

EFFICIENCY OF HEALTHCARE EXPENDITURE IN THE PRE-PANDEMIC AND PANDEMIC PERIODS

Alina Vysochyna,  <https://orcid.org/0000-0001-9490-1026>

Ph.D, Sumy State University, Ukraine

Aleksy Kwilinski, <https://orcid.org/0000-0001-6318-4001>

The London Academy of Science and Business, 120 Baker St., London W1U 6TU, UK

Department of Management, Faculty of Applied Sciences, WSB University, 41-300 Dabrowa Gornicza, Poland

Corresponding author: Alina Vysochyna, a.vysochyna@uabs.sumdu.edu.ua

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Abstract: *Via bibliometric analysis, the research identifies the contextual vectors of the healthcare financial provision effectiveness. Moreover, we broaden the empirical substantiation of panel data regression modelling for 34 European countries. In particular, we define performance of public (budgetary) and private financing to reduce the mortality rate and raise life expectancy in pre-pandemic and pandemic periods. The systematization of existing literature sources and approaches to solving the problem is implemented by means of bibliometric and monographic analysis. Consequently, there are 6 contextual clusters of scientific research on determining the healthcare financial provision effectiveness in the modern science. Within the analysed works, researchers mainly study general prerequisites of the healthcare financial provision effectiveness. The optimal cost formation of medical services for diagnosing and treating diseases is reproduced as well. The issue urgency consists in analysing the efficient patterns of spending various funds to decrease the mortality rate and increase life expectancy in the pre-pandemic and pandemic periods. Subsequently, we detect some general parameters of healthcare resistance to counter shocks similar to the COVID-19 pandemic. In this paper, we show statistical analysis of mortality indexes (total and COVID-19). Among 34 European countries, the highest and lowest efficiency levels were identified within these parameters. The study empirical block constructs 8 regression models on panel data. They differ in dependent (mortality rate or life expectancy) or independent variables (block 1: current and capital healthcare expenditures in GDP; block 2: current healthcare expenditures), and modelling period (pre-pandemic – 2000-2019, pandemic– 2020-2022 or the current period). The modelling results represent financial drivers and change inhibitors of the mortality rate and life expectancy during the pandemic and pre-pandemic periods. Therefore, we established the most effective groups of healthcare expenditures, which is based on the country epidemiological situation. The obtained results can be useful for scientists, representatives of state and local authorities.*

Keywords: COVID-19; efficiency; healthcare expenditure; life expectancy; mortality rate.

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Introduction. The coronavirus pandemic (COVID-19) launched some fundamental transformational processes to absorb the destructive disease impact on various parameters of the socio-economic life and health. Theory and practice require determining the empirical prerequisites and causal dependencies of healthcare expenditure influence on the mortality rate and life expectancy.

Therefore, we may formalize certain affecting patterns in the pre-pandemic and pandemic periods. They can also be compared to define changes in the healthcare financial provision effectiveness.

Via bibliometric analysis, the research identifies the contextual vectors of the healthcare financial provision effectiveness. Moreover, we broaden the empirical substantiation of panel data regression modelling for 34 European countries. In particular, we define performance of public (budgetary) and private financing to reduce the mortality rate and raise life expectancy in pre-pandemic and pandemic periods.

Literature Review. The first research step is bibliometric analysis of efficient healthcare funding to set main directions of its study. Here, Scopus publications should be involved (Scopus, 2023). We apply the search query TITLE-ABS-KEY (“healthcare expenditure” OR “health care expenditure” AND efficiency OR effectiveness).

A sample of 1,198 Scopus search hits was generated. The dynamics of publication activity is show at Figure 1.

