Health and Social-Economic Development of Area on the Example of Perm Krai

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Abstract: The results of the analysis of demographic and health indicators of the Perm krai in comparison with those of Russia are presented. The main demographic parameters: fertility, mortality, natural increase and the average life expectancy are seen in the time series. Some regional characteristics, such as a higher rate of population decline, primarily urban, high territorial variability in mortality rating from 6.2 to 26.6 per 1,000 of population and a positive natural increase in 2012 due to a higher birth rate are identified. In addition the state of socio-economic well-being of the population of Perm region based on four indicators is studied: the average per capita income, the average monthly nominal wage of workers in organizations, average size of pensions and the gross regional product per capita. In addition, the effect of these factors on the health of the region’s population is determined.

Коды классификатора JEL: J11, I15

Key words: Health • Demographic indicators • Fertility • Mortality • Average life expectancy • Indicators of socio-economic well-being • Correlation coefficients

INTRODUCTION

Health is one of the most important characteristics of the society, as it reflects the ability of the entire community to exercise their social and biological functions in specific conditions. The people's health as a socio-economic category is an essential factor in the employment potential of the society. Back in the "Ottawa Charter for promotion (for further improvements) of health", adopted in 1986, it was emphasized that good health is a major resource for social and economic development of society as a whole and for the individual and is the most important measure of the life quality. The following basic conditions and resources are necessary for health: peace, shelter, education, food, income, a stable ecosystem, sustainable resources, social justice and equality. Improving health requires a solid foundation in the form of these basic assumptions [1]

From the point of view of economic analysis health can be considered as a demanded consumer good as well as an investment good determined by pure cost of profit which are brought about by this good. Particularly increasing life expectancy means additional active periods when a person gets income and invests in his capital [2, p.204].

The value of health as the most important resource for the production of material goods is determined by the current trends to reduce the population replacement, its aging process and, thus, a decrease in population which considerably influences social-demographic safety. Social-demographic safety is ability to minimize social stress by providing decent life quality of population, increasing psycho-emotional immunity, strengthening protective forces against destabilizing social-economic effects [3, p.73].

In addition, today’s health greatly imprints tomorrow’s health and has a strong hereditary effect influencing and even predetermining the health of future generations.

Unfortunately, in our country many politicians believed and still believe the problem of ensuring the national health to be not the central one for the modern
world. In Russia there are other, more important priorities: military, government, economic. Therefore, in federal and regional programs of scientific, technological and economic development the quality of public health is not always given due consideration. Assessing the social impact of reducing in the level of health of the modern population, it is necessary to take into account the inevitable loss of future generations due to underestimation of the health factor at this time.

Ignoring the human factor has very negative consequences, both for the country and for its regions.

Studying public health in the absence of a single summary measure, one calculates a number of statistical coefficients that reflect the different aspects of this category and are grouped into the following blocks: fertility, mortality, life expectancy, disability and morbidity. The present system of indicators is used not only to assess the level of population health, but also to develop health and social policy, to identify priority medical measures for different groups of the population. And the rate of infant mortality and life expectancy, along with GDP per capita are important indicators of socio-economic well-being of the country.

To assess the quality of health of the population of Perm region we use average demographic and health statistics.

The demographic situation in the post-Soviet period in the province, as well as in Russia as a whole was characterized by a steady decline in population (Table 1).

Over the last 22 years the population of Perm krai decreased by 13% mainly due to the urban population, i.e. the urban population has decreased by 15.5% and rural population- by 5.2%. A similar analysis for the Russian Federation showed that from 1990 to 2012 the rate of decline of the population is 4 times lower (for urban areas - by 5.5 times and in the countryside by 1.3 times) i.e. the demographic challenge for the region is more relevant.

Dynamic analysis of the ratio of urban and rural population suggests that the area has a specificity: the proportion of the urban population in the study period decreased by 2.1% (close to all-Russian) and the rural population has increased, while in the RF it remained at the same level.

Reduction in the working age population, both in Russia and in Perm krai began in 2006. According to analysts this process will grow as the working age includes relatively small cohorts of the population born in the 1990s. On the one hand, it is grandchildren of a numerically small generation born in the years of the Great Patriotic War, on the other hand it is a modern reproductive focus on families with few children. The socio-economic crisis of the early 90-s and 1998 also played a role. Therefore, in the next 10 years the working age will include a much smaller in number generation, causing labor shortages in the labor market.

Against this background, there remains a significant proportion of the population over working age. Since 2007, their number has been growing. Currently, on the average people of retirement age are by 18.3% (or 82.8 million people) more than children and adolescents up to 16 years.

