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# Health Phones: A Potential Game Changer in Health Information Management

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**Abstract:**
Health education has to be one of the most effective ways to reduce morbidity and mortality in developing countries. We need to deliver vital messages and information to people at the lower quarter of the society to use changing behaviour and practices which can save and protect their lives. It is in this context, use of mobile phones in delivering vital health information is of significance. This article reviews few projects which successfully use mobile phones for health information delivery.
**Key Words:** mhealth; Mobile health; Health information seeking; Health information dissemination

## Introduction:

It has been predicted that mobile technology is beginning to have a big impact in health care, especially in developing countries and soon mobile technology could play a large role in detecting, mapping and responding to epidemics.[1]

Technology has taken healthcare industry a long way forward and so people are more aware about their health status and health needs. But this development has not fully benefited the lower crest of the society. The uncomfortable reality is that we live in a world where there is a silent emergency every day. It is in this scenario the possibility to use mobile phones in health care industry for effective dissemination of health information is of significance.

**mHealth** (mobile health) is the term used for the practice of medical and public health supported by mobile devices. The mHealth field has emerged as a sub-segment of eHealth and telemedicine, the use of information and communication technology, such as computers, mobile phones, communications satellite, patient monitors, etc., for health services and information.[2,3] mHealth applications include the use of mobile devices in collecting community and clinical health data, delivery of healthcare information to practitioners, researchers, and patients, real-time monitoring of patient vital signs, and direct provision of care via PDAs, for health services and information.

The motivation behind the development of the mHealth field arises from two factors. On the one hand, there are high population growth, a high burden of disease prevalence, low health care workforce, large numbers of rural inhabitants, and limited financial resources to support healthcare infrastructure and health information systems. On the other is the recent rapid rise in mobile phone penetration in developing countries to large segments of the healthcare workforce, as well as the population of a country as a whole.[4]

Worldwide, cellular technologies have demonstrated the incredible power of communication as an agent for social change. Mobile phones promise to benefit people in remote areas by making it easier and cheaper to diagnose diseases such as malaria and tuberculosis.[5]

### Global Cellular Subscription

The global cellular subscription rate has taken a giant leap from a 1,000 million to 5,000 million connections in a span of 10 years (2000 to 2010). (Fig. 1)

Over the years, the mobile phone subscription of developing countries has steadily increased compared to that in the developed countries.(Fig. 2)
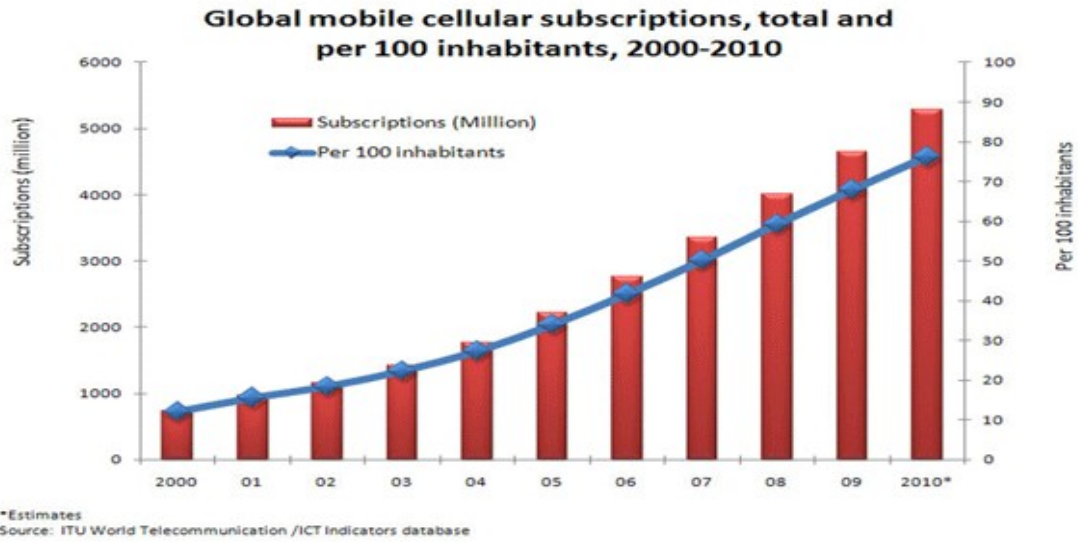
## Global mobile cellular subscriptions, total and per 100 inhabitants, 2000-2010

