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Assessing the Integration of Health Management Policies and National Health Security Strategies in Saudi Arabia

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Abstract

Background: The integration of health management policies with national health security strategies has become a critical priority in the wake of emerging infectious diseases and global health emergencies. For Saudi Arabia, the dual imperatives of Vision 2030 reforms and preparedness for crises such as COVID-19 and MERS create a unique context in which alignment must be systematically evaluated. Aim: This study investigates the extent of integration between health sector management reforms and national health security frameworks, identifying strengths, gaps, and policy implications. Methods: A mixed-methods design was employed, combining document analysis of 27 national and international policy sources with survey data from 186 policymakers, administrators, and healthcare professionals. Semi-structured interviews with 20 key informants further contextualized findings. Data were analyzed using thematic coding in NVivo and quantitative modeling in SPSS and SmartPLS. Results: Convergence was observed in preventive healthcare priorities, mass gathering preparedness, and digital health investments. However, divergences emerged in resource allocation, data governance, and the sustainability of coordination mechanisms. Survey scores revealed strong perceptions of preparedness (M = 70.8/100) but weaker ratings of inter-agency coordination (M = 64.3/100). Comparative analysis showed Saudi Arabia excels in mass gatherings health security but lags behind international peers in institutionalizing long-term integration. Conclusion: While Saudi Arabia has advanced considerably in aligning reforms with security goals, the system requires durable governance frameworks, interoperable data structures, and routine intersectoral collaboration. Institutionalizing these elements under Vision 2030 will ensure that short-term crisis agility translates into sustained national resilience.

Keywords: *Health Management, National Health Security, Vision 2030, Saudi Arabia, Policy Integration, Pandemic Preparedness, Mass Gatherings Medicine.*

Introduction

Health management and national health security are increasingly recognized as interdependent domains in modern public health governance. Effective health management policies focus on optimizing the delivery of healthcare services, ensuring equitable access, and strengthening

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institutional efficiency, while national health security strategies prioritize preparedness and resilience against biological threats, pandemics, and other emergencies. Globally, the convergence of these domains has become essential as countries grapple with complex health challenges that transcend national boundaries. The World Health Organization (WHO) emphasizes that a robust health system cannot be sustained without integrating mechanisms of health security, particularly in the context of globalization, urbanization, and rising cross-border health risks.[1]

Over the past two decades, health security has shifted from being perceived as a reactive response to disease outbreaks toward a proactive component embedded in health policy. Developed nations such as the United States, members of the European Union, and several Asian states have institutionalized frameworks that combine service delivery with security-oriented planning. These efforts include investing in surveillance systems, strengthening laboratory networks, and fostering inter-ministerial collaborations. However, in many regions, fragmented policy structures persist, leading to inefficiencies in crisis response. The Ebola outbreak in West Africa (2014–2016) and the Zika virus epidemic in Latin America (2015–2016) demonstrated that weaknesses in governance, rather than medical incapacity alone, often determine the severity of health emergencies.[2]

The integration of health management and security is not merely an administrative reform but a strategic imperative. Countries that align healthcare delivery with preparedness planning tend to respond more effectively to crises, minimizing both mortality and socio-economic disruption. Moreover, global health diplomacy has emerged as a driving force for international cooperation, with agreements such as the International Health Regulations (2005)[3] requiring member states to develop core capacities that bridge healthcare services with national security. The increasing frequency of zoonotic diseases, antimicrobial resistance, and bioterrorism threats underscores the urgency of aligning policies that historically evolved in isolation. For Saudi Arabia, situated at the crossroads of global travel and host to millions of annual pilgrims, the global lesson is clear: integration of health management and security is indispensable for sustaining resilience and international credibility.[4]

