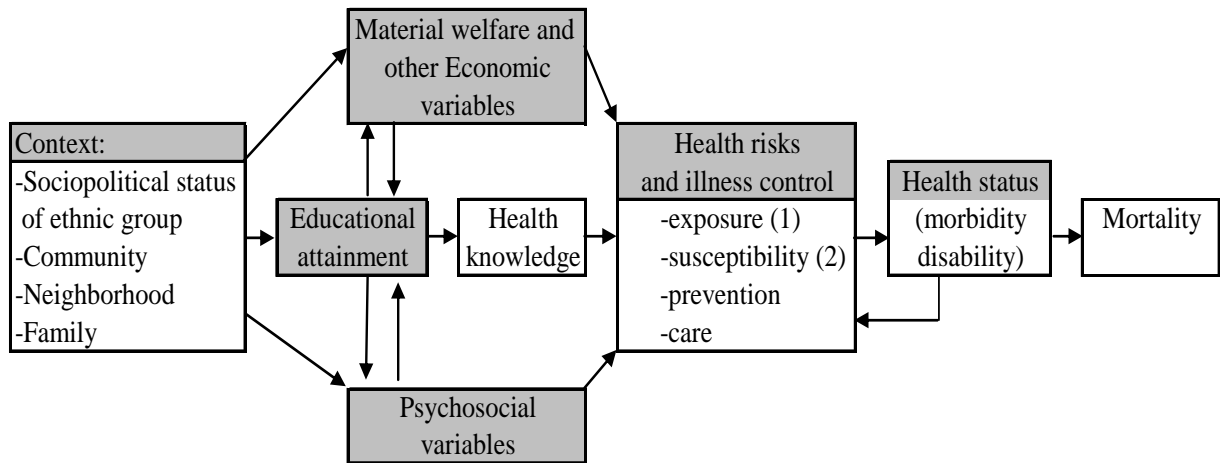
As deaths are ‘rare’ events, survey samples are often too small to derive robust estimates of mortality and examine ethnic group disparities. Therefore, we decided to focus on the antecedent state of mortality, i.e. perceived morbidity, and we set ourselves the following two objectives: (1) to determine if and to what extent disparities in health status exist between ethnic Russians and the native majority population in former Soviet Republics and, (2) to determine to what extent indicators of socioeconomic status and life-style behaviour explain variation in perceived morbidity. We use WHO World Health Survey data collected in several former Soviet Republics in the period 20001-2003.

Conceptualization

Inspired by theoretical and empirical work done by others (Chaturvedi, 2001; Doorslaer & Koolman, 2004; Harris, 2010; Lynch, Smith, Kaplan, & House, 2000; Macintyren, Ellaway, & Cummins, 2002; Mackenbach, Stirbu, Roskam, Schaap, Menvielle, Leinsalu et al., 2008; Nazroo, 2003; Oort, van Lenthe, & Mackenbach, 2005; Schrijvers, Stronks, Dike van de Mheen, & Mackenbach, 1999; Stronks, van de

Mheen, van den Bos, & Mackenbach, 1997), we derived a general working model (figure 1) to identify relevant determinants and to develop hypotheses on the effects of determinants on health status. It is a general model identifying main variable categories, pathways of influence and areas of interactions. Though not explicitly included in the model, age and sex are important control variables.

Figure 1: Determinants of health status and mortality



(1) includes voluntary, compulsive, involuntary exposure to adverse health behavior (e.g. smoking, drinking, excess food consumption, hazards in the working place or at home)

(2) expresses differences between persons in the physiological reaction of being exposed to a particular health risk

With respect to the *dependent* variable, we make use of one outcome variable in the category Health Status (namely morbidity/disability). The variable is an interval scale variable, which we named health status index (HSI), and it is derived from the response of 23 health-status questions on whether and to what extent the respondent had difficulties in the past 30 days with doing activities in the domains of pain, vision, hearing, cognition, self-care, mobility, usual activities, interpersonal relations and social participation. On each of these questions respondents were offered five Likert-scale response categories: from ‘extremely difficult or cannot do’ to ‘no difficulty at all or none’.

With respect to the *independent* variables we will deal in particular with variables in the following three categories (e.g. see figure 1): Material Welfare, Educational attainment, and Health risks and illness control.

Material welfare is represented by a household wealth index, derived from the response on questions about the possession of a wide range of goods and assets, and

on housing quality. The wealth index reflects accumulated wealth over a longer period in life. As the information collected pertains to the household in which people live, it is a more robust indicator for the quality of people's health-related living conditions than income (Filmer & Pritchett, 2001). Thus, the expectation is that a higher wealth status is associated with a higher health status (or lower perceived morbidity rate).

Educational attainment is represented by a variable measuring highest level of education attained. A higher level of education can be expected to lead to a higher awareness of maintaining a good health status and better health status.

