

REGIONAL ECONOMY

DOI: 10.15838/esc/2015.1.37.4

UDC 332.1:330.322.21 (470-17), LBC 65.04-56 (251)

© Gadzhiev Yu.A., Akopov V.I., Kanev V.N.

Dynamics of investment in fixed capital in the economy of the Northern regions



**Yusif Alimovich
GADZHIEV**

Ph.D. in Economics, Senior Research Associate, Head of the Laboratory, Federal State-Financed Scientific Institution the Institute of Socio-Economic and Energy Problems of the North Komi Scientific Center, Ural Branch of the Russian Academy of Sciences (26, Kommunisticheskaya Street, Syktyvkar, 167982, Russian Federation, gajiev@iespn.komisc.ru)



**Valerii Ishkhanovich
AKOPOV**

Ph.D. in Economics, Senior Research Associate, Federal State-Financed Scientific Institution the Institute of Socio-Economic and Energy Problems of the North Komi Scientific Center, Ural Branch of the Russian Academy of Sciences (26, Kommunisticheskaya Street, Syktyvkar, 167982, Russian Federation, gajiev@iespn.komisc.ru)



**Viktor Nikolaevich
KANEV**

Department Head, LLC RN-Severnaya Neft (4, Mira Street, Apartment 7, Usinsk, 169711, Russian Federation, vnkanev@yandex.ru)

Abstract. The article describes characteristics and trends of investment in fixed capital of the Northern regions. It singles out phases of rapid pre-crisis growth, crisis, post-crisis growth and stagnation. Stagnation and decline in recent years are caused by completed major investment projects, reduced own funds of enterprises, limited availability of investment resources and increased capital outflow. The article reveals

that the growth of investment in fixed capital of the North in the post-crisis period is provided by the regions, carrying out major investment in oil and gas pipeline transport, oil extraction, production and distribution of electricity, gas and water.

The changes in the sectoral structure of investment in fixed capital of the Northern regions are barely visible; the share of investment in the traded sector is still high, especially in mining, due to the Northern regions' specialization in the extractive industries. The share of investment in the public sector and social services remains low. The specific structure of investment in fixed capital has changed: the share of investment in buildings (excluding housing) and structures has increased greatly; the share of investment in machinery, equipment, vehicles has decreased due to insufficient investment in mining enterprises and financial shortages in manufacturing.

In most regions the structure of investment in fixed capital by directions is characterized by the increase in the share of investment in machinery, equipment, vehicles in new construction, investment in buildings and structures and the decline in the proportion of investment in machinery, equipment, vehicles modernization and reconstruction and acquisition of new fixed assets. The dynamics and the inefficient structure of investment in fixed assets and directions testify the shortage of investment in innovation in the Northern regions.

Key words: stagnation; investment in fixed capital; structure of investment by types, new construction, modernization and reconstruction; purchase of fixed assets; Northern regions.

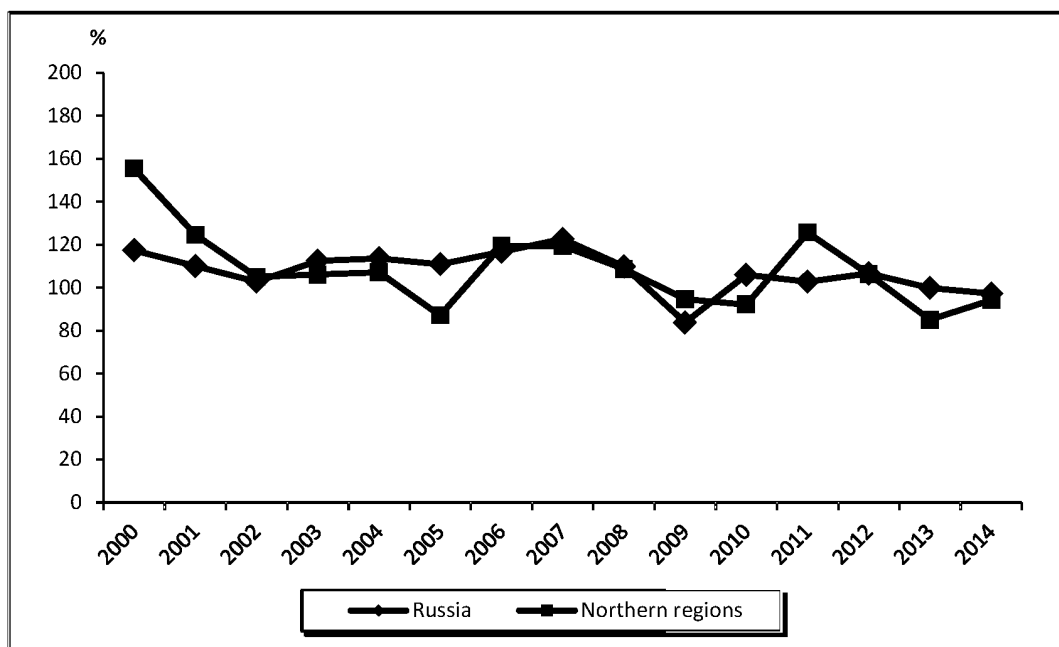
Nowadays the main task of the country's economy is to find a way out of stagnation. Its practical solution is directly related to overcoming deceleration and boosting economic growth by means of increased investment, primarily in the real sector as the main factor in modernization and economic growth. The situation is especially critical in the Northern regions, as the productive facilities are worn out, and the funding of investment does not fully ensure its updating and necessary technological and structural changes in the economy. These circumstances determine the need to study characteristics of dynamics, territorial, sectoral, and specific structures of investment in the fixed capital of the Northern regions.

Analysis of investment dynamics

Dynamics of investment in fixed capital of the economy in the North in 2000–2014

(January–February) was characterized by an unstable trend (*figure*) [5, pp. 922–923; 7, pp. 932–933; 11]. In the period under analysis in the North the indices of physical volume of investment in fixed capital dropped twice sharply, falling below 100% in 2005 and during the 2009–2010 global crises, then they grew rapidly in 2011 and again quickly fell in 2013–2014. In the first case the recession was caused by their sharp reduction in such investment-intensive regions, as Yamalo-Nenets Autonomous Okrug and Khanty-Mansi Autonomous Okrug, due to the termination of investment cycles; in the second case – by the consequences of the global economic and financial crisis; in the third – by the low base effect; in the fourth – by the completion of major investment projects and the entrepreneurs' expectations for more favorable conditions for investments.

Dynamics of investment in fixed capital of the Northern regions and Russia in 2000–2014, %



In Russia, compared with the North, the dynamics of investment in the economy was more smooth, it did not have a sharp drop (below 100%) in investment in 2005, but had a short-term downturn in 2009, then followed by significant growth in 2010–2012; in 2013–2014 there was a slight decline [5, pp. 922-923; 7, pp. 932-933; 11]. The main reasons are the following: restricted availability of investment resources (direct investment and loans) for domestic enterprises; speculation on the currency market due to the ruble depreciation; suspension of the natural monopolies' investment programs due to the tariffs freezing in 2014 and the sharp increase in the capital outflow, which significantly exceeds the volume of lending to the economy due to the events in Ukraine.

It should be noted that during the crisis in the Northern regions of Russia the decline in investment was much deeper than the drop in GRP and GDP. So, in 2009 investment in fixed capital in the North and in the Russian Federation fell respectively to 5.4 and 16.2% against 3.3% of GRP and 7.6% of GDP [4, pp. 296-293; 7, pp. 932-933].

In 2000–2012¹ the dynamics of investment in fixed capital of the North had three phases: *growth* (2000–2008), *crisis recession* (2008–2009) and *post-crisis growth* (2009–2012) (*tab. 1*). The recovery phase was characterized by the rapid growth of investment in the Northern regions, which amounted to 97.9% (in Russia – 152.4%).

¹ The analyzed period is limited to 2012 due to the lack of the Russian Statistics data for 2013

The revenue from large-scale export of raw materials, cheap foreign loans and government funding were key factors promoting rapid investment growth in the Northern regions and the country in general. Nenets Autonomous Okrug, the Sakhalin Oblast and the Arkhangelsk Oblast, Chukotka Autonomous Okrug, Kamchatka Krai and the Sakha (Yakutia) Republic had the highest rates of investment growth in 2000–2008 due to large investment in oil and gas production, diamond and gold mining, and defense industry. Khanty-Mansi Autonomous Okrug and the Komi Republic had the lowest rates due to the high base effect.

