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ASSESSING THE IMPACT OF HEALTHCARE REFORM IN SAUDI ARABIA: A QUANTITATIVE ANALYSIS OF STRUCTURAL TRANSFORMATION AND PRELIMINARY HEALTH OUTCOMES

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Abstract

Healthcare systems around the world are undergoing a shift through integrated, comprehensive policies aimed at systematically increasing capacity, enhancing quality, and improving equity. This study provides a quantitative evaluation of the Health Sector Transformation Program (HSTP) of the Kingdom of Saudi Arabia, strategically integrated into the Vision 2030 initiative, during the critical initial implementation phase (2019–2024). Using validated data from the Health Ministry of the Kingdom of Saudi Arabia's data authority, the General Authority for Statistics (GASTAT), this study provides a comprehensive analysis of structural parameters and documented mortality indicators. Based on extensive analysis, the results we found demonstrate significant improvements in the healthcare sector: a 33.3% increase in the doctor-to-population ratio, rising from 27.6 to 36.8 doctors per 10,000 population; a 3.6% growth in the total number of hospitals, expanding from 498 to 516; and a notable 27.1% decline in under-five child mortality rates, decreasing from 8.5 to 6.2 per 1,000 live births. Hospital bed density per population also increased modestly by 4.0%, reflecting overall population growth of 4.7% at the time. However, regional inequality in hospitals is substantial: the Riyadh region accounts for 22.3% of the total number of hospitals, although it constitutes only 13% of the Kingdom's total population. The ultimate success of healthcare and the effectiveness of transformed strategies cannot be fully evaluated due to data gaps in parameters such as post-2019 total mortality, patient data, and quality metrics. Although the initial results for the above parameters are very satisfactory and align with the goal of the HSTP strategy, continued implementation of these parameters, along with substantial improvements in the data parameters, is urgently needed.

Keywords: health policy reform, vision 2030, structural transformation, healthcare workforce, healthcare infrastructure, Saudi Arabia, quantitative analysis, health system assessment.

INTRODUCTION:

Currently, healthcare systems worldwide face increasing challenges in delivering high-quality care, despite resource constraints and significant demographic changes. Demographic challenges include an aging population, rising rates of chronic diseases, the demand for technological progress, and citizens' expectations. Systematic changes or reforms that involve strategies for developing the healthcare workforce, infrastructure, innovation, and public-private engagement are among the leading evidence-based policies that effectively address these challenges. Health reforms that entail comprehensive strategies to overhaul healthcare delivery are not only aimed at increasing service volume but also at revamping the healthcare delivery system to optimize efficiency, quality, and population reach (Commonwealth Fund, 2023; Kruk et al., 2018; World Health Organization, 2017). The Kingdom of Saudi Arabia is among the countries that have embarked on the broadest healthcare transformation project in the Middle East. This undertaking is a national commitment to healthcare transformation, which is integrally connected with the Vision 2030 initiative, also referred to as the Health Sector Transformation Program (HSTP).

Before accelerated reform implementation, the Saudi health system was very centralized, with the Ministry of Health (MoH) controlling around 57% of the total healthcare facilities and 58% of the total hospital beds; other government sectors controlled around 10% of the facilities and 17% of the total hospital beds, and the private sectors controlled around 33% of the facilities and 25% of the total hospital beds (Ministry of Health, 2019). This centralization, though successful in covering the whole population, faced severe challenges. A shortage of highly qualified healthcare professionals, especially specialists, restricted delivery service. A documented regional disparity in facilities contributed to several challenges regarding access. Lack of innovation in service delivery contributed to the organization's poor structure. Inadequate healthcare IT infrastructure hindered communications. The number of specialists per 10,000 populations of the country, Saudi Arabia, was only 27.6 in 2019, which is lower compared to the average of high per capita countries, which ranged between 35 and 40 per 10,000. Still, the number of nurses, 58.2 per 10,000 population, is below the standard range of 70–90 per 10,000 population (General Authority for Statistics, 2023, 2024; World Health Organization, 2017). As a strategy of Vision 2030, the government of Saudi Arabia prioritized healthcare as a "strategic national priority" that

