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Approaches to Measuring Labor Productivity in Healthcare: An Analysis of Russian and International Practices

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ABSTRACT

In recent years, successful practices from the industrial sector have increasingly been adopted within the service sector. This trend is reflected in the 2025 expansion of the list of industries included in the federal project “Labor Productivity”, which now encompasses healthcare. The **purpose** of this study is to analyze domestic and international methodologies, as well as theoretical and legal approaches, to measuring labor productivity in the healthcare sector. The author identifies, for the first time, both the shared features and the specific characteristics of this process. It is established that the assessment of healthcare labor productivity (LP) largely relies on traditional approaches based on output calculations using monetary and quantitative indicators. The study also reveals a methodological convergence in the measurement of LP in Russian healthcare, which is closely linked to the management tasks specific to each administrative level of the sector. To achieve the research objectives, **methods** of analysis and synthesis were employed. The **findings** may be of practical use to administrators of healthcare institutions, as well as to policymakers at both regional and federal levels. **Keywords:** labor productivity; healthcare effectiveness; international experience; integrated approach; measurement methodology

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INTRODUCTION

The relevance of the present study is determined by the need to enhance the performance of healthcare institutions, with labor productivity (LP) occupying a central role in this regard. It is not by chance that Nobel Prize laureate P. Krugman argues that productivity “is not everything, but in the long run it is almost everything...” [1, p. 229]. For a long time, this indicator remained outside the focus of healthcare managers, largely due to the absence of a standardized benchmark for its measurement, as well as the perception of the healthcare sector as a largely non-market domain with significant externalities, where productivity assessment requires the use of specific metrics that take into account indirect and external effects of its functioning.¹ This may explain why healthcare has not been included in the list of economic activities for which the productivity index is regularly assessed across the Russian Federation.² Given the existing debate regarding the appropriateness of applying labor productivity indicators to institutions within the social sector [2–5], the author’s attention to the issue of implementing this measure in healthcare represents a highly topical and timely theoretical and applied problem.

Current approaches to the assessment of labor productivity in both Russian and global healthcare systems are often fragmented and highly variable, suggesting the necessity of synthesizing existing economic research and practical methodologies in this field. At present, no such integrative studies are available in the publications of either Russian or international scholars. In this context, the view that “new concepts of efficiency and productivity have yet to be developed and learned to be measured” [6, p. 6] appears particularly relevant.

The significance of this study is further determined by the current stage of socio-economic development in Russia, marked by the launch of new national (NP) and federal projects (FP), which are increasingly associated with improving the effectiveness of public administration [7]. Among these, long-term development of the healthcare sector is directly supported by projects such as “Prolonged and Active Life,³” “Health Technologies,⁴” and “Family,⁵” which continue the earlier national projects “Health⁶” and “Demography⁷” implemented between 2019 and 2024. However, the strategic development indicators of the healthcare sector are not limited to the target benchmarks (TB) of these initiatives. Thus, beginning in 2025, the federal project “Labor Productivity,⁸” implemented within the framework of the national project “Efficient and Competitive Economy,⁹” includes a set of target indicators related to social sectors (including healthcare). In particular, indicators such as the “increase in cases of preventive follow-up monitoring per one employed position of a primary healthcare physician in outpatient settings,%” and the “increase in bed turnover rate,%” serve as monitoring measures reflecting changes in the studied indicator.¹⁰

³ NP “Prolonged and Active Life”. URL: <https://национальныепроекты.рф/new-projects/prodolzhitelnaya-i-aktivnaya-zhizn/>

⁴ NP “Health Technologies”. URL <https://национальныепроекты.рф/new-projects/tehnologii-zdorovya/>

⁵ NP “Family”. URL: <https://национальныепроекты.рф/new-projects/semya/>

⁶ NP “Health”. URL <https://национальныепроекты.рф/projects/>

⁷ NP “Demography”. URL <https://национальныепроекты.рф/projects/>

⁸ FP “Labour Productivity”. URL: <https://национальныепроекты.рф/new-projects/effektivnaya-konkurentnaya-ekonomika-proizvoditelnost-truda/>

