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### IS THE GLOBAL HEALTH SECURITY INDEX PREDICTIVE OF HEALTH SPENDINGS?(\*)

#### KÜRESEL SAĞLIK GÜVENLİĞİ İNDEKSİ SAĞLIK HARCAMALARINI BELİRLER Mİ?

Nazan KARTAL<sup>(1)</sup>

**Abstract:** The current study has been designed to examine the relationship between health expenditure and the levels of global health security observed in OECD member countries and key partners. The variables analyzed in this study include the GHS index data, the share health expenditure of gross domestic product and the proportion of public health expenditure in total health expenditure. A total of 43 countries were then ordered from highest to lowest according to each variable. To assess the predictability of health expenditure in relation to the GHS Index, a Spearman rank correlation analysis was conducted. The results show a statistically significant and positive correlation (Spearman coefficient = 0.693,  $p = 0.00$ ) between the GHS Index and the share of health expenditure in GDP, indicating that higher health spending as a percentage of GDP is associated with improved global health security. However, no statistically significant correlation was found between the GHS Index and the proportion of public health expenditure in total health expenditure (Spearman coefficient = 0.226,  $p = 0.146$ ). The study suggests that an increase in the allocation of resources to health and potential global crises in public finances could lead to an improvement in global health security levels.

**Keywords:** Global Health Security Index (GHSI), Organization for Economic Cooperation and Development (OECD), Health Spendings.

**JEL:** P5, O5, O21, I1, F6

**Öz:** Bu çalışma, OECD üye ülkeleri ve temel ortaklarında gözlemlenen küresel sağlık güvenliği düzeyleri ile sağlık harcamaları arasındaki ilişkiyi incelemek üzere tasarlanmıştır. Bu çalışmada kullanılan değişkenler GHS indeksi verileri, gayri safi yurtiçi hasıladaki sağlık harcamalarının payı ve toplam sağlık harcamalarındaki kamu sağlık harcamalarının oranıdır. 43 ülke her değişkene göre en yüksekten en düşüğe doğru sıralanmıştır. Sağlık harcamaları ve GHS indeksinin öngörülebilirliğini değerlendirmek için bir Spearman sıralaması korelasyonu yürütülmüş ve sağlık harcamaları ve GHS indeksiyle ilgili değişkenler karşılaştırılmıştır. GHS indeksi ile gayri safi yurtiçi hasıladaki sağlık harcamalarının payı arasındaki Spearman korelasyon katsayısı 0,693 olup p değeri 0,00'dır. Küresel sağlık güvenliği ile gayri safi yurtiçi hasıladaki sağlık harcamalarının payı arasında anlamlı ve pozitif bir ilişki bulunduğu görülmüştür ( $p < .05$ ). GHS indeksi ile kamu harcamalarındaki toplam sağlık harcamalarının payı arasındaki Spearman korelasyon katsayısı 0,226 olup p değeri 0,146'dır. Spearman korelasyon katsayısına göre, küresel sağlık güvenliği ile kamu harcamalarındaki sağlık harcamalarının payı arasında anlamlı bir ilişki bulunmadığı görülmüştür. Sonuç olarak, sağlığa ayrılan kaynak tahsisinin artırılması ve kamu maliyesinde yaşanabilecek küresel krizlerin, küresel sağlık güvenliği seviyelerinde iyileşmeyle çözülebileceği düşünülmektedir.

**Anahtar Kelimeler:** Küresel Sağlık Güvenliği İndeksi (GHSI), OECD (Ekonomik Kalkınma ve İşbirliği Örgütü), Sağlık Harcamaları.

