

# Do public governance and financial shocks effect public health? Empirical evidence from MENA region

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**Abstract:** Financial shocks have an incredible socioeconomic effect on both developed and developing countries. Various recent studies demonstrated that bad public governance impacted public health across all nations. In fact, this study aims to use panel data for 21 countries from the Middle East and North Africa (MENA) region over the period 2000–2020 to scrutinize the effect of both governance and financial crises on public health. We use the generalized method of moments (GMM) approach to carry out the empirical analysis. The objective of using this method is to deal with the issue of endogeneity between exogen variables. Results outline that there is a significant positive association between public governance indicators and public health. Moreover, we found a strong negative association between financial shocks and public health. Thus, the direct negative impact of financial crisis on public health could be mitigated by the indirect positive impacts via institutions and good public governance. This study gives insights to policymakers to take appropriate measures to decrease the severity of the financial shocks and improve healthcare services.

**Keywords:** public health; financial shocks; public governance; MENA region countries

## 1. Introduction

The financial shocks have generated significant interest in its economic and societal ramifications. Recent research indicates that financial crises are a recurring phenomenon in both industrialized and developing nations throughout history. These crises may have significant and far-reaching implications, as demonstrated by studies conducted by Laeven and Valencia (2012), Wang et al. (2022), and Wahidin et al. (2021). The economic literature has several theoretical and empirical research that establish a connection between financial crises and macroeconomic factors (Ahmed et al., 2020; Elfeituri and Alotaibi, 2021; Hossain and Arwatchanakarn, 2021). While numerous studies have explored the impact of financial instability on various aspects such as economic growth (Afonso and Blanco-Arana, 2022; Prochniak and Wasiak, 2017), quality of life (Betti et al., 2020; Thompson, 2023), poverty (Antoniades et al., 2020; Franzen and Bahr, 2024), and education (Widarni and Bawono, 2023), there is a scarcity of empirical research on the connection between financial crises and healthcare services.

The crisis is likely to have a sustained impact on the health of households, leading to increased unemployment, poor wages, and poverty. The deterioration of nutrition, increase in homelessness, and elevated stress caused by unemployment, and other constrained economic conditions may ultimately lead to adverse impacts on the quality of healthcare (Barnett et al., 2020; Fleming et al., 2023).

The deterioration of nutritional standards, rise in homelessness, and heightened stress due to unemployment, the fear of it, and the experience of more limited

economic circumstances may eventually lead to negative effects on the quality of healthcare.

This research has two distinct contributions to the current literature: Our study focuses on the nations of the Middle East and North Africa (MENA) region, specifically examining the impact of recent financial crises, such as the crises of 2008 and 2009. The recent economic research has shown that several nations in this area have been greatly impacted by these crises. Furthermore, while there are few empirical studies that examine the association between financial crises and health, to our knowledge, limited study has specifically investigated the influence of governance in moderating this relationship.

There are many factors behind the choice of MENA region countries in our empirical study. Firstly, this region has seen increased openness to external influences and becoming globally connected to the world economy. As a result, it has become particularly vulnerable to crisis and disruptions that impact global financial markets (Franza, 2022). Secondly, it is really accurate to state that the public governance of countries in the Middle East and North Africa (MENA) has a significant impact on their economic growth (Farooque et al., 2022). Thirdly, corruption significantly impacts the healthcare systems of these nations (Alnahdi, 2020). Finally, the healthcare systems in MENA nations continued to be very vulnerable to financial crises and governance indicators.

The paper is organized as follows: the second section encompasses the literature review. The model definition, empirical methods, and data sources are presented in the third section. The econometric analysis and findings are presented in section four, while section five provides both conclusions, policy implications, and research limitations.