aims for specific, measurable targets to ensure "more accessible and higher quality health services, better preventive healthcare, greater use of information and communications technology, and greater participation of the private sector" (Vision 2030, 2016). This visionary strategy recognizes the need for healthcare excellence to enhance economic competitiveness and the nation's overall well-being. The HSTP translates the very ambitious goals of Vision 2030 into various integrated mechanism streams: (a) building healthcare professionals' capacity through the expansion of residency training programs locally and systematically international recruitment of healthcare professionals, (b) infrastructural modernization through public-private partnerships and the development of new facilities, (c) comprehensive healthcare transformation using technology, (d) innovation of healthcare services focusing on the enhancement of primary healthcare and preventive healthcare strategies, and (e) the transformation of the structure of governance of the MoH, where the new perspective will concentrate on the regulation of the healthcare system rather than the delivery of services (Ministry of Health, 2024).

Previous empirical studies documenting the challenges faced by the Saudi healthcare system have identified specific deficiencies that require intervention. The literature suggests that the development of the healthcare workforce is essential to success, although shortages of healthcare practitioners limit service delivery (Almalki et al., 2011). Irregularities in the geographic allocation of healthcare facilities and services contribute to the development of unequal access to healthcare services (AlJarallah & AlRowaily, 2021). Poor implementation of best practices for service delivery negatively affects service delivery efficiency (Alhazmi et al., 2022). Poor development of information technology adversely effects on service delivery success (Rahman et al., 2023; Alharthi et al., 2019). The existing literature contains a limited number of studies employing quantitative methods to assess the impacts of healthcare reforms and preliminary outcomes in the early stages of implementation. To make informed healthcare decisions, it is essential to identify the effects of healthcare investments and reforms on the healthcare system.

This study addresses a critical gap by providing a comprehensive quantitative assessment of structural transformation for the period 2019–2024, thus covering the initial phase of reform implementation. Some of the areas assessed include workforce development, infrastructure enhancement, transformation of the service delivery platform, and validated government outcome measures. This comprehensive approach will ensure an evidence-based assessment of the achievement of the objective of the structural transformation reforms.

METHOD

Study Design and Data Sources

The study employed a quantitative, descriptive, and comparative approach, ensuring the accuracy of a research design aimed at assessing the structure that had developed in the healthcare system between the baseline year of 2019 and the initial stages of reform implementation during 2023-2024. The current study exclusively uses primary data, which is sourced from four reliable sources of data: (a) the Health Indicators of the year 2019, published by the Ministry of Health, indicating the baseline data of the total healthcare system of the country prior to the implementation of reforms, (b) the reports of the General Authority for Statistics (GASTAT) of the total number of healthcare establishments and personnel, published for the years 2023 and 2024, indicating data post-reforms, (c) the Budget Statement for the year 2024, published by the Ministry of Finance, indicating the specific financial allocation of the country and illustrating the financial commitment of the state toward reforms, and (d) the World Health Organization Global Health Observatory (WHO GHO) database, used for the assessment of independent observations of the prevalence of mortality, (World Health Organization, 2024). Specifically, this study used no secondary data and formulated no statistical analysis or inference. Only data published by specific, reliable sources were used for analysis.

Population and Study Period

The analysis covered the entire national healthcare system of the Kingdom of Saudi Arabia, including public facilities managed by the Ministry of Health, other government-managed facilities, and private facilities. The specific time period was 2019–2024; 2019 served as the baseline year preceding the Health Sector Transformation Program (HSTP), with 2023–2024 identified as the first year of HSTP implementation. Moreover, a two-year data gap occurred from 2020 to 2022, given GASTAT's predetermined data submission cycle, and data for these years are not available for structural measurement.

Indicators and Measurements

Six major structural factors were carefully identified using the criterion of permanent availability for the period 2019–2024 and worldwide use in healthcare system monitoring frameworks. The identified factors are (a) total number of hospitals for all sectors, (b) total number of hospital beds, (c) number of beds for 10,000 population (standardized for demographic changes), (d) number of physicians for 10,000 population (adjusted for workforce density), (e) number of nurses, including midwives, for 10,000 population (adjusted for workforce density), and (f) primary healthcare center capacity and geographic access.

The following two indicators of population healthcare outcomes were also investigated: (a) under-five mortality ratio (deaths per 1,000 live births), which tops the list of child healthcare and preventive healthcare system effectiveness, and (b) maternal mortality ratio (deaths per 100,000 live births), which tops the list of obstetric healthcare quality. The crucial data for the mortality statistics, specifically the rates of the above-mentioned indicators, was extracted for the year 2023, the last updated worldwide verified data provided by the WHO Global Health Observatory (GHO).