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## 1. Introduction

It is reasonable to acknowledge that constrained financial resources constitute a substantial challenge for all health systems. The World Health Organization (WHO) has identified health financing as one of the six fundamental pillars of a health system, and it could be argued that adequate financing is also necessary for other components (WHO, 2010). The global health crisis precipitated by the Covid-19 has prompted a re-evaluation of the strengths and weaknesses of health systems and policies around the world. A consensus is emerging that countries must invest more in order to enhance the quality of their health services. Recent developments have demonstrated the efficacy of short-term financing solutions in enabling health systems to respond to unforeseen challenges and provide a potential avenue for addressing such challenges. Nevertheless, research examining the relationship between the capacity to respond to unpredictable crises such as pandemics and stable, long-term health policies is limited (Marginean and Orastea, 2022).

Furthermore, the global impact of the pandemic has resulted in significant challenges to social and economic stability, with a dramatic loss of life. It is estimated that there was a 3.3% decline in global gross domestic product (GDP) in 2020 (Filippini and Filippini, 2021; The World Bank, 2022). All developed and developing countries have taken resolute action to mitigate the consequences of public health measures introduced in order to manage the pandemic. A multitude of countries have implemented economic and social packages, and a plethora of additional financial commitments have been made on a global scale as a direct consequence of a multitude of initiatives, including national and cross-border mobilisation efforts and improvements in cold chain storage facilities (Dudine, Hellwigg, Jahan, 2022).

Morgan and Astolfi (2015) have noted that there has been a slowing or decline in health expenditures in many countries in the years following the global financial crisis of 2015 for 34 OECD countries. The study by Thomson, García-Ramírez, Akkaxieva, Habicht, Cylus and Evetovits (2022) sought to gain insight into the resilience of health financing policy in the face of significant economic challenges, including the global financial crisis and the ongoing impact of the pandemic. It can be observed that the responses to the pandemic exhibited indications of insights gained from the 2008 crisis. Nevertheless, this also brought to light certain deficiencies in the European health financing policies that could potentially constrain national preparedness for economic shocks, particularly in countries with social health insurance systems.

The global health crisis has revealed the vulnerability of health systems worldwide, which frequently lack adequate funding. It is encouraging to observe a growing awareness of the importance of global health governance in supporting countries in the management of crises that affect a significant number of them (Lal et al., 2021). The field of global health security is concerned with the prevention, detection and response to public health threats, with a particular focus on the protection of people and communities from infectious disease threats (Heymann et al., 2015). Global Health Security Index (GHSI) represents a significant advancement in the evaluation and comparison of health security and associated capabilities among the 195 states parties to the International Health Regulations (IHR-2005). The objective of the GHS index is to facilitate tangible improvements in national health security and to enhance international capability to address infectious disease outbreaks, which have the potential to lead to international epidemics and pandemics, representing one of the

world's most widespread risks. The GHSI index was first published in 2019. In 2021, the GHSI was compiled using publicly available information across six categories, 37 indicators and 171 questions. In addition to these data points, the index takes into account a number of other factors that are crucial to combating epidemics. Furthermore, the aggregation of publicly available data helps to create a transparent picture of national health security gaps, which is an important aspect of the GHSI index. The 2021 GHSI report revealed a worrying fact: the majority of countries, including those with high income levels, have not yet made specific financial investments to strengthen epidemic or pandemic preparedness. It is evident that 155 of the 195 countries have not allocated national funds over the past three years to enhance their capacity to address epidemic threats. Moreover, only two low-income countries have documented evidence of providing financial support. There remains a dearth of financial contributions to the WHO from certain countries, including 14 high-income countries (Bell and Nuzzo, 2021).

The OECD is privileged to facilitate collaboration between its esteemed member countries and a range of esteemed partners on key global issues at the national, regional and local levels. The OECD is privileged to have 38 member countries across the globe. Member countries utilise the organisation's data and analysis to inform their policy decisions and also play a pivotal role in country reviews. In addition to its member countries, the OECD has the privilege of working closely with some of the world's largest economies, designated as Key Partners (Brazil, China, India, Indonesia, South Africa). Key partners can take part in OECD policy discussions, surveys and the statistical database (OECD, 2024). It was thought that including Key Partners in the current research would be beneficial.