Subscriptions (Million)
Per 100 inhabitants

*Estimates
Source: ITU World Telecommunication /ICT Indicators database

**Fig 1: Global cellular subscription over years**

## Mobile cellular subcriptions, by level of development

### 2000

Developing

Developed

Total 719 million

### 2005

Developing

Developed

Total 2.2 billion

### 2010*

Developed

Developing

Total 5.3 billion

*Estimates
Source: ITU World Telecommunication/ICT
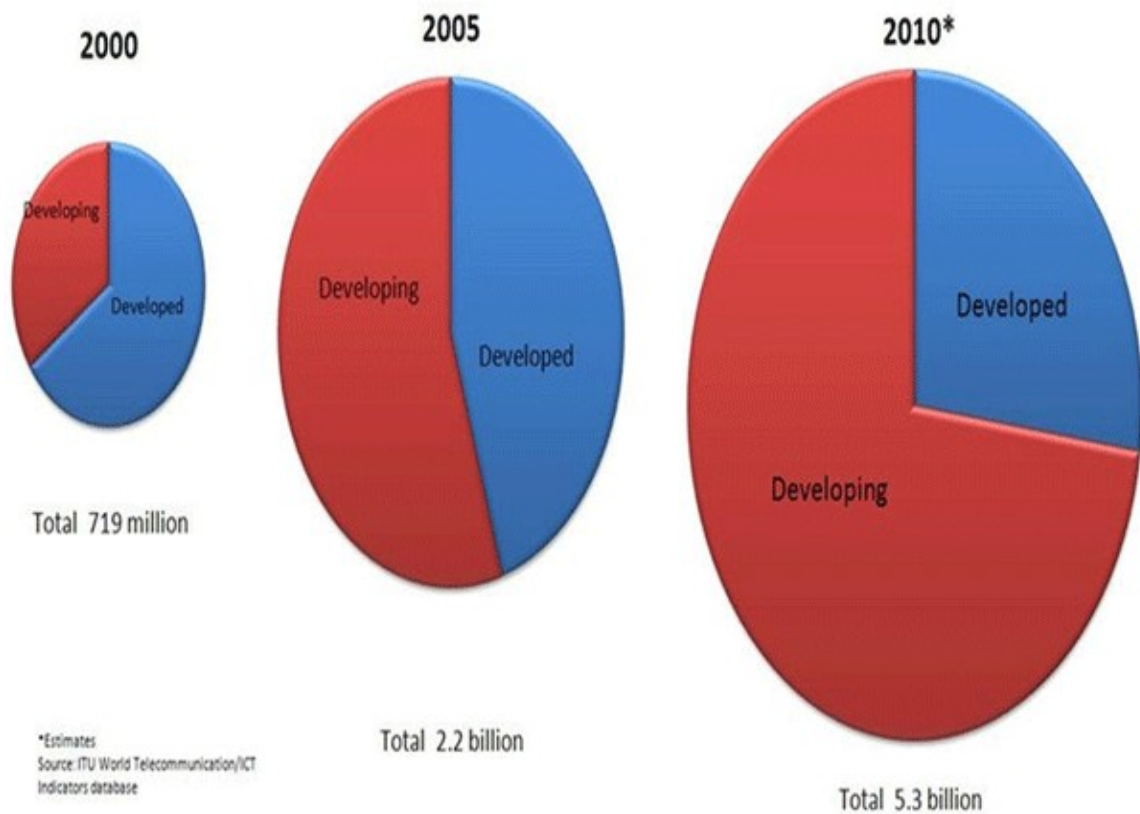Indicators database