⁹ NP “Efficient and Competitive Economy” URL: <https://национальныепроекты.рф/new-projects/effektivnaya-i-konkurentnaya-ekonomika/>

¹⁰ The Unified Plan for Achieving the National Development Goals of the Russian Federation up to 2024 and for the Planning Period up to 2030 (approved by the Order of the Government of the Russian Federation of 1 October 2021 № 2765-r). URL: https://www.consultant.ru/document/cons_doc_LAW_398015/

¹ On labour productivity in Russia’s economic sectors in comparison with other countries URL: <https://clck.ru/3JbL6P>

² Order of the Federal State Statistics Service of 28 April 2018 № 274 approving the methodology for calculating the “Labour Productivity Index” indicator URL: <https://docs.cntd.ru/document/557348428>

RESEARCH METHODOLOGY

In the course of the study, relevant literature sources on the research topic were examined, including the bibliographic databases PubMed and e-LIBRARY.RU, as well as regulatory and legal documentation. The latter was accessed through the reference legal systems Garant and ConsultantPlus, and the official legal information portal “Laws, Codes and Regulatory Legal Acts of the Russian Federation.”

RESEARCH RESULTS

Theory and Practice of Measuring Labor Productivity in Russian Healthcare

The limited number of examples of labor productivity measurement in Russian healthcare institutions demonstrates a wide variety of approaches to defining this indicator. The theoretical foundations of these practices are based on classical methods of productivity as-

essment, namely the consideration of labor intensity and output. Output is calculated on the basis of the number of services provided per unit of working time or per average employee. Structurally, output is represented through both monetary and physical metrics [8], such as the number of patient visits; the number of patients treated by a single physician; the number of procedures performed per member of mid-level medical staff; and the volume of healthcare provision (medical services) per healthcare worker [9]. Monetary valuation involves various approaches to determining labor productivity. These are formalized in the provisions of the OECD Manual on Measuring Productivity Growth at the Industry Level and at the Aggregate Level¹¹ and are calculated in

¹¹ The OECD Manual on Measuring Productivity Growth at the Industry Level and at the Aggregate Level. URL: <http://www.oecd.org/std/research>

Table 1

Generalized Analysis of Selected Practices for Measuring Labor Productivity in Russian Healthcare

Name of the research object	Measurement method	Measurement method, characteristic
Regional level		
Omsk Region	Monetary	OECD methodology
Tomsk Region	Monetary	OECD methodology
Kemerovo Region	Physical (quantitative)	Number of patient visits per physician
Republic of Crimea	Monetary	OECD methodology
Healthcare institution level		
Kursk City Polyclinic No. 5 (OBUZ)	Physical (quantitative)	Number of patient visits per physician
Kuzbass Clinical Cardiology Dispensary named after Academician L.S. Barbarash (GBUZ)	Physical (quantitative)	Number of patient visits per physician
City Polyclinic No. 191, Moscow Department of Health	Physical (quantitative)	Number of medical reports prepared by one physician per unit of time
Regional Clinical Hospital No. 3, Chelyabinsk (GAUZ)	Monetary	Total value of services provided / total time spent delivering services

Source: Developed by the author based on data from [13–22].

financial terms as the ratio of output (gross domestic or regional product, or profit), recorded on the basis of value added, to labor inputs (hours worked, number of employees, or number of jobs) [10].

Generalized and systematized practices for measuring the labor productivity of medical personnel in the domestic healthcare system are presented in *Table 1*.

Based on the data presented in *Table 1*, value-based (monetary) methods of measuring the indicator under study prevail at the regional level. This situation is associated with the fact that one of the key objectives of the healthcare system at the level of a constituent entity of the Russian Federation is to ensure the financial sustainability of the sector [11].

The focus of healthcare organization managers is primarily directed toward optimizing workforce management processes and assessing the quantitative and qualitative characteristics of personnel [12]. At this level, issues of employment, labor intensity, and work performance come to the forefront, with labor productivity serving as one of the key indicators of efficiency. Therefore, at the institutional (local) level, physical (quantitative) methods of labor productivity measurement predominate.

