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ANALYSIS OF THE RELATIONSHIP BETWEEN HEALTHCARE EXPENDITURE AND LIFE EXPECTANCY IN POST-SOVIET COUNTRIES

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Abstract. The article examines the relationship between healthcare expenditure and life expectancy in post-Soviet countries, taking into account differences in their economic and institutional conditions of development. The purpose of the study is to identify the specific characteristics of the statistical relationship between healthcare financing and life expectancy at the between-country and within-country levels. The empirical basis of the research consists of World Bank data covering 15 post-Soviet countries over the period 2000–2023, comprising 358 observations. The study employs descriptive statistical methods and panel econometric analysis based on the hybrid Mundlak model, which makes it possible to distinguish differences between countries from changes occurring within individual countries over time. The baseline model identifies a positive and statistically significant between-country association between healthcare expenditure as a share of GDP and life expectancy; however, this association is sensitive to the model specification. The scientific significance of the study lies in clarifying the possibilities and limitations of using healthcare financing indicators in comparative analyses of demographic outcomes across post-Soviet countries. The practical significance of the findings is determined by the need for a comprehensive consideration of financing structures, economic conditions and population health indicators when evaluating national healthcare systems. Prospects for further research involve examining the accessibility of medical care, the allocation of financial resources and the effectiveness of healthcare services provided.

Keywords: healthcare expenditure, life expectancy, post-Soviet countries, panel data, between–within analysis, healthcare financing.

Main provisions. This article examines the relationship between healthcare expenditure and life expectancy in 15 post-Soviet countries over the period 2000–2023. The study analyzes this relationship by considering both the disparities that emerged between these nations during their independent economic development and the changes that occurred within each individual state throughout the period under review. The analysis accounts for the level of economic development and common temporal factors.

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Introduction. Healthcare financing is a key element of national economic and social development. The level of expenditure depends on a country's economic capacity, its demographic structure, current healthcare needs, and the organization of its medical care system. At the same time, an increase in spending may reflect not only an expansion in the volume of medical services provided but also rising treatment costs or shifting needs within the population.

In international comparisons, the share of gross domestic product (GDP) is the standard metric used to gauge healthcare expenditure. Because this share is a function of both total healthcare spending and the size of the GDP, a change in either component can alter the indicator—even if the actual volume of medical services remains constant. Furthermore, this metric offers no insight into how resources are allocated or whether their use effectively improves health outcomes. Consequently, when examining the relationship between the share of healthcare spending and life expectancy, it is essential to account for other factors related to a nation's economic development.

Higher average healthcare spending may correlate with longer life expectancy in countries that enjoy favorable economic conditions or possess more mature institutional frameworks. However, differences between countries and changes occurring within individual nations represent distinct sources of statistical variation. This raises an important question: to what extent can statistical patterns identified through cross-country comparisons be applied to processes unfolding within specific national economies? In this context, the experience of the former Soviet republics is particularly instructive. Despite sharing common institutional origins, these countries have followed divergent paths regarding economic transformation, the development of healthcare financing systems, and demographic trends. The purpose of this study is to examine the relationship between healthcare expenditure and life expectancy across 15 post-Soviet countries from 2000 to 2023, while distinguishing between cross-country differences and the dynamics observed within individual states.

Literature review. The complexity of investigating the relationship between healthcare funding and life expectancy lies in the fact that the volume of expenditure reflects the financial conditions under which medical services are provided, whereas life expectancy is the cumulative outcome of a multitude of economic, demographic, and social processes. A significant starting point for understanding this distinction is the work of Preston [1], who concluded that the relationship between national income and life expectancy does not remain constant across different historical periods.

For the purposes of this article, research concerning the post-Soviet space is of particular interest. Semenova et al. [2] analyzed the historical development of healthcare in nine former Soviet republics, identifying a variety of reforms and financing mechanisms that emerged during the transition period. They also found that countries with comparable total expenditure levels can differ significantly in terms of the sources used to fund medical services—a variation they attribute to how financial responsibility is distributed between state institutions and households. The demographic dimension of regional differentiation is addressed by Tleshova et al. [3], who analyzed long-term disparities in life expectancy across groups of countries within the WHO European Region, including former Soviet republics. The authors concluded that differences in mortality patterns cannot be explained solely by the shared historical background of these nations.