The selection of indicators was made for the following reasons: (a) the indicators are consistent with existing frameworks for assessment of the healthcare system that are recognized worldwide and recommended by the WHO and other international bodies for healthcare, (b) the indicators use consistent definitions throughout the study period, (c) the indicators cover the entire spectrum of readiness of the structure, including the workforce, infrastructure, and service delivery, and (d) the indicators can provide a comparison measure with international standards and those of developed countries. The indicators were also reported at the national level and for the Riyadh Region, the highest-funded geographic area.

Data Extraction and Validation

The study data were collected manually by scouring official government sources for authoritative published data, which were then cross-checked for internal consistency using tables and footnotes. Calculations for the generated indicators (beds per capita, physicians per capita) were performed using official GASTAT publications, which provided mid-year population figures. Percentage changes used the following standard equation: [2024 Value - 2019 Value) / 2019 Value] × 100. For the generated mortality measures, the WHO GHO datasets, compiled from the latest international consensus estimates, were prioritized over national estimates, which were used to externally validate the published data against international reference standards. In cases where national and international estimates differed (e.g., under-five mortality figures), both sets of estimates were used, with careful indication of data sources and a concise description of the differences in underlying methodological approaches.

Ethical Considerations

This analysis used exclusively public-domain government data containing no personally identifiable information or individual patient records. No human subjects were involved in this descriptive policy analysis. The research did not require institutional ethics review under Saudi Arabia's regulatory framework governing secondary analysis of published government statistics, as confirmed by regulatory guidelines for analysis of aggregated public health data.

RESULTS

Baseline Health System Structure (2019)

At the early-reform baseline in 2019, the Saudi health system comprised 498 total health facilities of all organizational types distributed across the national health economy. This distribution reflected public facilities governed by the Ministry of Health (286 facilities, 57% of total); facilities governed by other government agencies and military/civil service (48 facilities, 10% of total); and privately operated healthcare facilities (164 facilities, 33% of total, Ministry of Health, 2019). This distribution pattern reflects the historical development of Saudi healthcare, with the dominant MoH sector presence supplemented by other public institutions and growing private-sector participation.

The system maintained 76,988 total hospital beds distributed across sectors as follows: 44,665 under MoH governance (58% of total capacity), 13,177 in other governmental facilities (17% of total capacity), and 19,146 private-sector beds (25% of total capacity). The concentration of beds in the public MoH sector reflects its historical role as the primary healthcare provider. There are 2,261 primary health centers under the MoH that provide community-based preventive and basic curative services as the foundation of the healthcare system (Ministry of Health, 2019).

The baseline workforce density for physicians and nurses was shown to be affected by a structural shortage that reduced healthcare system capacity, with 27.6 physicians and 58.2 nurses, including midwives, per 10,000 population (Ministry of Health, 2019). The shortage is significant when compared to the 35-45 physicians and 70-90 nurses per 10,000 in high-income countries. Furthermore, it also fell below the minimum adequacy thresholds of 25 physicians per 10,000 and 70 nurses per 10,000 set by the World Health Organization in relation to providing universal health coverage access (Ministry of Health, 2019; World Health Organization, 2017).

The baseline health outcome indicators indicated that, despite many years of investment in the healthcare sector, substantial work remained: under-five mortality was 8.5 per 1,000 live births, and the maternal mortality ratio was 11.9 per 100,000 live births. Although this was a creditable performance relative to other developing regions, it was still appreciably higher than in comparable developed countries, where under-five mortality rates are 5–6 per 1,000 and maternal mortality ratios are 10–15 per 100,000 (Ministry of Health, 2019; World Health Organization, 2017).

Structural Transformation (2019–2024)

The reform period has also seen the most profound and critical structural transformation in the form of a comprehensive expansion of the healthcare workforce. Densities increased substantially from 27.6 per 10,000 in 2019 to 33.6 per 10,000 in 2023, then rose further to 36.8 per 10,000 in 2024, representing a 33.3% increase relative to the 2019 baseline (Table 1). This comprehensive expansion also aligns with a prominent strategic priority under HSTP to increase residency enrollment, standardize international recruitment of healthcare personnel, and refine the geographic distribution of personnel across facilities and jurisdictions (General Authority for Statistics, 2024; Ministry of Health, 2024).

