

Middle East Centre



5 Admissions (from IP)  
65

# UNCOVERING PROGRESS OF HEALTH INFORMATION MANAGEMENT PRACTICES

The table lists various medical categories under 'Reason For Visit' and 'Adm.'.

Reason For Visit	Adm.
(Reg)	Medic
(Reg)	Cardio
(Reg)	Intern
(Reg)	Neuro
(Reg)	Total
(Reg)	Adm's
(Reg)	Nurse L
(Reg)	MDM Co

## EVIDENCE FROM KUWAIT'S PUBLIC HEALTH CARE SYSTEM

DARI ALHUWAIL

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# Uncovering Progress of Health Information Management Practices: Evidence from Kuwait's Public Health Care System

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## About the Author

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## Abstract

**Background:** The burden of chronic non-communicable diseases is a challenge for many countries that provide universal health coverage and is necessitating healthcare reform. Health information technology (IT) solutions can aid healthcare reform efforts. However, without proper information management, these efforts are futile. In this study, we examine Kuwait as a case of a high per-capita GDP country that faces information management challenges to draw insights that can be generalised to other developed countries.

**Objectives:** This study aims to: (i) uncover the status quo of information management practices in public organisations providing secondary and tertiary care through comparing their progress in compliance with the information man-

agement standards across the years; and (ii) offer recommendations to improve information management practices.

**Method:** This study analyses qualitative and quantitative accreditation-related data pertaining to compliance with the information management standard at all secondary and tertiary care public hospitals over two accreditation cycles.

**Results:** Overall, public hospitals are making positive progress in their compliance with the information management standard. However, issues exist with (i) effectively and efficiently transmitting data; (ii) developing and implementing an information management plan; (iii) involving the appropriate stakeholders in selecting health IT solutions; and (iv) access to the Internet by staff and patients.

**Conclusion:** The evidence underscores the benefits of complying with predetermined criteria and illustrates the overall improvements in information management practices. Without proper management of information at healthcare facilities, achieving safe and effective patient care is futile. The absence or lack of appropriate management of information can jeopardise patient safety through wrong prescriptions for example. The role of health IT in supporting good quality care and healthcare reform efforts cannot be ignored or sidelined any more in modern healthcare delivery.

**Implications:** With the rapid adoption of digital health systems, the role of health information management leaders should not be undervalued. Embracing health IT solutions with strong information management practices can aid healthcare reform efforts.

## Introduction

Healthcare systems around the globe face considerable challenges that hinder their efforts to deliver care services effectively and efficiently while improving the health of the population.<sup>1</sup> Globally, the toll of chronic non-communicable diseases, for example diabetes and hypertension, has become absolutely unbearable and the proliferation of these diseases among the growing populations threatens the economies of many countries.<sup>2</sup> Even in developed countries with universal health coverage, an affluent population and a high per-capita GDP, these challenges continue to persist.<sup>3</sup> Similar to many developed countries, the demand for healthcare services in the oil-rich State of Kuwait has been on the rise as its population continues to grow older and live longer.<sup>4</sup> Additionally, the dramatic changes in the population's socioeconomic status in the post-oil era have promoted a sedentary lifestyle and a high-calorie diet.<sup>5</sup> This kind of lifestyle facilitates the spread of non-communicable diseases such as diabetes,<sup>6</sup> hypertension,<sup>7</sup> and

<sup>1</sup> Theo Vos et al., 'Global, Regional, and National Incidence, Prevalence, and Years Lived with Disability for 328 Diseases and Injuries for 195 Countries, 1990–2016: A Systematic Analysis for the Global Burden of Disease Study 2016', *The Lancet* 390/10100 (2017), pp. 1211–59. Available at [https://doi.org/10.1016/S0140-6736\(17\)32154-2](https://doi.org/10.1016/S0140-6736(17)32154-2).

<sup>2</sup> Armando Arredondo and Raul Aviles, 'Costs and Epidemiological Changes of Chronic Diseases: Implications and Challenges for Health Systems', *PLoS One* 10/3 (2015), pp. 1–12. Available at <https://doi.org/10.1371/journal.pone.0118611>.

<sup>3</sup> David Tordrup, Aris Angelis and Panos Kanavos, 'Preferences on Policy Options for Ensuring the Financial Sustainability of Health Care Services in the Future: Results of a Stakeholder Survey', *Applied Health Economics and Health Policy* 11/6 (2013), pp. 639–52. Available at <https://doi.org/10.1007/s40258-013-0056-7>.

<sup>4</sup> Mustafa Younis, Maha Al-Hajeri, Yucuf Celik, Adnan Kisa and Jai Parkash, 'Healthcare of Aging Population of Kuwait', *Ageing International* 40/1 (2015), pp. 36–43; Osman Gulseven, 'Forecasting Population and Demographic Composition of Kuwait until 2030', *International Journal of Economics and Financial Issues* 6/4 (2016), pp. 1429–35.

<sup>5</sup> Ahmad Allafi et al., 'Physical Activity, Sedentary Behaviours and Dietary Habits among Kuwaiti Adolescents: Gender Differences', *Public Health Nutrition* 17/9 (2014), pp. 2045–52, available at <https://doi.org/10.1017/S1368980013002218>; Ahmad R. Al-Haifi et al., 'Relative Contribution of Physical Activity, Sedentary Behaviors, and Dietary Habits to the Prevalence of Obesity among Kuwaiti Adolescents', *Food and Nutrition Bulletin* 34/1 (2013), pp. 6–13, available at <https://doi.org/10.1177/156482651303400102>.

<sup>6</sup> Abdelmoneim Ismail Awad and Fatemah Mohammad Alsaleh, '10-Year Risk Estimation for Type 2 Diabetes Mellitus and Coronary Heart Disease in Kuwait: A Cross-Sectional Population-Based Study', *PLoS One* 10/1 (2015): e0116742, available at <https://doi.org/10.1371/journal.pone.0116742>; Azza A. Shaltout et al., 'Incidence of Type 1 Diabetes Has Doubled in Kuwaiti Children 0-14 Years over the Last 20 Years', *Pediatric Diabetes* 18/8 (2017): 761–6, available at <https://doi.org/10.1111/pedi.12480>.

<sup>7</sup> Arshad Mohamed Channanath, Bassam Farran, Kazem Behbehani and Thangavel Alphonse Thanaraj, 'State of Diabetes, Hypertension, and Comorbidity in Kuwait: Showcasing the Trends as Seen in Native versus Expatriate Populations', *Diabetes Care* 36/6 (2013): e75, available at <https://doi.org/10.2337/dc12-2451>; Arshad Mohamed Channanath, Bassam Farran, Kazem Behbehani and Thangavel Alphonse Thanaraj, 'Association between Body Mass Index and Onset of Hypertension in Men and Women with and without Diabetes: A Cross-Sectional Study Using National Health Data from the State of Kuwait in the Arabian Peninsula', *BMJ Open* 5/6 (2015): e007043, available at <https://doi.org/10.1136/bmjopen-2014-007043>.

cardiovascular diseases,<sup>8</sup> which are creating huge financial costs and, more importantly, claiming the lives of many people.<sup>9</sup>

In light of these challenges, the status quo of universal access to healthcare cannot be maintained any more. Hence, healthcare reform efforts have become a top priority for healthcare system leaders globally, including resource-rich countries.<sup>10</sup> Higher quality of care, improved health outcomes and reduced costs are important targets for all healthcare reform efforts.<sup>11</sup> To achieve these targets, the successful and effective adoption of health information technology (IT) solutions such as electronic health records (EHRs) by healthcare institutions has become paramount.<sup>12</sup> These solutions can enable the healthcare organisation to better manage information and improve care coordination among healthcare providers.<sup>13</sup> Additionally, health IT solutions can collect and monitor dynamic quality measures over time.<sup>14</sup> as well as eliminate duplication and avoid wasting the time and efforts of healthcare staff by making the results of prior diagnostic tests and interventions available at all points of care.<sup>15</sup>

Unfortunately, recent evidence highlights limitations and quality issues related to data associated with these solutions such as incomplete records<sup>16</sup> or miscoded data.<sup>17</sup> Merely

<sup>8</sup> Monira Alarouj, Abdullah Bennakhi, Y. Alnesef, M. Sharifi and Naser Elkum, 'Diabetes and Associated Cardiovascular Risk Factors in the State of Kuwait: The First National Survey', *International Journal of Clinical Practice* 67/1 (2013): 89–96. Available at <https://doi.org/10.1111/ijcp.12064>.