A substantial body of research focuses on the economic factors associated with life expectancy in Eastern European countries. For instance, Tsarke et al. [4] examined panel data from 13 countries and identified a positive statistical correlation between healthcare expenditure



and life expectancy. A study by Niki et al. [5] approaches the issue from a slightly different perspective, employing methods to analyze long-term relationships while accounting for the interdependence of observations across countries. The article in question examines healthcare expenditures within the context of various economic, environmental, and institutional factors. Gracia-de-Rentería et al. [6] analyzed the spatial patterns of life expectancy in European countries and identified "spillover" effects that extend beyond national borders. These studies focus on different aspects of the relationship under consideration; therefore, their results cannot be compared with one another. This is attributable to differences in the econometric models employed, the territorial coverage of observations and the economic characteristics accompanying healthcare expenditure.

The results obtained by Park et al. [7] for OECD countries indicated the absence of a statistically significant relationship between healthcare expenditure and life expectancy. At the same time, according to their findings, healthcare expenditure contributes to reducing mortality, while social expenditure demonstrates a positive association with life expectancy. In a study of OECD countries conducted by Roffia et al. [8], it was demonstrated that the nature of the relationship between expenditure and life expectancy may vary at different levels of healthcare financing. Quite different conclusions were obtained in the work of Karma [9], according to which healthcare expenditure does not in all cases serve as a statistically significant predictor of life expectancy among the countries examined.

In the post-Soviet region, empirical studies have predominantly focused on individual national economies or territorial units. Thus, Kossova et al. [10], using data from Russian regions, examine healthcare expenditure in relation to socioeconomic and behavioural characteristics influencing population health. A distinctive feature of this approach is that financial indicators are analysed alongside other conditions shaping demographic outcomes rather than being regarded as an independent and sole explanatory factor. With reference to Kazakhstan, Giyasova et al. [11] investigate the relationship between healthcare expenditure and life expectancy using the Granger causality testing approach. The findings are of interest for the analysis of temporal statistical relationships; however, the identification of a predictive relationship should not be equated with proof of a causal effect of healthcare financing on life expectancy. Both studies make a contribution to the examination of population health in individual post-Soviet states. Nevertheless, differences in methodological approaches and the territorial scope of the analysis do not make it possible to establish directly whether relationships identified through comparisons of average national indicators correspond to those arising from changes within the entire group of former Soviet republics.

Of particular interest for the present investigation is the work of Grasu et al. [12], in which life expectancy in European Union countries is examined using panel specifications that distinguish between persistent differences among countries and variation occurring within them over time. The results indicate a positive assessment of the relationship in question between the countries. At the same time, the findings show no statistically significant relationship within the individual countries. It can therefore be concluded that a relationship identified through a comparison of national systems may lose its statistical properties if the analysis is restricted to examining changes occurring within those systems. The methodological distinction corresponds closely to the problem addressed in the present research. At the same time, the economic and institutional characteristics of European Union member states cannot be regarded as representative of the entire post-Soviet region.

The scientific publications reviewed provide sufficient grounds for interpreting the relationship between healthcare expenditure and life expectancy as a conditional statistical association, the interpretation of which depends on the structure of the data employed and the



particular characteristics of national development. Differences in the methods used to measure healthcare financing, the selection of demographic indicators and the inclusion of economic or institutional characteristics lead to varying results in empirical studies. Equally important is the distinction between relationships established through between-country comparisons and those identified through changes occurring within individual states. Although this problem has been considered in studies of European countries, its specific characteristics for the entire group of 15 post-Soviet states remain insufficiently examined within a unified panel model.

Materials and methods. The empirical foundation of the present investigation is formed by annual statistical observations covering 15 countries of the former Soviet Union over the period 2000–2023. The countries included in the analysis are Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, the Kyrgyz Republic, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan. The statistical information was obtained from the World Development Indicators (WDI) database [13], which provides internationally comparable data for the countries under consideration. The indicators characterising healthcare expenditure originate from the World Health Organization's Global Health Expenditure Database and are incorporated into the WDI statistical series. Government effectiveness data were obtained from the World Bank's Worldwide Governance Indicators (WGI) database [17].