The *crisis years*, on the contrary, were marked by the deep decline of investment in the fixed capital of the Northern regions. In 2008–2009 it amounted to 7.9% (in Russia – 16.3%). The drop was especially

sharp in Nenets Autonomous Okrug, the Republic of Karelia and the Magadan Oblast due to the global financial crisis consequences, namely drastic reduction of the funds from parent enterprises and considerable appreciation of the loans provided by foreign and domestic banks. It was also partly affected by the regions' specialization on the industries sensitive to decline.

The growth of investment in fixed capital in the crisis years was observed in Chukotka Autonomous Okrug, Kamchatka Krai, the Komi Republic and the Sakha (Yakutia) Republic due to the continuous financing of large investment projects, particularly, the construction of the “Eastern Siberia–Pacific Ocean” oil pipeline (ESPO) and the “Bovanenkovo-Ukhta” gas pipeline, the launch of the “World” and the “Aykhal” mines in the

Table 1. Growth of investment in fixed capital of the Northern regions, 2000–2012, %*

| Regions | 2000–2008 | 2008–2009 | 2009–2012 | 2010–2012 |
|--------------------------------|-----------|-----------|-----------|-----------|
| Russian Federation, total | 152.4 | -16.3 | 16.7 | 9.6 |
| Northern regions, total | 97.9 | -7.9 | 20.7 | 31.8 |
| Republic of Karelia | 85.2 | -31.9 | 26.3 | 26.4 |
| Komi Republic | 65.1 | 24.7 | 110.6 | 66.6 |
| Arkhangelsk Oblast | 364.2 | -50.2 | 37.7 | 22.8 |
| Nenets Autonomous Okrug | 651.4 | -61.6 | -41.8 | -32.5 |
| Murmansk Oblast | 152.3 | -18.4 | 34.8 | 23.9 |
| Khanty-Mansi Autonomous Okrug | 44.5 | -4.3 | 25.3 | 25.5 |
| Yamalo-Nenets Autonomous Okrug | 84.6 | -10.8 | -19.8 | 25.6 |
| Sakha (Yakutia) Republic) | 256.7 | 9.4 | 61.7 | 36.2 |
| Kamchatka Krai | 280.2 | 61.9 | 12.9 | 1.6 |
| Magadan Oblast | 154.9 | -24.6 | 231.4 | 65.7 |
| Sakhalin Oblast | 446.6 | -16.3 | -59.9 | 18.4 |
| Chukotka Autonomous Okrug | 282.4 | 61.9 | 104.5 | 503.2 |

* Calculated by: [5, pp. 922-923, pp. 918-919; 7, pp. 928-929, pp. 932-933].

Sakha (Yakutia) Republic [7] and the “Step” investment project in the pulp and paper industry in the Komi Republic [8] and investment in the extraction of gold and silver in Chukotka Autonomous Okrug and Kamchatka Krai [9].

The *post-crisis period* (2009–2012) was characterized by the significant growth rates of investment in fixed capital of the Northern regions economy, which amounted to 20.7% (in Russia – 9.5%). They were especially high in the Magadan Oblast, the Komi Republic, Chukotka Autonomous Okrug mainly due to the allocations to mineral extraction, transport and the low base effect. At the same time, the negative growth rates were recorded in the Sakhalin Oblast, Nenets Autonomous district and Yamalo-Nenets Autonomous Okrug due to the completion of investment projects, the small amount of own funds and the limited availability of investment resources (direct investments and loans).

The regions’ contribution to the investment growth rates

The regions’ contribution to the growth rates of investment in fixed capital (IFC) was determined by the re-calculation of nominal volumes in 2004 constant prices and the calculation of absolute growth (CAG) as the difference between the actual volume (IFC) of the regions of the current and base years and the correlation of absolute values of growth (IFC) of the regions with the overall growth (IFC) in percent.

The pre-crisis years (2005–2008) were characterized by the positive contributions of all regions to the growth rates of

investment in fixed capital of the Northern regions. Export-oriented Yamalo-Nenets Autonomous Okrug, Khanty-Mansi Autonomous Okrug and the Sakha (Yakutia) Republic made the greatest contribution due to the revenues from oil, gas and diamonds export and the inflow of cheap foreign loans (*tab. 2*). Nenets Autonomous Okrug, the Sakhalin Oblast and the Arkhangelsk Oblast made a less significant contribution. Chukotka Autonomous Okrug, the Magadan Oblast and the Republic of Karelia made the lowest contribution. In general, despite a slight decrease, the Northern regions’ contribution to the growth of investment in fixed capital of the Russian economy remains substantial – 14.9%.

The *crisis years* (2008–2009) were marked by the drastic negative contribution (20.8%) of the Northern regions to the fall of investment in fixed capital of the country (see *tab. 2*). It was manifested in the oil and gas producing regions, such as Nenets Autonomous Okrug, Yamalo-Nenets Autonomous Okrug, Khanty-Mansi Autonomous Okrug and the Arkhangelsk Oblast, to the greatest extent. The main reasons were the following: the sharp reduction of own and borrowed funds due to substantial decline in the world oil and gas prices, the rising cost of loans on the global and domestic markets, the investors’ waiting for more favorable conditions to invest. During this period, only six regions made insignificant positive contribution to investment growth.

The *post-crisis period* was characterized by the Northern regions’ large contribution

Table 2. Contribution to the growth of investment in fixed capital of the Northern regions' economy in 2005–2012, %*

| Regions | 2005–2008 | | 2008–2009 | | 2009–2012 | |
|--------------------------------|--------------------|------------------|--------------------|------------------|--------------------|------------------|
| | Russian Federation | Northern regions | Russian Federation | Northern regions | Russian Federation | Northern regions |
| Economy, total | 100 | 100 | 100 | 100 | 100 | 100 |
| Northern regions | 14.9 | - | -20.8 | - | 22.7 | |
| Republic of Karelia | 0.3 | 1.9 | -0.7 | -3.2 | 0.4 | 1.9 |
| Komi Republic | 0.7 | 5.0 | 1.1 | 5.2 | 9.5 | 41.7 |
| Arkhangelsk Oblast | 1.1 | 7.3 | -4.1 | -19.9 | 1.1 | 4.9 |
| Nenets Autonomous Okrug | 1.5 | 9.9 | -5.8 | -27.7 | -1.2 | -5.1 |
| Murmansk Oblast | 0.6 | 4.1 | -1.9 | -9.2 | 1.2 | 5.2 |
| Khanty-Mansi Autonomous Okrug | 3.0 | 20.4 | -3.5 | -17.1 | 9.1 | 39.9 |
| Yamalo-Nenets Autonomous Okrug | 3.7 | 25.0 | -5.1 | -24.4 | -5.9 | -25.9 |
| Sakha (Yakutia) Republic | 2.3 | 15.1 | 2.3 | 11.0 | 8.6 | 38.0 |
| Kamchatka Krai | 0.1 | 0.6 | 0.1 | 0.3 | 0.1 | 0.6 |
| Magadan Oblast | 0.2 | 1.1 | -5 | 11.0 | 2.0 | 8.9 |
| Sakhalin Oblast | 1.4 | 9.1 | -2.2 | 0.3 | -3.3 | -14.7 |
| Chukotka Autonomous Okrug | 0.1 | 0.7 | -0.5 | 11.0 | 1.0 | 4.6 |

* Calculated by: [5, pp. 922-923, pp. 918-919; 7, pp. 928-929, pp. 932-933].

to the growth rate of investment in fixed capital of the country's economy (22.7%) due to the Komi Republic, Khanty-Mansi Autonomous Okrug and the Sakha (Yakutia) Republic (see tab. 2). At the same time, the large negative contribution of Yamalo-Nenets Autonomous Okrug and the Sakhalin Oblast was associated with the relocation of significant funds to other regions by OAO Gazprom, for example to the Komi Republic, the construction of the "Yamal-Europe" gas pipeline.

Sectoral structure of investment

Recently the structure of investment in fixed capital by sectors and branches of the Northern regions' economic activity has not changed radically. Thus, in 2005–2012 the share of investment of *traded*

and *non-traded sectors* remained almost unchanged and amounted to 58.9 and 35.8%, respectively, while that of the public and social services sector fell considerably: from 5.8 to 4.9% (tab. 3). Let us mention that the share of investment of the traded sector in the Northern regions was significantly higher than in Russia, and the share of the non-traded sector and the public and social services sector, on the contrary, was much lower. The Northern regions' raw-material orientation caused this situation.

