

The information and communication technology (ICT) revolution imposes particular challenges to health systems. These challenges can be divided into two broad areas. The first has to do with participation in the information society; the second considers how ICT impacts on access, cost effectiveness and quality of information.

The context of these challenges is that of globalisation and polarisation, in a world of increasing disparities between the rich and poor and within nations. The notion of the so-called “digital divide” is therefore an appropriate warning that the ICT is neutral. This term was first coined in the USA rather than in some impoverished less-developed country. The digital divide does not only have to do with who has a PC linked to the internet or who has a cellular phone, it is about how the digital technologies are a core feature of innovation and competitiveness. The World Development Report of 1999, notes, “Knowledge is like light, weightless and intangible; it can easily travel the world, enlightening the lives of people everywhere. Yet billions of people still live in the darkness of poverty, unnecessarily”. There are disparities in all countries, what is different about the disparities in South Africa is that they were legislated into practice for the purpose of racial dominion. Therefore, we have to overcome one divide, while a new one looms. The scale of disparities in basic social services remains daunting, and is exacerbated by the growing impact of the HIV/AIDS pandemic.

Bringing ICT connectivity to our health sector has to happen. This task needs to occur alongside the provision of basic health information infrastructure, which is the responsibility of the government. However, extensive provision of ICT is beyond the financial resources of the government alone. The partnership with donors and the private sector will therefore be a critical success factor.

According to the Millennium Declaration made by the World Summit on Information Society (WSIS) in Geneva 2003, our challenge is to harness the potential ICT to promote the development goals. These are the eradication of extreme poverty and hunger; achievement of universal primary education; promotion of gender equality and empowerment of women; reduction of child mortality; improvement of maternal health; and to combat HIV/AIDS, malaria and other diseases.

WHAT IS eHEALTH?

eHealth may be described as the combined use of electronic communication and information technology for the health sector. eHealth can be considered to be the health industry’s equivalent of e-commerce.

Because the Internet created new opportunities and challenges to the traditional health-care information technology industry, the use of a new term to address these issues seemed appropriate. These “new” challenges for the health-care information technology industry were mainly:

1. The capability of consumers to interact with their systems online (B2C = “business to consumer”)
2. Improved possibilities for institution-to-institution transmissions of data

(B2B = “business to business”)

3. New possibilities for peer-to-peer communication of consumers (C2C = “consumer to consumer”).

How can we define eHealth in the health sector? The assumption is that the definition cannot be pinned down, as it is a dynamic environment, constantly moving. It seems quite clear that eHealth encompasses more than a mere technological development. The commonly accepted definition of this term and concept is, ‘eHealth is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies.

In a broader sense, the term characterises not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology.’

This definition hopefully is broad enough to apply to a dynamic environment, such as the Internet and at the same time acknowledges that eHealth encompasses more than just “Internet and Medicine”.

On the other hand Telemedicine or Telehealth is defined as, “*The use of communications and information technology to deliver health services and exchange health information when distance separates the participants.*” (Elford, 1998)

Telemedicine, Telehealth and eHealth are all operational terms that describe some or all of the following activities: Health information exchange, education, consultations, medical practice, health promotion and health commerce through the use of ICTs.

Essentially, they would not exist without economical, effective, user-friendly ICT and their infrastructures.

eHEALTH DEFINED IN THE SOUTH AFRICAN CONTEXT

Combined utilisation of electronic communication and information technology to generate, capture, transmit, store and retrieve digital data for clinical, educational and administrative purposes. The purpose of e-health is to contribute to improve the health status of the people of South Africa through optimal use of ICT. This would include e-systems in the areas of:

- The delivery of health care;
- The surveillance of diseases and services;
- Health emergencies and hazards
- The management of health care institutions;
- Access to repositories of knowledge, applications and literature;
- The education of the public and formal education of health service professionals; and
- Research.

In May 2005, the 58th World Health Assembly, after having considered the potential impact that advances in ICT could have on health-care delivery, public health, research and health-related activities for the benefit of both the low- and high-income countries; adopted eHealth. The World Health Assembly went further to urge member states to consider a number of areas critical for eHealth implementation. These areas include the following; long-term strategies, infrastructure development, collaboration with private and non-profit sectors, reaching of vulnerable groups, multisectoral collaboration, establishment of national centres of excellence, as well as the establishment and implementation of public health information systems.