**Fig 2: Mobile subscription comparison between developed and developing countries**

It is interesting to note that mobile phones have become the handiest electronic equipment in the present era and is being used by people from all walks of life. According to International Telecommunication Union (ITU) statistics, until November 2010, it is estimated that, there are 5.3 billion active mobile subscriptions, thus suggesting that 90% of the world's population have access to mobile network. It is also interesting to note that 73% of these mobile subscriptions are in developing countries.[6]

Reaching large population in remote areas was unthinkable in olden days. With mobile communications revolution sweeping across the globe, nearly 90 per cent of the world's population now has access to a mobile-phone signal, including 80 per cent of people in rural areas.[3]

Few cases are reviewed here which is using mobile phones as tools for health information seeking as well as for dissemination of data.

### Method:

Data's abstracted from various resources and studies conducted in different parts of the world with an intention to study the different possibilities to use mobile phones in health information management.

### Case 1: A Case Study From USA on Mobile Phone Use for Health Data Search

A survey from the Pew Internet & American Life Project shows how the proliferation of smart mobile devices cause a shift in the way users are accessing data and information on health. The survey reveals that 17% of cell owners have used their phone to look up health or medical information on the Internet. It was also noted that 29% of cell owners of age group 18 to 29 have done health information searches and 9% of them have applications downloaded which they use to help track and manage their health. The heaviest use of health or medical related applications was by young adults.[7]

Currently some of the service providers in US are providing health care applications for counting calories and nutrition information, logging fitness workouts, providing health tips, to calculate disease risks, to calculate body mass index, for keeping personal health records, for providing users' health information to physicians and emergency workers etc.

Surprisingly, the highest use of cell phone health-information seeking and downloading cell phone health applications was among 18 to 29 year olds at 29% and 15% respectively. It suggests that, this new technology is welcomed among young adults in developed countries like US.

### Case 2: U.S. President's Emergency Plan for AIDS Relief (PEPFAR)

The U.S. President's Emergency Plan for AIDS Relief (PEPFAR) is the U.S. Government initiative to help save the lives of those suffering from HIV/AIDS around the world. PEPFAR is the cornerstone and largest component of the U.S. President's Global Health Initiative, with a special focus on improving the health of women, new-borns and children.

The goals of PEPFAR include strengthening the partner government capacity to lead the response to HIV epidemic and other health demands. It aims at integrating and coordinating HIV/AIDS programs with broader global health and development programs to maximize impact on health systems. PEPFAR is also investing in innovation and operations research to evaluate impact, improve service delivery and maximize outcomes.[8]

For the purpose of integrating and coordinating the program, PEPFAR is using technology to connect health systems in ten PEPFAR-supported countries by 2010 through the GSM Association Development Fund. For this reason *'Phones for Health'* program was launched. This program will make timely, relevant information available to program managers and service providers.[9]

### How will Phones-for-Health enable the Emergency Plan to support those infected and affected by HIV/AIDS?

In the developing world, more than 60% of the population now lives in areas with mobile phone coverage. GSM Association Development Fund expects this figure to rise to 85% by 2010. This makes it feasible to use mobile phones to transfer information directly to health authorities' computer systems, thus enabling rapid interventions such as distribution of medication and education programs for those at risk.[9]

### Case 3: 'AMREF' - African Medical and Research Foundation

**What is AMREF?** The African Medical and Research Foundation (or AMREF) was founded in 1957 by three surgeons as the Flying Doctors Service of East Africa. AMREF is bringing good quality and affordable health care closer to those who need it most - improving access to health treatment and preventing poor health through community education. Working closely with African communities and governments, AMREF ensures that its health projects are relevant and sustainable.[10]

**An overview of activities by AMREF over the years:** In the year 1950 when AMREF was founded, its core activities included Flying Doctors Services delivering health care to remote areas. By 1960 it introduced Radio programmes on National Radio for health workers thus strengthening their knowledge on health. In the year 1980 they started Print-based distance education programs and from 2000 onwards they started using technology to reach the masses by introducing supported learning systems by using telemedicine, eLearning and mLearning (mobile learning).[10]

