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REGIONAL SOCIAL INFRASTRUCTURE MANAGEMENT IN THE SYSTEM OF TOOLS USED FOR IMPROVING THE QUALITY OF LIFE FOR REGIONAL POPULATION¹

This paper analyzes the processes in the social sphere and the performance of operating the social infrastructure to improve the population's quality of life in the Russian regions. Particular attention has been paid to the role of organizational and administrative components, which include the regulation of social infrastructure institutions, planning, and programming that affect the performance of infrastructure facilities utilization. The goal of this study was to evaluate the effectiveness of social infrastructure management through the congruence of immediate results (dynamics of indicators for social services) and final results (parameters of the population's quality of life). The working hypothesis of the study was a breach of infrasystemic principle in the infrastructural support for improving the population's quality of life in the constituent entities of the Russian Federation because of the insufficient effectiveness of public administration. The work on this paper involved using a set of methodological approaches, such as structured, factorial, systemic, and evolutionary approaches, to substantiate the conceptual framework, prepare the method-based approaches, and determine the impact made by the changes in the parameters of social infrastructure facilities on provided services and shifts in the indicators of the population's quality of life. The paper proposes a method-based approach to quantifying the effectiveness of organizational and administrative components by using the diagnostics of sufficiency in the implementation of infrasystemic principle for the operation of social infrastructure based on elasticity coefficients. The proposed approach and analytical data obtained in the areas, such as health care, education, trade, housing & utilities, culture & sport, allowed ranking the regions of the Ural Federal District and identifying the areas of insufficient effectiveness in the organizational and administrative mechanism used for improving the population's quality of life as the basis for developing practical recommendations for the executive branch of constituent entities of the Russian Federation and adjustment of socioeconomic policies.

Keywords: quality of life, organizational and administrative components of regional social infrastructure, infrasystemic principle

The focus of the economy of the Russian Federation and its regions on strengthening the social orientation requires studying the condition and development of interrelated processes in the social area, such as improving the level and performance of the infrastructure operation and the population's quality of life. The constituent entities of the Russian Federation differ by their objective characteristics (natural resources, climate, and geographic location) that virtually cannot be changed in the short term, which preserves the conditions for heterogeneity of Russian economic space. At the same time, a more active use of regional management capacity, including in the area of social infrastructure (in all variety of its sectoral forms, such as health care, education, culture, sport, and other infrastructure), allows improving the level of social services, public wellbeing, and social stability of the regions even in the short-term period.

In the absence of radical shifts at the level of development and reduction of social space differentiation, the appearance of many publications and developed approaches to the classification of constituent entities of the Russian Federation in terms of their provision with the social infrastructure

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facilities, availability of social services, living conditions of the people indicate that some relationships have not been the subject of necessary theoretical study. This is also confirmed by the facts of declining satisfaction of the people's needs and quality of life [1-6].

The differences in interpretations of basic concepts on the considered issue required some clarification of terminology. The analysis of publications containing such concepts as the "social infrastructure" ("property set and specific activities" [7], "sectors of the economy, scientific and technical knowledge, services" [8], "material and technical base used to create the conditions for the public production" by taking into account the factor of need satisfaction [9], the aggregate of conditions and facilities (indivisible, having external effects, not subordinated to market mechanism),² "unity of facilities, systems, and institutions required for the life of population" [1], "facilities and services that help satisfy the needs"[10]), allowed concluding that social infrastructure is defined in many different ways: by its structural elements, objectives, and operation outcomes. These differences can be explained by the use of different methodological approaches.

Methodology of Study

In our view, the content of social infrastructure should be considered based on a set of the following methodological approaches: 1) structural, 2) factorial, 3) systemic, and 4) evolutionary. In accordance with the first approach, the social infrastructure is considered as a complex phenomenon of geographically localized economic system that includes the following components: material and physical (infrastructure), institutional (structural units, such as the institutions and organizations of different forms of ownership that adopt the economic decisions within their competence in the areas of utilizing the facilities to deliver the social services), organizational and administrative (an aggregate of public administrations involved in planning, regulating, monitoring, developing the rules, regulations, and procedures of institutions). The availability of organizational and administrative components is determined by the predominance of primarily state and municipal legal forms of ownership, dominance of nonmarket relations, and broad positive external effect on population during the consumption of social services.

The use of factorial methodological approach allows substantiating the terms for reproduction and preservation of the regional social infrastructure integrity [11]. In this case, the type of social infrastructure reproduction (expanded, narrowed) is determined by the complementarity of components—that is, by their alignment in terms of development, complexity, dynamics, etc. (material and technical components, human resources and institutions ensuring the delivery of social services, institutional rules and regulations, efficiency of organization and management, etc.), when any incongruities between these components affect the degree of achieving such targets as the adequate quality of life for the population in the Russian Federation.

In terms of systemic methodological approach, the social infrastructure of constituent entities of the Russian Federation is an element of regional economic system, and on the one hand, it is determined by established territorial living conditions, reproduction of labor force, personal development, etc., while on the other hand, it affects the quality of life in the regions through increased availability and range of social services, expansion of entrepreneurial activities, investments in the social sphere. The socioeconomic implications of changes in the social infrastructure of the territory are manifested in the multiplying effect (multiplying the positive or reinforcing the negative trends) causing the growth (or decline) of GRP, per capita income, availability of social spending, spatial differentiation in the living standards of population [12]. As demonstrated by the practice of developed countries, there is a positive correlation between GDP per capita and availability of social benefits, share of budget expenditures invested in the social sphere and level of differentiation among the population [13]. At the same time, the growth (or deterioration) in the quality of life improves (or weakens) the requirements of population to the condition of social infrastructure and quality of social services and, accordingly, expands (or narrows) the reproduction base of human potential.