## **2. Literature review**

Empirical evidence has demonstrated that the financial crisis has a profound and detrimental effect on society, particularly in emerging nations such as Asia. This is mostly due to the exacerbation of inflation, which in turn devalues native currency deposits and reduces household income. The unemployment rates have risen, leading to a decline in household income and a decrease in wealth. Moreover, the likelihood of psychiatric problems and suicides tends to rise as a result of job loss, while state spending on health and social services is reduced in order to redirect funds to other sectors. The reduction may necessitate a reorganization of the responsibilities and duties of healthcare staff, which might lead to a decline in the quality of services offered (Kountoura et al., 2020; Serapioni and Hespanha, 2019; Ugwunna and Mohamed, 2023). Access to healthcare for the general population, including the jobless, is hindered during a recession due to disruptions in both the demand and supply of healthcare services. Nations having experienced financial crises have difficulties when social security programs are reduced, leading to a decrease in government tax revenues. As a result, access to healthcare, particularly for low-income families, and the delivery of health services become challenging.

Based on an empirical analysis conducted by Van Dijk (2013), utilizing data from 187 banking crises in 126 nations between 1970 and 2009, it was discovered that these

findings have significant ramifications for society as a whole. During the six years that follow a crisis, the average life expectancy decreases by nine months. Karanikolos et al. (2016) conducted a comprehensive descriptive analysis of healthcare impacts of the recent economic crisis, focusing on research conducted in developed nations. Only studies that were published between January 2009 and July 2015 were chosen by authors. The analysis reveals that the financial shock of 2008 had detrimental impacts on mental well-being, such as an increase in suicide rates. Additionally, it affected certain non-communicable and communicable diseases, as well as access to healthcare services, to different degrees.

Greece has been greatly affected by financial shocks, resulting in the drop of public healthcare expenditure and the decrease in healthcare services quality. Several studies have scrutinized the effect of the financial shocks on healthcare and have found evidence of increased admittances in the public healthcare sector (Yfantopoulos et al., 2023; Serapioni and Hespanha, 2019). Additionally, it has been shown that during the current worldwide crisis, Greece had a 45% increase in suicides, a 60% increase in Human immunodeficiency virus (HIV) infections, and a rise in stillbirths from 3.31 per 1000 live births in 2008 to 4.36 in 2010. Moreover, Belvis et al. (2012) shown that Italy, following the subprime financial crisis, encountered the potential for decreased investments in preventive care, healthcare digitalization, and evidence-based medical infrastructure. Thus, in their study carried out in Canada, Rucket and Labonté (2014) investigated the mechanisms by which the financial shocks impacted healthcare disparities. It was found that, government austerity measures undermined social initiatives that aim to promote the equitable distribution of socio-economic factors that influence healthcare outputs. In the context of the financial shock of Indonesia of 1997, the cost of basic healthcare became too expensive for most impoverished individuals, especially women. Insufficient supplies and inability to compensate healthcare personnel are causing the closure of primary health care organizations. Therefore, throughout the East Asian financial shocks of 1998, Hopkins (2006) demonstrated a substantial decrease in healthcare spending in various Asian countries. Additionally, Baldacci et al. (2002) shown that throughout the Mexican financial shocks, the average income by month of households decreased by 31% between 1994 and 1996, and there was a corresponding 25% decrease in health spending.

It has been demonstrated via the existing studies healthcare services are undeniably impacted by the financial shocks. As a result, the healthcare sector will be burdened with the responsibility of effectively meeting the growing demands. Therefore, enhancing global health is a significant societal goal that yields immediate benefits in the form of extended and improved lifespans. In order to mitigate the magnitude of financial crises, it is our belief that improving governance and institutions is crucial. Establishing a novel public governance framework for the financial and healthcare sectors might potentially provide stability and long-term viability. Institutions and governance have become essential for development and are increasingly recognized as crucial factors in determining income levels (Behnezhad et al., 2021; Nikzad, 2021; Perugini and Tekin, 2022), hence promoting the general well-being of families. The quality of institutions and the legislative framework are expected to impact financial growth by influencing the financial sector's capacity to allocate resources for financing the healthcare sector (Kombo and Koumou, 2021;

Mujahid, 2023). Effective risk-based financial monitoring is enhanced by good governance, which is a crucial element that works in conjunction with financial supervision. The role of governance is crucial in ensuring the responsible functioning of financial organizations and maintaining constancy in the financial system. The rules and guidelines of good public governance were a significant element of international financial standards, and several authorities see effective public governance as the primary means of protection.