**What are mobile phones doing at AMREF?** Remote areas with limited access to health professionals were soon reachable and hence passing vital information to and from health experts became easier. An example for such mobile phone guided health information diffusion is taking photos and sending to experts who will guide the health professionals/workers in the remote areas on what to do. They also used cell phones for mapping hotspots or areas known to have disease outbreaks of a particular kind. This enabled the deployment of personnel to these areas. SMS's are used as reminders for people involved in the program for taking medicine in time, vaccination alerts, alerts about epidemic outbreaks, first aid etc. Mobile phones are also used for sharing community practice formed from interventions across various groups.
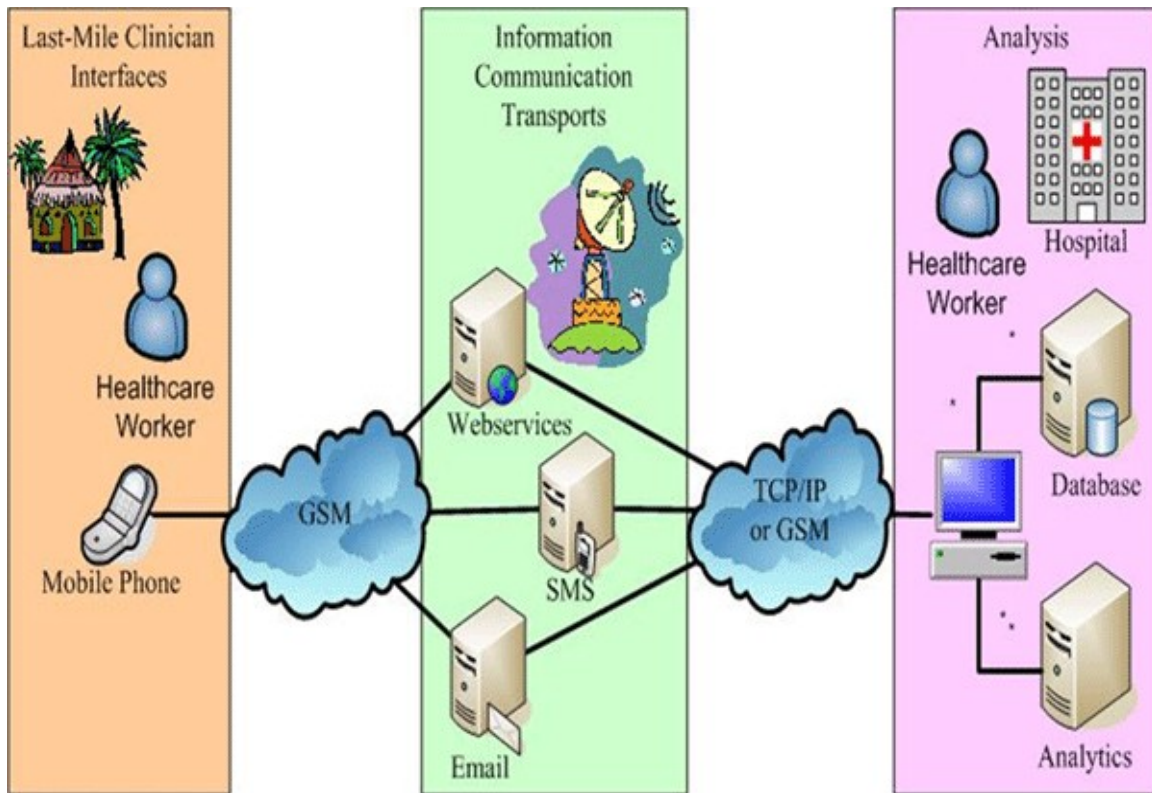
**Fig: 3 How the system works in AMREF**[10]

**Case 4: Health Phones in India**

India has a vast population at the lower strata of the society who are deprived of quality health care. They remain unaware of the modern technology and development in the health care industry, thus resulting in causalities which could be avoided if proper health information and facilities are available.