Let us consider the regions and healthcare organizations listed in *Table 1* in greater detail. In the Omsk Region, labor productivity is regarded as one of the factors contributing to the competitiveness of healthcare institutions within the sector [13]. In the Tomsk Region, labor productivity in healthcare demonstrated an upward trend during the period 2006–2012 [14]. An analysis conducted in the Republic of Crimea revealed that “against the background of a steady increase in profit accompanied by a simultaneous decline in the average number of medical personnel, labor productivity rose up to 2021, with a slight decrease by 2023 to the level observed in 2020” [15, p. 75]. In a previously published study, the author highlighted the heterogeneous dynamics of labor produc-

tivity in the healthcare sector of the Kemerovo Region over the period 2011–2021, measured using a physical (quantitative) approach [16].

In calculating the labor productivity of employees at Kursk City Polyclinic No. 5 (OBUZ), it was found that the number of patient visits per physician increased by 2.87 units between 2016 and 2018 [17].

At the Kuzbass Clinical Cardiology Dispensary named after Academician L. S. Barbarash (GBUZ), physicians’ labor productivity increased in 2019 and declined markedly in 2020 [18]. This measurement practice was applied not only in clinical but also in paraclinical departments. Thus, a physical (quantitative) method was employed at City Polyclinic No. 191 of the Moscow Department of Health [19], whereas a monetary method was used in the functional diagnostics department of Regional Clinical Hospital No. 3 in Chelyabinsk (GAUZ) [20].

In cases where labor productivity in Russian healthcare institutions was measured on a one-time basis using value-based assessment and OECD methodologies [21, 22], conclusions were drawn regarding the relatively low level of this indicator compared with countries such as Germany, Japan, and the United States.

Theory and Practice of Measuring Labor Productivity in International Healthcare

In analyzing international practices of labor productivity calculation, the present study draws on data from a number of countries that are members of the Organisation for Economic Co-operation and Development (OECD). Labor productivity is assessed with consideration of several factors, namely labor, capital, and investments in the provision of healthcare services. Thus, physicians’ labor input (Z_i) is treated as one of the resources incorporated into a multifactor model and is measured by multiplying the average number of medical personnel (H_i), expressed in full-time equivalent terms, by the average wage level (N_i).

Table 2

Approaches to Measuring the Volume of Medical Services in Selected OECD Countries

Measurement method	Characteristic	Countries
Monetary	Number of services weighted by their cost	Austria, Australia, Germany, Sweden, Japan
	Total number of services weighted by the Consumer Price Index (CPI)	United States, Norway, France, Finland
Physical	Number of services delivered (consultations, examinations, etc.)	Portugal, Hungary, Italy, Belgium

Source: Developed by the author based on OESD data. URL: https://www.oecd.org/en/publications/towards-measuring-the-volume-output-of-education-and-health-services_5kmd34g1zk9x-en.htmlpom

Note: CPI – consumer price index

In turn, the baseline output index of the sector (X_t) may be calculated either using a monetary (value-based) approach – by multiplying quantitative indicators of activity x_j (e.g., the number of procedures performed, consultations provided, prescriptions issued, etc.) by their respective costs (c_j) – or using a physical (quantitative) approach based on the volume of services delivered.

Changes in labor productivity (ΔLP) are determined by comparing the annual growth of output and inputs using the Laspeyres formula (1) [1]:

$$\Delta LP = \frac{x_t / z_t}{x_0 / z_0} - 1 = \frac{x_t / x_0}{z_t / z_0} - 1, \quad (1)$$

$$Z_t = H_t \cdot N_t \quad (2)$$

$$X_t = \sum X_j \cdot C_j \quad (3)$$

where Z_t denotes the quantitative measure of labor inputs in the reporting period and in the base period (Z_0); while X_t represents the volume of healthcare services provided in the reporting period and in the base period (X_0).

Approaches to calculating the output indicator X_t across different countries (Table 2) exhibit both common and country-specific features.