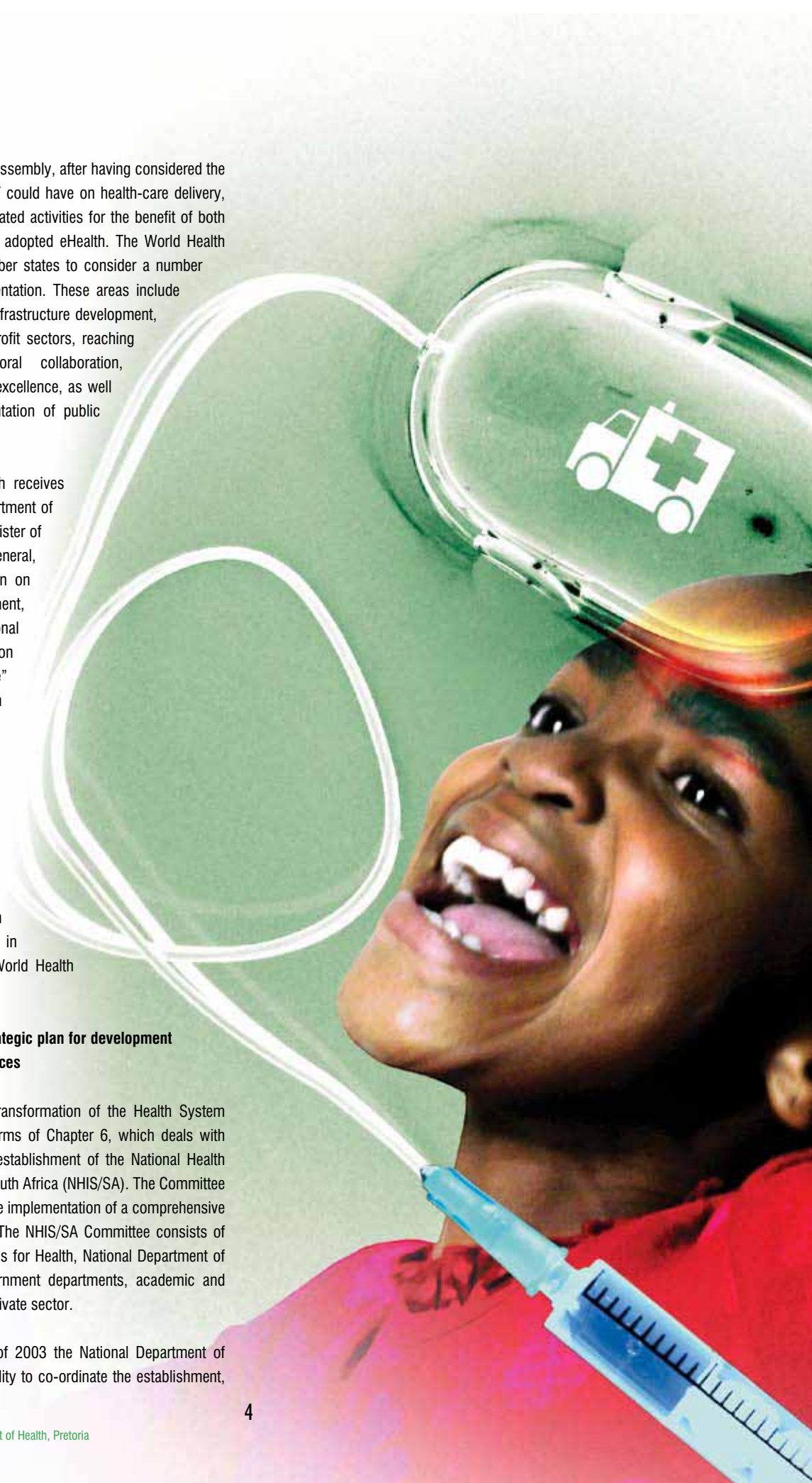
In eHealth the Department of Health receives support and guidance from the Department of Communications under the of the Minister of Communications and the Director General, the Presidential National Commission on Information Society and Development, as well as the Presidential International Advisory Council on the Information Society. The concept of an “inclusive” Information Society is included in the broad policy context of eHealth in South Africa to leverage these technologies in reducing the equity gap or the digital divide between our ‘first and second economies’.

The discussion below seeks to present the South African context of eHealth in terms of what has been achieved and the strategic vision in consideration to the seven critical World Health Assembly areas on eHealth adoption.

