

PROBLEMS AND PROSPECT OF SOCIO-DEMOGRAPHIC DEVELOPMENT OF RUSSIAN REGIONS

(by the example of Sverdlovsk region)

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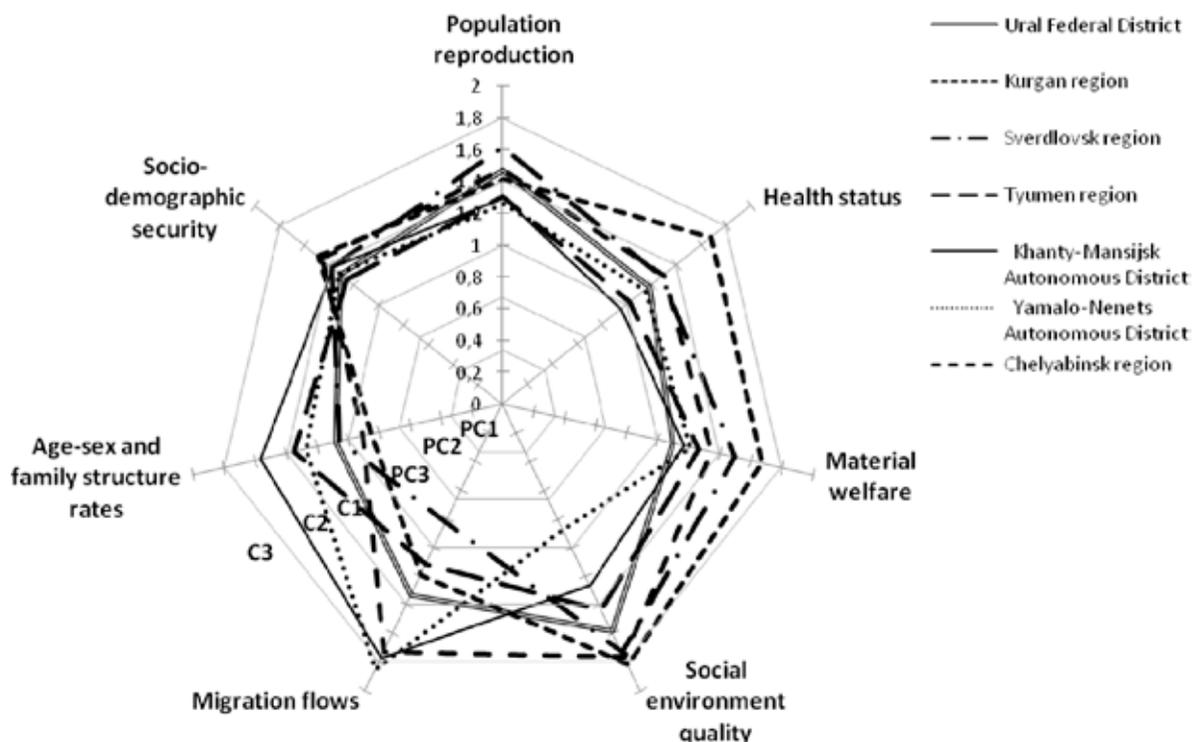
Condition and trends regarding socio-demographic security of Sverdlovsk region in 2000–2009 are illustrated; the most challenging activity scopes are highlighted. Priority guidelines and target values of socio-demographic security enhancement in Sverdlovsk region until 2020 are determined. Prediction regarding population reproduction rates and probabilistic prediction of the population size of Sverdlovsk region until 2020 according to three scenarios are worked out. Estimate of the prognostic level of socio-demographic security of Sverdlovsk region until 2020 by division into blocks was obtained.

Crude birth rate is one of the major population reproduction rates. As a result of improvement of the given rate in Sverdlovsk region by 2009, it increased by 37% during 2000–2009 and amounted to 1.55 (1.13 in 2000). However, when the 2009 rate is divided into its critical value 2.12, it makes us conclude that birth rate in Sverdlovsk region secures at present only 73.1% of population reproduction.

Substantial positive changes in the population reproduction processes may occur in case of death rate reduction and *life expectancy* growth. Certain success is already obvious: life expectancy has grown by almost 5 years (from 63.7 to 68.4) in Sverdlovsk region in 2000–2009. Yet, male life expectancy is still a matter of great concern: the given rate exceeded 60 only in 2006, and in 2009 it amounted to 62.3 years of age, which is 12 years lower than the female rate (74.6 years).