According to the data presented in Table 2, in assessing physicians' labor productivity, the volume of services delivered may be defined using either physical (quantitative) or monetary (value-based) approaches. The latter is more

widely applied in countries where the market serves as the primary regulator and mechanism for satisfying demand for healthcare services [23], and where service prices reflect producers' marginal costs and consumers' maximum utility.¹² This approach is predominantly associated with the United States, where a market-based healthcare system is implemented, as well as with France, Norway, and Finland, which exhibit a stronger orientation toward market principles despite operating within a social insurance model of sectoral governance. By contrast, the physical (quantitative) approach is mainly characteristic of countries with state-based and social insurance models of national healthcare systems, in which public institutions play the central role in ensuring access to medical services (Belgium, Hungary, Italy, Portugal, among others).

Unlike the emerging Russian practice of labor productivity measurement in this sector, some countries (e.g., the United Kingdom, Australia, and Germany) have a long-established history of developing this indicator. In these systems, clinical outcomes and certain aspects of healthcare service quality are incorporated as weighting co-

¹² Schreyer P. Towards measuring the volume output of education and health services: a handbook. https://www.oecd.org/en/publications/towards-measuring-the-volume-output-of-education-and-health-services_5kmd34g1zk9x-en.htmlpom based on (date of access: 01.06.2025).

Table 3

Examples of Qualitative Indicators Used in UK Healthcare System to Assess Productivity

Types of medical care	Indicators of the quality measurement of services rendered			
	Improving health indicators	Survival in the short term	Medical waiting time	National survey of patients
Inpatient care	+	+	+	+
Outpatient (ambulatory) care	-	-	-	+
Emergency medical care	-	-	-	+

Source: Developed by the author based on ONS data Office for National Statistics. URL: <https://www.ons.gov.uk/economy/economicoutputandproductivity/publicservicesproductivity/methodologies/sourcesandmethodsforpublicserviceproductivityestimates/>

Table 4

Characteristics of Output Measurement methods in Non-market Sectors

The name of the method	Industry	Brief characteristic of the method
Pseudo-price index method for output measurement	Culture, education, and other public sector industries	Calculated on the basis of data on output price indices for comparable products.
Output volume method	Education, healthcare	Measures the actual volume of services delivered, taking into account both their quantitative and qualitative characteristics.
Input (cost) method	Defense	Applied when it is not possible to assess qualitative characteristics, by summing all incurred costs.

Source: Compiled by the author based on the System of National Accounts – 2008 URL: <https://unstats.un.org/unsd/nationalaccount/docs/sna2008russianwc.pdf>

efficients. For example, in Australia, healthcare quality is assessed using the QALY unit (Quality-Adjusted Life Year), which conventionally represents one year lived in a stable state of health and reflects the contribution of the healthcare system to increasing both the length and quality of patients' lives. Data sources for such evaluations include sociological survey results, such as the national Household, Income and Labour Dynamics in Australia (HILDA) study, as well as findings from regular statistical analyses. Another method of adjusting service volumes ac-

ording to quality involves accounting for health indicators (morbidity and mortality) per unit of healthcare provision. Under this approach, labor productivity measurement should focus not only on the number of services delivered but also on outcomes that hold value for the patient.¹³

Within the United Kingdom's healthcare system, when determining quantitative indicators of medical staff activity, it is customary – where

¹³ Health workforce strategy. URL: <https://www.pc.gov.au/inquiries/completed/health-workforce/report/healthworkforce.pdf>

Table 5

Characteristics of Methods for Measuring the Volume of Healthcare Services

Description of the method	Characteristic	Category
Deflation of final service output	A procedure that converts economic indicators calculated at current prices into comparable constant prices.	A
Output volume method	Quantitative measurement of services delivered, adjusted using a quality coefficient.	A
	Quantitative measurement of services delivered without accounting for qualitative or monetary components.	C
Output volume method based on the International Classification of Diseases, 10th Revision (ICD-10)	A method for the quantitative assessment of treatment cases in which ICD-10 is used for classification.	B
<i>Note:</i> ICD-10 refers to the International Classification of Diseases, 10th Revision		

Source: Compiled by the author based on Guidelines for measuring prices and volumes in national accounts. URL: https://www.unescap.org/sites/default/files/1.Handbook_on_volume_measures_RUS.pdf

possible —to apply qualitative criteria aimed both at assessing the degree of clinical effectiveness achieved and at analyzing levels of patient satisfaction (Table 3). The information presented in Table 3 illustrates the differentiated nature of quality parameter approaches depending on the type of healthcare service provided. Thus, output adjustment is employed to reflect the impact and effect of the services delivered.