The studies have revealed that the five diseases – pneumonia, diarrhoea, malaria, measles and AIDS - together account for half of all deaths of children below the age of 5 years. Majority of these deaths are due to the lack of knowledge in handling critical situations. For the illiterate, currently the only source of information is probably going to be the people around them, who are also, in many cases, illiterate. The lack of knowledge remains the root cause of such causalities.[11]

Health education has to be one of the most effective ways to reduce maternal and child mortality. We need to deliver vital messages and information for people at the lower strata of the society to use changing behaviour and practices which can save and protect the lives of children and help them grow and develop to their full potential. With the continuous rapid growth in population and shrinking budgets, governments are finding it increasingly difficult and expensive, to effectively manage programmes and efforts that involve training and educating their large numbers of departments and staff. This is leaving health workers, and by extension, families and communities ignorant of the basic knowledge that could help prevent diseases and improve the quality of health of their families and communities. It is in this context '**Health phone'** is significant.[11]

Mobile phones have made it possible to reach our large population in remote areas, something that was truly unthinkable until very recently. With a population of 1.17 billion and a wireless user base of about 700 million (as of Oct., 2010), and growing at the rate of 15 to 20 million a month, cell phone penetration will reach 97% of our population by 2014,

according to a recent study.[11] As per Telecom Subscription in India, as on 31st March 2010, total telephone subscriber base had reached 621.28 million, the wireless subscription had reached 584.32 million and wire line subscription remained at 36.96 million.[12]

In such a scenario, the mobile phones can be a potential game-changer, which means we can reach the excluded, the illiterate, all those women, men and children. We can reach families and communities as a whole which was something we were never been able to do before.

**What will health phones do in India?**

Health phones will have preloaded content on low-cost mobile phones. It will provide health and nutrition content scripted on knowledge, prepared jointly by UNICEF, WHO, UNESCO, UNFPA, UNDP, UNAIDS, WFP and The World Bank.[11] The main areas of concern for such interventions are timing births, safe motherhood and new-born health, child development and early learning, Breastfeeding, nutrition and growth, immunization, diarrhoea, coughs colds and more serious illnesses, hygiene, malaria, HIV, child protection, injury prevention, emergency preparedness and response etc.

**How does it work?**

The content will be pre-loaded on popular low-cost models of mobile phones for which no signal is required, nor cost to download videos and other media. Users choose what they want to watch and listen to and when, wherever they happen to be. Health Phone provides families with their own personal reference library and guide to better health practices. It is available in real time, right to those who need it, when they need it and when a health problem is about to strike, where they are, and as they are.

The pilot content of health phones is available in English and 15 Indian languages like Hindi, Assamese, Bengali, Gujarati, Kannada, Konkani, Malayalam, Marathi, Oriya, Punjabi, Rajasthani, Sanskrit, Tamil Telugu and Urdu.[11]

**Case 5: Mobile Phones in Family Planning**

A study was conducted to assess the acceptability and feasibility of delivering the Standard Days Method (SDM) using mobile phone application developed by Institute for Reproductive Health (IRH) at Georgetown University in Washington, DC, United States. SMS technology has been used to provide health-related information directly to users and to serve as reminders to people needing to take medicines at regular intervals. In light of the high unmet need for family planning (FP) and reproductive health (RH) information, there is the significant potential to help women avoid pregnancy and improve their reproductive health by providing them with timely, actionable, personalised information through SMS.[13] IRH developed a mobile application called CycleTel that supplies the Standard Days Method (SDM) directly to a user's cell phone.