Due to the swift progression of the crisis and the ambiguity regarding its repercussions in many nations, it is crucial to prioritize the monitoring of its consequences on the health sector. The primary objective of this study is to address the existing research gap by investigating the correlation between public governance, financial shocks, and healthcare quality in 21 countries from the MENA area during the period of 2000–2020. This will be achieved by employing the dynamic GMM estimator.

### 3. Methodology

#### 3.1. Model specification

The objective of this study is to analyze the influence of a financial crisis on the overall health condition, with a particular focus on the function of public healthcare governance. As a result, in our current research we utilize a panel data set consisting of 21 nations in the MENA area, for which data is available spanning from 2000 to 2020. The analysis is broken into two distinct phases. Firstly, we analyze the immediate influence of financial crises and governance indices on the public health. Next, we evaluate the indirect impact of the financial shocks on public healthcare via public governance as a moderator variable. The proposed model through the Equation (1) is developed based on many empirical studies (Alnabulsi, 2022; Effie, 2014; Fountoulakis et al., 2012; Stoddart, 2021; VANDOROS et al., 2013; Xie et al., 2023):

$$H_{it} = \delta_i + \lambda' X_{it} + \varepsilon_{it} \quad (1)$$

In the above equation “*i*” represents the nation-specific impact, that is independently distributed and remains stable across all nations, “*i*” represents each MENA nation, with values ranging from 1 to 21. While “*t*” represents the period from 2000 to 2020. The error term  $\varepsilon$  is assumed to be independently distributed over all time periods within each country *i*.  $H_{it}$  refers to a health indicator, whereas  $X_{it}$  represents a vector of determinant variables that are supposed to have an impact on health status.

In this study, we utilize the generalized method of moments (GMM) for panel data analysis, as initially suggested by Arellano and Bond (1991) and subsequently enhanced by Blundell and Bond (1998). The purpose of using this method is to solve the issue of endogeneity. The GMM technique incorporates lagged health as an exogen variable in its dynamic analysis. Hence, the dynamic Equation (2) is represented in the subsequent format:

$$(H_{i,t} - H_{i,t-1}) = \delta_i + \lambda_0 H_{i,t-1} + \lambda' X_{it} + \xi_{it} \quad (2)$$

Arellano and Bond (1991) have used lagged variables in levels as tools for estimating the first difference equation as follows:

$$(H_{i,t} - H_{i,t-1}) - (H_{i,t-1} - H_{i,t-2}) = \lambda_0(H_{i,t-1} - H_{i,t-2}) + \lambda' (X_{it} - X_{it-1}) + (\xi_{it} - \xi_{it-1}) \quad (3)$$

According to Arellano and Bond (1991), the difference estimator is determined by applying moment conditions as follows:

$$\left. \begin{aligned} E[H_{i,t-s}(\xi_{i,t} - \xi_{i,t-1})] &= 0, \text{ For } s > 2, t = 3, \dots, T \\ E[X_{i,t-s}(\xi_{i,t} - \xi_{i,t-1})] &= 0, \text{ For } s > 2, t = 3, \dots, T \end{aligned} \right\} \quad (4)$$

This step is necessary in the estimation process because lagged differences of the exogen variables are utilized as instruments in the levels' equation. Two crucial assumptions are made: first, that the error term is not correlated, and second, that there is no correlation between the difference in the explanatory variables and the error term, even though there may be an association between the levels of the explanatory variables and the country-specific error term. The obtained stationarity characteristics are as follows:

$$E[H_{i,t+p}\eta_i] = E[H_{i,t+q}\eta_i] \text{ and } E[X_{i,t+p}\eta_i] = E[X_{i,t+q}\eta_i] \quad (5)$$

For any values of  $p$  and  $q$ ,

The extra moment requirements for the regression in levels, as presented by Arellano and Bover (1995), are as follows:

$$\left. \begin{aligned} E[(H_{i,t-s} - H_{i,t-s-1})(\eta_{i,t} + \xi_{i,t-1})] &= 0, \text{ For } s = 1 \\ E[(X_{i,t-s} - X_{i,t-s-1})(\eta_{i,t} + \xi_{i,t-1})] &= 0, \text{ For } s = 1 \end{aligned} \right\} \quad (6)$$

