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Informatics in clinical practice in developing countries: still early days

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Tamil Nadu will soon become the first state in India to provide telemedicine in the public sector when the local hospital in Thiruvalur is connected to the Chennai Medical College (about 40 km away) through an integrated services digital network (ISDN) line and linked terminals. Tamil Nadu cannot yet connect every district and taluk hospital to the nearest medical college because the ISDN facility is not available in many places outside Chennai. This reflects misplaced priorities in a country which has developed technologies for launching missiles and satellites and for producing nuclear bombs; provides cellular telephones, colour televisions, and luxury cars for the rich; and sends thousands of computer professionals to the United States every year. The story is the same everywhere in the developing world.

Summary points
- Developing countries can benefit the most from informatics and telemedicine, but they have the least access to these technologies
- Despite growing interest in informatics and telemedicine, developing countries have not made much progress
- Inadequate access to technology, inadequate investment in health care, and misplaced priorities have hindered developments
- In the absence of deliberate government policy, new technologies will benefit only the rich
- Priority must be given to establishing the infrastructure for health care as technology alone can be counterproductive

Inadequate access to technology
- Inadequate access to technology, especially computers and telecommunications, is a key factor in the inability of developing countries to take advantage of progress in delivering health care. Most developing countries do not have the necessary infrastructure—the computer terminals, networks, communication channels, and bandwidth. This is not surprising when we consider that the income of the richest 20% of the world’s population, which enjoys 83% of the world’s income, is 80 times greater than that of the poorest 20%.
- In developing countries as a whole, 3.9% of the population have a telephone line, 0.7% have a computer, and 0.05% have access to the internet.
- According to Bruce Girard, former director of Latin America’s community radio, Pulsar, 95% of all computers in the world are in the developed nations. In many African countries fewer than 0.5% of people have a telephone line (table). In India, the proportion is 1.9%, compared with over 60% in the United States, Sweden, Switzerland, Norway, Denmark, and Canada. The Human Development Report 1997 tells us that in Australia one person in five owns a personal computer; in India the proportion is only one in 1000. There is an average of one fax machine for every 30 people in industrialised countries, but in developing countries, one fax machine serves more than 1000 people. A Swiss person spends an average of four hours a year on international phone calls compared with 60 seconds for a Chinese and 12 seconds for an Ethiopian. For every person who logs on to the internet in developing countries there are 149 people logging on in the industrialised world. In mid-1998, the United States, with less than 5% of the world’s population, had more than 50% of the world’s internet users. In contrast, South Asia, home to 20% of humanity, accounted for less than 1% of internet users.

The simple truth is that the information and communication revolutions have not yet touched millions of people in the developing world. These people continue to be the “have nots” and the “know nots” and risk being left behind always. In one of the greatest achievements of the century, we got rid of apartheid based on skin colour, but we are now facing the emergence of apartheid founded on access (or lack of it) to information.

Investment on health
- Most developing countries invest very little in health care. In 1990-7, rich countries spent more than $2500 (£1500) per capita on health—about 10% of their gross domestic product. However, low income countries spent barely $15 (£9) per capita. This was 4.5% of their very low gross domestic product, and just above the estimated $12 (£7) a year needed to secure the

Availability of telephone lines in selected countries

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<td>United States</td>
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*1971 data.
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Success stories

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Use of informatics

To be fair, conscientious doctors and organisations in many
developing countries have tried to use informatics as much as they can. For example, the neurosurgery department at the King
Edward Memorial Hospital in Mumbai has maintained an
electronic patient records system since 1957, thanks to the
foresight of its founders, neurosurgeon Homi Dastur and
neurologist Anil Desai. Amrita Institute of Medical Sciences in
Kochi in the southern Indian state of Kerala has established
India’s first filmless hospital, where all radiology images are
stored in computer image archives and are available on any of
the computers located within the institute. Last year, Sri
Ramachandra Medical College in Chennai, India, was linked to
Toronto’s Hospital for Sick Children in Ontario, Canada. This
enabled doctors in the two hospitals to share their expertise in
performing open heart surgery on infants and young children on
a real time basis through an internet/video link via satellite.