In the absence of a benchmark unified at the level of the global scientific community, each country may independently determine the necessity and adequacy of adjustment coefficients for the volume of services delivered, taking into account relevant requirements, patient complexity, levels of patient satisfaction, and other indicators that correspond to the challenges of modern patient-centered and value-based healthcare. At the same time, international experience indicates the importance of consistently developing labor productivity measurement methodology, beginning with direct output-based indicators and gradually moving toward an integrated approach that incorporates the quality of medical care and the degree of patient satisfaction. A possible modification of the tra-

ditional physical (quantitative) method of labor productivity calculation was demonstrated in the author's previously published work [24]. The present study analyzes a number of documents that establish the legal foundations for its measurement within the framework of a regulatory approach to healthcare governance in Russia.

Review of the Regulatory and Methodological Foundations for Determining Labor Productivity

in International Practice and Russian Healthcare
The focus of the present analysis is on regulatory legal acts that have made a significant contribution to understanding approaches to labor productivity assessment. The System of National Accounts 2008 (SNA 2008) guidelines state that the category under consideration should be understood as “the volume of output per hour worked (or per employed person).¹⁴” The provisions of this document apply to both market and non-market sectors, including education, healthcare, defense, and others. A distinctive feature of non-market

¹⁴ “The system of National Accounts — 2008” URL: <https://unstats.un.org/unsd/nationalaccount/docs/sna2008russianwc.pdf>

sectors lies in the complexity of assessing both the quality of services rendered and labor productivity. In addition to the information presented in *Table 1*, it is important to clarify the approaches to the quantitative evaluation of healthcare service output indicators. According to SNA 2008, several methods exist for measuring output, and their application depends on the characteristics of the specific sector. As shown in *Table 4*, for healthcare the preferred approach is the one based on the quantitative assessment of output volume while taking into account its qualitative characteristics.

Subsequent documents largely develop the ideas of SNA 2008 by further specifying the content and approaches to labor productivity calculation. Thus, the European Commission's Handbook on Price and Volume Measures in National Accounts defines the volume of healthcare output as the medical care received by patients, adjusted for the quality of services provided for each type of care. At the same time, it is noted that quantitative indicators should be applied in conjunction with data on healthcare costs or prices.¹⁵ The document also presents a classification of methods for assessing output volume, indicating the feasibility and appropriateness of their application (*Table 5*):

- *Category A methods* – the most appropriate approaches for measuring output volume.
- *Category B methods* – acceptable when Category A methods cannot be applied.
- *Category C methods* – methods that cannot be applied in practice.

The information presented in *Table 5* reflects the priority of applying quantitative methods incorporating quality adjustment coefficients or cost deflation when assessing output indicators for the measurement of labor productivity in the healthcare sector.

The documents discussed above represent examples of the development of *international-level* regulatory foundations for labor produc-

¹⁵ Handbook on Price and Volume Measures in National Accounts URL: https://www.unescap.org/sites/default/files/1.Handbook_on_volume_measures_RUS.pdf

tivity governance in healthcare. An illustration of a successful *national-level* methodological framework for labor productivity measurement is provided by the Atkinson Review (United Kingdom), which formulates key principles for defining labor productivity in non-market sectors and serves as an important reference point for practical healthcare management. Among the most significant principles are the following: the greatest possible standardization of approaches to measuring the volume of services delivered in both market and non-market sectors; the necessity of adjusting quantitative analyses of public services to account for their quality; and the requirement to establish criteria for the quantitative assessment of direct output.¹⁶