The GMM-system estimator is produced by employing the moment requirements specified in Equations (4)–(6). The reliability of the instruments directly impacts the consistency of the GMM estimator. The Sargan test is employed to assess the soundness of the instruments by testing the over-identifying constraints. To evaluate the financial shock and its impact on public healthcare sector, we suggest the following fundamental econometric model:

$$H_{it} = \delta_i + \delta_1 H_{it-1} + \delta_2 FC_{i,t} + \lambda' X_{it} + \xi_{it} \quad (7)$$

The endogen variable in this model is the rate of infant mortality per 1000 live births, denoted as  $H_{it}$ . The financial shock construct is denoted as  $FC_{it}$ . While  $X_{it}$  represents a vector of exogen variables commonly utilized in this kind of econometric models, including Gross Domestic Product growth, degree of financial development, degree of international commerce openness, annual inflation variation, degree of urbanization, distribution of doctors per population, environmental deterioration via CO<sub>2</sub> emission, and healthcare spending per capita. While  $\lambda$  represents the vector of parameters that need to be estimated, and  $\varepsilon_{it}$  represents the error term. **Table 1** recapitulates the definition of all variables of the empirical structural model.

To assess the extent to which financial shocks impact public healthcare via public governance indicators, it is necessary to incorporate the association term between different constructs of public governance and the construct of financial shock into Equation (7) as follows:

$$H_{it} = \delta_i + \delta_1 H_{it-1} + \delta_2 FC_{i,t} + \lambda' X_{it} + \gamma' (FC_{it} \times GOV_{it}) + \xi_{it} \quad (8)$$

**Table 1.** Variables and description.

Variables	Description	Symbols
Health indicator	Is measured by the rate of infant mortality per 1000 live births.	$H_{it}$
Financial crisis	Financial crisis is measured by a time dummy variable that takes the value of 1 for 2008 and 2009 and zero otherwise.	$FC_{it}$
GDP growth	Gross Domestic Product growth represents the growth of GDP per capita.	$GDPG_{it}$
Inflation	Inflation is measured as the annual change in the GDP deflator.	$INF_{it}$
Financial development	is approximated by the domestic credit provided to the private sector as a % of Gross Domestic Product.	$FD_{it}$
Trade openness	defined as the combined value of exports and imports as a percentage % of Gross Domestic Product.	$TRADE_{it}$
Urbanization	measured by the proportion of the population living in urban zones.	$URB_{it}$
Density of physicians	measured by calculating the number of doctors per 1000 individuals in the population.	$PHYS_{it}$
Environmental degradation	Environmental degradation is measured by per capita CO <sub>2</sub> emissions	$ENV_{it}$
Healthcare expenditure	measured by the total amount spent per person on healthcare, which includes both government and private expenditures.	$HEXP_{it}$
Public governance indicators	It's a composite variable and a synthetic indicator of governance constructed by the PCF method. It includes six sub-variables:	$GOV_{it}(PCF)$
	1) Rule of law	RL
	2) Control of corruption	COR
	3) Regulatory quality	RQ
	4) Voice and accountability	VA
	5) Government effectiveness	GE
	6) Political stability and lack of violence	PS
Interaction between financial crisis and public governance		$FC_{it} \times GOV_{it}$

As previously mentioned, effective governance is considered to have a greater capacity to mitigate the adverse impact of financial shocks, hence contributing to the improvement of health outcomes. If the computed coefficient is both positive and statistically significant, it would suggest the presence of complementarity, indicating that governance plays a crucial role in mitigating the impact of financial crises on health care services. We have a specific interest in examining the impact of the association term, as we anticipate that the extent of financial shocks might be mitigated by several factors, such as improved public governance.