Investment in mineral extraction prevails in the *traded sector* of the Northern regions (see tab. 3). In 2012 its share was almost 3.5 times higher than in Russia. The share of investment in manufacturing

Table 3. Structure of investment in fixed capital in terms of the key sectors of the RF Northern regions (in current prices), %*

| Region | 2005 | | 2008 | | 2012 | |
|---|--------------------|------------------|--------------------|------------------|--------------------|------------------|
| | Russian Federation | Northern regions | Russian Federation | Northern regions | Russian Federation | Northern regions |
| Economy, total | 100 | 100 | 100 | 100 | 100 | 100 |
| Traded sector | 34.3 | 58.5 | 34.2 | 57.7 | 35.9 | 59.2 |
| Agriculture, hunting and forestry | 4.0 | 0.6 | 4.4 | 0.4 | 4.3 | 0.3 |
| Fisheries | 2.1 | 1.0 | 0.1 | 0.1 | 0.1 | 0.3 |
| Mining | 13.4 | 55.3 | 14.1 | 54.5 | 16.4 | 56.8 |
| Manufacturing | 16.8 | 2.3 | 15.7 | 2.7 | 15.1 | 1.8 |
| Non-traded sector | 58.1 | 35.7 | 65.8 | 42.3 | 54.7 | 35.9 |
| Production and distribution of electricity, gas and water | 6.6 | 5.1 | 7.7 | 3.8 | 10.7 | 7.2 |
| Construction | 3.5 | 3.1 | 3.4 | 4.1 | 3.0 | 1.8 |
| Wholesale and retail trade; repair of motor vehicles, motorcycles, etc. | 3.9 | 0.5 | 3.2 | 0.5 | 3.9 | 0.3 |
| Hotels and restaurants | 0.3 | 0.1 | 0.4 | 0.1 | 0.5 | 0.0 |
| Transport and communication | 25.9 | 19.9 | 24.4 | 23.6 | 31.5 | 21.4 |
| Financial activities | 1.4 | 0.3 | 0.9 | 0.3 | 3.3 | 0.6 |
| Real estate transactions, lease and services | 16.6 | 6.6 | 16.7 | 5.3 | 1.8 | 4.5 |
| Sector of government and social services | 7.7 | 5.8 | 8.7 | 4.7 | 9.4 | 4.9 |
| Public administration and military security, mandatory social insurance | 1.5 | 1.1 | 1.7 | 1.2 | 1.9 | 1.4 |
| Education | 1.5 | 1.8 | 2.0 | 1.3 | 1.9 | 1.4 |
| Health and social services | 2.2 | 1.4 | 2.4 | 1.2 | 2.3 | 1.1 |
| Provision of public utilities, social and personal services | 2.4 | 1.6 | 2.7 | 1.1 | 3.2 | 1.0 |

* Calculated by: [5, pp. 934-937; 6, pp. 542-545; 7, pp. 942-945].

industry is still insufficient – 8 times less than in the country as a whole. Less than 1% accrues to agriculture, hunting and forestry, fishing and fish farming. In general, investment in the traded sector is not enough to accelerate the pace of economic growth; the sectoral structure of investment remains inefficient, as the allocations to fixed capital of manufacturing and agriculture are negligible.

Nenets Autonomous Okrug (91.9%), Khanty-Mansi Autonomous Okrug (73.4%), Yamalo-Nenets Autonomous Okrug (67.1%), Chukotka Autonomous Okrug (61.9%) and the Sakhalin Oblast (61.9%) had the highest share of investment in fixed capital of the traded sector among the Northern regions in 2012. Investment in mineral extraction prevailed [5, pp. 934-937; 6, pp. 542-545; 7, pp. 942-945].

Kamchatka Krai (24.3%), the Komi Republic (26.2%) and the Sakha (Yakutia) Republic (33.5%) have the low share of investment. In the first two regions it was caused by large-scale investment in fixed capital of transport (pipelines), and in the third – in production and distribution of electricity, gas and water. The sectoral structure of investment of the traded sector is the best possible in the Republic of Karelia, where the funds are equally directed to mineral extraction (13.7%) and manufacturing (24.5%) [5, pp. 934-937; 6, pp. 542-545; 7, pp. 942-945].

The *non-traded sector* of the Northern regions is marked by investment in fixed capital of transport and communication. Their share amounted to 21.4% in 2012 due to the peripheral location of the regions and the laying of pipelines of large extent (see tab. 3). They are followed by investment in production and distribution of electricity, gas and water, real estate transactions, lease and services, etc. In general, the sectoral structure of investment in the non-traded sector of the North is not effective, as little funds are given to such important industries, as construction, wholesale and retail trade, hotel and restaurant activities, etc.

In 2012 among the Northern regions the Komi Republic (71.6%), the Sakha (Yakutia) Republic (57.8%) and Kamchatka Krai (56.7%) had the largest share of investment in the non-traded sector, mostly investment in transport and communications, real estate transactions, lease and services [5, pp. 934-937; 6, pp. 542-545; 7, pp. 942-945]. Nenets

Autonomous Okrug (7.1%), Khanty-Mansi Autonomous Okrug (23.6%), Yamalo-Nenets Autonomous Okrug (29.4%) and Chukotka Autonomous Okrug (33.5%) had the low share of the non-traded sector due to relatively low investment in infrastructure and high investment in the traded sector [5, pp. 934-937; 6, pp. 542-545; 7, pp. 942-945].

There were no significant changes in the sectoral structure of investment of the *public and social services sector* of the North in 2005–2012, although the share of investment in education, public administration and military security increased slightly (see tab. 3).

The regions with the large share of investment in fixed capital of this sector were the following in 2012: Kamchatka Krai (19%) – due to massive investment in education and health and social services; the Murmansk Oblast (16.8%) and the Arkhangelsk Oblast (10.5%) – due to growing investment in public administration. Nenets Autonomous Okrug (1.0%), the Komi Republic (2.2%), Khanty-Mansi Autonomous Okrug (3.0%) and Yamalo-Nenets Autonomous Okrug (3.5%) were characterized by the small share of investment due to private enterprises' large scale financing of this sector, i.e., extra-budgetary funds.

In general, the sectoral structure of investment in fixed capital of the Northern regions in terms of their economies development can be considered normal; investment in the traded sector prevail, as it brings in return. However, large scale investment in mining operations on the

background of too modest investment in manufacturing raises concern. The share of investment in the public and social services sector, particularly, in education, health and public services, is very low.

Structure of investment by types

The *structure of investment in fixed capital by types of fixed assets* of the North has changed. So, in 2005–2012 the share of investment in machinery, equipment and vehicles decreased from 36.4 to 30.4% (in Russia – from 41.1 to 36.3%); the reduction (27.9%) was especially sharp in the 2009 crisis year (*tab. 4*).

This reduction is caused by the export-oriented enterprises' lack of interest in reindustrialization due to easily obtained large revenues in the pre-crisis and a lack of funds in the crisis and post-crisis periods. At the same time, there was an increase in the share of investment in housing, buildings

(excluding housing) and structures due to grown investment in private housing construction and transmission devices (oil and gas pipelines, transmission lines), infrastructure (transport and terminal facilities) and environmental (waste disposal facilities and sewage treatment plants) objects. It should be noted that this structure is characterized by the high level of *other investment* associated with high costs for maintenance and deep exploratory drilling for oil and gas. The above trends are typical for the Russian economy as a whole.

The Murmansk Oblast (56.6%), the Magadan Oblast (45.0%), Kamchatka Krai (39.3%) and the Republic of Karelia (38.9%) had the highest share of investment in machinery, equipment and vehicles among the Northern regions in 2012 [3, pp. 59-64]. However, this rather indicates their specialization in manufacturing

Table 4. Dynamics of the structure of investment in fixed capital of the Northern regions by types of fixed assets in 2005–2012, %*

| Types of fixed assets | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|--|------|------|------|------|------|------|------|------|
| <i>Russian Federation</i> | | | | | | | | |
| Investment in fixed capital, total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Housing | 12.0 | 11.8 | 13 | 13.6 | 15.3 | 11.4 | 12.7 | 15.2 |
| Buildings (excluding housing) and structures | 40.4 | 40.9 | 41.7 | 42.6 | 45.5 | 42.6 | 43.3 | 42.6 |
| Machinery, equipment and vehicles | 41.1 | 40.5 | 38.9 | 37.7 | 33.1 | 38.6 | 37.9 | 36.3 |
| Other | 6.5 | 6.8 | 6.4 | 6.1 | 6.1 | 7.4 | 6.1 | 5.9 |
| <i>Northern regions</i> | | | | | | | | |
| Investment in fixed capital, total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Housing | 4.9 | 4.3 | 4.3 | 3.6 | 5.0 | 5.1 | 3.7 | 5.8 |
| Buildings (excluding housing) and structures | 47.6 | 52.3 | 47.4 | 48.9 | 52.7 | 53.4 | 54.1 | 54.7 |
| Machinery, equipment and vehicles | 36.4 | 33.2 | 37.7 | 35.2 | 27.9 | 27.3 | 32.4 | 30.4 |
| Other | 11.1 | 10.2 | 10.5 | 12.3 | 14.4 | 14.2 | 9.9 | 9.1 |
| * Calculated by: [1, pp. 58-63; 3, pp. 59-64]. | | | | | | | | |

industries than the active modernization of industrial enterprises. The large proportion of investment in buildings (excluding housing) and structures, characteristic of the Sakhalin Oblast (81.5%), the Komi Republic (65.5%), Yamalo-Nenets Autonomous Okrug (62.4%) [3, pp. 59-64] is caused by the specificity of production technologies used in these regions (for example, ice-resistant platforms for oil and gas extraction in the Sakhalin Oblast, etc.) and the replacement and renewal of obsolete structures.

