

Chapter 2

Innovative Healthcare Applications of ICT for Developing Countries

Arni Ariani, Allya P. Koesoema, and Soegijardjo Soegijoko

Abstract Globally, there is a rising demand for an effective, efficient, and trustworthy healthcare delivery system, particularly in developing countries with large populations and significant remote or inaccessible areas. The use of ICT to deliver healthcare services, in particular eHealth and its sub-category m-health, offers an enormous potential to reduce costs, advance health information exchange, and improve healthcare access, as well as public and personalized medicine. However, developing countries also face unique challenges to optimally develop and apply ICT in healthcare sector, including financial feasibility, infrastructure, access, equity, and quality; knowledge and research evidence; leadership and governance; security and interoperability; and social and technological environments. We review innovative ICT healthcare applications and different types of implementation challenges

that this proposed model will serve as a basis for the implementation of ICT in healthcare sector in developing countries.

Keywords Chronic diseases • Developing countries • e-Health • Healthcare • Information and communication technology • m-Health • Quality of life • Wellness management

1 Introduction

Globally, there is a rising demand for an effective, efficient, and trustworthy healthcare delivery system (Wanless 2002). Developing nations with large rural areas and populations particularly have more crucial healthcare issues to deal with, such as the prevalence of chronic

psychological support systems, outbreak management, and disease surveillance and monitoring (Isabalija et al. 2013; Gurol-Urganci et al. 2013; Soegijoko et al. 2009).

However, LMICs often have inadequate health services and medical care infrastructure (Kahn et al. 2010). The average gross domestic product (GDP) per capita for developing and developed countries from 1995 to 1999 was \$1100 and \$27,000, respectively (Gaziano 2005). Furthermore, LMICs assign 6% of their gross national income (GNI) in healthcare costs compared with 10% for developed countries—resulting in a huge budget allocation gap (\$74 vs. \$2733)

The aim of this book chapter was to propose a comprehensive design model for ICT applications in developing countries as an aid for: (1) disease management and surveillance, (2) treatment planning and monitoring, and (3) quality control of healthcare.

2 Challenges

For successful developments and applications of ICT in healthcare, especially in developing countries, we have to consider existing and potential challenges. This section discusses various factors, based on existing examples of applications already developed in a number of countries. These challenges include: funding needs, infrastructure and related factors, knowledge and research evidence, leadership and governance, security and interoperability, and sociocultural and technological environments. These factors need to be considered before developing e- or m-health systems in