The observation period comprises 24 years, which, given the number of countries examined, would provide 360 country-year observations in a complete panel. The actual dataset contains 358 observations. This difference is attributable to the absence of current healthcare expenditure data for Ukraine in 2022 and 2023 in the statistical series employed. The missing values were retained as gaps in the dataset, without recourse to interpolation or imputation. Thus, the analysis is based on the available annual observations rather than on an artificially completed sequence of expenditure indicators.

As the principal measure of population health, life expectancy at birth, expressed in years, was selected as the dependent variable. Current health expenditure (CHE), calculated as a percentage of gross domestic product, serves as the main explanatory indicator. Differences in the economic conditions of the countries are taken into consideration through GDP per capita at purchasing power parity, expressed in constant 2021 international dollars. To determine whether the identified patterns extend to indicators beyond life expectancy, the analysis also examines premature mortality from non-communicable diseases and mortality among children under the age of five. A summary of the variables, their units of measurement, and the corresponding data sources is presented in Table 1.

The 20-year lag of the old-age dependency ratio corresponds to the historical values of this indicator for 1980–2003, matched by country to observations for 2000–2023. The source of the historical series is WDI (SP.POP.DPND.OL). The observation period of the dependent variable remains unchanged.

For econometric estimation, current health expenditure (CHE), originally expressed as a percentage of GDP, is converted into a proportion and transformed using the natural logarithm, $\ln(\text{CHE}/100)$. GDP per capita is likewise represented in logarithmic form. The adopted transformations permit proportional differences in the explanatory variables to be related to variations in life expectancy, measured in years. At the initial stage, descriptive measures are employed to characterise the distribution of the principal indicators and the extent to which their variation reflects differences among national averages or changes occurring within individual countries.

**Table 1** – Definitions, sources and measurement of study variables

Variable	Source / indicator code	Measurement and role
Life expectancy at birth (LE)	WDI: SP.DYN.LE00.IN	Years; dependent variable
Current health expenditure (CHE)	WDI: SH.XPD.CHEX.GD.ZS	% of GDP; principal explanatory variable; $\ln(\text{CHE}/100)$
GDP per capita, PPP	WDI: NY.GDP.PCAP.PP.KD	Constant 2021 international dollars; logarithmic income control
Old-age dependency ratio	WDI: SP.POP.DPND.OL	Persons aged 65+ per 100 persons aged 15–64; demographic sensitivity variable
Domestic general government health expenditure (GHED)	WDI: SH.XPD.GHED.GD.ZS	% of GDP; alternative public-financing measure
Out-of-pocket expenditure (OOP)	WDI: SH.XPD.OOPC.CH.ZS	% of current health expenditure; financing-composition measure
Total natural-resource rents	WDI: NY.GDP.TOTL.RT.ZS	% of GDP; additional country characteristic (S7)
Government effectiveness	WGI: GE.EST	Worldwide Governance Indicators estimate; institutional characteristic (S7)
Premature NCD mortality, ages 30–70	WDI: SH.DYN.NCOM.ZS	Probability of death from four major noncommunicable disease groups (%); alternative outcome (S8)
Under-five mortality	WDI: SH.DYN.MORT	Deaths per 1,000 live births; logged alternative outcome (S8)
Notes: 1) Compiled by the authors; 2) WDI = World Development Indicators, WGI = Worldwide Governance Indicators, NCD = noncommunicable diseases; 3) Healthcare expenditure data originate from the WHO Global Health Expenditure Database.		

The decomposition of the explanatory variables follows the approach developed by Mundlak [14,15]. For each country, the mean of a time-varying regressor is calculated over the available annual observations, after which the deviation of each observed value from the corresponding mean is determined. In the baseline equation, this procedure is applied to the logarithmic indicators of healthcare expenditure and GDP per capita. Their country-specific averages represent the between-country component, whereas deviations from these averages describe variation within national economies over the observation period. Year fixed effects are additionally introduced to account for influences common to the countries in particular years. The resulting model takes the following form:

$$LE_{it} = \alpha + \beta_W(h_{it} - \bar{h}_i) + \beta_B\bar{h}_i + \gamma_W(g_{it} - \bar{g}_i) + \gamma_B\bar{g}_i + \lambda_t + \varepsilon_{it} \quad (1)$$

LE_{it} – life expectancy at birth (years) in country i and year t ;

$h_{it} = \ln(\text{CHE}_{it}/100)$ – natural logarithm of current healthcare expenditure as a proportion of GDP, where **CHE** is originally reported as a percentage of GDP;

