



## Inmarsat and VSee help bridge the gap between urban and rural healthcare

**Inmarsat offers the broadest portfolio of global broadband, machine-to-machine and voice satellite services. Our ground network and satellites operates with an average availability of 99.9%, so whatever enterprise, governmental, NGO or humanitarian organisation you work in, you can depend on Inmarsat's connectivity, wherever your operations are based.**

**Our portfolio of services is accessed via a variety of portable, vehicular and fixed terminals that are rugged enough to withstand challenging environments and extremes of temperature.**

Telemedicine is helping to bridge the gap between rural and urban healthcare which can be as vast as some of the distances involved between the two.

But alongside a shortage of skilled healthcare workers and infrastructure, reliable communications is one of the biggest barriers to its success.

Inmarsat's services are now helping to break down this barrier by providing remote communities – those without fixed or cellular communications – access to technology-enabled healthcare solutions and applications.

Our global portfolio of voice and data services are empowering doctors via eHealth applications and telemedicine solutions to diagnose, treat, monitor and share vital health information with other doctors – in real-time – anywhere in the world.

As well as helping to counteract a lack of healthcare infrastructure our services can be used to support an under-skilled workforce, control the spread of communicable diseases and record the increase of non-communicable diseases such as diabetes and heart disease.

Healthcare workers can also have access to eLearning to increase their skills by joining online educational courses where they can learn at their own pace, attend virtual classes and have group discussions.

Our latest partnership with US company, VSee, is a great example of how Inmarsat

is constantly exploring new ways to put its expertise and global satellite network to new and innovative uses for humanitarian needs.

### Reaching isolated communities

VSee is a Silicon Valley-based videoconferencing and collaboration company, which specialises in telemedicine.

In 2013, it took part in a trial with the Albert Schweitzer Hospital (HAS) Gabon, West Africa, to demonstrate how invaluable telemedicine is in helping hard to reach communities.



**“Inmarsat plays an essential role in extending medical services, remote health consultations or online health education and training to rural and remote areas that are otherwise without the internet.”**

**Becky Wai**  
VSee Director of Medical Services

The hospital lies on the banks of the Ogooué River in the middle of a tropical rain forest, a four-hour drive from the capital, Libreville.

HAS was founded in 1913 by Nobel Peace Prize winner Albert Schweitzer and is the oldest hospital in the country and, for many years, was the only hospital in Gabon.

The hospital serves around 60 isolated villages, many of which are only accessible by boat rides taking up to an hour.

Most of the villages do not have essential services like electricity or running water and, if villagers are sick, they have to visit the hospital.

Indeed, the only medical care villagers receive in the community is when nurses visit one village a week to immunise children against childhood diseases.

It is during these visits that sick villagers often take the opportunity to ask for help.

## Checking children's health

Mathieu Forgues, a medical student at Harvard Medical School, Boston, was invited to trial VSee remote ultrasound in two isolated villages.

"For many villagers, especially children, this is the only chance they will have to see a doctor because there may only be one pediatrician in the area," said Mathieu.

The Albert Schweitzer Fellow carried out ultrasound check-ups on children using the battery-powered VSee Telemedicine Field Kit and BGAN terminal.

As soon as he arrived at the settlements, he placed the BGAN terminal on flat ground facing the sky, and connected the VSee kit to the terminal via Ethernet cable.

Almost immediately, he was able to establish a communications link to HAS where Dr Jean-Daniels was waiting to consult on the relayed ultrasound images.

Mathieu asked for volunteers at the village and children had their eyes, ears and chests examined using the ultrasound. Thankfully, no problems were picked up.

However, the trial showed how well the kit worked in relaying good quality images and how reliable the satellite connectivity was.

It also demonstrated how vital the kit could be in identifying villagers who may need further

examinations or immediate treatment – either at the hospital or at home, thereby avoiding a long and strenuous journey.

## Vital role in fetal and maternal care

Mathieu also made a live VSee telemedicine call via BGAN between Dr Jean-Daniels at HAS and Sarosh Rana, Assistant Professor of Obstetrics, Gynecology and Reproductive Biology at Harvard Medical School.

