

Chapter 77

Information Security Threats in Patient–Centred Healthcare

Shada Alsalamah

King Saud University, Saudi Arabia

Hessah Alsalamah

King Saud University, Saudi Arabia

Alex W. Gray

Cardiff University, UK

Jeremy Hilton

Cranfield University, UK

ABSTRACT

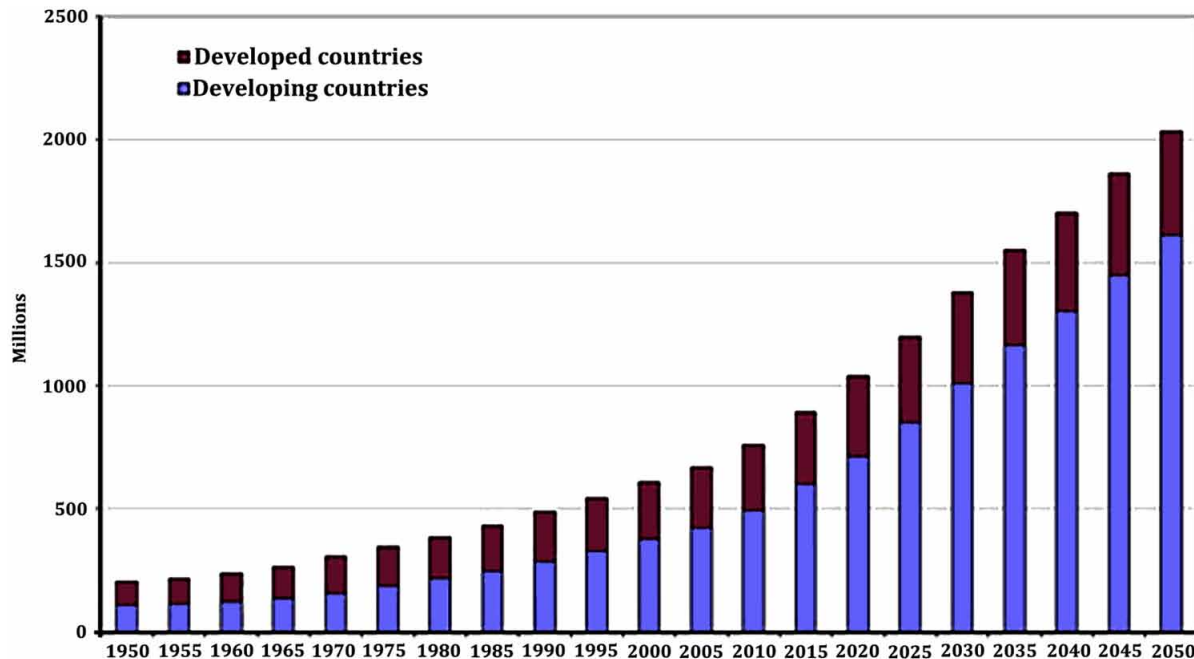
Healthcare is taking an evolutionary approach towards the adoption of Patient-Centred (PC) delivery approach, which requires the flow of information between different healthcare providers to support a patient's treatment plan, so the Care Team (CT) can seamlessly and securely access relevant information held in the different discrete Legacy Information Systems (LIS). Each of these LIS deploys an organisational-driven information security policy that meets its local information sharing context needs. Nevertheless, incorporating these LIS in collaborative PC care brings multiple inconsistent policies together, which raises a number of information security threats that can block the CT access to critical information across a patient's treatment journey. Using an empirical study, this chapter identifies information security threats that can cause the issue, and defines a common collaboration-driven information security design. Finally, it identifies requirements in LIS to address the inconsistent policies in modern PC collaborative environments that would help improve the quality of care.