Despite improvement of the population reproduction rates, the *natural increase rate* in Sverdlovsk region remains negative: it amounted to -8.2 in 2000, -1.5 in 2009, -0.9 person per 1000 people in January – August 2010.

The migration growth rate as one of the probable alternatives of natural population loss balancing had steadily been declining in Sverdlovsk region in 2000–2002: from 12 to -9 persons per 10 thousand people. The rate's positive trend had been observed starting from 2003, and the value had become stable



Note. Security states: N — normal (zero values of the crisis level, not specified on the diagram); PC1 — pre-crisis initial state; PC2 — pre-crisis aggravating state; PC3 — pre-crisis critical state; C1 — crisis unstable state; C2 — crisis aggravating state; C3 — crisis extreme state

Fig. 1. Diagnostics results in terms of socio-demographic security in the UFD Subjects in 2000

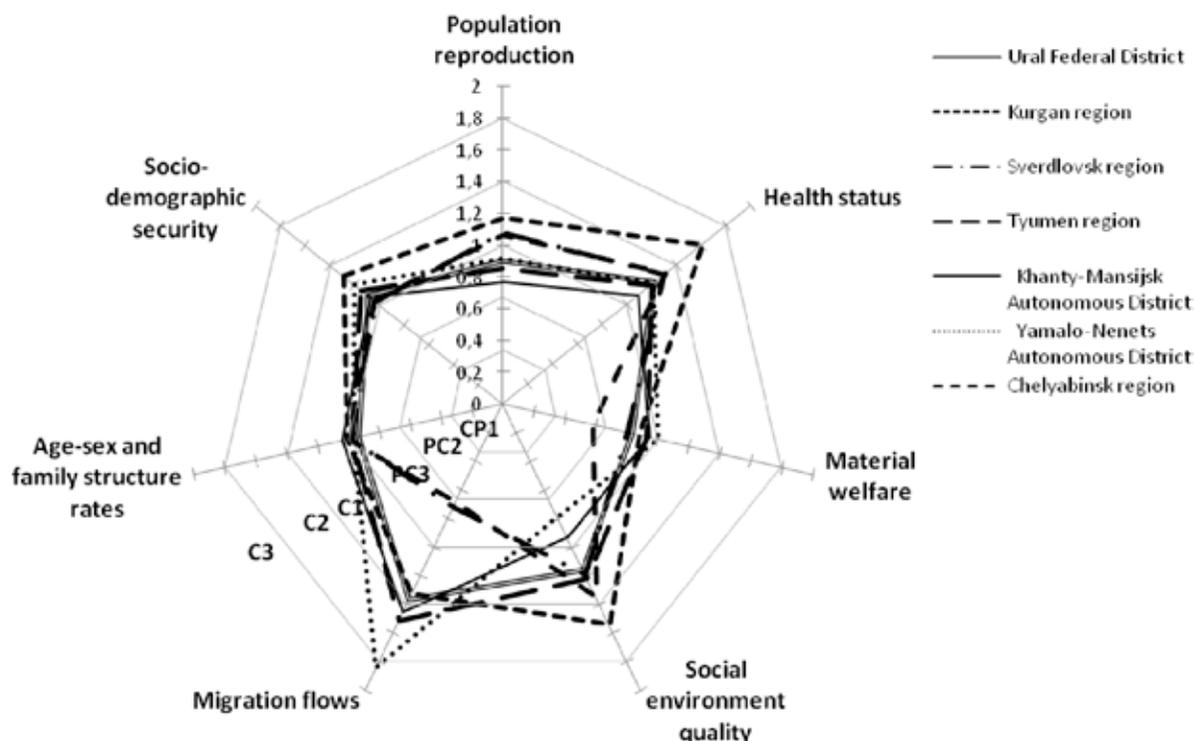


Fig. 2. Diagnostics results in terms of socio-demographic security in the UFD Subjects in 2009

at a level of 20–23 in 2005–2008. However, the financial and economic crisis has resulted in dynamics decline relative to a lot of branches of economy [1]. Slowdown of demand for labour migrants occurred; as a result, in 2009 the migration growth rate was 13 persons per 10 thousand people (3.6 in January – November 2010).

