

**Review Article****m-HEALTH- CAN IT IMPROVE INDIAN PUBLIC HEALTH SYSTEM**Sanjeev Davey<sup>1</sup>, Anuradha Davey<sup>2</sup>**Author's Affiliation:**<sup>1</sup>Assistant Professor, Community Medicine, Rohillakhand Medical College & Hospital, Bareilly, India; <sup>2</sup>Assistant Professor, Community Medicine, Subharti Medical College, Meerut, India**Correspondence**

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**ABSTRACT**

**Introduction:** The role of Mobile application evaluation in public health (m-health) is now in fact, essential for us to make use of this very fast growing technology in making the bright future of Public health of people.

**Objectives:** To critically analyze the role of Mobile Applications in Public Health (m-health).

**Materials and methods:** A Systematic Review of related studies in literature published till 30<sup>th</sup> June 2013 on role of Mobile-Applications in Public health (m-Health) was done.

**Results:** A wide variety of Mobile health applications are available in Mobile Phone Market with lack of proper Regulation from health care authorities and with variably good results.

**Conclusions:** We must use these applications guardedly weighing its benefits and utility in Public Health as well as capitalize the good prospect and capability of m-health worldwide application in the field of Public Health Globally. This means that we can have a greater access to larger segments of a population in developing countries like India and this can improve the capacity of our India health system to provide quality healthcare, which is in great demand today.

**Key words:** Internet, Public Health, m- Health e-Health

**INTRODUCTION**

We all are influenced by the *Mobile Revolution* in this century, as mobile phones have spread its roots from richest to the poorest in developing countries like India. **Mobile Health or m-Health** is a medical and public health practice which is supported by all kinds of mobile devices, like mobile phones, patient monitoring devices, PDAs and other wireless devices for providing health services and health information for people.<sup>1</sup> This field uses information and communication technology (ICT), has been done with the help of computers, mobile phones, communications satellite, patient monitors, etc., for health care services and health care information's in past in public health practice.<sup>2</sup>

**e-Health - A father of m-Health**

We must note that m-health is not a subset of or mobilization of e-health. e-Health is a technology that supports the functions and delivery of healthcare, while m-Health provides healthcare access, as m-Health is based on mobile technology, healthcare through information and delivery, can better reach areas, people, and/or healthcare practitioners with previously limited exposure to aspects of healthcare. Often m-Health project using mobile phones to access data on diseases like HIV/AIDS rates require an e-Health system for managing, storing, and assessing the data therefore e-Health projects many times operate as the backbone of m-Health projects.

Increasing threat of Communicable as well as Non-Communicable disease epidemics coupled

with shortage of healthcare professionals is a real challenge in developing countries like India in achieving the health related Millennium Development Goals (HR-MDGs). This problem can be solved by an almost explosive growth of mobile communications offering a new opportunity in promotion of quality healthcare of Indian people as Mobile phone reaches further into developing countries than any other information and communication technology (ITC) and health infrastructures.<sup>3</sup> Mobile phones have been found to be an appropriate and very promising tool for disease control interventions in developing countries like India, where its use has been done in key diseases like HIV/AIDS and that too by way of **bulk-SMS (push& voice) messaging** and this is found to be well accepted by the population.<sup>4</sup>

Let us see how m health can further improve public health system of India by its applicability, objectives as given below **m-Health applications in public health system of India by way of mobile devices:**<sup>3,4,5</sup>

<sup>TM</sup>Collecting community and clinical health data (**Remote data collection**)

<sup>TM</sup>Delivery of healthcare information to practitioners, researchers, and patients (**Communication and training for healthcare workers**)

<sup>TM</sup>Real-time monitoring of patient vital signs (**Remote monitoring**)

<sup>TM</sup>Direct provision of care (**Mobile telemedicine**).

<sup>TM</sup>Diagnostic and treatment support (**Remote Patients Management**)

<sup>TM</sup>Diseases and epidemic outbreak tracking (**Public Health Surveillance**)

<sup>TM</sup>Patients education and awareness (**IEC and BCC Messages**)

<sup>TM</sup>Disaster warning (**Disasters Management**)

<sup>TM</sup>**Communicable Diseases Management** like TB care with speed and the benefits all across the globe. **m-Health to Improve TB Care'** is also now a new upcoming area with a potential for mobile health (m-Health) to revolutionize the fight against tuberculosis (TB).