The recent years have witnessed positive and negative changes in investment *in fixed capital directions* in the Northern regions (*tab. 5*).

The positive trends in 2007–2012 include the reduction in the proportion of investment in buildings and structures and the rise in the share of investment in machinery, equipment and vehicles in the *new construction*; the increase in the share of investment in buildings and structures in the *modernization, reconstruction and acquisition of new fixed assets*.

Table 5. Dynamics of the structure of investment in fixed capital of the Northern regions by the key directions in 2007–2012, %*

| Direction | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|----------------------------------|------|------|------|------|------|------|
| <i>Russian Federation</i> | | | | | | |
| New construction | | | | | | |
| Buildings and structures | 78.3 | 77.9 | 76.5 | 75.1 | 75.6 | 75.2 |
| Machinery, equipment, vehicles | 11.9 | 77.9 | 14 | 14.8 | 14.7 | 15.5 |
| Modernization and reconstruction | | | | | | |
| Buildings and structures | 61.1 | 60.5 | 61 | 64 | 61.8 | 75.2 |
| Machinery, equipment, vehicles | 36.4 | 36.7 | 35.8 | 33.2 | 32.9 | 15.5 |
| Acquisition of new fixed assets | | | | | | |
| Buildings and structures | 4.6 | 6.3 | 7.2 | 7.1 | 7 | 5.8 |
| Machinery, equipment, vehicles | 88.8 | 88.9 | 88.1 | 89.9 | 90.1 | 91.1 |
| <i>Northern regions</i> | | | | | | |
| New construction | | | | | | |
| Buildings and structures | 78.3 | 73.0 | 76.1 | 76.8 | 76.1 | 75.4 |
| Machinery, equipment, vehicles | 11.9 | 13.8 | 11.4 | 8.3 | 12.8 | 12.4 |
| Modernization and reconstruction | | | | | | |
| Buildings and structures | 61.1 | 64.2 | 67.9 | 63.2 | 71.1 | 70.9 |
| Machinery, equipment, vehicles | 36.4 | 25.9 | 23.1 | 31.5 | 21.3 | 22.2 |
| Acquisition of new fixed assets | | | | | | |
| Buildings and structures | 4.6 | 10.0 | 13.7 | 11.8 | 11.3 | 11.4 |
| Machinery, equipment, vehicles | 88.8 | 81.8 | 78.8 | 83.6 | 82.7 | 85.6 |

*Calculated by: [1, pp. 64-69; 2, pp. 64-69; 3, p. 64-69].

The negative trends concern the decline in the share of investment in machinery, equipment, vehicle in the *modernization, reconstruction* and *acquisition of new fixed assets*.

In 2012 among the Northern regions the largest share of investment in buildings and structures in the new construction belonged to Kamchatka Krai (96.4%), Chukotka Autonomous Okrug (90.1%), the Republic of Karelia (86.2%) and the Magadan Oblast (84.1%); machinery, equipment and vehicles – the Murmansk Oblast (27.0%), the Komi Republic (19.7%) and the Magadan Oblast (14.1%) [3, pp. 64-69].

The large share of investment in buildings and structures in the modernization and reconstruction belonged to the Sakhalin Oblast (94.6%), Kamchatka Krai (86.2%), Chukotka Autonomous Okrug (85.6%) and the Republic of Karelia (84.2%); machinery, equipment and vehicles – the Murmansk Oblast (44.1%), the Magadan Oblast (43.6%) and the Sakha (Yakutia) Republic (32.3%) [3, p. 64-69].

In the acquisition of new fixed assets the large share (85.6%) belonged to investment in machinery, equipment and vehicles. Such investment was particularly high in the Republic of Karelia (97.1%), the Magadan Oblast (95.2%), Kamchatka Krai (94.4%), the Murmansk Oblast (93.8%) and Chukotka Autonomous Okrug (93.5%) [3, pp. 64-69].

Among the Northern regions the large share of investment in buildings and structures was characteristic of Nenets Autonomous Okrug (48.6%), the Sakha

(Yakutia) Republic (16.0%) and the Komi Republic (15.5%) due to the expenditure on infrastructure, environmental and transmission facilities for production needs.

The process to improve the reproductive structure of fixed assets, investment in fixed capital by directions of the Northern regions is ambiguous. In terms of the payback period (repayment) it is more profitable to invest in the modernization and reconstruction than in the new construction, that is why the increase in the share of investment in this form of reproduction of fixed assets can be considered as a progressive trend. However, if you consider this in terms of enterprises' innovative development, involving the transition to a qualitatively new technological production level, you need to invest in the new construction. Though they give feedback at later time than investment in the modernization and reconstruction, but boost the production due to scientific-technological progress achievements. If the share of morally and physically outdated industrial enterprises is high, obviously, it is more profitable to invest in the first two directions than in the acquisition of new fixed assets.

Thus, the analysis of the dynamics and the structure of investment in fixed capital of the Northern regions' economy has revealed the following:

– investment in the Northern regions' economy, compared with Russia, fell down during the crisis to a lesser extent and rose in the recovery period more quickly due to the implementation of large-scale investment projects;

– the Magadan Oblast, the Komi Republic, the Murmansk Oblast and the Sakha (Yakutia) Republic had high growth rates of investment in fixed capital in the recovery period due to investment in mining, pipeline transport and the low base effect;

– the decline of investment in fixed capital of the Northern regions in 2013 and the expected decline in 2014 is caused by the completion of major investment projects, the limited availability of investment resources (direct investments and loans), the entrepreneurs' expectations for more favorable conditions to invest, the speculations on the foreign exchange market due to ruble depreciation, the suspension of natural monopolies' investment programs due to the freezing of tariffs in 2014;

– the Komi Republic, Khanty-Mansi Autonomous Okrug and the Sakha (Yakutia) Republic made a great contribution to the growth of investment in fixed capital of the North in the recovery period due to large investment in oil and gas pipeline transport, oil extraction, production and distribution of electricity, gas and water;

– the sectoral structure of investment in fixed capital has not changed significantly,

there is still a high share of investment in the traded sector, especially mining, due to the Northern regions' specialization in the extractive industries;

– the structure of investment in fixed capital by types has changed dramatically, the share of investment in buildings (excluding housing) and structures has increased, the share of investment in machinery, equipment and vehicles has notably decreased due to reluctant investment in rough manufacturing;

– there are positive and negative trends in the structure of investment in *fixed capital by directions*. The positive ones include the decline in the proportion of investment in buildings and structures and rise in the share of investment in machinery, equipment and vehicles in the *new construction*; the increase in the share of investment in buildings and structures in the *modernization* and *reconstruction* and the *acquisition of new fixed assets*. The negative trends are the following: the decline in the share of investment in machinery, equipment and vehicles in the *modernization* and *reconstruction* and the *acquisition of new fixed assets*.

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Resource security of healthcare in Russia: issues of territorial differentiation*



**Konstantin Nikolaevich
KALASHNIKOV**

Ph.D. in Economics, Research Associate, Federal State Budgetary Institution of Science Institute of Socio-Economic Development of Territories of Russian Academy of Science (56A, Gorky Street, Vologda, 160014, Russian Federation, e-mail: konstantino-84@mail.ru)

Abstract. Russia's regions (federation subjects) vary greatly by level of socio-economic development; this fact leads to inequality in social infrastructure development as well. The same can be said about healthcare. There is a strong link between economic development in the regions and funding of medical care. It is necessary to point out that the actual level of morbidity and mortality is not reflected in the volumes of resource supply of the sector in terms of territories; consequently, the principles of social justice and social solidarity are violated.

