

# Percolation clusters of territorial inequality due to the spread of the coronavirus infection

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**Abstract.** Due to the influence of the coronavirus infection, the issues of regional governance and territorial planning have been included in the urgent agenda of territorial development for two years in a row. Within the framework of this issue, a number of challenges of territorial administration are already being investigated. One of them is maintaining the achieved level of economic development and replenishing problematic aspects due to the spread of the coronavirus infection, which seriously affected all economic processes in 2020. The article reveals the management structure of Sverdlovsk region (Russia) and analyses the main socio-economic indicators of the region's development. The results of the analysis contribute to identifying the urgent problem of regional governance and territorial planning of Sverdlovsk region, i.e. the deepening inter-territorial inequality caused by an unfavourable epidemiological situation. The authors propose management solutions aimed at improving regional governance and territorial planning of Sverdlovsk region in the context of the identified problem.

**Keywords:** regional governance, territorial planning, effects of coronavirus, Sverdlovsk region, percolation clusters.

## 1 Introduction

Sverdlovsk oblast is one of the largest constituent entities of the Russian Federation, which is part of the Ural macroregion. The administrative centre of the oblast is the city of Ekaterinburg.

The regional governance structure includes government bodies such as the Legislative Assembly of Sverdlovsk Region, the Government of Sverdlovsk Region headed by the highest official of the RF constituent entity – the Governor of Sverdlovsk region, executive bodies of sectoral management – ministries, departments, administrations, as well as territorial intersectoral executive bodies – administrations of five administrative districts of Sverdlovsk region. In the context of the coronavirus infection, the authorities should pay particular attention to the territorial development.

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## 2 Literature review

As of January 1, 2020, there were 20,846 municipalities in Russia, and the population was 146,748,590 people [6]. They live in urban districts, rural and urban settlements, and cities. At the same time, a significant part of the Russian population live in cities. According to official data, the share of the urban population in Russia amount to 74.7% [6].

The methodological basis of the research includes the fundamental works of Russian and foreign scientists in the field of municipal administration. For example, Madyarova [4] claims that "territorial development is one of the most problematic spheres of governance". The development of territories during the COVID-19 pandemic showed that provision of urban amenities also matters, so Latypov and Plotnikov [3] write that "providing urban amenities is an area where the subject and limits of municipal-legal regulation are the most vague in terms of the activities aimed at implementing a set of specific measures". Peshin [7] argues that "the main problem of housing and communal services and gentrification, in particular, is local monopoly, that is a lack of competition in the area under consideration". In the course of the research, we also used the proceedings of scientific-practical conferences, as well as normative regulatory acts of the Russian Federation and Sverdlovsk oblast.

Studies on COVID-19 in Central and Eastern Europe [14-19], see for instance the study of Duncan Light on COVID-19 in Romania and how transnational labour had to suffer due to coronavirus [14] and many other examples for Eastern Europe in a special issue dedicated to coronavirus launched by journal Eurasian Geography and Economics in the end of year 2020. So, Richard Connolly, et al. [16] investigate energy-related deformations in the development of Russian territories during a pandemic, and Danika Shantic [17] investigate the management of migration processes during quarantine in Serbia, Robert Krzysztofik [18] showed the peculiarities of spatial and functional changes in connection with the COVID-19 epidemic in Poland, Piotr Kourzhil [19] territorial differences in development depending on the "severity" of quarantine in the Czech Republic.

## 3 Materials and Methods

We analyzed the main indicators of the socio-economic development of Sverdlovsk region for 2016-2020 in the context of the indicators presented by the regional statistics body in late May, 2021. The study of the emerging trends allowed drawing preliminary conclusions about the need for extra attention to the factors that created negative trends during the development of the region under the COVID-19 spread.

## 4 Results

The study of statistical data makes it possible to single out the main socio-economic indicators of Sverdlovsk region's development (Table 1) [6, 10].