Health risks and illness control captures different aspects of health risk behaviour. In this study it is represented by the following 'exposure' and 'prevention and care' variables. Information about 'exposure' is obtained from the response on questions about smoking and alcohol use. Information on 'prevention and care' is obtained from the response on questions on physical activity (number of days in the past week that the respondent did, respectively, vigorous, moderate and light physical activities for at least 10 minutes per day) and a proxy for illness control (extent of satisfaction with access to health care, when needed). In the case of Latvia this information was unfortunately not present in the dataset. In the text below we also use the concept 'life-style' to describe health behaviour in terms of these health risk and illness control variables. The obvious hypothesis is that, on average, indications of a healthy life-style (no smoking, drinking, and moderate physical activity, receiving health care if needed) will be associated with higher levels of health status.

Health status declines as age increases, and the health status of men and women differ. With respect to age we use a functional classification based on general life-cycle and life-style characteristics. Although data were collected from persons 18 years and older, we have not included the records of persons 18-24 years old because of censoring. Persons in that age range may still at school or university and this is not measured in the survey. We assume that all respondents of age 25 and older have completed their education. The age groups are: 25-34 years, 35-59 years, 60+ years. Many persons in the first age-group are still single or they are in the first stages of family formation. They are more likely to go out, be with friends, and try to establish a financial base for family building. In this age-group unhealthy life-styles emerge and may prevail (smoking, drinking) of which the consequences show up only later in the life course. For many persons in the second age group this is the stage in which children are raised and when the costs and benefits of having children are exposed. In this age-bracket the health consequences of unhealthy life-styles at an earlier age may start to show up more frequently than in the previous age-group. The last age-group

includes the elderly, many of whom are retired. In this age-group relatively more persons have health problems due to ageing and unhealthy life-styles at earlier ages. Thus, health status indices are expected to decline as ages increase. While women rate their health worse than men and visit the hospital more often, they are less likely to die at each age. This paradox can partly be explained by differences in the prevalence of chronic conditions between men and women (Case & Paxson, 2005; Yin, 2007). We expect the average HSI scores of women to be lower than those of men.

Figure 1 shows pathways of how the socio-political context may affect health status. A lower socio-political status of members of ethnic minorities may translate into limited access to the labour market and other income-earning activities, limited access to higher levels of education and to health care, leading to a lower overall health status. As the socio-political status of ethnic Russians has deteriorated significantly in the period 1991-2001 this may have led, on average, to a lower overall health status compared to national majority populations. The review of the socio-political situation of ethnic Russians in former Soviet Republics (Minorities at Risk Project (MRP), 2010) suggest that we should expect to find differences to be largest in Estonia and Latvia and least in the Ukraine.

Our model also helps to determine which of the various factors are the most important of the various determinants of health status. Different views have been expressed on this issue. Some authors argue that ethnic disparities in health and mortality can best be understood by examining underlying factors such as wealth status, educational attainment, spatial and cultural context people live in (Cornia & Panizza, 2000; Kawachi & Berkman, 2003; Leinsalu, Vagero, & Kunst, 2004; Macintyre, Ellaway, & Cummins, 2002; Stronks, van de Mheen, van den Bos et al., 1997; Van Lenthe, Martikainen, & Mackenbach, 2007). Others have argued, however, that such disparities can best be understood by examining life-style differences (e.g. (Schenk, 2007) (Cockerham, Hinote, Abbott, & Hearpfer, 2004; Schrijvers, Stronks, Dike van de Mheen et al., 1999)).

Data and Methods

We used World Health Organization survey data collected in selected former Soviet republics in the period 2001-2003, 10-12 years after independence. These data were collected within the framework of the WHO World Health Surveys (WHS) project covering 61 countries (WHO, 2001; World Health Organization, 2009). Conducted about 10 years after independence of former Soviet Republics, the objective of the surveys was to obtain, from a nationally representative sample of persons 18 years

and older, information on the context in which they live and on behavioural, socioeconomic, and epidemiological risk factors of health and mortality. WHS data were collected in six of the 15 former Soviet Republics, including Russia (Russian Federation). We used WHS data of five countries for which information on ethnicity was present or could be reconstructed from the data: Estonia, Latvia, Ukraine, Kazakhstan, and Russia. Russia was included as a kind of bench-mark population as it is the country of origin of many ethnic Russians in former Soviet Republics.

Data were collected by either a face-to-face interviewing method (Estonia, Latvia, Russian Federation, and Kazakhstan) or by means of a postal survey (Ukraine). Using external data sources, post-stratification weights were derived to cope with age and sex-specific non-response bias. Sample design weights were derived to compensate for respondents having different sample selection probabilities. These weights were combined and used in the analyses of the data.

The table below summarizes main population and survey characteristics. About 64.8 million people live in the four former Soviet Republics (excluding Russian Federation) and about one in five persons, i.e. 13.4 million people, is ethnic Russian. This is similar to the general situation in the Russian Federation where about one in five persons belongs to one of the main ethnic minority groups such as the Tatars, Ukrainians, Bashkirs, Chuvash, Chechens and Armenians. Kazakhstan is the only (Sunni) Islamic country whereas in all countries many ethnic Russians liaise with the Russian Orthodox Church.

Table 1. Main population and survey characteristics, 2002.

