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## Role of information communication technology (ICT) in health & fitness

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### Abstract

Information and communication technology (ICT) is a tool that facilitates communication and the processing and transmission of information by electronic means. In the 21st century, ICT is becoming increasingly important in health promotion and disease prevention. The widespread use of the Internet and mobile phones is currently challenging the way people are educated, supported and followed up. This paper sees health and fitness as a complex interaction of biomedical, social, economic, and political determinants. It highlights the ways in which ICT can be used as one of the tools to help meet the health-related Millennium Development Goals (MDGs). Major constraints and challenges that need to be faced in integrating ICTs into health awareness are described. Some emerging technological trends that may shape future use of ICTs in the health sector are also given.

**Keywords:** Information communication technology, health, fitness

### Introduction

ICTs are defined as tools that facilitate communication and the processing and transmission of information and the sharing of knowledge by electronic means. This encompasses the full range of electronic digital and analog ICTs, from radio and television to telephones (fixed and mobile), computers, electronic-based media such as digital text and audio-video recording and the Internet.

Information and communications technologies (ICTs) can play a critical role in improving health care for individuals and communities. By providing new and more efficient ways of accessing, communicating, and storing information, ICTs can help bridge the information divides that have emerged in the health sector in developing countries—between health professionals and the communities they serve and between the producers of health research and the practitioners who need it. Through the development of databases and other applications, ICTs also provide the capacity to improve health system efficiencies and prevent medical errors.

The health sector has always relied on technologies. According to the World Health Organization, technologies form the backbone of the services to prevent, diagnose and treat illness and disease. ICTs are only one category of the vast array of technologies that may be of use. Given the right policies, organization, resources and institutions, ICTs can be powerful tools in the hands of those working to improve health.

ICTs have clearly made an impact on health care. They have:

- Improved dissemination of public health information and facilitated public discourse and dialogue around major public health threats
- Enabled remote consultation, diagnosis and treatment through telemedicine
- Facilitated collaboration and cooperation among health workers, including sharing of learning and training approaches
- Supported more effective health research and the dissemination and access to research finding
- Strengthened the ability to monitor the incidence of public health threats and respond in a more timely and effective manner
- Improved the efficiency of administrative systems in health care facilities.

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This translates into savings in lives and resources and direct improvements in people's health. In Peru, Egypt and Uganda, effective use of ICTs has prevented avoidable maternal deaths. In South Africa, the use of mobile phones has enabled TB patients to receive timely reminders to take their medication. In Cambodia, Rwanda, South Africa and Nicaragua, multimedia communication programmes are increasing awareness of how to strengthen community responses to HIV and AIDS. In Bangladesh and India, global satellite technology is helping to track outbreaks of epidemics and ensure effective prevention and treatment can reach people in time.

### **E-health**

e-health is the use of emerging information and communication technology, especially the Internet, to improve or enable health and healthcare. This term bridges both the clinical and non-clinical sectors and includes equally individual and population health-oriented tools. According to Eysenbach's to read: 'e-health is an emerging field of health informatics, referring to the organisation and delivery of health services and information using the Internet and related technologies.

eHealth (also written e-health) is a relatively recent term for healthcare practice supported by electronic processes and communication, dating back to at least 1999. Usage of the term varies. Some argue that it is interchangeable with health informatics with a broad definition covering electronic/digital processes in health while others use it in the narrower sense of healthcare practice using the Internet. It can also include health applications and links on mobile phones, referred to as m-health or mHealth. Since about 2011, the increasing recognition of the need for better cyber-security and regulation may result in the need for these specialized resources to develop safer eHealth solutions that can withstand these growing threats.

### **Forms of e-health**

The term can encompass a range of services or systems that are at the edge of medicine/healthcare and information technology, including:

- Electronic health records: enabling the communication of patient data between different healthcare professionals (GPs, specialists etc.).
- Computerized Physician Order Entry: a means of requesting diagnostic tests and treatments electronically and receiving the results.
- Prescribing: access to prescribing options, printing prescriptions to patients and sometimes electronic transmission of prescriptions from doctors to pharmacists.
- Clinical Decision Support: providing information electronically about protocols and standards for healthcare professionals to use in diagnosing and treating patients.
- Telemedicine: physical and psychological diagnosis and treatments at a distance, including telemonitoring of patients functions.
- Consumer health informatics: use of electronic resources on medical topics by healthy individuals or patients.
- Health knowledge management: e.g. in an overview of latest medical journals, best practice guidelines or epidemiological tracking (examples include physician resources such as Medscape and MDLinx).
- Virtual healthcare teams: consisting of healthcare

professionals who collaborate and share information on patients through digital equipment (for transmural care).