$g_{it} = \ln(\text{GDPpc}_{it})$ – natural logarithm of GDP per capita at purchasing power parity (PPP), measured in constant 2021 international dollars;



$\bar{h}_i$ and $\bar{g}_i$ – country-specific means of the transformed variables, calculated over the available country-year observations;

$h_{it} - \bar{h}_i$ and $g_{it} - \bar{g}_i$ – within-country deviations from the corresponding country mean;

β_W and γ_W – within-country coefficients for healthcare expenditure and GDP per capita, respectively;

β_B and γ_B – between-country coefficients for healthcare expenditure and GDP per capita, respectively;

λ_t – year fixed effects shared across countries;

α – model intercept;

ε_{it} – regression error term.

The within-country parameter (β_W) characterises the conditional association of life expectancy with deviations of logarithmic healthcare expenditure from its national mean, whereas the between-country parameter (β_B) reflects differences among country-specific averages. The latter cannot be regarded as an estimate of the change in longevity that would follow an increase in healthcare expenditure within a particular country.

Estimation is carried out by ordinary least squares (OLS), with standard errors clustered at the country level. Under the adopted logarithmic specification, a proportional increase of 10% in the healthcare expenditure share corresponds to $\beta \times \ln(1.10)$ years in the fitted relationship. Here, β denotes the coefficient associated with the relevant component of expenditure. The hypothesis that the within-country and between-country coefficients are equal is examined by a separate statistical test.

Since the panel sample comprises only 15 country clusters, conventional cluster-robust inference is supplemented by a restricted wild cluster bootstrap procedure employing Webb weights and 99,999 replications [16].

The robustness checks (S1–S6) examine the exclusion of countries, regional groups and selected periods, as well as lagged healthcare expenditure and nonoverlapping multi-year changes. Natural-resource rents and government effectiveness are subsequently considered using a common sample of 313 country-year observations (S7). Compared with the baseline sample of 358 observations, 30 observations are excluded because natural-resource rent data are unavailable, and another 15 observations are excluded because government effectiveness estimates are unavailable for 2001. In addition, specification S8 examines premature mortality from noncommunicable diseases and mortality among children under five years of age as alternative outcome indicators.

Results and Discussion. The principal statistical characteristics of the variables observed in the 15 post-Soviet countries during 2000–2023 are presented in Table 2. In addition to the mean values and overall standard deviations, the table reports separate measures of variation between countries and within individual countries over time.

For the countries included in the analysis, average life expectancy amounts to 70.91 years, while current healthcare expenditure represents 6.06% of GDP. The variation in longevity is distributed almost equally between differences in national averages and changes observed within individual countries, with corresponding standard deviations of 2.21 and 2.16 years. A different pattern is characteristic of healthcare expenditure, for which the dispersion of country-specific averages exceeds the variation recorded over time within national economies. The estimated coefficients and the results of statistical significance tests are presented in Table 3.

**Table 2** - Descriptive statistics, 2000-2023

Variable	N	Mean	SD	Between-country SD	Within-country SD	Min.	Max.
Life expectancy, years	358	70.91	3.05	2.21	2.16	63.54	78.79
CHE, % of GDP	358	6.06	1.91	1.59	1.12	1.99	13.68
GHED, % of GDP	358	2.81	1.35	1.26	0.57	0.55	6.52
OOP, % of CHE	358	48.12	18.31	17.88	5.86	16.01	84.79
GDP per capita, PPP, thousand 2021 international \$	358	17.77	11.40	10.50	5.12	1.37	46.64
Old-age dependency, %	358	16.48	8.05	8.04	2.03	4.86	33.87
ln(CHE/100)	358	-2.855	0.333	0.289	0.180	-3.915	-1.989

Notes: 1) Authors' calculations based on WDI [13]; 2) SD = standard deviation; between-country and within-country SD refer to the variation in country means and deviations from country means, respectively.

