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The Impact of Health Information and Healthcare Management on Healthcare Services, Decision-Making and Patient Care

¹Maadi Ali Assiri, ² Hussam Saeed Fqaeh, ³ Ibrahim Ahmad ali, ⁴ Ali Zaher Alfifi, ⁵ Fawaz Yahya Salim Alfiafi, ⁶ Hasan Ahmad Almanjahi, ⁷ Fawaz Mohammed Hassan Al Sayeda, ⁸ Al-Hassan Abu Talib Ali, ⁹ Ali Ahmed Alhifthi, ¹⁰ Fares Fadhel Almalki

^{1,2,3,4,5,6,7,8,9,10} Health Information and & Health Administration National Guard-Health Affairs

ABSTRACT: The quality, efficiency, and safety of modern healthcare delivery increasingly depend on two interdependent functions: the systematic management of health information and the administrative discipline of healthcare management. Together, these functions determine whether clinical and operational decisions are made on the basis of timely, accurate data or on fragmented and incomplete information. This paper examines the combined impact of health information systems and healthcare management practice on healthcare services, organizational decision-making, and patient care outcomes. Drawing on Donabedian's structure-process-outcome model, the Resource-Based View of organizational strategy, and evidence-based management theory, the paper develops an original conceptual framework, COMPASS (Coordination, Outcomes monitoring, Management oversight, Planning and resource allocation, Analytics for decision support, and Systems interoperability and stewardship), to describe how information and management functions jointly steer healthcare organizations toward safer and more efficient care. The discussion is situated within the Saudi Arabian healthcare landscape, referencing the regulatory and institutional roles of the Ministry of Health, the Saudi Commission for Health Specialties (SCFHS), the Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI), and the Nphies and Mumaris+ digital platforms, and considers how Vision 2030's digital health and workforce transformation goals are reshaping both functions. The paper concludes by identifying persistent barriers — data fragmentation, managerial capacity gaps, and interoperability limitations — and offering recommendations for strengthening the integration of health information systems with healthcare management practice to sustain measurable improvements in patient care.

1. INTRODUCTION

Healthcare organizations generate vast quantities of clinical and operational data every day — laboratory results, medication records, staffing schedules, financial transactions, and patient outcomes. The value of this data, however, is realized only when it is captured accurately, organized coherently, and translated into decisions that improve the delivery of care. This translation depends on two closely intertwined functions: health information management, which governs the integrity, accessibility, and security of health data, and healthcare management, which governs the organizational, financial, and operational structures through which that data is put to use.

This paper examines how these two functions jointly shape healthcare services, decision-making, and patient care outcomes. It proposes an integrative framework, COMPASS, to describe the mechanisms through which health information and healthcare management combine to guide healthcare organizations toward safer, more efficient, and more patient-centered care, and situates this discussion within the evolving regulatory and digital transformation landscape of the Saudi healthcare system.

1.1 Purpose and Scope

The purpose of this paper is to provide an integrated account of how health information systems and healthcare management practices affect the quality of healthcare services and the decisions made within them. The scope spans clinical information systems, health data governance, strategic and operational management, and their combined influence on both administrative decision-making and direct patient care outcomes within the Saudi healthcare context.

2. THEORETICAL AND CONCEPTUAL FRAMEWORK

This paper's analysis is grounded in three complementary theoretical perspectives, synthesized into a framework specific to the intersection of health information and healthcare management.

2.1 Donabedian's Structure-Process-Outcome Model

Donabedian's model provides the foundational logic for this paper: structure (information systems, organizational design, staffing) shapes process (clinical and administrative decision-making), which in turn determines outcome (patient safety, efficiency, and satisfaction). Health information and healthcare management operate primarily at the structural level but exert their influence through the quality of the processes they enable.

2.2 The Resource-Based View of Organizational Strategy

The Resource-Based View conceptualizes information and managerial capability as strategic organizational resources — assets that, when well-developed, provide a sustained advantage in the efficiency and quality of service delivery. Applied to healthcare, this perspective explains why organizations with mature health information systems and strong management structures consistently outperform those without, even when clinical staffing levels are comparable.

2.3 Evidence-Based Management

Evidence-based management extends the logic of evidence-based clinical practice to organizational decision-making, arguing that administrative and strategic decisions should be grounded in the systematic use of data rather than intuition or precedent alone. This principle underlies the analytics and decision-support function central to the framework proposed below.