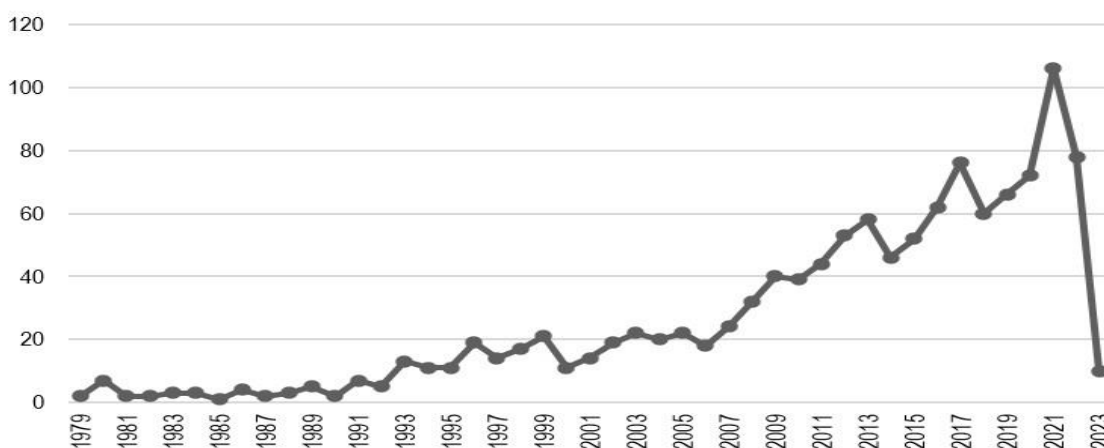


Figure 1. Scopus publication dynamics for efficiency of healthcare expenditure

Sources: developed by the author on the basis of (Scopus, 2023).

According to Figure 1, the publication activity covers 1979-2023. Visually, there are several publication shifts:

- 1) 1979-1992 – emergence of research on the topic (annually, 3-4 published publications);
- 2) 1993-2006 – moderate publication growth (annually, 16-17 published publications);
- 3) 2007-2023 – sharp publication rise (annually, 54 published publications; the highest intensity in 2013, 2017 and 2021).

The maximal annual publication rate (106 articles) was recorded during the COVID-19 pandemic.

Geographically, the research rates of the analysed topic are represented at Figure 2.

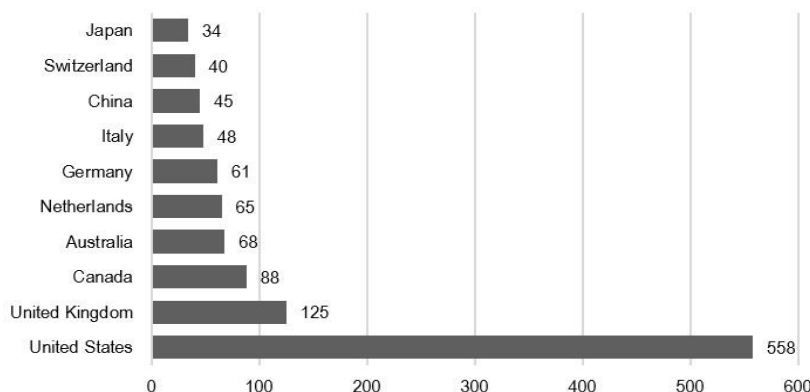


Figure 2. TOP-10 countries with the largest amount of Scopus publications on healthcare expenditure

Sources: developed by the author on the basis of (Scopus, 2023).

According to Figure 2, the highest publishing rate on healthcare financing effectiveness is traced in the USA, the United Kingdom and Canada. There are moderate publications in Australia, the Netherlands and Germany. The lowest values concern Italy, China, Switzerland and Japan.

To determine the contextual relationships within Scopus publications (Scopus, 2023), in which such concepts as «healthcare expenditure», «efficiency» or «effectiveness» are mentioned, we initiated the bibliometric analysis. We processed 1,198 publications via the VOSviewer v.1.6.17 toolkit (VOSviewer, 2023).

The bibliometric analysis results are shown at Figure 3.