<sup>9</sup> Ali H. Mokdad et al., 'The State of Health in the Arab World, 1990-2010: An Analysis of the Burden of Diseases, Injuries, and Risk Factors', *The Lancet* 383/9914 (2014), pp. 309–20. Available at [https://doi.org/10.1016/S0140-6736\(13\)62189-3](https://doi.org/10.1016/S0140-6736(13)62189-3).

<sup>10</sup> Kazem Behbehani, 'Kuwait National Programme for Healthy Living: First 5-Year Plan (2013-2017)', *Medical Principles and Practice* 23/Suppl. 1 (2014), pp. 32–42, available at <https://doi.org/10.1159/000358884>; Nicholas Conway et al., 'The Kuwait-Scotland eHealth Innovation Network (KSeHIN): A Sustainable Approach to Quality Improvement in Healthcare', *Quality in Primary Care* 22/1 (2014), pp. 43–51.

<sup>11</sup> Donald M Berwick, Thomas W Nolan, and John Whittington, 'The Triple Aim: Care, Health, and Cost', *Health Affairs* 27/3 (2008), pp. 759–69.

<sup>12</sup> Güneş Koru, Dari Alhuwail, Maxim Topaz, Anthony F. Norcio and Mary Etta Mills, 'Investigating the Challenges and Opportunities in Home Care to Facilitate Effective Information Technology Adoption', *Journal of the American Medical Directors Association* 17/1 (2016), pp. 53–8, available at <https://doi.org/10.1016/j.jamda.2015.10.008>; Melinda Beeuwkes Buntin, Sachin H. Jain, and David Blumenthal, 'Health Information Technology: Laying the Infrastructure for National Health Reform', *Health Affairs* 29/6 (2010), pp. 1214–19, available at <https://doi.org/10.1377/hlthaff.2010.0503>.

<sup>13</sup> Karmen S. Williams, Gulzar H. Shah, Jonathon P. Leider and Akarti Gupta, 'Overcoming Barriers to Experience Benefits: A Qualitative Analysis of Electronic Health Records and Health Information Exchange Implementation in Local Health Departments', *EGEMS* 5/1 (2017), pp. 1–22, available at <https://doi.org/10.5334/egems.216>.

<sup>14</sup> Buntin, Jain and Blumenthal, 'Health Information Technology'.

<sup>15</sup> Koppel R et al., 'Role of Computerized Physician Order Entry Systems in Facilitating Medication Errors', *Journal of the American Medical Association* 293/10 (2005), pp. 1197–1203. Available at <https://doi.org/10.1001/jama.293.10.1197>.

<sup>16</sup> Adam Wright et al., 'Problem List Completeness in Electronic Health Records: A Multi-Site Study and Assessment of Success Factors', *International Journal of Medical Informatics* 84/10 (2015), pp. 784–90. Available at <https://doi.org/10.1016/j.ijmedinf.2015.06.011>.

<sup>17</sup> Simon de Lusignan et al., 'A Method of Identifying and Correcting Miscoding, Misclassification and

having an electronic record for a patient does not mean that the information in that record is sufficient for safe and effective healthcare practice.<sup>18</sup> Therefore, the adequate management and governance of health information is a necessary precursor to the effectiveness of health IT solutions. Ineffective information management will not aide healthcare reform efforts but rather create additional problems, increase hazards and introduce additional barriers to realising the benefits of healthcare reform.<sup>19</sup>

To date, little is known about the current pressing challenges, gaps and opportunities concerning information management practices in Kuwait's healthcare institutions. The aim of this empirical research is to uncover the status quo of information management practices in public hospitals and centres providing secondary and tertiary care services. Additionally, this research offers policy recommendations to improve health information management (HIM) practices. The evidence from this study can be useful to hospital administrators, HIM professionals and policy-makers.

In this paper, we discuss HIM practices and define them as the activities concerned with the management of healthcare data and information resources to improve the quality of health information for decision-making.<sup>20</sup> Due to the uptake of health IT tools and systems adoption by many healthcare organisations, HIM professionals are no longer confined to the 'records room'; HIM professionals are more involved today in the digital healthcare environment.<sup>21</sup> The primary focus of this study is on HIM practices. However, discussing the digitisation of HIM practices is unavoidable and hence we address some of the implications resulting from the digitisation of HIM.

## Background

The healthcare system in the State of Kuwait offers universal access to healthcare services with 70 percent of healthcare services being provided by the public or government sector represented by the Ministry of Health (MoH).<sup>22</sup> This public healthcare system is distributed across Kuwait's six governorates and is organised into three levels: primary, secondary and tertiary. The primary healthcare centres, conveniently located in residential areas across the country, provide the first line of primary care services and the

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Misdiagnosis in Diabetes: A Pilot and Validation Study of Routinely Collected Data', *Diabetic Medicine* 27/2 (2010), pp. 203–9. Available at <https://doi.org/10.1111/j.1464-5491.2009.02917.x>.

<sup>18</sup> Nicole G. Weiskopf, George Hripcsak, Sushmita Swaminathan and Chunhua Weng, 'Defining and Measuring Completeness of Electronic Health Records for Secondary Use', *Journal of Biomedical Informatics* 46/5 (2013), pp. 830–6. Available at <https://doi.org/10.1016/j.jbi.2013.06.010>.

<sup>19</sup> Xiaoming Zeng, Rebecca Reynolds and Marcia Sharp, 'Redefining the Roles of Health Information Management Professionals in Health Information Technology', *Perspectives in Health Information Management* 6 (2009): 1f.

<sup>20</sup> Kathleen M. LaTour, Shirley Eichenwald, and Pamela K. Oachs (eds), *Health Information Management: Concepts, Principles, and Practice*, vol. 5 (Chicago, IL: AHIMA, 2006).

<sup>21</sup> Zeng, Reynolds, and Sharp, 'Redefining the Roles of Health Information Management Professionals in Health Information Technology'.

<sup>22</sup> 'World Health Survey in Kuwait: Summary Report 2013', *Ministry of Health* (Sulaibikhat, Kuwait, 2015).

entry point into the healthcare system. Secondary care is provided through six general hospitals offering a wide range of clinical specialities. Tertiary care is provided via more specialised and disease-focused hospitals and centres.<sup>23</sup> The workforce, clinicians and administrators working in this system are multinational and come from diverse educational and cultural backgrounds.<sup>24</sup>

To better manage health information, Kuwait has made significant investments in digital health infrastructure since 2000.<sup>25</sup> A variety of health IT solutions have been implemented at MoH facilities,<sup>26</sup> including EHRs at primary healthcare centres<sup>27</sup> and hospitals,<sup>28</sup> as well as Picture Archiving and Communication Systems.<sup>29</sup> However, the maturity and adoption levels of these solutions vary greatly among healthcare facilities and, to our knowledge, no formal evaluation was performed to assess them. Higher education institutions in Kuwait, namely Kuwait University and the Public Authority for Applied Education and Training, train HIM professionals who work in medical records departments at healthcare institutions. However, the remaining health and allied health professionals, i.e. pharmacists, technologists, and nurses, receive minimal information management training throughout their academic curriculum.

An important effort in moving health IT and HIM towards having a more influential role in health delivery is reaching certain maturity milestones established by globally recognised standards. The National Accreditation Program for Hospitals (NAPH) in Kuwait, established by the Quality and Accreditation Directorate (QAD) at MoH, provides a means to facilitate improvements in HIM. The NAPH is concerned with improving care quality and enhancing patient safety through creating, implementing, monitoring and evaluating pro-

<sup>23</sup> 'Health Systems Profile: Kuwait', Regional Health Systems Observatory - Eastern Mediterranean Regional Office, *World Health Organization* (Cairo, Egypt, 2006).