	Estonia		Latvia		Ukraine		Kazakhstan		Russian Federation	
	Estionians	Russians	Latvians	Russians	Ukrainians	Russians	Kazakhs	Russians	Russians	Others
Population	1.3 million		2.2 million		46.0 million		15.3 million		140.1 million	
Ethnic composition	68%	26%	58%	30%	78%	17%	54%	30%	80%	20%
Effective sample size	471	182	586	182	1513	375	2143	1700	3544	455

Principal Component Analysis (PCA), a special type of Factor Analysis, was used to derive a household Wealth Index based on information on the possession of 19 different types of household assets (e.g. possession of car, certain household equipment and electronics). The theoretical expectation is that the extracted first component scores reflect 19 asset-item weights so that a single wealth index score for each respondent can be computed. For each country, PCA goodness-of-fit statistics

revealed that the first component scores indeed could be used to derive such an index. For instance, compared to the other components, the first component explained most of the variance in the intercorrelation matrix, between 22% en 26%. These findings are similar to values found in other studies (Filmer & Pritchett, 2001) and provide support to the derivation of country-specific Wealth Indices.

Reliability and Principle Component Analysis were used to derive a country-specific overall indicator of health status, the Health Status Index (HSI). This index is experimental in the sense that it has not been developed and used before. Therefore, the first step was to examine, using the method of Reliability Analysis, whether the response of 29 questions on different aspects health could be summarised by a single Health Status Index. Questions pertain to the domains of pain, vision, hearing, cognition, self-care, mobility, usual activities, interpersonal relations and social participation. It turned out that, in all countries covered by this study, the response of 23 of the 29 questions showed sufficient inter-correlation to be of use for constructing an HSI. The measure of reliability for the Health Status Index was high in all countries (i.e. Cronbach alpha >0.90). In a second step, we used PCA to derive the item weights for the 23 variables and to compute HSI values for each respondent. In a third step, to facilitate comparison between countries, predicted HSI values were rescaled to fit a yardstick ranging from very bad (=0) to very good (=5)

We used Multiple Classification Analysis (MCA), a special type of Analysis of Variance, to examine effects of the determinants of health status, including ethnic group membership. The results of MCA show the effect of each category of a determinant on health status, both before and after taking account of effects of all other determinants. MCA essentially fits an additive model to the data so that for each category of a determinant a *deviation-value* from the overall grand mean (HSI index) is estimated. With the results of MCA it is easy to derive estimates of the health status of all kinds of subgroups by simply adding the estimated deviation-value of a category of interest to the overall mean HSI. MCA facilitates the easy profiling of subgroups in terms of selected person characteristics and concomitant HSI-values. MCA conveniently handles variables measured at different measurement scales and it does not require a linearity assumption (Andrews, Morgan, Sonquist, & Klem, 1972).

Results

In the first part of this section we compare the distributional characteristics of respondents of the national majority population vis-à-vis Russian minority respondents in terms of the explanatory variables used in the multivariate analysis.

Differences in distributional characteristics between the two groups will affect the analysis of ethnic disparities in health status. Table 2 shows that in the case of Estonia small differences can be observed between the two study populations.

Table 2. Percentage distributions^a of control and independent variables and median age of respondents, by country and ethnic group.

		Estonia		Latvia		Ukraine		Kazakhstan		Russia	
		Nationals	Russians	Nationals	Russians	Nationals	Russians	Nationals	Russians	Russians	Other
<i>Controls</i>	Age, 25-34	24	22	28	20	31	25	36	26	20	17
	35-59	42	52	37	40	44	53	56	53	43	46
	60+	33	26	35	40	25	22	8	20	36	37
	Median age	51	49	51	54	45	47	39	45	50	46
	Sex, Female	66	64	69	66	64	62	68	65	64	62
	Male	34	36	31	34	36	38	32	35	36	38
<i>Material Welfare</i>	Poorest 40%	35	47	38	48	36	32	37	20	40	43
	Middle 40%	41	39	38	40	43	42	35	50	40	37
	Richest 20%	24	15	23	13	21	26	28	30	20	20
<i>Education</i>	Below secondary	28	19	79	33	13	7	2	6	39	44
	Secondary	52	62	8	57	51	49	44	49	21	19
	College or higher	20	18	13	10	37	45	55	44	41	37
<i>Health risks and care</i>	Smoking, No	67	60	69	57	75	74	78	69	72	72
	Yes	33	40	31	43	25	26	22	31	28	28
	Alcohol, Never	10	15	12	14	26	22	39	30	23	30
	Ever, but not last week	41	37	46	37	30	33	24	24	34	24
	Ever, and last week too	49	48	42	50	44	45	38	45	44	45
	Physical activity, Low	21	34			22	34	30	28	28	26
	Low-Medium	26	25			30	27	26	14	23	17
	High-Medium	23	22	n.a.		21	16	24	29	23	30
	High	30	19			26	23	21	28	26	28
	Gets the care needed, Dissatisfied	37	42	39	45	49	42	13	26	28	19
Neither Dissat. or Sat.	33	29	27	30	32	38	16	20	31	22	
Satisfied	29	28	34	25	19	20	71	54	41	59	
n		471	182	586	182	1513	375	2143	1700	3544	455

^aTotal column percentages (100,0) are suppressed. Due to rounding variable categories may not precisely sum to 100%.

^bn.a.= not available. Physical activity in past 7 days was not recorded and/or compiled in the Latvian dataset.