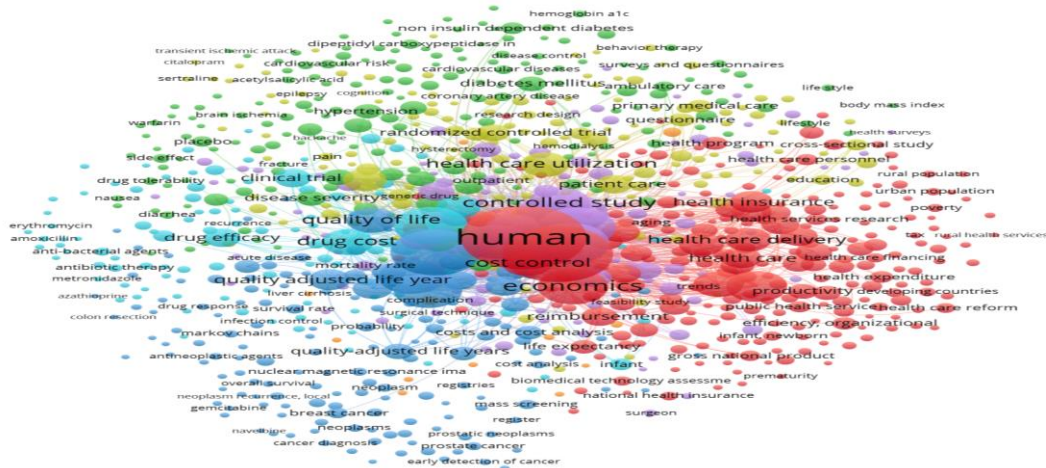


Figure 3. Network visualisation of co-occurrence of key words in Scopus publications on healthcare expenditure efficiency

Sources: developed by the author on the basis of (Scopus, 2023; VOSviewer, 2023).

Figure 3 lets us single out the following clusters of scientific research:

- Red cluster (245 items) – relationships between health care expenditures and economic, socio-demographic, gender, urban and organizational determinants;
- Green cluster (188 items) – evaluation of medical service costs to treat diseases;
- Blue cluster (154 items) – assessment of medical service costs to diagnose and treat cancer;
- Yellow cluster (142 items) – financial provision to treat mental illnesses (including various addictions: alcohol, narcotic, etc);
- Purple cluster (108 items) – patients' hospitalisation costs as to age; emergency medical care provision;
- Turquoise cluster (107 items) – medical service costs to diagnose and treat infections or viruses (including COVID-19).

To secure the in-depth analysis of healthcare financing effectiveness, it is reasonable to read the TOP-10 most cited Scopus publications (Scopus, 2023) on the specified topic. Their full description is given in Table 1.

Table 1. The TOP-10 most cited Scopus publications on healthcare expenditure efficiency

Nº	Document title	Authors	Year	Source	Cited by
1	Forecasting the impact of heart failure in the United States: A policy statement from the American heart association	Heidenreich, P.A., Albert, N.M., Allen, L.A., (...), Piña, I.L., Trogon, J.G.	2013	Circulation: Heart Failure, 6(3), pp. 606-619	1819
2	Economic costs of diabetes in the U.S. in 2002	Hogan, P., Dall, T., Nikolov, P.	2003	Diabetes Care, 26(3), pp 917-932	1368
3	Principles of educational outreach ("academic detailing") to improve clinical decision making	Soumerai, S.B., Avorn, J.	1990	JAMA: The Journal of the American Medical Association, 263(4), pp. 549-556	924

Continued Table 1

No	Document title	Authors	Year	Source	Cited by
4	Association between palliative care and patient and caregiver outcomes: A systematic review and meta-analysis	Kavalieratos, D., Corbelli, J., Zhang, D., (...), Heller, L., Schenker, Y.	2016	JAMA - Journal of the American Medical Association, 316(20), pp. 2104-2114	579
5	Tackling of unhealthy diets, physical inactivity, and obesity: Health effects and cost-effectiveness	Cecchini, M., Sassi, F., Lauer, J.A., (...), Guajardo-Barron, V., Chisholm, D.	2010	The Lancet, 376(9754), pp. 1775-1784	572
6	Fractures attributable to osteoporosis: Report from the national osteoporosis foundation	Melton III, L.J., Thamer, M., Ray, N.F., (...), Silverman, S.L., Siris, E.S.	1997	Journal of Bone and Mineral Research, 12(1), pp. 16-23	466
7	Oral versus initial intravenous therapy for urinary tract infections in young febrile children	Hoberman, A., Wald, E.R., Hickey, R.W., (...), Ruley, J., Janosky, J.E.	1999	Pediatrics, 104(1 I), pp. 79-86	399
8	The costs of asthma	Barnes, P.J., Jonsson, B., Klim, J.B.	1996	European Respiratory Journal, 9(4), pp. 636-642	393
9	Cost-of-illness of neck pain in the Netherlands in 1996	Borghouts, J.A.J., Koes, B.W., Vondeling, H., Bouter, L.M.	1999	Pain, 80(3), pp. 629-636	331
10	What it will take to achieve the as-yet-unfulfilled promises of health information technology	Kellermann, A.L., Jones, S.S.	2013	Health Affairs, 32(1), pp. 63-68	307