**Table 1.** The main socio-economic indicators of the development of Sverdlovsk region.

Indicator	2016	2017	2018	2019	2020	Deviation 2020/2016, %
GRP, million rubles	1990837	2 130910	2277576	2500000	2330000	117.04
GRP per capita, rubles	459812	492434	527159	558500	541000	117.66
Volume of investments in fixed assets of the region, billion rubles	376,4	337,8	367,8	450,4	381,127	101.26
Number of legal entities and sole proprietors covered by the Unified Register of Small and	199 531	203 059	202 425	202 101	193 555	97.00

<b>Indicator</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>Deviation 2020/2016, %</b>
Medium-Sized Enterprises in Sverdlovsk region [11]						
Companies' turnover, billion rubles	5432.6	4221.2	4812.4	5763.7	5932.2	109.20
Industrial production index (in % to the previous year)	107.0	103.1	109.0	101.7	102.3	95.61
Retail trade turnover, billion rubles	1054.2	1078.2	1130.7	1196.9	1117.6	106.01
Volume of paid services to the population, billion rubles	331.9	347.8	369.5	407.4	324.3	97.71
Agricultural products, billion rubles	76.5	77.7	82.5	85.6	81.7	106.80
Total labor force, thousand people	2230.1	2179.1	2149.1	2124.5	2109.1	94.57
Employed, thousand people	2092.4	2059.8	2046.1	2035.1	1986.9	94.96
Unemployed, thousand people	137.7	119.2	103.0	89.4	122.2	88.74
Average nominal monthly accrued wage of one employee, rubles	32036	33640.4	36729	39994	42144	131.55
Population total	4330006	4329341	4325256	4315699	4310681	99.55
Male population	1986567	1986069	1984167	1980351	1979942	99.67
Female population	2343439	2343272	2341089	2335348	2330739	99.46
Population under the working age (0–15 years)	806507	827782	841741	849064	850470	105.45
Working-age population (men aged 16–60, women aged 16–55)	2438394	2400067	2367093	2337774	2375450	97.42
Population above the working age (men aged 61 or above, women aged 56 or above)	1085105	1 101492	1116422	1128861	1084761	99.97
Number of births	59840	53386	50254	46039		
Number of deaths	60831	57685	58511	57392		
Population increase/decrease	-991	-4299	-8257	-11353		

Analysis of the data presented for the last 5 years in the context of the enlarged groups of industries allows us to arrive at the following conclusions:

- The decrease in GRP in 2020 was due to the unfavorable epidemiological situation in the Russian Federation and in the world as a whole, which seriously affected all economic processes;
- The flow of investments in the region is steadily increasing, and various measures are being implemented to support small and medium-sized businesses, which meets the current trends in the development of the regional economy in the Russian Federation;
- During the period under review, several economic indicators showed a stable increase followed by a decline in 2020, which was logical due to the coronavirus spread;
- The region is characterized by all-Russian demographic and employment problems and trends, such as the population decline, a strong rise in the working-age population due to the increase in the retirement age, a fall in the number of both men and women employed in the economy, as well as an increase in the number of the unemployed, especially among the male population.

Thus, the conclusions obtained in the course of the analysis become the basis for identifying the urgent problem of regional governance and territorial planning of Sverdlovsk region, i.e. the deepening inter-territorial inequality caused by the spread of the coronavirus infection.

## 5 Discussion

The spread of COVID-19 in the Ural macroregion and Sverdlovsk oblast, in particular, has given rise to such an administration problem as the unpreparedness of public authorities to eliminate negative economic consequences of an unfavorable epidemiological situation in the long term [12]. The danger of delay and failure to implement long-term planning in an effort to solve the arising problems of economic development by methods of short-term planning can lead to Sverdlovsk region losing its status of a stable non-subsidized subject of the Russian Federation with a dynamically developing economy [8, 13].

As a result, a draft solution to this problem should be developed. Within the framework of the project, it is necessary to identify the parties in charge of the event, the list of required resources, as well as to establish the approximate timing and the socio-economic efficiency of the activities implemented (Table 2).