According to the evolutionary methodological approach, the development of social infrastructure in the Russian Federation is influenced by the established "development trajectory" inherited from the administrative system, which is manifested in the duality of processes: 1) persistence of "residual" financing scheme for material and technical base of social infrastructure; 2) active market reforming

² Criticism of Modern Bourgeois Theories of Finance, Money, and Credit. Edited by G. P. Solyus. Moscow: Finansy, 1978 [electronic resource, in Russian] <http://www.kredit-moskva.ru/kritika.html> (date of access: 3/16/2015).

of the institution system (optimization of budgetary institution network) and the mechanism of public administration (transition to program- and target-based approach and budgeting for results).

The aggregate of these methodological approaches and their practical importance require that the mechanism used for the management of social infrastructure in the regions comply with the infrasystemic principle [14]. The latter can be defined as follows: all components of the regional social infrastructure (structured approach) should operate in accordance with the principle of "mutual gravitation," reinforcement of their congruence (factorial approach) in terms of development, efficiency, degree of complexity, etc. (systematic and evolutionary approaches). According to this principle, if any component stagnates (or leaves the others behind in terms of development), this creates an imbalance, which is more often manifested as a restriction in the development of all other components (more rarely, it is seen as a stimulus of internal growth by pulling ahead the others). The infrasystemacy is breached in case of inconsistency between the material & physical, institutional, and organizational & administrative components. In this case, the latter serves as the most real condition for quantitative and qualitative changes in the operation of social infrastructure and implementation of its existing capacity in the present time. Such focus is confirmed by the fact that the economic publications point out to the imperfections in the planning of public sector institutions, government programs, opacity and delay in monitoring the activities of government authorities (including the satisfaction of people with the services) as causes of dissatisfaction with the operation of social infrastructure [2].

The organizational and administrative components of the regional social infrastructure ensure the effectiveness of institutions and availability of social services (provided with infrastructure facilities); however, this is only the immediate result. We can talk about the broad external effect that, in our view, is that the end result represents the impact on improving the quality of life of the regional population. This is confirmed by the fact that the government agencies determine the hierarchy of objectives and activity areas of state institutions, rules and regulations established for operation of social infrastructure institutions, ensure the rationalization of budgetary flows, monitor and evaluate the achievement of indicative targets, and accordingly, the effectiveness of execution determines the shifts in the quality of population's life in the constituent entities of the Russian Federation.

The diversity of views on the concept of the "quality of life" required that the authors clarify their understanding of this term. In our opinion, the quality of life is an aggregate of objective and subjective conditions for the existence and development of personality (reproduction potential, living

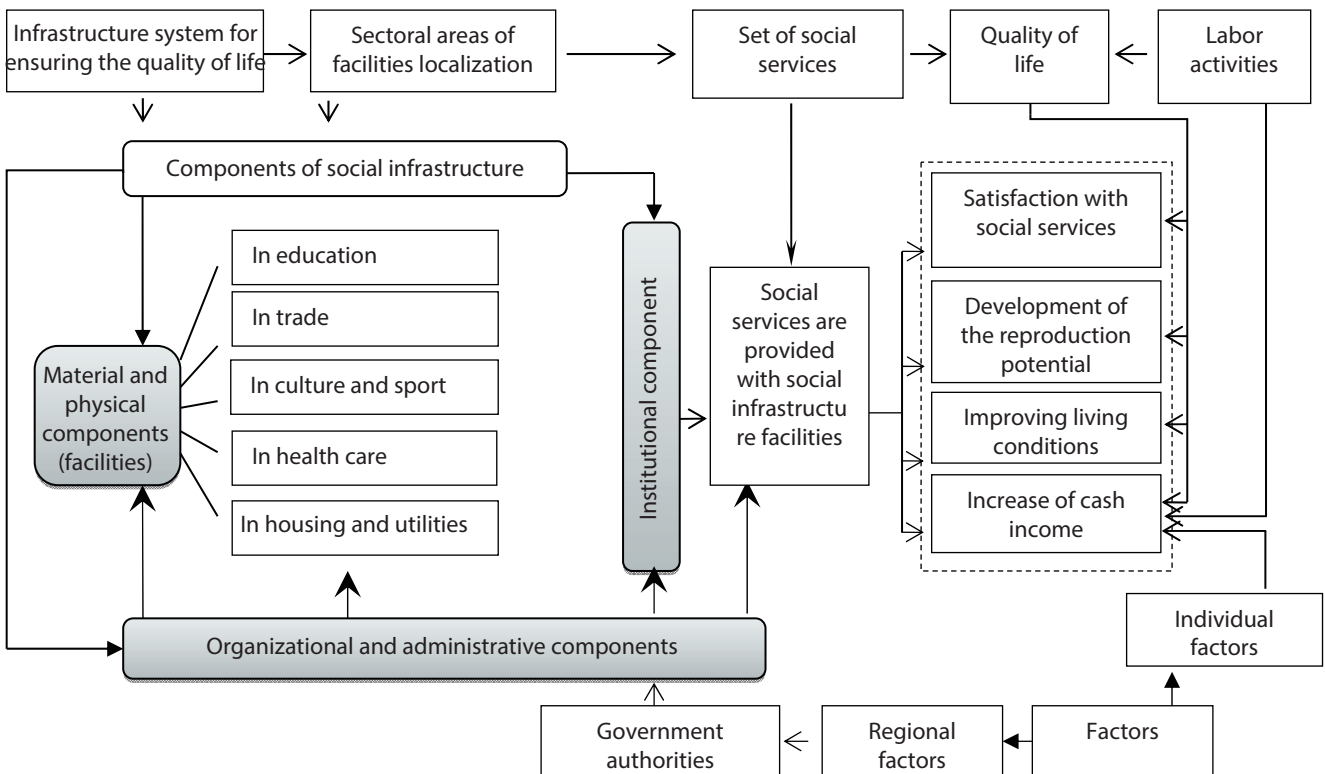


Fig. 1. Transmission relationships in the influence of social infrastructure on the regional population's quality of life

conditions, level of income, and satisfaction with consumption of social benefits). The diversity of such conditions required selecting and focusing on a definitely limited range of issues and abstracting from other problems (such as the employment, environment, and crime), which are no less important. Moreover, in the context of the subject matter of this study, we considered the fact that the social infrastructure does not directly affect the cash income of the population (this is affected to a larger extent by the employment infrastructure), and therefore, our further analysis is not focused on the issues of income [12]. The main emphasis is made on living conditions and reproduction of the labor force, the satisfaction of needs [15].