Based on the given analysis, certain conclusions regarding the demographic condition can be made. An integrated diagnostics technique allows estimating absolute and relative socio-demographic security rate in the region with latent processes taken into consideration [2, 3]. The diagnostics is based on the indicative analysis technique, which the Ural Scientific School represented by the authors considered appropriate to be applied for task solution in terms assessment of quality of life [4], and economic and energy security [5, 6].

The obtained estimate of socio-demographic security of the Ural Federal District demonstrates the fact that no improvement in terms of socio-demographic security was observed in all the UFD Subjects including Sverdlovsk region in 2000–2009, and the crisis phenomena were retained in 2009 (Fig. 1, 2).

At the same time, the analysis by division into blocks allowed highlighting the most challenging activity scopes and establishing cause-and-effect relationship between them (Fig. 3).

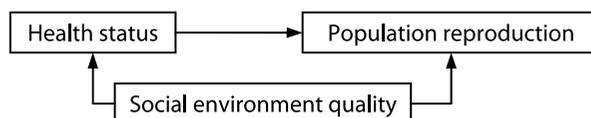


Fig. 3. Interrelation of the most challenging activity scopes in terms of socio-demographic security in Sverdlovsk region

Table 1
Priority guidelines and target values of socio-demographic security enhancement in Sverdlovsk region until 2020 are determined

Problems	Priority guidelines	Target values	
		2015	2020
Low quality of social environment	Reduction of death rate due to external causes (pers./100000 people)	120	60
	Reduction of number of persons with an occupational illness identified for the first time (pers./10000 of occupied people)	1.5	0.7
Poor health status of the population	Reduction of death rate in the working age (pers./100000 working-age people), including:	540	390
	— circulatory illnesses;	150	115
	— malignant neoplasms	60	35

It follows from Figure 3 that low quality of the social environment and poor health status of the population of Sverdlovsk region, apart from being independent problems, have adverse effect on the

population reproduction processes as well. On this basis priority guidelines and target values of socio-demographic security enhancement in Sverdlovsk region until 2020 were determined (Table 1).

So far as population reproduction rates are resultant indicators of the regional socio-demographic security, 3 development scenarios have been worked up for the period until 2020:

1. *Inertia scenario* assumes that in case of retention or deterioration of the existing economic condition in Russia the chances for population reproduction improvement are low.

2. *Support scenario* assumes efficient implementation of the “Concept of the demographic policy in the Russian Federation until 2025” without the influence of regional state target programs taken into consideration.

3. *Efficiency scenario* assumes efficient implementation of the system of program activities worked out to solve the problems of socio-demographic development of Sverdlovsk region.

The prediction results for Sverdlovsk region demographic rates until 2020 obtained by application of the synergy approach [7] are given in Table 2.

For the reason that the obtained prediction values of the key demographic rates are to a large extent unspecified (and that is aggravated by the economic

crisis), a simulation instrument based on the simulation technique was developed to estimate long-term population size [8, 9]. Probabilistic prediction of the population size of Sverdlovsk region until 2020 obtained by application of the mentioned simulation instrument is given in Table 3.

Based on the analysis of the prediction results, efficiency scenario was identified as a strategic scenario of development of Sverdlovsk region. The given scenario is stipulated by simultaneous efficient implementation of the “Concept of the demographic policy in the Russian Federation until 2025” and the system of program activities worked out to solve the problems of socio-demographic development of Sverdlovsk region.

Reaching the target values in terms of socio-demographic security improvement (Table 1) and implementation of the efficiency scenario of socio-demographic development of Sverdlovsk region until 2020 (Table 2) would make it possible to change the crisis level of socio-demographic security of Sverdlovsk region to a pre-crisis one by 2020 (Fig. 4).

Thus, normal condition within the prognostic year interval is impossible to be reached due chiefly to high sluggishness of demographic processes.