1. Consideration for a long-term strategic plan for development and implementation of eHealth services

In 1997, the White Paper on the Transformation of the Health System in South Africa was published. In terms of Chapter 6, which deals with Health Information, it proposed the establishment of the National Health Information Systems Committee of South Africa (NHIS/SA). The Committee developed the National Strategy for the implementation of a comprehensive National Health Information system. The NHIS/SA Committee consists of representatives of the Provincial MECs for Health, National Department of Health (NDOH), other relevant government departments, academic and research institutions, as well as the private sector.

In terms of the Health Act No. 61 of 2003 the National Department of Health is charged with the responsibility to co-ordinate the establishment,



implementation and maintenance by provincial departments, district health councils, municipalities and the private sector of health information systems of the national, provincial and local levels in order to create a comprehensive health information system.

2. Development of the infrastructure for information and communication technologies for health as deemed appropriate to promote equitable, affordable and universal access

The NDOH has adopted a Telemedicine strategy for the use of ICT for the provision of health-care services. A National Telemedicine Strategy for South Africa was established in 1998. Implementation was conducted in phases, with the first phase, starting in 1999 with the establishment of 28 pilot sites in six provinces. The initial applications were Tele-Radiology, Tele-Ultrasound for antenatal services, Tele-Pathology and Tele-Ophthalmology. ISDN lines were used to network the Telemedicine sites. There are currently 68 Telemedicine sites in South Africa.

One of South Africa's health-care challenges is the drain of medical doctors from the less-developed rural communities to the more developed urban areas. It is difficult to attract and retain doctors in rural communities because of professional isolation from their peers, lack of continued medical opportunities, low patient volume and loss of continuity when patients are referred to hospitals in larger urban centres. The recruitment and retention of rural medical doctors forms part of South African Telemedicine system's main deliverables. Through telemedicine technology, the medical doctors in underdeveloped communities find their practice less isolating because the system facilitates frequent contact with distant colleagues in more developed centres and who share their interests.

At the moment the South African Telemedicine System provides academic professionals from major South African Medical Academic Institutions to extend their educational capabilities to health-care professionals throughout the rural communities without having to provide facilities and teachers in every rural location.

The academic institutions provide clinical practical training to community service doctors and help them obtain Continued Medical Practice (CPD) credits. National South African Clinical Grand Rounds are conducted regularly for sharing of information and decision-making regarding diagnosis and management of specific complex clinical cases. By attracting primary health-care providers to rural areas of the country, the telemedicine system has reinforced the policy of promoting primary health-care delivery to underserved communities.

The initial Telemedicine Evaluation done by the Medical Research Council, found that access to specialist radiologist reporting was possible within an hour, compared to five to seven days. Telemedicine improved medical ability to diagnose and manage various medical conditions; particularly those related to trauma and chest diseases and reduced professional isolation. Concerning closed head injury referrals between Witbank and Pretoria

Academic Hospitals, there was an average of ten referrals per month in 2001 compared with an average of 48 per month in the absence of Telemedicine. This provided evidence of the cost-effectiveness of technology.

As part of the work of the South African National Telemedicine System, a Telemedicine Research Test-bed was set up between Tonga Hospital and three clinics in Mpumalanga for clinical research and the development and evaluation of new and appropriate Telemedicine technologies. Preliminary results showed that as the use of Telemedicine increased, the number of referrals dropped.

The study that was conducted on cost-benefit analysis of the South African Telemedicine System revealed the following:

- Most consultations were achieved through effective E-mail and telephone lines. Full Telemedicine real time interactive system was only used for complex cases.
- Telemedicine very significantly reduced the need for patients to travel from South African rural communities to urban tertiary facilities. This in turn reduced travelling and accommodation costs.
- Additional savings were realised from keeping a patient in a local remote and less expensive facility rather than larger and more expensive tertiary hospitals.
- The South African countryside also derived further economic benefits by retaining medical professionals in the remote rural communities and by utilising local health facilities for various diagnostic studies and procedures.
- Timely diagnosis and treatment provided through Telemedicine also contributed to health promotion strategies, disease prevention and reduction of medical complications. These measures further contributed to the reduction of health-care delivery costs in the country.
- Telemedicine had the medical specialists imparting knowledge to the remote doctors, thereby indirectly giving training to those doctors on various medical conditions.

3. Building on closer collaboration with the private and non-profit sectors of information and communication technologies, to improve public health services

The NDOH recognises the value of collaboration between the public, non-governmental organisations (NGOs) and private sector for the implementation of eHealth projects. The establishment of a Closed Health Broadcast Channel (CHBC) is an example of the kind of benefits that has been achieved through such collaborations.