Members of the Russian minority in Estonia tend to be somewhat less well-off in terms of material welfare, they are more often smokers, are less physical active and more often dissatisfied because they cannot get the health care needed.

A more or less similar picture emerges in the case of Latvia. An anomaly is observed with respect to educational status of nationals compared to ethnic Russians. The percentage of Latvians with some secondary education or less is extremely high and the percentage with High School education is extremely low.

In the Ukraine the two study groups do not seem to differ much though Russian minority respondents tend to be somewhat better-off and better educated than the Ukrainian respondents.

Ethnic Russian respondents in Kazakhstan are older, somewhat better-off in terms of material welfare, use more often alcoholic drinks and are more frequently dissatisfied with the health care system when needed. The strict language rules that are applied at universities may explain why, in 2003, relatively fewer ethnic Russians attained a college or higher level of educational attainment.

In the Russian Federation ethnic minorities do not differ much from the ethnic Russian majority population. Only in terms of educational attainment ethnic minorities in Russia lag somewhat behind. Furthermore, compared to Russians, ethnic minorities more often report to be satisfied with access to health care when needed. Differences between ethnic groups and the majority population in Russia in terms of the characteristics presented in table 2 are minor.

So far, the conclusion is that about 10-12 years after independence differences between ethnic Russians and the majority population in former Soviet Republics are not large in terms of the presented characteristics. Given the often harsh language and citizenship laws, forms of discrimination, limitations in access to labour markets and income earning opportunities, and in spite of lack of data on the situation before independence, it is reasonable to ask the question whether the political events in 1991 have led to a disadvantaged health status of ethnic Russians compared to the health status of the majority population in former Soviet republics. In as far as distributional differences do exist they pertain to material welfare and educational attainment and to a lesser degree to satisfaction with access to health care. Whether observed differences are actually large or small can only be determined if WHS panel survey data would have been available for the same respondents with a reference year prior to the date of independence.

We now turn to a discussion on the uni- and multivariate analysis of health status. Below we examine ethnic group disparities in health status by country, and we assess if and to what extent material welfare, educational attainment, and health risks and care characteristics explain variation in health status, while also accounting for distributional differences between the two groups in terms of age and sex.

Table 3 presents results of Multiple Classification Analysis. In the second row, the table presents for each country an estimate of the overall mean value of the Health Status Index (HSI). Values of HSI run from 0 (lowest level of health) to 5 (highest level of health). The lowest overall health status, irrespective of ethnicity, is observed in Latvia (3.98) and the highest in Kazakhstan (4.35).

In the main part of the table deviation-values are presented for each category of the control and explanatory variables, before (first column) and after (second column) effects of all other variables in the model have been accounted for. The value of eta is an indicator of the relative importance of a particular explanatory variable *without* taking account of other variables in the model. Thus, eta indicates the *gross* effect of a variable on HSI. Beta indicates the relative importance of a variable after the effects of all other variables in the model have been accounted for. It should be interpreted as a measure of the net effect of that variable within the context of the model. Beta indicates the net effect of a variable on HSI. In the bottom of the table values of R^2 show how much of the variation in health status in each country is explained by the variables included in the model.

With respect to ethnic disparities in health status table 3 shows that both before and after account is taken of effects of other variables, statistically significant health disparities are observed in Estonia, Ukraine and Kazakhstan. For instance, the average HSI of ethnic Russians in Estonia is $4.16 - 0.11 = 4.05$, while for the Estonian majority population the HSI is $4.16 + 0.05 = 4.21$. This is a gross-difference of 0.16 is confounded by effects that other model variables have on HSI. After these effects have been filtered out, the HSI of ethnic Russians is $4.16 - 0.05 = 4.11$ and of Estonians $4.16 + 0.02 = 4.18$, resulting in a net-difference of 0.07 HSI points.

In a similar manner ethnic disparities in health status can be estimated for the other countries. In the case of the Ukraine the average health status of ethnic Russians turns out to be better than that of Ukrainians while in Kazakhstan the Russian minority has on average a lower health status.

Table 3. Multiple Classification Analysis results^a: overall mean HSI scores and deviations from mean scores for independent variable categories.