<sup>24</sup> Maram G. Katoue and Jean Ker, 'Implementing the Medicines Reconciliation Tool in Practice: Challenges and Opportunities for Pharmacists in Kuwait', *Health Policy* 122/4 (2018), pp. 404–11. Available at <https://doi.org/10.1016/j.healthpol.2017.12.011>.

<sup>25</sup> Alan S. Weber et al., 'Systematic Thematic Review of e-Health Research in the Gulf Cooperation Council (Arabian Gulf): Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates', *Journal of Telemedicine and Telecare* 23/4 (2017), pp. 452–9. Available at <https://doi.org/10.1177/1357633X16647894>.

<sup>26</sup> Dari Alhuwail and Rodrigo Barnes, 'Diabetes Care in the Age of Informatics: Kuwait-Scotland Health Innovation Network' in Proceedings of the Second Kuwait Conference on e-Services and e-Systems, KCESS '11 16 (New York, NY, USA: ACM, 2011), pp. 1–7. Available at <https://doi.org/10.1145/2107556.2107572>.

<sup>27</sup> Saadoun F. Al-Azmi, Aida M. Mohammed and Manal I. Hanafi, 'Patients' Satisfaction with Primary Health Care in Kuwait after Electronic Medical Record Implementation', *The Journal of the Egyptian Public Health Association* 81/5–6 (2006), pp. 277–300; Eiman Al-Jafar, 'Exploring Patient Satisfaction before and after Electronic Health Record (EHR) Implementation: The Kuwait Experience', *Perspectives in Health Information Management* 10 (2013): 1c.

<sup>28</sup> Habib Alquraini, Abdul Majeed Alhashem, Makhdoom A. Shah and Rafiqul I. Chowdhury, 'Factors Influencing Nurses' Attitudes towards the Use of Computerized Health Information Systems in Kuwaiti Hospitals', *Journal of Advanced Nursing* 57/4 (2007), pp. 375–81. Available at <https://doi.org/10.1111/j.1365-2648.2007.04113.x>.

<sup>29</sup> Ali Jassem Buabbas, Dawood Ameer Al-Shamali, Prem Sharma, Salwa Haidar and Hamza Al-Shawaf, 'Users' Perspectives on a Picture Archiving and Communication System (PACS): An In-Depth Study in a Teaching Hospital in Kuwait', *JMIR Medical Informatics* 4/2 (2016): e21. Available at <https://doi.org/10.2196/medinform.5703>.



grammes and standards of quality and safety across all departments of MoH.

The NAPH was established in 2008 and originated from Accreditation Canada's Client Centred Accreditation Program.<sup>30</sup> The programme is tailored to make it appropriate and applicable to the context of Kuwait's healthcare system and the nature of care services provided by MoH hospitals. The programme provides a process for hospitals to assess, monitor and improve their performance on an ongoing basis. The programme is composed of 12 standards that cover a wide range of important areas and services such as human resources, clinical services and information management.

Initially, organisations begin by completing a self-assessment survey evaluating their compliance with the set national standards on a predetermined 5-point scale ranging from 'no compliance' to 'substantial compliance'. This is followed by an on-site survey conducted by an expert team of healthcare professionals or surveyors. These MoH healthcare professionals have been trained on the accreditation-related assessments and evaluations. The on-site surveys validate the hospitals' self-assessment scores and serve as a means of external peer review and validation. The survey visits entail team interviews, touring the hospital, reviewing all relevant documentation, facilitating various focus group interviews and finally completing the survey report. After the survey has been completed, organisations receive a report highlighting the results, the hospital's strengths, recommendations for improvement and an accreditation decision. Organisations are encouraged to follow up on the recommendations from the report and continue to make ongoing improvements to their services.

Currently, there are debates in the literature on the value of accreditation and whether it is worth the time and money. Yet many healthcare organisations and systems around the world are engaged in accreditation activities.<sup>31</sup> There is still no definitive evidence suggesting that accreditation is fruitless.<sup>32</sup> We acknowledge that while compliance with accreditation standards does not guarantee the attainment of superior quality, it establishes a baseline of minimum expectations that are required for a safe and high-quality care organisation. In this work, we do not necessarily study or address the benefits or value of accreditation itself (i.e. better health outcomes or lower costs). Rather, we focus on the progression of compliance with information management standards and compare this progression in secondary and tertiary healthcare organisations. We attempt to uncover the effects of engaging in accreditation processes and its results on information management practices.

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<sup>30</sup> Nafeesa Ladha-Waljee, Stephen McAteer, Veronica Nickerson and Adil Khalfan, 'Using the Accreditation Journey to Achieve Global Impact: UHN's Experience at the Kuwait Cancer Control Center', *Healthcare Quarterly* 17/ 2 (2014), pp. 33–7.

<sup>31</sup> Miranda B. Lam et al., 'Association between Patient Outcomes and Accreditation in US Hospitals: Observational Study', *British Medical Journal* 363 (2018), pp. 1–10: k4011, available at <https://doi.org/10.1136/bmj.k4011>; Virginia Mumford, Kevin Forde, David Greenfield, Reece Hinchcliff and Jeffrey Braithwaite, 'Health Services Accreditation: What Is the Evidence That the Benefits Justify the Costs?', *International Journal for Quality in Health Care* 25/5 (2013), pp. 606–20, available at <https://doi.org/10.1093/intqhc/mzt059>.

<sup>32</sup> Hussein Algahtani, Ahmad Aldarmahi, Juan Manlangit Jr and Bader Shirah, 'Perception of Hospital Accreditation among Health Professionals in Saudi Arabia', *Annals of Saudi Medicine* 37/4 (2017), pp. 326–32. Available at <https://doi.org/10.5144/0256-4947.2017.326>.

Additionally, in this work we use the theory of ‘Swift, Even Flow’ suggested by Roger Schmenner<sup>33</sup> when comparing compliance scores of tertiary care organisations and secondary care hospitals. The theory suggests ‘that the more swift and even the flow of materials (or information) through a process, the more productive is that process’. This theory has been used in similar studies investigating the role of information technology in the efficiency and performance of hospitals.<sup>34</sup> In accordance with the above-mentioned theory, we hypothesise that tertiary care organisations can be classified as ‘Service Factories’ due to their high level of specialisation. On the other hand, secondary care hospitals can be considered ‘Service Shops’, which in turn provide a variety of care services customised to customer needs (i.e. different medical specialities).

## Methods

### Approach and Data Sources

The convergent design mixed methods approach is used to gain a comprehensive, context-specific and rich understanding of the research topic.<sup>35</sup> This approach allows for an integrative collection and analysis of both quantitative and qualitative data at similar times.<sup>36</sup> Prior to data collection, the required ethical approvals were granted from the ethical review board at MoH. This study analyses accreditation-related data from hospitals and centres providing secondary and tertiary care services. Specifically, this study examines anonymous data collected by QAD at MoH pertaining to compliance with the information management standard at each hospital. Refer to Appendix 1 for detailed information about the standard and its related criteria.

The dataset contains numerical self-assessment scores and survey scores in addition to the survey comments on nine criteria as illustrated in Table 1. Surveyors’ comments were included in the dataset and are part of the report to the hospitals at the end of the accreditation cycle. These comments provide insights about the rationale behind the scoring as well as suggestions for improvements. Overall, the dataset covers two accreditation cycles with cycle one taking place in 2012–2013 and cycle two taking place in 2016–2017; these datasets were the only ones available and captured by MoH. The indicators of performance for safety, designated as Criterion 10 (10.0–10.2), were not included because they were only introduced in the second accreditation cycle hence comparative analysis cannot be performed.

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<sup>33</sup> Roger W. Schmenner, ‘Service Businesses and Productivity’, *Decision Sciences* 35/3 (2004), pp. 333–47. Available at <https://doi.org/10.1111/j.0011-7315.2004.02558.x>.