For the aggregated analysis of the impact made by the social infrastructures on the quality of life in the regions, we use the concept of "system of infrastructural support for improving the quality of life" of constituent entities of the Russian Federation as a set of interrelated and mutually reinforcing elements: regional social infrastructure, social services created on its basis, the availability of which affects the improvement of the living conditions, reproduction potential, income, and satisfaction of the regional population (i.e., the parameters of the population's quality of life). We analyzed the following sectors: education, trade, culture & sport, health care, and housing & utilities; while some other important components of the infrastructure, such as domestic service, transport, and communication, were not included in the analysis. Accordingly, these elements represent the links of "transmission chain" in the system of infrastructural support for improving the quality of life, which is shown in Fig. 1.

Methods for Evaluating the Organizational and Administrative Components of Regional Social Infrastructure

The working hypothesis of this study is that a breach of infrasytemacy in the operation of the system of infrastructural support for improving the quality of life in the regions results from the ineffectiveness of organizational and administrative components. In this context, we introduce the interpretation of the effectiveness (since it is difficult to directly measure the results of organizational and administrative components). The effectiveness is achieved when there is an elastic response from changes in the indicators that describe the blocks (links of the common transmission chain)—such as "Facilities—Services" of the social infrastructure and "Services—Population's Quality of Life"—in the general system of infrastructural support for improving the population's quality of life (as a predominant growth in the parameters of the next link compared to the changes in the parameters of the previous link). While understanding the conditional character of such interpretation for the term "effectiveness" (the classic definition as the ratio of benefits to the costs is not obvious here), we consider it appropriate in view of its highly loaded meaning.

Given the heterogeneity of socioeconomic space in the Russian Federation, the regions differ in terms of their effectiveness, and the breaches may occur in each link of the transmission chain "Infrastructure Facilities—Social Services—Quality of Life." There are possible options while the effectiveness can be achieved only in the first or second "connection." In our opinion, the main organizational and administrative reasons of ineffectiveness associated with the breaches in the transmission include the following: 1) first link: lack of sufficient organizational and administrative regulations and rules for institutions (organizations) of social sphere; 2) second link: imperfect measures of public administration in the social sphere of the region in terms of resource concentration, set of applied measures, etc.

In accordance with the above, we have identified the following grading for the effectiveness of organizational and administrative components in the system of infrastructural support for improving the quality of life in the regions of the Russian Federation: 1) It operates effectively if similar estimates have been achieved at all levels of the transmission chain; 2) It is ineffective in the opposite situation; 3) There is an intermediate state in case of divergent estimates made for the links (Fig. 2). In this case, the effectiveness analysis is appropriate not only as a part of implementing the strategic goal, which is the improvement in the quality of life, but also for the impact on its components and by taking into account the sectoral lines of relationship (for example, the infrastructure facilities in education affect the education services, reproductive potential, and level of income; health care facilities affect health care services and reproduction potential; culture & sports facilities affect culture & sports services, level of cash income, and reproduction potential; the spheres of trade and housing & utilities affect the services in the area of trade and housing & utilities and the living conditions).

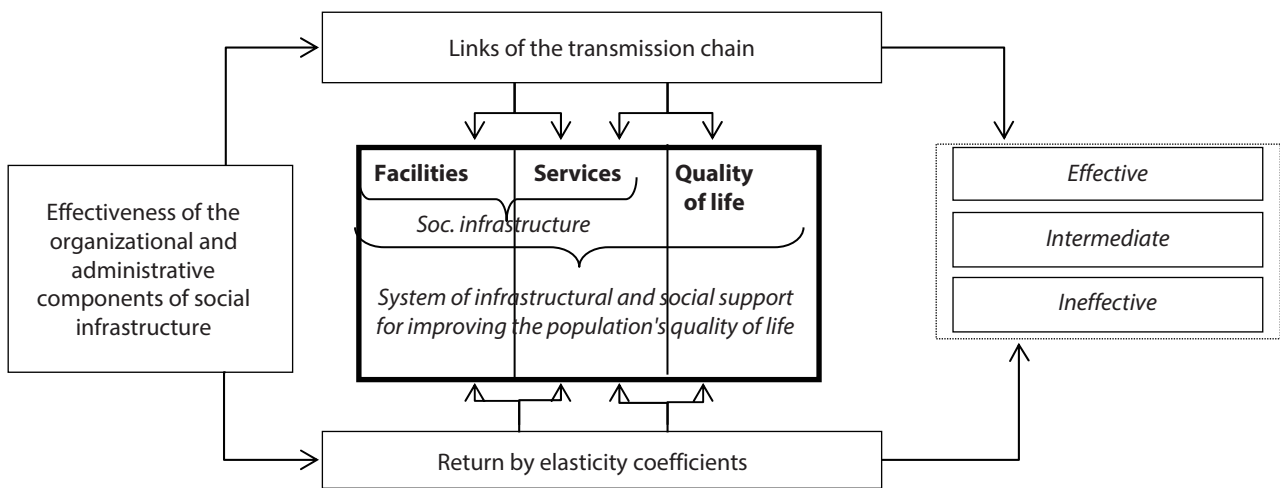


Fig. 2. Grading of development for the organizational and administrative components

The following methodological approaches have been used to determine the level of effectiveness of organizational and administrative components in the constituent entities of the Russian Federation (elasticity estimates).

We determined the system of individual indicators characterizing the regional social infrastructure facilities and vital infrastructure facilities; social services based on such facilities; parameters of quality of life of the population of constituent entities of the Russian Federation (with differentiation by sectoral areas, such as education, health care, culture & sport, trade, and housing & utilities). This selection is based on data obtained by monitoring the effectiveness of the executive branch in constituent entities of the Russian Federation.³ Tables 1 and 2 show the system of indicators broken down into blocks.