Sources: developed by the author on the basis of (Scopus, 2023).

The above-mentioned papers can be combined into the following research blocks:

- Treatment cost effectiveness for specific diseases: diabetes (Hogan et al., 2003), asthma (Barnes et al., 1996), neck pain (Borghouts et al., 1999);
- New treatment methods for specific diseases: heart illnesses (Heidenreich et al., 2013), osteoporosis (Melton et al., 1997), urinary problems (Hoberman et al., 1999);
- Educational roles in clinical decision-making (Soumerai and Avorn, 1990), information in health care (Kellermann and Jones, 2013);
- Efficiency of palliative and hospital treatment to optimize health care (Kavalieratos et al., 2016);
- Lifestyle impacts on health, medical system and budget (Cecchini et al., 2010).

In terms of the researched topic, it is the diagnosing and treatment cost effectiveness for specific diseases that is investigated most often. Simultaneously, the optimal financing of general hospitalization, emergency and palliative care are focused on.

Methodology and research methods. The empirical part of this study tests the hypothesis if it is more effective to resist the destructive COVID-19 impact in countries with a higher pre-pandemic financing of the healthcare system. The researched sample includes 34 European countries: Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Moldova, the Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Serbia, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Ukraine, the United Kingdom. The study period covers 2000-2022 (or the latest available observation). Independent variables characterise different features of the financial healthcare provision:

- Capital Health Expenditure (% of GDP);
- Current Health Expenditure (% of GDP);
- Domestic General Government Health Expenditure (% of Current Health Expenditure);
- Domestic Private Health Expenditure (% of Current Health Expenditure);
- External Health Expenditure (% of Current Health Expenditure);
- Out-of-Pocket Expenditure (% of Current Health Expenditure).

Dependent variables of the models are: death rate, crude (per 1,000 people) and life expectancy at birth, total (years). All indexes are selected from the collection "Health Nutrition and Population Statics" in the statistical database of the World Bank Group (World Bank DataBank, 2023).

The relationship between dependent and explanatory variables will be determined via the panel data regression models in the Stata 14.2/SE software product (Stata, 2023).

Results. Therefore, to identify the financial healthcare provision effectiveness during the pre-pandemic and pandemic periods, we should analyse dynamic indexes of the COVID-19 mortality rate. It is a ratio of two values values: total COVID-19 cases, per million, cumulative against total COVID-19 death, per million, cumulative (Worldometer, 2023). The 2020-2021 dynamics of the calculated index is represented at Figure 4.

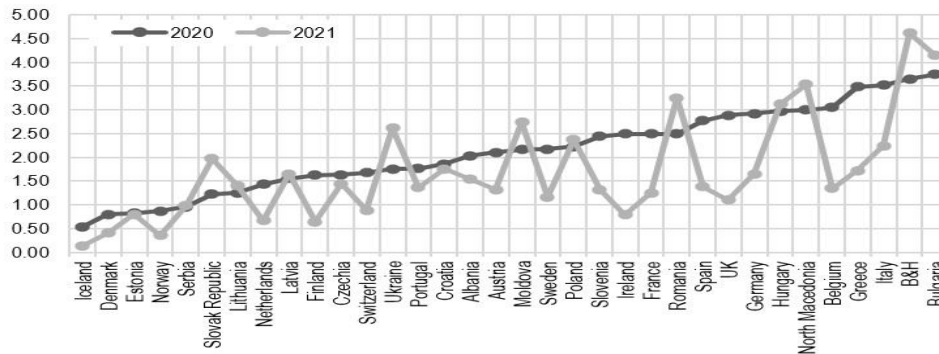


Figure 4. The COVID-19 mortality rate in 34 European countries in 2020-2021

Sources: developed by the author on the basis of (Worldometer, 2023).