The modern age structure of population of the region in accordance with the classification of the UN should be considered demographically old as the proportion of the population aged 65 years and older is 12.1%, which is well above the UN criterion - 7%. The aging of the population...
Table 2: Dynamics of fertility and mortality in Perm krai in comparison with the RF (1,000) [4; 5]

<table>
<thead>
<tr>
<th>Year of monitoring</th>
<th>Fertility Perm krai</th>
<th>Fertility Russian Federation</th>
<th>Mortality Perm krai</th>
<th>Mortality Russian Federation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>13.9</td>
<td>13.4</td>
<td>12.1</td>
<td>11.2</td>
</tr>
<tr>
<td>1995</td>
<td>9.4</td>
<td>9.3</td>
<td>16.1</td>
<td>15.0</td>
</tr>
<tr>
<td>2000</td>
<td>9.7</td>
<td>8.7</td>
<td>16.2</td>
<td>15.3</td>
</tr>
<tr>
<td>2001</td>
<td>9.0</td>
<td>15.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>9.7</td>
<td>16.2</td>
<td></td>
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</tr>
<tr>
<td>2003</td>
<td>11.3</td>
<td>10.2</td>
<td>18.3</td>
<td>16.4</td>
</tr>
<tr>
<td>2004</td>
<td>11.4</td>
<td>10.4</td>
<td>17.7</td>
<td>15.9</td>
</tr>
<tr>
<td>2005</td>
<td>10.9</td>
<td>10.2</td>
<td>17.9</td>
<td>16.1</td>
</tr>
<tr>
<td>2006</td>
<td>11.0</td>
<td>10.3</td>
<td>16.5</td>
<td>15.1</td>
</tr>
<tr>
<td>2007</td>
<td>12.1</td>
<td>11.3</td>
<td>15.7</td>
<td>14.6</td>
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<tr>
<td>2008</td>
<td>13.0</td>
<td>12.0</td>
<td>15.6</td>
<td>14.5</td>
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<tr>
<td>2009</td>
<td>13.3</td>
<td>12.3</td>
<td>15.0</td>
<td>14.1</td>
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<tr>
<td>2010</td>
<td>14.1</td>
<td>12.5</td>
<td>15.3</td>
<td>14.2</td>
</tr>
<tr>
<td>2011</td>
<td>14.1</td>
<td>12.6</td>
<td>14.7</td>
<td>13.5</td>
</tr>
<tr>
<td>2012</td>
<td>14.8</td>
<td>13.3</td>
<td>14.2</td>
<td>13.3</td>
</tr>
</tbody>
</table>

Source: gks.ru, permstat.gks.ru

is not only the hallmark of Perm krai. This process has affected all regions of Russia and almost all developed countries. But if in the developed countries the main factor of aging of the population is increase in life expectancy, in Russia and in the Perm region, in particular it is the decline in birth rates, high level of mortality among people of working age.

Traditionally, a significant contribution to population change is paid by fertility, mortality and migration. Table 2 shows the dynamics of the main demographic indicators of Perm region and the Russian Federation for the years 1990-2012.

In 2012 in Perm krai one of the highest birth rates is recorded for the last 22 years - 14.8 per 1,000 of population, which is 6.5% more compared with 1990. Territorial feature is the excess of fertility over the nationwide indicators. 1995-2000 is the most unfavorable period for consideration of this demographic indicator.

Growing birth rate in Perm krai is noticed since 2006. In 2012, 4.9% more children were born than in 2011. This is a result of the implementation of measures aimed at addressing population issues, including support for mothers. The national project "Health" focuses on the development of primary health care, making it preventative, helping women during pregnancy and childbirth through birth certificates, increasing maternity and childhood benefits, increasing the availability of high-tech care, conducting "pilot" projects to strengthen the management of public health.

However, optimistic dynamics of fertility is in some degree due not only to the successful implementation of socio-demographic policy in the region and improvement of the system of regional health care, but also due to the peculiarities of modern statistics. On the one hand, the children of illegal immigrants are taken into account and absence of precise information about the number of workers leads to possible increase of the birth rate, on the other hand, the number of births includes now 500 gram children.

According to Yuri Krupnov, the chairman of the Supervisory Board of the Institute of Demography, Migration and Regional Development increase in the birth rate and increase in life expectancy of Russians in recent years only by 20 percent are associated with state programs and stimulus measures. In Perm krai in recent years there has been an active policy to stimulate the birth rate using such a tool as maternity capital [6, p.51].

For the period 2003-2012, there was improvement in the main indicator of health of the population of Perm krai. The overall mortality rate has decreased by 22.4% (including the working age - 25.7%). A similar pattern can be seen on the national level. Positive trends are determined by democratic processes taking place in Russia as well as in the most European countries [7].