The present study sought to examine the correlation between health expenditure and global health security levels among OECD member countries and their key partners.

## **2. Methods**

### **2.1. Study Population**

In order to gain a comprehensive overview, this analysis encompasses all OECD member countries and the Key Partners, namely Brazil, China, India, Indonesia and South Africa. This study encompassed a total of 43 countries.

### **2.2. Data Collection**

The country-level data on global health security were obtained using the GHS Index 2021 statistics, which are accessible at <http://www.ghsindex.org/>. The data on the proportion of countries' gross domestic product allocated to health were obtained from the WHO (2024). The data illustrating the proportion of public health expenditure relative to the total expenditure on health were sourced from the World Bank (2024). It should be noted that the most up-to-date data on health expenditures are for 2021.

### **2.3. Statistical Analysis**

The variables used in this research are the GHS index data, the share of gross domestic product allocated to health, and the share of public health expenditure in total health expenditure. The 43 countries are ranked from highest to lowest according to each variable. According to this approach, the highest score indicates the best global health security index score and the country with the highest share of health and public health. Countries with equal scores are given the same rank numbers. Spearman rank

correlation was performed to evaluate the predictability between health expenditures and the GHS index. All statistical analyses were conducted using the statistical software package SPSS 26 (Statistical Package for the Social Sciences).

### 3. Findings

As indicated by the GHS index, the USA is in the leading position with a score of 75.9 in the overall ranking, which is 4.8 points ahead of Australia in second place. In addition to its overall score, the United States is ranked first in three of the six areas: prevention, health system capacity and compliance with international norms. Costa Rica occupies the 73rd position globally and is ranked last in the OECD in terms of overall performance, with a score of 40.8. With the exception of four countries, the majority of the top 20 countries in the global ranking of the GHS index are members of the OECD. It would appear that countries which are among the key partners of the OECD also demonstrate superior performance in the global ranking in comparison to some countries which are situated at a lower level in terms of GHSI scores (Table 1).