Table 1

Indicators of Parameters of Population's Quality of Life

Conditions for the existence and development of individual	Parameter of the population's quality of life (X_Q)	Symbol of the indicator
Reproduction potential	Life expectancy, years	X_{QRP_1}
	Share of employed population with higher and secondary vocational education (%)	X_{QRP_1}
Level of cash income	Ratio of real average monthly wage of workers in the region to the real average monthly wage of workers in the Russian Federation	X_{QCI_1}
Living conditions	Share of population living in residential apartment buildings recognized as nonhazardous dwellings (%)	X_{QLC_1}
	Share of population participating in paid cultural and leisure activities organized by public (municipal) cultural institutions	X_{QLC_2}
	Share of consumer spending on the purchase of nonfood products (%)	X_{QLC_3}

³ The selection was made from the indicators summarized in databases evaluating the effectiveness of the executive branch in constituent entities of the Russian Federation [electronic resource]: http://www.minregion.ru/activities/monitor/exec_evaluation/ (checked on: 9/10/2014); Regions of Russia. Socioeconomic indicators. 2008 [electronic resource, in Russian]: http://www.gks.ru/bgd/regl/B08_14p/Main.htm (date of access: 9/10/2014); Regions of Russia. Socioeconomic indicators. 2009 [electronic resource, in Russian]: http://www.gks.ru/bgd/regl/B09_14p/Main.htm (date of access: 9/10/2014); Regions of Russia. Socioeconomic indicators. 2010 [electronic resource, in Russian]: http://www.gks.ru/bgd/regl/B10_14p/Main.htm (date of access: 9/10/2014); Regions of Russia. Socioeconomic indicators. 2011 [electronic resource, in Russian]: http://www.gks.ru/bgd/regl/B11_14p/Main.htm (date of access: 9/10/2014); Regions of Russia. Socioeconomic indicators. 2012 [electronic resource, in Russian]: http://www.gks.ru/bgd/regl/B12_14p/Main.htm (date of access: 9/10/2014) Socioeconomic indicators. 2013 [electronic resource, in Russian]: http://www.gks.ru/bgd/regl/B13_14p/Main.htm (date of access: 9/10/2014) Socioeconomic indicators. 2014 [electronic resource, in Russian]: http://www.gks.ru/bgd/regl/b14_14p/Main.htm (date of access: 2/5/2015)

Conditions for the existence and development of individual	Parameter of the population's quality of life (X_Q)	Symbol of the indicator
Satisfaction of vital human needs	Satisfaction of population with health care	$X_{QSatis.HC}$
	Satisfaction of population with the quality of general education	$X_{QSatis.ED}$
	Satisfaction of population with housing & utilities services	$X_{QSatis.T}$
	Satisfaction of population with conditions for physical fitness and sports activities	$X_{QSatis.CS}$

Table 2

Indicators describing the provision with regional social infrastructure facilities and social services provided with such facilities

Social sphere	Regional social infrastructure facilities and vital infrastructure facilities (X_F)	Symbol of the indicator	Regional social infrastructure services and vital infrastructure services for the population (X_S)	Symbol of the indicator
Education	Number of preschool educational institutions, institutions per 10,000 children of preschool age	X_{FEd_1}	Number of children for 100 places in preschool educational institutions, persons	X_{SEd_1}
	Number of general educational institutions (excluding evening (shift-based) general educational institutions), institutions per 10,000 people below the working age	X_{FEd_2}	Share of graduates participating in the unified state examination, % of the graduates of public (municipal) educational institutions	X_{SEd_2}
	Number of educational institutions of secondary vocational education, institutions per 10,000 people	X_{FEd_3}	Graduates with secondary vocational education, per 10,000 people	X_{SEd_3}
	Number of educational institutions of higher professional education, institutions per 10,000 people	X_{FEd_4}	Graduates with higher professional education, per 10,000 people	X_{SEd_4}
Health care	Number of outpatient care institutions, institutions per 10,000 people	X_{FHC_1}	Amount of outpatient care assistance per 1 resident	X_{SHC_1}
	Number of hospital beds, beds per 10,000 people	X_{FHC_2}	Amount of inpatient care assistance per 1 resident	X_{SHC_2}
Culture & sport	Provision with sports facilities, facilities per 10,000 people	X_{FCS_1}	Share of population systematically engaged in physical fitness activities and sport	X_{SCS_1}
	Library fund, books per 10,000 people	X_{FCS_2}	Number of users of library fund, persons per 10,000 people	X_{SCS_2}
Housing & utilities	Total average area of residential premises per 1 resident	X_{FH_1}	Share of non-hazardous housing, % of the total housing area	X_{SH_1}
Trade	Number of wholesale and retail outlets; repair of motor vehicles, motorcycles, household goods and personal items, outlets per 10,000 people	X_{FT_1}	Retail trade turnover per capita, rubles	X_{ST_1}

Individual indicators describing the condition of social infrastructure facilities (X_F) have two indexes: the first relates to the sectors (facilities in education: X_{FEd} , health care: X_{FHC} , culture & sport: X_{FCS} , trade: X_{FT} , housing & utilities: X_{FH}); service indicators (X_S) have the appropriate sectoral indexes (X_{SEd} , X_{SHC} , X_{SCS} , X_{ST} , X_{SH}); individual indicators of quality of life (X_Q) are divided into components: X_{QRP} is for reproduction potential, X_{QCI} is for level of cash income, X_{QLC} is for living conditions. Each individual indicator is normalized.