		Estonia		Latvia		Ukraine		Kazakhstan		Russia	
Overall mean Health Status Index (HSI)		4.16		3.98		4.19		4.35		4.10	
		Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net
<i>Ethnicity</i>	Nationals	0.05	0.02	0.01	0.01	-0.02	-0.02	0.08	0.03	0.00	0.01
	Russians	-0.11	-0.05	-0.03	-0.04	0.10	0.09	-0.10	-0.04	-0.02	-0.04
	<i>eta,beta</i>	<u>0.08</u>	<u>0.04</u>	0.02	0.02	<u>0.07</u>	<u>0.06</u>	<u>0.14</u>	<u>0.05</u>	0.01	0.02
<i>Controls</i>	Age, 25-34	0.38	0.31	0.50	0.38	0.35	0.30	0.28	0.27	0.48	0.37
	35-59	0.16	0.07	0.15	0.11	0.08	0.06	0.04	0.04	0.25	0.17
	60+	-0.45	-0.29	-0.51	-0.38	-0.58	-0.47	-0.82	-0.81	-0.56	-0.40
	<i>eta,beta</i>	<u>0.36</u>	<u>0.24</u>	<u>0.43</u>	<u>0.32</u>	<u>0.46</u>	<u>0.38</u>	<u>0.50</u>	<u>0.50</u>	<u>0.55</u>	<u>0.40</u>
	Sex, Female	-0.03	-0.04	-0.09	-0.04	-0.10	-0.08	-0.04	-0.04	-0.10	-0.05
Male	0.08	0.11	0.20	0.08	0.17	0.14	0.07	0.08	0.18	0.09	
<i>eta,beta</i>	<u>0.05</u>	<u>0.07</u>	<u>0.14</u>	<u>0.05</u>	<u>0.17</u>	<u>0.14</u>	<u>0.08</u>	<u>0.09</u>	<u>0.17</u>	<u>0.08</u>	
<i>Material Welfare</i>	Poorest 40%	-0.32	-0.12	-0.32	-0.14	-0.13	0.04	-0.07	-0.08	-0.34	-0.11
	Middle 40%	0.16	0.04	0.17	0.10	0.01	-0.03	-0.07	0.00	0.18	0.06
	Richest 20%	0.34	0.15	0.31	0.08	0.18	0.01	0.18	0.08	0.36	0.13
	<i>eta,beta</i>	<u>0.29</u>	<u>0.11</u>	<u>0.28</u>	<u>0.12</u>	0.15	0.04	<u>0.17</u>	<u>0.09</u>	<u>0.37</u>	<u>0.13</u>
<i>Education</i>	Below secondary	-0.35	-0.19	-0.06	-0.06	-0.66	-0.30	-0.50	-0.12	-0.29	-0.09
	Secondary	0.05	0.01	0.10	0.08	0.07	0.03	0.00	0.00	0.28	0.15
	College or higher	0.30	0.23	0.21	0.19	0.08	0.04	0.04	0.01	0.14	0.01
	<i>eta,beta</i>	<u>0.24</u>	<u>0.15</u>	<u>0.10</u>	<u>0.09</u>	<u>0.30</u>	<u>0.14</u>	<u>0.15</u>	<u>0.04</u>	<u>0.30</u>	<u>0.11</u>
<i>Health risks and care</i>	Smoking, No	-0.07	-0.01	-0.12	-0.02	-0.08	0.00	-0.04	-0.03	-0.09	0.00
	Yes	0.17	0.04	0.22	0.04	0.24	0.00	0.13	0.08	0.23	0.00
	<i>eta,beta</i>	0.11	0.02	0.17	0.03	0.18	0.00	<u>0.11</u>	<u>0.07</u>	0.18	0.00
	Alcohol, Never	-0.26	-0.10	-0.39	-0.19	-0.12	-0.01	-0.08	-0.04	-0.30	-0.11
	Ever, but not last week	-0.06	-0.02	-0.15	-0.05	-0.12	-0.04	0.02	0.13	-0.05	0.02
	Ever, and last week too	0.19	0.06	0.26	0.11	0.14	0.03	0.05	-0.04	0.20	0.04
	<i>eta,beta</i>	0.17	0.06	<u>0.25</u>	<u>0.11</u>	0.17	0.04	<u>0.09</u>	<u>0.11</u>	<u>0.25</u>	<u>0.08</u>
	Physical activity, Low	-0.43	-0.29			-0.18	-0.08	-0.13	0.00	-0.35	-0.18
	Low-Medium	0.03	0.05			-0.04	0.04	-0.03	-0.06	0.02	0.02
	High-Medium	0.27	0.13	n.a. ^b		0.19	0.08	0.08	0.03	0.22	0.11
High	0.19	0.15			0.07	-0.03	0.10	0.02	0.16	0.08	
<i>eta,beta</i>	<u>0.29</u>	<u>0.19</u>			<u>0.18</u>	<u>0.08</u>	<u>0.15</u>	<u>0.05</u>	<u>0.29</u>	<u>0.15</u>	
Gets the care needed, Dissatisfied	-0.07	-0.06	-0.15	-0.14	-0.18	-0.15	-0.14	-0.09	-0.17	-0.17	
Neither Dissat. or Sat.	0.08	0.05	0.17	0.11	0.17	0.12	0.05	0.04	0.02	0.01	
Satisfied	0.01	0.02	0.04	0.09	0.17	0.17	0.03	0.02	0.09	0.10	
<i>eta,beta</i>	<u>0.07</u>	<u>0.05</u>	<u>0.14</u>	<u>0.12</u>	<u>0.24</u>	<u>0.19</u>	<u>0.10</u>	<u>0.07</u>	<u>0.14</u>	<u>0.14</u>	
R ²	23.2%		23.3%		30.3%		30.2%		38.9%		
n	696		768		1888		3843		2485		

^a Statistically significant results, at 95% level, are indicated by italicized and underlined values of eta and beta.

^b n.a.= not available. Physical activity in past 7 days was not recorded and/or compiled in the Latvian dataset.

The data suggest that ethnic disparities in health status are absent in Latvia and the Russian Federation³.

With respect to the hypothesized effects of model variables on health status, table 3 shows the following.