<sup>34</sup> Sarv Devaraj, Terence T. Ow and Rajiv Kohli, ‘Examining the Impact of Information Technology and Patient Flow on Healthcare Performance: A Theory of Swift and Even Flow (TSEF) Perspective’, *Journal of Operations Management* 31/4 (2013), pp. 181–92. Available at <https://doi.org/10.1016/j.jom.2013.03.001>.

<sup>35</sup> Timothy C. Guetterman, Michael D. Fetters and John W. Creswell, ‘Integrating Quantitative and Qualitative Results in Health Science Mixed Methods Research through Joint Displays’, *Annals of Family Medicine* 13/6 (2015), pp. 554–61. Available at <https://doi.org/10.1370/afm.1865>.

<sup>36</sup> Pat Bazeley, ‘Integrative Analysis Strategies for Mixed Data Sources’, *American Behavioral Scientist* 56/6 (2012), pp. 814–28. Available at <https://doi.org/10.1177/0002764211426330>.

## Participants

Secondary care: All public hospitals providing secondary care services are included (N=6). The hospitals' names are concealed to protect their identity given that they represent the entire population of public hospitals providing secondary care services.

Tertiary care: More than half of public healthcare organisations (7 out of 13) provide tertiary care services, which include tertiary care hospitals and specialised centres. Three organisations participated only in the second accreditation cycle and therefore their data is not included in this study. This is due to the fact that it is not possible to compare their progress against their performance in prior accreditation cycles.

Given the small population size and to protect the identity of the participating organisations as required by the dataset owners, (i.e. QAD at MoH), no further demographic information can be provided i.e. averages or ranges of patient admissions or number of outpatient visits etc.

## Analysis

A basic descriptive analysis was performed on the numerical surveyor-reported scores across the two accreditation cycles and for each criterion along with its constituent parts. The surveyor scores are considered for calculations because the scores represent an evaluation by external experts and are based on evidence supplied by the hospital. Notably, while overall there is a high level of agreement between the self-reported scores and surveyor-reported scores, investigating the surveyor scores is more reliable since scores are evidence-based as explained earlier.

In addition, we ran a two-sample t-test to compare the mean changes between cycles for both secondary and tertiary care organisations for each criterion. We considered an alpha of .05 when reporting that a test statistic is significant. In other words, we consider statistical tests to be significant when they show a P value of less than .05.

The qualitative data comprised by the survey comments is used to support the evidence and justify the results. The Framework Method<sup>37</sup> is used to analyse this qualitative data. The analysis was iterative, and the data was sorted, summarised and synthesised in key themes according to the Information Management criteria.

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<sup>37</sup> Nicola K. Gale, Gemma Heath, Elaine Cameron, Sabina Rashid and Sabi Redwood, 'Using the Framework Method for the Analysis of Qualitative Data in Multi-Disciplinary Health Research', *BMC Medical Research Methodology* 13/117 (2013), pp. 1–8. Available at <https://doi.org/10.1186/1471-2288-13-117>.

## Results

### Information Management Practices

For an overview of hospitals' performance in each criterion of the information management standard spanning the two accreditation cycles, refer to Table 1 for secondary care hospitals and Table 2 for tertiary care organisations. The two-sample t-test showed that there is a difference in the score of mean changes between cycles based on the type of care organisation (i.e. secondary and tertiary) with a P value of (0.115). Additionally, the hospitals that had high scores on their information management plan achieved better results than those that did not ( $P = 0.206$ ).

Table 1: Compliance Rates with Information Management Criteria for Each Secondary Care Hospital Between Accreditation Cycles

Criterion	S1	S2	S3	S4	S5	S6	Average
1.0 Info. Mgmt. Plan							
Cycle 1	3.0	2.3	2.0	2.2	3.8	0.0	2.2
Cycle 2	2.0	3.3	3.0	2.0	4.0	2.7	2.8
% $\Delta^*$	-20.0%	20.0%	20.0%	-4.0%	4.0%	54.0%	12.3%
2.0 Tech. Selec- tion							
Cycle 1	1.3	1.0	1.7	1.7	4.0	0.0	1.6
Cycle 2	1.0	3.0	3.0	4.0	4.0	2.3	2.9
% $\Delta^*$	-6.0%	40.0%	26.0%	46.0%	0.0%	46.0%	25.3%
3.0 Privacy & Security							
Cycle 1	3.0	3.5	2.3	2.3	4.0	0.0	2.5
Cycle 2	3.7	3.3	3.3	4.0	3.3	2.3	3.3
% $\Delta^*$	14.0%	-4.0%	20.0%	34.0%	-14.0%	46.0%	16.0%
4.0 Info. Trans- fer							
Cycle 1	2.3	3.0	1.7	2.7	4.0	2.0	2.6
Cycle 2	3.7	3.3	3.7	4.0	4.0	3.0	3.6
% $\Delta^*$	28.0%	6.0%	40.0%	26.0%	0.0%	20.0%	20.0%
5.0 Aggregating Info.							
Cycle 1	2.5	1.0	0.5	3.5	4.0	2.0	2.3
Cycle 2	2.0	3.0	3.5	4.0	4.0	2.0	3.1
% $\Delta^*$	-10.0%	40.0%	60.0%	10.0%	0.0%	0.0%	16.7%

Criterion	S1	S2	S3	S4	S5	S6	Average
6.0 Analytics							
Cycle 1	3.0	2.0	1.0	3.0	4.0	0.0	2.2
Cycle 2	1.0	4.0	4.0	4.0	4.0	3.0	3.3
% Δ*	-40.0%	40.0%	60.0%	20.0%	0.0%	60.0%	23.3%
7.0 Info. Exchange							
Cycle 1	4.0	4.0	3.0	3.0	4.0	3.0	3.5
Cycle 2	4.0	4.0	4.0	4.0	4.0	3.0	3.8
% Δ*	0.0%	0.0%	20.0%	20.0%	0.0%	0.0%	6.7%
8.0 Internet Access							
Cycle 1	2.0	0.5	0.0	0.0	4.0	0.0	1.1
Cycle 2	2.5	2.5	2.5	3.5	4.0	2.0	2.8
% Δ*	10.0%	40.0%	50.0%	70.0%	0.0%	40.0%	35.0%
9.0 Quality Indicators							
Cycle 1	3.0	0.0	0.0	3.0	4.0	2.0	2.0
Cycle 2	3.0	3.5	4.0	3.5	4.0	2.5	3.4
% Δ*	0.0%	70.0%	80.0%	10.0%	0.0%	10.0%	28.3%

Notes

\* The delta reflects the change between the evaluation cycles based on a 5-point scale.

\*\* The scores refer to: 0=No compliance; 1=Partial compliance (1-25%); 2=Partial compliance (26-50%); 3=Partial compliance (51-75%); 4=Substantial compliance (≥76%).

Table 2: Compliance Rates with Information Management Criteria for each Tertiary Healthcare Facility Between Accreditation Cycles

Criterion	T1	T2	T3	T4	T5	T6	T7	Average**
1.0 Info. Mgmt. Plan								
Cycle 1	2.50	1.50	1.80	1.50	3.30	3.50	2.00	2.30
Cycle 2	3.33	4.00	4.00	3.83	4.00	4.00	3.80	3.85
% Δ*	16.6%	50.0%	44.0%	46.6%	14.0%	10.0%	36.0%	31.0%
2.0 Tech. Selection								
Cycle 1	2.70	2.30	2.00	0.70	2.30	4.00	1.30	2.19
Cycle 2	3.33	3.00	3.33	4.00	4.00	4.00	2.30	3.42
% Δ*	12.6%	14.0%	26.6%	66.0%	34.0%	0.0%	20.0%	24.7%