$GOV_i$  is a composite matrix that encompasses six governance indicators from the International Country Risk Guide (ICRG) namely government effectiveness, political stability and lack of violence, voice and accountability, regulatory quality, rule of law, and control of corruption (Arif and Dutta, 2024). The control of corruption construct assesses the perception of the extent to which public authority is used for personal benefit. It also encompasses both minor and major kinds of corruption. The indicator of government effectiveness assesses the capacity of a government to provide both public and civil services. Furthermore, this indicator quantifies the degree of autonomy of the public administration from political interference. The construct of political stability and lack of violence measures the level of neatness that must be observed throughout political transitions (Arif and Dutta, 2024; Hilmário de Oliveira Siqueira, 2023; Spyromitros and Panagiotidis, 2022). The absence of such order may necessitate

the disturbance of the government and result in accompanying acts of violence. The legal guidelines, including both official and unofficial rules, establish the connection between the public and private sectors. Regulatory quality assesses the degree to which rules facilitate economic growth and progress, rather than imposing unnecessary constraints. The voice and accountability constraint measures the degree to which voters can hold politicians responsible and express their thoughts via pressure-group such as mass media and civil society. All these variable measurements are employed separately to assess the relative significance of each component in impacting healthcare sector. This is mostly attributed to the strong correlation that may occur between various variables, which is thought to cause significant analysis problems owing to multicollinearity concerns. In addition, we employ the principal component analysis (PCA) to provide an alternative measure of governance indicators. This metric is derived from the 6 governance indicators mentioned before. The selection of the six governance constructs was designed to ensure it seems synthetic, since it encompasses a significant amount of information on economic risk, political risk, and social risk simultaneously. The significance of decomposing this variable lies in its comprehensive consideration of all institutions in elucidating the connections between financial crises and healthcare services. One further justification for selecting this synthetic variable is its significant function as an indication of good governance. Theorists credit it with the advantage of ensuring an effective system of governance that encompasses all aspects of legislation.

### **3.2. Data sources**

To accomplish the main goals of our study, we utilize panel data from 21 nations in the MENA region. The data spans from 2000 to 2020 and is readily accessible.

The choice of nations and time period is solely determined by the data's availability. Therefore, a total of 21 countries (the MENA region covers Algeria, Bahrain, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestinian Authority, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates, Yemen and Iran) in the MENA region were selected to fulfill the study's goals. Missing data are addressed by calculating the average of the existing data, as it has been shown that nation values do not undergo major changes over time. Specific markers are more pertinent and frequently employed in elucidating health condition. The variables used in this study are sourced from the ICRG. The health variable is quantified by the rate of infant mortality per 1000 live births. Therefore, Environmental deterioration is measured by the quantity of CO<sub>2</sub> emissions per capita. The variable "TRADE" is determined by the combined value of both exports and imports as a percentage of Gross Domestic Product. While the financial development is approximated by the domestic credit provided to the private sector as a percentage of GDP. However, the Urbanization variable is determined by the proportion of the inhabitants living in urban areas. The density of physicians is determined by calculating the number of physicians per 1000 individuals of inhabitants. Besides, Healthcare spending is assessed by the total amount spent per person on healthcare, which includes both public and private expenditures. The governance indicators dataset derived from the International Country Risk Guide (ICRG) consists of six

variables: voice and accountability, political stability and lack of violence, government effectiveness, regulatory quality, rule of law, and control of corruption.

#### 4. Empirical results and discussion

The direct impact of financial shocks and public governance on health sector are outlined in **Table 2**. Nevertheless, these findings do not provide a thorough depiction of the correlation between financial instability and health since they just encompass the immediate effects. Financial shocks can also have an indirect impact on the health system through governance and institutions, that will be elucidated in our next analysis.

