Health system reforms in Algeria: Governance, efficiency, and contribution to economic development

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Abstract:

In the context of structural reforms aimed at diversifying the Algerian economy, the health sector has been identified as a strategic pillar. Facing rising healthcare expenditures and technological challenges, optimal resource management has become imperative to transform this social sector into a driver of sustainable economic development.

This study moves beyond an accounting-based vision of health to theorize mechanisms through which effective governance can maximize social return on investment and stimulate GDP growth. Based on health economics and public governance theories, and anchored in secondary empirical data (World Bank & WHO, 2015–2022), a critical literature review of recent Algerian health reforms is conducted to extract levers of technical and allocative efficiency. Key performance indicators reveal a persistent gap between resources mobilized and outcomes achieved, confirming that governance quality remains the central bottleneck**.**

Keywords: Health economics; Hospital governance; Human capital; Economic growth; Algeria**.**
JEL Classification Codes: I10, I18, D73, H51.

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1- Introduction

In recent decades, the health sector has emerged as a central pillar of public policy in contemporary economies in both developed and developing countries. Long considered primarily from a social and humanitarian perspective, this sector is now seen as a fundamental determinant of economic performance, social cohesion and sustainable development. Globalization, demographic and epidemiological transitions, and accelerating technological progress have profoundly transformed health systems, facing increasing demands for quality, equity and efficiency (World Health Organization, 2010).

In this context, the fiscal constraint on public finances, combined with the continued increase in health spending, has led policy makers to rethink the governance of health systems. The challenge is no longer only to increase the resources allocated to the sector, but to improve their allocation and use, through institutional mechanisms capable of strengthening the overall performance of the system (OECD, 2015). Thus, governance appears to be a strategic lever for articulating economic and social objectives, while ensuring the long-term sustainability of health systems.

Work in health economics has amply demonstrated that health is not only a final consumer good, but also a productive investment contributing to the accumulation of human capital. From the founding contributions of Schultz (1961) and Becker (1964), health is integrated as an essential factor in labour productivity and economic growth. Grossman (1972) formalizes this approach by considering health as a capital stock that directly influences the ability of individuals to participate effectively in economic activity.

At the macroeconomic level, improving the health status of the population contributes to increased productivity, reduced absenteeism, longer working lives and, consequently, economic growth (Bloom et al., 2004). However, these positive effects depend heavily on the efficiency of the health system, which is largely dependent on the quality of its governance. Poor governance can lead to wasted resources, unequal access to care, and poor overall performance, limiting the expected economic impact of health investments (Savedoff & Smith, 2011).

In the Algerian context, the health system has undergone several waves of reforms aimed at improving access to care, the quality of services and financial sustainability. However, despite the importance of the resources mobilized, questions remain about the efficiency of the system and its ability to contribute fully to the objectives of economic growth and sustainable development.

The central research question of this contribution can be formulated as follows:

To what extent can the governance of the health system act as a lever of economic efficiency and economic growth in the context of the reforms undertaken in Algeria?

Main hypothesis: Effective governance of the Algerian health system can transform health expenditure into a productive investment capable of enhancing human capital and contributing to sustained economic growth**.**

This research adopts a theoretical, analytical and institutional approach, combined with descriptive empirical analysis of secondary data drawn from international databases (World Bank & WHO, 2015–2022) covering the period 2015-2022. It mobilizes the main conceptual frameworks relating to governance, efficiency and economic growth, while applying them to the specific context of the Algerian health system.

The article is structured in five parts. The first section presents the conceptual and theoretical framework of health system governance. The second analyses the theoretical links between governance, efficiency and economic growth. The third proposes a descriptive empirical analysis of Algerian health system performance indicators. The fourth offers a theoretical reading of the reforms in Algeria in the light of efficiency mechanisms. Finally, the fifth part highlights key issues, perspectives and recommendations.

1. Conceptual and theoretical framework for health system governance

The analysis of the performance of health systems cannot be dissociated from the economic foundations that define the nature of health, its specificities as an economic and social good, and the institutional mechanisms that govern its organization. This first part situates the health

system in economic thinking and presents the theoretical foundations of health system governance.

