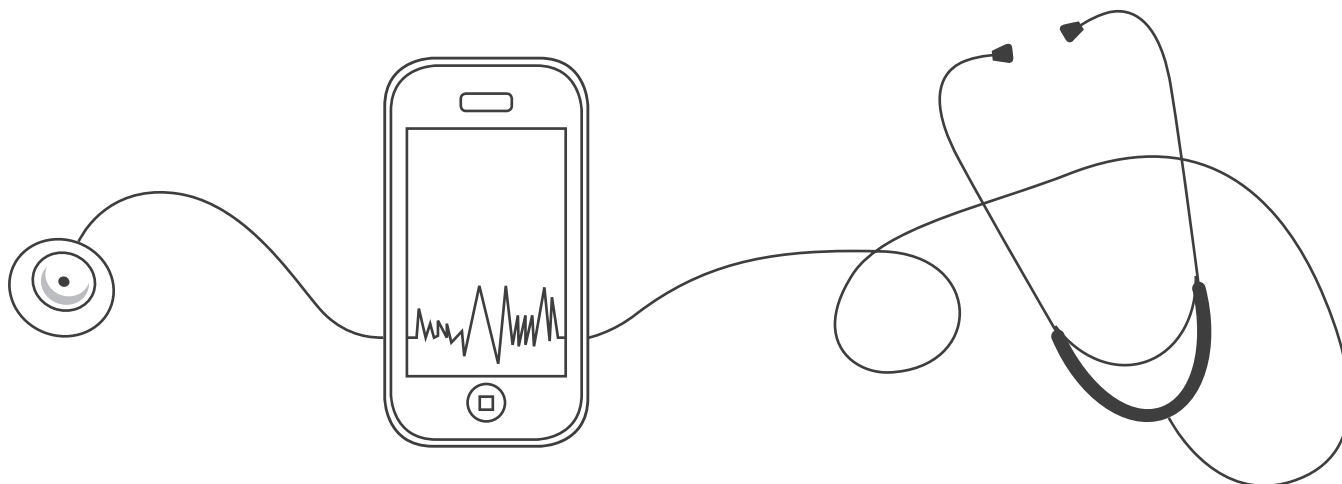# Telemedicine can lower health care costs in Africa

Prof Maurice Mars and Dr Louwrence Erasmus

Worldwide, the inflation of health care costs continues with no end in sight. Internationally, telemedicine is used to keep the ageing population out of hospitals and emergency rooms. This could be the answer to Africa's health care woes.

Telemedicine is usually defined as the provision of health care over a distance using information and communication technology (ICT), and includes the provision of health education over a distance. People's health can be monitored in their homes by devices that send information back to a central site by telephone or through the internet. Telemedicine can also be conducted by live interactive video-conferencing, with the patient seeing the doctor face to face, over a distance, with special devices used to assist clinical examination.

Another form is store-and-forward telemedicine, where a photograph is taken of a skin lesion, for example, and attached to an email containing the relevant history, clinical findings and results of special investigations, and sent by a doctor or nurse to another doctor or specialist for diagnosis or a second opinion. Most people have unknowingly practised telemedicine when either seeking or giving medical advice over the telephone.

The health problems of Africa are different from those of the developed world or old economies. Africa carries 24% of the world's burden of disease, and is served by only 3% of the world's health workers, who have access to 1% of global health expenditure. Its population continues to grow rapidly and is expected to nearly double by 2050.

Telemedicine holds great promise for Africa. It can provide rural health care in the most remote areas. All that is needed is a satellite or cellular communication link. This will reduce the long journeys that people need to undertake, sometimes up to days on foot, to get to the nearest health care service point, like a clinic. Telemedicine also increases access to scarce medical specialists in bigger centres and academic institutions.

Through telemedicine, the geographic gap between colleagues is also overcome, as isolated doctors can receive support from their peers at a distance. The severe shortage of doctors can also be overcome by linking several health care facilities serviced by a health care worker to a doctor or doctors allocated to them. Telemedicine provides a platform for the delivery of education by the leading minds in health and medicine to health workers and doctors in the field with minimum disruption to the delivery of health care services. Telemedicine also provides a platform for effectively facilitating research over a large geographic area in a short time.

Africa has yet to embrace tele-medicine. Poverty and civil unrest have left most African countries with poor infrastructure. Fixed telephone line penetration is 1.5% and, as fixed telephone lines provide most internet access, internet penetration

in sub-Saharan Africa is only 4.5%. Bandwidth is both limited and expensive. Fixed-line broadband penetration is 0.1% and the cost of a monthly broadband subscription and 1 GB of data exceeds the average gross monthly income per family in 22 African countries. Mobile phone penetration is now in the region of 32%. One may see this as the solution to connectivity, but costs remain high.

Poor countries have small budgets and even smaller health budgets. The governments of 20 African countries budget less than US$20 (about R160) per capita per annum for health. This amount includes the costs of ICT for health purposes.

Thirty-one African countries have fewer than 10 doctors per 100 000 people. In comparison, Germany has 240 doctors for every 100 000 people, Italy has 370 and Norway has 380. Telemedicine is seen as a solution to the shortage of doctors in Africa. However, something that is often forgotten is that telemedicine adds additional steps to the normal workflow of already overburdened doctors and nurses at both the sending and receiving sites.

International telemedicine across borders will be required to help overcome the shortage of doctors. Such a service will need enabling policies and legislation. However, African policy-makers have been slow to grasp the potential of telemedicine. None of the policies published by the African Union, the New Partnership for Africa's Development (NEPAD) or African health ministers mention e-health, m-health, telehealth, ICT for health or telemedicine. Very few African countries have either an e-health or a telemedicine policy or strategic plan, and this will continue to obstruct the uptake of telemedicine.

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a shortage of doctors to teach and train new doctors and specialists. It is not uncommon for medical schools, and indeed countries, to have no specialists in some disciplines.

E-learning in the health sector has been one of the most successful uses of telemedicine in Africa to date. Some of the examples include the following:

- The Resau en Afrique Franco-phone pour la Telemedicine Project, based at the Hopitaux Univesitaires de Geneve, which involves 15 West African countries
- The African Medical and Research Foundation (AMREF) Project to raise the qualifications of 40 000 nurses in Kenya
- The video-conferenced post-graduate training programme of the University of KwaZulu-Natal in South Africa

What is needed now is a telemedicine awareness campaign among health workers in Africa and international support for low-bandwidth clinical telemedicine across borders.

It will require an international effort to resolve issues related to licensing and liability. Furthermore, one should not lose sight of the necessary skills to manage and maintain the technology that enables the successful functioning of telemedicine.

In an effort to address the above issues, the Graduate School of Technology Management at the University of Pretoria is collaborating with the Department of Telemedicine at the University of KwaZulu-Natal and

the Health Technology Management Group in the Department of Human Biology at the University of Cape Town. This multi- and transdisciplinary approach to finding a solution in resource-limited settings by using telemedicine is currently unique.

The first project on which the three partners are currently working is the development of courses for health care workers, based on the current offering of modules at the respective institutions. ❸

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