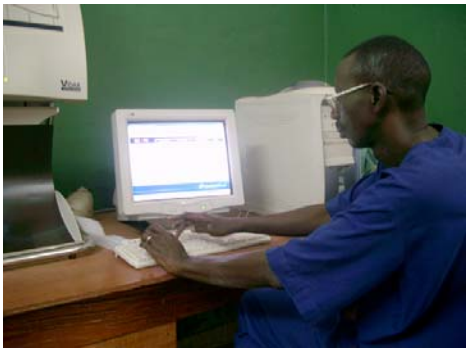
Teleradiology in Mali

Quick diagnoses and better treatments in rural areas

Telemedicine is a relatively new development in the health sector whereby modern communication technology enables doctors in rural areas to call in the help of specialised doctors in larger, academic hospitals to give the right diagnose and to decide upon the right course of treatment. In Mali, IICD assisted SOMIM (Société Malienne d'Imagerie Médicale) with setting up Internet connection between the hospital 'Point G' in Bamako and three hospitals in the rural areas of Timbuktu, Mopti and Sikasso to experiment with teleradiology. The Teleradiology project provides a solution for the lack of trained radiologists in rural hospitals, by offering the possibility to send or receive x-ray scans and diagnosis over the Internet. After a difficult start doctors from three rural hospitals now use the technology. The healthcare in rural areas has significantly improved as patients get a quicker diagnosis and better medical treatment. The project has even proved able to save people's lives!

Telemedicine is one the outcomes of the advances in communication technologies. Telemedicine is an innovation in the medical sector which enables the communication and sharing of medical information electronically over distance. Telemedicine enables continuing medical education over the Internet or access to medical information from digital databases and libraries. It is extremely useful in countries where the available medical expertise is scarce, like in developing countries.

In most of the developing countries the health situation is extremely poor. There is, in general, an overall lack of specialists, nurses, hospitals, equipment and proper education to provide the population with adequate health services. Delivery of healthcare in developing countries is one of the most pressing needs. The few specialists and services are often concentrated in cities. Poor infrastructure, scarce and expensive telephony services and a lack of library facilities isolates rural health workers - who serve most of the population - from specialist support and up-to-date information. The poor health situation in the developing countries has attracted the attention of the developed world. Three out of ten of the Millennium Development Goals focus on improving healthcare.



A doctor in Sikasso sending an x-ray

The Malian initiative

One of the problems of the Mali healthcare system is that almost all radiologists in Mali are located in the capital of Bamako. This means that all expert diagnosis of radios have to take place in the capital, sometimes up to 1,000 kilometres from the regional hospital where the first analysis is made.

In 2002, the Dutch International Institute for Communication and Development (IICD) was approached by the Société Malienne d'Imagerie Médicale (SOMIM) in the person of Dr. Mahamadou Touré.

Dr. Touré had participated in an IICD Roundtable Workshop for the health sector in Mali where problems and potential solutions in the health sector in Mali were discussed and asked if IICD was able to help solve the structural problems of radiology. Dr. Touré proposed to use the benefits of Internet technology to address the structural problem of the lack of specialist radiologists in Mali. Together with medical student Romain-Rolland Tohouri, who wrote his thesis on the opportunities of teleradiology for developing countries, he formulated a project aiming to:

- *Create awareness* - Hospital staff would have to be made aware of the possibilities of ICT for Health.
- *Build capacity* - Hospital staff would have to develop general ICT skills and/or specific ICT4Health skills.
- *Reduce costs* - Significant reductions of costs for both hospitals and patients were expected on travel costs for patients, and improved use of local hospital facilities (less pressure on - more expensive - hospital facilities in the capital).

The people who would have to benefit most of this project were the related hospital staff and patients whose x-rays need to be submitted for an expert diagnosis by a radiologist.

IICD assisted with the implementation of the project which included among others the installation of equipment in four hospitals in Bamako (Point G), Timbuktu, Mopti and Sikasso which should facilitate the production and exchange of radio scans via the Net, the building of sufficient capacity to successfully implement the project through awareness creation seminars and training workshops and assistance to set up an organisational and financial system to guarantee the sustainability of the project. The outcome of the project would also be used by IICD to interest the national government of Mali in applying ICT to their national health policy.

Setbacks

During the first year of implementation, the project had several setbacks, especially on the technical and organisational level: scanners proved more expensive than budgeted, software for the scanners was not supplied, connectivity and server problems at the level of Keneya Blow'n (another health project assisted by IICD which provides a website with medical information) forced the Teleradiology project to migrate to a Canada-based server. On the organisational side, it became clear that the project lacked dedicated staff for the execution part. Most of the work was done by the consultants of ICT Development Centre (IDC), a training partner of IICD.