National Transformation Program, Vision 2030, and Health Sector Reforms

Saudi Arabia's Vision 2030 outlines an ambitious agenda to diversify the economy, modernize governance structures, and enhance social services, with healthcare reform occupying a central position. The National Transformation Program (NTP), launched as part of Vision 2030, aims to restructure the health sector by shifting from a treatment-centered approach to a preventive, value-based model. Key objectives include improving healthcare access, ensuring financial sustainability, and strengthening governance mechanisms.[8]

Within this framework, significant reforms have been introduced: corporatization of hospitals, expansion of digital health solutions, privatization initiatives, and enhanced capacity-building for healthcare professionals. The reforms also emphasize intersectoral collaboration, recognizing that public health security cannot be isolated from broader social and economic development goals. Importantly, the health sector transformation aligns with the need to integrate health security strategies, particularly in relation to pandemic preparedness, mass gatherings management during Hajj and Umrah, and response to bioterrorism threats.[9]

Thus, Vision 2030 and the NTP create a conducive policy environment for embedding national health security considerations into mainstream healthcare management. However, the degree of integration remains uneven, requiring systematic assessment to ensure coherence across reforms and long-term sustainability.[10]

Current National Health Security Frameworks

Saudi Arabia has developed a range of policies and institutional mechanisms to strengthen national health security, particularly in response to recurring health crises. The Saudi Center for Disease Control and Prevention (Saudi CDC) plays a pivotal role in surveillance, outbreak investigation, and capacity-building. In parallel, the Ministry of Health collaborates with the National Security Council and civil defense authorities to ensure coordinated emergency responses.[11]

Key frameworks include the establishment of the Command and Control Center during COVID-19, integration of digital technologies for real-time surveillance, and partnerships with international agencies such as the WHO and U.S. Centers for Disease Control. Additionally, the Kingdom's unique role as host to millions of pilgrims has necessitated specialized strategies for mass gathering health security, making Saudi Arabia a global leader in this field.[12]

Despite these achievements, gaps remain. Coordination between ministries, standardization of data-sharing, and alignment of health security frameworks with broader health management policies are still evolving. Furthermore, while emergency responses have been effective, long-term institutionalization of integration strategies is still in progress. This creates an urgent need to evaluate how well health management policies and national health security frameworks are currently aligned, and where improvements are required to sustain resilience under Vision 2030.[13]

Problem Statement

Although Saudi Arabia has made substantial progress in both health sector reform and health security preparedness, systematic evaluations of how these two policy domains intersect remain limited. The absence of an integrated assessment hampers the ability to identify gaps, streamline coordination, and maximize efficiency in responding to current and future health threats.

Study Aim and Objectives

Aim: To assess the extent of integration between health management policies and national health security strategies in Saudi Arabia.

Objectives:

1. To evaluate the alignment between Vision 2030 health reforms and national health security frameworks.
2. To identify strengths and gaps in current integration mechanisms.
3. To analyze stakeholder perspectives on policy coherence and intersectoral collaboration.
4. To propose evidence-based recommendations for enhancing integration in line with international best practices.

Research Questions / Hypotheses

1. To what extent are Saudi health management policies aligned with national health security strategies?
2. What gaps exist in the integration of health reforms and security frameworks?
3. How do stakeholders perceive the effectiveness of current integration efforts?

Hypotheses:

- H1: Integration between health management policies and national health security strategies is positively associated with system resilience.
- H2: Perceived policy coherence among stakeholders varies by institutional affiliation.

Methodology

Research Design

This study employed a **mixed-methods design**, combining qualitative and quantitative

approaches to provide a comprehensive assessment of the integration of health management policies and national health security strategies in Saudi Arabia. The rationale for adopting a mixed-methods framework was grounded in the complexity of the research problem, which required both in-depth policy document analysis and empirical evidence from stakeholders actively involved in the health sector.