**Table 2.** The direct impacts of financial shocks and public governance on public healthcare.

Variables	Endogen variable: Public health (IMR's/1000 live births)						
	1	2	3	4	5	6	7
$H_{it-1}$	2.343*** (0.000)	2.671*** (0.000)	1.983*** (0.003)	2.625*** (0.002)	2.064*** (0.000)	1.375*** (0.000)	2.364*** (0.000)
FC	-0.361** (0.000)	-0.471*** (0.000)	-0.533*** (0.001)	-0.265*** (0.002)	-0.636*** (0.000)	-0.695*** (0.000)	-0.086*** (0.000)
RL	-3.701** (0.021)	-	-	-	-	-	-
VA	-	-3.66* (0.042)	-	-	-	-	-
GE	-	-	-3.637** (0.055)	-	-	-	-
PS	-	-	-	-3.412** (0.026)	-	-	-
RQ	-	-	-	-	-3.181** (0.014)	-	-
COR	-	-	-	-	-	3.364** (0.038)	-
GOV(PCF)	-	-	-	-	-	-	-4.012*** (0.008)
GDPG	-0.943*** (0.000)	-1.139*** (0.000)	-0.894*** (0.000)	-1.092 (0.002)	-0.731** (0.000)	-1.014*** (0.000)	-1.174*** (0.000)
FD	-2.076** (0.03)	-2.348*** (0.000)	-2.456*** (0.000)	-2.051** (0.025)	-2.065*** (0.000)	-2.096*** (0.000)	-2.117*** (0.000)
TRADE	-2.845** (0.058)	-1.984** (0.045)	-1.562** (0.024)	-2.141** (0.033)	-1.635 (0.135)	-1.547* (0.06)	-3.367** (0.012)
URB	-0.155*** (0.010)	-0.185** (0.032)	-0.173*** (0.000)	-0.161*** (0.000)	-0.169*** (0.000)	-0.185*** (0.000)	-0.191*** (0.000)
INF	0.15*** (0.000)	0.067* (0.097)	0.391** (0.056)	0.079** (0.032)	0.232 (0.112)	0.491*** (0.000)	0.035*** (0.000)



**Table 2.** (Continued).

Variables	Endogen variable: Public health (IMR's/1000 live births)						
	1	2	3	4	5	6	7
ENV	0.039** (0.148)	0.0287* (0.095)	0.055 (0.235)	0.011 (0.165)	0.0255 (0.285)	0.0667*** (0.000)	0.129* (0.070)
HEXP	-0.761*** (0.000)	-0.871*** (0.000)	-0.432*** (0.002)	-0.854*** (0.000)	-0.765*** (0.000)	0.593* (0.082)	0.961*** (0.000)
PHYS	-3.761*** (0.000)	-3.571*** (0.000)	-2.122*** (0.000)	-4.965*** (0.000)	-3.705*** (0.000)	-2.668*** (0.000)	-4.807*** (0.000)
CST	4.48** (0.000)	5.767*** (0.000)	7.943*** (0.000)	2.687*** (0.000)	6.245*** (0.001)	3.257*** (0.000)	4.387** (0.000)
<b>Diagnostic chekinLig</b>							
SarganTes t	0.536	0.687	0.465	0.604	0.557	0.484	0.679
Obs	735	735	735	735	735	735	735

Note: \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%.

**Table 2** shows that the predicted coefficients of the financial crisis (FC) construct stay negative with strong significance, with values ranging from 0.086 to 0.695. These findings are consistent with those of Crookes et al. (2020), who used an interrupted time series analysis to assess the patterns in Greek household spending for healthcare before and after a crisis, from 2004 to 2017. It has been observed that there has been a rise in spending on inpatient treatments and medications since the beginning of the crisis, while expenditure on outpatient care has been declining. Our findings from MENA countries provide a chance to emphasize the repercussions of cost-shifting in times of austerity. Moreover, our results are in line with those of Thompson (2023), who found a negative impact of the financial crisis on psychological well-being and life satisfaction of British household.

Findings show a positive significant effect of inflation (INF) on infant mortality rate. This finding is in accordance with those of Bao et al. (2022), who argued that inflation had a significant positive effect on the infant mortality rate. Our research findings indicate that a 1 percent increase in inflation leads to a rise in the newborn mortality rate from 0.035 to 0.391 percent. In fact, higher inflation decreases individuals' buying power and negatively impacts consumption patterns, resulting in malnutrition and worse health conditions. Consequently, inflation has the potential to result in unemployment. Consequently, individuals are unable to provide the essential requirements of their children, including nutritious food, education, and healthcare. The effect of inflation on the health industry might be significant.

Results show that health expenditure (HEXP) effect negatively the infant mortality rate in MENA region countries. These findings are in line with those of the study carried out by Kara and Ersin (2020) on OECD countries. The results indicate a significant correlation between healthcare spending and infant mortality rates in MENA countries. Another significant finding is the presence of a positive causal relationship between health spending and the infant death rate. When analyzing these findings, it is advisable for MENA nations to implement measures aimed at

augmenting health spending in order to effectively reduce the infant mortality rate.