According to expectation, the variables age, sex, material welfare, education, physical activity and access to health care all show effects in expected directions. More specifically, in all countries health status decreases with age and women have a lower health status than men. Furthermore, in four of the five countries, a higher wealth status is associated with a higher health status and in all countries a higher level of educational attainment is associated with a higher health status. In countries where physical activity was measured, higher levels of physical activity are associated with a higher health status. In all countries where respondents reported to be satisfied with access to health care such persons appear to have a higher health status than those who are dissatisfied.

Contrary to expectation are the results produced by the variables smoking and use of alcohol. Smoking behaviour does not explain variation in health status in four of the five countries and in the country where smoking does effect health status (Kazakhstan), it is associated with a higher health status, even after effects of other model variables have been accounted for. Also, alcohol consumption is, on average, associated with a better health status, even after effects of other variables have been filtered out. This is remarkable in light of the context of countries of Eastern Europe where (excessive) alcohol use is perceived as a major health risk, leading to premature mortality, notably among men (Leon, Saburova, Tomkins, Andreev, Kiryanov, McKee et al., 2007).

Based on the values of eta, not surprisingly, age appears as the most important predictor of health status. However, material welfare, educational attainment and the life-style factor 'physical activity' are also important in the explanation of health status in former Soviet republics. For each of these variables, values of beta show that their relative importance remains largely intact after effects of all other model variables have been filtered out.

The results in table 3 in the net-column can be used for the profiling of population groups with respect to their health status. For instance, Estonians who are 60+,

³ Contrary to the other countries, the comparison group in the Russian Federation consist of a mix of representatives of different ethnic groups. It is of course possible that specific ethnic groups do show major health status disparities with ethnic Russians in the Russian Federation.

female, belong to the poorest segment in the society, have little education, with little physical activity and who do not generally get the health care when needed have a health status (HSI)-score of $4.16+(0.02)+(-0.29)+(-0.04)+(-0.12)+(-0.19)+(-0.29)+(-0.06)=3.21$. The predicted health status score of a women belonging to the ethnic Russian minority population in Estonia with the same characteristics would be 3.14. This health status score is much lower than that of women who are in the age group 18-34, belong to the wealthiest segment in society, have a college or higher level of education, who have a moderate to high level of physical activity and who perceive that they get the health care when needed. Estonian women with those characteristics would on average have a HSI score of 5.0 while a similar women belonging to the Russian minority population would have a score of 4.93.

The conclusion of the multivariate analysis is that ethnic disparities in health status are small or absent in former Soviet republics. Furthermore, material welfare status, educational attainment and degree of physical activity appear to be much more important to the explanation of health status than ethnic affiliation. The MCA results can be used for the profiling of health status scores of sub-groups in the population (e.g., with low and high health status scores) using the predicted category-values of variables included in the model.

Discussion

The socio-political status of ethnic Russians in former Soviet republics changed dramatically after these republics became independent nations in 1991. Shortly after independence, fear of discrimination and suppression, and economic motives drove millions of ethnic Russians to the ethnic heartland, the Russian Federation (Russia). Independence brought an end to the privileged position of many ethnic Russians in the society as, for instance, indicated by their ability to control appointments of civil servant and government positions. However, considerable numbers of ethnic Russians remained in the Newly Independent States. Overnight these people became immigrants and an ethnic and political minority in the country where most of them were born or had lived for many years. In most countries, ethnic Russians became subject to strict assimilation laws, among others involving the passing of exams in the new national language and cultural customs whereby the use of Russian language and culture was discouraged in most of these countries. Furthermore, in many instances they were excluded from government and university jobs. In some countries, such as Latvia, access to the labour market became problematic and they were exposed to different forms of discrimination.

We asked ourselves the question whether, in the aftermath of the profound political changes in 1991, this drop in socio-political status had led to a situation whereby ethnic Russians are now worse-off in terms of health status and living conditions than the national majority population. Furthermore, we posed the question to what extent aspects of living conditions, such as wealth, educational attainment and life-style, impinge on the health status of people in former Soviet republics. To date, the only data available to examine this are WHO World Health Survey data collected in five former Soviet republics during the period 2001-2003, about 10-12 years after independence. For the purpose of this study we developed a general Health Status Index (HSI) whereby index-scores of respondents were calculated and standardized to facilitate comparison between ethnic groups within and between countries.

Main findings are that ethnic disparities in health status do exist but that differences are not large. In Estonia and Kazakhstan ethnic Russians have on average a lower health status than members of the majority population while in the Ukraine their health status is higher. The latter finding may be related to the fact that many ethnic Russians in the Ukraine are concentrated in certain areas where they are more in control of living and health conditions (e.g. Crimea region). In Latvia and the Russian Federation ethnic disparities in health status seem to be absent. On average, the population in Kazakhstan has the highest average score on the health status index and the Latvian population the lowest.

Multivariate results show that material wealth status, educational attainment and physical activity are important factors contributing to the explanation of health status in the countries considered. Contrary to expectation though is the finding that smoking and alcohol consumption does not seem to be of much importance to the explanation of health status.

The use of the Health Status Index (HSI) in combination with the technique of Multiple Classification Analysis (MCA) proved to be a useful approach to examine and compare health status differentials within and between countries. HSI in combination with MCA can also be used as an instrument for the profiling of the health status levels of various population groups in terms of their socio-economic and other characteristics.