Success stories

In what became a major public health success story in recent
times, information technology played a key role in

minimum preventive and essential clinical services. Even Latin
America spends far more ($274 (£164)) than the meagre $16
(£9.50) in South Asia, $34 (£20) in sub-Saharan Africa, $18
(£10.50) in India, and $19 (£11) in China. People living in
remote areas in developing countries have little or no access to
medical and healthcare services. The nearest hospital or clinic
is hours or even days away. There is a severe shortage of medicines
and of healthcare professionals—especially specialists.

Need for better communication

The combination of inadequate investment in health care
and a poor communications infrastructure can be deadly. Poor
health care can result from a lack of good information. Decisions
may be based on outdated information. Research may be
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Synopsia on telemedicine for developing countries—one in Portugal
(1997) and another in Argentina (1999). The WHO has incor-
porated telemedicine as a major tool in its Health for All strategy.
But, as always, the proof of the pudding is in the eating—that is,
the actual spread and proper use of telemedicine in these coun-
tries. Often, there is the real threat that new technologies will
benefit only the rich and will have no impact on the poor. For
example, cardiologists in Amman now receive and diagnose
electrocardiographic data via satellite, land lines, and the inter-
et from medical centres, corporations, hotels, holiday resorts,
and even the Royal Jordanian Airlines. In contrast, the
HealthNet email service in Nepal concentrates on simple
telemedicine solutions involving low cost personal computers
and basic, text based email. In a country with scarce medical
expertise and an unevenly distributed population, that is the right
good thing to do.

Satellite

Agency is trying to make a difference. Satellite, is a
non-commercial organisation, based in Massachusetts, USA,
that provides free store and forward messaging services for
developing countries via a low earth orbiting satellite called
HealthSat-2. The HealthNet project of Satellite, funded by the
International Development Research Centre of Canada and
others, for example, connects health professionals in 21
countries in Africa (Botswana, Burkina Faso, Cameroon, Congo,
Eritrea, Ethiopia, Gabon, Gambia, Ghana, Kenya, Malawi, Mali,
Mozambique, Nigeria, South Africa, Senegal, Sierra Leone,
Sudan, Tanzania, Uganda, and Zimbabwe); five countries in Asia
(China, Indonesia, Myanmar, Nepal, and the Philippines);
Bolivia; and Haiti. The HealthNet email service distributes AIDS
Newsletter and provides summaries of published reports, expert
commentary, event information, and community discussion
facilities in numerous forums like the cardiovascular health
forum ProCOR, in which health professionals in 51 countries
participate. Burns surgeons in Mozambique, Tanzania, and
Uganda have used the network to consult with one another on
surgical techniques.

Midjan Group

The Midjan Group comprises experts from the telecommuni-
cations sector, telemedicine institutes, ministries of health,
manufacturers and equipment suppliers, universities, and hospi-
tals, who share the common objective of promoting telemedicine
applications in developing countries. It provides European tele-
medicine services to countries like Senegal and South Africa.
There have also been a few examples of indigenous efforts such as the one in South Korea connecting hospitals in fishing and farming villages to university hospitals in Seoul.

One other use of informatics in no way advances medical practice in the developing countries. This is the rapid growth of medical transcription centres in countries like India.

Limiting factors

The bottom line is that developing countries, which can benefit the most from the use of informatics and telemedicine, are the ones that have the least access to them. Despite growing interest in telemedicine and medical informatics in these countries, issues of affordability, cost effectiveness, and sustainability remain to be addressed. In clinical practice, informatics is useful in four fields—electronic patient records, telemedicine, clinical decision systems, and improving access to information. But it has its limitations. Enrico Coiera has pointed out that medicine, more than other professions, is culture specific and depends to a very large extent on the social context within which the practitioner and the patient interact. The dialogue between the patient and the doctor takes place in a combination of natural language and gestures, and in an atmosphere of interpersonal understanding. Hence, it cannot be reduced easily to transmission by mere computers. In any case, telemedicine and other applications of information technology in medicine cannot replace the basic health infrastructure. Email is no sub-

3 International Telecommunication Union. Table of basic indicators. www.itu.int/itu-t/industryoverview/at_gloance/basic.pdf (accessed March 1999).