### **m-health Objectives**

Today many types of smart phones are powerful and capable enough in putting an informed doctor, comprehensive medical library and bio-monitoring device in their pocket. Techniques like *Mobile videos (3G Doctor)* can better do behavior change communication in National health programmes of India and promote to maintain healthier long-term lifestyle choices to prevent rising Non-Communicable

Diseases in Indian Health Care System. With this we can accomplish, important m-health objectives, which can be as given below:

1. Increased access to healthcare and health-related information to hard-to-reach populations;
2. Improved ability to diagnose and track diseases;
3. Timelier results dissemination,
4. More actionable public health information; and
5. Expanded access to ongoing medical education and training for health worker.
6. The Doctors can also send a simple SMS to remind patients of their appointments for management of their diseases, is also one of the working principle areas in m-health.

Because of the pervasiveness and capability of mobile devices and networks to the health of society and ability of the basic functions of the mobile devices such as – **Voice calls and SMS (voice & text)** to drive a fundamental change in all societies' health and healthcare, that's why authors have done systematic review on this topic to know whether m-health can be a way to improve Indian Public health System.

### **OBJECTIVE**

To critically analyze the role of mobile (m-health) in Indian Public Health System as a possible way to improve Indian public health System via systematic review approach

### **MATERIALS AND METHODS**

A systematic review of studies on m-health in literature published till 30<sup>th</sup> June 2013 on role of m-Health in Public health was done. A comprehensive systematic review was done from Pubmed, WHO, Cochrane database and Google scholar and Bio-med Central. Both positive and negative studies were included of last 10 years on key word *m-health* in above search areas. M-health studies in developing world were taken as criteria for guiding role and its expected results in Indian health care setup. m-Health studies on impact, effectiveness and evaluation of m-health in public health were the 3 main criteria taken for inclusion in this systematic review and previous systematic reviews and exploratory studies on m-health in developing world were the main study designs taken. Studies on m-health in developed world as well data from thesis/dissertation were excluded ex-

cept for m-health definition.

## RESULTS

### M- Health Activities in Developing World:

Some of the projects in developing world have been successful and continue to develop into long-term services that help those in need, but many have simply fallen by the wayside. There are many externally- or government-funded m-health pilots/projects in the last few years in developing countries, such as<sup>6</sup>:

1. **Freedom HIV/AIDS in India** - A mobile games to promote HIV/AIDS awareness;
2. **Learning about Living in Nigeria**- teenagers can ask sexual health questions by text message;
3. **Handhelds for Health in India**-uses mobile technologies (instead of pen and paper) to collect field data on disease or public health;
4. **Mobile Telemedicine System in Indonesia** - allows remote patients to receive a routine check-up using a mobile phone.

The real power of m-health is to enable the patients and providers in these regions to help themselves like as given below:<sup>7</sup>

<sup>TM</sup> The ability to send a SMS to request an ambulance in a remote village in India, or <sup>TM</sup> Services that are set up to enable clinicians and patients to do things more effectively, <sup>TM</sup> Service set up by surgeons in Tanzania- to send bus fares to patients via m-money so they can make it to the hospital to have their operation.

### Indian Initiatives in field of m-Health

Mobile Health can become a 3000 crore market in India by 2017. M-health and E-health is knowing to make an entry into India's primary health centres (PHCs) and sub-centres as the health ministry plans to go hi-tech. The steering committee on health said that in the 12th plan (2012-17), all district hospitals would be linked to leading tertiary care centres through telemedicine, Skype and similar audio visual media. M-health will be used to speed up transmission of data in this. Economies of Indian states can grow 1.08 per cent faster with every

10 per cent increase in Internet and broadband connections, says a study released by Indian Council for Research on International Economic Relations (ICRIER). As per a report by

HealthCursor, the tele-density in urban areas in India is almost 100 percent while in the rural areas, it is 37 percent. The pervasiveness of m-health and e-health platforms will be harnessed in the MDG and National Health plans in India. Over the last decade, telehealth in India has been primarily facilitated and driven by government funding. The government now has a major policy initiative in mobile health. Many government-driven telemedicine programmes have failed to live a long life. These programmes do not have a successful business model and die after the government grants run out. Healthcursor Consulting Group has prepared a report on several such reforms that were implemented by Govt. of India from the year 2005 onwards and lessons learnt. Some of the factors that lack in Govt. based implementations here are:

1. Patient satisfaction – do patients like the technology?
2. Clinical efficacy – how well we can treat the patients remotely rather than face to face?
3. Business case and sustainability – development of clear metrics to measure the project, including for example decreasing number of transports, reduced rate of hospitalization and increased productivity.