According to Figure 4, it is Iceland, Denmark, Estonia, Norway and Serbia that are the TOP-5 countries with the lowest mortality rate. Here, the COVID-19 mortality rate in 2020-2021 did not exceed 1%. We may preliminarily regard the healthcare system in these states as effective to counter the destructive pandemic impact.

In contrast to 2020, most healthcare systems have adapted to pandemic challenges, which decreased the COVID-19 mortality rate in 2021. At the same time, there are also European countries with an almost twofold death rise in 2021. That concerns Slovakia (1.22% – 2020; 1.97% – 2021), Moldova (2.17% – 2020; 2.73% – 2021), Romania (2.5% – 2020; 3.25% – 2021), North Macedonia (3% – 2020; 3.54% – 2021), Bosnia and Herzegovina (3.64% – 2020; 4.61% – 2021) and Ukraine (1.75% – 2020; 2.62% – 2021). Consequently, the health care effectiveness of these countries in countering the COVID-19 impacts or other threats cannot be considered satisfactory in future.

As a part of statistical analysis, we should observe the mortality rate change in 34 European countries (Figure 5). According to these data, the 2000-2020 mortality fall was recorded in Denmark, Estonia, Iceland, Ireland, Norway and Sweden. Here, the COVID-19 mortality is low, which also confirms the healthcare efficiency in these states. Meanwhile, there was a rapid death increase for 2000-2020 in Albania, Bosnia and Herzegovina, Lithuania, North Macedonia, Poland, and Moldova. Besides, the 2019-2020 mortality during the COVID-19 period was higher than that of 2000-2020 in Great Britain, Ukraine, Switzerland, Sweden, Estonia, Denmark, the Czech Republic, Belgium and Austria. It testifies the significant destructive COVID-19 impact on healthcare. Therefore, the system needs reforming to raise its resistance to future global threats.

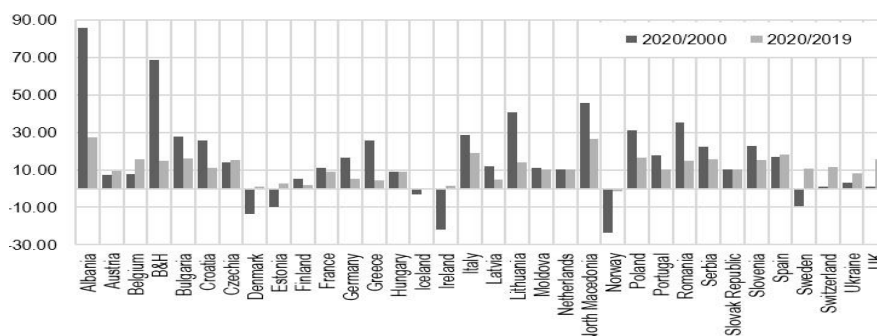


Figure 5. The death rate changes, crude (per 1,000 people) in 2000-2020 and 2019-2020 for 34 European countries

Sources: developed by the author on the basis of (Worldometer, 2023).

The next step of our research is the panel data regression modelling to determine influence of healthcare expenditures on the mortality and life expectancy shifts in the pre-pandemic and pandemic periods. We conducted a preliminary correlation analysis for multicollinearity between independent variables. Subsequently, we arranged some blocks of these variables as different models:

a) Block 1 – Capital Health Expenditure (% of GDP) and Current Health Expenditure (% of GDP);

b) Block 2 – Domestic General Government Health Expenditure (% of Current Health Expenditure), Domestic Private Health Expenditure (% of Current Health Expenditure), External Health Expenditure (% of Current Health Expenditure), Out-of-Pocket Expenditure (% of Current Health Expenditure).

Each block will be tested for causality with two dependent variables – Death Rate, crude (per 1,000 people) and Life Expectancy at birth, total (years).

At the same time, each model will be calculated for 2 time periods: pre-pandemic (2019-2000) and pandemic (2019-2022 or the last available observation period).