The 33.3% increase in physician supply per 10,000 population is particularly significant, as it brings Saudi Arabia closer to the high-income-country range of 35–40 per 10,000. This closes a prior gap relative to international benchmarks. This effort represents a concrete expression of commitment to workforce development as a mechanism for reform.

There has also been a substantial increase in the nursing workforce, rising from 58.2 per 10,000 in 2019 to 64.7 per 10,000 in 2023, then to 70.6 per 10,000 in 2024, marking a cumulative increase of 21.3%. This brings Saudi Arabia's nursing rate

to nearly the minimum adequacy level set by the World Health Organization, which stands at 70 per 10,000. The increase in the nursing workforce can be attributed to a strategic plan aimed at advancing advanced practice nursing, reinforcing the nursing workforce recruitment process, and recognizing nursing as a vital component of a functional healthcare system (General Authority for Statistics, 2023, 2024). The simultaneous 21.3% increase in the nursing workforce indicates a united effort in staffing rather than merely physician hiring.

Infrastructure Development

The increase in healthcare facilities did not keep pace with the growth of the healthcare workforce, reflecting a deliberate policy emphasis. The total number of hospitals increased from 498 in 2019 to 516 in 2024, showing a 3.6% increase (Table 1). This increase corresponds to an increase in private participation in healthcare facilities by 18, most of which are in the private sector, while those in the public sector remain relatively stable. From a regional perspective, the Riyadh region's number of hospitals increased from 109 in 2023 to 115 in 2024, thereby maintaining the highest share of all hospitals in the country at 22.3%, despite representing 13% of the country's population (Ministry of Health, 2019).

There has been a moderate increase in hospital bed capacity despite a substantial population increase and rising healthcare demand. The total number of beds increased from 76,988 in 2019 to 82,600 in 2024, representing a 7.4% absolute increase. However, after adjusting for population growth, the number of beds per 10,000 population increased modestly from 22.5 in 2019 to 23.4 in 2024. This represents a 4.0% per capita increase. This moderate increase in per capita beds reflects a strategic policy focus on alternative healthcare delivery models, such as ambulatory care, rather than prioritizing hospital beds. This policy focus is consistent with global evidence that effective primary care delivery reduces hospitalizations and, in turn, improves population health outcomes.

The difference between stable bed density and absolute expansion rates is evident: stable bed density shows a 4.0% per-capita expansion rate, whereas total expansion shows a 7.4% rate. This variation is based on the rebalancing of strategies from a hospital bed-driven inpatient care model. The rate of population growth, which rose 4.7% from 33.4 million in 2019 to 35.3 million in 2024, exceeds that of the per-capita expansion of beds.

Primary Healthcare Reorganization

During this period, a significant reorganization and reclassification of the primary healthcare infrastructure took place, integrating various delivery points for primary care. According to a GASTAT report, in 2023 there were 2,140 traditional primary health care centers under the Ministry of Health. However, in 2024, GASTAT revised its systematic definition to also include traditional primary healthcare centers, as well as medical complexes that provide comprehensive primary healthcare services, such as family medicine, diagnostic, dental, and urgent care. The number of primary healthcare facilities reported increased by 170% from 2023 to 2024 (General Authority for Statistics, 2024).

The reported increase primarily reflects an expanded measurement universe and redistribution, rather than the introduction of new facilities. It signifies the acknowledgment and incorporation of multiple primary care delivery points within a unified healthcare framework. This aligns with the objective of transforming the Health Sector, in which primary healthcare is emphasized as an essential foundation for healthcare performance, expenditure management, and the optimization of population health outcomes (Health Sector Transformation Program, 2024; General Authority for Statistics, 2024).

Financial Resource Allocation

The government has made a huge, unprecedented fiscal commitment to transforming the healthcare sector. This is evident in the 2024 Budget Statement of the Ministry of Finance, which allocates 214 billion Saudi Arabian Riyals to Health and Social Development. This constitutes about 6.5% of all government spending, with healthcare expenditures among the most significant contributors in this country (Ministry of Finance, 2024). This allocation shows a strong political commitment to achieving the transformation objectives. Although it does not specify the allocation for the Health Sector Transformation Program (HSTP) compared to other expenditures, it indicates a substantial budget, reflecting a political commitment to reform the healthcare sector.