SDM is a fertility awareness-based method that requires the user to avoid unprotected sex during days 8-19 of her menstrual cycle. It was found to be more than 95% effective in avoiding unplanned pregnancy and has since been recognised as an evidence-based practice by the World Health Organization (WHO).[13]

**How does the system work?**

CycleTel provides a woman with information about her daily fertility status according to the SDM and advice on avoiding or achieving pregnancy. The woman provides the date of her menstrual period starts (each cycle), after which she can be advised of her fertility status on a daily basis via text messaging. Additional messages support correct use of the SDM, monitor her cycle lengths to identify whether they are in the 26-32 day range, and offer information on other FP options and RH issues, with an emphasis on the importance of healthy timing and spacing of pregnancies. As the project develops, women and men will be able to access, via SMS, answers to their questions about SDM and other RH issues.[13]

The CycleTel project is being carried out as part of the Fertility Awareness-based Methods (FAM) Project, a 5-year global project with the main aim of taking modern, natural FP methods (NFPs) that were developed and tested by IRH.[13]

**Conclusion:**

It is clear from the cases discussed that the use of mobile phones holds promise for improving health of the developing world. The significant benefits of mobile phones in health care industry are:

- Extending the ability of Ministries of Health to create national health information networks that reach all communities.

- Bringing together the existing mobile phone infrastructure in the developing world, and extend the span of health information networks to reach the vast majority of populations, even in remote areas.

- The health workers in the field can use software on their mobile phones to submit critical health information directly into central computer systems.

- It will allow health officials and service providers to view, analyse and respond to this vital data immediately.

Mobile phone has made communication possible in ways that were truly unthinkable until very recently. It is used in multiple ways in the field of health information sharing in different parts of the world. Mobile phones are emerging as vital equipment in disseminating health information data. It will be used widely for **Personal Healthcare Intervention** (e.g. adherence to medication, immunization rates, self reporting (e.g., blood glucose levels, Lipid profile etc.) and **Public Health Intervention** (e.g. wide area surveillance and notification, mass notification etc.) in the future.

**References:**

1. A world of witnesses: When everybody becomes a nomadic monitor, A survey of mobility. *The Economist.* Apr 10, 2008,

2. Vital Wave Consulting. mHealth for Development: The Opportunity of Mobile Technology for Healthcare in the Developing World. United Nations Foundation, Vodafone Foundation. February 2009. Available at http://www.vitalwaveconsulting.com/insights/articles/mHealth.htm

3. Germanakos P, Mourlas C, Samaras G. A Mobile Agent Approach for Ubiquitous and Personalized eHealth Information Systems. Proceedings of the Workshop on 'Personalization for e-Health' of the 10th International Conference on User Modelling (UM'05). Edinburgh, July 29, 2005, pp. 67-70.

4. Ranck J. Time to get mHealth moving. Available at http://www.scidev.net/en/opinions/time-to-get-mhealth-moving-1.html

5. mHealth. Available at http://en.wikipedia.org/wiki/MHealth

6. World Telecommunication/ICT Development Report 2010; monitoring the WSIS targets, A mid-term review. Available at http://www.itu.int/dms_pub/itu-d/opb/ind/D-IND-WTDR-2010-PDF-E.pdf

7. Steven Wilkins MPH. Health information seeking: Who is using a cell phone to find it? Available at www.healthecommunications.wordpress.com

8. PEPFAR's Five-Year Strategy. Available at http://www.pepfar.gov/strategy/document/133251.htm

9. Connecting to a Healthy Future (Updated January 2009). Available at http://www.pepfar.gov/press/80384.htm

10. Otieno PK. Are Mobile Phones Better Learning Tools than Computers? African Medical and Research Foundation (AMREF). Available at http://www.amrefusa.org/.../uganda-m4d-conference-presentation-nov2010-.ppt%20-%20United%20States

11. Health Phones: What every family and community has a right to know. Available at www.health-phones.org

12. Telecom Regulatory Authority of India. Annual Report 2009-10. Available at http://www.trai.gov.in/annualreport/AnnualReport_09_10English.pdf

13. Lavoie KS, Jennings VH, Puleio M, Jha P, Lundgren R. Family Planning via Mobile Phones: Proof-of-concept Testing in India (CycleTel), November 18, 2009. Available at http://www.comminit.com/en/node/307314/2674