### INDIAN EXAMPLES IN M-HEALTH

Both govt and private setup are exploring areas in m-health. Some examples are like as given below:

1. **Non-emergency help lines (Government):** At this point in time, more than 4 large states in India are looking to set up these helpline for consumers and people who live in rural areas and do not have access to basic health.
2. **Emergency help lines (Private Set UP): 1066-** A National 24 hour emergency and trauma care helpline by Apollo Hospitals Group.
3. **Apollo - Aircel Mobile Health Care:** Aircel customers can call **55104** from their mobile and talk to Health Experts from Apollo for any health related queries and get interim relief for life's little health urgencies - anytime, anywhere for anyone. Apollo Mobile Healthcare provides access to quality medical advice from the comfort of your home/office. Gets you instant advice on medical/health and wellness queries from a

- panel of doctors specializing in various fields. The Charges for Apollo Mobile Healthcare service on 55106 are @ Rs. 2/min
4. **Apollo M.I.N.D Line:** Apollo M.I.N.D. Line is a psychological tele-counselling helpline to support individuals who are dealing with complications faced in everyday life.
  5. **B positive:** BPositive, a health and lifestyle magazine, initiated by Apollo Hospitals Group, was launched in 2008. B Positive conforms to the mission of empowering the people to conquer the world with a positive attitude, by creating awareness about health.
  6. **Apollo Telemedicine:** Telemedicine brings healthcare within reach of population residing in medically inaccessible areas. They will also be able to share their medical reports and images to ensure an all round investigation and an accurate diagnosis. Doctors can get in touch with their peers to discuss complicated cases or to get specialized help remotely.
  7. **Apollo Prism:** Apollo Prism is a patient-controlled Personal Health Record with which the users can import and manage health records created during various doctor visits and can also access their online health record and medical reports anytime and anywhere.
  8. **Airtel- Doctor:** A consultancy based doctor helpline and toll free helpline service on 54321 in which call @ Rs 3/mint for airtel users.
  9. **Apollo Munich, ICICI Lombard Health Insurance Companies:** SMS and Health Line Services for their customers are one good initiative by health Insurance companies.
  10. **MedIndia web site:** Services like ask a health question on their mobile site.
  11. **Mobile Clinics:** Similarly, mobile clinics, telemedicine centres and health information on mobile phones is catching up as priorities amongst Indian Government.
  12. **Heart Helplines:** Asian Heart Institute (AHI) Mumbai has started an emergency service based on mobile communication which also has air-lift capability to AHI by helicopter from distant parts of India.
  13. **Dr SMS:** SMS - an initiative by Kerala Government.

## DISCUSSION

Mobile technology has spread its roots recently into low- and middle-income nations. In the

mHealth field, mobile technology means mobile phone technology and the entrance of other technologies to facilitate healthcare. India has done a lot in the mobile health applications with the launch of several different services but the majority of initiatives are focused on spreading prevention and awareness messages and the Mobile Health market opportunity for India is around 8% of the total Asia-Pacific opportunity by 2017.

### Strengths of m-health technology

The m-Health has grown rapidly in a very short period but it requires a more thorough and scientific approach in its understanding and evaluating its progress.<sup>8</sup> mHealth requires a solid, interdisciplinary scientific approach for the rapid change associated with technological progress.<sup>9</sup> Resources have also now been allocated to developing m-Health interventions, like use of mobile technology for behavior change communication (BCC). Although the majority of mobile phone users worldwide live in the developing world, most research evaluating BCC mHealth interventions has taken place in developed countries. Although m-Health is viewed as a promising tool in developing countries with the ability to foster behavior change, more evaluations of current interventions need to be conducted to establish stronger evidence.<sup>10</sup>

### RTBP via m-health in India

The Real-Time Biosurveillance Program (RTBP) pilot which was done to monitor the health status of the country like india, found that the RTBP via m-health can reduce expenses, introduce benefits, and improve the efficiencies in disease surveillance and mitigation in India.<sup>11</sup>

### Weaknesses of m-health technology

M-health can significantly change the way that health-care is practiced in future, and it is clear that it is the human factors that are more difficult to overcome, rather than the technological ones. The primary barriers in m- health found are language, timing of messages, mobile network fluctuations, lack of financial incentives, data privacy, and mobile phone turnover.<sup>12</sup>

1. The biggest mistake is developing/introducing products and services without proper consideration of the **importance of patient privacy**.
2. For sustainability of mobile health programs in Indian health care System need to

be based on key building blocks and strong partnerships.<sup>3</sup>

## CONCLUSIONS

Mobile technology is changing the health care delivery across the developing world like india by giving people who live in rural villages the ability to connect with doctors, nurses and other health care workers in major cities even a phone call can compress the time that it would have taken before to come to that decision point and get the pregnant woman care more often and quickly. m- health has many potentials like, it can lower costs, improve the quality of healthcare as well as shift behavior to strengthen prevention, all of which can improve health outcomes in the long run. Flexibility is critical in m- health projects in designing policies and regulations to steer or enhance m-health's growth. The m- health industry would be best served with regulatory strategies which can focus on the most urgent needs of health. The integration of point-of-care diagnostics with mobile phones can provide the user with a telemedicine capability that is truly mobile with real time data monitoring and transfer with instant diagnosis.

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