According to the level of mortality Perm krai is ranked the ninth out of 14 in the Volga Federal District (hereinafter – VFD), but the pace of its decline is in the third position. In 2012, the reduction in the death rate was
3.6% compared to 2011, while in the Volga Federal District - 2.8%, the infant mortality rate has increased by 18.2%, as well as in the whole of Russia in connection with revising the criteria of live birth.

In 2012, 37453 residents of Perm krai died from all causes, in urban areas - 27,052 people and in rural areas - 10401. The mortality rate was 14.2 per 1000 of population, which is higher than in the Russian Federation - (13.3 per 1,000) and in VFD - (13.9 per 1,000) and less than 31.8% of the figure for total mortality in the population of the region in 2011. On the scale of total deaths [8], the mortality rate of Perm krai is estimated as average. At the same time, high variability of the territorial factor from 6.2 to 26.6 per 1000 should be noted. In 38 from 48 territories of the region the mortality rate exceeds the average figure by 48. The number of deaths in urban areas is 13.7, while in rural areas - 15.8 per 1,000 inhabitants.

Since 1999, high rates of infant mortality decreased from 18.8 to 7.4 in 2011, which was due to systematic monitoring of health of women and children, as well as the optimization of the flow of births to maternity units equipped with modern facilities and having the appropriate human resources. However, in 2012 this index rose again due to changes in criteria of live births since 2012.

In 2012 in Perm region 572 children aged 0 to 17 years died which is by 9.7% more than in 2011. The rate per 100,000 was 110.1 versus 98.7 in 2011. The increase in mortality in this age group was mainly due to children in the first year of life, with the death rate of children in rural areas 1.4 times higher than in urban areas.

10671 people of working age died that is 6.7 for 1000 of the population, which is lower than in 2011 (7.4 per 1000), but higher than in the Russian Federation (6.0 per 1000). Mortality of the working population in the urban area is ??6.2 per 1,000 people, in the village 8.6 compared to 6.6 and 9.3, respectively, in 2011.

Mortality of people over working age was 44.9 per 1000 people (46.4 in 2011), including 43.6 in urban areas, in rural areas 49.2 vs. 44.4 and 52.9 in 2011, i.e. in this age group mortality has decreased.

The structure of mortality of the population has not undergone any changes. Still the first place belongs to diseases of the circulatory system - 55.9% (in 2011 56.5%), the second place - neoplasms - 14.2% (in 2011 13.6%) and the third place - injury and poisoning- 12.9% (in 2011 13.1%). Consequently, in the structure of mortality of the population, compared to the previous year, the share of deaths from neoplasms has increased.

Causes of death at working age are distributed differently: the first place is occupied by cardiovascular diseases - 32.5%, the second place - injury and poisoning - 32.4%, the third place - neoplasms 11.4%. In this age group the proportion of deaths from neoplasms has also decreased.

The structure of mortality of children from 0 to 17 years is as follows: the first place is occupied by perinatal diseases - 30.9%, the second place is occupied by injury and poisoning - 27.8%, the third place - congenital anomalies - 19.8%. There has been a decrease in mortality from injury and poisoning from 31.1% to 27.8% and from congenital anomalies - 20.0% to 19.8%, but mortality from perinatal diseases increased significantly from 20.0% to 30.9% due to birth of low weight infants weighing up to 1000 grams. Deaths from respiratory diseases decreased from 8.5% to 5.4%.

The absolute number of deaths of children under 1 year was 329, nearly 70% of them (224) were children who died in 224 urban areas, the rest - in the countryside. In 2012 infant mortality rate rose from 7.4 to 8.5 per 1000. In Russia the figure was 8.7 per 1000 and in the Volga federal district it was much lower - 7.7 per 1,000 live births. The changes are unfortunate. Infant mortality rate in rural areas increased to 9.7 in 2012 compared to 9.2 in 2011, in the city - 8.2 versus 6.4.

In the structure of infant mortality the first place is taken by diseases of the perinatal period - 53.8%, followed by congenital anomalies - 28.0%.

In the structure of infant mortality mortality from diseases of the perinatal period increased from 37.5% to 53.8%, mortality from respiratory diseases and congenital anomalies decreased from 7.6% to 4.3% and from 32.7% to 28.0% respectively.

In 2012 in Perm krai there died 4 pregnant, puerperant and women in labor. The maternal mortality rate is 10.3 per 100,000 live births.