Totally, 8 variations of panel data regression models will be formed (Tables 2-9).

Table 2. Regression results of identifying the healthcare expenditure impact (Block 1) on death rate in the pre-pandemic period

Death	Coef.	St. Err.	t-value	p-value	95% Confidence Interval		Sig
Cur	-.1856	.0262	-7.10	0	-.2369	-.1344	***
Cap	.0668	.0968	0.69	.4899	-.1229	.2565	
Constant	11.9224	.4207	28.34	0	11.0979	12.7469	***

*** $p < .01$, ** $p < .05$, * $p < .1$

Sources: developed by the author.

Therefore, for 34 European countries in the pre-pandemic period, the impact of capital health expenditures on death rate is not statistically significant. However, a 1% current health expenditure increase (% of GDP) leads to a 0.19% mortality decrease.

Table 3. Regression results of identifying the healthcare expenditure impact (Block 2) on death rate in the pre-pandemic period

Death	Coef.	St. Err.	t-value	p-value	95% Confidence Interval		Sig
Dom_gov	-.3109	.2609	-1.19	.2335	-.8223	.2005	
Dom_prv	-.2746	.2601	-1.06	.2912	-.7845	.2353	
Ext	-.3971	.2617	-1.52	.1292	-.91	.1159	
Oops	-.0704	.0159	-4.44	0	-.1015	-.0393	***
Constant	42.1767	26.1065	1.62	.1062	-8.9911	93.3445	

*** $p < .01$, ** $p < .05$, * $p < .1$

Sources: developed by the author.

For the structure of current healthcare expenditures, Table 3 shows that only out-of-pocket expenditures have a statistically significant impact on performance. Thus, a 1% out-of-pocket expenditure increase (% of current health expenditure) causes a 0.07% mortality decrease with a 99% confidence probability. The remaining types of current health expenditures do not have a significant impact on the pre-pandemic mortality.

Table 4. Regression results of identifying the healthcare expenditure impact (Block 1) on life expectancy in the pre-pandemic period

Life	Coef.	St. Err.	t-value	p-value	95% Confidence Interval		Sig
Cur	.8166	.0618	13.22	0	.6956	.9376	***
Cap	1.0012	.2299	4.36	0	.5507	1.4518	***
Constant	70.5756	.6943	101.64	0	69.2147	71.9364	***

*** $p < .01$, ** $p < .05$, * $p < .1$

Sources: developed by the author.

Table 4 shows that in 34 European countries, current and capital expenditures have a positive and statistically significant influence on life expectancy in the pre-pandemic period. Thus, a 1% increase in the relevant types of healthcare expenditures contributes to an increase in life expectancy by 0.82 years and 1 year, respectively.

Table 5. Regression results of identifying the healthcare expenditure impact (Block 2) on life expectancy in pre-pandemic period

Life	Coef.	St. Err.	t-value	p-value	95% Confidence Interval		Sig
Dom_gov	3.5103	.6792	-5.17	0	4.8415	2.1791	***
Dom_prv	3.2982	.6778	-4.87	0	4.6267	1.9697	***
Ext	3.6294	.681	-5.33	0	4.9641	2.2948	***
Oops	.2414	.0362	-6.67	0	.3123	.1704	***
Constant	428.1138	67.9516	6.30	0	294.9311	561.2965	***

*** $p < .01$, ** $p < .05$, * $p < .1$

Sources: developed by the author.

Table 5 proves an increase in the specific weight of all expenditure types in the structure of current healthcare expenses with a 99% confidence probability. In the pre-pandemic period, it leads to a life expectancy rise. The impact on efficiency of the domestic public current healthcare expenditures, domestic private current healthcare expenditures and external current expenditures is almost the same and contributes to the life expectancy growth by 3.3-3.6 years.

However, the impact of out-of-pocket expenditures is weaker. A 1% independent variable increase causes a life expectancy increase by 0.24 years.