The article analyzes statistical data on the RF subjects and shows the extent of territorial disparities in the provision of population with the main healthcare resources: financial (the amount of per capita funding and the level of implementation of territorial programs of state guarantees), labor (provision of population with doctors and nursing staff), equipment (provision with hospital beds). The author points out the regions that show consistently low rates of resource security of healthcare.

The article reveals that the differentiation between the RF subjects by level of per capita financing of healthcare reaches 10 times, the provision of population with doctors – 3 times, with nursing staff – 2 times, with hospital beds – 3 times. Moreover, territorial differences in the provision of Russia's citizens with healthcare services are quite stable. The reduction of differentiation is observed only in the indicator of provision of citizens with ward beds; it was achieved through the restructuring and reduction of the number of hospital beds. Territorial inequalities in the provision of healthcare and population with resources still exist at the municipal level as well.

* The study was supported by the grant of the Russian Science Foundation No. 14-18-03120.

Government agencies should conduct social policy that aims to eliminate sharp disparities in providing citizens with medical care; moreover, this should be done only by improving the situation in the regions where the situation is the gravest. In addition, it is necessary to use more extensively the mechanisms of funding taking into account the specifics of territories and objective needs of population with regard to healthcare. In Russia this process, as the article shows, is going on, but very slowly.

Key words: healthcare, financial resources, human resources, hospital beds, territorial differentiation, subject of federation.

Introduction

The problems of resource support of healthcare are classified as the most relevant and important for Russia. They are regularly reflected in the works of leading Russian scientists and practitioners, who agree that limited resources are unreasonably used in Russian healthcare [5, 7, 17].

The important measures to increase the financing of the sector, taken in 2000–2012 (the national project “Health” and the Healthcare Modernization Program), undoubtedly played an important role in the development of the healthcare system, but there were no fundamental changes in the financial provision of the sector. The situation is worsening today. So, the 2015 budget in terms of healthcare costs was rigorously criticized by the well-known Russian expert G.E. Ulumbekova who called it “500,000 deaths” [15]. We agree with her authoritative opinion that the lack of state financial assistance to healthcare can lead to these consequences.

The situation with the underfunded healthcare sector is further complicated by the RF subjects’ unequal socio-economic development. The heterogeneity of the regions’ provision with healthcare infrastructure objects and, more importantly,

the lack of correlation between demand and supply of health services result in the territorial inequality in the opportunities to get medical care [8]. And if the popular notion “every nation gets healthcare that it deserves” (regarding the relations between the level of socio-economic and legal development of the society and the state of healthcare) can be justified at the international level, the sharp differences in the access to medical assistance within a single state are a violation of social justice and social solidarity principles¹.

In this respect, it is critical to analyze the resource potential of healthcare of the territories. The article studies the provision of healthcare with material, labor and financial resources and the RF territories’ differentiation by resource capabilities of the sector.

Financial resources of healthcare

The deficit financing of national healthcare often sounds as the main reproach to those responsible for making decisions [15]. Indeed, spending on health in the Russian Federation is noticeably

¹ Article 41 of the Constitution of the Russian Federation stipulates equal rights for free medical care for all citizens, but does not consider its quantity and quality, therefore, it is impossible to refer to the violation of constitutional guarantees. However, the equality of citizens regardless of residence is stipulated by the law on CMI.

inferior to that in the developed world. In Russia in 2012 it amounted to 6.3% of GDP (this corresponds to the level of the countries, such as Turkey, Albania, Latvia, Uzbekistan), and during several previous years this figure had not changed significantly. In 2008 it amounted to 5.1% of GDP. In the post-industrial countries the share of spending on healthcare is higher; it ranges from 9–11% (Germany, Canada, Japan, Finland, Italy, etc.) to 17% in the USA [14, 19, 20]. At the same time, the share of public expenditure in the total healthcare financing in Russia comprised 61% (in 2012), which was considerably less than in many developed countries (for example, in Germany – 76%, Finland – 75%, Italy – 78%). Thus, the low levels of health expenditure in Russia can not be justified by its free provision guaranteed by the state.

The universal health insurance (in Russia – compulsory medical insurance (CMI)), designed to ensure the citizens' equal access to medical services anywhere in the country, is not able to achieve this goal in its present state of development. And while it is true that the territories of any country, especially if we are talking about Russia, are extremely heterogeneous by institutional characteristics, the provision and implementation of social guarantees should not differ significantly among the regions.

Meanwhile, to date the territorial programs of state guaranteed free medical care differ by the level of financial assistance provided in the RF subjects. According to the Federal State Statistics Service data,

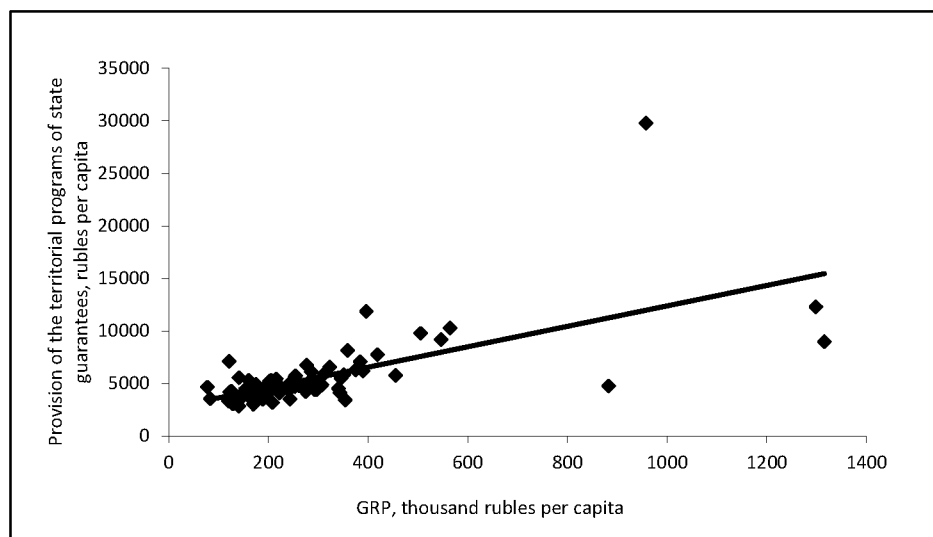
the differentiation by actual expenditure on healthcare per capita is great: there is the maximum value in Chukotka Autonomous Okrug (in 2012 – 29750.4 rubles per person) and the minimum one in the Republic of North Ossetia-Alania (2841.9 rubles per person).

It is important that the regional disparities in per capita expenditures on healthcare are mainly caused not by the different levels of insurance risks, i.e. the actual state of the population's health, but by the unequal economic development of territories, regarding the tax base [7]. As a result, the regions with the developed industry and the high level of GRP per capita allocate more funds to healthcare than the less developed (the population size is also important, for example, the multimillion city of Moscow is among the regions with low expenditure on health per capita). There is a close correlation (the correlation of mean force, $R=0.642$) between the indices of GRP per capita and the provision of the territorial programs of state guarantees with the resources of insurance funds (CMI) (*figure*)².

The chart in Figure 1 shows that the expenditure is high in the Northern, oil-producing regions (particularly, the Sakhalin Oblast) and in the small region rich in minerals – Chukotka Autonomous Okrug.

² There is a correlation of mean force ($R=0.574$) between GRP per capita and the total expenditure on TPSG. There is a weak correlation ($R=0.372$) between the indices of GRP per capita and the provision of territorial programs with budget means, as in Saint Petersburg, the Chelyabinsk Oblast and the Magadan Oblast in 2012 the indicators of budget expenditures on healthcare were significantly greater than in other regions. For this reason the correlation between GRP per capita and the total expenditure on TPSG is quite weak.

Correlation between the provision of the territorial programs of state guarantees and GRP per capita, 2012



Source: Federal State Statistics Service data, 2013.

The North Caucasian republics demonstrate, as a rule, the minimum values³.

The shortage of the territorial program of state guarantees is a significant indicator of health financing. It is expressed in percent as a share of the shortfall in the healthcare funds from their required amount. Though, in general, the shortage of territorial programs of state guarantees in the Russian Federation is reduced (for example, if in 2011 it reached almost 19%, in 2013 it amounted to little more than

9%), it is early to talk about success. In 2013 the territorial programs were balanced only in 25 RF subjects, including in the cities of Moscow and Saint Petersburg⁴. In 2013 the maximum deficit of financial support of the programs was registered in the Republic of Dagestan – 22% of the total demand (in 2011 it amounted to more than 50%) or 65% of the demand in budgetary allocations of the RF subjects' budgets (*tab. 1*)⁵.