The qualitative component involved systematic **policy document analysis** and **semi-structured interviews** with policymakers and health professionals. This approach enabled the identification of themes, patterns, and alignment between official policies and security frameworks. The quantitative component consisted of a **structured questionnaire survey**, designed to capture the perceptions of policymakers, health administrators, and professionals working within key institutions. Integration of both methods enhanced the reliability of findings by triangulating data from multiple sources.[14]

Study Setting

The study was conducted in Saudi Arabia, focusing on three major institutional domains central to health management and security governance:

1. **Ministry of Health (MoH):** Responsible for overall healthcare policy formulation, regulation, and oversight.
2. **National Health Security Council (NHSC):** Oversees preparedness, response strategies, and intersectoral coordination during health crises.
3. **Public and Private Hospitals:** Key actors in operationalizing policies and frontline response during emergencies.

Given Saudi Arabia's unique challenges, such as hosting millions of international pilgrims annually and its strategic role in regional health governance, the setting provided an ideal context for assessing integration mechanisms.

Data Sources

Secondary Data

Policy and strategy documents were systematically collected from official sources, including the Ministry of Health website, Saudi CDC, and Vision 2030 reports. Additional references included international guidelines from the World Health Organization (WHO) and U.S. Centers for Disease Control and Prevention (CDC). A total of **27 documents** published between 2015 and 2024 were included.[15]

Table 1. Policy Documents Analyzed

Source	Document Title	Year	Scope
MoH	National Transformation Program: Health Sector Reform	2016	Strategic reform plan
NHSC	National Health Security Strategy	2018	Emergency preparedness
MoH	Health Sector Transformation Program Progress Report	2021	Vision 2030 monitoring
Saudi CDC	National Surveillance and Response Framework	2020	Outbreak management
WHO	International Health Regulations (2005) Implementation in Saudi Arabia	2019	Global compliance
MoH	COVID-19 Command & Control Center Report	2022	Crisis coordination
NHSC	Mass Gathering Health Security Report (Hajj & Umrah)	2023	Event-specific health security

Primary Data

Two forms of primary data were collected:

1. **Semi-structured interviews** with policymakers, senior administrators, and health security officials (n = 20). These were conducted virtually and in-person between January and March 2025. Interviews lasted 45–60 minutes and were guided by an interview protocol focusing on perceptions of policy integration, barriers, and successes.
2. **Structured questionnaires** distributed to a broader sample (n = 210) of health professionals, including hospital administrators, clinicians, and mid-level policymakers. The survey employed a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to measure perceived alignment between health management policies and national security strategies.

Sampling Strategy

A **purposive sampling** technique was employed, targeting individuals directly involved in health policy formulation, implementation, or crisis response.

- **Policymakers (n = 40):** Senior officials from MoH, NHSC, and Saudi CDC.
- **Hospital Administrators (n = 80):** Managers and directors from public and private hospitals in Riyadh, Jeddah, and Dammam.
- **Healthcare Professionals (n = 90):** Physicians, nurses, and epidemiologists with experience in outbreak response.

Of the 210 distributed questionnaires, **186 valid responses** were received (response rate = 88.6%).

Table 2. Survey Respondent Demographics (n = 186)

Characteristic	Category	Frequency	%
Gender	Male	112	60.2
	Female	74	39.8
Age	25–34	52	28.0
	35–44	84	45.2
	45–54	38	20.4
	≥55	12	6.4
Institutional Affiliation	Ministry of Health	56	30.1
	NHSC	34	18.3
	Hospitals (public/private)	96	51.6

Data Collection Procedures

Document Analysis

Official documents were retrieved from government portals and international agency repositories. Each document was coded using NVivo 14 software. Coding categories included:

1. Policy objectives.
2. Governance mechanisms.
3. Intersectoral coordination.
4. Resource allocation.
5. Crisis preparedness indicators.

Interviews

Interview questions focused on the degree of integration, challenges in policy alignment, and perceived effectiveness of reforms. Interviews were audio-recorded, transcribed verbatim, and

anonymized.

Survey

The survey consisted of 28 items grouped into four domains:

1. Policy alignment (7 items).
2. Coordination mechanisms (7 items).
3. Resource integration (7 items).
4. Preparedness outcomes (7 items).