Table 6. Regression results of identifying the healthcare expenditure impact (Block 1) on death rate in the pandemic period

Death	Coef.	St. Err.	t-value	p-value	95% Confidence Interval		Sig
Cur	-.203	.1823	-1.11	.2655	-.5604	.1543	
Cap	.055	.2738	0.20	.8407	-.4816	.5917	
Constant	13.6504	1.6041	8.51	0	10.5064	16.7943	***

*** $p < .01$, ** $p < .05$, * $p < .1$

Sources: developed by the author.

Table 6 demonstrates that no current or capital healthcare expenditures have a statistically significant effect on the pandemic mortality.

Table 7. Regression results of identifying the healthcare expenditure impact (Block 2) on death rate in the pandemic period

Death	Coef.	St. Err.	t-value	p-value	95% Confidence Interval		Sig
Dom_gov	.9467	.1512	6.26	0	.6504	1.243	***
Dom_prv	.893	.1518	5.88	0	.5955	1.1904	***
Ext	1.5195	.5267	2.88	.0039	.4871	2.5519	***
Oops	.1441	.0495	2.91	.0036	.0471	.2411	***
Constant	-84.763	15.2039	-5.58	0	-114.5621	-54.9639	***

*** $p < .01$, ** $p < .05$, * $p < .1$

Sources: developed by the author.

In the overall structure of current expenditures, Table 7 shows that the specific weight growth of all types of healthcare expenditures has a statistically significant effect on the pandemic mortality rise. Simultaneously, external healthcare expenditures have the strongest influence while out-of-pocket expenditures have the smallest impact.

Table 8. Regression results of identifying the healthcare expenditure impact (Block 1) on life expectancy in the pandemic period

Life	Coef.	St. Err.	t-value	p-value	95% Confidence Interval		Sig
Cur	1.3226	.1731	7.64	0	.9834	1.6618	***
Cap	.0261	.2541	0.10	.9182	-.472	.5242	
Constant	67.5692	1.5279	44.22	0	64.5746	70.5639	***

*** $p < .01$, ** $p < .05$, * $p < .1$

Sources: developed by the author.

Table 8 shows that in 34 European countries during the pandemic period, the current health expenditures contribute to the life expectancy increase. A 1% healthcare expenditure increase leads to a life expectancy

increase by 1.32 years with a 99% confidence probability. However, capital health expenditure is not a relevant driver of the life expectancy increase during the COVID-19 pandemic.

Table 9. Regression results of identifying the healthcare expenditure impact (Block 2) on life expectancy in the pandemic period

Life	Coef.	St. Err.	t-value	p-value	95% Confidence Interval		Sig
Dom_gov	.3673	.2696	1.36	.173	-.1611	.8957	
Dom_prv	.4729	.2705	1.75	.0804	-.0573	1.0031	*
Ext	-.6496	.6952	-0.93	.3501	-2.0121	.7129	
Oops	-.261	.0595	-4.39	0	-.3777	-.1444	***
Constant	45.3472	27.0218	1.68	.0933	-7.6146	98.309	*

*** $p < .01$, ** $p < .05$, * $p < .1$

Sources: developed by the author.

In the structure of current healthcare expenditures, Table 9 demonstrates that domestic private expenditures and out-of-pocket expenditures have a statistically significant influence on life expectancy. At the same time, a 1% increase in the weight of domestic private healthcare expenditures leads to a life expectancy increase by 0.47 years. However, an out-of-pocket healthcare expenditure rise affects the pandemic life expectancy with a 99% confidence probability. It leads to a dependent variable reduction by 0.26 years.

Conclusions. Therefore, our research concerned the financial healthcare provision among 34 European countries in the pre-pandemic and pandemic periods. The obtained results make the following conclusions:

1) Bibliometric analysis of 1,198 Scopus publications confirms the topic study rise since 2007. The research leaders are the USA, the United Kingdom and Canada.

2) There are 6 contextual clusters in study of the financial healthcare provision effectiveness. They investigate healthcare expenses: costs for diagnosing and treating specific diseases, for age hospitalisation, for emergency care, etc.

3) Iceland, Denmark, Estonia, Norway and Serbia resist the pandemic most effectively (by the COVID-19 mortality rate).

4) For 34 studied countries, it is empirically proven that the pre-pandemic mortality rate fell due to the increase in the specific weight of current healthcare expenditures. Especially, that concerns the out-of-pocket health expenditures.