Table 3

Methods for calculating the integral indexes of social infrastructure and population's quality of life

Index	Calculation method
Integral index describing the condition of social infrastructure facilities (I_{Fi})	$I_{Fi} = \frac{\sum_{j=1}^n I_{Fij}}{n},$ where I_{Fij} = individual normalized indicator evaluating the condition of social infrastructure facilities $I_{Fij} = \frac{X_{Fij} - X_{Fijmin}}{X_{Fijmax} - X_{Fijmin}},$ calculated as sectoral index; i = sphere of localization (education (ED), health care (HC), culture & sport (CS), trade (T), and housing & utilities (H)); X_{Fij} = value of j -th individual indicator of i -th facility in the system; X_{Fijmin} , X_{Fijmax} = minimum and maximum value of the j -th individual indicator of the i -th facility
The integral index describing the provided social services (I_{Si})	$I_{Si} = \frac{\sum_{\varphi=1}^m I_{S_{i\varphi}}}{m},$ where $I_{S_{i\varphi}}$ = individual normalized indicator evaluating the provided social services $I_{S_{i\varphi}} = \frac{X_{S_{i\varphi}} - X_{S_{i\varphi}min}}{X_{S_{i\varphi}max} - X_{S_{i\varphi}min}},$ calculated as a sectoral index; i = sectoral sphere of localization (education (ED), health care (HC), culture & sport (CS), trade (T), and housing & utilities (H)); $X_{S_{i\varphi}}$ = value of φ -th individual indicator of i -th facility in the system; $X_{S_{i\varphi}min}$, $X_{S_{i\varphi}max}$ = minimum and maximum value of φ -th individual indicator of the i -th facility
The integral index describing the parameters of quality of life (I_Q) of regional population and its components	$I_Q = \frac{\sum_{p=1}^r I_{Q_p}}{r},$ where I_{Q_p} = integral index of regional parameter of population's quality of life is calculated as $I_{Q_p} = \frac{\sum_{z=1}^l I_{Q_{pz}}}{l},$ where $I_{Q_{pz}}$ = individual normalized indicator for the development of the parameter of regional population's quality of life $I_{Q_{pz}} = \frac{X_{Q_{pz}} - X_{Q_{pz}min}}{X_{Q_{pz}max} - X_{Q_{pz}min}},$ p = parameter of population's quality of life (reproduction potential (RP), living conditions (LC), level of cash income (CI), satisfaction of vital human needs in the relevant sphere of sectoral localization (Satis.); $X_{Q_{pz}}$ = value of z -th individual indicator of p -th parameter of regional population's quality of life; $X_{Q_{pz}min}$, $X_{Q_{pz}max}$ = minimum and maximum value of the z -th individual indicator of a p -th parameter of population's quality of life.

The integral indexes evaluating the condition of relevant blocks (facilities: I_{Fi} ; services: I_{Si} ; social infrastructure of i -th sectoral sphere; quality of life index: I_Q) are calculated under a single scheme as the arithmetic average of individual normalized indicators of its components (Table 3).

The elasticity coefficients have been calculated based on integral indexes: 1) $Q_{Fi}^{S_i}$ is the elasticity of changes in the integral index of indicators of provided services by the change of integral indexes describing the parameters of social infrastructure facilities (how much will the indicators of provided social services increase when the index of provision with facilities increases by 1 percent = $Q_{Fi}^{S_i} = \frac{\Delta I_{S_i}}{\Delta I_{F_i}}$);

2) $Q_{S_i}^{Q_p}$ is the elasticity of changes in the integral index of indicators describing the population's quality of life in case of changes in the integral indexes describing the indicators of services provided with the social infrastructure (how much will the indicators of quality of life increase when the indicators of provided social services increase by 1 percent = $Q_{S_i}^{Q_p} = \frac{\Delta I_{Q_p}}{\Delta I_{S_i}}$).

If the value of dynamic coefficients of congruence is greater than one, this indicates positive changes brought by the policy to manage and develop the social infrastructure. If the value of coefficients is less than one, the institutional and organizational measures are not sufficient for effective work and are regarded as a negative shift.

The analysis of effectiveness of organizational and administrative components of the system of infrastructural support for improving the population's quality of life was carried out in accordance with the following algorithm: when the values of elasticity coefficients are greater than one in two lines (first: "the ratio of the growth index of the integral indicator for the provided services to the growth index of the integral indicator for infrastructure facilities," second: "the ratio of the growth index of the integral indicator of quality of life to the growth index of the integral indicator of provided services"), the organizational and administrative components in the region are interpreted as effective; accordingly, when both coefficients are less than one, it is interpreted as the absence of infrastructural relationship or "ineffectiveness"; the "intermediate state" is a different combination of coefficients (in the first line, the coefficient of congruence is more than one, while in the second line, it less than one, or vice versa). Such analysis will allow concluding whether the infrasystemic principle is implemented in the operation of social infrastructure in the Russian economic space and quantifying the organizational and administrative components in the system of infrastructural support for improving the quality of life.

Table 4 shows the formalized scale for evaluating the organizational and administrative components of the social infrastructure.

Table 4

Evaluation criteria for elasticity coefficients of relationships in the transmission chain of the system of infrastructural support for improving the regional population's quality of life

No.	Dynamics of organizational and administrative components of the system of infrastructural support for improving the regional quality of life	Link "Facilities— Services"	Link "Services— Quality of Life"
		Options	Options
1	Positive (<i>P</i>)	$Q_{F_i}^{S_i} \geq 1$	$Q_{F_i}^{Q_p} \geq 1$
2	Negative (<i>N</i>)	$Q_{F_i}^{S_i} < 1$	$Q_{F_i}^{Q_p} < 1$
3	Negative for the activities of public and municipal administration authorities (<i>NPMA</i>)	$Q_{F_i}^{S_i} \geq 1$	$Q_{F_i}^{Q_p} < 1$
4	Negative for management of social infrastructure institutions (<i>NI</i>)	$Q_{F_i}^{S_i} < 1$	$Q_{F_i}^{Q_p} \geq 1$

Analysis of Effectiveness of Organizational and Administrative Components in the System of Infrastructural Support for Improving the Regional Population's Quality of Life

Table 5 and 6 present the results of calculating the indexes of growth of integral indicators for provision with social infrastructure facilities, services, and changes in the regional population's quality of life by sectoral social areas.