Table 1 Verified Healthcare System Indicators, Saudi Arabia 2019–2024

Indicator	2019	2023	2024	Total Change
Total hospitals (all sectors)	498	499	516	+18 (+3.6%)
Hospitals in Riyadh Region	NR	109	115	+6 (+5.5%)
Total hospital beds	76,988	80,300	82,600	+5,612 (+7.3%)
Hospital beds per 10,000 pop.	22.5	23.8	23.4	+0.9 (+4.0%)
Physicians per 10,000 pop.	27.6	33.6	36.8	+9.2 (+33.3%)
Nurses per 10,000 pop.	58.2	64.7	70.6	+12.4 (+21.3%)
MoH primary healthcare centers	2,261	2,140	5,779[1]	+3,518 (+155.6%)[2]

Under-five mortality per 1,000	8.5	6.2	NR	-2.3 (-27.1%)[3]
Maternal mortality per 100,000	11.9	9.42	NR	−2.48 (−20.84%).

Note: NR = Not Reported. [1]Reflects expanded GASTAT definition including medical complexes. [2]Real facility expansion lower. [3]Uses WHO 2023 data.

Table 2 Percentage Change in Key Healthcare Indicators, 2019–2024

Indicator	2019	2024	% Change
Total hospitals	498	516	+3.6%
Hospital beds per 10,000 pop.	22.5	23.4	+4.0%
Physicians per 10,000 pop.	27.6	36.8	+33.3%
Nurses per 10,000 pop.	58.2	70.6	+21.3%

Health Outcome Indicators

There has been significant progress in under-five mortality rates, which decreased from 8.5 per 1,000 live births in 2019 to 6.2 in 2023, representing a 27.1% decrease. This rate has been significantly higher than the population growth rate, reflecting important changes in healthcare delivery and preventive care. This rate of 6.2 per 1,000 live births in 2023 also meets the World Health Organization target and exceeds the 2020 Sustainable Development Goals targets for this area, reflecting progress toward achieving the 2030 SDG target of 25 per 1,000 live births (World Health Organization, 2024). An improvement in child mortality rate usually represents a set of integrated improvement areas at a system level, such as improved immunization coverage, enhanced management of infectious diseases, decreased rates of malnutrition, improved emergency obstetric care, improved neonatal resuscitation, and enhanced maternal health services, which are all areas that are set for improvement in HSTP.

The data on maternal mortality indicate a substantial measurement gap that has hampered a comprehensive evaluation of reform. The 2019 baseline of 11.9 maternal deaths per 100,000 live births declined to 9.42 in 2023, according to the country's healthcare report for that year. Maternal mortality rates are not captured in the 2024 healthcare statistics published by GASTAT. This has hampered any comprehensive evaluation of the impact of HSTP investments in obstetric care, skilled delivery attendance, and maternal emergency care.

DISCUSSION

Workforce Expansion as a Main Strategy for Reform

This analysis highlights a notable structural achievement: a 33.3% increase in physician density, rising from 27.6 to 36.8 per 10,000 population. This trend indicates improvement towards meeting the standards of developed nations and meeting the thresholds set by WHO for the successful delivery of universal health coverage. This significant improvement in the healthcare workforce also indicates a major focus of HSTP policies on the development of healthcare workforces as a key cornerstone of a robust healthcare performance.

Research on the healthcare workforce indicates that workforce adequacy is a critical factor in the functionality and effectiveness of healthcare systems. Insufficiencies in a country's medical workforce limit access to care, undermine the quality of care, intensify patient safety concerns, and exacerbate the rise in noncommunicable disease rates. Studies pertaining to Saudi healthcare conditions highlighted that a long-standing insufficiency in the healthcare workforce has imposed major impediments to developing healthcare services and specialized sectors in this country (Almalki, 2011). The 33.3% increase in physician workforce share reported in this study reflects a major milestone in overcoming these conventions.

The Saudi Arabian government has been able to increase their healthcare workforce by means of three primary approaches: (a) increasing their domestic residency training capacities and medical school pipeline by establishing new medical institutions with residency programs; (b) actively engaging in an international physician search with a focus on identifying specialized areas where a deficiency in expertise still locally exists; and, thirdly, through a redistribution of their workforce in a manner that maximizes equity of distribution with regards to geography and types of facilities. (c) Nursing personnel have also increased by 21.3%.