At this point we reflect on three important methodological points. First, the fact that 10-12 years after independence ethnic disparities in health status seem small does not tell the whole story because data on the state of affairs *before* independence are absent. Nevertheless, it is not inconceivable that the drop in socio-political status of ethnic Russians that occurred in some countries may have led to a significant

deterioration of living conditions and, ultimately, to a much lower health status than before independence. Unfortunately, this and related hypotheses cannot be tested due to lack of data. Second, even if such ‘before-after’ survey data would have been available the analysis would have been hampered by selection bias because the living conditions and health status of ethnic Russians who fled or migrated after independence to the neighbouring Russian Federation may have been quite different from those of ethnic Russians who decided to remain in the Newly Independent States. Third, the disadvantage of cross-sectional surveys is that one cannot be always certain about the time sequence of cause and effect. It is, for instance, possible that a decline in health status led to a deterioration of socio-economic conditions and material welfare.

If in the coming years follow-up surveys will take place in the Newly Independent States that were already part of the World Health Surveys project in 2001-2003, then health status *change* since 2001 could be measured. Analysis of these two rounds of data will contribute to a better understanding of current ethnic disparities in health status in former Soviet republics.

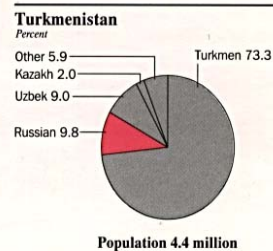
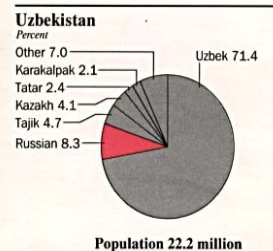
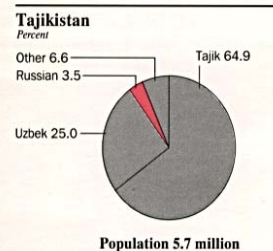
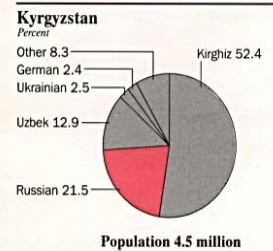
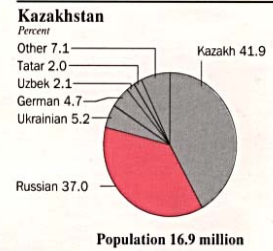
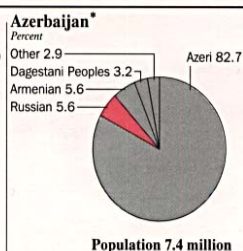
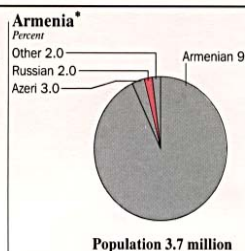
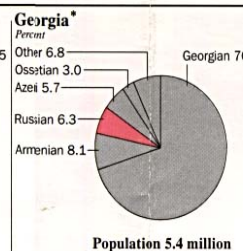
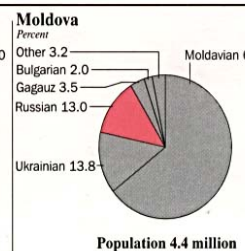
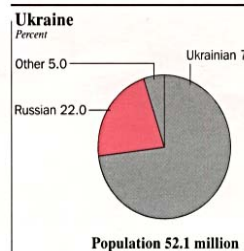
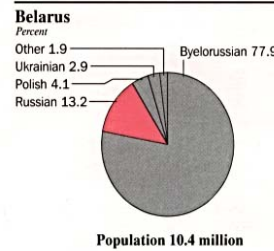
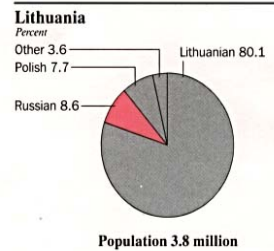
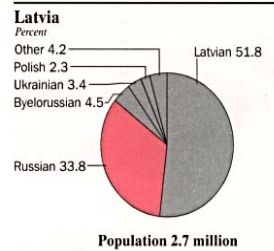
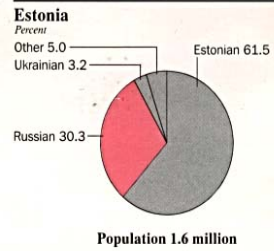
References