Maternal mortality is one of the components of the total mortality coefficient which due to its low level has no material impact on the demographic situation in general, but in the evaluation of public health and health care it is common practice to use the maternal mortality rate. The maternal mortality rate in Perm krai for a number of years was higher than the level of maternal mortality in the Russian Federation and the Volga Federal District. In 2012, the figure dropped by 2.4 times compared to the previous year and by 3.0 times in comparison with 2007. One of the leading causes of maternal mortality is abortions. Of the number of deaths from abortion more than 20% occur in women under 25, i.e. 12.5 per 1,000 of population (2010 - 13.0).
Table 3: Life expectancy at birth (years)

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perm krai</td>
<td>64.0</td>
<td>65.0</td>
<td>66.0</td>
<td>66.6</td>
<td>67.3</td>
<td>67.8</td>
<td>68</td>
</tr>
<tr>
<td>Russia</td>
<td>66.6</td>
<td>67.5</td>
<td>67.9</td>
<td>68.7</td>
<td>69.6</td>
<td>70.3</td>
<td>69.7</td>
</tr>
</tbody>
</table>

Table 4: The correlation of demographic and key socio-economic indicators of Perm krai

<table>
<thead>
<tr>
<th>Health indicators</th>
<th>Average per capita monthly income, rubles</th>
<th>Average monthly nominal wage of workers of organizations</th>
<th>Gross regional product per capita</th>
<th>Average size pensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertility</td>
<td>0.93</td>
<td>0.85</td>
<td>0.94</td>
<td>0.54</td>
</tr>
<tr>
<td>Mortality</td>
<td>-0.84</td>
<td>-0.92</td>
<td>-0.75</td>
<td>0.99</td>
</tr>
<tr>
<td>Life expectancy</td>
<td>0.99</td>
<td>0.96</td>
<td>0.99</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Russia has one of the highest abortion rates in the world, there is 0.7 abortion per one birth [9].

The natural increase of population in Perm krai in 2012 has a positive balance of 0.6 vs. -0.6 in 2011. Obviously, the demographic situation in the region continues improving. In 2012, over 25 territories have a positive natural increase of the population. Last year there were only 20 such territories.

Demographic situation is usually estimated using the integral indicator of life expectancy of the population. In Russia for the first time in 10 years, life expectancy began to decline in 2012. The current indicators are the result of the economic and social situation in the early 1990s. According to Andrei Akopian, the director of the National Center for Human Reproduction and Family Planning, life expectancy of Russians can catch up with life expectancy in the European Union (in 2012 - 79.76 years) only by the years 2030-2045 [10].

Table 3 shows dynamics of the index for the years 2006-2011 in Russia and in Perm krai.

Over the past seven years, life expectancy in the Perm Krai has risen from 64.0 to 68.0 years and in Russia from 66.6 to 69.7 years. In this case, the indicator in the region was increasing more actively (an increase by 6.25%), compared to all-Russian (4.6%), but despite this, life expectancy in Perm krai is 1.7 year lower than in the Russian Federation in 2012. Experts believe that in the 2000s demographics including life expectancy, was growing as the country was getting out from the demographic hole of the 1990s. Now, when the lifespan has reached the level of 1989 it will not increase further. The country can hardly compensate for the loss of population due to mortality, as Yuri Krupnov, the chairman of the Supervisory Board of the Institute of Demography, Migration and Regional Development says.

In order to establish the relationship of health to the socio-economic well-being of the region, we have analyzed the correlations between them. The main four indicators of the socio-economic well-being were taken from regional statistics: the average per capita income of the population, the average monthly nominal wage of workers of organizations, the average size of pensions and the gross regional product per capita.

The calculations show that the correlation coefficients are of different orientation. The birth rate and an indicator of the expected average life are in direct proportion to the average socio-economic factors (respectively r = 0.7 and 0.8) and the mortality rate is inversely related (r = 0.9). Table 4 shows the results of calculations of the coefficients of correlation between the level of fertility, mortality, life expectancy and average annual socio-economic indicators which include the average per capita income of the population, the average monthly nominal wage of workers of organizations, the average size of pensions and the gross regional product per capita.

As the correlation analysis shows, the greatest power of influence on fertility is determined by the gross regional product per capita and per capita incomes. Mortality and life expectancy are determined, above all, by the value of the gross regional product per capita.

**CONCLUSIONS**

- Decrease of the population in Perm krai during the period of market reforms by 13% was due to urban population.
- The territorial feature of Perm krai is exceeding birth rate over the average coefficient in Russia.
- There is a positive tendency of decreasing death rate (by 22.3% for the last 10 years).
Birth rate and average life expectancy are directly dependent on annual social-economic coefficients \((r=0.7\) and \(0.8\) respectively) and death rate is in inverse proportion \((r=0.9)\).

Gross national product per capita considerably determines birth rate as well as death rate.

**Summary:** Signs of improvement in the demographic of indicators allow us to hope that adopted in 2013 Health Development Program of Perm krai till 2020, Concept of the long-term target program "Development of Health in Perm krai for 2013-2017" will contribute to optimization of the demographic situation, which is the key to successful social and economic development of the region. However, be aware of limited demographic indicators for the level of public health, economic and social well-being of the country and region.

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