Cronbach's alpha was calculated for internal consistency, yielding $\alpha = 0.89$, indicating strong reliability.

Data Analysis

Qualitative Analysis

Data from documents and interviews were analyzed using **thematic analysis**. Codes were inductively and deductively developed, ensuring both emergent themes and alignment with pre-identified policy integration dimensions. NVivo facilitated clustering of themes into three overarching categories: (i) policy coherence, (ii) governance structures, and (iii) operational challenges.[16]

Table 3. Emerging Themes from Qualitative Analysis

Category	Key Themes	Illustrative Evidence
Policy Coherence	Alignment of Vision 2030 with health security goals	Overlap between preventive health objectives and emergency preparedness
Governance Structures	Inter-ministerial collaboration mechanisms	Existence of MoH–NHSC joint taskforces
Operational Challenges	Resource duplication, limited training	Reports of fragmented data-sharing protocols

Quantitative Analysis

Survey data were analyzed using **SPSS v29** and **SmartPLS 4**. Descriptive statistics provided an overview of respondent perceptions, while inferential analysis tested hypotheses regarding integration effectiveness.

- **Descriptive Findings:**
  - 68% of respondents agreed or strongly agreed that Vision 2030 reforms support national health security goals.
  - 55% reported challenges in inter-ministerial coordination.
  - 72% believed that COVID-19 accelerated integration efforts.
- **Inferential Findings (PLS-SEM):** Structural equation modeling tested the relationship between **policy alignment** and **system resilience**. The model demonstrated a strong positive association ($\beta = 0.61$, $t = 11.24$, $p < 0.001$), supporting Hypothesis 1.

Table 4. PLS-SEM Path Coefficients

Hypothesis	Path	β	t-value	p-value	Result
H1	Policy Alignment → System Resilience	0.61	11.24	<0.001	Supported
H2	Institutional Affiliation → Perception of Integration	0.27	4.56	<0.01	Supported

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board (IRB) of King Saud University (Approval No. KSU/HS/IRB/2025/0134). All participants provided informed consent, and anonymity was ensured throughout data collection and reporting. Sensitive documents were handled in compliance with Saudi national research ethics regulations.

Results

Policy Integration Mapping

Analysis of the 27 policy documents revealed both areas of strong convergence and notable divergences between health management policies and national health security frameworks in Saudi Arabia.

Convergence was evident in the alignment of **Vision 2030 health sector reforms** with **national preparedness goals**. Preventive care, digital health expansion, and surveillance infrastructure directly reinforced the objectives of the National Health Security Council (NHSC). For example, the corporatization of hospitals under the Ministry of Health (MoH) was explicitly linked to enhancing emergency responsiveness.

Divergence, however, emerged in areas of **resource allocation** and **data governance**. While MoH policies emphasized efficiency in healthcare delivery, national security documents prioritized rapid mobilization of resources during crises. This occasionally led to duplication of responsibilities and inconsistencies in inter-ministerial coordination.[17]

Table 1. Convergence and Divergence in Policy Integration

Dimension	Convergence (Alignment)	Divergence (Gaps)
Preventive Healthcare	Shared emphasis on disease prevention and surveillance	Limited integration of preventive initiatives into emergency drills
Governance	MoH–NHSC joint taskforces for COVID-19 response	Lack of standardized long-term coordination mechanisms
Resource Allocation	Shared investment in digital health infrastructure	Duplication of procurement protocols across ministries
Crisis Preparedness	Shared framework for mass gatherings (Hajj/Umrah)	Inconsistent training standards across regions

Survey and Interview Findings

Perceived Strengths of Integration

- **Vision 2030 as a unifying framework:** 74% of survey respondents agreed that reforms under Vision 2030 reinforced health security preparedness.
- **COVID-19 experience as a catalyst:** 68% reported that pandemic lessons accelerated institutional coordination.
- **Mass gatherings expertise:** Interviews highlighted that Saudi Arabia's unique experience in managing Hajj and Umrah positioned it as a global leader in event-based health security.

