TACKLING CORRUPTION IN THE HEALTH SECTOR

Victoria Bozhenko, ORCID: https://orcid.org/0000-0002-9435-0065
Postdoctoral Researcher, Tubingen University, Germany; Associate Professor, Sumy State University, Ukraine
Corresponding author: victoria.bozhenko@wiso.uni-tuebingen.de
Type of manuscript: research paper

Abstract: Corruption in the health sector is unique because it includes abuse by public officials and unscrupulous behavior by other actors (drug manufacturers, health professionals, patients, etc.). The urgency of solving the scientific problem lies in the fact that financial relations in the medical field arise between a wide range of persons who can act as initiators of corruption decisions and/or their executors. The study’s main goal is to analyze the forms of corruption in the healthcare system and their consequences for society, as well as to assess the degree of interrelationship between the level of corruption and indicators of financial support in the healthcare sector. The methods of structural and comparative bibliometric analysis and correlation analysis became the methodical tools of the conducted research. The object of research is 140 countries in the world. The conducted bibliometric analysis testified to the permanent growth of the study of the issue of corruption in medicine in the scientific environment. Scientists from the United States, United Kingdom, and Germany have implemented the largest number of works on a certain topic. The conducted correlation analysis also empirically confirmed that an increase in the level of corruption in the country leads to an increase in the share of household expenses for financing their own medical needs. The article founds that the population in countries with a low level of corruption (the corruption promotion index is closer to 100) has a higher level of provision of vital medical services (reproductive health, health of women, newborns, and children, infectious diseases, non-infectious diseases and opportunities provision of services and access to them). Countries with a high level of anti-corruption and coverage of medical services include Finland, Sweden, Germany, and Great Britain. The results of the research can be useful for state regulatory bodies, specialized organizations in the field of health care, as well as public organizations.

Keywords: bribery, corruption, coverage of medical services, health care, pharmaceuticals.
JEL Classification: D73, H15, I15

Received: 29 June 2022 Accepted: 16 August 2022 Published: 30 September 2022

Funding: This research was funded by a grant from the Ministry of Education and Science of Ukraine (No. s/r 0121U100467, 0122U000783).

Publisher: Sumy State University


Introduction. Due to fraud and corruption, the world's health care system loses an average of about $455 billion annually out of $7.35 trillion, or 6.2% of the total. These losses arise because of unscrupulous behavior at the level of public authorities, private companies, or individual patients. The Financial Action Task Force (FATF) recognizes that the healthcare sector is one of the main sources of corruption schemes. Corruption in the medical field can occur at all stages of the business chain: from research and development to the release of medical drugs and equipment and their promotion. Making a significant number of management decisions related to the production and distribution of medical devices creates numerous opportunities for corruption. According to the Organization for Economic Cooperation and Development (2020), 45 percent of the world's citizens believe that the health care sector is corrupt or very corrupt. Based on this, the fight against corruption in the health care sector is one of the key issues of stable development not only for underdeveloped but also for highly developed countries of the world. Corruption negatively influences health sector. The embezzlement of public health budgets and kickbacks in the procurement process can result in the overpayment of goods and services. This in turn may threaten a country’s ability to provide health services. Corruption shifts resources from the public sector, making it difficult to appropriately fund healthcare facilities that help ensure increased access and quality care. Because of corruption’s significant negative effect on morbidity rates, infant and child mortality, and health spending, the impact can have life-and-death consequences. The bottom line is that tackling corruption in the health sector is crucial for ensuring human and economic development.

Copyright: © 2022 by the author. Licensee Sumy State University, Ukraine. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/ 4.0/).
**Literature Review.** An in-depth bibliometric analysis was conducted to study the publication activity on issues of corruption in the health care system. The scientometric database Scopus was chosen for the study. The following keywords were used to search for scientific publications on the selected issue: «corruption» AND «medic* OR health OR pharmaceut*». The combination of keywords made it possible to identify 2325 scientific articles in the Scopus scientometric database. The dynamics of scientific publications on the studied issues from 2000 to 2021 are presented in Figure 1.

![Figure 1. The number of scientific publications devoted to corruption in the health sector](image)

Figure 1 indicates the relevance of the problem of combating corruption in medicine, as well as the permanent growth of the study of this issue in the scientific environment. In 2021, 237 works were published and indexed in the scientometric database Scopus, which simultaneously includes such keywords as «corruption» AND «medic* OR health OR pharmaceut*», which is more than three times more than in 2010.