International comparative evidence from successful healthcare systems consistently supports Saudi Arabia's focus on workforce development over the expansion of inpatient beds. Successful models in Northern European nations, Canada, and Australasian countries focused on increasing their workforce, coupled with a targeted strategy of ambulatory models rather than widespread inpatient expansion, in order to increase access and enhance quality of care delivery (Commonwealth Fund, 2023; Kruk, 2018; World Health Organization, 2017). These models succeeded in providing better care with fewer beds in healthcare facilities than traditional models. The increase of merely 4.0% in per capita beds in Saudi Arabia, coupled with substantial workforce development, provides evidence of strategic planning aligned with an evidence-based transition from hospital-centric models to those emphasizing primary care.

Infrastructure Development Based on Evidence-Driven Models of Care

The small increase in the number of hospitals (3.6%) and the 4.0% per-capita increase in hospital beds, relative to the 4.7% population growth rate, are consistent with policy rebalancing informed by international strategic planning research. Recent studies on strategic health systems emphasize that, in low- and middle-income developing countries, there should be a focused effort to enhance community and primary health care facilities rather than pursue extensive expansions of hospital infrastructure in health systems burdened by preventable diseases. (Alhazmi et al., 2022; WHO, 2017).

There is global evidence available that reinforces a strategy change and highlights multiple benefits attainable with a well-structured and resourced primary healthcare (PHC) system: decrease unnecessary admissions based on efficient community-based control and prevention offered for chronic conditions, better health service continuity and organization, improved patient satisfaction through easier access to health services, fewer gaps and discontinuities with current practice, and finally, better cost-effectiveness and health outcomes (Kruk et al., 2018). The strategy implemented by the Saudi Arabian government, characterized by moderate growth in hospital bed capacity alongside a significant increase in the number of physicians, facilitated the development of enhanced outpatient services.

The systematic efforts to formally integrate and align various primary care delivery points (family medicine clinics, diagnostic centers, dental clinics, urgent care facilities) into a cohesive, unified primary healthcare system architecture are reflected in the reclassification that increased the number of documented primary care facilities from 2,140 to 5,779. Although it represents, to some extent, a measurement adjustment rather than the establishment of new services, it still represents a significant step forward within the framework of the integration and management of primary health care as a basic component within the health system's restructuring. It aligns with HSTP's strategy, which focuses on strengthening primary health care as the backbone of health system operations, expenditure control, disease prevention, and population health optimization (Ministry of Health, 2024).

Health Outcome Improvements: Early Evidence of System Effectiveness

The documented 27.1% reduction in under-five mortality, from 8.5 to 6.2 per 1,000 live births, represents the most persuasive and tangible measure of Meaningful Reform success. It notably exceeded the changes attributable to population growth (4.7), indicating actual progress at the health system level rather than a mere demographic shift. The advancements achieved align with the target track II for Sustainable Development Goal 3, indicating progress toward the target of reducing under-five mortality rates to 25 per 1,000 by 2030.

Health sector goals centered on improving child survival rates typically include several related changes, such as expanding immunization services and increasing access to immunization programs; improving the management and treatment of infectious diseases, such as acute respiratory and gastrointestinal infections; improving nutrition and reducing malnutrition; and enhancing emergency obstetric care services to ensure safer deliveries. Within the framework of the Health Sector Transformation Plan (HSTP) reforms, it is essential that all comprehensive and system-driven outcomes undergo simultaneous enhancements across various dimensions of health sector reform initiatives (World Health Organization, 2024).

It is important to consider that improvements in mortality rates must be evaluated in light of various contextual factors. The analysis period from 2019 to 2024 must encompass the accelerated phase preceding the significant changes between 2019 and 2022, including certain gaps, and a maximum of 1–2 years of comprehensive and intensive implementation efforts during 2023–2024. Comprehensive tracking beyond these periods is essential, ideally by contrasting the data with those of similar nations that did not implement significant changes during these periods.