According to the block estimate of the prediction level of socio-demographic security of Sverdlovsk

Table 2

Prediction of the key demographic rates for Sverdlovsk region until 2020

Territory	2009*	2010			2015			2020		
		Inertia scenario	Support scenario	Efficiency scenario	Inertia scenario	Support scenario	Efficiency scenario	Inertia scenario	Support scenario	Efficiency scenario
Crude birth rate, pers./1000 people	12.8	12.1	12.6	12.7	11.8	12.7	12.9	12.0	12.7	13.0
Crude death rate, pers./1000 people	14.3	14.8	14.5	14.3	14.6	13.8	12.4	14.1	13.5	11.1
Natural increase rate, pers./1000 people (№1+№2)	-1.5	-2.7	-1.9	-1.6	-2.8	-1.1	0.5	-2.1	-0.8	1.9
Migration growth rate, pers./10000 people	13.0	17.1	17.1	17.1	13.2	13.2	13.2	10.0	10.0	10.0
Gross population growth на 10000 people (№3+№4/10)	-0.2	-1.0	-0.2	0.1	-1.5	0.2	1.8	-1.1	0.2	2.9

*de facto

Table 3

Probabilistic prediction of the population size of Sverdlovsk region until 2020, thousand people

Year	Inertia scenario			Support scenario			Efficiency scenario		
	Median	95.44% confidence band	99.73% confidence band	Median	95.44% confidence band	99.73% confidence band	Median	95.44% confidence band	99.73% confidence band
2010	4388	4385-4391	4383-4392	4393	4391-4396	4389-4398	4396	4392-4399	4390-4401
2015	4356	4349-4363	4346-4367	4397	4388-4406	4383-4410	4422	4403-4441	4393-4451
2020	4329	4316-4342	4310-4349	4401	4386-4417	4378-4424	4478	4439-4516	4420-4535

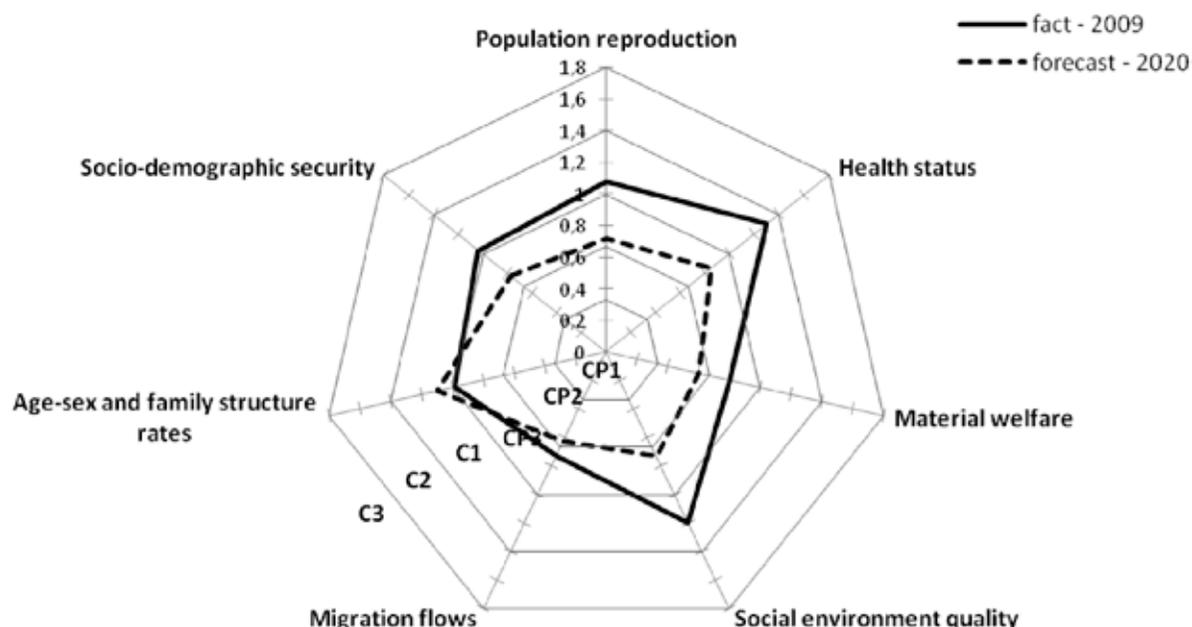


Fig. 4. Current and prognostic levels of socio-demographic security of Sverdlovsk region

region, deterioration of the age-sex and family structure rates will occur. Such changes will primarily be due to the persisting trends:

- Reduction of the working-age population size;
- Ageing of the population;
- (reduction of the working-age population size and ageing of the population results in increase of the demographic load on the working population)
- Drop in number of potential mothers.

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