An analysis of the geographic structure of the affiliation of scientists with a high publication activity in the study of corruption in the health care system showed that the largest number of works on a certain topic was implemented by scientists from the United States (616 publications), the United Kingdom (276 publications), Germany (144 publications). Even though these countries have a sufficiently effective anti-corruption system (in 2020, the corruption perception index in the USA is 67 out of 100 points, Great Britain is 78, Germany is 80), the issue of corruption in the health care system causes a heated scientific debate. Scientists from the USA, Great Britain, Germany, India, Canada, Australia, and China published a total of 63.5% of scientific works on this issue. Regarding the sectoral structure of research, the issue of corruption in the health care system is quite interdisciplinary. 27.8% of all research was conducted in the field of medicine (1,169 publications), while 21.0% was in the social sciences (884 publications).

Currently, 8% of all data management research has been conducted in the medical field. Rekunenko et al. (2022) found an upward trend in healthcare data management publications, with the largest growth in 2019 and 2020.

A significant number of scientific works are devoted to the influence of corruption on the satisfaction of basic human needs. Li et al. (2018) believe that reducing corruption can be an effective method of improving health outcomes. Delavallade (2006) empirically proves that corruption among public authorities transforms the structure of public spending, reducing the share of social spending (education, health care, and social protection) and increasing the share of public spending on order, energy, and defense.

For economic growth, the impact of spending on education was statistically significant and positive, and health care expenditure was negative and statistically insignificant (More and Aye, 2017; Palienko and Lyulyov, 2018). In the long-term period, optimizing public spending leads to increased returns to scale (Kouassi, 2018).

According to the results of the study Liaropoulos et al. (2008), it was established that a significant share of unofficial payments in the field of health care is made to gain access to public hospitals and receive higher quality services. High levels of corruption have a greater impact on physical health in low-income countries than in high-income countries (Achim et al., 2020).

A large number of studies and lawsuits already document the strategies by which drug companies hide, ignore or distort the evidence for new drugs; distort medical literature; and misrepresent products to prescribing physicians. Meeting the needs of pharmaceutical companies takes priority over meeting the needs
of medical drugs due to excessive demand and limited supply have become more frequent (GRECO, 2020).

Priority access to medical services, tests, and medical equipment, to avoid quarantine, as well as falsification and/or their executors (Hussmann, 2020):

In the medical field arise between a wide range of persons who can act as initiators of corruption decisions which makes it relatively attractive for violators (from petty corruption to corruption at the national or international level (Transparency International, 2006).

Health care is unique because it includes not only abuses by public officials, but also unscrupulous behavior on some illegal activity that involves public officials, civil servants or politicians. However, corruption in the healthcare sector, the correlation coefficient was calculated.

Insurance companies lose billions of euros every year precisely because of fraudulent operations (inflating the cost of medical services, presenting fictitious documents to obtain insurance compensation), but not because of corruption (Regional Cooperation Council, 2018).

To overcome manifestations of corruption in the clinical data management system, it is proposed to use machine learning applications (Vasylyev et al., 2021).

Methodology and research methods. This research aims to analyze the forms of corruption in the healthcare system and their consequences for society, and to assess the degree of interrelationship between the level of corruption and indicators of financial support in the healthcare sector. The methods of structural and comparative bibliometric analysis were used to study trends and structural regularities of publication activity on issues of corruption in the health care system (Saheer et al., 2022). The scientometric database Scopus was chosen for the bibliometric analysis. Within the scope of the literature review, the theoretical and empirical foundations in formulating the hypothesis are discussed. Accordingly, the hypothesis of the research was determined as follows.

H1: Corruption negatively affects general government health expenditure.

H2: Corruption negatively affects health service coverage.

Probabilistic correlations are used to study the interdependence of mass socio-economic phenomena. To assess the degree of connection between the level of corruption and indicators of financial support in the healthcare sector, the correlation coefficient was calculated.

Results. To analyze the forms of corruption and its consequences for society, it is first necessary to understand what is included in the health care sector. WHO (1998) views the health sector as a system of organized public and private health services (including health promotion, disease prevention, diagnosis, treatment, and care services), policies and activities of health departments and ministries, health-related non-governmental organizations and public organizations, as well as professional associations. Telizhenko et al. (2022) developed a methodology for evaluating the integral indicator of the development of the healthcare system by region using a functional approach (a model based on the construction of a data stream). Note that insurance companies, being one of the key intermediaries in the financing of medical services, cannot be classified as subjects of corruption schemes. Insurance companies lose billions of euros every year precisely because of fraudulent operations (inflating the cost of medical services, presenting fictitious documents to obtain insurance compensation), but not because of corruption (Regional Cooperation Council, 2018).

