

Deformation of Social Constraints in the Context of the Coronavirus Crisis on the Example of Industrial Regions

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Abstract: The consequences of the covid-19 coronavirus crisis, in many cases, become decisive for adjusting the prospects for socio-economic development. The social limitations of the coronavirus crisis in terms of efficiency differ significantly by region. Regional differences predetermine many prerequisites for incomplete or ineffective fulfillment of part of social restrictions, their deformation. The main points of the study are devoted to two directions of analysis of deformations and loss of performance of social constraints in lockdown. The first is to analyze the influence of the region's employment structure on lockdown restrictions. The second is to analyze the influence of the regional specifics of the social space on the effectiveness of the lockdown. Within the framework of the analysis, a number of problematic issues of the methodology for analyzing unstable processes and assessing the comparative effectiveness of "hard" social restrictions (lockdown) are considered on the example of large industrial regions of the Urals. The study is aimed at adapting the practice of solving the problems of coronary crisis to regional conditions.

1 INTRODUCTION

The patterns of the spread of covid-19 across territories inevitably differ. Numerous social features are characteristic of most regions and countries. The totality of factors that determine the intensity of contacts on the territory is reflected in the specifics of the social space.

Obviously, the spatial distribution of covid-19 differs markedly across territories (Kashnitsky, 2020), and the social factors determining the spread of the pandemic are diverse (the medical and epidemiological aspects of the pandemic are extraterritorial and largely uniform). Social factors include: the size and density of the population, the degree of isolation of territories and social groups, the intensity of interregional and international communications, population mobility and migration processes, the economic specialization of the territory and the structure of employment, cultural traditions, lifestyle and communication, the organization of public spaces and much more.

The social aspect of the coronavirus crisis requires separate consideration. The variety and difference of social factors cause significant differences in the dynamics of the spread of corona crisis across territories. The range of various restrictive measures during the coronavirus crisis is also very wide: from recommendations on keeping a distance in public places to "hard" forms of lockdown. The social space for each territory is unique. Its specificity significantly affects the effectiveness of restrictive measures. It is obvious that the use of general template measures without taking into account the specifics of the social space will give a significant difference in the results across territories.

Further, the results of the analysis of the specifics of regional socio-economic processes in the context of corona crisis are considered. The features of the development of social processes of corona crisis in the context of a lockdown are further considered on the example of the leading regions of Russia with a high concentration of the urban population.

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2 RESEARCH METHODOLOGY

The unpredictable dynamism of the crown crisis significantly complicates the formalization of various socio-economic processes. The crisis aspect of a pandemic, with obvious unpredictability, is becoming a classic version of the "black swan" (Taleb, 2010). In such conditions, the construction of a single universal holistic model of the transformation of social space is practically unrealistic. In these cases, it is more expedient to consider the system of local models of the most significant processes. It is also necessary to update a number of methodological foundations of the system analysis of the development of regional social processes.

Studies of the dynamics of the coronavirus crisis made it possible to determine a number of methodological provisions for the regional adaptation of general measures to combat the coronavirus crisis (Gordeev, 2020). Variability and limited formalization make classical approaches of systems analysis hardly applicable in the context of coronavirus crisis. The adaptation of the methodological foundations of systems analysis to consider complex, dynamic, changeable systems becomes interdisciplinary. Research in such conditions is inevitably associated with "soft systems methodology" (Checkland, 2000). The adaptability of this methodology makes it possible to introduce refinements directly into the process of research and search for solutions.

A special place here is occupied by specialized information-adapted approaches related to the visualization and analysis of combined graphical and digital information (Neytan, 2013; Gray, 2020). Such adapted approaches provide a combination of heuristic methods of analysis, the study of graphics and the formalized mathematical apparatus of assessments. The advantages of such approaches in the study of complex processes of spatial transformations are obvious (Gordeev, 2021).