The difference in the analysis periods is due to the absence of comparable data and changes in the structure of indicators provided in the Report on Evaluating the Effectiveness of the Executive Branch in Constituent Entities of the Russian Federation. For this reason, the indicators of the quality of life index (total and by component) have been calculated for different time intervals.

The analysis of data provided in the tables allows concluding that during the considered period all constituent entities of the Ural Federal District showed negative change in the indexes "for services" in the health care; also, the trade and housing & utilities sectors stand out in the integral indexes for "infrastructure facilities." Overall, the indexes describing the quality of life and its objective parameters increased in all regions, except for the Tyumen Region.

Table 5

Calculation of the indexes of growth of integral indicators for facilities and services of social and infrastructural support in the Russian Federation and regions of the Ural Federal District (UFD) (2007–2013 and 2008–2013)*

Region	Education		Health care		Trade		Utility		Culture & sport	
	2008–2013		2007–2013		2007–2013		2007–2013		2008–2013	
	$\Delta I_{F_{Ed}}$	$\Delta I_{S_{Ed}}$	$\Delta I_{F_{HC}}$	$\Delta I_{S_{HC}}$	ΔI_{F_T}	ΔI_{S_T}	ΔI_{F_H}	ΔI_{S_H}	$\Delta I_{F_{CS}}$	$\Delta I_{S_{CS}}$
Russian Federation	1.03	1.35	1.05	0.74	0.78	1.05	0.47	1.27	1.02	1.15
UFD	0.98	1.14	1.04	0.84	0.83	1.03	0.21	1.07	1.10	1.20
Tyumen Region	0.84	0.92	0.75	1.04	1.03	1.28	0.20	0.91	1.12	1.16
Sverdlovsk Region	1.04	1.25	1.12	0.65	0.76	0.82	0.17	1.37	0.97	1.23
Chelyabinsk Region	1.02	1.09	1.03	0.88	0.80	0.82	0.26	1.08	0.97	1.06
Kurgan Region	0.97	1.30	1.29	0.83	0.77	1.34	0.98	0.92	1.27	1.34

$$\Delta = \frac{I_{S_t} - I_{S_{t-1}}}{I_{S_{t-1}}}, t = \text{current (considered) period.}$$

* Highlighted cells indicate the values of indicators with a positive growth rate.

Table 6

Calculation of the indexes of growth of integral indicators for the quality of life and its parameters in the Russian Federation and regions of the Ural Federal District (2007–2011 and 2008–2011)*

Region	2007–2013					2008–2013				
	$\Delta I_{\bar{Q}}$	ΔI_Q	$\Delta I_{Q_{RP}}$	$\Delta I_{Q_{LC}}$	$\Delta I_{Q_{CI}}$	$\Delta I_{\bar{Q}}$	ΔI_Q	$\Delta I_{Q_{RP}}$	$\Delta I_{Q_{LC}}$	$\Delta I_{Q_{CI}}$
Russian Federation	1.23	1.27	1.84	1.13	0.98	1.16	1.19	1.73	1.05	0.95
UFD	1.14	1.20	1.96	0.98	1.09	1.12	1.18	1.72	1.02	0.87
Tyumen Region	0.95	0.99	1.64	0.73	0.89	1.06	1.21	1.38	1.08	0.89
Sverdlovsk Region	1.34	1.53	1.95	1.30	0.90	1.22	1.35	1.81	1.12	0.86
Chelyabinsk Region	1.34	1.48	2.11	1.11	0.86	1.18	1.27	1.68	1.00	0.85
Kurgan Region	1.25	1.35	2.36	0.99	0.70	1.17	1.25	2.42	0.88	0.70

$$\Delta I_Q = \frac{I_{Q_t} - I_{Q_{t-1}}}{I_{Q_{t-1}}}; \Delta I_{F_p} = \frac{I_{F_{pt}} - I_{F_{pt-1}}}{I_{F_{pt-1}}}, t = \text{current (considered) period; } \Delta I_{\bar{Q}} = \text{integral index for the quality of life (including the level of cash income).}$$

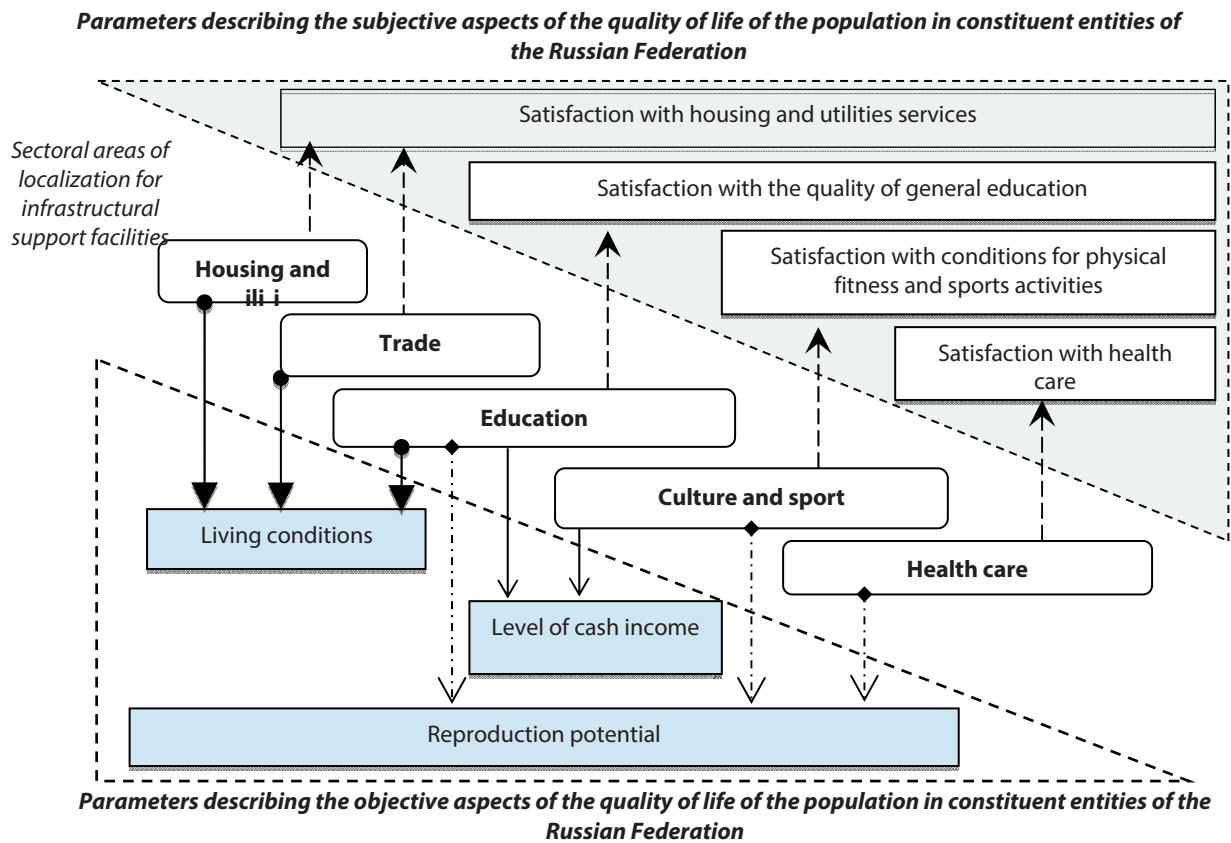
* Highlighted cells indicate the values of indicators with a positive growth rate.