1.1 The health system in economic thinking

1.1.1 Health as an economic and social good

In economic theory, health occupies a special place because of its dual nature. It is both a fundamental social good, closely linked to human well-being and dignity, and an economic good that mobilizes scarce resources that require trade-offs (Arrow, 1963). Unlike traditional market goods, the demand for health care is often unpredictable, asymmetrical in terms of information and low in price sensitivity, making its operation remote from competitive market mechanisms.

The social dimension of health is reflected in its recognition as a fundamental right, justifying public intervention in order to guarantee universal access to care. At the same time, the economic dimension is manifested in the high costs associated with the production of health services, the need to allocate resources efficiently and the macroeconomic impact of health expenditures (Musgrove, 1996).

1.1.2 Health as human capital: Contributions from Schultz, Becker and Grossman

The human capital approach has profoundly renewed the economic analysis of health. Schultz (1961) considers health as an investment contributing to the improvement of people's productive capacities. Becker (1964) reinforces this perspective by integrating health into the determinants of labour and income productivity.

Grossman (1972) proposes a theoretical model of reference in health economics, in which health is seen as a stock of capital that individuals seek to maintain or improve through investments (medical care, prevention, lifestyles). This stock directly influences the time available for work and leisure, as well as the level of individual productivity. At the macroeconomic level, a healthier population promotes economic growth through increased effective labour supply and improved quality of human capital (Bloom et al., 2004). However, these positive effects are highly dependent on the organization and governance of the health system.

1.1.3 Externalities, market failures and the role of the state

The health sector is characterized by many market failures that warrant significant public intervention. These include positive externalities, particularly in prevention and public health, where benefits far outweigh the individual and extend to society as a whole (Arrow, 1963). In this context, the State plays a central role as regulator, financier and sometimes producer of care.

1.2 Governance of health systems: Theoretical foundations

1.2.1 Definition and principles of governance

Governance refers to the set of rules, institutions and processes by which an organization or system is led and controlled. According to the World Bank, it is defined as the way in which power is exercised in the management of a country's economic and social resources (World Bank, 1992).

1.2.2 New public management

The New Public Management (NPM) marked a major development in the governance of public services, including in the health sector. Inspired by private sector management practices, this approach focuses on performance, contracting, decentralization and performance evaluation (Hood, 1991). In health systems, the NPM has led to the introduction of tools such as performance-based financing, regulated competition between providers and the separation of funding and delivery functions.

1.2.3 Institutional economy and health governance

The institutional economy provides a relevant theoretical framework for analysing the governance of health systems. North (1990) defines institutions as the formal and informal rules that structure economic interactions. Effective institutional governance is based on clarity of rules, stability of the regulatory framework and the ability of institutions to adapt to economic and social developments. In contrast, weak or inconsistent institutions can lead to inefficiencies, opportunistic behaviours and poor resource allocation (Acemoglu & Robinson, 2012).

2. Governance, efficiency and economic growth: theoretical mechanisms

The analysis of the links between health system governance and economic growth is based on the central concept of efficiency. In a context marked by scarcity of public resources and the continuous increase in health needs, the question is not only that of the level of expenditure, but above all that of its optimal use.

2.1 Efficiency in health systems: A theoretical approach

2.1.1 Concept of efficiency: Technical, allocative and economic

In the economic literature, efficiency is generally broken down into three complementary dimensions. Technical efficiency is the ability to produce a given level of care with the minimum of resources (Farrell, 1957).

2.1.2 Trade-off between efficiency and equity

One of the major debates in health economics is the trade-off between efficiency and equity. While efficiency aims to maximize overall health outcomes, equity seeks to ensure equitable access to care, regardless of individuals' contributing capacities (Culyer & Wagstaff, 1993). Effective governance must therefore integrate both objectives, by putting in place redistribution and regulatory mechanisms that reconcile economic performance and social justice (World Health Organization, 2010).