In studies of social processes in corona crisis, a special place is occupied by the problem of their dependence on the trajectory of previous development (known as "Path Dependence") (Auzan, 2015). The range of issues considered within the framework of Path Dependence is extremely diverse (Rastvortseva, 2018). These include the presence of many sociocultural traditions that determine the intensity of contacts between people (large number of families, traditions of communication between relatives, frequency and scale of feasts, etc.).

"Path Dependence" also includes some management specific issues (for example, when the

severity of the declared measures is discounted by the non-obligation of their implementation). Deformation, as an unpredictable change in social constraints, in this case is one of the forms of transformation of the regional social space. The study of such a dynamic situation is associated with the analysis of "short" trajectories and change points of trends in unstable socio-economic dynamics.

The considered areas of research are related to the analysis of the transformation of the regional social space corona crisis. Further, regional features are considered that are of particular importance in the coronavirus crisis. The first features are determined by the structure of employment in the region. Other features are reflected in the inherited stereotypes of society's behavior, which significantly change the effectiveness of the effectiveness of social restrictions in the event of a lockdown. Updating the methodology and analysis tools open up new opportunities in the study of regional characteristics, which are essential for the deformation of social constraints into lockdown.

3 DISCUSSION

The regional structure of employment and the spatial system of settlement with the traditions of society largely determine the deformation and effectiveness of social restrictions.

3.1 The Influence of the Industry Structure of Employment on the Effectiveness of Social Constraints

The possibilities of introducing and the effectiveness of social restrictions by territories are largely limited by the structure of employment. The effectiveness of any social restrictions is determined by the degree of coverage of the population of the territory. However, to ensure life, it is necessary to continue the work of a number of infrastructure areas and a number of enterprises and organizations of a continuous cycle (hereinafter also referred to as life support). The existence of the sphere of life support inevitably presupposes a significant number of residents "falling out" of isolation at any lockdown.

It is obvious that a large number of workers in the field of life support, their uneven distribution creates the preconditions for the concentration of people at certain production and social facilities, which inevitably reduces the effectiveness of social restrictions. The number of workers in the field of life

support is determined by the socio-economic specifics and can vary significantly across territories. Taking into account the factor of the working population excluded from isolation is an important element of organizing social restrictions and spatial transformations.

The structure of employment varies significantly across regions. The employment structure of the city of Moscow, as an informal leader in initiating social restrictions and administrative reforms in Russia, differs markedly from a similar structure in other regions. These regions include the Chelyabinsk Region, one of the leading industrial territories of the Urals.

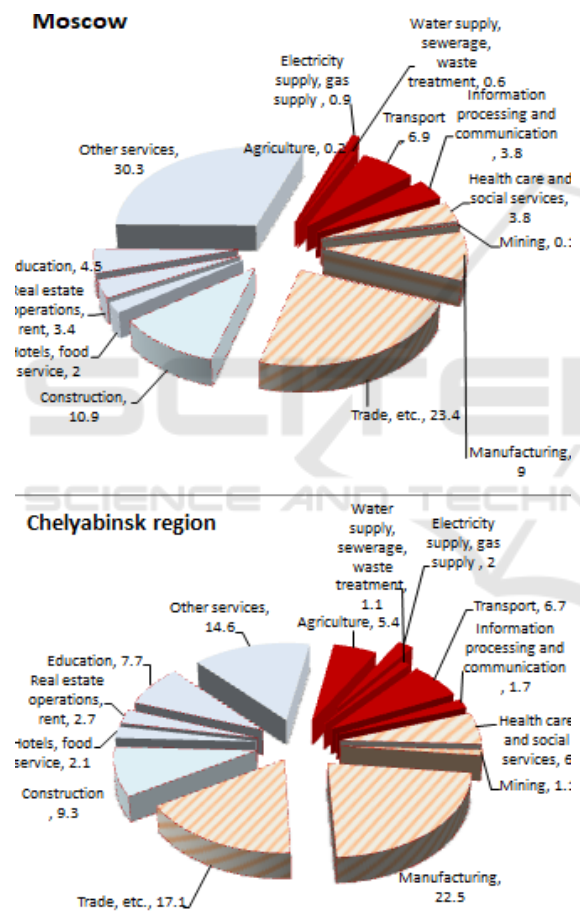


Figure 1: Distribution of the number of employees by industry, in Moscow and the Chelyabinsk region (% of total employment).

