TELEMEDICINE IN DEVELOPING COUNTRIES

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INTRODUCTION

- Telemedicine in developing countries is a tool of Global Health
- Global health is not just about health
  - There are critical relationships among health, healthcare, education, economic development, and business leadership and management
  - Developing countries (DCs) bear a disproportionate burden of poor health: malaria, respiratory infections, HIV/AIDS, diarrheal diseases, maternal mortality, and a host of other ailments that result in suffering and premature death.
...Introduction

- Many people in developing countries lack clean water or sanitation and reliable electric power. Consequently economic growth is often poor, along with an insufficiency in internal agriculture to feed their own people.
- There is clearly a relationship between health and economic progress, since when ill health cripples many people of working age, economic progress is slow.
- Underdevelopment also leads to poorer nutrition, lack of medical care, and poor public health.
- Poor people face disease and high mortality, but they often lack the vital tools (fertilizer, education, medicine, clean water, or basic credit) that can help them to overcome poverty.
Countries in the Developing World

Advanced Economies
In Transition
Less Developed
Least Developed
You might recall that IBM’s Watson supercomputer defeated the two top Jeopardy players in 2011. Watson has since been touted as the future of diagnostic medicine... replacing physicians (!??)

In the following, I will give you the answer, and you tell me what the question is.....
SOME APPLICATIONS OF TELEMEDICINE IN THE DEVELOPING WORLD
ANSWER: “COLLABORATIVE TRANS-NATIONAL RESEARCH AND ACTION THAT PROMOTES HEALTH FOR EVERYONE”
QUESTION: “WHAT IS GLOBAL HEALTH?”
Answer: “A communication technology that can be classified into two categories:
1) Transmission of information between healthcare providers and patients, or
2) Transmission of information among healthcare providers
QUESTION: “WHAT IS TELEMEDICINE (TM)?”
CONTRAINTS ON SUPPORT FOR REMOTE AND RURAL HEALTHCARE IN DEVELOPING COUNTRIES

- Shortage of qualified local healthcare providers, including specialists
- Patients with limited literacy
- Lack of public health education in disease prevention and/or management
- Clinics and hospitals poorly equipped
- Poor roads and transportation links to major urban centres
OBSTACLES TO IMPLEMENTING TELEMEDICINE

- Limited availability of wideband Internet and other network communication systems
- Unreliable electrical power
- Shortage of trained technical support personnel
- High costs of technology
- Limited access to specialists for remote consultations (in urban centres and other countries)
- Limited availability of local healthcare providers with technical training
- Lack of long range government commitment to sustainable telemedicine
- Differences in language spoken by remote healthcare providers and local patients
SAMPLE TELEMEDICINE APPLICATIONS IN DEVELOPING COUNTRIES
Answer: “A telecommunication technology that helps to automate telephone voice interactions”
**QUESTION:** “**WHAT IS INTERACTIVE VOICE RESPONSE (IVR)**”

- **Example TM Applications of IVR**
  - Data collection and monitoring field activities in public health (Peru 2006)
  - Chronic disease management of hypertension and diabetes (Honduras and Mexico 2011)

- **Benefits of IVR**
  - 24/7 availability of frequently needed telephone voice information to people making enquiries, for education of people on specific topics, or for entering response data online
Answer: “A technique for sending short text messages digitally over regular telephone lines”
**Question: What is SMS (Short Message Service) or Text Messaging?**

- **Example TM applications of SMS**
  - Education about and prevention of HIV infection (India, Kenya, South Africa)
  - Surveillance and tracking of malaria and malnutrition (Uganda, India)
  - Monitoring patients, and recording data for disease management (Tanzania, South Africa)
  - Compliance concerning taking medications for HIV/AIDS and TB (South Africa, Mexico)

- **Benefits of SMS**
  - Mobile phone service (used for SMS) is the most widely used communication service in the developing world
Answer: A technique for communicating messages between computers over a network
**QUESTION: WHAT IS E-MAIL?**