**Table 1. Country Rankings and Scores by GHSI**

| Country (ranked) | Overall score | Prevention | Detection | Response  | Health Systems | Norms      | Risk      |
|------------------|---------------|------------|-----------|-----------|----------------|------------|-----------|
| United States    | (1)75.9       | (1)79.4    | (3)80.1   | (3)65.7   | (1)75.2        | (1)81.9    | (31)73.3  |
| Australia        | (2)71.1       | (7)65.2    | (2) 82.2  | (10) 61.6 | (5) 69.2       | (8) 72.2   | (21) 76.0 |
| Finland          | (3)70.9       | (12)58.2   | (15)67.5  | (1) 70.7  | (6) 68.7       | (4) 77.8   | (9) 82.6  |
| Canada           | (4)69.8       | (4)70.4    | (11)70.8  | (35)49.2  | (8) 67.3       | (2)79.2    | (10) 81.8 |
| Slovenia         | (6) 67.8      | (6) 65.7   | (11)70.8  | (13) 59.9 | (2)72.8        | (24)63.9   | (30)73.4  |
| United Kingdom   | (7)67.2       | (9) 63.5   | (11)70.8  | (7) 64.8  | (7) 68.3       | (31)62.5   | (34)73.0  |
| Germany          | (8) 65.5      | (29)49.1   | (8)72.4   | (20)56.3  | (22)56.0       | (4) 75.0   | (6)83.9   |
| Korea            | (9) 65.4      | (30) 48.8  | (6) 73.8  | (4) 65.0  | (15)62.5       | (10)69.4   | (32) 3.1  |
| Sweden           | (10)64.9      | (3)77.3    | (19)62.5  | (68) 39.8 | (30)53.5       | (6) 73.6   | (8)82.7   |
| Netherlands      | (11)64.7      | (13)57.8   | (25)57.1  | (17) 58.2 | (9) 66.7       | (15)68.1   | (12) 80.2 |
| Denmark          | (12)64.4      | (8) 64.3   | (17)64.6  | (28) 51.8 | (11)64.5       | (39)61.1   | (14) 79.9 |
| New Zealand      | (13)62.5      | (39)45.0   | (5) 75.3  | (30)50.3  | (45)48.9       | (3)77.8    | (17)77.7  |
| France           | (14)61.9      | (11) 59.4  | (46)45.7  | (37) 47.7 | (4)70.4        | (21)65.3   | (7)82.9   |
| Latvia           | (14)61.9      | (21) 51.6  | (4) 77.1  | (29)51.2  | (17)60.6       | (42)59.7   | (37) 71.3 |
| Spain            | (17)60.9      | (32)47.5   | (10)70.8  | (24) 54.6 | (32)52.9       | (24)63.9   | (24)75.6  |
| Japan            | (18)60.5      | (45)43.1   | (9)71.1   | (14)59.5  | (38)51.6       | (18)66.7   | (39)70.9  |
| Norway           | (19)60.2      | (17)53.8   | (45)46.3  | (18)57.5  | (58)45.0       | (10)69.4   | (1)89.0   |
| Lithuania        | (21)59.5      | (60)38.2   | (18)64.3  | (15)58.7  | (18)59.9       | (33)62.5   | (32)73.3  |
| Belgium          | (22)59.3      | (16)54.2   | (32)52.9  | (41)46.4  | (13)64.2       | (37)61.1   | (19)77.2  |
| Switzerland      | (23)58.8      | (26) 50.2  | (53) 42.5 | (5) 64.9  | (40)50.9       | (42)59.7   | (4) 84.6  |
| Mexico           | (25)57.0      | (50)41.9   | (30)54.3  | (6) 64.8  | (26)54.7       | (13)68.1   | (85)57.9  |
| Austria          | (26)56.9      | (18)53.3   | (54)41.4  | (61)41.8  | (28)54.0       | (24)63.9   | (2)87.2   |
| Chile            | (28)56.2      | (34)47.2   | (22)58.1  | (15)59.5  | (32)52.9       | (67)53.1   | (45)66.2  |
| Poland           | (29)55.7      | (44)43.5   | (54)42.5  | (26)53.3  | (33)52.7       | (7)72.2    | (40)70.1  |
| Estonia          | (30)55.5      | (47)42.5   | (56)41.3  | (20)56.2  | (43)49.4       | (17)66.7   | (20)76.9  |
| Ireland          | (31)55.3      | (19)52.9   | (37)50.4  | (63)41.4  | (37)51.7       | 84(58)55.6 | (14)79.9  |
| Portugal         | (33)54.7      | (20)52.8   | (52)42.6  | (61)41.5  | (29)53.9       | (42)59.7   | (18)77.5  |
| Hungary          | (34)54.4      | (28)49.4   | (63)38.1  | (32)50.1  | (27)54.6       | (33)62.5   | (36)71.7  |
| Slovak Republic  | (34)54.4      | (22)51.3   | (71)37.1  | (50)43.7  | (14)62.7       | (42)59.7   | (35)72.2  |
| Colombia         | (38)53.3      | (24)50.9   | (23)57.9  | (33)49.8  | (46)48.5       | (36)61.5   | (118)51.0 |
| Czechia          | (39)52.8      | (36)46.1   | (65)37.8  | (33)50.1  | (23)55.8       | (77)51.4   | (22)75.6  |
| Italy            | (41)51.9      | (33)47.2   | (40)49.7  | (53) 3.2  | (68)40.2       | (22)65.3   | (47)65.9  |
| Greece           | (42)51.5      | (40)44.8   | (41)48.9  | (39)46.7  | (55)46.2       | (24)63.9   | (82)58.3  |
| Brazil           | (43)51.2      | (27)49.7   | (31)53.6  | (20)56.3  | (41)50.3       | (126)41.7  | (94)55.9  |
| Indonesia        | (45)50.4      | (76)31.8   | (28)55.4  | (31)50.2  | (64)41.2       | (1368) 9   | (98)55.0  |
| Türkiye          | (46)50.0      | (235)1.1   | (56)41.4  | (91)36.6  | (305)3.9       | (425)9.7   | (89)57.2  |
| Iceland          | (50)48.5      | (58)40.0   | (71)36.4  | (36)47.9  | (35)52.2       | (160)34.4  | (137)9.9  |
| Luxembourg       | (51)48.4      | (82)30.3   | (82)33.3  | (40)46.4  | (75)36.7       | 53(56.9)   | (3)86.5   |
| China            | (52)47.5      | (43)43.9   | (42)48.5  | (75)38.5  | (36)51.8       | (141)38.9  | (57)63.4  |