Criterion	T1	T2	T3	T4	T5	T6	T7	Average**
3.0 Privacy & Security								
Cycle 1	3.70	2.00	2.70	1.30	4.00	2.70	2.30	2.67
Cycle 2	3.00	3.00	4.00	4.00	4.00	4.00	4.00	3.71
% Δ*	-14.0%	20.0%	26.0%	54.0%	0.0%	26.0%	34.0%	20.9%
4.0 Info. Trans- fer								
Cycle 1	3.30	2.00	1.30	1.30	4.00	3.70	2.00	2.51
Cycle 2	3.67	2.00	4.00	3.00	4.00	4.00	4.00	3.52
% Δ*	7.4%	0.0%	54.0%	34.0%	0.0%	6.0%	40.0%	20.2%
5.0 Aggregat- ing Info.								
Cycle 1	3.00	3.00	1.00	1.00	4.00	2.00	1.00	2.14
Cycle 2	2.50	2.50	4.00	3.50	4.00	2.50	4.00	3.29
% Δ*	-10.0%	-10.0%	60.0%	50.0%	0.0%	40.0%	60.0%	22.9%
6.0 Analytics								
Cycle 1	3.00	3.00	1.00	1.00	4.00	1.00	2.00	2.14
Cycle 2	3.00	2.00	4.00	4.00	4.00	4.00	4.00	3.57
% Δ*	0.0%	-20.0%	60.0%	60.0%	0.0%	60.0%	40.0%	28.6%
7.0 Info. Ex- change								
Cycle 1	4.00	4.00	2.00	2.00	4.00	4.00	3.00	3.29
Cycle 2	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
% Δ*	0.0%	0.0%	40.0%	40.0%	0.0%	0.0%	20.0%	14.3%
8.0 Internet Access								
Cycle 1	2.00	1.00	1.50	1.00	NA	0.00	0.00	0.92
Cycle 2	1.50	3.00	3.50	4.00	4.00	3.50	3.50	3.29
% Δ*	-10.0%	40.0%	40.0%	60.0%	NA	70.0%	70.0%	47.4%
9.0 Quality Indicators								
Cycle 1	2.50	2.50	0.00	1.00	1.00	3.00	1.00	1.57
Cycle 2	3.50	4.00	4.00	3.00	4.00	4.00	3.50	3.71
% Δ*	20.0%	30.0%	80.0%	40.0%	60.0%	20.0%	50.0%	42.9%

## Notes

\* The delta reflects the change between the evaluation cycles based on a 5-point scale.

\*\* The scores refer to: 0=No compliance; 1=Partial compliance (1-25%); 2=Partial compliance (26-50%); 3=Partial compliance (51-75%); 4=Substantial compliance (≥76%).

Overall, public hospitals in Kuwait are making positive progress in their information management practices over the span of accreditation cycles. This can be noted from Figures 1 and 2 showing the progression in compliance with the standards in secondary and tertiary care organisations, respectively.

Figure 1: Comparing Progression Compliance Rates with All Criteria Among Secondary Care Hospitals Across the Two Accreditation Cycles.

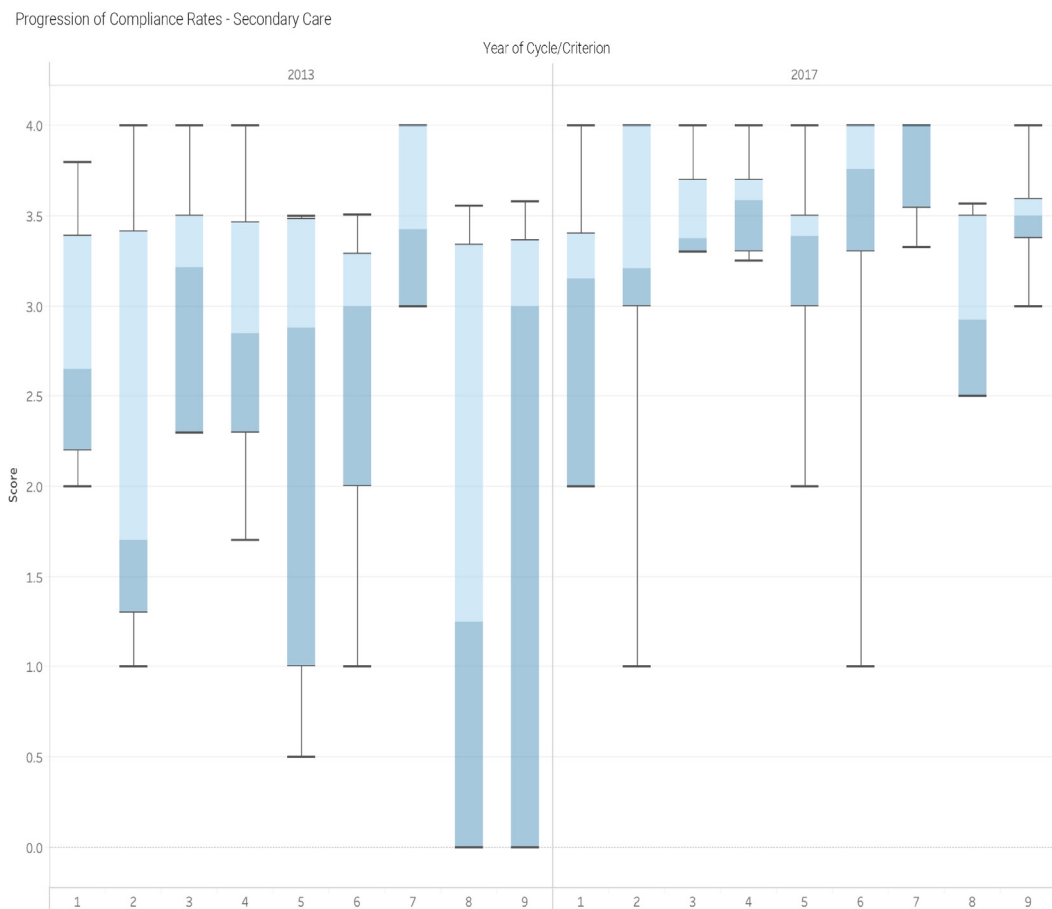
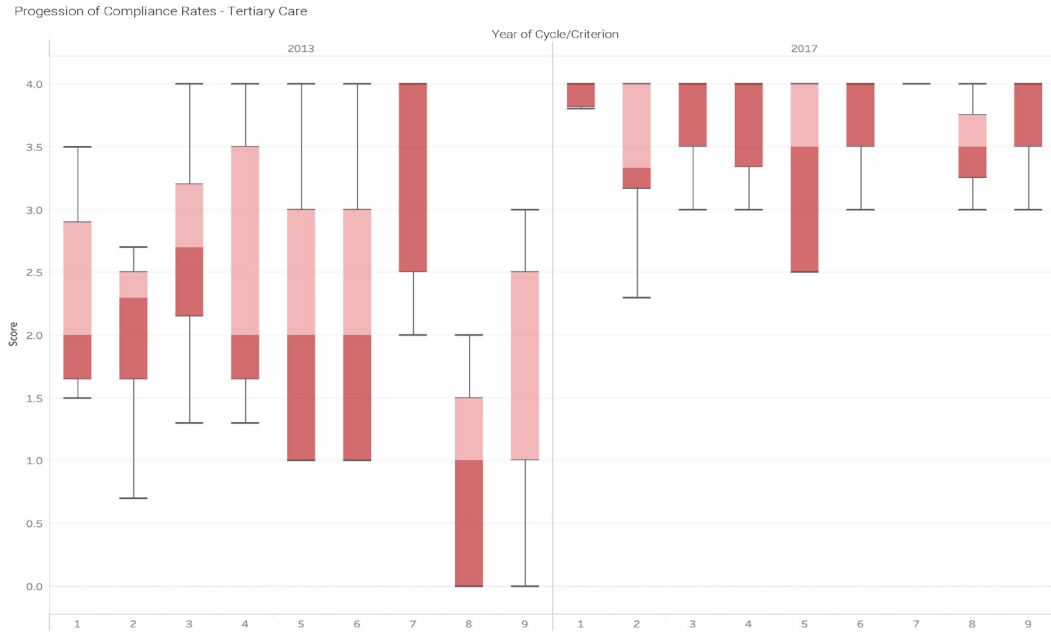


Figure 2: Comparing Progression Compliance Rates with All Criteria Among Tertiary Care Organisations Across the Two Accreditation Cycles



Refer to Table 3 for a comparison of compliance rates with the information management standard between secondary and tertiary care organisations across the two accreditation cycles.