Table 3 - Associations between health expenditure and life expectancy at birth

Variable	(1) Baseline	(2) + OOP	(3) + old-age dependency, t	(4) + old-age dependency, t-20	(5) GHED	(6) GHED + OOP
Health spending, within countries	-0.846 (0.889)	-0.892 (0.774)	-1.005 (0.827)	-0.581 (0.748)	-0.670 (0.439)	-0.990 (0.865)
p	0.357	0.268	0.244	0.450	0.149	0.272
Health spending, between countries	3.949 (1.454)	4.011 (1.227)	-0.684 (4.282)	4.039 (2.946)	0.918 (1.022)	3.999 (1.382)
p	0.017	0.006	0.875	0.192	0.384	0.012
p (bootstrap)	0.031	0.049	0.903	0.618	0.400	0.069
Log GDP per capita, between countries	1.703 (0.506)	2.051 (0.567)	-0.810 (1.820)	1.752 (1.270)	1.158 (0.599)	2.133 (0.598)
Additional variable, between countries	-	0.021 (0.030)	0.282 (0.199)	-0.009 (0.226)	-	0.128 (0.049)
p ($\beta_W = \beta_B$), bootstrap	0.071	0.036	0.963	0.529	0.232	0.104
R ²	0.692	0.699	0.743	0.698	0.579	0.672
N / G	358 / 15	358 / 15	358 / 15	358 / 15	358 / 15	358 / 15

Notes: 1) Authors' estimates based on WDI [13]; 2) Country-clustered standard errors are reported in parentheses; 3) The additional between-country variable is OOP in models (2) and (6), the current old-age dependency ratio in model (3), and its 20-year lag in model. CHE is used in models (1)–(4), and GHED in models (5)–(6); 4) All models include year fixed effects.

The estimates reported in Table 3 reveal a positive relationship between the average share of healthcare expenditure in GDP and life expectancy across the countries under consideration. In quantitative terms, a 10% increase in the share of expenditure corresponds to approximately 0.38 years of additional life expectancy when comparing countries, while accounting for specific economic and temporal factors.

An analysis of the relationship based on deviations from country-specific means yielded the following results. The within-country coefficient is negative and fails to reach statistical significance; furthermore, a formal test showed no significant difference between the two expenditure coefficients in the baseline model. However, in a model specification that includes out-of-pocket expenditure (paid directly by households), the difference is statistically significant ($p = 0.036$). Since this result is not consistently replicated across other specifications, it is not



appropriate to claim the existence of systematic differences between cross-country and within-country relationships.

As shown in Figure 1, there are notable disparities in life expectancy even among countries with relatively similar average shares of healthcare expenditure as a percentage of GDP. The observed relationship remains positive after adjusting for GDP per capita. The slope coefficient derived from the graphical comparison is approximately 3.89, compared to 3.949 in the baseline hybrid specification.