|              |          |          |          |           |          |           |          |
|--------------|----------|----------|----------|-----------|----------|-----------|----------|
| Israel       | (53)47.2 | (51)41.6 | (44)46.7 | (47)44.4  | (24)55.2 | (178)30.9 | (54)64.2 |
| South Africa | (56)45.8 | (74)32.1 | (38)50.0 | (9)62.0   | (90)29.2 | (118)43.1 | (82)58.5 |
| India        | (66)42.8 | (85)29.7 | (51)43.5 | (139)30.3 | (56)46.1 | (92)47.2  | (74)60.2 |
| Costa Rica   | (73)40.8 | (75)31.9 | (83)33.1 | (56)42.6  | (82)32.8 | (141)38.5 | (46)65.9 |

The United States, which occupies the top position among OECD countries and its key partners in the GHSI, also has the highest share of health expenditures in GDP, while India has the lowest. The Czech Republic exhibits the highest proportion of total health expenditures within public expenditures, while Switzerland demonstrates the lowest.

**Table 2. Countries and Health Expenditures and Life Expectations**

| Countries       | GHS index (overall ranking) | Total healthcare expenditure as a share of GDP | Public expenditure on healthcare as percent of total healthcare expenditure |
|-----------------|-----------------------------|------------------------------------------------|-----------------------------------------------------------------------------|
| United States   | (1) 75.9                    | (1) 17.36                                      | (34) 56.8                                                                   |
| Australia       | (2) 71.1                    | (14) 10.54                                     | (19) 75.1                                                                   |
| Finland         | (3) 70.9                    | (15) 10.25                                     | (9) 81.3                                                                    |
| Canada          | (4) 69.8                    | (4) 12.33                                      | (20) 74.5                                                                   |
| Slovenia        | (5) 67.8                    | (21) 9.48                                      | (23) 72.6                                                                   |
| United Kingdom  | (6) 67.2                    | (3) 12.36                                      | (7) 83.7                                                                    |
| Germany         | (7) 65.5                    | (2) 12.93                                      | (13) 78.4                                                                   |
| Korea           | (8) 65.4                    | (24) 9.33                                      | (32) 63.1                                                                   |
| Sweden          | (9) 64.9                    | (9) 11.25                                      | (3) 85.9                                                                    |
| Netherlands     | (10) 64.7                   | (8) 11.29                                      | (28) 68.8                                                                   |
| Denmark         | (11) 64.4                   | (12) 10.82                                     | (5) 85.4                                                                    |
| New Zealand     | (12) 62.5                   | (16) 10.05                                     | (14) 77.2                                                                   |
| France          | (13) 61.9                   | (5) 12.31                                      | (16) 76.7                                                                   |
| Latvia          | (14) 61.9                   | (26) 9.04                                      | (31) 63.4                                                                   |
| Spain           | (15) 60.9                   | (13) 10.74                                     | (21) 84.2                                                                   |
| Japan           | (16) 60.5                   | (12) 10.82                                     | (6) 84.2                                                                    |
| Norway          | (17) 60.2                   | (17) 9.92                                      | (4) 85.6                                                                    |
| Lithuania       | (18) 59.5                   | (30) 7.82                                      | (29) 68.7                                                                   |
| Belgium         | (19) 59.3                   | (11) 11.04                                     | (11) 79.2                                                                   |
| Switzerland     | (20) 58.8                   | (7) 11.8                                       | (41) 35.7                                                                   |
| Mexico          | (21) 57.0                   | (37) 6.08                                      | (38) 52.9                                                                   |
| Austria         | (22) 56.9                   | (6) 12.1                                       | (17) 76.4                                                                   |
| Chile           | (23) 56.2                   | (23) 9.34                                      | (34) 56.8                                                                   |
| Poland          | (24) 55.7                   | (36) 6.44                                      | (24) 71.9                                                                   |
| Estonia         | (25) 55.5                   | (33) 7.49                                      | (15) 77.1                                                                   |
| Ireland         | (26) 55.3                   | (35) 6.72                                      | (13) 78.4                                                                   |
| Portugal        | (27) 54.7                   | (10) 11.14                                     | (30) 64.4                                                                   |
| Hungary         | (28) 54.4                   | (34) 7.38                                      | (26) 71.1                                                                   |
| Slovak Republic | (29) 54.4                   | (31) 7.75                                      | (10) 80.3                                                                   |
| Colombia        | (30) 53.3                   | (27) 9.02                                      | (22) 72.7                                                                   |
| Czechia         | (31) 52.8                   | (20) 9.49                                      | (1) 87.4                                                                    |
| Italy           | (32) 51.9                   | (22) 9.38                                      | (18) 76.1                                                                   |