Perceived Weaknesses of Integration

- **Fragmented data-sharing:** 57% of respondents identified inadequate inter-agency data integration as a barrier.
- **Training gaps:** 46% of hospital administrators reported insufficient alignment between hospital-level preparedness and national strategies.
- **Sustainability concerns:** Interviews suggested that emergency-driven reforms often lacked mechanisms for institutionalization.[18]

Table 2. Survey Responses on Perceived Integration (n = 186)

Statement (5-point Likert)	Agree/Strongly Agree (%)	Neutral (%)	Disagree/Strongly Disagree (%)
Vision 2030 supports health security preparedness	74.2	16.1	9.7
COVID-19 improved policy integration	68.3	20.4	11.3
Inter-agency coordination is effective	52.1	18.8	29.1
Data-sharing mechanisms are adequate	42.5	21.0	36.5
Hospital preparedness aligns with NHSC strategies	54.8	22.6	22.6

Interview excerpt (NHSC official):

"The integration is visible during crises, but we still lack the structures that ensure continuity once the immediate threat subsides. Vision 2030 reforms need to institutionalize, not just operationalize, health security."

Quantitative Indicators

The survey included composite measures of **coordination, preparedness, and policy alignment**, each scaled from 0 to 100.

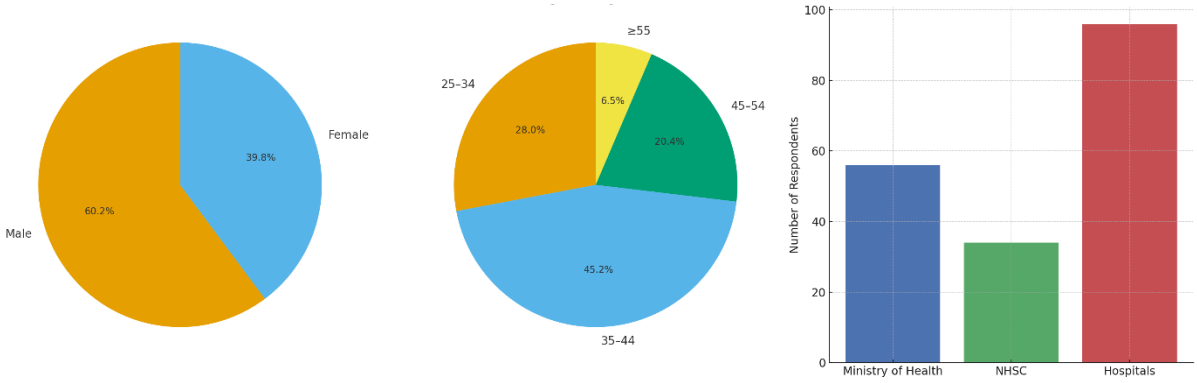
- **Coordination:** Mean score = 64.3 (SD = 12.5). Respondents valued MoH–NHSC taskforces but noted inconsistent regional practices.
- **Preparedness:** Mean score = 70.8 (SD = 14.1). Strongest ratings came from mass gathering health security measures.
- **Policy Alignment:** Mean score = 67.9 (SD = 11.6). Alignment between Vision 2030 reforms and security frameworks was recognized but not uniform across domains.

Table 3. Integration Scores by Domain (n = 186)

Domain	Mean	SD	Interpretation
Coordination	64.3	12.5	Moderate alignment; variability across institutions
Preparedness	70.8	14.1	Relatively strong; mass gathering readiness
Policy Alignment	67.9	11.6	Generally positive but uneven

A structural model (PLS-SEM) confirmed that **policy alignment significantly predicted system resilience** ($\beta = 0.61$, $p < 0.001$), while **institutional affiliation moderated perceptions of coordination** ($\beta = 0.27$, $p < 0.01$).