The pre-pandemic life expectancy was positively determined by the growth of both current and capital healthcare expenditures. The influence of domestic public current healthcare expenditures, domestic private current healthcare expenditures and external current expenditures was the strongest.

The pandemic mortality did not depend on current or capital expenditures in general. However, the increase in the specific weight of all types of current healthcare expenditures in the overall structure of current costs has a statistically significant effect on the mortality rise.

Meanwhile, the pandemic life expectancy is positively determined by the current expense growth, especially out-of-pocket expenditures (% of current costs) and other private healthcare expenditures.

Therefore, the ability of households to cover the medical care costs with their own funds allows to increase the pandemic life expectancy. On the contrary, none of state agents of healthcare support has proven their effectiveness in countering the pandemic.

The obtained results can be useful for scientists and authorities to optimize the financial healthcare provision. That is adjusted for the most efficient resilience to COVID-19 and other national or global threats.

Author Contributions: conceptualization, A.V. and A.K.; methodology, A.V. and A.K.; software, A.V.; validation, A.V. and A.K.; formal analysis, A.V.; investigation, A.V.; resources, A.V. and A.K.; data curation, A.V.; writing-original draft preparation, A.V. and A.K.; writing-review and editing, A.V.; visualization, A.V.; supervision, A.V.; project administration, A.V.; funding acquisition, A.V.

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Аліна Височина, к.е.н., доцент, Сумський державний університет, Україна

Олексій Квілінський, Лондонська академія науки та бізнесу, Сполучене Королівство; Банківський коледж, Польща

Ефективність видатків на охорону здоров'я у допандемічний та пандемічний періоди

Метою студії є виявлення на основі бібліометричного аналізу контекстуальних векторів дослідження ефективності фінансового забезпечення системи охорони здоров'я, а також емпіричне обґрунтування засобами регресійного моделювання на панельних даних для 34 європейських країн ефективності витрачання державних (бюджетних) та приватних коштів у контексті зниження рівня смертності та зростання тривалості життя як у пандемічний, так і допандемічний періоди. Систематизація літературних джерел та підходів до вирішення проблеми, реалізована засобами бібліометричного та монографічного аналізів, засвідчила, що на сьогоднішній день у науковій літературі сформувалося 6 контекстуальних кластерів наукових досліджень щодо визначення ефективності фінансового забезпечення системи охорони здоров'я. У проаналізованих працях науковці переважно досліджують загальні передумови забезпечення ефективності фінансування системи охорони здоров'я, а також оптимізацію формування вартості медичних послуг для діагностики та лікування окремих хвороб. Актуальність вирішення наукової проблеми полягає в необхідності аналізу паттернів ефективності витрачання коштів з різних джерел для зниження рівня смертності населення та зростання тривалості життя у допандемічний та пандемічний періоди, що дозволить виявити загальні параметри резистентності системи охорони здоров'я у протидії шокам, подібним до пандемії COVID-19. У роботі проведено статистичний аналіз динаміки показників загальної смертності та смертності від COVID-19 і визначено серед 34 європейських країн ті з них, що мають найкращий та найгірший рівень ефективності за цими параметрами. Емпіричний блок дослідження передбачає побудову 8 регресійних моделей на панельних даних, що відрізняються за залежними змінними (рівень смертності чи тривалість життя населення), набором незалежних змінних (блок 1: поточні та капітальні видатки на охорону здоров'я у ВВП; блок 2: складові поточних видатків на охорону здоров'я) та періодом моделювання (допандемічний – 2000-2019, пандемічний – 2020-2022 чи останній доступний період). Результати моделювання дозволили виявити фінансові драйвери та інгібітори зміни рівня смертності та тривалості життя населення у пандемічний та допандемічний періоди. Це дозволило обґрунтувати найбільш ефективні групи видатків на охорону здоров'я з урахуванням епідеміологічної ситуації в країні. Результати можуть бути корисними науковцям, представникам органів державної влади та місцевого самоврядування.

Ключові слова: видатки на охорону здоров'я; ефективність; рівень смертності; тривалість життя; COVID-19.