|                     |           |           |           |
|---------------------|-----------|-----------|-----------|
| Greece              | (33) 51.5 | (25) 9.17 | (37) 54.0 |
| <b>Brasil</b>       | (34) 51.2 | (18) 9.89 | (39) 44.8 |
| <b>Indonesia</b>    | (35) 50.4 | (41) 3.71 | (35) 55.0 |
| Türkiye             | (36) 50.0 | (40) 5.38 | (12) 54.7 |
| Iceland             | (37) 48.5 | (19) 9.73 | (8) 83.5  |
| Luxembourg          | (38) 48.4 | (38) 5.67 | (2) 87.3  |
| <b>China</b>        | (39) 47.5 | (39) 5.38 | (36) 54.7 |
| Israel              | (40) 47.2 | (29) 7.9  | (27) 70.8 |
| <b>South Africa</b> | (41) 45.8 | (28) 8.27 | (33) 62.1 |
| <b>India</b>        | (42) 42.8 | (42) 3.28 | (40) 36.6 |
| Costa Rica          | (43) 40.8 | (32) 7.57 | (25) 71.8 |

The Spearman correlation coefficient between the GHS index and the share of health expenditures in GDP is 0.693, with a p-value of 0.00. This indicates a statistically significant and positive relationship between global health security and the share of health expenditures in GDP ( $p < .05$ ). In other words, an increase in the proportion of health expenditure in gross domestic product is accompanied by an equivalent increase in the global health security index. The Spearman correlation coefficient between the GHS index and the share of total health expenditures in public expenditures is 0.226, with a p-value of 0.146. These findings indicate that there is no statistically significant relationship between global health security and the share of health expenditures in public expenditures (Figure 1).