Considering that financial shocks might impact public health by affecting the public institutions quality, we employ various metrics of public governance to examine the empirical connection between these governance indicators, environmental deterioration, and public healthcare. All the seven econometric models (**Table 2**) incorporate interaction terms, that are created by multiplying governance indices with financial crises.

The **Table 3** provides a summary of the data pertaining to the indirect influence of financial shocks on public healthcare, via the six constructs of governance indicators. The predicted parameters of the financial shocks remain negative with high significance, with values ranging from 0.058 to 0.562. The explanation for this phenomenon might be attributed to inadequate regulatory frameworks or an excessive degree of financial deregulation (Arcand et al., 2012; Pesendorfer and Pesendorfer, 2020). Nevertheless, the interaction effects between governance indicators (rule of law, regulatory quality, voice and accountability, government effectiveness, political stability and lack of violence) and financial crisis demonstrate a noteworthy negative significance, contrasting with the interaction effect between financial crisis (FC) and control of corruption (COR). These findings are in accordance with those of Alnahdi (2020) who carried a study on the impact of corruption on healthcare services for a sample of 15 MENA countries over the period 1996-2018. He found a positive unidirectional causality between corruption and healthcare services. Moreover, Vaidean et al. (2021) found the same findings in his study carried out on 27 countries of the European Union over the period 2005–2020. The impact of institutional quality and the legislative framework on financial development lies in their ability to facilitate the allocation of resources by the financial sector towards the financing of the health sector. This suggests that higher-quality institutions have the ability to mitigate the impact of financial shocks (Hu and Qi, 2022). This research validates the premise that enhancing governance might potentially mitigate the severity of financial crises, hence contributing to a drop in infant death rates. In addition, well-functioning institutions might potentially mitigate the health consequences of financial instability by addressing broader healthcare policies' concerns, such as ensuring the overall provision of high-quality healthcare services, implementing third-party payers' services, and providing more effective healthcare programs. High-quality public institutions could also offer guidance and information on cleanliness, proper health practices, and other valuable knowledge for the general community. These reasons suggest that the stability of the financial system is influenced by the quality of institutions. Specifically, a strong quality level of public institutions mitigates the impact of financial crises and thus diminishes the adverse effects of financial shocks. This suggests that global crises, due to their widespread nature, can expose weaknesses in global governance and introduce new long-term risks. The implementation of effective governance and strong leadership is crucial for rebuilding trust and fostering improved international collaboration. This validates the idea that well-functioning institutions have a substantial impact on health outcomes through the enhancement of healthcare services. In general, effective governance is considered to have a greater capacity to mitigate the adverse impact of financial instability, hence contributing to the improvement of health outcomes.