Nevertheless in 2004, approximately 150 hospital staff members of the four involved hospitals were informed about the project during seminars, and 35 hospital staff members in the four hospitals received basic training. Specific training on scanner and software use for dedicated hospital teams took place in April 2005 in Bamako and Mopti, and the first successful exchange of an x-ray via the Internet was performed during that same training workshop. An initial diagnosis of potential bone cancer in one of the fingers by local staff in Mopti of an x-ray of a patient's hand was dismissed by the experts in Bamako as a default error on the x-ray film, thus saving the patient from the premature amputation he himself had requested for!

Hospital in Sikasso, Mali

Impact and lessons learned

After the initial start up problems the project turned out to be quite successful. It was even proven that people's lives were saved because of the possibility to send a proper diagnosis via the telemedicine link.

At the end of 2006 a survey was held among the doctors participating in the project. In total 338 x-rays had been sent to hospital Point G in Bamako for a second opinion of a radiologist, which is an average of 30 x-rays per hospital per month. Of these x-rays 22 had an urgent need. Most of the x-rays (92%) were successfully sent and of good quality (83%). Although there was sometimes a delay in the actual transmission of the x-rays, the delay was considered to be acceptable by most (95%) of the specialists. Unsuccessful transmissions of x-rays were mostly caused by lack of connectivity or technical problems with the computers. All specialists made use of the technology. As statistics show that in general 50% of the generalist doctors make mistakes in interpreting an x-ray, compared to only 5% of the radiologists it can be concluded that due to the project the quality of healthcare in the three rural hospitals improved significantly. Looking back on the project a few lessons can be drawn from this project.

1) When introducing a new technology in a developing country, it is of vital importance that the innovation is need-driven rather than technology-driven. The fact that the idea for this project was born during a Roundtable Workshop in which various stakeholders of the Malian health sector participated, made it much more likely that the project would be adapted. There was a will to use the new technology as it was in fact decided upon by most of the users.

2) There has to be a small group of 'early adopters', people with a sense for innovation who are keen to try out new things. In most cases it is the younger generation already familiar with using computers and Internet. With regard to this project the students were the motivators and carriers of using teleradiology.

Dr. Mahamadou Touré being interviewed

The students believed in the potential of telemedicine and were, according to the project coordinator, 'key actors' in the project. Besides the students, the fact that the initiator of the project was a very well known and is also a well respected professor contributed greatly to the success of the project. Dr. Mahamadou Touré convinced people of the potential of telemedicine and his charisma convinced users of the essence of telemedicine.

3) It is important to include a gradual training path. Training was not only a big part of the project, but the training made small and gradual steps. The training was focussed on basic ICT skills; how to work with a computer, how to use e-mail and how to use Internet. People liked these trainings because trainings provided some important spin offs for them. Lessons learned in the training could also be used outside of work. Users now see the possibility of ICT to improve their standard of living and the project widened their horizon, not only at a working level, but also on a project level. In the training, a separate component was also the maintenance of the telemedicine system. This made the people self-sufficient and independent from the Western implementers.

4) Awareness seminars can be very effective not only to raise awareness amongst potential users, but also to filter motivated people from people who are not willing to use the technology.

The Teleradiology project organised awareness seminars that were held at hospitals where afterwards interested people could sign up for telemedicine training. The telemedicine project thus only dealt with motivated people who decided themselves to use teleradiology. Another factor that also contributed to the success of the seminars was the fact that they were held by local people themselves.

5) The project worked with very elementary telemedicine equipment. Although it did not conform to the guidelines and laws of the Western world, it was easier to maintain and understand than sophisticated telemedicine equipment.

6) What also contributed to the success of the teleradiology project is the fact that the government of Mali has decentralised in the past eight years leaving much more space for hospitals to operate independently from the government. They are now able to set their own budgets and can make their own decisions to what happens in hospitals. This speeds up on decision-making, which certainly helps to start up experiments like teleradiology.

A growing interest in ICT for health

The Teleradiology project has drawn the attention of donors and healthcare workers all over Africa and contributed to the growing interest in using ICT to improve healthcare. In 2006, the project owner Dr. Touré was invited to present the project to the participants of the Roundtable Workshop for Health in Tanzania.

In January 2007 the Teleradiology project was also one of the projects on ICT and health presented at the 12th Francophone Days for Medical Information Technology in Mali, a conference organised by the Société Malienne d'Informatique Biomédicale et de Santé (SOMIBS). The conference was attended by more than 200 participants from 13 Francophone countries.

In Mali, using ICT in health is high on the agenda. Over the last six years, the government of Mali has started to use ICT as a development tool in a number of government projects, including computerisation of the entire health department, the governmental Intranet, the annual E-Festival and the creation of a government agency dedicated to ICT (AGETIC). At sub-regional level, Mali is even a founding member of the Francophone African Network for Telemedicine (RAFT). The government has also just signed a Memorandum of Understanding with Health on the Net Foundation on the opening of a sub-regional office to represent the foundation in French-speaking Africa. In addition, Mali is encouraging individual and community-based initiatives relating to ICT in general.

Different West-African countries have now shown their interest in replicating the Teleradiology project. Although IICD is not involved in most of these countries yet, it will be looking for possibilities to offer its support to these countries to set up similar projects.