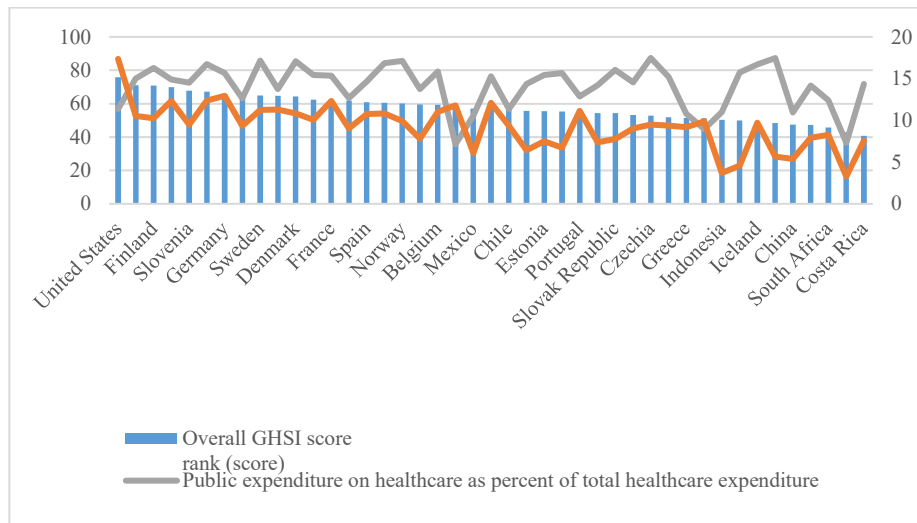


Figure 1. GHS Index Rankings and Healthcare Expenditures

#### 4. Discussion

The objective of this study is to examine the influence of the global pandemic caused by the SARS-CoV-2 virus on the patterns of health expenditure in OECD members and their key partners. The findings of the analysis, within the context of the research, confirm the existence of a significant relationship between the GHS index and health expenditures in GDP by the OECD and its key partners. The analysis yielded the result that an increase in the global health security index was observed to correlate with an increase in the share of health expenditures in GDP. It was observed that the GHS

index scores of countries such as the USA, Canada and Germany, which are positioned at the upper echelons of the GHS index, increased in proportion to the share of health from the GDP. GDP is an important determinant of health expenditure. It can be observed that the resilience of these countries' health systems increases as the share of health expenditure increases. In countries with limited human and physical capital, private and public health expenditures can positively impact per capita income levels while also offering social and humanitarian benefits (Gaies, 2022). The global health crisis precipitated by the SARS-CoV-2 virus has highlighted the necessity for investment in global health security. This encompasses the monitoring of epidemics and the preparation for potential crises. Nevertheless, it is imperative that countries address the dearth of financial resources allocated to such contingencies and implement more proactive measures. In the current century, in which numerous environmental and health threats are on the rise, it is imperative that countries enhance their expenditure on health. The results of a research indicate a positive correlation between higher levels of health expenditure and enhanced health capacity (Khan, Awan, Islam, Muurlink, 2020). It is established that increases in national income result in a corresponding rise in health expenditure, with an increasing proportion of this expenditure being financed through public and private channels (Fan and Savedoff, 2014). It has been observed that mortality rates are lower in countries with stronger health service capacity, particularly during the ongoing pandemic. These countries also spend a higher proportion of their gross domestic product on health care.

A further significant outcome of the study is that public expenditure on healthcare as a proportion of total healthcare expenditure is an unreliable indicator of the GHS index. In general, it has been observed that there is no increase in the GHS index as the share allocated to health in public expenditures increases. This situation can be associated with the health systems of the countries in question. Furthermore, the extent of this situation is subject to variation according to the level of development of the countries in question. While some countries prefer public financing in their health systems, some prefer private financing or mixed methods (Dieleman et al., 2016). It is expected that the rate of public health expenditures is lower in countries such as the USA, where out-of-pocket expenditures and private financing methods are preferred. When the health expenditure levels of the countries are examined with the GHS index ranking, it is seen that some countries allocate less public resources to health. It is seen that Switzerland, which is among the countries with a high level of welfare, is not in the top ranks among OECD countries in terms of global health security and does not allocate enough resources. When examined in terms of GHSI dimensions, it is seen that it lags far behind in terms of early detection, health system durability and capacity. Again, a similar situation is seen in countries such as the USA and Canada. Despite the fact that these countries are perceived as being among the highest spenders on health from both the GHS index and gross domestic product perspectives, it is possible to argue that they are unable to demonstrate effective performance in terms of public financing. This situation shows that individuals spend their health expenses out of pocket or with other private financing methods. The evidence suggests that public health expenditure is higher in countries with a universal health insurance system that covers the entire population (Oxley and Macfarlan, 1994). The results of the study also corroborate this conclusion. In countries such as Luxembourg and the Czech Republic, it is evident that public financing plays a dominant role in health expenditure, yet it is outperformed in terms of the GHS index. It is thought that these countries should also strengthen their health systems in terms of global health security.