Both doctors were able to review ultrasound images and consult in real-time on a healthy lady who was eight months pregnant.

The volunteer had come to pick up her two young children, a girl and a boy, who had been treated for malaria.

whether the mother has pre-eclampsia and to check the placenta and its position, the baby's growth and its position.

"If you can scan a pregnant lady three times during her pregnancy then the outcome is very different to someone who hasn't been scanned at all."

## Tough kit for tough conditions

The VSee kit comprises of an iPad, diagnostic tools and medical devices such as ultrasound, dermoscopes, otoscopes, stethoscopes, EKG monitors, allowing real-time medical images and readings to be sent across to doctors at hospitals anywhere in the world via BGAN.

The kit was specially created to withstand



Sarosh, who was able to check the baby's growth, position and the placenta using the ultrasound, said: "We asked if she wanted to find out what sex her baby was and she was very happy to learn it was a boy."

She added that telemedicine using ultrasound has a big role to play in obstetrics and maternal health in remote communities.

"So many young women lose their lives and when the mother dies there's a huge impact on her family.

"Using telemedicine and the ultrasound, you can look for fetal conditions and find out if it's a twin pregnancy, an ectopic pregnancy,

the sometimes harsh conditions that health workers can find themselves in when visiting the isolated villages.

It is lightweight, waterproof, and tough so that nurses, interns, or humanitarian workers can simply toss the kit into the boat without worrying about anything breaking or becoming waterlogged.

At the same time, it provides the same high quality video across four distinct camera feeds, allowing doctors to see both the patient and real-time medical images and readings, without an external video mixer or toggling between images.





## BGAN reliability

The kit's ability to help doctors treat patients in remote areas is dependent upon connectivity using Inmarsat's BGAN network.

BGAN provides users up to half-megabyte speed connectivity for voice and data anywhere in the world, using terminals that are no larger than the size of typical laptop.

Users can also choose from a portfolio of on-demand streaming rates, depending on the application they use.

Becky Wai, VSee's Director of Medical Services, praised BGAN's performance and Inmarsat's role.

"Inmarsat plays an essential role in extending medical services, remote health consultations or online health education and training to rural and remote areas that are otherwise without the internet," she said.

"The BGAN terminal is small enough to put it in a backpack and it's ready to use in less than a minute when on the field. There is no complicated setup and configuration - just pressing a few buttons.

"During the two trial visits to the village, Inmarsat was 100 per cent reliable, offering all needed services to link remote medical teams to city-based doctors."

Inmarsat is continuing its work with VSee and other partners, playing an important part in improving access to health services in under-developed countries.

## The future

On the back of the successful trials in Gabon, VSee is now working with remote Syrian refugees in Iraqi Kurdistan.

Doctors at the refugee camp in Domiz have been successfully treating hundreds of patients for a range of conditions using VSee, consulting with specialists from around the world.

It has also been working Shell Nigeria visiting its oil production rigs and oil fields to diagnose and treat patients.

## Enabling healthcare provision

BGAN can be used in remote medical centres, private clinics or hospitals for primary, secondary or tertiary care, or emergency responses, because it is available over Inmarsat's global 3G satellite network, which is completely independent of cellular or fixed connectivity.

Because of this always-available connectivity, it enables eHealth solutions in these areas to offer real time access to:

- Electronic health records
- eSurveillance systems
- eConsultation
- ePrescription
- Monitoring of vital signs
- Knowledge management systems
- eLearning
- Telemedicine

## BGAN at-a-glance

- BGAN is powered by the global Inmarsat-4 (I-4) satellite network, operating at 99.9 per cent availability
- BGAN offers Standard IP connectivity for email and web browsing
- A range of guaranteed streaming rates enables potential life-saving applications such as real-time videoconferencing
- Discreet plug-and-play terminals are easy to set up, with no technical expertise needed
- Power consumption is low and batteries, if used, can be recharged from a solar panel
- Choose from a range of monthly flat-rate customised price packages.

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