- Mental Health or m-Health: includes the use of mobile devices in collecting aggregate and patient level health data, providing healthcare information to practitioners, researchers and patients, real-time monitoring of patient vitals and direct provision of care (via mobile telemedicine).
- Medical research using Grids: powerful computing and data management capabilities to handle large amounts of heterogeneous data.
- Health Informatics / Healthcare Information Systems: also often refer to software solutions for appointment scheduling, patient data management, work schedule management and other administrative tasks surrounding health.

### **Medical/Health Technologies**

A simple definition, produced by WHO (2004) is that health technologies are solutions to health problems. They are essential any tool, device or procedure used in health care. This can include ICTs and when it does, these are usually categorised as:

- Diagnostic Technologies - electrocardiography, electroencephalography, myography, x-ray imaging, fiberoptic endoscopy, computerized tomography, magnetic resonance imaging, ultrasonography, coronary angiography, non-invasive functional organ studies, radionuclide uptake and imaging diagnostic procedures, biochemical, hematological, serological, microbiological, and tissue pathology analytical studies, genetic analysis.
- Therapeutic Technologies - including curative and preventive technologies such as pharmaceuticals, laparoscopic and laser surgery techniques, vaccination, radiation by external sources or radionuclides, and the evolving applications of genetic engineering and gene therapy to human disease.
- Information Technologies - including manual and computerized data systems, medical records, clinical and administrative documentation, communication resources, fax machines, telephone, e-mail, the internet, handheld computers and portable digital assistants (PDAs), electronic medical records and "smart cards".

### **ICTs and the health-related MDGs**

The United Nations Millennium Development Goals (MDGs) are 8 goals that UN Member States have agreed to try to achieve by the year 2015.

The United Nations Millennium Declaration, signed in September 2000, commits world leaders to combat poverty, hunger, disease, illiteracy, environmental degradation and discrimination against women. The MDGs are derived from this Declaration. Each MDG has targets set for 2015 and indicators to monitor progress from 1990 levels. Several of these relate directly to health.

Health is at the heart of the Millennium Development Goals (MDGs) - recognition that health is central to the global agenda of reducing poverty as well as an important measure of human development (WHO, 2005). Three of the eight MDGs are directly health-related:

- reduce child mortality (goal 4)
- improve maternal health (goal 5)
- combat HIV and AIDS, malaria and other diseases (goal 6)

The other MDGs include health related targets and reflect many of the social, economic, environmental and gender-related determinants that have an impact on people's health. Achieving them will also contribute to improvements in the health status of thousands of millions of people around the world:

- eradicate extreme poverty and hunger (goal 1)
- improve education (goal 2)
- empower and educate women (goal 3)
- improve water and sanitation systems (a key component of goal 7)
- improve international partnerships (among other things to improve access to affordable, essential drugs on a sustainable basis – goal 8)

The eight MDGs do not work in isolation and therefore cannot be treated in isolation. Policy efforts and discussions need to consider the broader health determinants that impact upon people's lives (WHO, 2005).

The World Bank (2003) and SIDA (Greenberg, 2005) <sup>[4]</sup> are among the main development actors who have explored the connection between ICTs and efforts to reduce poverty and achieve the other MDGs. The main conclusion of all these studies is that ICTs, when incorporated effectively into development programmes can be useful tools in efforts to reach the MDGs.

### Challenges and contradictions

ICT for health (or e-health) programs are often considered to be expensive, time-consuming, risky and otherwise distracting from the primary focus.

Cost of accessing the internet, maintaining the equipment and buying new ones is also a challenge. In other cases costs of installing internet facilities and maintaining it is also a challenge for poor countries.

In addition to the costs and status of infrastructure, several hospitals fail to work together because of the incompatibility of equipment and software. Related to this is the presence and availability of experts in real time. In cases where consultations have to be made across continents, there is also the issue of time difference and presence of experts when they are required.

Most of the information available on the internet is in English or in languages not accessible to the wider segments of the population. For those who can access English, there is the challenge of understanding medical jargon used in most of these sites.

### Conclusion

Besides these challenges many of the examples demonstrates how information and communications technologies (ICTs) can play a critical role in improving health care for individuals and communities. by providing new and more efficient ways of accessing, communicating, and storing information. Through the development of databases and other applications, ICTs also provide the capacity to improve health system efficiencies and prevent medical errors.

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