

Name of the committee: World Health Organization

Issue: Using ICTs to deliver high-quality, appropriate and accessible healthcare in low-resource and remote areas

Name of the chairs: WANJIRU MUIGAI Hanna, COURT Rémy

Unprecedented challenges require unique solutions: this is the reasoning behind the overall theme of FerMUN 2020, "ICTs for SDGs." Information and Communication Technologies (ICT) have the potential to accelerate progress towards every one of the Sustainable Development Goals (SDGs), and the role of the International Telecommunication Union (ITU) is to maximize this potential. FerMUN 2020 is a chance for young people from across the world to come together in support of this mission.

Using ICTs to deliver high-quality, appropriate and accessible healthcare in low-resource and remote areas

1. Introduction

Low resource areas are demographic areas with limited resources and identifiable challenges, whereas remote areas are localities that are far from urban areas or are not connected to the global community.

Developing and sustaining ICT in the last few decades has become essential in a world in which economic and social activity has been widened, deepened, and transformed. Basically, a more networked world provides a more widespread and rapid growth of employment, quality care, productivity, output, and overall economic growth. There has been a dynamic increase in computing power ensured by the emergence and rapid evolution of microprocessor technology.

Another major issue entails deploying systems in low-income areas. Primarily, it is difficult to guarantee the use of ICT systems in low resource areas despite the tremendous benefits of these systems (Papali, 2016). This is the single greatest challenge in designing a computing infrastructure for rural health informatics. Also, inadequacy or lack of qualified technical support teams presents a problem in such demographics (Rwashana and Williams, 2008). Lack of consistent and affordable electricity affect the vast majority of rural-based health centers. Where power is available, it is mainly unreliable and unstable. Extending power gross to such demographics may take decades based on the number of human resources, and revenue needed. With such issues, providing free and effective healthcare remains adamant.

2. Overview

a. Potentials and constraints

ICT has various possibilities in low resource areas. For instance, ICT can be used in rural and small resource areas to provide a wide variety of services varying from improved public health education to emergency advice. Besides, ICT can be effectively used to mitigate the consequences of natural disasters (Panel, 2002). It also increases the transparency and efficiency of revenue usage, which, in turn, enhances quality care. The potentials of ICT are primarily dependent on the health system, the service providers, availability of resources, and the accessibility by beneficiaries. Telemedicine is a more promising advancement in medical technology which offers an opportunity for healthcare providers to offer their services despite the locality of the patient. However, this field remains nascent and may take decades to become practical fully.

The significant constraints involve access to higher bandwidth that is required for transmitting physiological data and complex medical images in regards to telemedicine (Rwashana & Williams, 2008). Besides, such computer systems are costly and may require specialized technical support team. In some remote areas, use and access to telephone-line-based are limited, and broadband access may be unavailable. Such services may not be available or are way too expensive to provide services to the critical mass necessary for making an impact (Papali, 2016). On the other hand, lack of infrastructure in remote areas restricts usage and access to ICT. These constraints continue to extend the technological gap between developed and developing countries, further creating a divide between populations.

The USA is one of the most advanced countries in terms of technology globally. The country has heavily invested in Electronic health records and other ICT related systems in healthcare (Ghosh & Chandrasekhar, n.d). However, despite this advancement, the cost of healthcare and healthcare output in the country is largely unproportioned. There is still a need to enhance healthcare in remote areas in the US and other countries. India, for example, may need to enhance on potentials of ICT in order to alleviate the constraints. About 30% of the country's population is unable to access quality healthcare based on demographic locations.

b. Past solutions

The cost of technology usage and access has reduced tremendously for the last three decades. Computing power had fallen from 760 US dollars in 1970 to 17 cents in 1999. This aspect has led to a decrease in the price of personal computers and other computer software's. Also, countries have invested in developing infrastructure and global connectivity in order to improve health services. Other countries have significantly invested in the use of EHR, and cloud services to enhance technology use in hospitals.

These issues can be mitigated by investing more on the acquisition of low power consuming software and hardwares. Also, hospitals can make use of cloud internet providers to fully implement the usage of Electronic health records (Panel, 2002). This implies, however the

need to install computer software's or to hire ICT personnel. Enhancing education and computer literacy can help mitigate the issues relating to a lack of qualified ICT personnel (Blantz, 2010). However, this may necessitate substantial investment in the education sector, including offering incentives and tuition remedies. Such an endeavor will lay a more significant burden to the government, especially in low-income areas. Is it worth it? Yes, investing in education primarily impacts on economic development positively. Widespread poverty may limit access and awareness on the available ICT services. According to Rwashana and Williams (2008), the governments and global society should take necessary measures to alleviate poverty, and enhance knowledge on available technologies in healthcare. The physical environment in most rural and remote is characterized by heat, dust, and humidity, each of which is a challenge for standard computer hardware. This aspect must be mitigated in order to realize the benefits of using ICT in health facilities in such areas.

c. Impact on the economy

Underlying economic advancement, engineering innovation and outcomes in the healthcare is creativity and innovation in the ICT sector. Primarily, ICT has tremendous economic importance in developing countries in terms of healthcare. For instance, with ICT there is improved dissemination of public health information and facilitated public discourse and dialogue around major public health threats. This form of accuracy and publicity of information ensures countries do not misuse public resources, or present false data on health status. Moreover, ICT promotes research and effective health research and the dissemination and access to research finding. However this aspect can be expensive for developing countries due to lack of research specialists, scientific equipments and revenue to set up research centers.

With ICT there is improved the efficiency of administrative systems in health care facilities. Country's revenue is thus used carefully minimizing costs while maximizing health outcomes. This aspect also has strengthened the ability to monitor the incidence of public health threats and respond in a more timely and effective manner. 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.

