



Key benefits

- 1** Last mile solution: bridges the digital divide by connecting remote communities to the internet
- 2** Reliability: operates over the Inmarsat-4 satellite and ground network, offering over 99.9% availability
- 3** Resilience: not susceptible to terrestrial network issues such as infrastructure loss in natural disasters and conflict
- 4** Pervasive: powers connectivity anywhere on the planet except the polar regions

Digital Frontiers: Nigeria

Satellite connectivity saving lives

Healthcare in Nigeria's remotest communities is being improved by satellite-enabled mobile medical applications.

IPP overview

The UK Space Agency's International Partnership Programme (IPP) is a five-year, £152 million programme designed to partner UK space expertise with governments and organisations in emerging and developing economies around the world to deliver a sustainable economic or societal benefit. All IPP projects are fully aligned to the United Nations' (UN) Sustainable Development Goals (see relevant SDGs below).

Inmarsat has been awarded IPP funding for three projects in Nigeria, Indonesia and the Philippines which began in 2017.

The challenge

Improvements in healthcare in Nigeria are failing to keep pace with the nation's economic development, with health indicators such as infant mortality rates among the highest in the world. Provision is hampered by poor infrastructure and isolation of rural communities, leaving people with little or no regular medical care provision. Medical services in these areas often have catchment populations as large as 50,000 people.

These communities are also the most likely to be without access to the internet through fixed or mobile networks, further isolating remote health workers and their patients from medical information and advice. A study by our project partner InStrat Global Health Solutions into the penetration of 3G wireless services found that most of Nigeria's coverage is concentrated around urban centres and State capital cities. It found that approximately 47% of Nigeria's estimated 193 million population is not covered by any 3G network.



The solution

The Nigeria IPP project extends the reach of basic medical services into off-grid communities. It does so by tackling the 'last mile' challenge – the final portion of the communications network that physically reaches the service user – using Inmarsat BGAN satellite technology.

We are working with InStrat and the Nuffield Centre for International Health and Development of the University of Leeds to deliver sustainable mobile healthcare applications that:

- Provide video-based health worker training
- Improve health systems management and governance
- Improve disease surveillance capabilities



With the support of the Nigerian State Health Ministries, 75 medical centres in Kano and Ondo States and the Federal Capital Territory (FCT) have been supplied with BGAN satellite terminals. The small, lightweight mobile terminals provide on-demand data rates at up to 512 kbps or dedicated streaming at up to 650 kbps, enabling IP access to broadband data and voice simultaneously.

InStrat mobile health solutions provided for the project are:

- CliniPAK – a computer-based point-of-care data capture and decision support tool that allows health workers to collect patient health information on tablets and send the data to remote servers through the Inmarsat satellite network. Aggregated data is analysed and used for better patient care and to support evidence-based policy decision making and programme management.
- VTR Mobile – a training application that can be used on any smartphone, tablet or laptop/desktop computer. VTR supports multi-media training content including text, audio- and video-based training.
- EWORS – an Early Warning Disease Outbreak Recognition application that enables the detection of disease

outbreaks earlier than is possible with traditional paper-based surveillance. EWORS allows the electronic collection and analysis of routine clinical and non-clinical data to chart the likelihood of a disease outbreak in a given geography and notify State and local Disease Surveillance Officers.

The results

Midway through the 27-month project, monitoring and evaluation (M&E) indicated that positive outcomes were being achieved. State Ministries of Health were getting more complete and accurate data to inform policy decisions; health worker test scores and healthcare delivery standards were improving; and disease surveillance was more proactive.

Health workers across the project States cited how they have been empowered through high quality training and regularly used the videos to provide critical care to pregnant women and their infants, including cases where they were able to:

- Resuscitate a newborn baby
- Stop a new mother from bleeding to death
- Educate pregnant women and nursing mothers on breastfeeding

EWORS helped increase disease reporting rates in the project areas from 20% to 65%, with the speed and accuracy of data analysis and interpretation significantly increased.

There were also indications that service users have found the treatment they received in the first year of the project better, linking their satisfaction to the fact that health workers referred to the relevant videos in order to provide more appropriate care.

The future

Sustainability is a key feature of all the IPP projects. By upskilling medical workers and improving the management of clinics and health programmes, the Nigeria project is creating a model that can easily be rolled out, strengthening the country's healthcare system – a move that is unanimously supported by the State Ministries involved.

In addition, the project is now assuming a broader role as a socio-economic development catalyst. Diverse non-health public and private sector players have recognised the potential for satellite communications to bridge the connectivity gap in sectors including defence and security, election monitoring, agriculture and community Wi-Fi.

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