**Table 3.** The indirect effect of financial crisis on health through governance.

Variables	Dependent variable: Health (IMR's/1000 live births)						
	1	2	3	4	5	6	7
H <sub>it-1</sub>	1.654** (0.036)	1.591** (0.027)	2.027** (0.033)	0.972* (0.074)	1.376** (0.021)	2.792* (0.085)	2.102*** (0.004)
FC	-0.058** (0.000)	-0.397*** (0.000)	-0.294*** (0.001)	-0.265*** (0.002)	-0.376*** (0.000)	-0.425*** (0.000)	-0.562*** (0.000)
RL×FC	-1.379** (0.007)	-	-	-	-	-	-
VA×FC	-	-1.198*** (0.001)	-	-	-	-	-
GE×FC	-	-	-2.346** (0.066)	-	-	-	-
PS×FC	-	-	-	-1.674*** (0.008)	-	-	-
RQ×FC	-	-	-	-	-2.561*** (0.005)	-	-
COR×FC	-	-	-	-	-	1.243** (0.116)	-
GOV×FC	-	-	-	-	-	-	-2.716*** (0.000)
GDPG	-2.513*** (0.000)	-1.932*** (0.000)	-2.795*** (0.000)	-1.792*** (0.000)	-2.306** (0.000)	-1.413*** (0.004)	-0.937*** (0.000)
FD	-4.267** (0.032)	-4.935*** (0.000)	-3.391*** (0.000)	-2.929** (0.007)	-3.795*** (0.000)	-4.926*** (0.000)	-2.782** (0.021)
TRADE	-0.928*** (0.008)	-1.066** (0.045)	-0.791*0* (0.001)	-1.173*** (0.000)	-0.668** (0.043)	-1.053*** (0.009)	-0.748** (0.012)
URB	-2.356** (0.039)	-1.528** (0.053)	-0.868*** (0.000)	-1.368*** (0.000)	-1.096** (0.080)	-2.455*** (0.002)	-1.836*** (0.000)
INF	0.426*** (0.000)	0.637** (0.027)	0.671*** (0.006)	0.499** (0.032)	0.536*** (0.003)	0.491*** (0.000)	0.560*** (0.000)
ENV	0.165* (0.108)	0.084* (0.095)	0.096 (0.132)	1.326 (0.110)	1.391 (0.125)	1.958 (0.215)	0.792 (0.176)
HEXP	-1.385** (0.025)	-1.094*** (0.000)	-0.892*** (0.002)	-1.159*** (0.000)	-1.222*** (0.000)	-0.993*** (0.002)	-1.358*** (0.000)
PHYS	-2.365*** (0.000)	-1.783** (0.031)	-3.641*** (0.000)	-2.682*** (0.005)	-3.387*** (0.000)	-1.628*** (0.000)	-2.673*** (0.000)
CST	7.365** (0.001)	4.681*** (0.000)	6.969*** (0.009)	5.964*** (0.000)	4.972*** (0.002)	7.928*** (0.006)	6.492** (0.000)
<b>Diagnostic chekinLig</b>							
SarganTest	0.497	0.591	0.516	0.643	0.597	0.694	0.572
Obs	735	735	735	735	735	735	735

Note: \* Significant at 10% \*\* Significant at 5%; \*\*\* Significant at 1%.

## 5. Conclusion and implications

This research aims to examine the impact of financial shocks and public governance indicators on public health. The current study aims to examine how public governance can serve as an additional pathway via which financial volatility impacts the quality of healthcare. In order to do this, we utilize a sample consisting of 21 nations from the MENA region, covering the time span from 2000 to 2020. Regarding the approach, we employ the dynamic GMM estimator to estimate the health model. This is done to address any potential endogeneity issues with the explanatory variables. The empirical findings indicate that Asian countries have a consistently declining correlation between financial shocks and healthcare quality, as well as a favorable association between governance indicators and health. Furthermore, the adverse impact of financial shocks on public healthcare can be mitigated through the good indirect impacts resulting from improved governance. These findings suggest that the financial crisis has a significant influence on health, but the negative consequences may be mitigated by implementing effective governance and institutional solutions. This suggests that strong institutions have a direct and indirect impact on both financial stability and the quality of healthcare in Asian nations. This is achieved by improving the financial system and increasing the performance of public spending on healthcare. It plays a crucial role in resolving the financial crisis and instilling trust for a stable future.

As a policy implication, it is necessary to take specific actions to decrease the severity of the financial crisis and improve healthcare services. This involves recognizing the crucial role of good public governance in overcoming the financial shocks. Governments should focus on restoring confidence for the future and avoiding excessive regulations that could harm the entrepreneurial spirit necessary for strategic economic development (Jaziri and Aliouat, 2023). Public authorities must collaborate with all market players to further implement good public governance practices that will support additional legal measures aimed at addressing health issues. During a financial shock, especially if the financial system is incapable of providing funding for the public health sector, healthcare budgets and programs could be much more crucial as sources of assistance. If this situation arises, it becomes crucial, especially for the Global Fund, to examine governmental grants with the aim of ensuring sufficient health supply actors that benefit the whole public healthcare system.

The study has a limitation of being conducted in MENA countries that could be clustered into two different groups high-income countries such as Golf Cooperation Council (GCC) countries and medium-income countries. This clustering could impact findings especially in GCC countries. More extensive research is projected to be conducted on the impact of financial recovery on the resilience of MENA countries' health care systems.

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