Corruption is gradually turning from a domestic problem into a global threat (Bozhenko, 2021). The World Bank (2000) describes corruption as the «use of public office for private gain». This definition concentrates on some illegal activity that involves public officials, civil servants or politicians. However, corruption in health care is unique because it includes not only abuses by public officials, but also unscrupulous behavior by other actors (drug manufacturers, medical professionals, patients, etc.). Corruption in healthcare can range from petty corruption to corruption at the national or international level (Transparency International, 2006).

The health care system is characterized by a high level of decentralized relations with limited supervision, which makes it relatively attractive for violators (Vincke and Cylus, 2011). This means that financial relations in the medical field arise between a wide range of persons who can act as initiators of corruption decisions and/or their executors (Hussmann, 2020):

- state regulatory bodies (parliament, Ministry of Health, specialized institutions);
- manufacturers and suppliers of medical drugs and equipment;
- providers of medical services (state and private hospitals, doctors, pharmacists);
- payers of medical services (enterprises, private individuals);
- consumers of medical services;
- International organizations in the field of health care.

The COVID-19 pandemic has further exacerbated the challenge of transparency, accountability, and oversight mechanisms in the health care sector. Since the beginning of the pandemic, cases of bribery to obtain priority access to medical services, tests, and medical equipment, to avoid quarantine, as well as falsification of medical drugs due to excessive demand and limited supply have become more frequent (GRECO, 2020).
Thus, on average in the countries of the European Union, about 6% of citizens paid bribes to get access to medical services, and 29% of citizens used personal connections. Among the countries of the European Union, the level of bribery in the field of health care was the highest in Romania (22%) and Bulgaria (19%), Lithuania (19%), and Hungary (18%) (Transparency International, 2021).

Corruption in the healthcare system can take the form of bribery, extortion, theft, embezzlement, and undue influence. The main types of corruption offenses in the healthcare sector are:

- buying and selling positions in the hospital administration can be part of the client system of political parties;
- non-transparent selection procedure for positions in health care institutions;
- providers of medical services may be fictitious companies created for money laundering and other illegal purposes;
- conspiracies of doctors or other specialists in the field of health care to provide a recommendation for high-cost treatment to receive a «kickback» for the provided medical services and drugs;
- pharmaceutical companies can finance healthcare professionals to promote their products;
- acceleration of the procedure of registration of medicinal products or bribery of officials of executive authorities for its formal passage;
- bribery of employees of regulatory bodies and medical professionals to provide false data about the results of clinical trials of medicinal products;
- inappropriate use of pharmaceuticals and other resources;
- inappropriate and ineffective use of funds in the medical field;
- non-transparent public procurement procedure;
- distorted results of marketing research.

The pharmaceutical sector accounts for a significant portion of health care budgets worldwide. Almost a fifth of the entire health care budget in OECD countries is spent on medicines (OECD, 2011).

The pharmaceutical industry is vulnerable to fraud and corruption because it is heavily influenced by government regulation. In the absence of a system of control and oversight of the pharmaceutical industry, individual government officials may control several key decision-making points in the pharmaceutical supply chain and may have the discretion to make biased regulatory decisions. In addition, the sale of pharmaceutical products is a profitable type of economic activity, since there is always a stable demand for medicinal products, and consumers of medical products have clearly expressed signs of opportunistic behavior.

Corrupt relations in the pharmaceutical sector can occur at various stages of management decision-making: production, registration, selection, purchase, distribution, as well as prescription and dispensing of medicinal products (Campos and Pradhan, 2011). A team of scientists led by Daryn Lehoux and Sergio Sismondo is investigating such a concept as «epistemic corruption» (Epistemic Corruption), which involves the distribution and use of false facts or their manipulation in the scientific and academic environment in the field of science, medicine and information technology to obtain financial benefit from such actions.

To obtain additional profit and speed up the process of quality certification of medicinal products, some manufacturers in countries with a low level of state regulation, supervision, and control violate the principles and norms of Good Manufacturing Practices (GMPs). Non-observance of professional ethical standards for the production of medicinal products leads to the appearance of low-quality and ineffective medicinal products on the pharmaceutical market. These medicines may contain the wrong amount of active ingredient, no active ingredient at all, or the wrong active ingredient. Steingruber and Gadanya (2021) estimate that the counterfeit pharmaceutical market is worth more than $200 billion a year.

The World Health Organization estimates that one in ten medical products in low- and middle-income countries (LMICs) is substandard or falsified. According to the results of the conducted research Ozawa et al. (2018), it was established that in the period from 1993 to 2017, 13.6% of all medicines, 19.1% of antimalarial drugs, and 12.4% of tested antibiotics were of poor quality or falsified.