In the diagrams of the structure of employment (Figure 1), the shares of workers by industry are ranked according to three categories of importance for livelihoods (from the largest with dark red shading, to the least with light blue shading). Obviously, the presented structures of the number of

employed in the city of Moscow and the Chelyabinsk region differ significantly. (See Rosstat RF. Regions of Russia. URL: <https://rosstat.gov.ru/folder/210/document/13205>). These differences reflect a significant difference in the proportion of life-support workers falling out of isolation.

3.2 Influence of the Specifics of Social Space on the Effectiveness of Lockdown Restrictions

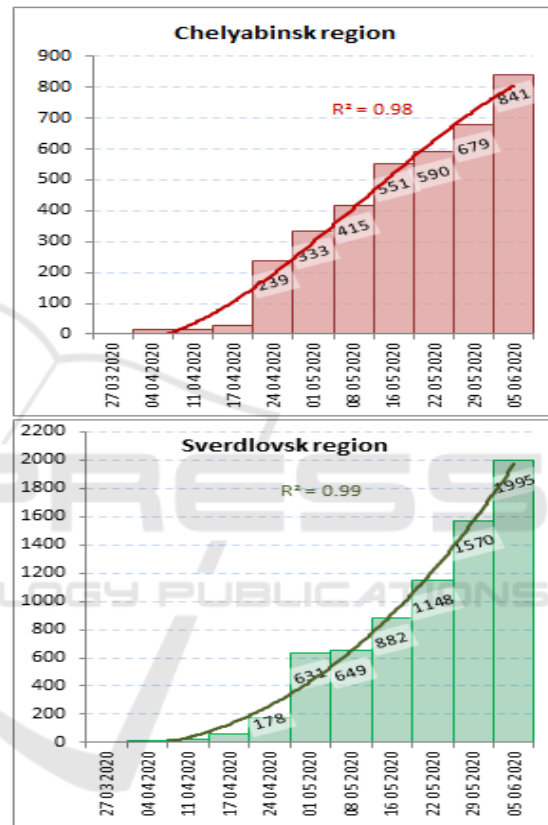


Figure 2: Dynamics of weekly increase in detected infections (people) and approximation of a nonlinear trend, Chelyabinsk and Sverdlovsk regions.

The effectiveness of various social restrictions (from the simplest to a complete lockdown) can vary significantly due to the characteristics of the reaction of society. For the effectiveness of social restrictions, the specificity of social space is of particular importance, which is associated with the possibility of reducing the number of contacts between people with the threat of infection. This possibility depends on many factors of previous development. Among them are difficult to assess: the nature of social communications, features of the psychology of social behavior, etc.

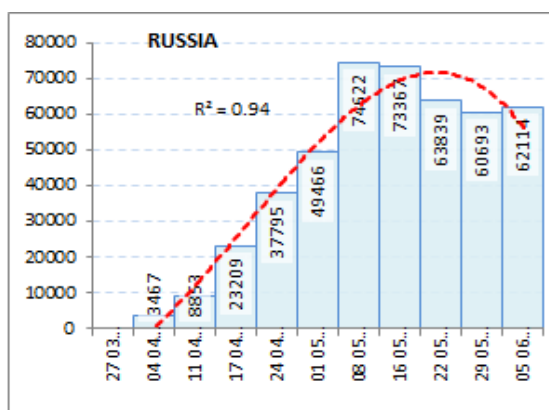


Figure 3: Dynamics of weekly increase in detected infections (people) and approximation of a nonlinear trend, Russia.

