Medicine on the move
Underfunding of public healthcare means high-quality services have been an unaffordable luxury for many in India. But the growing use of telemedicine is leading to improvements

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India’s most advanced telemedicine van, which has an on-board pathology lab and x-ray facilities, has been used to treat more than 50,000 patients. Photograph: Ryan Lobo/guardian.co.uk

In a clearing on the edges of Vazhachal forest, scores of forest-dwelling tribal villagers, dressed in their best clothes, are standing in pouring monsoon rain. They are waiting outside a dilapidated two-storey concrete building that today is serving as a makeshift diagnosis room and pharmacy.

This is Athirapally medical camp, one of several monthly camps that provides healthcare services for Kerala’s most underserved villages. It is organised by the Amrita Institute of Medical Sciences (Aims), a specialist hospital some 100km away in Kerala’s state capital, Kochi. Aims works with the Kerala forestry department, which arranges transport so the villagers can attend.

On the first floor, Dr Siddanth Reddy places his stethoscope on eight-year-old Bishir’s chest. “Most commonly the rural children that come here have fever and cough, sometimes breathing difficulties. A big problem is TB, so we take a blood count, give a chest x-ray in the telemedicine van, and if there are any abnormalities we refer them to our main hospital,” he says.

Public healthcare is free in India, yet years of under-investment in public health means that facilities are grossly understaffed and under-equipped. As a result, 80% of Indians seek private healthcare. Such expenditure is the leading cause of poverty in India, contributing to the impoverishment of 39 million Indians annually. Aims treats about 45,000 patients free of charge each year.

Bishir has a fever. He’s been coughing for the past two months. “We hoped it would go away,” says his mother, Karthu. “The hospital is too far.” Like a large number of India’s rural poor, Bishir never received a BCG vaccination against TB. Low rates of immunisation and health awareness mean many Indians continue to die from easily
preventable diseases.

**An ageing population**

India's most advanced telemedicine van is at Athirapally today. It is a hi-tech mobile diagnostic unit, complete with x-ray, echocardiograph and on-board pathology lab. The van was funded by NGO Direct Relief International in 2006 and has been used to treat more than 500,000 patients across the country.

The van is connected via satellite to Aims, enabling real-time consultations with specialists at the hospital. Although static telemedicine units have been around for a while, they are dependent on high-speed broadband, so are less useful.

Karthu sits by Bishir, as the van's technical facilitator, Prasanth, completes a chest x-ray. The hard copy x-ray is then taken back up to Reddy. There are no abnormalities so Reddy gives Bishir a prescription, available on the ground floor free of charge, saving Karthu and Bishir a 40km trip to the nearest hospital.

"Telemedicine can enable much faster, more efficient and more accurate care. It is no good without trained and competent staff, but can be extremely beneficial to patients as it can cut costs and save time," says Dr Kumar Menon, Aims's director of telemedicine.

India has a massive resource gap of about 2.6 million health workers and, to compound problems, nearly 60% of existing health workers practise in urban areas.

About 70% of India's population lives in rural areas, often far from healthcare providers. Both the World Health Organisation and India's 2005 Rural Health Mission consider the use of technology and outreach work imperative to bringing better healthcare to India's most vulnerable people.

From within the van, Prasanth takes blood from 66-year-old Shamugan to determine his blood sugar level after complaining of depleting vision in one eye. He also has severe chest pains and lays on his back while a chest x-ray and ECG is performed. "I feel out of breath after only taking a few steps," he says, as the ECG beeps in the background.

Once Shamugan's results are collated, the van uses satellite technology to connect with the main Aims hospital. Prasanth sends the results and a digital image of the x-ray and the ECG to Aims's head of cardiology, Dr Haridas. The doctor analyses the results, prescribes the correct course of medication and makes an appointment for Shamugan to visit the hospital, which provides free healthcare for those living below the poverty line of RS2,000 a month (about £26). The details of Shamugan's tele consultation are recorded on the van's database, as are Bishir's diagnosis and prescription, and those of every other patient seen today.

Specialist care, which is needed for chronic illnesses, such as cardiovascular diseases, cancers and diabetes - India's biggest killers and causes of disability - is virtually non-existent in rural areas. The World Bank believes India is grossly unprepared for the coming burden of non-communicable diseases, such as heart disease and cancer, as its population ages. Investment in telehealth could be vital for the future, as the burden of such chronic diseases will continue to increase significantly over the next 25 years.

Despite these benefits, the use of ICT (information and communication technologies) healthcare intervention in India is still very much in its infancy and has not benefited the vast majority of the rural or urban poor.

"It involves a lot of expenditure — the government funding has to be there," says Dr Alok Agrawal of Delhi's private Apollo Hospital chain, the first hospital chain in India to use telemedicine. "You need staff who are technically sound and a doctor who knows what he's doing technically. You need infrastructure."

Mobile phone penetration has extended throughout India, and leading software companies such as IBM and HP are working on health programmes that use text-messaging services, or interactive voice responses for those who are not literate. This could be particularly useful for chronic disease management.
But although India is the world's second fastest growing economy, progress in healthcare has not matched this growth and India compares poorly with countries at similar levels of development.

According to Menon and his colleagues, a multi-pronged approach is necessary to improve access to quality healthcare for India's poor. All aspects of telehealth should be implemented, they believe, from static telephone lines to advanced mobile health units. All data must be kept in a repository such as a national health grid. This can be used to keep information on areas of disease outbreak and could be used to share information on effective healthcare practice.

There is general agreement from medical and development professionals that health policies must be strengthened and accountability levels raised in order to meet the government's recent pledges to increase public health spending. Without these interventions, India will almost certainly not reach its Millennium Development Goal targets for health and fail to fulfil its economic potential.

As Athirapally medical camp packs up for the day, the staff prepare to head back to Kochi. The Kerala forestry department uses jeeps to drive the villagers as close as they can to the forest, before the villagers disembark and return to their homes.