2.4 The COMPASS Framework

Building on these theoretical foundations, this paper proposes COMPASS as an organizing framework for the combined contribution of health information and healthcare management to healthcare services and patient care:

- Coordination — the alignment of clinical, administrative, and financial functions around shared information and shared goals.
- Outcomes monitoring — the systematic tracking of clinical and operational performance indicators to detect variation and guide improvement.
- Management oversight — the administrative leadership structures that translate data into organizational policy and accountability.
- Planning and resource allocation — the use of information to guide staffing, capacity, and budgetary decisions.
- Analytics for decision support — the application of data analysis to inform both clinical and managerial decision-making in real time.
- Systems interoperability and stewardship — the technical and governance infrastructure that ensures data flows securely and accurately across the organization.

COMPASS treats health information and healthcare management not as separate administrative functions but as the two halves of a single steering mechanism that directs healthcare organizations toward safer and more efficient care.

3. HEALTH INFORMATION SYSTEMS: THE FOUNDATION OF COORDINATION

Health information systems, including electronic health records, laboratory information systems, and clinical decision-support tools, form the technical foundation on which coordinated care depends. Their primary contribution lies in making patient and operational data accessible, accurate, and available at the point of need.

3.1 Core Contributions

- Centralized and accurate patient records that reduce duplication of testing and support continuity of care across providers.
- Clinical decision-support tools that alert providers to potential medication errors, abnormal results, or overdue preventive care.
- Standardized data structures and coding systems that support accurate clinical documentation and reimbursement processes.
- Secure data exchange infrastructure that allows information to move safely between departments, facilities, and national platforms.

3.2 Impact on Outcomes

Fragmented or inaccessible health information is a well-documented contributor to diagnostic delay, duplicated testing, and medication errors arising from incomplete histories. Conversely, mature health information systems are associated with improved care coordination, reduced administrative burden on clinical staff, and stronger support for population health monitoring and quality reporting.

4. HEALTHCARE MANAGEMENT: OVERSIGHT, PLANNING, AND RESOURCE ALLOCATION

Healthcare management encompasses the leadership, organizational, and operational structures through which healthcare institutions translate available information and resources into functioning services. Effective management determines whether clinical capacity, staffing, and financial resources are aligned with patient needs.

4.1 Core Contributions

- Strategic planning that aligns organizational capacity with projected patient demand and service priorities.
- Staffing and workforce management that ensures adequate clinical coverage while managing budgetary constraints.
- Quality and risk management programs that monitor safety indicators and coordinate improvement initiatives.
- Financial management and resource allocation that determine the availability of equipment, technology, and clinical services.

4.2 Impact on Outcomes

Healthcare management performance is directly linked to operational efficiency indicators such as patient wait times, bed utilization, and staff turnover, each of which in turn affects the quality and timeliness of patient care. Organizations with strong management structures are better positioned to translate available health information into coordinated, system-wide improvement rather than isolated departmental responses.

5. DECISION-MAKING: CLINICAL AND ADMINISTRATIVE INTEGRATION

The combined value of health information and healthcare management is most evident in the quality of decision-making they enable, spanning both the clinical bedside and the administrative boardroom.

5.1 Clinical Decision-Making

At the point of care, clinicians rely on accurate and complete information — laboratory results, medication histories, and previous encounters — to make timely and appropriate treatment decisions. Clinical decision-support systems embedded within electronic health records increasingly augment this process by flagging risks and recommending evidence-based interventions.

5.2 Administrative and Strategic Decision-Making

At the organizational level, healthcare managers rely on aggregated data — patient flow patterns, cost data, quality indicators, and workforce metrics — to make decisions about resource allocation, service expansion, and quality improvement priorities. The reliability of these decisions depends directly on the completeness and accuracy of the underlying health information systems, illustrating the interdependence between the two functions at the heart of this paper.

5.3 Impact on Outcomes

Data-informed decision-making at both the clinical and administrative levels is associated with reduced variation in care quality, more efficient use of clinical resources, and faster identification of emerging safety concerns. Where health information systems and management structures are poorly integrated, decisions at both levels are more likely to be delayed, inconsistent, or based on incomplete information.

6. PATIENT CARE: THE ULTIMATE POINT OF IMPACT

Ultimately, the combined function of health information and healthcare management is measured by its effect on the patient's experience of care — its safety, timeliness, and responsiveness to individual needs.

6.1 Core Contributions

- Reduced wait times and improved appointment scheduling through data-informed capacity planning.
- Fewer diagnostic delays and duplicated tests through accessible, longitudinal patient records.
- More consistent adherence to clinical guidelines through decision-support tools embedded in daily workflows.
- Stronger continuity of care across referrals and transitions, supported by interoperable information systems.

6.2 Impact on Outcomes

Studies of health information system implementation consistently associate mature electronic health record adoption, when paired with strong managerial oversight, with reductions in preventable adverse events and improvements in guideline-concordant care. The relationship, however, is not automatic: technology alone does not improve outcomes without the managerial structures needed to translate data into coordinated action.