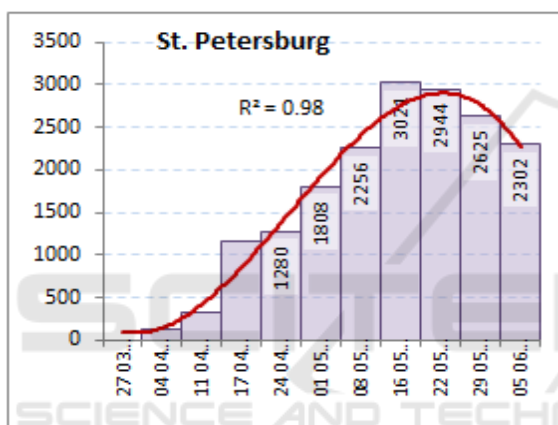


Figure 4: Dynamics of weekly increase in detected infections (people) and approximation of a nonlinear trend, St. Petersburg.

Regional specificity inevitably affects the dynamics of morbidity after the introduction of social restrictions. A similar situation is shown by the results of the analysis of the dynamics of the number of infections in the regions of Russia after the introduction of the lockdown in early April 2020 (Gordeev, 2020). The analysis was based on information from official reporting materials. These are data on monitoring the current situation in the regions of the Communication Center of the Government of the Russian Federation on the situation with coronavirus (by the number of detected infections, weekly). The initial initial period of 2020, when all cases of disease were detected, can be considered representative. The impact of systematic reporting errors and misstatements, the traditional factor of "crafty figure" (Khanin 2018) in this case is minimal.

Analysis of the dynamics of the number of infected in the regions of Russia during the period of the first lockdown - "isolation" (April - May 2020) shows that the specificity of the social space of the territories significantly changes the dynamics of the spread of coronavirus. This explains the relatively low effectiveness of social restrictions in the most "severe" lockdown scenarios in some territories. Such territories include the Sverdlovsk and Chelyabinsk regions. Strict restrictions (the right to leave the place of residence only for a specific list of essential reasons) in these regions did not ensure a quick change in the situation.

In Figure 2. The general characteristics of the dynamics of the detected infections in the Sverdlovsk and Chelyabinsk regions (in the conditions of "severe" social restrictions) are presented. Including:

- weekly increase in detected infections (people);
- nonlinear trend of the weekly increase in the number of infections (marked with a solid line) with an estimate of the approximation accuracy R.

The presented dynamics reflects only a slight slowdown in growth towards the end of the period under review in the Chelyabinsk region. The dynamics of the Sverdlovsk region is even worse. It is noticeably inferior to the dynamics in Russia (Figure 3) where a reversal to a decline is noticeable in the trajectory. The dynamics of St. Petersburg looks even more preferable (Figure 4). Although in this region there was a "milder" lockdown regime. Strict restrictions were introduced only for certain risk groups (age groups, those with chronic diseases, etc.).

Obviously, with the introduction of severe lockdown restrictions in a number of regions, the deformation of the social space will be significant. Inevitably, places of disproportionately high (excessive) concentration of people in the social space and "risk groups" of people who have visited such places of congestion are formed. As a result, the minimization of the number of contacts is not ensured and the goal of quickly changing the situation is not achieved. At the same time, the negative consequences of social restrictions are significant.

Accurate numerical estimates of direct and indirect damage to the consequences of irrationally "hard" restrictions are practically indefinable. However, they are reflected indirectly in the change in the quality of life. The results of a sociological survey of the Chelyabinsk branch of the RANEPА (Figure 5) indicate a noticeable deterioration in the quality of life of almost half of the population of the Chelyabinsk region even before the expiration of the lockdown from April to May 2020.

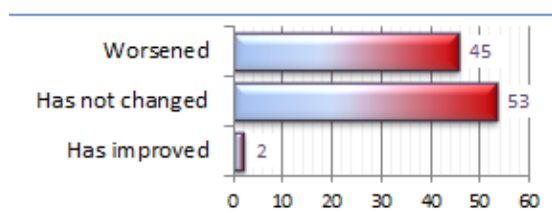


Figure 5: The results of the answer to the question "How has your financial situation changed over the two quarantine months?", residents of the Chelyabinsk region in May 2020.