³ Undoubtedly, Moscow, Chukotka Autonomous Okrug and the Republic of Dagestan are too different territorial units to analyze them together without appropriate conditions. The Northern regions, Southern republics and megacities differ qualitatively from each other not only by the level of socio-economic development, but also by social and cultural contexts. However, in this work the complex coefficients are analyzed across a range of RF subjects, primarily, for clarity and convenience. The author understands that many comparisons and conclusions presented in the article require additional methodological comments.

⁴ Here and below: for the detailed information on the RF subjects see the Report on Implementation of the Program of State Guarantees of Free-of-Charge Provision of Citizens with Medical Care in 2013. Available at: <http://www.rosminzdrav.ru>

⁵ In 2013 in 58 RF subjects the deficit of financial support of the territorial programs at the expense of budgetary appropriations of the RF subjects' consolidated budgets amounted to 81.7 billion rubles (9% of the total demand, or 27% of the RF subjects' demand in budget allocations, calculated in accordance with the 2013 regulations).

Table 1. Deficit of financial support of the territorial programs of state guarantees in the RF subjects, 2013

| Rank | 10 subjects with the maximum deficit | Value, in % | Rank | 10 subjects with the minimum deficit | Value, in % |
|--------------|--------------------------------------|-------------|------|--------------------------------------|-------------|
| 1 | Republic of Dagestan (max) | 22.1 | 49 | Orel Oblast | 4.7 |
| 2 | Mari El Republic | 21.4 | 50 | Krasnoyarsk Oblast | 2.5 |
| 3 | Republic of Khakassia | 20.1 | 51 | Republic of Bashkortostan | 2.3 |
| 4 | Altai Republic | 19.9 | 52 | Lipetsk Oblast | 2.3 |
| 5 | Republic of Kalmykia | 19.5 | 53 | Nizhny Novgorod Oblast | 1.5 |
| 6 | Tambov Oblast | 18.5 | 54 | Novgorod Oblast | 1.0 |
| 7 | Chechen Republic | 17.8 | 55 | Ryazan Oblast | 0.7 |
| 8 | Republic of Ingushetia | 17.8 | 56 | Belgorod Oblast | 0.6 |
| 9 | Altai Krai | 17.5 | 57 | Samara Oblast | 0.6 |
| 10-11 | Volgograd Oblast | 17.3 | 58 | Republic of Mordovia (min) | 0.2 |
| 10-11 | Vologda Oblast | 17.3 | | | |

Note. In the RF as a whole – 9.2
 *Without 25 regions with 100% provision of the territorial programs of state guarantees.
 Source: Federal State Statistics Service, 2014.

The territorial inequality persists at the municipal level as well. For example, the expenditures on health per capita differ by 2–3 times in the Vologda Oblast municipalities [5]. It is important that this is caused not only by the differences in the population's objective requirements in healthcare, but by the unevenly developed facilities and resources of medical institutions. In Cherepovets, Sokolsky District and Velikoustyugsky District where there are large networks of medical institutions, mainly hospitals, the quantitative and qualitative characteristics of the facilities and resources are significantly higher than in other areas [5].

The volume of budget financing of the municipalities is calculated according to the standard on the basis of actual expenses on healthcare in the previous period, therefore, the value of the correction

factors used to estimate the costs for the Vologda Oblast municipalities differ by more than two times.

The application of the advanced methods to pay for medical care is one of the mechanisms to eliminate such distortions. They encourage institutions not to maintain already established material assets, but to finance the volumes of medical care, taking into account the requirements of separate territories. It creates the preconditions for greater social justice in the distribution of public health resources and promotes their effective use.

In 2004–2006 the prevalence of different methods to pay for medical care in regions was studied on the basis of the surveys of healthcare executives. This study has revealed the significant differentiation of RF subjects by the use of mechanisms to finance healthcare and revealed the

widespread popularity of obsolete methods to pay for medical services. In 2004–2006 Russian healthcare approved the practice to pay for outpatient services, which led to the growth of visits to doctors, but did not result in the prevention of diseases. Devoid of these shortcomings and tested in other countries the per capita payment method was used only in 14% of the regions in 2006 (19% in 2004). In 8–11% of the RF subjects the unconstructive and outdated “cost estimates” method was used to pay for outpatient care [12].

In the same period a greater number of regions used such method, as payment for the number of days spent at hospital – from 42% in 2004 to 47% in 2006. It encourages hospitals to maintain the maximum number of beds, increase stationary admission and length of treatment. There is a rise in the application of the payment method based on the average cost of treatment in specialized departments, but this method does not consider the differences in the expenses to treat diseases of varying complexity. Meanwhile, the method of payment for the agreed amount of medical care, which takes into account the real complexity of aid and promotes hospitals to enhance the use of resources, was used in only 8% of the regions at that time (in the Kemerovo Oblast, the Kostroma Oblast, the Samara Oblast, the Tula Oblast and the Chuvash Republic) [12].

However, there were positive changes in this period. For example, the payment for each completed case of stationary admission became widespread among the methods to pay for hospital care: in 2005 it was used in

49% of the regions and in 2006 – already in 65%.

How has the situation changed after 10 years? According to the Ministry of Healthcare of the Russian Federation, 57 RF subjects, providing medical care on an outpatient basis, used the method of payment per unit volume of medical care (medical service, visit, reference, completed treatment case) in 2013.

Eighteen RF subjects used the best method of payment by per capita financing for registered individuals together with payment per unit volume of medical care. However, only 8 RF subjects (the Arkhangelsk Oblast, the Penza Oblast, Altai Krai, the Tyumen Oblast, the Kemerovo Oblast, the Tomsk Oblast, the Sakha (Yakutia) Republic and Kamchatka Krai) used the method of payment by per capita financing for registered individuals with regard to the indicators of medical organization performance, including the costs on medical care provided by other medical organizations [1].

In 2013 twenty-one subjects of the Russian Federation paid for each completed treatment case at hospital. It was a positive trend. However, nine RF subjects used the payment methods that were not stipulated by the program, including per unit volume of medical care (a bed-day).

Thus, the transfer to the leading methods of payment for medical care is very slow in Russia. This is caused not only by the sluggishness of local authorities, but by the lack of institutional leaders' interest in adopting new principles of financing, which can reduce the revenue of institutions.

Labor resources of healthcare

The healthcare system presupposes the availability of well-trained medical personnel, providing healthcare, prevention and treatment of diseases, rehabilitation of patients at a high professional level with the observance of ethical standards. Availability of doctors and nurses refers to the relative number of these categories of professionals working in medical institutions of the region.

According to the World Bank, the number of doctors in Russia amounts to 4.3‰ (persons per 1,000 population), which is highly significant. In the world the average value of this indicator is only 1.5‰, in Europe – 3.7‰. There are index values, similar to the Russian one, in Lithuania (4.1‰), Georgia (4.2‰), Switzerland and Andorra (3.9‰), Sweden and Bulgaria (3.8‰), Uruguay, Spain and

Norway (3.7‰), the Czech Republic and Kazakhstan (3.6‰). In a few countries there is a greater availability of doctors than in the Russian Federation. It is methodologically incorrect but still rather illustrative to compare our country with them. They are the following: Austria (4.8‰), San Marino (5.1‰), Greece (6.2‰), Cuba (6.7‰), Monaco (7.2‰) and Qatar (7.7‰) [20].

The territorial inequalities in the availability of doctors retain its sharpness at the level of RF subjects. The differentiation in the provision of doctors covers a wide range of values – from the maximum one in the largest cities of Moscow (68.6‰) and Saint Petersburg (81.2‰), Chukotka Autonomous Okrug and the Republic of North Ossetia-Alania (73.8 and 71.7‰) to the minimum one in the Chechen Republic (27‰) (*tab. 2*).