In contrast to certain foreign countries, the healthcare sector in Russia, as noted above, is not included in the list of industries for which labor productivity is routinely calculated. At the same time, a retrospective analysis of sectoral legislation has identified a limited number of references to measurement approaches, illustrating the institutional integration of labor productivity considerations within the industry. In the Soviet Union, this indicator was examined in the context of the economic justification for establishing labor standards and was defined on the basis of actual output, measured by the number of patients seen by a physician in an outpatient clinic and the amount of time spent on this activity.¹⁷ Other documents from both the Soviet and Russian periods contain references to factors influencing labor productivity

¹⁶ Atkinson A. B. The Atkinson review: final report. Measurement of government output and productivity for the national accounts. URL: <https://clck.ru/3MhKwr>

¹⁷ Letter of the Ministry of Health of the USSR dated 2 October 1987 No. 02-14/82-14 "On the Procedure for Expanding Autonomy and Increasing the Accountability of Heads of Healthcare Authorities in the Application of the Order of the Ministry of Health of the USSR dated 13 August 1987 No. 955" (together with the "Methodological Guidelines on Labor Standardization for Medical Personnel"). URL: <https://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=ESU&n=11641#BOKLKuT4a7wXQ2ll>

in healthcare, in connection with the scientific organization of labor¹⁸ and lean production,¹⁹ as well as the application of this evaluation tool within the functional responsibilities of administrative and managerial staff in clinical department.²⁰

CONCLUSION

The conducted analysis allows the following conclusions to be drawn:

1. Existing practices of labor productivity measurement in Russian healthcare are methodologically comparable to approaches applied in foreign countries and are based on both monetary (value-based) and physical (quantitative) methods of calculation.

2. The choice of methods for determining output indicators of healthcare service provision, as well as the approaches to labor productivity measurement, is largely shaped by the structure of the national healthcare system.

3. Distinctive features of this process in international practice are associated with the development of labor productivity assessment methods that incorporate service quality requirements and the implementation of a patient-centered approach.

4. In contrast to international experience, Russian healthcare currently lacks scientifically grounded methodologies for measuring this indicator.

5. At present, the sector is at an initial stage of actively applying the concept of labor productivity to evaluate institutional performance, driven by the implementation of the national project "Labor Productivity." Further accumulation of empirical data may provide a basis for developing evidence-based methodologies to improve measurement approaches.

6. Prospects for further research lie in providing a scientific rationale for the directions of methodological development in measuring labor productivity in the Russian healthcare sector. This may be achieved through the synthesis of domestic and international practices, taking into account contemporary priorities in healthcare development, which are associated with improving the quality and safety of medical services, ensuring sectoral sustainability, and adopting integrated, systemic, and human-centered approaches.

¹⁸ Scientific Organization of Labor in Clinical Diagnostic Laboratories of Healthcare Institutions (Methodological Guidelines) (approved by the Ministry of Health of the USSR on 5 May 1975). URL: <https://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=ESU&n=10768#1wiMKuT7vUG9WKZT>

¹⁹ Federal Project "Lean Polyclinic." Methodological Guidelines for the Application of Lean Production Methods in Medical Organizations. URL: <https://ovmf2.consultant.ru/cgi/online.cgi?req=doc&base=LAW&n=371095&cacheid=87658DFC727AE43B4806C94845D16792&mode=splus&rnd=hvR0mg#KbWfB1Vg1fdDRivq>

²⁰ Order of the Ministry of Health and Medical Industry of the Russian Federation dated 29 November 1994 No. 256 (as amended on 29 September 1997) "On the Organization of Emergency Narcological Care Units (Wards)." URL: <https://recipe.ru/nd/medical-and-pharmaceutical-workers/prikaz-minzdravmedproma-rf-ot-29-11-1994-n-256-red-ot-29-09-1997-ob-organizatsii-otdelenij-palat-neotlozhnoj-narkologicheskoy-pomoshhi-prikaz-komiteta-farmatsii-g-moskvy-ot-22-09-1997-n-129-ob-organ/>

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