4 CONCLUSIONS

In the general case, social restrictions, other things being equal, should contribute to a significant improvement in the situation with the spread of the disease. However, the real picture in the regions may be different.

When social restrictions are introduced, in a number of cases, problems of significant deformation (unpredictable and "undesirable" transformation) of social space inevitably arise. The following are observed: a temporary excessive concentration of people in certain places, an uneven redistribution of the load in the sphere of life support, an uneven contraction of markets and a temporary "shortage" of goods and services, as well as many other negative consequences.

The inertia of previous development ("Path Dependence") is inevitably reflected in the implementation of many social constraints. Inherited livelihood traditions, combined with different local characteristics, can significantly alter the performance of many social constraints. In some cases, the consequences of large-scale unbalanced, irrational social constraints only contribute to the spread of infection.

The problems of formally imposed restrictions and managerial stereotypes are especially problematic in the context of "hard" lockdown restrictions and uncontrolled deformation of the social space. In contrast, regions with milder restrictions have greater opportunities for socio-economic spatial transformations and significantly lower losses for the quality of life.

The studies carried out make it possible to form the basis for considering many interdisciplinary issues related to socio-economic development in the context of the coronavirus crisis. A separate place is occupied by further studies of the previously raised issues. the relationship between social constraints and spatial transformations.

In the context of local specifics, adaptable regional practices and approaches to solving the problems of coronavirus crisis will be more effective than standard ones. In the existing conditions of heterogeneity and low predictability of many socio-economic processes, new problems of "post-coronavirus reality" are inevitable. They are superimposed on previous problems of socio-economic development (problems of low growth of the "new normal" (Silin 2016)).

When "new waves" of a pandemic emerge, the presented research results create the basis for more correct assessments in the preparation of management decisions. They help to minimize socio-economic losses and create prerequisites for the growth of the effectiveness of social constraints. The way out of the coronavirus crisis will be more effective with a differentiated approach, both at the regional and municipal levels.

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REFERENCES

- Auzan, A., 2015. The effect of the Path Dependence. The problem of dependence on the trajectory of the previous development of the evolution of hypotheses, *Bulletin of Moscow University, Series 6: Economics*, 1, pp.3–17.
- Checkland, P., 2000. Soft Systems Methodology: A Thirty Year Retrospective, *Systems Research and Behavioral Science*, 17, pp. 11–58.
- Gordeev, S., 2020. Limitations and transformations in the social space of coronacrisis: assessments of regions during the COVID-19 pandemic, *Socium and Power*, (85), pp. 32-50.
- Gordeev, S., 2021. Visualization of the regional migration dynamic and change of models of sustainable development, *Ural Environmental Science Forum "Sustainable Development of Industrial Region"*, *E3S Web of Conferences*, 258, 12002.
- Kashnitsky, I., Aburto, J., 2020. *COVID-19 in unequally ageing European regions*, OSF Preprint.
- Khanin, G., 2018. Sly number: 30 years later, *Ideas and ideals*, No. 2, 1. pp. 139-163.
- Gray, J., Bounegru, L., Milan S., Ciuccarelli, P., 2017. *Ways of seeing data: towards a critical literacy for data visualizations as research objects and research devices*,

Innovative Methods in Media and Communication Research. London, U. K.: Palgrave Macmillan, pp. 227-252.

Neytan, Y., 2013. *Iskusstvo vizualizatsii v biznese*, Moscow, Mann, Ivanov i Ferber, 352 p.

Rastvortseva, S., 2018. Theoretical aspects of the possibility of leaving the region's economy from the trajectory of previous development, *Journal of Economic Theory*, T. 15, No. 4, pp. 633-642.

Silin, Y., Animitsa, Ye., Novikova, N., 2016. New Normal in Russian Economy: Regional Specificity, *Economy of Region*, vol. 12, No. 3, pp. 714—725.

Taleb, N., 2010. *The Black Swan. The Impact of Highly Improbable*, Penguin Books Ltd., 446 p.