A separate link in the chain of corrupt relations in the pharmaceutical sector belongs to the marketing of medicines, which involves the establishment of unethical relations between pharmaceutical companies and medical workers. In the US alone, the pharmaceutical industry spends approximately $42 billion annually on advertising, which equates to an average of $61,000 per physician (Gagnon, 2013).

Corruption in the field of medicine and pharmaceuticals has systemic consequences not only on the health care system but also on the functioning of the entire society. The presence of corruption schemes in the field of health care leads to irrational and ineffective use of state funds, which complicates the proper financing of health care institutions. In particular, resources that could be used for scientific research are wasted; prices for services or products may be inflated; patients are exposed to medical risks due to improper treatment or unsafe
drugs. Corruption increases the social differentiation of the population in obtaining access to medical services (RCC, 2018). In addition, corruption undermines public trust in the government and health workers as guarantors of basic needs. Corruption has serious implications for equality and non-discrimination, as it has a particularly pronounced impact on the health of vulnerable and socially excluded populations, including children and people living in poverty (UN Human Rights). While reducing inequality within and between countries is one of the goals of sustainable development in 2030 (Cabelkova et al., 2021).

The presence of corruption schemes in the health care system causes non-targeted and irrational use of public funds, as well as a decrease in the overall funding of the medical sector system. Based on the data of 135 countries of the world, the degree of relationship between the level of corruption and indicators of financial support of the health care system was assessed using the linear correlation coefficient (table 1).

Table 1. Results of assessing the relationship between the level of corruption and indicators of financial support of the health system

<table>
<thead>
<tr>
<th>Indicators</th>
<th>2015</th>
<th>2017</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corruption Perceptions Index</td>
<td>Domestic general government health expenditure (% of GDP)</td>
<td>+0.732</td>
<td>+0.733</td>
</tr>
<tr>
<td></td>
<td>Out-of-pocket (OOPS) as % of Current Health Expenditure (CHE)</td>
<td>-0.567</td>
<td>-0.557</td>
</tr>
<tr>
<td></td>
<td>Domestic General Government Health Expenditure (GGHE-D) as % Current Health Expenditure (CHE)</td>
<td>+0.634</td>
<td>+0.626</td>
</tr>
</tbody>
</table>

Sources: developed by the author.

The data in Table 1 indicate the presence of a high positive correlation between the level of public spending and the corruption perception index during 2015-2019. This means that in countries with a low level of corruption, there is generally more financing of public spending on the health care system. The conducted correlation analysis also empirically confirmed that an increase in the level of corruption in the country leads to an increase in the share of household expenses for financing their own medical needs (the linear correlation coefficient ranges from -0.560, i.e., there is an average degree of closeness of the relationship).

Underfunding of the health care system causes a chain reaction in the social sphere of society, namely, an increase in the level of morbidity of the population as a result of improper and unsystematic diagnosis of the health of patients, a reduction in life expectancy, and a deterioration in the health of the population. According to the calculations of scientists, it has been established that every year, on average, corruption takes the lives of at least 140,000 children (Hanf et al., 2011). To assess the degree of relationship between corruption and medical services, a pairwise correlation coefficient was calculated. Therefore, the correlation coefficient between the indices of corruption facilitation and health care coverage is +0.690, which indicates the presence of a close direct relationship between these variables. Figure 1 shows the dependence of the indices of corruption promotion and coverage of medical services in the cross-section of the countries of the world.

Figure 2. The relationship between the indices of promotion of corruption and the UHC service coverage index in 2019

Sources: developed by the author.
The data in Figure 2 demonstrate that the population in countries with a low level of corruption (the corruption promotion index is closer to 100) have a higher level of provision of vital medical services (reproductive health, health of women, newborns and children, infectious diseases, non-infectious diseases, and service provision capabilities and access to them). Countries with a high level of anti-corruption and coverage of medical services include Finland, Sweden, Germany, and Great Britain. About Ukraine, the corruption promotion index in 2019 was 30 points. (the average value for the countries of the world is 45.4 units), and the level of coverage by medical services is 73 units. (average value for the countries of the world is 66.4 units). These figures prove that despite the high level of corruption in Ukraine, the provision of a sufficiently high level of medical services is ensured. In addition, the inefficient health care financing system leads to a low level of remuneration for medical workers, their social insecurity, and, accordingly, the need to find additional sources of income for them (providing additional paid medical services, unscrupulous cooperation with pharmaceutical companies, etc.).