Table 3: Rate of Compliance with Information Management Criteria for Public Secondary and Tertiary Healthcare Facilities Across Two Accreditation Cycles

Type & Criterion	C1	C2	C3	C4	C5	C6	C7	C8	C9**
Secondary									
Cycle 1	2.2	1.6	2.5	2.6	2.3	2.2	3.5	1.1	2.0
Cycle 2	2.8	2.9	3.3	3.6	3.1	3.3	3.8	2.8	3.4
% Δ*	12.3%	25.3%	16.0%	20.0%	16.7%	23.3%	6.7%	35.0%	28.3%
Tertiary									
Cycle 1	2.30	2.19	2.67	2.51	2.14	2.14	3.29	0.92	1.57
Cycle 2	3.85	3.42	3.71	3.52	3.29	3.57	4.00	3.29	3.71
% Δ*	31.0%	24.7%	20.9%	20.2%	22.9%	28.6%	14.3%	47.4%	42.9%

Notes

\* The delta reflects the change between the evaluation cycles based on a 5-point scale.

\*\* C refers to the Information Management Criterion. The scores refer to: 0=no compliance; 1=Partial compliance (1-25%); 2=Partial compliance (26-50%); 3=Partial compliance (51-75%); 4=Substantial compliance (≥76%).



In the following sections, we discuss organisations providing secondary care separately from those providing tertiary care services. We refer to a secondary care hospital with the letter ‘S’ and a tertiary care hospital with the letter ‘T’ followed by an anonymised number referring to the specific organisation.

Table 4: Representative Quotes from the Survey Team

Ref	Representative Quote
Q1	“Information management plan needs to be developed in collaboration with other clinical and professional departments.”
Q2	“The team is encouraged to develop comprehensive schedule for education and training in information management.”
Q3	“Develop and implement a policy to ensure a restricted access for authorised staff to medical records.”
Q4	“To gain the trust of the hospital client, hospital should improve medical record management.”
Q5	“Lack of the electronic medical file system or Hospital Information System is a challenge to share information.”
Q6	“No comprehensive computerised hospital wide system yet.”
Q7	“We recommend compliance and monitoring Internet use policy.”
Q8	“To provide Internet to staff and clients.”
Q9	“Challenges: There are language barriers, especially for information management, human resources pose challenges.”
Q10	“Area for Improvement: The linkage between strategic and operational plans among the senior leaders and staff.”
Q11	“There is limited information technology in the hospital.”
Q12	“Some departments (laboratory and diagnostic imaging) use information technology; however, there are no established criteria for the selection.”
Q13	“Prevention of physical damage (such as fire) is lacking and should be addressed urgently.”
Q14	“It is strongly recommended that patients not have access to their own medical records. The surveyors witnessed patients carrying their own medical records ... electronic information technology should be incorporated into the service with planned security, and backup systems to cover for possible that some loss or physical damage to record systems happen.”
Q15	“Even though the [organisation] acknowledges the importance of an electronic medical record, there is no evidence of integration of information technology between departments.”
Q16	“There is no benchmarking against best practices.”
Q17	“Data are being provided by the [organisation] to the ministry.”
Q18	“There is evidence that the [organisation] has developed and monitored indicators of performance regarding information management activities that are hospital-wide and service-based.”

*Notes*

*Q refers to Quote followed by a sequential number.*

## Secondary Care

### Information Management Plan

The majority of hospitals struggle to develop and implement an information management plan to meet their information needs. S1 and S4 have a deteriorating rate of improvement in complying with this criterion. Only S5 has substantial compliance in this regard. One issue is the need to engage all the relevant departments in developing this plan (Q1 – refer to Table 4 for representative quotes). The data also indicates that some hospitals need to improve and increase the availability of training about information management to all staff members, both clinical and non-clinical staff (Q2).

### Technology Selection

Only two hospitals S4 and S5 achieved full compliance in this criterion by involving the appropriate clinical, managerial and information technology staff in the selection and integration of health IT systems at the hospital. The remaining hospitals show partial improvements in compliance with this criterion. However, S1 regressed.

### Data Privacy and Security

The majority of hospitals have good levels of compliance in protecting the privacy and security of health information. Interestingly, S2 and S5 show declining rates of compliance in this matter. Some of the issues noted by the survey team include the lack of policies that restrict unauthorised access to patients' records (Q3). Additionally, the data from some hospitals indicate the absence of a backup system for patient records, whether paper or electronic. Survey results highlight that clients' trust in the hospital's ability to protect information is critical (Q4).

### Information Transfer

In this criterion, all hospitals improved their processes related to transmitting data effectively and efficiently. Only S3, S4 and S5 have functioning EHRs and hence their high levels of compliance with this criterion as noted by the surveyors. The lack of electronic systems such as EHRs, laboratory information systems and radiology information systems contribute to lower levels of efficiency and sometimes ineffective information transfers (Q5).

### Aggregating Information

Three hospitals show improvements in compliance with this criterion, which in turn is concerned with aggregating information and data to support patient care, administrative decision-making and quality improvement initiatives. Only S5 remained substantially compliant while S1 showed a decline in compliance and H6 shows no improvement and remained partially compliant. This is largely attributed to the lack of electronic informatics solutions (Q6).

## **Analytics for Decision-Making**

For this criterion, nearly all hospitals improved their compliance attainment. However, for S1, the level of compliance decreased (from up to 75% to up to 25%). One survey team indicates that the data collected is not fully utilised in generating reports to improve decision-making by the hospital's administration.

## **Information Exchange**

All hospitals show improvement with respect to contributing data and information to serve the various statistical reports generated by MoH as well as external databases in accordance with laws or regulations. Only S6 remains in medium compliance with this criterion. One survey team suggests that an integrated informatics solution across the hospital can help improve efficiency and communication in the hospital.

## **Access to the Internet**

All hospitals indicate improvements in providing access for staff to information that can support safe patient care. Only S5 is substantially compliant with this criterion. The remaining hospitals report minor to medium compliance. One survey team indicate issues with monitoring and enforcing appropriate use policies for the Internet (Q7). Another team suggests that access to the Internet should also be made available to patients (Q8).

## **Quality Performance Indicators**

The evidence suggests that all hospitals identify the required indicators of performance for quality in their information management efforts and monitor them as part of their quality improvement activities. Only S3 and S5 are substantially compliant, while S6 remains in minor compliance with the criterion.

## **Other Issues**

Survey teams report several other challenges that are relevant to information management. The diversity of the languages spoken by the hospital's staff can be a barrier to the effective implementation of information management (Q9). The evidence also suggests misalignment between strategic and operational plans, which in turn can negatively impact information management (Q10).

## **Tertiary Care**

### **Health Information Plan**

All organisations have made significant improvements with respect to developing and establishing an information management plan for their organisation. Initially, only 2/7 (T5 and T6) organisations had high-levels of compliance with this standard, while the remaining five ranged in compliance from low partial compliance (1%–25%; score of 1.50) to medium compliance (25%–50%; score of 2.50). Some of the issues highlighted by the

surveys include the organisational plan lacking definition of data, information, security, confidentiality and integrity.

### **Information Technology Selection**

Almost all organisations improved their compliance with having the appropriate staff participating on behalf of the organisation in selecting, integrating and using health IT systems and solutions. Only one organisation, T7, remains at a ‘medium partial’ compliance (25%–50%; score of 2.30). The remaining organisations achieved ‘high compliance’ scores ranging from 3.33 all the way to 4.00. In some organisations, the adoption of health IT systems is low (Q11). One shortcoming surveyors note about organisations using health IT solutions is that there are no clear established criteria for selecting the appropriate solutions (Q12).

### **Privacy and Security**

Six out of the seven organisations perform exceptionally well with the vast majority achieving ‘substantial’ compliance. Only one organisation, T1, reduced in compliance with respect to this criterion (from 3.70 to 3.00). The surveyors attribute this to the lack of prevention measures to protect paper records from physical damage (Q13). Another survey team notes some concerns regarding the confidentiality and security of the patient when investigating how patient records are transported using unsecured and unlocked physical files. Another issue highlighted by the surveyors discusses the potential loss of the sole copy of the patient paper file that is often carried by the patient or their caregiver (Q14).