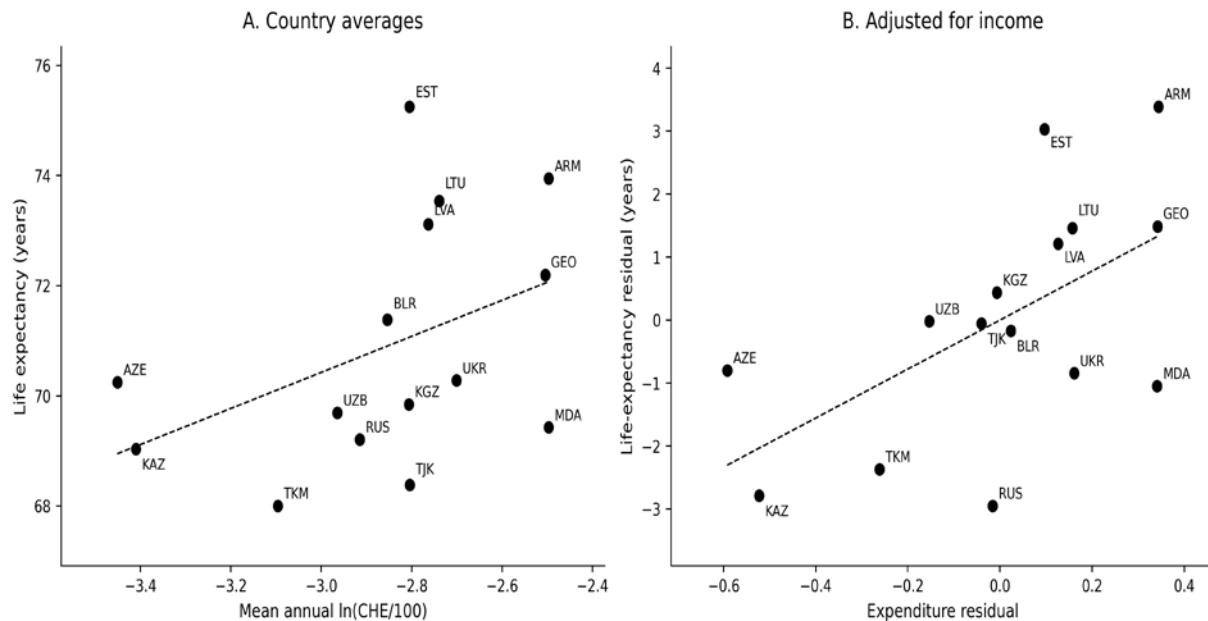


Figure 1 – Between-country association between healthcare expenditure and life expectancy, 2000-2023

Note: Authors' calculations based on World Development Indicators

A robustness check involving variations in the sample composition demonstrated that excluding individual countries does not alter the positive sign of the cross-country coefficient. Excluding the Baltic states reduces its statistical significance (wild-bootstrap $p = 0.113$), while excluding Central Asian nations increases the p -value to 0.270. Excluding 2020–2021 or Ukraine entirely produces estimates close to those obtained in the baseline specification.

Incorporating additional demographic characteristics also alters the cross-country estimates. The current old-age dependency ratio has the most notable impact, whereas using its historical value introduces significant uncertainty into the estimate. When out-of-pocket household payments are included, the positive sign of the coefficient for current healthcare expenditure remains; however, substituting these with government expenditure leads to a smaller coefficient and a loss of statistical significance. These differences indicate that the estimates are sensitive to the specific financing indicators and demographic characteristics selected.

An analysis of temporal relationships failed to reveal a consistent positive association within individual countries. In models with healthcare expenditure lagged by one to three years, the within-country coefficients range from -1.21 to -1.17 , with conventional p -values between 0.116 and 0.192. For nonoverlapping five-year changes, the coefficients range from -1.55 to -0.77 , while the ten-year estimate is -2.13 . Some five-year and ten-year specifications are



statistically significant under conventional country-clustered inference, but none reaches the 5% significance level under the wild cluster bootstrap. These findings may stem from the delayed impact of medical care, shifts in economic conditions, or an increase in spending in response to population needs. It is not possible to disentangle these potential explanations based on the calculations performed. The results of the robustness checks (S1–S6) are presented in Table 4.

Table 4 – Robustness checks of the expenditure–life expectancy relationship (S1–S6)

Specification	N / G	Coefficient β (SE)	Conventional p	Bootstrap p
S1: Leave-one-country-out				
All 15 exclusions, range of between-country estimates	334–336 / 14	3.211–5.200	0.004–0.070	0.009–0.083
S2: Regional exclusions				
Excluding Baltic countries	286 / 12	3.110 (1.633)	0.083	0.113
Excluding Central Asian countries	238 / 10	2.925 (1.366)	0.061	0.270
S3: Exclusion of observation periods				
Excluding 2020–2021	328 / 15	3.865 (1.532)	0.024	0.032
S4: Exclusion of Ukraine				
Excluding Ukraine entirely	336 / 14	4.112 (1.501)	0.017	0.032
S5: Lagged healthcare expenditure				
One-year lag, within-country coefficient	343 / 15	–1.174 (0.856)	0.192	0.233
Two-year lag, within-country coefficient	328 / 15	–1.167 (0.771)	0.152	0.193
Three-year lag, within-country coefficient	313 / 15	–1.213 (0.724)	0.116	0.149
S6: Nonoverlapping multi-year changes				
Five-year changes, starting in 2000	60 / 15	–1.269 (0.605)	0.054	0.092
Five-year changes, starting in 2001	60 / 15	–1.552 (0.732)	0.052	0.141
Five-year changes, starting in 2002	59 / 15	–1.060 (0.440)	0.030	0.054
Five-year changes, starting in 2003	59 / 15	–0.769 (0.583)	0.209	0.230
Ten-year changes, starting in 2000	30 / 15	–2.127 (0.835)	0.023	0.066
Notes: 1) Authors' calculations based on WDI [13]; 2) N/G = observations/country clusters; 3) parentheses show clustered standard errors; 4) S1 summarizes 15 country exclusions; 5) Bootstrap p-values use wild cluster bootstrap with Webb weights.				

