



ICT AND HEALTH

ICT utilization has had a profound impact on health care within developing countries. It enables health care workers perform remote consultation and diagnosis, access medical information and coordinate research activities more effectively than ever before. ICT also provides an effective and cost-efficient channel for the distribution of health and disease prevention information to the general public.

Providing Remote Health Care Services

Today, health care workers can provide remote consultation, diagnosis and treatment, and collaborate with colleagues without traveling long, costly distances. In Gambia, for instance, health care workers use digital cameras and computers to send images of a patient's symptoms to physicians in nearby towns or overseas for diagnosis. ICT has played a pivotal role in controlling Onchocerciasis (river blindness) in West Africa. Local inhabitants use computers and satellite radio to transmit data collected by sensors along 50,000 km of rivers to entomologists who then calculate the optimum time to spray against the disease-carrying blackfly. Today, river blindness has been eradicated in seven countries, enabling 30 million rural inhabitants to live free of the disease (Kenny, Navas-Sabater and Qiang 2002).

Storing and Disseminating Health Care Information

Greater access to medical information not only helps the public understand general health issues, but ICT can also be used for disease prevention. By transmitting health messages via radio and television, the public can be educated on how to take preemptive actions to prevent or curb the spread of disease. Health care facilities utilize computers to lower costs and improve service by expediting administrative processes such as storing patient records and procuring medical supplies.

Research and Training for Health Care Workers

ICT allows health care workers in developing countries to access the latest medical research. It also provides a way to further their training through online educational programs. A significant percentage of health care workers in Uganda (54 percent) and Kenya (20 percent/ year) have participated in radio training courses that lead to improved health care services (Kenny 2003). Physicians in Bangladesh use the Internet to access online medical journals for a mere US\$1.50 per month, while physicians in Africa use the Internet to track meningitis outbreaks to curb its spread (The Economist 2001).

ICT's Role in Achieving Health-related MDGs

ICT is an invaluable tool for health care workers and for the international development community in their combined effort to address three of the MDGs directly related to the health sector: (#4) reducing child mortality; (#5) improving maternal health; and (#6) combating HIV/AIDS, malaria and other diseases.

MDG#4. Reducing Child Mortality

Prior to the 1990s, child mortality rates had been steadily declining but during the last decade, progress has slowed considerably. In fact, in some parts of Africa, child mortality rates increased. As of 2000, nine percent of children born worldwide would not live to see their fifth birthday according to the United Nations Development Program (UNDP 2001). The World Health Organization estimates that disease or a combination of disease and malnutrition is responsible for 70 percent of these deaths (World Bank 2002a). These deaths are avoidable and ICT can help. Measles and other "diseases of childhood" are readily preventable through vaccination. The mortality due to diarrhea can be reduced with oral rehydration

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therapy, and vaccines exist to prevent some diarrheal diseases. Some acute respiratory infections can be cured with antibiotics, others can be prevented using vaccines, and the mortality from viral respiratory infections can be reduced with appropriate medical care. Health care workers can use ICT to establish databases to track vaccination programs, to coordinate antibiotic shipments and to inform communities of medical services, which can help to reduce child mortality.

The Tygerberg Children's Hospital of Cape Town, South Africa implemented a tele-medicine system in 1999 with funding from the local Rotary Club. The system uses affordable, off-the-shelf computer equipment and software—a hard drive, scanner, and digital camera—to enable rural hospitals scan and send x-rays and blood-test results to Tygerberg. A Tygerberg health care worker reviews the data, forwards it to the appropriate diagnostic specialist and the specialist then emails treatment recommendations to the rural hospital. This system not only provides rural children with life-saving medical care but saves families costly transportation fees. Sending a child to Tygerberg would cost a farm worker the equivalent of one-week's salary (bridges.org 2003a).

MDG #5. Improve Maternal Health

In 1995, more than 500,000 women died from complications during pregnancy and childbirth, which in most cases are preventable or at least, treatable. Developing countries are particularly susceptible to these complications, as maternal death is the leading cause of death for women of reproductive age (World Bank 2002a). The World Bank Group's World Development Report 2002 noted that empirical studies found a woman's access to the media is associated with better health and fertility outcomes.¹⁰ ICT can also help providers in their efforts to make maternal health care services more efficient and effective. Therefore, ICT can play a critical role in reducing the incidence of maternal death numbers by facilitating access to information and to health care services.

In 1996, the Ugandan Ministry of Health, UNFPA and the Uganda Population Secretariat initiated the Rural Extended Services and Care for Ultimate Emergency Relief (RESCUER) project to reduce a mortality rate estimated at 506 per 100,000. The project was designed to improve maternal health by connecting traditional rural community health providers with a cost-effective formal health delivery system. Due to the scarcity of electric power in most rural areas and the lack of fixed telephone lines, Ugandan officials decided to employ very high frequency (VHF) radio technology that operated on fixed base stations, mobile walkie-talkies and vehicle radios. In 1999, three years after the project was implemented, a study sample of the Iganga district concluded that the maternal mortality rate had decreased by nearly 50 percent (World Bank 2002b).