Geographic and Equity Disparities: Persistent Structural Challenges

Despite these documented improvements at the system level, substantial inequity in the distribution of healthcare resources remained at the geographic level. As before, the Riyadh region contained the majority of the country's healthcare resources, including 115 of 516 hospitals nationwide (22.3%), despite comprising approximately 13% of the country's total population. The continued majority in this region represents a region with greatly underserved capacity elsewhere. These historical and entrenched tendencies toward centralization and path-dependent location within Riyadh will not be easily altered without explicit equity-driven policy developments (AlJarallah & AlRowaily, 2021).

The HSTP strategic framework clearly mentions geographic equity as an objective. However, significant structural data are not available to show equity convergence or geographic distribution. The fact that there has not been an equitable distribution, with Riyadh's proportion remaining relatively stable from 109/499 = 21.8% in 2023 to 115/516 = 22.3% in 2024, while still seeing national growth, shows that while there has been growth with national distribution, it hasn't been done with a focus on underserved areas. It could be an implementation issue with equity policies or driven by broader economic factors.

Establishing an equitable distribution of health resources and facilities, specialty health services, and healthcare practitioners requires a specific policy imperative with set incentive structures (for providers and facility development), a structure for governing and equitable distribution of health financing, and an accountability structure that tracks equity-defined policy metrics. Otherwise, market and historical/advantage factors will more likely continue driving inequities.

Digital Health Transformation: Progress, Promise, and Measurement Challenges

The National Platform for Health and Insurance Exchange Services (NPHIES), Electronic Health Records, and telemedicine services are examples of national initiatives that involve digital transformation, making it a crucial cross-cutting area within HSTP. However, this quantitative analysis is evident: a critical challenge goes beyond being a Saudi Arabian issue and instead represents a global one, wherein national governments rarely provide comprehensive, quantifiable data on the level of adoption and implementation of digital health. These include the percentage of facilities with operational EHRs.

Despite the development of qualitative information about establishing regulatory guidelines, implementing platforms, and planning efforts (Ministry of Health, 2024). The Council of Health Insurance (2025) has suggested that a quantitative measure is necessary to objectively assess the impact of system adoption rates on healthcare practitioners and patients. It is apparent that significant adoption challenges arise in implementing online healthcare platforms internationally.

It thus becomes imperative for monitoring and evaluating future health systems to develop and enact comparable global online indicators covering facility EHR system adoption and functionality, provider adoption and usage rates, interoperability among various health information systems, telemedicine usage rates, patient participation with online tools, and ultimately connections with hospital and community health outcomes, respectively (Rahman et al., 2023; Alharthi et al., 2019). As it stands, without these measurable parameters, no determination on return on investment can be made.

Financial Protection and Equitable Access: Hidden Equity Risks

Although they cannot be measured using current structural data, financial protection tools and guarantees for equal access are pressing concerns that require immediate attention. Despite allocating extensive resources (214 billion SAR) to health sector transformation, affordability and financial hardship related to healthcare costs were evident among Saudi households, particularly among poorer segments, as previously documented in the literature (Al-Hanawi et al., 2018). Without financial protection provisions, extending and developing manpower and facilities could have limited effects on individuals of lower socioeconomic status.

Empirical research on health system reforms implemented in similar mid-income countries and contexts illustrates that some changes in health system structure can paradoxically increase health inequities, particularly when additional cost-sharing and user fees are introduced in the private sector, without financial aid or equity-protection measures (Alghamdi & Aljadani, 2023). The HSTP addresses specific goals of encouraging greater involvement in the private sector; integral to these goals are targeted equity-protecting measures. There have been numerous empirical studies on financial difficulties arising from healthcare expenses and costs.

Public–Private Partnership Dynamics: Benefits, Risks, and Governance

The number of private healthcare facilities increased from 164 in 2019 to an estimated 182 in 2024, reflecting an 11% growth rate that exceeds the public-sector expansion rate. While this growth aligns with Vision 2030's goal of strengthening partnerships, careful evaluation of the policy implications is necessary. The potential benefits of public–private partnerships (PPPs) include improving efficiency, fostering innovation, attracting funding, enhancing management in the private sector, reducing government financial burdens, stimulating competition and quality improvement, and expanding service delivery.

On the other hand, PPP challenges include fragmentation of healthcare delivery, loss of system coherence, a potential decline in equity standards if private care primarily serves wealthier communities, increased patient costs, and variability in the quality of care across healthcare sectors. Evidence from PPP models in Middle Eastern healthcare systems indicates that PPP success depends on regulatory systems that ensure healthcare sector integration, protect equity to prevent cream-skimming practices, establish uniform quality indicators, and enforce strict accountability mechanisms (Alghamdi & Aljadani, 2023; Al-Hanawi et al., 2018).