It is interesting to analyze the data on elasticity coefficients not only in relation to the quality of life in general but also by its components. To do this, we used the following scheme of possible influence between the facilities and services of the regional social infrastructure and quality of life components of the population in the constituent entities of the Russian Federation (Fig. 3).

Tables 7 and 8 show the elasticity coefficients obtained for sectoral areas of social infrastructure. Thus, it is obvious that there is no impact of changes in integral indexes "for services" in education, culture & sport on the indexes of disposable income, and there is no impact of indicators for trade and housing & utilities on changes in the integral indexes of living conditions (for Tyumen, Kurgan, and Sverdlovsk Regions).

It can be noticed that the elasticity coefficients for the impact made by the parameters of education services on reproduction potential of the regional population is more significant than on the integral indicators of the population's quality of life in general; also, there is a weak impact on the living standards and disposable income in the Sverdlovsk, Chelyabinsk, and Kurgan Regions.

The conducted analysis allows not only ranking the regions located in similar natural and geographic zones and having close levels of development (Chelyabinsk and Sverdlovsk Regions) but also viewing in detail the capacity for work demonstrated by the system of infrastructural support for improving the population's quality of life. The figures below allow evaluating the indexes for the growth rate of facilities, services, quality of life in health care sector. The abscissa axis represents the values of indexes for the growth rate of integral indicators of provision with social infrastructure services (ΔI_{S_t}), the ordinate axis represents: 1) the indexes for the growth rate of the integral indicator



The type of arrow shows the impact of sectoral areas on components of the population's quality of life

Fig. 3. The relationship of facilities and services of regional social infrastructure and components of the quality of life of the population in constituent entities of the Russian Federation

Table 7

Calculation of elasticity coefficients in education, culture & sport for the Russian Federation and regions of the Ural Federal District*

Region	Education (2008–2013)					Culture & sport (2007–2013)			
	$Q_{F_{Ed}}^{S_{Ed}}$	$Q_{S_{Ed}}^Q$	$Q_{S_{Ed}}^{Q_{RP}}$	$Q_{S_{Ed}}^{Q_{LC}}$	$Q_{S_{Ed}}^{Q_{CI}}$	$Q_{F_{CS}}^{S_{CS}}$	$Q_{S_{CS}}^Q$	$Q_{S_{CS}}^{Q_{RP}}$	$Q_{S_{CS}}^{Q_{CI}}$
Russian Federation	1.31	0.88	1.28	0.78	0.70	1.13	1.03	1.50	0.83
UFD	1.16	1.04	1.51	0.89	0.76	1.09	0.98	1.43	0.73
Tyumen Region	1.10	1.32	1.50	1.17	0.97	1.04	1.04	1.19	0.77
Sverdlovsk Region	1.20	1.08	1.45	0.90	0.69	1.27	1.10	1.47	0.70
Chelyabinsk Region	1.07	1.17	1.54	0.92	0.78	1.09	1.20	1.58	0.80
Kurgan Region	1.34	0.96	1.86	0.68	0.54	1.06	0.93	1.81	0.52

RP = reproduction potential, LC = living conditions, CI = level of cash income.

* Highlighted cells indicate the values of dynamic congruence coefficients that are greater than one.

Table 8

Calculation of elasticity coefficients in health care, trade, and housing & utilities for the Russian Federation and regions of the Ural Federal District*

Region	Health care (2008–2013)			Trade (2007–2013)			Housing & utilities (2007–2013)		
	$Q_{F_{HC}}^{S_{HC}}$	$Q_{S_{HC}}^Q$	$Q_{S_{HC}}^{Q_{RP}}$	$Q_{F_T}^{S_T}$	$Q_{S_T}^Q$	$Q_{S_T}^{Q_{LC}}$	$Q_{F_H}^{S_H}$	$Q_{S_H}^Q$	$Q_{S_H}^{Q_{LC}}$
Russian Federation	0.70	1.72	2.49	1.35	1.21	1.08	2.70	1.00	0.89
UFD	0.81	1.43	2.33	1.24	1.17	0.95	5.10	1.12	0.92
Tyumen Region	1.39	0.95	1.58	1.24	0.77	0.57	4.55	1.09	0.80
Sverdlovsk Region	0.58	2.35	3.00	1.08	1.87	1.59	8.06	1.12	0.95
Chelyabinsk Region	0.85	1.68	2.40	1.03	1.80	1.35	4.15	1.37	1.03
Kurgan Region	0.64	1.63	2.84	1.74	1.01	0.74	0.94	1.47	1.08

RP = reproduction potential, LC = living conditions, CI = level of cash income.