Governments are pivotal in the evolving structure of health financing, representing the preeminent source of global health funding. A positive correlation exists between government spending on health and income (Dieleman et al., 2016). It is evident that governments were a significant contributing factor in the escalation of health spending in 2020. In comparison to previous years, public health spending increased significantly during the pandemic. It has been documented that a considerable proportion of total health expenditure in numerous countries was allocated to preventive health services. During this period, both public and out-of-pocket health spending increased (WHO, 2022). In response to the global health crisis precipitated by the SARS-CoV-2 virus, countries have experienced unparalleled increases in health spending. In particular, almost all low- and middle-income countries increased their public spending on health in 2020, both in terms of per capita expenditure and as a share of GDP (WHO, 2022). In the context of the pandemic, 14 OECD countries demonstrated a collective increase in health spending of 5% on average (Gupta and Sala, 2022).

It is crucial to maintain growth in public health expenditures, as these investments can facilitate the financing of essential health services (Evans and Etienne, 2010). Additionally, increased public health financing may indirectly affect health outcomes by increasing household financial resources for other determinants of health, such as food and education, resulting in reduced spending on health care (Leive and Xu, 2008). The postponement or avoidance of health services, the ageing of populations, the prevalence of health risk factors and the burden of the recent pandemic have emphasised the necessity for augmented investment in capital, in addition to resources for recurrent health expenditures (Warner and Zaranko, 2022). The global challenges of climate change, food insecurity and the Ukraine-Russia war create additional long-term imperatives for development financing. These circumstances are prompting countries to re-examine their development financing strategies in order to enhance their capacity to address pressing global challenges (Glassman, Keller, Smitham, 2023). The negative impact of environmental challenges on global health security is a significant concern. In a study examining the correlation between environmental degradation and healthcare costs, it was found that the accumulation of CO<sub>2</sub> emissions was a contributing factor to the rise in public healthcare expenditures (Sileem, 2016). In light of these findings, it can be posited that countries should consider augmenting their public financing of health expenditures.

## 5. Conclusion

An analysis of the GHS indexes reveals that a number of countries are ranked lower than non-OECD countries. It thus follows that countries such as Turkey, Iceland, Luxembourg, Israel and Costa Rica must endeavour to enhance their global health security levels. In the contemporary era, characterised by the prevalence of global and ecological threats, it is anticipated that countries will possess enhanced capabilities in terms of both preventive measures and the capacity for rapid action and response to these threats. Furthermore, the financial capabilities of countries and their distribution of resources for the aforementioned threats are also significant considerations. It is anticipated that this financing will be sourced from public resources in countries with high levels of welfare. Therefore, it is argued that increasing the share of public finance allocated to health and possible global crises could lead to increased levels of global health security.

It is crucial to analyse the response of countries during the pandemic process as reflected in the GHS Index in order to determine how existing resources are being utilised and to effectively prepare for future global crises. The GHS Index has become an important tool for assessing the resilience of countries' health systems to health crises. It is anticipated that this study will prove beneficial for policymakers and countries alike. The findings of this study are confined to the OECD and its key partners. It is proposed that the scope of the research be expanded to include a greater number of countries and additional variables for further evaluation in future studies.

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