The Health Sector Transformation Program (HSTP) governance structure, which entails a shift in the role of the Ministry of Health (MoH) from a sole service deliverer to a system steward, is a critical infrastructure component necessary for PPP management. That said, whether the use of such infrastructure has improved the management of PPPs remains unproven.

Critical Data Gaps and Measurement Limitations Constraining Reform Evaluation

There are key measurement discrepancies that significantly hinder a full assessment of reform. First, the absence of indicators from the Ministry of Health regarding health outcomes from 2019 onward is a major strategic shortcoming, making it impossible to confirm whether structural reforms have had a positive impact on overall population health. Although the reported improvements in infant mortality rates via WHO are encouraging, a single mortality rate measure is not sufficient (Alrahwan & Alsabaan, 2023; World Health Organization, 2024).

Second, patient experiences and care quality have still not been measured. The structural indicators show system readiness but do not evaluate patient safety, care quality, effectiveness, timeliness of patient access, patient satisfaction, responsiveness, and other aspects that are becoming essential for assessing a health system worldwide. An urgent priority should be to develop patient-reported outcomes, along with quality and safety indicators.

Third, analysis is still lacking on cost-effectiveness and financial sustainability. After investing 214 billion SAR in the transformation, it is crucial to assess the per-patient cost of delivered services and the financial sustainability of these interventions. Future evaluations should include health economic analysis components such as cost-effectiveness, return on investment, and financial sustainability.

Alignment with International Evidence on Effective Health System Transformation

The structural improvements described in this analysis largely align with international research on best practices for health systems enhancement. Successful health systems around the world have improved healthcare delivery through workforce development, strengthening primary healthcare, and the strategic application of information technology (Commonwealth Fund, 2023; World Health Organization, 2017). These evidence-based approaches and international best practices are incorporated into Saudi Arabia's reform strategy.

Several aspects of HSTP remain unimplemented or unassessed. For structural changes to benefit population health, it is crucial to have effective quality assurance, ongoing improvement cycles, patient safety, and a method for tracking patient outcomes. Although infrastructure development for HSTP's digital transformation projects could potentially support monitoring of patient outcomes, building a robust clinical infrastructure is also necessary. Experience has shown that infrastructure alone cannot guarantee the success of healthcare reforms.

CONCLUSIONS

Saudi Arabia's Health Sector Transformation Plan shows real progress in its initial phase (2019-2024). Some major achievements include a 33.3% increase in doctors, a 21.3% rise in nurses, a 3.6% increase in bed occupancy, and a 27.1% reduction in child mortality before age five. This progress is driven by policies aimed at strengthening the health workforce and advancing primary healthcare services, rather than increasing bed capacity. These solutions align with international evidence on effective health system approaches.

However, significant challenges remain. First, data gaps after 2019 in health indicators, patient satisfaction, and quality of care make it difficult to fully assess the overall contribution of health initiatives, particularly with respect to child mortality rates. Second, current policies do not directly address geographic disparities in resource allocation and could threaten the equity goals of Vision 2030. Third, insufficient policy support leaves structural gains unverified in financially disadvantaged communities.

The Health Sector Transformation Program is a significant, ongoing initiative that shows initial signs of success in structural transformation. To sustain progress, future efforts must expand capacity while also enhancing quality, equity, outcome measurement, and governance. Future research must prioritize a systematic evaluation of these transformations to enhance policy effectiveness and optimize health outcomes.

Limitations

Several important limitations substantially affect the scope and interpretability of findings and warrant explicit acknowledgment. First, the data provided contain only structural indicators that do not measure healthcare quality, patient safety, healthcare effectiveness, or healthcare service use. This means the mere enhancement of healthcare infrastructure will not ensure better access to healthcare for the population. Second, data constraints largely limit evaluation to the Riyadh Region, and analysis of all 13 regions of the Kingdom of Saudi Arabia is not feasible. Third, the absence of detailed cost data disaggregated by service type or patient population meant that the analysis could not examine cost-effectiveness, financial sustainability, or financial protection impacts. These limitations substantially constrain our ability to draw definitive causal conclusions about the effectiveness of reform.

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