* Highlighted cells indicate the values of dynamic elasticity coefficients that are greater than one.

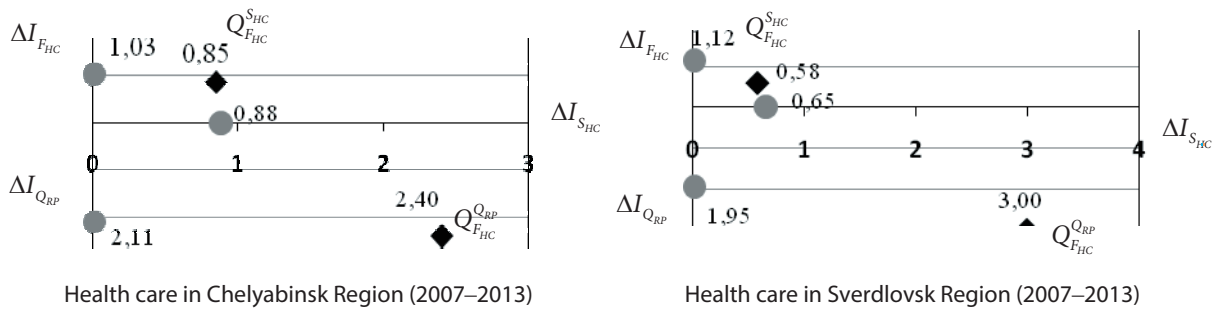


Fig. 4. The congruence in the growth of integral indexes for the indicators of facilities, services, and quality of life in health care

of provision with social infrastructure facilities (ΔI_{F_i}) (the coordinate axis points upward), 2) the indexes for the growth rate of the population's reproduction potential as a component of regional population's quality of life ($\Delta I_{Q_{RP}}$) (the coordinate axis points downward). Their values are indicated by a circle. The coordinate plane indicates the elasticity coefficients that correspond to the links of transmission chain: a) "Facilities—Services" of social infrastructure ($Q_{F_i}^{S_i}$); b) "Services—Population's Quality of Life" ($Q_{S_i}^{Q_{RP}}$); the values of specified indexes (a, b) are indicated with a diamond symbol (Fig. 4).

It is obvious that there is a lag in the indicators for the growth of services, while the health care makes a great contribution to the reproduction potential (the values of elasticity coefficients are 2.40 in Chelyabinsk Region and 3.00 in Sverdlovsk Region).

Conclusions and Recommendations

Table 9 shows the formalized results of calculations for the elasticity coefficients, including the criteria elaborated in Table 3, by regions of the Ural Federal District.

Table 9

Conclusions based on calculation results for the elasticity coefficients to describe the effectiveness of organizational and administrative components in the system of infrastructural support for improving the regional population's quality of life (2007–2013)*

Region	Transmission chains (Facilities—Services—Population's Quality of Life) By sectoral areas of localization				
	Education	Health care	Culture & sport	Trade	Housing & utilities
Russian Federation	NPMA	NI	P	P	P
Tyumen Region	P	NPMA	P	NPMA	P
Sverdlovsk Region	P	NI	P	P	P
Chelyabinsk Region	P	NI	P	P	P
Kurgan Region	NPMA	NI	NPMA	P	NI

* Highlighted cells indicate the development areas: negative management of institutions (NI) is highlighted in light gray; negative management of regional infrastructure by executive branch authorities (NPMA) is highlighted in dark gray; overall positive management (P) is indicated without highlighting.

The conducted analysis and obtained analytical data confirm the potential use of proposed approach to draw attention of regional authorities on the need to improve the effectiveness of the organizational and administrative mechanisms in specific sectors and on specific levels of management concerning the institutions or infrastructure system in general. In particular, the results of conducted study allow making the following conclusions.

First, the most problematic area is health care, which is typical for the Russian Federation in general and for virtually all regions of the Ural Federal District. Moreover, most problems have been identified directly in the activities of health care institutions, while, in the Tyumen region, they have been found in the management of regional sector by the executive branch authorities in general. The organizational and administrative measures to improve the effectiveness of the sector management, which have been recently the subject of active discussions, can be as follows: 1) organizing family-oriented technologies, provision of medical services; transition to the system of electronic personal accounts for patients, doctors, and nurses, which, in turn, requires improving the skills of health care

personnel through the introduction of telecommunication technology (which will eliminate a number of problems in the services provided to the public by medical institutions); 2) establishing information and analytical services to prepare managerial decisions in the area of health care; organizing the monitoring of population's health based on the results of periodic medical examinations and prophylactic examinations, zoning the territory by noncontagious diseases; restructuring the network of institutions and optimizing the patient flow by the complexity of provided inpatient medical care; organizing the work of emergency, first aid and specialized emergency medical assistance as a unified system; monitoring the needs in human resources and coordinating their preparation with the institutions of secondary vocational, higher, postgraduate, and additional education (which will allow improving the performance in managing the sector and satisfaction of the population).

Second, the Kurgan Region is characterized by a set of problems in other infrastructure sectors (education, culture & sport) that require the government executive branch authorities to substantially adjust their program-based measures and increase the support and attention to such issues as the expansion in the range of social services in these sectors; the development of modern forms and focus on various segments of trainees and others (organizing the activities of innovative education centers; providing information and technical base for the infrastructure of public regional libraries and museums; creating distance education schools and centers to support gifted children and provide them with targeted financial support; establishing the centers for social technologies; developing internship platforms to improve the skills of teaching personnel; organizing targeted distance learning of education system employees; focusing the personnel employed in the area of physical fitness and sport on improving the physical ability and health of the population).

Thus, the implementation of proposed recommendations will contribute to increasing the performance of social policy based on systemic approach to addressing the problems of social infrastructure development as a tool for improving the population's quality of life in the constituent entities of the Russian Federation.

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