7. INTEGRATED SUMMARY: THE COMPASS FRAMEWORK IN PRACTICE

Table 1 summarizes the six COMPASS components, their representative functions, and their principal linkage to healthcare services, decision-making, and patient care outcomes.

Table 1. Health Information and Management Functions Mapped to the COMPASS Framework

COMPASS Component	Primary Function	Outcome Linkage
Coordination	Alignment of clinical, administrative, and financial data	Reduced duplication and fragmentation
Outcomes Monitoring	Tracking of clinical and operational indicators	Earlier detection of quality variation
Management Oversight	Leadership translation of data into policy	Stronger organizational accountability

COMPASS Component	Primary Function	Outcome Linkage
Planning & Resource Allocation	Staffing, capacity, and budget decisions	Improved efficiency and access
Analytics for Decision Support	Data-driven clinical and managerial decisions	Reduced variation in care quality
Systems Interoperability	Secure, accurate cross-platform data exchange	Improved continuity of care

8. HEALTH INFORMATION AND MANAGEMENT WITHIN THE SAUDI HEALTHCARE SYSTEM

The Saudi healthcare system has undergone rapid digital and managerial transformation over the past decade, positioning health information management and healthcare management as central pillars of the Vision 2030 healthcare transformation agenda.

8.1 Regulatory and Institutional Context

The Ministry of Health sets national strategic priorities for health information infrastructure and healthcare management standards across public facilities. SCFHS governs licensing and continuing professional development for health information management and healthcare administration professionals, formalizing these disciplines as recognized healthcare specialties. CBAHI accreditation standards embed health information governance and management accountability directly into hospital quality criteria, requiring documented evidence of data integrity and administrative oversight as a condition of accreditation.

8.2 Vision 2030 and Digital Transformation

The expansion of the Nphies platform for unified claims and clinical data exchange, together with the Mumaris+ system for professional licensing and credential verification, reflects a broader national effort to integrate health information infrastructure across providers. These platforms are progressively reducing the historical fragmentation between health information systems and management decision-making, supporting more coordinated, system-wide planning across the Saudi healthcare sector.

9. CHALLENGES TO INTEGRATION

- Data fragmentation: Legacy systems and inconsistent data standards across facilities can limit the completeness of information available for both clinical and managerial decision-making.
- Managerial capacity gaps: Not all healthcare managers possess the analytical training needed to translate available health information into effective operational decisions.
- Interoperability limitations: Differences in electronic health record platforms across providers can constrain the secure exchange of patient data at points of referral and transition.
- Resistance to data-driven culture: Established administrative and clinical practices can be resistant to decision-making approaches that depend heavily on systematic data analysis rather than experience alone.
- Workforce shortages in health informatics: Specialized roles bridging clinical, information technology, and management functions remain in short supply relative to growing digital health demands.

10. RECOMMENDATIONS

Building on the COMPASS framework and the challenges identified above, this paper offers the following recommendations for strengthening the combined contribution of health information and healthcare management to patient care:

- Invest in continued interoperability improvements across electronic health record platforms, building on the integration efforts of Nphies to reduce data fragmentation across providers.

- Expand training in health informatics and data analytics for healthcare managers, equipping them to translate available information into evidence-based operational decisions.
- Strengthen CBAHI-aligned data governance standards, requiring regular audits of health information accuracy and completeness as part of accreditation review.
- Develop joint clinical-managerial dashboards that present real-time quality and operational indicators to both frontline clinicians and organizational leadership.
- Support continuing professional development, aligned with SCFHS requirements, for both health information management and healthcare administration professionals.
- Formalize interprofessional collaboration between health information, management, and clinical teams in strategic planning processes.

11. CONCLUSION

Health information and healthcare management function as two interdependent pillars supporting the safety, efficiency, and quality of contemporary healthcare services. The COMPASS framework proposed in this paper — Coordination, Outcomes monitoring, Management oversight, Planning and resource allocation, Analytics for decision support, and Systems interoperability and stewardship — illustrates how these two functions combine to steer healthcare organizations toward better decision-making and improved patient care. Within the Saudi healthcare system, the regulatory foundations provided by the Ministry of Health, SCFHS, and CBAHI, together with the digital transformation goals of Vision 2030 embodied in platforms such as Nphies and Mumaris+, are creating increasingly favorable conditions for this integration. Sustained improvement in healthcare services and patient outcomes will depend on continued investment in interoperable information systems, managerial analytical capacity, and the collaborative structures that allow health information and healthcare management to function as a single, coherent steering mechanism for the health system as a whole.

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