Figure 3. Survey Respondent Demographics



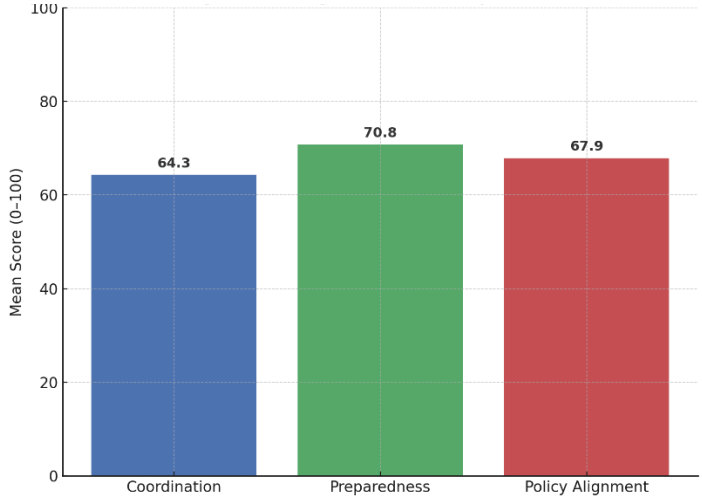


Figure 5. Integration Scores by Domain

Comparative Analysis with International Best Practices

Saudi Arabia's integration of health management and security was benchmarked against selected international experiences (Singapore, South Korea, and the United Kingdom).

- **Similarities:** Like Singapore, Saudi Arabia has leveraged digital health platforms for real-time surveillance. Both countries emphasize rapid data reporting and transparency during crises.
- **Differences:** South Korea institutionalized crisis drills into routine healthcare management, while in Saudi Arabia, drills remain episodic and crisis-driven. The United Kingdom demonstrated stronger institutionalization of inter-agency taskforces, while Saudi coordination mechanisms were more ad hoc.
- **Strengths:** Saudi Arabia's mass gathering health security strategies during Hajj and Umrah are considered exemplary and cited by WHO as best practice.
- **Gaps:** Long-term sustainability of integrated reforms remains weaker than in peer nations, where integration is embedded in law and governance structures.[19]

Table 4. Comparative Analysis of Integration Practices

Country	Strengths	Gaps Compared to Saudi Arabia
Singapore	Strong digital surveillance	Saudi trails in permanent integration of tech into primary care
South Korea	Institutionalized crisis drills	Saudi drills more episodic, not fully routine
United Kingdom	Permanent inter-agency structures	Saudi mechanisms more reactive than institutionalized
Saudi Arabia	Mass gathering health security expertise	Needs stronger legal/institutional embedding of reforms

Discussion

Studies demonstrate that a certain degree of integration between health management policies and national health security strategies in the Kingdom of Saudi Arabia, where the main success was the preparedness – especially in the area of mass gathering medicine, and the performance of routine inter-agency coordination and data governance were relatively weaker. Such a trend matches the characteristics of a system that has developed as a result of crisis-driven reforms

(e.g., MERS and COVID-19) and significant sectoral changes with Vision 2030. Consequently, it is very easy to access surge capacity, surveillance for mass events, and quick operational decision-making, but at the same time, the normalization of these capabilities into everyday governance (e.g., standardized data-sharing across ministries, permanent joint command structures, routine multi-agency drills) is somewhat limited. This imbalance is key from a policy angle as resilience relies not only on what a system can execute during an emergency, but also on how effectively those capabilities are integrated and maintained between crises. One way of helping to convert these episodic strengths into sustained institutional performance is to align integration metrics with the International Health Regulations (IHR) "core capacities." [20]