ICT offers indirect importance to the economy. For instance, with quality care, populations are able to develop country's economy. Based on common knowledge notion, healthy populations can work productively to achieve national and international goals. There is a need therefore to invest on ICT.

Overall, ICT has numerous impacts on country's economy. Arguably, all economic importance inclines on achieving economic growth and eliminating wastes of revenue. With ICT countries can save on revenue for use in other development projects and provision of basic necessities. However, ICT use, implementation and setting up presents a challenge in developing countries. This can be attributed to the high cost of e-medicine equipments.

3. Cases Studies

a. Providing healthcare in rural and remote areas: lessons from the international space station

The international space station typically circumnavigates the globe every 90 minutes, 400 km above the earth's surface and at a speed of 27 600 km per hour. The international space station is one of the most advanced technologies presenting an isolated dynamic technological hub. However, its location ironically gives it something in common with rural areas in low- and middle-income countries here on earth. There is a dire need for medical care and basic emergency.

In cases of emergency, it is impossible for a space station to glide back to earth for medical attention. Also, it may not be possible for many astronauts to accompany the ailing colleague back to earth. In this case, a one Soyuz spacecraft is usually docked for evacuation and may take up to 24 hours to land on earth. This feature presents a challenge, especially in critical medical situations. This is the same situation for persons in remote areas. However, the United States' National Aeronautics and Space Administration (NASA) have devised ways to mitigate the issue by using onboard ultrasound and Earth-based telemedicine consultation. In addition, NASA offers about 60 hours of medical training to crew members which are similar to average paramedics in the USA (Blantz, 2010). The training is crucial in cases of emergencies and seeks to prevent death while impacting basic medical knowledge to astronauts.

In this context, task shifting could help mitigate challenges facing healthcare provision in remote areas. Cadres of healthcare workers are trained to provide medical care traditionally provided by doctors. Primarily, task-shifting has melodramatically expanded human resources in areas with a chronic shortage of healthcare workers (Pimmer et al., 2013). Audiovisual technology in telemedicine entails the use of both technology and people when offering medical services. This aspect has been applied in space stations effectively and can be replicated in rural and remote areas. However, task-shifting requires people, training, and cooperation between all levels of the health system. Costs, training needs, theft, and unreliable power sources limit the ubiquitous use of point-of-care ultrasound. This necessitates the need for willing participation of innumerable individuals, institutions, medical professional societies, non-governmental organizations, and governments.

b. Concrete applications

The following case studies were retrieved from: <http://www.healthconnect-intl.org/ictforh.html>. In each, de Quadros & Epstein (2002) aims to exhibit importance of ICT on a day to day life in various counties.

"Physician in a remote rural hospital is initially unable to diagnose a patient with a complex array of symptoms. However, using his MEDLINE search training and the hospital's Internet

connection, he is able to diagnose and successfully treat the patient for a tropical disease the patient picked up while traveling abroad”

“Another physician looks at her hospital’s prescription trends using the newly created electronic health record system and finds that other physicians are not using the post-surgical antibiotic that is shown to be most effective according to the current international guidelines. She speaks to the administration about advocating a switch in antibiotics that will improve patient recovery outcomes and thereby save the hospital money”

“A neonatologist, who transmits CT-scans and other medical images by e-mail to his network of personal contacts around the world to help in diagnosing and treating premature newborns, estimates that teleconsultations have helped him to save numerous lives during the past year.”

“A young woman, too embarrassed to ask her physician about reproductive health issues and the risks of sexually transmitted infections, anonymously contacts physicians at a woman’s health clinic, where they’ve set up e-mail accounts for staff in order to support these types of physician-patient interactions”

4. Bibliographie

- Papali, A. (2016). Providing health care in rural and remote areas: lessons from the international space station. Bulletin of the World Health Organization, 94(1), 73. Retrieved from; <https://www.who.int/bulletin/volumes/94/1/15-162628/en/>
- Eric Blantz. July 12, 2010. *4 Key Challenges and Solutions to ICT Deployments for Rural Healthcare*. Retrieved from; <https://www.ictworks.org/4-key-challenges-and-solutions-ict-deployments-rural-health-care/>
- Rwashana, A., & Williams, D. (2008). Enhancing healthcare delivery through ICTs: A case study of the Ugandan immunisation system. International Journal of Education and Development using ICT, 4(2). Retrieved from; <https://pdfs.semanticscholar.org/99f6/d67b3e01128e75e7f45899929bcbo92bo4c1.pdf>
- Ghosh, V. J., & Chandrasekhar, C. P. This paper outlines the potential offered by technological progress in the information and communication technologies (ICTs) industries for the health sector in developing countries, presents some examples of positive experiences in India, and considers the difficulties in achieving this potential. The development of ICTs can bring about improvements in health in developing countries in at. Retrieved from: <https://www.medicusmundi.ch/de/bulletin/mms-bulletin/informations-und-kommunikationstechnologien/ict-and-health-development-potential-and-constraints/the-potential-and-the-constraints-in-low-income-countries>
- Pimmer, C., Linxen, S., Gröhbiel, U., Jha, A. K., & Burg, G. (2013). Mobile learning in resource-constrained environments: a case study of medical education. Medical teacher, 35(5), e1157-e1165.
- Panel, I. L. (2002). Digital transformation: A framework for ICT literacy. Educational Testing Service. Retrieved from:

<https://www.semanticscholar.org/paper/A-research-and-development-on-curriculum-framework>

- de Quadros, C. A., & Epstein, D. (2002). Health as a bridge for peace: PAHO's experience. *The Lancet*, 360, s25-s26. <http://www.healthconnect-intl.org/ictforh.html>.