**Table 2.** Draft solution to the problem of the deepening of territorial inequality.

No.	Action	Contractor	Resources required	Time frame	Forecast effect
1	Measures aimed at optimizing the tax burden on medium-sized and large businesses (investment tax credits, tax preferences for participants in priority investment projects) when implementing investment projects	Government of Sverdlovsk region, Ministry of Finance of Sverdlovsk region	Financial, legal, organizational, managerial and information resources	2021-2022	<ol style="list-style-type: none"> <li>1. Formation of an investment-attractive image of Sverdlovsk region;</li> <li>2. Introduction of project management when implementing organizational measures;</li> <li>3. Promoting business activity in the region by developing competition in socially significant and priority markets</li> </ol>
2	Providing subsidies from the regional budget to the budgets of municipalities in Sverdlovsk region to co-finance municipal programs (subprograms) aimed at developing small and medium-sized businesses	Government of Sverdlovsk region, local authorities of municipalities located in Sverdlovsk region	Financial, legal, organizational, managerial and information resources, entrepreneurial abilities of the population	2021-2022	<ol style="list-style-type: none"> <li>1. Reducing tension in the labor market and creating conditions for self-employment;</li> <li>2. Increasing the share of the employed in small and medium-sized businesses</li> </ol>
3	Creation of state or municipal industrial parks (technoparks) for small and medium-sized businesses	Government of Sverdlovsk region, Ministry of Investment and Development of Sverdlovsk region	Financial, legal, organizational, managerial, land and information resources, property, entrepreneurial abilities of the population	2021-2025	Creation of at least 10 industrial parks (technoparks) of various ownership forms and territories of advanced socio-economic development
4	Development of a system of cooperation between subjects of industrial, scientific, educational activities, as well as small and medium-sized businesses	Government of Sverdlovsk region, Ministry of Investment and Development of Sverdlovsk region, Ministry	Financial, production, technical, legal, organizational, managerial and information resources, entrepreneurial	2021-2023	Stimulating industrial complex organizations located in Sverdlovsk region to develop a system of continuous vocational education and improve the quality of training for workers in

No.	Action	Contractor	Resources required	Time frame	Forecast effect
		of Education and Youth Policy of Sverdlovsk region, Ministry of Industry and Science of Sverdlovsk region	abilities of the population		engineering and technical specialties, including through the successful activities of universities in the territories of partner enterprises, educational and production complexes, laboratories, centres of applied qualifications, implementing educational programs for training specialists in mechanical engineering, metallurgy and energy enterprises, targeted training of workers
5	Measures aimed at promoting industrial products to interregional markets	Government of Sverdlovsk region, Ministry of Investment and Development of Sverdlovsk region, Ministry of Industry and Science of Sverdlovsk region	Financial, production, technical, legal, organizational, managerial and information resources, entrepreneurial abilities of the population	2021-2022	Increasing the number of markets for selling products, improving interregional ties of Sverdlovsk region with other regions of the Russian Federation
6	Strengthening the material and technical base of social service organizations	Government of Sverdlovsk region, Ministry of Social Policy of Sverdlovsk region	Financial, production, technical, legal, organizational, managerial and information resources, and property	2021-2022	Increase in the share of social service organizations in satisfactory condition in the total number of such organizations
7	Measures aimed at promoting industrial products with export potential	Government of Sverdlovsk region, Ministry of Investment and Development of Sverdlovsk region, Ministry of Industry and Science of Sverdlovsk region	Financial, production, technical, legal, organizational, managerial and information resources, entrepreneurial abilities of the population	2021-2022	Increase in the number of markets for selling products and the number of business partners of Sverdlovsk region

We believe that optimization of the tax burden on businesses when they implement investment projects can have a positive effect on the development of territories [1, 4]. In turn, subsidies provided to the local budgets by the regional budget to support entrepreneurs can serve as the basis for their sustainable development and strengthening the competitiveness of the territory [2].

The development of industrial parks should be the primary avenue in this field [1, 4, 12]. All of the above areas of development will give sustainable results while strengthening the trend in the sale of products from the territories outside the region.

## 6 Conclusion

The proposed measures will create positive dynamics in the activities of regional governance structures, as well as lead to positive shifts in the development of Sverdlovsk region's territorial potential in the context of the COVID-19 pandemic, which will eliminate the imbalance in the interregional cooperation between the Ural macroregion's subjects and other constituent entities of the Russian Federation [5, 9]. Territorial inequality is noticeable and during the period preceding the pandemic it increased significantly [6, 9] inequality markers also clearly shifted. So industrial territories turned out to be the most stable in comparison with infrastructural ones, similar trends are also observed in European countries [14-19].

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