Table 2. Availability of doctors, persons per 10,000 population, 2013

| 10 regions with the highest availability * | Value in ‰ | | 10 regions with the lowest availability (2013) | Value in ‰ | |
|--|------------|------|--|------------|------|
| | 2003 | 2013 | | 2003 | 2013 |
| Saint-Petersburg | 77.3 | 81.2 | Kostroma Oblast | 36.1 | 35.5 |
| Chukotka Autonomous Okrug | 73.2 | 73.8 | Pskov Oblast | 34 | 35.5 |
| Republic of North Ossetia-Alania | 67.1 | 71.7 | Mari El Republic | 35.6 | 35 |
| Moscow | 73 | 68.6 | Vologda Oblast | 33.9 | 34.7 |
| Astrakhan Oblast | 65.5 | 65.8 | Tambov Oblast | 34.4 | 34.5 |
| Tomsk Oblast | 68.6 | 61.1 | Leningrad Oblast | 29.8 | 34.3 |
| Amur Oblast | 59.2 | 60.6 | Vladimir Oblast | 34.7 | 33.9 |
| Magadan Oblast | 54.7 | 59.5 | Tula Oblast | 33.7 | 33.6 |
| Yaroslavl Oblast | 56.9 | 58 | Kurgan Oblast | 27.7 | 30.2 |
| Khabarovsk Krai | 58.3 | 57.9 | Chechen Republic | no data | 27 |

Note. In the RF as a whole – 49; the difference between the maximum and minimum values – 3 times.
 *Ranked according to the 2013 data
 Source: Federal State Statistics Service, 2014.

The territorial differences in the availability of labor resources in healthcare are quite stable, and in 2003 the ratio of maximum and minimum values of the analyzed indicator among the RF subjects amounted to 3.2. The composition of the groups of regions-leaders and regions-outsiders by the availability of doctors is relatively constant. There is a stable low level of the availability of doctors in the Pskov Oblast, the Vologda Oblast, the Tula Oblast and the Kurgan Oblast (in 2003 and 2013 they belonged to the group of 10 regions with the lowest value).

The differences in the availability of doctors retain at the municipal level. So, the difference between the minimum (10‰ in Kaduysky District) and the maximum (22.4‰ in Velikoustyugsky District) values of the availability of doctors is 2.2 times in the Vologda Oblast, even if we do not take into account large cities.

The low staffing level and the high secondary employment level cause the shortage of physicians in the Russian Federation. The situation in the Vologda Oblast is quite vivid: the availability of doctors in the Vologda Oblast hospitals averaged 91% in 2013 but the provision of established post with individuals amounted only to 49%. At the same time, the secondary employment factor was equal to 1.9 and in certain areas of the region it reached 2.1 (Babaevsky District). The availability of nurses is higher: when the availability of nursing staff amounted to 94%, the provision of established post with individuals – 63%, with the secondary

employment coefficient being equal to 1.5. Excessive load at work (including night shifts) has a negative impact on physical and mental health of doctors, which leads to the lower quality of medical service (according to the population survey, 18% of the citizens, visiting medical institutions, mentioned the medical personnel's careless attitude and 14% – rudeness), provided by the regional health institutions, and the decline in the prestige of the profession [4].

Though the Russian Federation has a great number of doctors in comparison with other countries, their shortage is officially declared (in 2000–2013 the availability of doctors in Russia increased insignificantly – by 2%). There is reason to believe that this does not refer to the lack of doctors in general, but to the lack of primary care specialists.

So, the Minister of Healthcare of the Russian Federation V. Skvortsova argues that the number of primary care physicians in Russia is below the WHO standard by 2–2.5 times [13]. However, this is true only in relation to general practitioners: in Russia their number is two or more times less than in Europe and the world. So, in Russia their number amounted to 20.5⁶ per 1,000 population in 2000, in the WHO European Region – 54 in 2000 and 60.8 in 2012, in the UK – 81.2 in 2012 (64.5 in 2000), Germany – 65.8 in 2011 and in France 159.2 in 2012 [19].

⁶ This is the latest data on the Russian Federation, given in the WHO data base in 2014.

Such differences are understandable: the institute of family physicians was not typical for Russia; however, general practitioners and medical assistants were quite common.

What is the situation with the development of services provided by general practitioners in the RF subjects? Despite the fact that in 2013 the values of the indicators cover a wide range – from 0.1% in Moscow, the Republic of Ingushetia and Yamalo-Nenets Autonomous Okrug to 3.8% of the Chuvash Republic; in most RF subjects the number of family physicians is insignificant (from 0.1 to 0.9%). The situation in the Chechen Republic and the Republic of Adygea is particularly unfavorable, as there are practically no family doctors.

The concern of those responsible for the decision making in healthcare about the lack of general practitioners is clear: they follow the WHO recommendations, in accordance with which the major emphasis is laid on primary healthcare. However, in the context of Russian realities this opinion is not always shared by both citizens and medical staff.

First, the situation with the availability of general practitioners is quite favorable, according to the data on the world countries. In Russia its level reaches 145.9; it is the largest value in the world. To be more convincing we present the data on the number of general practitioners in the countries close to the Russian socialist past and the countries of the Western world. The number of first contact physicians was 140.9 in Belarus in 2011, 135.1 in Ukraine

in 2012, 83.4 in France in 2011, 89.8 in Germany in 2011 and 137.5 in Italy in 2011 [19].

Second, in the adverse conditions of high mortality and extensive-stage diseases the narrow specialists are extremely important. Primary care doctors and general practitioners can not succeed in such urgent and acute sector, as oncology – the specialized public service should be established. One can not but notice the outflow of personnel from public institutions to private clinics. What is more, the surveys show that the patients are concerned about the shortage of narrow specialists. It is especially noticeable in those regions where there are no medical educational institutions or the level of socio-economic development and the wages in healthcare are low.

According to the sociological surveys conducted in the Vologda Oblast, 32% of the citizens often face the problem of a lack of the necessary specialist [4]. However, the citizens find it most difficult to get an appointment with a doctor due to long queues (55%); it indicates a lack of district primary care physicians and general practitioners. It leads to longer waiting time, reduced reception time and, consequently, decreased effectiveness of primary care and increased flow of patients to the specialists and hospitals⁷.

⁷ Staff shortage is acute not only for primary or secondary healthcare. For example, “The public report on the performance of the Vologda Oblast Healthcare Department in 2013”, which touches upon human resources in healthcare, argues that the shortage is felt in all types of medical organizations in the region. Available at: <http://okuvshinnikov.ru/files/ocenka/duganov.pdf>

Russia has notable regional differences in the availability of nursing staff. Thus, the differentiation between the richest and poorest regions reaches twice the value. The highest level of the availability of nursing staff is observed in the Magadan Oblast (151.3 ‰), Chukotka Autonomous Okrug (151.1‰), the Murmansk Oblast (149.3‰), the Komi Republic (146.6‰) and Khanty-Mansi Autonomous Okrug (144.4‰). The stable low level of the availability of nursing staff is registered in the Republic of Dagestan, the Republic of Ingushetia, the Moscow Oblast, the Chechen Republic, the Leningrad Oblast (in 2003 and 2013 they belonged to the group of 10 regions with the minimum values). In general, the most unfavorable situation is observed in the Republic of Ingushetia, the Republic of Dagestan, the Rostov Oblast and Primorsky Krai (*tab. 3*).

The availability of nursing staff is quite stable in the country as a whole. In 2000–

2013 it decreased only by 2%. The analysis of the situation in retrospect indicates the reduction of territorial disparities in availability of nursing staff in the region. In 2003–2013 the differences in the values of maximum and minimum indices decreased from 2.8 to 2 times.

The optimal ratio of the number of physicians and nurses working in the medical institutions of the country plays an important role. Health economics has an axiom, which states that the effective staffing can not be achieved without a significant numerical advantage of nursing staff over doctors.

In Russia the number of nurses is 2 times higher than doctors but in Europe and the United States the number of nursing staff is 4 times higher. In the Vologda Oblast, for example, the situation is close to the “Western pattern” but due a rather acute shortage of doctors in the region.

Table 3. Availability of nursing staff, persons per 10,000 population

| 10 regions with the highest availability* | Value, in ‰ | | 10 regions with the lowest availability (2013) | Value, in ‰ | |
|---|-------------|-------|--|-------------|------|
| | 2003 | 2013 | | 2003 | 2013 |
| Magadan Oblast | 147.9 | 151.3 | Rostov Oblast | 89.3 | 92.1 |
| Chukotka Autonomous Okrug | 137.3 | 151.1 | Samara Oblast | 100.1 | 91.7 |
| Murmansk Oblast | 136.7 | 149.3 | Kaliningrad Oblast | 86.2 | 90.9 |
| Komi Republic | 138.8 | 146.6 | Krasnodar Oblast | 100.1 | 88.1 |
| and Khanty-Mansi Autonomous Okrug | 133.1 | 144.4 | Primorsky Krai | 88.1 | 87.4 |
| Sakhalin Oblast | 127.6 | 143.5 | Republic of Dagestan | 80.4 | 82.1 |
| Tyva Republic | 137.3 | 139.7 | Republic of Ingushetia | 51.6 | 77.1 |
| Arkhangelsk Oblast | 141.8 | 139.7 | Moscow Oblast | 81.5 | 76.7 |
| Sakha (Yakutia) Republic | 138.5 | 137.4 | Chechen Republic | н.д. | 73.2 |
| Altai Republic | 128.7 | 135.3 | Leningrad Oblast | 73.3 | 73 |

Note. In the RF as a whole – 105.7; the difference between the maximum and minimum values – 2 times.

