Chapter 34

Opportunities and Challenges of Integrating mHealth Applications into Rural Health Initiatives in Africa

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ABSTRACT

Within the broader field of eHealth, a new sub-specialization is emerging from the dramatic uptake of mobile phones throughout the world, namely mHealth. mHealth is characterized by the use of a broad range of mobile information and communication technologies including mobile phones, personal digital assistants, and remote medical devices and sensors to support medical and public health efforts. Mobile technologies serve as an extension of existing health information and telemedicine systems as well as stand-alone support systems for health professionals and individuals within the general public. This chapter highlights the developments and trends within mHealth and how the integration of mobile technology has been used to support the Millennium Villages Project. Each of the Millennium Villages, which serve populations ranging from 5,000 to 55,000 people, are located in ten countries throughout Africa, and they have been established to illustrate how targeted interventions valued at approximately $110 USD per capita can be used to achieve the Millennium Development Goals.

INTRODUCTION

The Millennium Development Goals (MDGs), set at the Millennium Summit in 2000, are quantified targets aimed at reducing extreme poverty, hunger, disease, gender inequality, environmental degradation, poor access to safe drinking water and sanitation, meant to be achieved by 2015 (Sanchez et al., 2007). Figure 1, developed by the World Health Organization (WHO) provides an overview of the MDGs, with a specific detailed presentation of health-specific objectives, targets, and measures of success. In 2005, the United Nations Millennium Project identified practical ways to achieve the MDGs, however, questions arose regarding sub-Saharan Africa's ability to achieve their targets given its low productivity of food, heavy burden of infectious disease, and insufficient core

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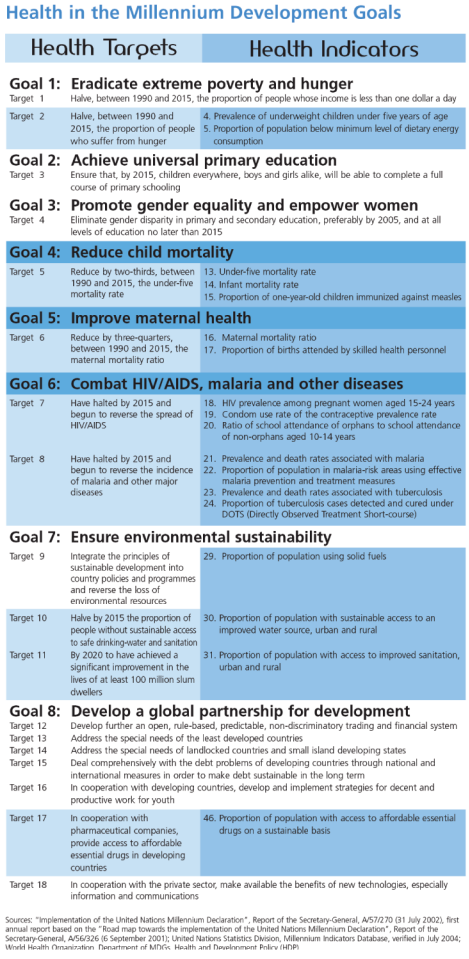
Figure 1. To be reached by 2015, the Millennium Development Goals were set at the United Nations Millennium Summit in 2000 (Reprinted with permission from the World Health Organization Press)



Health in the Millennium Development Goals

Health Targets		Health Indicators
Goal 1:	**Eradicate extreme poverty and hunger**	
Target 1	Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day	
Target 2	Halve, between 1990 and 2015, the proportion of people who suffer from hunger	4. Prevalence of underweight children under five years of age 5. Proportion of population below minimum level of dietary energy consumption
Goal 2:	**Achieve universal primary education**	
Target 3	Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling	
Goal 3:	**Promote gender equality and empower women**	
Target 4	Eliminate gender disparity in primary and secondary education, preferably by 2005, and at all levels of education no later than 2015	
Goal 4:	**Reduce child mortality**	
Target 5	Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate	13. Under-five mortality rate 14. Infant mortality rate 15. Proportion of one-year-old children immunized against measles
Goal 5:	**Improve maternal health**	
Target 6	Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio	16. Maternal mortality ratio 17. Proportion of births attended by skilled health personnel
Goal 6:	**Combat HIV/AIDS, malaria and other diseases**	
Target 7	Have halted by 2015 and begun to reverse the spread of HIV/AIDS	18. HIV prevalence among pregnant women aged 15-24 years 19. Condom use rate of the contraceptive prevalence rate 20. Ratio of school attendance of orphans to school attendance of non-orphans aged 10-14 years
Target 8	Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases	21. Prevalence and death rates associated with malaria 22. Proportion of population in malaria-risk areas using effective malaria prevention and treatment measures 23. Prevalence and death rates associated with tuberculosis 24. Proportion of tuberculosis cases detected and cured under DOTS (Directly Observed Treatment Short-course)
Goal 7:	**Ensure environmental sustainability**	
Target 9	Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources	29. Proportion of population using solid fuels
Target 10	Halve by 2015 the proportion of people without sustainable access to safe drinking-water and sanitation	30. Proportion of population with sustainable access to an improved water source, urban and rural
Target 11	By 2020 to have achieved a significant improvement in the lives of at least 100 million slum dwellers	31. Proportion of population with access to improved sanitation, urban and rural
Goal 8:	**Develop a global partnership for development**	
Target 12	Develop further an open, rule-based, predictable, non-discriminatory trading and financial system	
Target 13	Address the special needs of the least developed countries	
Target 14	Address the special needs of landlocked countries and small island developing states	
Target 15	Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term	
Target 16	In cooperation with developing countries, develop and implement strategies for decent and productive work for youth	
Target 17	In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries	46. Proportion of population with access to affordable essential drugs on a sustainable basis
Target 18	In cooperation with the private sector, make available the benefits of new technologies, especially information and communications	

Sources: "Implementation of the United Nations Millennium Declaration", Report of the Secretary-General, A/57/270 (31 July 2002), first annual report based on the "Road map towards the implementation of the United Nations Millennium Declaration", Report of the Secretary-General, A/56/326 (6 September 2001); United Nations Statistics Division, Millennium Indicators Database, verified in July 2004; World Health Organization, Department of MDGs: Health and Development Policy (HDP)

infrastructure - including water, roads, power, and telecommunications. In March 2004, the Millennium Villages Project (MVP) was conceptualized and the first villages launched at the end of 2004 and the beginning of 2005 in Kenya and Ethiopia, respectively. Ten additional villages were established in 2006 with an additional two added in 2007-2008 for a total of 14 Millennium Village clusters. These village clusters (serving populations that range from 5,000-55,000 people with an average of 30,000 people per cluster) are located in Ethiopia, Ghana, Kenya (2), Malawi (2), Mali (2), Nigeria (2), Rwanda, Senegal, Tanzania, and Uganda. The overall strategy of MVP aims to apply evidence-based practices and technologies to address agricultural productivity, public health, education, and infrastructure through an integrated approach.

In October 2007, in its effort to strengthen the infrastructure component within the villages, MVP launched a strategic partnership with Ericsson to bring enhanced connectivity and broadband access to the Millennium Villages in the 10 countries in Africa in which the project operated. In the MVP, the first sector prioritized to leverage connectivity and for targeted applications was health. Beginning with the targets presented in the figure and the selected interventions being implemented by