The Department together with SENTECH signed a Memorandum of Understanding for the development of a Closed Health Broadcast Channel in 1999. The objectives of establishing the CHBC were to address the need for access to health education, training and professional development by health-care professionals, as well as the provision of health education to communities and patients when they visit clinics and hospitals. The satellite television communication channel is the most effective way of distributing video content to a large number of health-care facilities that are geographically

distributed across the country reaching the target audience without the delay of time barriers created by distance. It is also an effective way of addressing the immediate and future health education needs of the general public and further developing the skills and knowledge of health-care professionals.

The project was first piloted in 30 sites which received broadcasting in June 2002. In 2003, Mindset Network, an NGO involved in multimedia education, joined the collaboration. The CHBC currently provides electronic content focusing on HIV/AIDS, STIs and TB. The project has since expanded to 110, with broadcasting capability in digital video broadcast, Internet Protocol with on demand content access in five languages, as well as multimedia content.

In August 2004, the project received a Standard Bank/CPSI award for the best Public Private Partnership in service delivery. Expansion of the Health Channel to 79 new sites is underway.

4. Endeavour to reach communities, including vulnerable groups, with eHealth services appropriate to their needs

The South African National Telemedicine System focuses on supporting primary health-care services, particularly for women and children in the rural areas of South African. This modern technology is used for health promotion and prevention programmes as mentioned with the CHBC. Provide early diagnosis and intervention as well as management of various diseases affecting women, children and other residents in the rural areas.

Physicians and specialists at major South African Medical centres supervise routine pre-natal care and sonogram examinations of rural women by midwives and other rural health-care providers, thereby reducing perinatal and neonatal mortality rates.

Internal medicine specialists are using high-resolution cameras to study skin and mucousal lesions and to assist with the diagnosis, management and control of various sexually transmitted diseases and infectious diseases.

Ophthalmologists from tertiary centres are examining eyes and retinas of patients in remote rural areas. Specialists are supervising ear, nose and throat examinations with laryngoscopes and otoscopes.

Radiologists from major centres are able to receive and interpret diagnostic radiographic studies from the remote areas, without moving from one area to another. They are able to provide immediate diagnosis to trauma victims and other patients requiring emergency medical attention in remote areas.

Pathologists from academic medical centres are examining pap smears, blood smears, bone marrow and other tissue smears and hence facilitate early diagnosis and intervention, while diseases are still at a preventable or curable stage.

5. Mobilisation of multisectoral collaboration to determine evidence-based eHealth standards and norms, evaluation of activities, sharing of the knowledge

of cost-effective models, and ensuring quality, safety and ethical standards

South Africa is a member of Health Informatics Africa (HELINA) and has been actively involved in the organisation of conferences within SADC. We hosted the 2003 HELINA conference in South Africa and will support the 2006 HELINA Conference in Arusha, Tanzania.

6. Establishment of national centres and networks of excellence for eHealth best practice, policy coordination, technical support for health care delivery, service improvement, information to citizens, capacity building and surveillance

The Presidential National Commission on ISAD (PNC) has identified eHealth as a priority focus area for ICT implementation. An eHealth Unit has been established within the PNC to strengthen the coordination of eHealth in the country.

7. Consideration for establishment and implementation of national public health information systems and the improvement through information, the capacity for surveillance of, and rapid response to disease and public health emergencies

As in most countries worldwide, South Africa has a routine notification system for reporting specific infectious diseases. The primary purposes of the reporting system are disease control, prevention and the monitoring of disease trends. Some of the most critical challenges facing many surveillance systems and thus hindering rapid response include under, late, and incomplete reporting of information.

In recognition of these challenges, the NDOH is in the process of implementing an electronic web-based notification system, which will replace the current EPI-INFO 6 system.

This web-based system allows rapid reporting of conditions such as cholera, haemorrhagic fevers, measles, etc. Further, a cellular phone link will be automated to send a short message service (sms) to a group of selected users at national and provincial level to inform and hopefully elicit their speedy response.

South Africa has begun the systematic implementation of information systems to support national public health needs. The challenge remains to continue improving the capacity of health workers to use these systems.

CONCLUSION

ICTs appear to hold the key to meeting some of the challenges that face health-care, especially in the developing countries. The challenges are however considerable but achievable. They include the technological, socio-economic and political issues. Facilitating access is crucial, as well as ensuring that those with access are able to derive the greatest benefit from it.