* Ranked according to the 2013 data

Source: Federal State Statistics Service, 2014.

It is difficult to give an objective assessment of personnel resources due to the complexity of the issue (the average figures include important quality characteristics: specialization, professional category, staffing structure, wages, impact of incentives, etc.). However, even the analysis of general statistical indicators allows us to determine the problems typical for the Russian healthcare, particularly, the problems of territorial disparities in the availability of medical personnel in the region.

We can not but mention a paradoxical situation: on the background of impressive indicators of the availability of physicians in the country as a whole, the municipalities complain of the acute shortage of medical personnel.

Hospital bed⁸

Russia is in the lead among the world countries by the scale of inpatient care. According to the WHO estimates, in 2005–2012 the availability of public hospital beds reached 97‰ in the Russian Federation. By this indicator Russia lags behind only 4 countries: Monaco (165‰), Japan (137‰), North Korea (132‰) and the Republic of Korea (103‰) [19]⁹.

This great availability is the heritage of the Soviet healthcare system that primarily

presupposed the functioning of hospitals. In the Soviet period the large number of hospitals was considered as the main indicator of a good healthcare system. It is no coincidence that the N.A. Semashko Research Institute of Social Hygiene and Health Service Management set standards (number of beds per 10,000 population, etc.), which are mandatory throughout the country. The need to provide all Soviet people with medical care led to the construction of many hospitals of various specialties and all levels of territorial organization.

In the post-Soviet period due to the chronic lack of funds in Russia many hospitals were closed and the number of hospital beds was reduced. Consequently, the reception of patients was also decreased, but the timing of inpatient treatment remained high due to the extensiveness of the treatment regime [18].

In 2004 the hospital stock was further diminished in the framework of the healthcare restructuring process, aimed, according to the official statements, at boosting intra-industry efficiency¹⁰.

The method to estimate the Executive authorities' performance in the RF subjects was developed in 2007 and recommended to use. It encouraged the regional authorities to reduce "excessive" hospital stock. The goal was simple – to eliminate disparities in the volume of inpatient care among the

⁸ The facilities and resources of healthcare include not only hospital stock, however, this article, primarily due to the universality and accessibility of official statistics data, uses the indicator of ward bed provision. The development of inpatient care does not reveal the effectiveness of healthcare, however, provides valuable information about its availability.

⁹ The minimum level is observed in Mali, where there is 1 ward bed per 10,000 population.

¹⁰ The basic principles of the restructuring process are set out in the draft sectoral program "Enhancement of the structural efficiency of the RF healthcare system for 2004–2010" (2004).

Table 4. Availability of public hospital beds, persons per 10,000 population

| 10 regions with the highest availability | Value, in ‰ | | 10 regions with the lowest availability* | Value, in ‰ | |
|---|-------------|-------|---|-------------|------|
| | 2000 | 2013 | | 2000 | 2013 |
| Chukotka Autonomous Okrug (max) | 184.5 | 148.3 | Chelyabinsk Oblast | 120.7 | 74.9 |
| Magadan Oblast | 143.8 | 125.6 | Chechen Republic | No data | 74.1 |
| Nenets Autonomous Okrug | 116.2 | 121.5 | Moscow Oblast | 106.7 | 72.1 |
| Sakhalin Oblast | 131.5 | 120.8 | Stavropol Krai | 88.8 | 72.1 |
| Tyva Republic | 161.7 | 117.4 | Republic of Dagestan | 81.2 | 67.7 |
| Sakha (Yakutia) Republic | 148.2 | 106.9 | Republic of Adygea | 103.5 | 67.4 |
| Kamchatka Krai | 146.6 | 106 | Tyumen Oblast | 106.7 | 67.3 |
| Orel Oblast | 118.9 | 97.7 | Leningrad Oblast | 99.2 | 66.7 |
| Zabaikalsky Krai | 125.3 | 96.3 | Republic of Tatarstan | 114.1 | 65.5 |
| Smolensk Oblast | 130.6 | 95 | Republic of Ingushetia (min) | 41.6 | 47.2 |

Note. In the RF as a whole – 81.5; the difference between the maximum and minimum values – 3 times.
Source: Federal State Statistics Service, 2000; Ministry of Health of the Russian Federation, 2014.

regions and reduce them to a single federal “standard”¹¹.

The implementation of these “optimization” measures has resulted in the rapid reduction of hospital stock. For example, in the Vologda Oblast in 2000–2013 the bed complement decreased by 30%. As a result, the bed population ratio was high in the region compared to the country as a whole for a long time; in 2009 it was equal to the federal rate.

This policy has led to the reduced availability of hospital beds; the territorial differentiation remained, but became more moderate. If in 2000 the difference in the bed population ratio between the richest and poorest regions (Chukotka

Autonomous Okrug and the Republic of Ingushetia) reached more than 4 times (without taking into account the then existing Koryak Autonomous Okrug, Evenk Autonomous Okrug and Taymyr Dolgano-Nenets Autonomous Okrug), in 2013 – 3 times. The most unfavorable situation was observed in the republics of the North Caucasus, where the healthcare system remained at a low level of development during this period (*tab. 4*).

It is interesting to note that in the North-Caucasian republics the executive authorities’ performance in the sphere of healthcare was evaluated as “effective” in accordance with the approved method due to the weak development of healthcare infrastructure [3].

There is the indicator that does not reveal significant differences between the RF subjects. It is a level of funding for palliative care, which is equally low in all regions of the country. This is a great

¹¹ The method was developed and approved by the Commission for Improvement of State Administration and Justice under the President of the Russian Federation to execute the decree of the RF President “On the assessment of Executive authorities’ performance in the subjects of the Russian Federation” of June 28, 2007, No. 825. Protocol No. 1 of July 18, 2007.

organizational and ethical problem of the Russian healthcare system. In Russia, as a rule, the patient with severe and incurable disease requiring regular medical supervision is discharged from the hospital to “follow up by place of residence”, i.e. to let him/her die at home. This problem is not being solved today. Despite the fact that in 2013 the Program of state guarantees for the first time established the average ratios of volume and cost per unit volume of palliative care provided in hospitals, their size is extremely small. In 2013 the actual volume of palliative care in hospital amounted to 0.035 bed-days per person, which is more than 2 times lower than the average standard set by the program (0.077 bed-days per person) [1]. The average cost of 1 bed-day for palliative care was by one third lower than the 2013 limited standard and amounted to 1,180.7 rubles. This medical care was not provided to citizens in 29 subjects of the Russian Federation.

Conclusion

The problems of territorial inequality are always complex. The article tries to reveal the scale and reasons of territorial differentiation in the provision of basic health resources on the basis of simple and accessible statistical information. Not all the possible and important aspects of the problem were discussed. Thus, it is necessary to analyze the role of the Federal Law No. 326 “On compulsory medical insurance” in the leveling of territorial imbalances in the availability of healthcare, the specificity and the efficiency of spatial distribution of healthcare networks, etc. However, this study has indicated acute problems of the

Russian healthcare system related to the uneven distribution of resources and objects of healthcare infrastructure in the country.

The analyzed facts should help draw the authorities’ attention to the financing gap in healthcare, which is exacerbated by the nonfulfillment of the RF subjects’ expenditure commitments to provide medical assistance. Even the officially approved expenditure level is not ensured by the necessary funds. In 2013 the programs of state guarantees were fully funded only in 25 RF subjects.

The RF subjects are characterized by the significant differentiation in the level of human resources and the development of the material and technological base, primarily hospital stock. Thus, among the RF subjects the difference in the availability of doctors reaches 3 times, of nursing staff – 2 times, hospital beds – 3 times. The restructure of hospital stock, aimed at optimizing and aligning the provision of inpatient care in the regions, has reduced the gap in the provision of public hospital beds at the expense of the significant reduction of inpatient care.

The given examples of territorial differentiation should not lead to the conclusion about the redundant financing of healthcare in the regions with the highest indices of costs and the overall provision of resources in healthcare. It is inappropriate, especially in the conditions of insufficient financing of the industry. It is important to pay attention to the regions-outside, where the provision of medical care is lower than should be according to the scarce federal standard.

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