INTRODUCTION

Population ageing is a demographic revolution affecting the entire world (United Nations Population Fund (UNFPA), 2014) due to medical advances, increased child survival, and improved health care. This is evidenced by figures published by the UNFPA (UNFPA, 2014); see Figure 1, which shows the increasing number of people aged 60 or over between the years 1950-2050 in the world's developed

DOI: 10.4018/978-1-5225-3926-1.ch077

Figure 1. Number of people aged 60 or over: World, developed and developing countries, 1950-2050 (UNFPA, 2014)



and developing countries (UNFPA, 2014). However, this does not mean that older persons should be a burden (UNFPA, 2014). Older people's health conditions require more holistic care as comorbidity is more prevalent in older patients than in younger ones (McGarrrigle, H., Personal Communication, November 2013). Patients with comorbidity suffer from more than one condition at a time, and so they follow multiple treatment pathways. It is clear that healthcare delivery systems need to cope with this emerging need, and be ready for the ageing population, with modern integrated healthcare services that can cope holistically with a patient with more than one health condition.

Therefore, the delivery of healthcare in many countries has been shifting towards an integrated PC care using an evolutionary approach that incorporates Legacy Information Systems (LIS). PC healthcare is where care provision is tailored to meet an individual patient's needs holistically. It is the basis of modern healthcare collaborative environments today, and many countries are using an evolutionary approach to shift towards PC care by building integrated systems based on the sound foundations of the current LIS to support it. The movement towards PC using LIS creates a new information sharing context that is collaboration-driven and is different from local organisation-driven contexts of LIS. This new context, however, requires medical information to flow with the patient between different healthcare providers as they follow the patient's treatment plans and share information across healthcare organisations. This allows the CT to seamlessly access relevant information held in different discrete information systems so that a complete picture is available if required. Nevertheless, meeting this collaboration-driven information sharing context demands an information security context that can carefully balance between enabling seamless access to CT without invading the patient's privacy. This can be addressed using an information security design that ensures the confidentiality, integrity, and availability of patient information is preserved in this collaborative environment (Calder & Watkins, 2008; Mense et al., 2013;

20 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/information-security-threats-in-patient-centred-healthcare/192744

Related Content

Extended Clinical Discourse Representation Structure for Controlled Natural Language Clinical Decision Support Systems

David José Murteira Mendes, Irene Pimenta Rodrigues, Carlos F. Baeta and Carlos Solano-Rodriguez (2015). *International Journal of Reliable and Quality E-Healthcare* (pp. 1-11).

www.irma-international.org/article/extended-clinical-discourse-representation-structure-for-controlled-natural-language-clinical-decision-support-systems/136780

The Need for Developing Learning Healthcare Organisations

Nilmini Wickramasinghe (2020). *Handbook of Research on Optimizing Healthcare Management Techniques* (pp. 1-15).

www.irma-international.org/chapter/the-need-for-developing-learning-healthcare-organisations/244692

Detection of Antibiotic Constituent in *Aspergillus flavus* Using Quantum Convolutional Neural Network

Sannidhan M. S., Jason Elroy Martis, Ramesh Sunder Nayak, Sunil Kumar Aithaland Sudeepa K. B. (2023). *International Journal of E-Health and Medical Communications* (pp. 1-26).

www.irma-international.org/article/detection-of-antibiotic-constituent-in-aspergillus-flavus-using-quantum-convolutional-neural-network/321150

Disability Access to the Built Environment: Web-Based On-Line Evaluation and Information Dissemination

Catherine E. Bridge and Simeon J. Simoff (2000). *Managing Healthcare Information Systems with Web-Enabled Technologies* (pp. 239-265).

www.irma-international.org/chapter/disability-access-built-environment/25834

Node and Hub Data Gathering Architectures for Healthcare Applications based on IEEE 802.15.6 Standard

Hadda Ben Elhadj, Lamia Chaari, Saadi Boudjit and Lotfi Kamoun (2015). *International Journal of E-Health and Medical Communications* (pp. 38-62).

www.irma-international.org/article/node-and-hub-data-gathering-architectures-for-healthcare-applications-based-on-ieee-802156-standard/133568