Table 5 presents the extended specifications (S7) and the results for alternative health outcomes (S8).

Table 5 – Extended specifications and alternative health outcomes

Specification / outcome	N	Between β (SE)	Conventional p	Bootstrap p
S7: CHE, common sample	313	3.785 (1.361)	0.015	0.035
S7: + natural-resource rents	313	0.913 (2.570)	0.728	0.742
S7: + government effectiveness	313	1.273 (1.307)	0.347	0.399
S7: + rents and effectiveness	313	1.092 (2.102)	0.612	0.670
S8: life expectancy, 2000–2021	330	3.982 (1.444)	0.015	0.032
S8: premature NCD mortality	330	–4.694 (2.891)	0.127	0.126
S8: ln(under-five mortality)	330	–1.166 (0.268)	0.001	0.101
Notes: 1) Authors' calculations based on WDI [13] and WGI [17]; 2) Country-clustered standard errors are reported in parentheses.				



As we can see, for the full sample of 313 observations, the cross-country coefficient in the baseline specification is 3.785. When natural resource rents are included, this figure drops to 0.913; when the effectiveness of public administration is taken into account, it becomes 1.273. Including both variables simultaneously yields a coefficient of 1.092. Most importantly, in none of the extended specifications does the statistical significance persist.

In the analysis of premature mortality from non-communicable diseases, the cross-country coefficient is -4.694 , while for the logarithm of the under-five mortality rate, it is -1.166 . The latter estimate is statistically significant when using standard clustered standard errors ($p = 0.001$), but not when applying the wild cluster bootstrap ($p = 0.101$). The differences in these estimates also stem from the choice of financing indicator. Public expenditure and out-of-pocket household payments represent different facets of healthcare financing; therefore, coefficients derived from them cannot be viewed as equivalent measures of the sector's performance.

A primary statistical limitation of this study is the small number of countries, which reduces the precision of cross-country estimates, even given the long observation period. Furthermore, life expectancy is influenced by economic, demographic, and institutional conditions that are not fully captured in the model. The possibility of a reverse causal relationship – between the population's health status and healthcare spending – cannot be ruled out either.

Conclusion. An analysis of the relationship between healthcare expenditure and life expectancy across 15 post-Soviet countries from 2000 to 2023 leads to the following findings:

1. The baseline model reveals a positive, statistically significant cross-country association between the share of healthcare expenditure in GDP and life expectancy. A 10% higher share of expenditure is associated with an increase in life expectancy of approximately 0.38 years. While a positive within-country relationship is not statistically confirmed, the difference between the two coefficients also fails to reach statistical significance at the 5% level.

2. Cross-country estimates are highly sensitive to the economic, demographic, and institutional characteristics of the states. When natural resource rents and the effectiveness of public administration are included in the model, the expenditure coefficient decreases and loses its statistical significance. Consequently, the relationship identified in the baseline model does not hold across all the specifications examined.

3. The use of different healthcare financing indicators in examining changes in life expectancy produces different estimates, while the analysis of alternative mortality indicators does not provide statistically robust confirmation of the baseline result. In this connection, the use of healthcare expenditure as a share of GDP as an independent indicator of the performance of national healthcare systems is limited.

The practical significance of the research findings is determined by the possibility of their use by government authorities and analytical organisations in conducting comparative assessments of healthcare financing and developing a system of indicators for monitoring the sector. Prospects for further research are associated with expanding the range of indicators analysed to include characteristics of healthcare accessibility, the allocation of financial resources and the effectiveness of medical services.

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ПОСТКЕҢЕСТІК ЕЛДЕРДЕГІ ДЕНСАУЛЫҚ САҚТАУ ШЫҒЫСТАРЫ МЕН КҮТІЛЕТІН ӨМІР СҰРУ ҰЗАҚТЫҒЫ АРАСЫНДАҒЫ ӨЗАРА БАЙЛАНЫСТЫ ТАЛДАУ

