Help from Above

With an exchange of greetings by satellite, Queen Elizabeth II of England and President Frederick Chiluba of Zambia officially inaugurated an experiment in communications that could revolutionize health care in Africa.

The project, called HealthNet, is an innovative use of satellite technology that will transmit medical information and enable physicians to communicate with their colleagues throughout the world. "If there were such a return on all investment in education, the world would know less suffering," said President Chiluba in his message to the Queen earlier this year.

HealthNet was begun by SatelLife, an international, non-profit organization based in Cambridge, Massachusetts that aims to address health information and communication needs in the developing world. SatelLife chose to use low-earth orbit satellite technology to accomplish its goals.

IDRC is collaborating with SatelLife on the HealthNet project. This is a natural partnership; IDRC has been promoting the use of this technology since the early 1980s because of its interest in exploring the potential use of satellites to improve communication to and from the developing world.

Built by Surrey Satellite Technology Ltd. at the University of Surrey in the UK, the HealthNet satellite is designed to transmit information to and receive messages from ground stations based at medical institutions in Africa and other regions of the world.

Benefits Africa

Africa, with its severe communication problems, stands to benefit most from HealthNet's technology. Expensive and unreliable phone systems, non-existent transmission lines, and costly medical literature make it hard for African physicians to keep abreast of recent medical developments and communicate with other health professionals.

Examples of communication difficulties abound. There are more telephones in Manhattan than on the entire continent of Africa. Once, a disease control officer in Zimbabwe tried to telephone his counterpart in Mozambique about an outbreak of cholera on the border. He could not, however, get through. Cost is another barrier to communication — professors at the University of Zambia have to pay about one-tenth of their monthly salaries to send a one-page fax to Europe.

Africa also suffers from a dearth of medical information. Financial constraints have forced medical libraries to cut their journal subscriptions; in some cases, the most recent acquisitions date back to the 1970s. In Uganda, where AIDS is a major health concern, current information on the virus is scarce. The first journal article on AIDS was published in 1981 and Makerere University, once considered the jewel of African medical institutions, has not been able to pay for a periodical since 1980. "Here's a country being ravaged by an epidemic and they cannot afford the literature describing it," says Dr Charles Clements, Executive Director of SatelLife.

This poverty of information has compromised health care in Africa —

HealthNet's satellite is checked out prior to launching.
planning is done without sufficient facts, decisions are based on outdated information, and research is in danger of being irrelevant or unnecessary. "If you can't communicate and if you don't have access to information, you can't change anything — you're working on an island," says David Balson, a Senior Program Officer with IDRC's Information Sciences and Systems Division. "HealthNet will contribute to ensuring that a person's geographic location is not a handicap."

The satellite that can transcend national boundaries is no bigger than a beach ball. It revolves around the earth in a 800-km orbit 14 times each day, sending out a continuous signal that is picked up by a modified amateur (HAM) radio attached to a personal computer. Once the signal is recognized, a message transfer takes place between the satellite and the ground station. When in range of a ground station, the satellite can transmit about 30 pages a minute. Satellite is exploring the possibility of acquiring space on a second satellite in 1993 in order to provide greater capacity and to provide alternative channels in case of failures.

**LICENCES ISSUED**

In Africa, ground stations have been licenced in Congo, Ghana, Kenya, Mozambique, Tanzania, Uganda, and Zambia. They are operating in all these countries, with the exception of Ghana where a station is in the process of being established. In total, 15 African countries are expected to participate in the project being funded by IDRC. Canada has also issued an experimental licence for HealthNet's operation to Memorial University in St. John's, Newfoundland. Memorial, with its expertise in telecommunications, will act as a North American "gateway" for the project. Messages that originate in North America will be sent to the university via conventional electronic mail for transfer to the satellite. Surrey Satellite Technology Ltd. in the UK will provide the same function for Europe.

Initially, there was a risk that some countries might be reluctant to grant licences because of concerns over security and potential loss of telecommunications revenue. Telecommunications authorities, however, can monitor all traffic on the system if required. The system's capacity is also relatively small so it does not compete with the large telecommunications networks in Africa. Moreover, HealthNet provides an important health service that contributes to a country's development. "We have not been turned down anywhere (for a licence)," says Julia Royall, Satellite's Deputy Director. "Our mission is convincing and we are not an active challenge to revenue or security."

**ELECTRONIC NEWS**

Regular satellite transmissions have begun, along with ongoing training of ground station staff. The first issue of HealthNet News was issued by satellite in March 1992, the occasion marked by the exchange of messages between Queen Elizabeth and President Chiluba. HealthNet News is an electronic newsletter featuring summaries, abstracts, and articles with current medical information. The New England Journal of Medicine is allowing the use of its articles for the project and other journals are expected to follow suit. Ground stations will also be equipped with CD-ROM players and disks, giving users access to journals and databases independent of the satellite system.

A second feature of the satellite's health information service is the library partnership program. Medical libraries in Africa are being twinned with other libraries throughout the world to facilitate the exchange of information. The University of Florida Health Science Library is already paired with the medical library at the University of Zambia. The Oswaldo Cruz Institute in Brazil is serving as a resource for the medical library in Mozambique.

Doctors will also be able to get advice on particular cases and problems via the satellite. The Massachusetts General Hospital and the Harvard School of Public Health are interested in providing clinical and public health consultation to HealthNet users in the South.

Perhaps the most important application of the satellite, however, is that it enables medical professionals in Africa to communicate with their colleagues. Information sharing will be possible on a global scale whereas before, it was difficult to get a message from one regional district to another. Physicians in Mozambique have used HealthNet to establish electronic links with their counterparts in Zambia to compare notes about diseases that are as yet undocumented in African medical literature.

**EXPENSIVE PROJECT**

Such a far-reaching project requires a big budget. SatelLife raised approximately US$1.5 million last year for HealthNet through contributions from agencies, foundations, corporations, and individuals and from the sale of communications capacity on the satellite. The project is studying other ways to generate revenue so that the system can be sustained on a long-term basis and at minimal cost to developing countries. For example, users in the North could be charged a reasonable fee for access to the satellite.

HealthNet's potential is as great as the problems it seeks to resolve — access to information and the capability to communicate. The research component of the IDRC project will evaluate this potential and determine whether radio and satellite technology is both sustainable and effective in meeting HealthNet's many objectives. If HealthNet proves to be successful, it could advance health care in Africa and in the rest of the developing world.

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