- **Example TM applications of e-mail**
  - Teleradiology and teledermatology (Botswana 2010)
  - International teleradiology for TB, obstetrics, and pediatric care (Liberia 2011)

- **Benefits of e-mail**
  - Sending relatively high resolution graphics/pictures by e-mail attachments for specialist diagnosis is inexpensive and effective. E-mail is a commonly available application, with worldwide reach on the Internet
ANSWER: INTERACTIONS AMONG PEOPLE IN WHICH THEY CREATE, SHARE, AND EXCHANGE INFORMATION AND IDEAS IN VIRTUAL COMMUNITIES AND NETWORKS
**Question: What is social media?**

- Example TM applications of social media
  - Disaster response and crisis maps through Twitter (Haiti 2011)

- Benefits of social media
  - A large percentage of the population carries mobile devices. These can be used to communicate with and organize groups of individuals in times of crisis.
ANSWER: A SYSTEM OF INTERLINKED HYPERTEXT DOCUMENTS ACCESSED VIA THE INTERNET
QUESTION: WHAT IS THE WORLD WIDE WEB?

- Example TM application on the Web
  - Online education and training (Peru 2011)

- Benefits of the Web
  - Once content is available online, it can be viewed by a large number of individuals through Internet access at any place and at any time. Online education and training can include interactions and automated feedback to improve the learning experience.
Answer: A mobile phone built on a specialized mobile operating system, with more advanced computing capability and connectivity than a standard cell phone.
**QUESTION: WHAT IS A SMART PHONE?**

- Example TM application of smart phones
  - Health self management (Democratic Republic of the Congo, Cambodia, and the Philippines 2013)

- Benefits of smart phones
  - Health self management involves education, training, interacting with care providers, monitoring and managing one’s own health. This can be managed with online personal health records that provide storage for monitored data, and functionalities that support smart phone applications. The potential is for less intervention by care providers, while at the same time improving one’s health and reducing costs.
Answer: The live exchange and mass articulation of information among several persons and machines remote from one another but linked by a telecommunications system.
QUESTION: WHAT IS TELECONFERENCING?

- Example TM application of Teleconferencing
  - Remote consultations among physicians for victims of stroke (India 2013)

- Benefits of Teleconferencing
  - This application allows two or more care providers to consult verbally with one or more stroke specialists in diagnosing and/or treating stroke victims. Obviously this can be applied in the diagnosis and treatment of many other medical issues, with a likely improvement in the quality of the outcome due to the assistance of specialists.
Answer: A live connection between people in separate locations for the purpose of communication, usually involving audio and often text as well as video.
**QUESTION: WHAT IS VIDEOCONFERENCING?**

- **Example TM applications of videoconferencing**
  - Education of medical students, nurses, and clinicians (Kosova 2009)
  - Educating trainees in radiation oncology (India 2011)
  - Remote consultation for diagnosis in disaster relief (Armenia 1988)

- **Benefits of videoconferencing**
  - Good quality videoconferencing can support remote education and training with live demonstrations, and remote consultation of specialists with one or more local healthcare providers and patients.
ANSWER: REMOTE VIDEO, VOICE, AND TEXT INTERACTIONS BETWEEN DOCTORS AND PATIENTS, INCLUDING PATIENT MEASURES BY SELF OR BY ACCOMPANYING STAFF TO DIAGNOSE PATIENT HEALTH STATUS AND TO TREAT HEALTH PROBLEMS
**Question: What is a remote video medical appointment?**

- Example TM applications of remote video medical appointments
  - Remote patient consultations with specialists (Sri Lanka 2010)
  - General practitioner’s remote appointment with a patient (Canada 2012) – a system designed and built by Ken Nwosu, a former MSc eHealth student at McMaster, specifically suited for environments in developing countries.
THANK YOU FOR YOUR INTEREST AND ATTENTION!

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