MDG #6. Combat HIV/AIDS, Malaria and Other Diseases

Infectious diseases cause tremendous suffering, leave children orphans, stifle economic productivity and burden health care systems around the world. ICT offers new opportunities to effectively combat these diseases.

For instance, Cape Town, South Africa, has one of the highest rates of tuberculosis (TB) worldwide. In order to treat and contain TB, patients must adhere to a strict treatment of four tablets, five times a week, for six months. The treatment too often fails because patients forget to take their medication. In 2002, South Africans tried a different approach that led to tremendous success. They used mobile phones, Short Messaging Service (SMS) technology and a pilot computer database. Every half-hour, the database scans a list of patients and sends a SMS text message to those patients needing to take their medication. Of the 138 patients participating in the pilot, only one treatment failure occurred (bridges.org 2003b).

¹⁰ Differences in income and education levels were taken into consideration and the association held true.



ICT and Health:

Selected World Bank Funded Projects

infoDev

Voxiva: A Voice Portal for Health

Peru, 2001 – Present

US\$700,000

(infoDev contributed US\$250,000)

Voxiva is an international organization established in 2001 to provide voice and data solutions for the public health sector. Through the creation of a shared application platform, ALERTA, Voxiva enables both the collection of data from health care workers on the ground and the interaction between health care workers across countries. This project targets 76 health care facilities and 204 users among doctors, nurses, technicians and other health care personnel in two geographic zones south of Lima. These zones comprise over 200,000 inhabitants and 49 districts. Peru was chosen to pilot this system due to the recent expansion of its telecommunications infrastructure.

6,000 health centers across Peru are currently required to report on outbreaks of certain types of diseases (e.g. cholera, dengue, malaria, polio) to enable the Ministry of Health to take remedial action. However, prior to Voxiva, the reporting system was entirely paper-based and it could take up to three weeks before the information was received at the Ministry of Health, by which point the disease would have increased and maybe spread to many other parts of the country. Beyond the challenge of reporting disease, the health care system faced the problem of providing feedback to remote health care workers. More than 90% of users reported receiving health alerts “never”, “rarely” or “less than once a month”.

To help tackle these problems, Voxiva started work in Peru in March 2002 with the objective to improve the speed and reach of communications between health care professionals

and organizations. Currently 76 health care facilities have been connected to the network and have been able to submit 4,269 reports and 28,296 cases electronically. Designated health care authorities now receive immediate notifications of suspected cholera, Bartonellosis (a vector borne disease of the Andean region), other diseases, and local disasters. Thus, health care officials have been able to learn about new cases and to respond in a matter of hours and days instead of weeks.

IFC

Salutia, Argentina and Brazil Health Care Sector

2001 – 2004

US\$12.5 million

(IFC contributed US\$2.5 million)

Established in 1999, Salutia is a privately held health care connectivity company focused primarily on payer/provider transactions in Brazil and more recently, in Argentina. The company is starting a proprietary, multichannel, Internet-centric transaction platform –Health24TM– to efficiently and securely process transactions and exchange information among health care payers and providers and eventually among patients and suppliers. Salutia’s core clients are health care payers who determine initial care eligibility and authorization.

E-health connectivity companies offer tremendous promise in Latin America and worldwide. Through connectivity, administrative inefficiencies are reduced and the distribution of clinical information is improved. Salutia has the potential to not only reduce health care administrative waste, but also improve the quality of care by giving health care professionals more complete, accurate data at the point of care. This project demonstrates that health care connectivity, enabled by ICT, can play a significant role in improving health care services.

infoDev

The Child Health Care Telemedicine Network, Russia

1999 – 2002

US\$3.75 million

(infoDev contributed US\$250,000)

In St. Petersburg, the oncology unit of First Municipal Children's Hospital is the center for the treatment of leukemia for the northwest region of the Russian Federation. Prior to installing computers and Internet access, hospital physicians were isolated from the medical community outside St. Petersburg. By using ICT, a network was formed that links the St. Petersburg hospital to the Georgetown University Children's Medical Center and the Lombardi Cancer Center in Washington, DC, providing access to educational and consultative resources.

The network consists of desktop computers, a server, Internet access, an electronic microscope with monitor and digital imaging equipment enabling physicians to conduct medical consultations via email by transmitting digitized images. The success of this low-tech, user-friendly and cost-efficient network quickly led to an expansion of its geographic reach to include additional medical facilities in the Russia Federation and new connections in Europe.

Today, physicians in St. Petersburg consult with their counterparts in Moscow and in the West on a daily basis. Examples of international medical consultations between Russian physicians and United States, United Kingdom and German cancer specialists have opened new lines of communication across great distances and cultural barriers. The result is improved care for pediatric patients. In the case of a 16-year-old boy with Acute Lymphocytic Leukemia, a consultation with a specialist in the UK spared the boy painful and dangerous blood transfusions (Amoss 2002).