### **Information Transfer**

Four out of the seven hospitals achieved ‘substantial compliance’ with this criterion. One organisation, H2, has a ‘low partial’ compliance score with the criterion related to having processes for effective and efficient data transmission. Two other organisations achieved ‘high partial’ compliance (50%–75%; scores 3.00 and 3.67). Information transfer issues still exist despite the adoption of some health IT systems (Q15).

### **Information Aggregation**

For this criterion, only three organisations achieved ‘substantial’ compliance. Another three achieved ‘medium partial’ compliance (26%–50%; scores of 2.50) and only one achieved ‘high partial’ compliance. Notably, two organisations dropped in compliance with the criterion from 3.00 to 2.50. The surveyors highlight some issues that lead to declining scores including the statistical data not being utilised for strategic hospital planning.

### **Decision-Making Support**

Five out of the seven organisations achieved ‘substantial’ compliance with respect to management using information to plan, make strategic decisions and prioritise quality

improvement initiatives. On the other hand, one organisation, T1, achieved a 'high partial' compliance score (50%–75%; score 3.00). while another organisation, T2, declined to a 'low partial' compliance score from 3.00 to 2.00. Surveyors attribute this decline to the lack of benchmarks with best practices (Q16).

### Exchanging Information

All organisations achieved 'substantial' compliance with respect to contributing and reporting information to external databases for statistical and public health purposes. The surveyors noted that data from the organisations is sent to MoH as per the regulations in place (Q17).

### Internet Accessibility

Compliance with this criterion varied between organisations. Only two organisations achieved substantial compliance with providing access to the World Wide Web. Another four organisations achieved high partial compliance (50%–75%; score range 3.00–3.50). Only one organisation decreased from medium partial compliance to low partial compliance (1%–25%; score 1.50). In another hospital, the survey team stated that 'the guidelines for internet use are in place. However, no physical internet in place'. Survey teams also made a suggestion to 'develop, implement and monitor policy for an acceptable use of data and information sources'.

### Quality Indicators

Surveyors report that the majority of organisations achieved substantial compliance in identifying performance indicators for quality and safety in the information management plan (Q18). The remaining three organisations achieved high partial compliance with scores ranging from 3.00 to 3.50.

## Discussion

The results from this study indicate an overall improvement in compliance with the information management standard by hospitals providing secondary care services. This improvement could be the result of becoming more aware of the standard and the attempts by hospitals to attain higher levels of compliance.<sup>38</sup> The results also highlight different challenges facing tertiary care organisations compared to secondary care hospitals. Tertiary care organisations face issues with effectively and efficiently transmitting data, aggregating clinical and administrative data, and using information to plan, make strategic decisions, and prioritise quality improvement initiatives. On the other hand, secondary care hospitals have different issues related to developing and implementing an information management plan, involving the appropriate stakeholders in selecting health

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<sup>38</sup> Subashnie Devkaran and Patrick N O'Farrell, 'The Impact of Hospital Accreditation on Clinical Documentation Compliance: A Life Cycle Explanation Using Interrupted Time Series Analysis,' *BMJ Open* 4/8 (2014). Available at <https://doi.org/10.1136/bmjopen-2014-005240>.

IT solutions, and access to the Internet by staff and patients.

The effectiveness of information management practices is dependent on formulating, communicating and adhering to a clear strategic plan. The evidence suggests that hospitals without clear or comprehensive information management plans, which are inclusive of all the stakeholders, are not able to attain the desired levels of compliance with the information management standard. This shows the importance of having a comprehensive information management plan that aligns with existing national strategies.

Currently, in Kuwaiti public hospitals, there is no designated leadership position responsible for information management practices across the hospital. While the information systems/technology vendors or departments at hospitals often assume this function, they remain mainly focused on supporting the information technology infrastructure. In turn, this creates major hurdles in supporting safe patient-centred care via good HIM.<sup>39</sup>

Additionally, the results indicate that some organisations need to improve the availability and accessibility to information management training for all staff members. Without properly investing in training staff on the important aspects of information management practices as well as proper use of technology tools/systems, hospitals will not reap the benefits of saving time and effort, and their information management efforts will likely be wasted or at best underutilised.<sup>40</sup> Ongoing professional training and mentorship should also be available to the professionals working in medical records departments.<sup>41</sup>

Preserving the security and confidentiality of data and information is a primary concern for hospitals globally. With rising rates of adoption of health informatics solutions, cybersecurity has been a major topic of interest.<sup>42</sup> While the evidence indicates that hospitals have improved their security practices, it is concerning that some hospitals are still facing issues with unauthorised access to patients' physical records. Adopting EHRs with the appropriate privacy and security mechanisms in place can be an effective solution.<sup>43</sup>

As highlighted from the survey teams' comments, organisations which adopt and deploy

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<sup>39</sup> Claire F. Snyder et al., 'The Role of Informatics in Promoting Patient-Centered Care', *Cancer Journal* 17/4 (2011), pp.211–18. Available at <https://doi.org/10.1097/PPO.0bo13e318225ff89>.

<sup>40</sup> Ann Scheck McAlearney, Julie Robbins, Nina Kowalczyk, Deena Chisolm and Paula H. Song, 'The Role of Cognitive and Learning Theories in Supporting Successful EHR System Implementation Training: A Qualitative Study', *Medical Care Research and Review* 69/3 (2012), pp.294–315. Available at <https://doi.org/10.1177/1077558711436348>.

<sup>41</sup> Mari Bates et al., 'Perceptions of Health Information Management Educational and Practice Experiences', *Perspectives in Health Information Management* 11 (2014): 1d.

<sup>42</sup> Eric D. Perakslis, 'Cybersecurity in Health Care', *The New England Journal of Medicine* 371/5 (2014), pp. 395–7, available at <https://doi.org/10.1056/NEJMp1404358>; Kuang-Ming Kuo, Chen-Chung Ma, and Judith W. Alexander, 'How Do Patients Respond to Violation of Their Information Privacy?', *Health Information Management* 43/2 (2014), pp. 23–33.

<sup>43</sup> José Luis Fernández-Alemán, José Luis Fernández-Alemán, Inmaculada Carrión Señor, Pedro Ángel Oliver Lozoya and Ambrosio Toval, 'Security and Privacy in Electronic Health Records: A Systematic Literature Review', *Journal of Biomedical Informatics* 46/3 (2013), pp. 541–62. Available at <https://doi.org/10.1016/j.jbi.2012.12.003>.

integrated informatics solutions, such as EHRs, have better scores compared with their peers who do not. However, current levels of adoption and maturity of health informatics solutions in Kuwait are limited.<sup>44</sup> While some hospitals have some electronic solutions such as EHRs or laboratory information systems, these solutions are operating in a silo and do not interface with other systems in or outside the hospital. Hospitals should adopt, implement and maintain integrated health informatics solutions to support the various functions within the hospital as well as outside of the hospital and across the nation.

Intriguingly, none of the datasets examined in this research are available to the public. This could be due to the nature of business operations in the public sector as in some instances more government openness can be dysfunctional and reduce operational capacity.<sup>45</sup> However, sharing the outputs and performance of the healthcare organisations' information management can potentially increase trust amongst the public, including the staff working at these institutions, by providing insights into how the information is handled and managed, thereby improving these practices.<sup>46</sup> This openness can also create healthy competition between healthcare organisations to continuously improve their practices by allowing consumers to view and select healthcare organisations that outperform their peers.

### **Hospitals as Service Factories vs Shops**

The role and focus of tertiary care organisations is different from secondary care hospitals. Considering the theory of 'Swift, Even Flow' of Roger Schmenner,<sup>47</sup> we argue that tertiary organisations can be considered as 'Service Factories' for their focused range of services, which in turn enables more efficiency-focused care delivery through repetitive service delivery. On the other hand, secondary hospitals can be considered 'Service Shops' that provide a variety of services tailored to customer needs thus allowing them to focus more on responsiveness to the needs of their customers rather than efficiency through repetitiveness.