- Andrews, F.M., Morgan, J.N., Sonquist, J.A., & Klem, L. (1972). *Multiple Classification Analysis*. Survey Research Center, Institute for Social Research, University of Michigan
- Case, A., & Paxson, C. (2005). Sex Differences in Morbidity and Mortality. *Demography* 42(2), 189-214.
- Chaturvedi, N. (2001). Ethnicity as an epidemiological determinant: crudely racist or crucially important? *International Journal of Epidemiology* 30, 925-927.
- CISSTAT (1994). *CIS Statistical Bulletin*. Minsk, Belarus
- Cockerham, W.C., Hinote, B.P., Abbott, P., & Hearpfer, C. (2004). Health Lifestyles in Central Asia: The Case of Kazakhstan and Kyrgyzstan. *Social Science and Medicine* 59(7), 1409-1421.
- Commercio, M., & Sil, N. (2005). The Legacies of Soviet Nationality Politics and Divergent Patterns of Post-Soviet Ethno-Political Mobilization: Russian Minorities in the Baltics and Central Asia, *Annual Meeting of the American Political Science Association*. Marriott Wardman Park, Washington DC.
- Commercio, M.E. (2004). Exiles in the Near Abroad: The Russian Minorities in Latvia and Kyrgyzstan. *Problems of Post-Communism* 51(6), 23-32.
- Cornia, G.A., & Panizza, R. (2000). *The mortality crisis in transitional economies*. Oxford University Press
- Doorslaer, E.v., & Koolman, X. (2004). Explaining the Differences in Income-related Health Inequalities Across European Countries. *Health Economics*, 13, 609-628.
- Filmer, D., & Pritchett, L. (2001). Estimating Wealth-effects without Expenditure Data or Tears: An Application to Educational Enrolments in States of India. *Demography*, 38, 538-589.
- Fowkes, B. (2002). *Ethnicity and Ethnic Conflict in the Post-Communist World*. New York: Palgrave
- Harris, K.M. (2010). An Integrative Approach to Health. *Demography*, 47(1), 1-22.

- Kawachi, I., & Berkman, L.F. (2003). *Neighbourhoods and health*. Oxford University Press.
- Leinsalu, M., Vagero, D., & Kunst, A.E. (2004). Increasing Ethnic Differences in Mortality in Estonia after the Collapse of the Soviet Union. *Journal of Epidemiology and Community Health*, 58, 538-589.
- Leon, D.A., Saburova, L., Tomkins, S., Andreev, E.M., Kiryanov, N., McKee, M., & Shkolnikov, V.M. (2007). Hazardous alcohol drinking and premature mortality in Russia: a population based case-control study. *Lancet*, 369(9578), 2001-2009.
- Lynch, J.W., Smith, G.D., Kaplan, G.A., & House, J.S. (2000). Income Inequality and Mortality: Importance to Health of Individual Income, Psychosocial Environment, or Material Conditions. *British Medical Journal*, 320, 1200-1204.
- Macintyre, S., Ellaway, A., & Cummins, S. (2002). Place effects on health: how can we conceptualise, operationalise and measure them? *Social Science and Medicine*, 55, 125-139.
- Mackenbach, J.P., Stirbu, I., Roskam, A.-J.R., Schaap, M.M., Menvielle, G., Leinsalu, M., & Kunst, A.E. (2008). Socioeconomic Inequalities in Health in 22 European Countries. *The New England Journal of Medicine*, 358(23), 2468-2480.
- Minorities at Risk Project (MRP) (2010). Minorities at Risk Dataset. College Park, MD: Center for International Development and Conflict Management. <http://www.cidcm.umd.edu/mar/>.
- Nazroo, J.Y. (2003). The structuring of ethnic inequalities in health: economic position, racial discrimination, and racism. *American Journal of Public Health*, 93(2), 277-284.
- Oort, F.V.A., van Lenthe, F.J., & Mackenbach, J.P. (2005). Material, Psychosocial, and Behavioral Factors in the Explanation of Educational Inequalities in Mortality in the Netherlands. *Journal of Epidemiology and Community Health*, 59, 214-220.
- Pettai, V., & Hallik, K. (2002). Understanding the process of ethnic control: segmentation, dependency and co-optation in post-communist Estonia. *Nations and Nationalism*, 8(4), 505-529.
- Schenk, L. (2007). Migration and health: developing an explanatory and analytical model for epidemiological studies. *International Journal of Public Health*, 52(2), 87-96.
- Schrijvers, C.T.M., Stronks, K., Dike van de Mheen, H., & Mackenbach, J.P. (1999). Explaining Educational Differences in Mortality: The Role of Behavioural and Material Factors. *American Journal of Public Health*, 89(4), 535-540.
- Stronks, K., van de Mheen, H., van den Bos, J., & Mackenbach, J. (1997). The interrelationship between income, health and employment status. *International Journal of Epidemiology*, 26(592-600).
- University of Texas (UT) (2010). Map of Ethnic Russians in the Newly Independent States in 1994. http://www.lib.utexas.edu/maps/commonwealth/russians_ethnic_94.jpg.
- Van Lenthe, F., Martikainen, P., & Mackenbach, J. (2007). Neighbourhood inequalities in health and health related behaviour: result of selective migration? *Health and Place*, 13, 123-137.
- WHO (2001). WHO Multi-country Survey Study on Health and Responsiveness 2000-2001. GPE Discussion Paper 37. Vienna: WHO.
- World Health Organization (2009). World Health Surveys: <http://surveydata.who.int/index.html>.
- Yin, S. (2007). Gender Disparities in Health and Mortality. How long one lives depends on gender and context, among other factors. Population Reference Bureau. <http://www.prb.org/Articles/2007/genderdisparities.aspx>.

Annex 1. Main concentrations of Ethnic Russians in former Soviet Republics in 1994.

Ethnic Russians in the Newly Independent States



*Ethnic percentages for Georgia, Armenia, and Azerbaijan taken from the 1989 Soviet census; they may not accurately reflect present-day conditions.