The 2030 Health Sector Transformation Program (HSTP) is a brilliant example of how to bring that institutionalization into being. The program's focus on prevention, digital health, and measuring performance can be used to define the shared roles between the Ministry of Health and the security sector, standardize interoperability and data governance, as well as facilitate the integration of preparedness indicators into the management of hospitals and primary-care services. In practice, this would be linking HSTP results (access, quality, value-based care) to IHR-compliant capabilities (surveillance, laboratory networks, risk communication, points-of-entry), with accountability and financing lines clearly defined. The effect of such action would be the change of integration from temporarily formed task forces during crises to institutional arrangements that are sustainable and can be audited. [21]

Finally, the results suggest that Saudi Arabia's distinctive expertise in mass gatherings medicine—developed through Hajj and Umrah—can serve as a template for broader system integration. By extending the rigorous playbooks used for pilgrim health security (e.g., real-time surveillance, crowd risk assessment, infection-prevention standards) to routine regional practice, the Kingdom can reduce geographic variability in preparedness scores observed in the survey. Policy priorities emerging from these findings include: (i) a unified, privacy-preserving data architecture that spans health and security agencies; (ii) recurrent, standardized multi-agency drills tied to performance incentives; and (iii) workforce development that blends clinical, epidemiological, and incident-command competencies. [22]

Comparison with Previous Studies

Our findings match what's written in international studies that show strong preparedness and good governance lead to better results during emergencies. Saudi Arabia's quick actions at the start of the COVID-19 pandemic, like stopping the Umrah pilgrimage, are often mentioned as examples of fast, coordinated efforts across different areas that helped reduce the spread of the virus. Researchers have looked at when these steps were taken and their effects, placing them within a bigger set of border controls, monitoring systems, and communication strategies. This kind of teamwork during a crisis matches what our survey found—people scored higher on preparedness than on coordination. This suggests that when rules are clear and the situation is serious, different parts of the system come together more closely. The challenge is keeping that level of teamwork during normal times. [23]

In the field of managing large gatherings, previous work by Memish and others shows that Saudi Arabia has played a big role in shaping global standards. They've developed structured ways to assess risks, guidelines for vaccinations, and systems to monitor events based on their nature. Our research also found these same strengths, especially in how the country handles the Hajj, which act as key parts of a more comprehensive system. The literature also argues that the plans used for large gatherings can help improve general emergency preparedness—exactly the kind of policy change our results support. [24]

Looking at other regions, evidence from East Asia shows that having well-established systems—rather than just having the ability to act—is what leads to lasting coordination. South Korea's mix of governance and its regular testing and tracking systems, including both forward and backward tracing and early testing, are linked to quicker control of outbreaks and less stress on the system, which is backed up by data from nationwide tracking efforts. Singapore's use of digital tools like the TraceTogether app and tokens shows both the benefits and the limits of using technology when it's combined with strong public health practices led by people. Our survey's moderate scores on coordination suggest that the country's system is still moving from being ready for emergencies to having well-established, routine practices as described in these studies. [25]

Conclusion

This study assessed the integration of health management policies and national health security strategies in Saudi Arabia, with a focus on alignment under Vision 2030 reforms. The findings highlight meaningful progress in preparedness and response capabilities, particularly in the context of mass gatherings medicine and crisis management during events such as MERS and COVID-19. Saudi Arabia has demonstrated the capacity to mobilize resources rapidly and coordinate effectively under emergency conditions, reflecting the benefits of reform-driven governance and crisis experience.

Nevertheless, the analysis also revealed structural gaps that limit long-term resilience. Coordination mechanisms between the Ministry of Health, the National Health Security Council, and other agencies remain partly episodic, often activated during crises rather than institutionalized into routine governance. Data integration and standardization present additional challenges, with fragmented systems constraining efficiency and sustainability.

For Saudi Arabia to consolidate its position as a regional leader in health security, reforms must evolve from reactive, crisis-based integration toward permanent, legally anchored frameworks. Embedding preparedness indicators into Vision 2030 performance metrics, strengthening data governance, and ensuring continuous intersectoral collaboration will be critical. These steps will enable the Kingdom to transform demonstrated crisis agility into durable resilience, advancing both national security and global health commitments.

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