

## Chapter 20

# The Role of E-Health in Developing Nations

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### ABSTRACT

*Many developing nations have begun to introduce elements of e-Health to improve service provision. This chapter provides an account of work in the area including case studies where pioneers have utilised modern mobile technologies to quickly and efficiently introduce new mHealth interventions, despite being resource-limited and having a heavy disease burden. Telemedicine has become well established, linking these nations with specialists in centres of excellence. Obstacles such as cost, inadequate infrastructure, data security, and the lack of a trained health informatics workforce need to be resolved. Several innovative solutions have been put forward: satellite broadband access for the most remote areas, international sponsorship initiatives, use of open source software, and exchange programmes for staff education. There is strong support from the World Health Organization and other international bodies, as development of the eHealth agenda has the potential to help ease access barriers and improve provision of healthcare in developing countries. This is explored in this chapter.*

### E-HEALTH: DEFINITION, SCOPE AND FUNDING

e-Health as a term has been in use for many years, but even up to recently there was little agreement as to what exactly it encompasses. Oh and colleagues (2005) noted that it was in widespread use, but found over 50 unique definitions in the literature. There is broad agreement that it involves the use of information and communication technology for provision of healthcare. This obviously has a very large scope and includes many areas such as

telemedicine, telecare, electronic health records, clinical decision support systems and more recently the concept of m-Health (mobile Health). With the shift towards smartphone technology, m-Health has gained in significance and it is likely that many newer applications will be developed in this area. This has particular relevance for developing countries as the traditional reliance on desktop computing appears to be waning and the opportunities for mobile technologies are increasing. Considering that many of these countries are spread over large geographical areas that are

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often difficult to access, m-Health may be the most economical way of introducing e-Health interventions.

e-Health has broad support from governments, non-government organisations, industry and healthcare providers. There are some major funding initiatives in progress with the aim of stimulating development and uptake. For example, the European Commission's (EC) seventh research framework programme has a total budget of more than €50 billion, with prioritisation for e-Health. The World Health Organization (WHO) has urged member states to reach communities, including vulnerable groups, with e-Health services appropriate to their needs (World Health Organization, 2005). They also publish a yearly Compendium showcasing innovative technology for low-resource settings.

Unfortunately, e-Health currently lacks a system of international coordination, and many countries are involved in disparate efforts. Additionally, many e-Health projects are not conducted as part of a research trial, or take the form of small pilot studies. There is still a need for policymakers to encourage joined-up thinking across different nations and to coordinate efforts to minimise duplication and foster exchange of ideas. This would also help to increase the evidence base and to demonstrate that e-Health can be useful for the end user in developing countries.

## **EVOLUTION AND EVIDENCE**

As early as 1969, computers were predicted to be a solution for the growing demands of healthcare provision (Barnett & Sukenik, 1969). Although the capabilities of technology have improved exponentially since then, there is still a need for better evidence for the effectiveness of e-Health solutions. The WHO resolution on e-Health speaks about "the potential impact that it could have" and the EC notes that e-Health will provide "better, more efficient healthcare services for all".

Although it seems logical, there is however an inherent danger in assuming that e-Health will have benefits for patients. For example, one study reported an unexpected increase in mortality when a computerised provider order entry (CPOE) system was introduced in a paediatric hospital (Han et al., 2005). It has been suggested that socio-technical change may have been responsible for this result (O'Hanlon 2011). It demonstrates the importance of considering usability when designing these systems, and of performing careful evaluations when implementing them (Catwell & Sheikh, 2009). Thankfully a more recent similar project demonstrated a significant reduction of 20% in mortality (Longhurst et al., 2010).

Recently the first systematic review of the evidence for e-Health was published (Black et al., 2011). The authors noted that despite support from policymakers and "techno-enthusiasts", there was only a small amount of evidence to substantiate claims being made about their effectiveness. In particular they found no evidence that they were more cost-effective. This has serious implications when considering the use of e-Health in developing nations as there is an opportunity cost involved. If governments begin to fund e-Health interventions it may be at the expense of other services that may arguably be cheaper and more effective. There is a need for a more robust evidence-base before this can be recommended. In particular there should be more emphasis on what these interventions can achieve in resource-limited environments.

## **E-HEALTH APPLIED TO DEVELOPING NATIONS**

It has been estimated that the developing world consists of over 5 billion people in 127 countries (Wootton, 2008). Healthcare in developing nations can be disorganised, underfunded and lacking in resources. These countries incur almost 80% of all deaths related to chronic diseases (World Health Organization, 2005). Geneva: WHO; 2005. [Aug

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