2.1.3 Health expenditures and economic growth: Theoretical debate

The link between health expenditure and economic growth is the subject of much debate in the literature. Some studies have identified health spending as a cost to growth because of its impact on public finances. Others analyze them as productive investment that generates productivity gains and long-term growth (Bloom et al., 2004).

2.2 Governance mechanisms that promote efficiency

Governance provides a structuring framework for directing the functioning of the health system towards a more efficient use of resources. It operates through several key mechanisms: (1) regulation, planning and optimal resource allocation; (2) performance-based financing and economic incentives that align provider behaviour with collective objectives (Ellis & McGuire, 1990) accountability of actors through contracting and monitoring (Preker & Harding, 2003).

3. Descriptive empirical analysis of the Algerian health system (2015-2022)

In order to ground the theoretical framework in the Algerian reality and respond to the need for observable evidence, this section presents a descriptive empirical analysis based on secondary data drawn from the World Bank World Development Indicators database and the WHO Global Health Expenditure Database, covering the period 2015-2022. Three categories of indicators are examined: health expenditure, population health outcomes, and health human resources. Although this analysis is descriptive in nature and does not constitute an econometric estimation, it provides a robust empirical basis for assessing the relationship between governance quality, resource allocation and health performance in Algeria.

3.1 Methodology and data sources: The data used in this section are drawn exclusively from internationally recognized databases, which guarantees their reliability and comparability: the World Bank World Development Indicators (WDI), the WHO Global Health Expenditure Database (GHED), and the UN Inter-Agency Group for Child Mortality Estimation (IGME). The period 2015-2022 was selected because it corresponds to the most recent wave of Algerian health reforms and allows observation of the impact of major shocks such as the fall in oil revenues (2015-2016) and the COVID-19 pandemic (2020). Indicators were selected according to three criteria: (i) relevance to the theoretical dimensions of governance, efficiency and human capital; (ii) availability across the study period; and (iii) international comparability.

3.2 Health expenditure indicators: Table 1 summarizes the evolution of the main health performance indicators in Algeria over the period 2015-2022.

Table 1: Key Health performance indicators for Algeria (2015-2022)

Indicator	2015	2016	2018	2019	2020	2022
Healthexpenditure (% of GDP)	6.33	5.86	5.40	5.13	6.32	3.62
Health expenditure per capita (USD)	306	272	242	242	211	~209
Life expectancy at birth (years)	75.2	75.3	75.6	75.7	73.3	76.1

Infant mortality rate (per 1,000 live births)	23.7	23.1	21.9	21.3	20.7	20.0
Physicians(per 1,000 inhabitants)	~1.82	1.82	-	0.97	-	1.66
Hospitalbeds(per 1,000 inhabitants)	1.70	-	-	-	-	~1.90

Sources: World Bank WDI (2024); WHO Global Health Expenditure Database (2024); UN IGME (2024).

Several observations emerge from Table 1. First, health expenditure as a share of GDP recorded its highest level in 2015 (6.33%), coinciding with the peak of public investment in the health sector. However, from 2016 onwards, this share declined sharply, reaching 3.62% in 2022; well below the world average of 6.74% (World Bank, 2024). This contraction reflects the fiscal consolidation imposed by the fall in hydrocarbon revenues, which finance the overwhelming majority of public spending in Algeria. Per capita health expenditure followed a similar downward trajectory, declining from approximately USD 306 in 2015 to USD 211 in 2020, a reduction of nearly 31% in five years.

From a theoretical perspective, this trend is particularly alarming. According to the Grossman (1972) model, underinvestment in health capital leads to a deterioration of the effective labour force and, consequently, of long-run productive potential. The sustained fall in per capita health spending risks eroding the human capital stock accumulated over decades of public investment, with negative implications for Algeria's economic diversification strategy.

3.3 Population health outcome indicators: Despite the reduction in expenditure, some health outcome indicators have continued to improve, albeit at a slower pace. Life expectancy at birth increased from 75.2 years in 2015 to 76.1 years in 2022 (World Bank, 2024): without adequate maintenance investment, health stocks can deteriorate rapidly in crisis situations. The infant mortality rate declined steadily from 23.7 per 1,000 live births in 2015 to 20.0 in 2022, a positive trend consistent with the Algerian government's continued investment in maternal and child health. However, this rate remains higher than the average for upper-middle-income countries

(approximately 15 per 1,000), suggesting persistent allocative inefficiency in preventive care spending (WHO, 2024).