**Conclusions.** Corruption is a negative social phenomenon, which in modern conditions takes on a scale that threatens the national security of the state. Corruption contributes to the irrational use of public funds, the residual principle of financing the medical industry, uneven access to medical services, a decrease in the quality of medical care, etc. Although corruption leads to limit the population's equal access to medical services. Corruption in the procurement of medicines and medical equipment increases costs and can lead to the emergence of substandard or harmful medical products on the market. The human costs of counterfeit drugs and vaccines in terms of health outcomes and lifelong effects on children far exceed the financial costs. To provide social support for the state in combating corruption, it is necessary to purposefully form a mass legal consciousness that is consistent with the cultural characteristics of the population and the moral regulators of social behavior.

**Conflicts of Interest:** Not applicable.

**Data Availability Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**References**


Лиаропулос, Л., Сиску, О., Кайтелідіу, Д., Теодору, М., & Катостарас, Т. (2008). Неформальні сплати в галузі лікарської допомоги в Греції. Health Policy, 87(1), 72–81. [Google Scholar] [CrossRef]


Мрабет, С., Беначенхуа, С.М., Кхаліл, А. (2022). Вимірювання ефекту харчування послуг у галузі охорони здоров'я у відносинах Постачальник–Клієнт в альгерійській частині галузі. SocioEconomic Challenges, 6(1), 100-112. [Google Scholar] [CrossRef]

Мяйненкі, С. (2022). Вплив електронізації на прозорість громадських установ. Business Ethics and Leadership, 6(2), 103-115. [Google Scholar] [CrossRef]

ОЕЦ (2011). Огляд охорони здоров'я 2011: ОЕЦ індикатори. Організація для співпраці у економіці та розвитку. Вилучено з [Link]

ОЕЦ (2020). Публічна інтенсивність для ефективного вірусовування COVID-19 і відновлення. Вилучено з [Link]


Палінко, М., та Лулюйов, О. (2018). Вплив соціальних факторів на макроекономічну стабільність: емпірична дослідження для України та Європейській регіон. SocioEconomic Challenges, 2(1), 103-116. [Google Scholar] [CrossRef]

РЦК. (2018). Списки корупційних ризиків в галузі міцьоно-технічного. Вилучено з [Link]


UN Human Rights. Special Rapporteur on the right to health. Вилучено з [Link]

Вікторія Боженко, к. е. н., науковий співробітник, Тюбінгенський університет (Німеччина); доцент, Сумський державний університет (Україна)

Протидія корупції у сфері охорони здоров’я

Корупція у сфері охорони здоров’я є унікальною, оскільки вона включає не тільки зловживання з боку державних посадовців, а й недоброчесну поведінку інших суб’єктів (виробники медичних препаратів, медичних працівників, пацієнтів тощо). Актуальність вирішення наукової проблеми полягає в тому, що фінансові відносини у медичній галузі виникають між широким колом осіб, які фактично можуть виступати за конфлікти інтересів, що впливає на якість та ефективність охорони здоров’я.
ініціаторами корупційних рішень та/або їх виконавцями. Основною метою дослідження є проаналізувати форми прояву корупції в системі охорони здоров’я та їх наслідки для суспільства, а також оцінити ступінь взаємозв'язку між рівнем корупції та індикаторами фінансового забезпечення сфери охорони здоров’я. Методичним інструментарієм проведенного дослідження стали методи структурного та компаративного бібліометричного аналізу, а також кореляційного аналізу. Об’єктом дослідження обрано 140 країн світу. Проведений бібліометричний аналіз засвідчив перманентне зростання вивчення питання корупції в медицині у науковому середовищі. Найбільша кількість робіт з визначеної тематики реалізова на вченими з United States, United Kingdom, Germany. Проведений кореляційний аналіз також емпірично підтверджив, що підвищення рівня корупції в країні призводить до збільшення частки витрат домогосподарств на фінансування власних медичних потреб. У статті встановлено, що населення у країнах з низьким рівнем корупції (індекс сприяння корупції ближче до 100) мають вищий рівень забезпеченості життєво необхідними медичними послугами (репродуктивне здоров’я, здоров’я жінок, новонароджених і дітей, інфекційні захворювання), ніж у країнах з високим рівнем корупції. Крім цього, неефективна система фінансування охорони здоров’я призводить до низького рівня оплати праці медичних працівників, її соціальної незахищеності, і відповідно необхідність пошуку додаткових джерел отримання доходу ними (надання додаткових платних медичних послуг, недоброчесна співпраця з фармацевтичними компаніями тощо). Результати проведенного дослідження можуть бути корисними для органів державного регулювання, профільних організацій у сфері охорони здоров’я, а також громадських організацій.

Ключові слова: корупція, охорона здоров’я, покриття медичними послугами, фармацевтика, хабар.