Interestingly, the results from this study indicate that tertiary care organisations achieved significant improvements in compliance with the information management standard in comparison with secondary care hospitals (refer to Table 3). Considering the type of hospital can provide insights into how information management practices can affect its operations. It is clear from this study that tertiary care organisations have a clear advantage of being a 'Service Factory' allowing them to focus on providing a focused range of services which could contribute towards attaining better information management compliance scores.

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<sup>44</sup> Weber et al., 'Systematic Thematic Review of e-Health Research in the Gulf Cooperation Council (Arabian Gulf)'.

<sup>45</sup> Arie Halachmi and Dorothea Greiling, 'Transparency, E-Government, and Accountability: Some Issues and Considerations', *Public Performance & Management Review* 36/4 (2013), pp. 562–84. Available at <https://doi.org/10.2753/PMR1530-9576360404>.

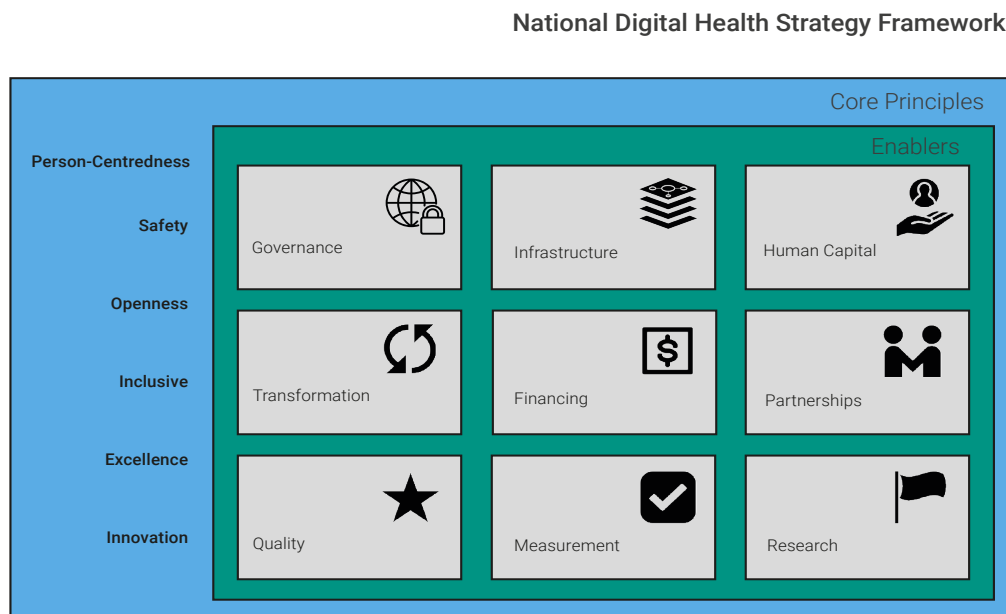
<sup>46</sup> John C. Bertot, Paul T. Jaeger, and Justin M. Grimes, 'Using ICTs to Create a Culture of Transparency: E-Government and Social Media as Openness and Anti-Corruption Tools for Societies', *Government Information Quarterly* 27/3 (2010), pp. 264–71. Available at <https://doi.org/10.1016/j.giq.2010.03.001>.

<sup>47</sup> Schmenner, 'Service Businesses and Productivity'.

## Digitally-Enabled Health Informatics Strategy

The rapid advances in digital tools and systems in the healthcare sector offer an opportunity to improve and streamline information management practices. These advances cannot be ignored or sidelined. Therefore, it becomes paramount that healthcare leaders develop and embrace a digitally-enabled health informatics strategy to support proper information management practices. If not already in place, regulators should spearhead and develop national strategic digital health and informatics plans. As depicted in Figure 3, we offer our framework for developing such a strategy based on professional experience, engagement and published evidence.

Figure 3. Suggested National Digital Health Strategy Framework.



Proper information management practices are at the heart of this framework, which in turn is person-centred and focuses on safety, openness, inclusivity, excellence and innovation. Throughout its lifecycle, the plan should be inclusive of all relevant stakeholders, including patients and their advocates. Without proper information management practices, data and information governance will be impossible. Specific laws and regulations concerning the use of health information, in all its forms whether paper-based or digital, are necessary to properly govern health information. Additionally, healthcare institutions should be involved in continuous assessments to reveal their digital health maturity. These assessments will allow the institutions to reveal their strengths, highlight areas for improvement and aid in prioritising which issues or areas to focus on. The HIMSS EMRAM evaluation<sup>48</sup>

<sup>48</sup> Lorren Pettit, 'Understanding EMRAM and How It Can Be Used by Policy-Makers, Hospital CIOs and Their IT Teams', *World Hospitals and Health Services* 49/3 (2013), pp. 7–9.



and the NHS Digital Maturity assessment<sup>49</sup> are examples to be used.

Moreover, clinical informatics leadership roles, i.e. Chief Clinical Informatics Officer and Chief Nursing Informatics Officer, should be clearly defined and integrated into the organisational structure of the healthcare institution.<sup>50</sup> Academic institutions should also prepare to meet the demand for these roles and integrate HIM and informatics training into the academic curriculum for all health and allied-health disciplines.<sup>51</sup> This will help prepare the future workforce to work with digital health solutions and truly embrace the power that these solutions provide for enhancing healthcare delivery.

### Strength and Limitations

The evidence uncovered in this study was captured by healthcare professionals with a wealth of experience working at MoH and was performed consistently over two cycles with several years between the cycles. The dataset is rich with both quantitative data (self-reported hospital score and surveyors' score) and qualitative data (comments from the survey team). However, some interesting phenomena could not be further explored such as reasons why a hospital decreased in compliance in a specific criterion. Additionally, the dataset does not systematically evaluate the informatics infrastructure and setup at the time of the survey to better understand the information management context and the level of its automation. Rich feedback from healthcare organisations and their views about information management challenges and opportunities could be valuable by providing more contextual evidence that can lead to better and well-informed improvement plans. Lastly, the results can be informative for policy-makers and hospital administrators in Kuwait when evaluating their information management practices. Given the similarities between the healthcare system in Kuwait and many developed countries, (for example, many of the Economic Co-operation and Development (OECD) countries), the findings can potentially be applicable elsewhere. However, careful consideration of the contextual determinants is required before assuming generalisability.

### Conclusion

The socio-economic context and the challenges facing the healthcare system in the State of Kuwait, as well as many other developed countries, necessitates careful consideration of the information management practices in healthcare institutions and systems. The results highlight that the role of HIM in aiding healthcare reform efforts can no longer be postponed or ignored. The evidence from this study illustrates that Kuwait's public

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<sup>49</sup> Daniel S. Johnston, 'Digital Maturity: Are We Ready to Use Technology in the NHS?', *Future Hospital Journal* 4/3 (2017), pp. 189–92, available at <https://doi.org/10.7861/futurehosp.4-3-189>.

<sup>50</sup> Joseph Kannry et al., 'The Chief Clinical Informatics Officer (CCIO): AMIA Task Force Report on CCIO Knowledge, Education, and Skillset Requirements', *Applied Clinical Informatics* 7/1 (2016): 143–76, available at <https://doi.org/10.4338/ACI-2015-12-R-0174>.

<sup>51</sup> Helen Cooper, 'Changing Roles of Health Information Managers: An Education Perspective', *Health Information Management Journal* 38/3 (2009):, pp.38–42, <https://doi.org/10.1177/183335830903800306>.

hospitals and tertiary care organisations are making positive progress overall in their compliance with information management standards as part of the National Accreditation Program for Hospitals. However, issues remain concerning the development and implementation of an information management plan as well as involving the appropriate stakeholders in selecting the appropriate health IT solutions for the hospital. Today, digital health solutions that are governed by strong HIM act as the circulatory system of the modern healthcare system transporting the necessary information to the various parts of this system. When the arteries of this system are constricted or clogged with absent, fragmented, inefficient or isolated information management practices or systems, the consequences are dire! It is time to reform healthcare through strong information management and governance powered by informatics and digital tools.

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## Disclosures

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