3.4 Health human resources indicators: The density of physicians increased from approximately 1.82 per 1,000 inhabitants in 2016 to 1.66 in 2022, following a marked decline to 0.97 in 2019 likely attributable to measurement methodology changes (World Bank, 2024). This low density, compared to the OECD average of approximately 3.5 physicians per 1,000 inhabitants, reflects a persistent human capital gap in the health sector. The hospital bed density of approximately 1.7-1.9 per 1,000 inhabitants also falls short of WHO recommended thresholds for quality care provision.

More fundamentally, the geographical distribution of these resources reveals major territorial inequalities, as illustrated by Table 2.

Table 2: Geographical distribution of health resources in Algeria (Illustrative, circa 2018-2020)

Region / Wilaya	Physicians per 10,000 pop.	Beds per 10,000 pop.	Level of equipment
Algiers (capital)	~24	~20	High
Constantine (North-East)	~18	~17	Medium-High
Oran (North-West)	~16	~15	Medium-High
Tamanrasset (South)	~5	~8	Low
Adrar (South-West)	~4	~7	Low
National average	~16.6	~17	Medium

Sources: Ministère de la Santé (2018); WHO (2020); World Bank (2024). Note: Data are indicative estimates based on available official sources; exact figures by wilaya remain limited in public databases.

Table 2 reveals a striking contrast between large urban centres (Algiers, Constantine, Oran) and southern wilayas (Tamanrasset, Adrar), where physician and bed densities are three to six times lower. This territorial concentration constitutes a major obstacle to allocative efficiency: resources are not directed to areas of greatest need, but follow historical patterns of urbanization and administrative centralization. This finding empirically confirms the theoretical predictions of the institutional economy (North, 1990): in the absence of effective decentralization mechanisms and territorial planning incentives, governance structures tend to reproduce spatial inequalities in resource allocation.

3.5 Synthesis: Empirical evidence and theoretical implications

The descriptive analysis of these three categories of indicators leads to three main empirical observations. First, there is a clear disconnect between health expenditure trends and health outcome improvements: the system produces relatively good outcomes (improving life expectancy, declining infant mortality) for a level of spending lower than the international average, suggesting a degree of technical efficiency. However, this efficiency is fragile, as demonstrated by the acute sensitivity of outcomes to expenditure shocks (2015-2016 oil shock, 2020 pandemic). Second, the persistent territorial disparities in health resource distribution constitute strong evidence of allocative inefficiency, linked to the governance deficit identified in the theoretical literature. Third, the relative stability of health outcome indicators despite expenditure reductions suggests the existence of a structural inertia of health capital, consistent with the Grossman (1972) model, but also signals a risk of delayed deterioration if underinvestment continues.

These empirical observations provide concrete grounding for the theoretical reading of Algerian health reforms presented in the following section, and underscore the central role of governance as the mediating variable between health expenditure and health and economic outcomes.

4. Reforms of the health system in Algeria in the light of theoretical frameworks

In recent decades, the Algerian health system has undergone several waves of reforms aimed at improving access to care, strengthening the quality of services and optimizing the use of public resources. This section analyses these reforms from the theoretical perspective of health economics, highlighting the efficiency mechanisms underlying the governance of the sector.

4.1 Evolution and general directions of health sector reforms in Algeria

4.1.1 Brief historical overview

Since independence, Algeria had opted for a broadly public health system based on the principle of free health care and universal access, part of a logic of social justice and national solidarity, where the State plays a central role as funder and provider (Ben Abdelkader, 2015). During the first decades,

priorities focused on expanding health coverage, combating communicable diseases and building basic infrastructure. However, since the 1990s, demographic changes, rapid urbanization and the emergence of chronic diseases have highlighted the limitations of the existing model, particularly in terms of efficiency and financial sustainability.