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Түйін. Мақала посткеңестік елдердегі денсаулық сақтау шығыстары мен халықтың күтілетін өмір сүру ұзақтығы арасындағы өзара байланысты осы мемлекеттердің экономикалық және институционалдық даму жағдайларындағы айырмашылықтарды ескере отырып зерттеуге арналған. Зерттеудің мақсаты денсаулық сақтауды қаржыландыру мен өмір сүру ұзақтығы арасындағы статистикалық байланыстың еларалық және ел ішіндегі деңгейлердегі ерекшеліктерін анықтау болып табылады. Зерттеудің ақпараттық негізін Дүниежүзілік банктің 2000–2023 жылдар аралығындағы посткеңестік 15 мемлекет бойынша 358 бақылауды қамтитын деректері құрады. Жұмыста сипаттамалық статистика әдістері және елдер арасындағы айырмашылықтарды, сондай-ақ жекелеген мемлекеттердегі зерттелетін көрсеткіштердің уақыт бойынша өзгерістерін бөлек бағалауға мүмкіндік беретін Мундлактың гибриді моделіне негізделген панельдік эконометриялық талдау қолданылды.



Базалық модель нәтижелері денсаулық сақтау шығыстарының жалпы ішкі өнімдегі үлесі мен халықтың күтілетін өмір сүру ұзақтығы арасында еларалық деңгейде оң және статистикалық тұрғыдан мәнді байланыс бар екенін көрсетеді, алайда бұл байланыстың статистикалық мәнділігі модельдің таңдалған спецификациясына тәуелді. Зерттеудің ғылыми маңыздылығы посткеңестік мемлекеттердегі демографиялық нәтижелерді салыстырмалы талдау барысында денсаулық сақтауды қаржыландыру көрсеткіштерін қолдану мүмкіндіктері мен шектеулерін нақтылаудан көрінеді. Алынған тұжырымдардың практикалық маңызы ұлттық денсаулық сақтау жүйелерін бағалау кезінде қаржыландыру құрылымын, экономикалық жағдайларды және халық денсаулығының көрсеткіштерін кешенді түрде ескеру қажеттілігімен айқындалады. Болашақ зерттеулердің бағыттары медициналық көмектің қолжетімділігін, қаржы ресурстарын бөлу ерекшеліктерін және көрсетілетін медициналық қызметтердің нәтижелілігін зерделеумен байланысты.

Түйінді сөздер: денсаулық сақтау шығыстары, күтілетін өмір сүру ұзақтығы, посткеңестік елдер, панельдік деректер, еларалық және ел ішіндегі талдау, денсаулық сақтауды қаржыландыру.

АНАЛИЗ ВЗАИМОСВЯЗИ РАСХОДОВ НА ЗДРАВООХРАНЕНИЕ И ОЖИДАЕМОЙ ПРОДОЛЖИТЕЛЬНОСТИ ЖИЗНИ В ПОСТСОВЕТСКИХ СТРАНАХ

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Резюме. Статья посвящена исследованию взаимосвязи между расходами на здравоохранение и ожидаемой продолжительностью жизни населения в постсоветских странах с учётом различий в экономических и институциональных условиях их развития. Цель исследования заключается в выявлении особенностей статистической связи между финансированием здравоохранения и продолжительностью жизни на межстрановом и внутривнутристрановом уровнях. Информационную основу исследования составили данные Всемирного банка по 15 постсоветским государствам за 2000–2023 годы, включающие 358 наблюдений. В работе применены методы описательной статистики и панельного эконометрического анализа на основе гибридной модели Мундлака, позволяющей раздельно оценить межстрановые различия и изменения исследуемых показателей внутри стран во времени. В базовой модели установлена положительная статистически значимая межстрановая связь между долей расходов на здравоохранение в ВВП и ожидаемой продолжительностью жизни, однако её статистическая значимость зависит от выбранной спецификации модели. Научная значимость исследования состоит в уточнении возможностей и ограничений применения показателей финансирования здравоохранения при сравнительном анализе демографических результатов в постсоветских государствах. Практическая значимость полученных выводов определяется необходимостью комплексного учёта структуры финансирования, экономических условий и показателей здоровья населения при оценке национальных систем здравоохранения. Перспективы дальнейших исследований связаны с изучением доступности медицинской помощи, особенностей распределения финансовых ресурсов и результативности предоставляемых медицинских услуг.

Ключевые слова: расходы на здравоохранение, ожидаемая продолжительность жизни, постсоветские страны, панельные данные, межстрановой и внутривнутристрановой анализ, финансирование здравоохранения.

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