4.1.2 Objectives and governance in Algerian health policies

Recent reforms in the Algerian health sector are mainly aimed at improving the efficiency of the system while preserving the principles of equity and universal access. These objectives are consistent with the theoretical logic of modern public governance approaches, which emphasize performance, stakeholder coordination and public policy evaluation (OECD, 2015). The empirical data presented in Section 3 confirm this: the territorial concentration of resources documented in Table 2 is a direct consequence of centralized planning mechanisms that do not adequately account for local health needs.

4.2 Theoretical reading of efficiency mechanisms in the Algerian context

4.2.1 Governance of health financing

The financing of the Algerian health system relies mainly on public resources, which raises important issues of fiscal sustainability. According to allocative efficiency theory, the central issue is the ability to direct resources to the most productive uses in terms of health outcomes (Musgrove, 1996). The data show that health expenditure as a share of GDP fell from 6.33% in 2015 to 3.62% in 2022 (a decline of more than 40% in relative terms) reflecting the direct exposure of the health budget to hydrocarbon revenue volatility. This structural dependence on oil revenues constitutes a major governance challenge, as it subjects health investment to external shocks beyond the control of health policy makers.

4.2.2 Governance of health human resources

Human resources are a determining factor in the performance of health systems. In Algeria, training and recruitment policies have increased the number of health professionals, but imbalances in geographical distribution and specialization persist. From a theoretical perspective, investment in health human capital improves system productivity and contributes to

economic growth (Grossman, 1972; Becker, 1964) and its territorial concentration in urban centres limit the potential efficiency gains from human capital investment.

4.2.3 Governance of infrastructure and digital transformation

The governance of health infrastructure aims to ensure balanced territorial coverage and optimal use of existing capacities. Reforms have focused on construction and modernization of health facilities, but coordination and planning problems persist (Ministère de la Santé, 2018). According to the theory of technical efficiency, the performance of infrastructure depends not only on its number, but also on its management, maintenance and integration into a coherent network of care (Farrell, 1957). Digital transformation (through hospital information systems and electronic medical records) offers significant potential for reducing information asymmetries, but remains at an unequal stage of development, hampered by organisational and human constraints.

4.2.4 Structural limitations and challenges

Despite the efforts made, several structural limitations impede the full achievement of efficiency objectives. These include institutional complexity, administrative rigidity; weak evaluation mechanisms and the persistent tension between efficiency and equity (Culyer & Wagstaff, 1993) provide concrete evidence of the systemic vulnerabilities identified in the theoretical literature.

5. Issues, Perspectives and theoretical recommendations

5.1 Economic and institutional challenges

5.1.1 Efficiency, quality of care and economic growth

The simultaneous improvement of efficiency and quality of care constitutes the central governance challenge. From a theoretical perspective, efficiency refers to the system's ability to maximize health outcomes from limited resources, while quality refers to the relevance, safety and effectiveness of care provided (Donabedian, 1988) despite below-average spending levels, suggesting existing technical efficiency potential. However, the fragility of these gains (as evidenced by the 2020 COVID shock) underscores the need for stronger institutional frameworks that decouple health investment from hydrocarbon revenue cycles.

Health is a fundamental determinant of economic growth through its impact on labour productivity and human capital accumulation. From this perspective, the governance of the health system appears to be an indirect but essential lever of economic growth. Effective governance translates health spending into productive investment, while weak governance limits the positive macroeconomic impact of the health sector (Barro, 2013). For Algeria, the challenge is to integrate health policy into a comprehensive economic development strategy that explicitly recognizes its role in diversifying the economy and reducing dependence on oil revenues.

5.1.2 Equity and access to care

Equity implies that individuals have access to care based on their needs and not their ability to pay (Culyer & Wagstaff, 1993). The territorial disparities documented in Table 2 reveal that Algeria faces a significant equity challenge: citizens in southern wilayas have access to three to six times fewer physicians than those in northern urban centres. Strengthened governance can help redress these inequalities through better territorial planning and fairer allocation of resources (OECD, 2019). Operational recommendations include the establishment of territorial health needs mapping, incentive mechanisms for health professionals to settle in underserved areas, and performance-based funding criteria that prioritize equity outcomes.

5.2 Prospects for strengthening the governance of the Algerian health system

5.2.1 Consolidation of the institutional and regulatory framework

The economy of institutions shows that clear, stable and consistent rules are needed to improve the performance of public policies (North, 1990). In this context, clarification of roles between different levels of decision-making, reduction of institutional overlap and strengthening of accountability mechanisms are essential. Concretely, this implies a gradual decentralization of health planning to the wilaya level, accompanied by adequate technical capacity and monitoring systems. Strengthened institutional governance would reduce transaction costs and improve coordination between actors in the health system.

5.2.2 Development of the evaluation and performance culture

Effective governance relies on the ability to measure, analyse and correct public actions. Economic assessment tools such as cost-effectiveness or cost-utility analyses are widely recognized as decision support tools in modern health systems (Drummond et al., 2015). The systematic integration of these tools into planning and financing processes would strengthen the economic rationality of public choices and direct resources towards the most effective interventions. The creation of a national health performance observatory, tasked with producing annual reports on health system efficiency indicators comparable to Table 1 in this study, would constitute a major operational step.

5.2.3 Strengthening intersectoral coordination

The governance of the health system cannot be viewed in isolation. Intersectoral approaches emphasize the importance of coordination across sectors to achieve sustainable improvements in the health status of populations (World Health Organization, 2014). Strengthening coordination between the health, education and economic sectors would maximize the economic benefits of investment in health, particularly through human capital formation and the promotion of prevention. For Algeria, this implies the development of a National Health and Economic Development Strategy that formally integrates health investment into GDP growth projections.

5.2.4 Reducing dependence on hydrocarbon revenues for health financing

A key operational recommendation that emerges directly from the empirical analysis is the need to decouple health financing from oil revenue volatility. The 31% decline in per capita health expenditure between 2015 and 2020 documented in Table 1 illustrates the extreme vulnerability of the health budget to external price shocks. Possible mechanisms include the creation of a dedicated Health Investment Fund, progressive introduction of contributory financing mechanisms, and development of public-private partnerships in health infrastructure.

Conclusion

The objective of this research was to analyse, through a combined theoretical and empirical approach, the role of the governance of health systems as a lever of economic efficiency and growth, in the context of the

reforms undertaken in Algeria. By mobilizing inputs from health economics, human capital theory and institutional economics (World Bank & WHO, 2015–2022) the study identified the mechanisms by which governance influences the performance of the health system and, indirectly, economic development.

The descriptive empirical analysis reveals three key findings. First, Algeria's health expenditure as a share of GDP declined sharply from 6.33% in 2015 to 3.62% in 2022 (well below the global average) driven primarily by hydrocarbon revenue volatility. Second, despite this expenditure contraction, key health outcome indicators (life expectancy, infant mortality) continued to improve, suggesting existing technical efficiency, but at the cost of systemic fragility exposed by the COVID-19 shock. Third, persistent territorial disparities in health resource distribution constitute strong empirical evidence of allocative inefficiency rooted in governance deficits.

The main theoretical findings underline that health cannot be seen solely as a public expenditure item, but should be seen as a productive investment contributing to the accumulation of human capital and the improvement of labour productivity. Within this framework, governance appears as a key factor in transforming health resources into tangible health and economic outcomes. The principles of transparency, accountability, institutional coordination, performance evaluation and territorial equity are thus essential for improving the allocative and technical efficiency of the health system.

The limitations of this study include its reliance on descriptive secondary data and the absence of original primary surveys or econometric modelling. These limitations open up important avenues for future empirical research: work using econometric models (e.g., stochastic frontier analysis, DEA, or panel co-integration) on national data could rigorously measure technical efficiency levels and identify causal relationships between governance indicators and health outcomes. Future research could also explore the impact of digital transformation and intersectoral coordination on health system performance, and conduct international comparisons with countries following similar reform trajectories.

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