Establishing Access to Obstetric Ultrasound Services in Remote Areas through a teleradiology platform for reporting.

THE AGA KHAN UNIVERSITY

Uzma F Qureishi Tanveer Khan, Nidhi Leekha, Sudhir Vinayak

Aga Khan University Hospital, Nairobi Kenya

What and Why?

- Access to obstetric ultrasound services is challenging in remote areas due to a shortage of trained sonographers and radiologists, leading to delays in diagnosis and increased maternal and fetal morbidity and mortality.

- WHO[1] and FIGO recommends at least 1 or 2 screening obstetric ultrasounds before 24 weeks.

WHO recommendations on maternal and newborn care for a positive postnatal experience. Geneva: World Health Organization; 2022.

THE AGA KHAN UNIVERSITY

Study Objective

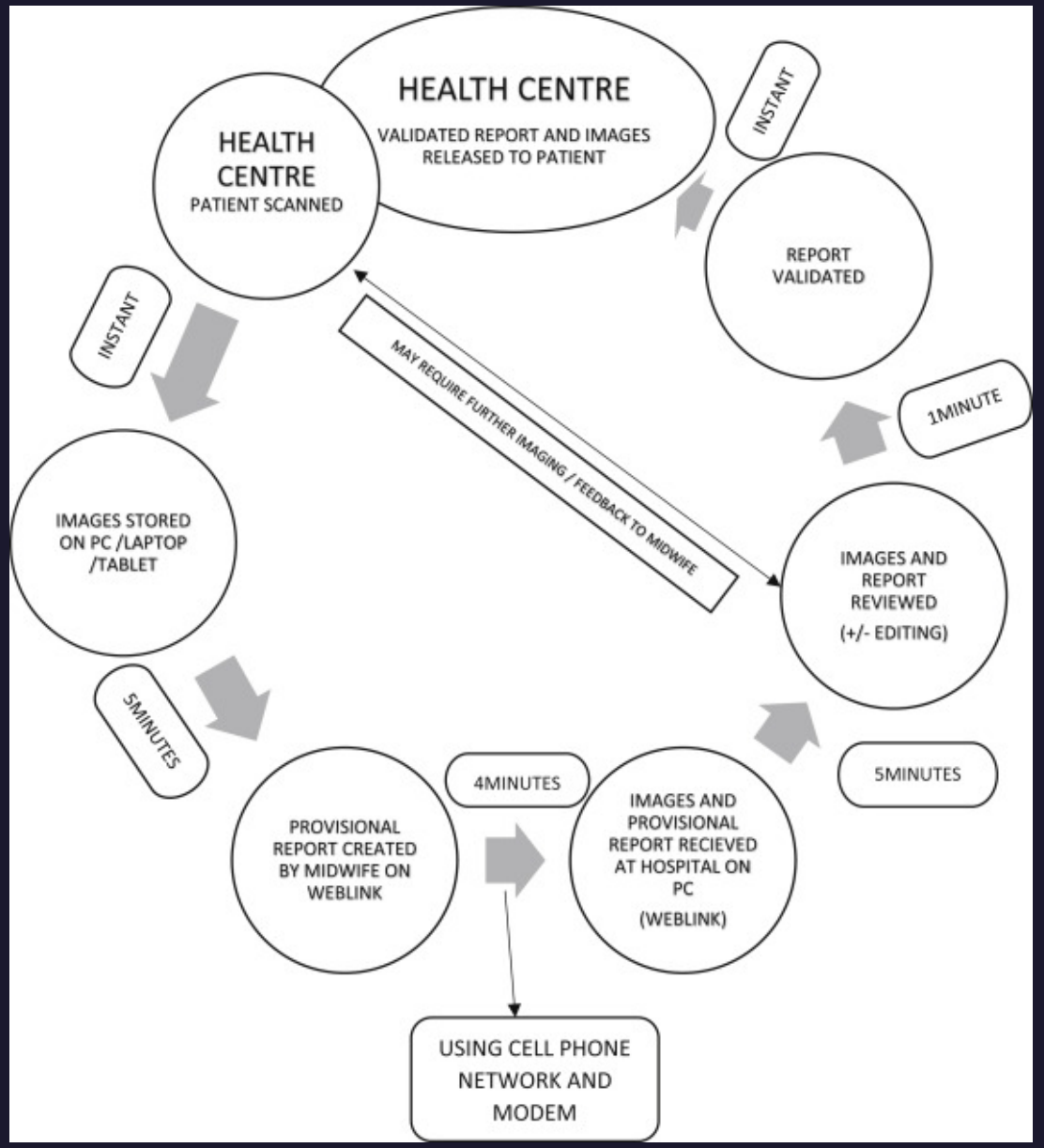
- Our primary study objective was to evaluate the performance of the VISIQ ultrasound scanner and a teleradiology platform for transmitting ultrasound images from remote clinics to radiologists.

- The secondary objective included assessing implementation a communication protocol for quality control and enhancing education and teleradiology for more effective examinations by inexperienced users.[2]

Vinayak S, Sande J, Nisenbaum H, Nolsøe CP. Training Midwives to Perform Basic Obstetric Point-of-Care Ultrasound in Rural Areas Using a Tablet Platform and Mobile Phone Transmission Technology—A WFUMB COE Project. Ultrasound Med Biol. 2017 Oct 1;43(10):2125–32 ple Footer Text

THE AGA KHAN UNIVERSITY

Methods



THE AGA KHAN UNIVERSITY

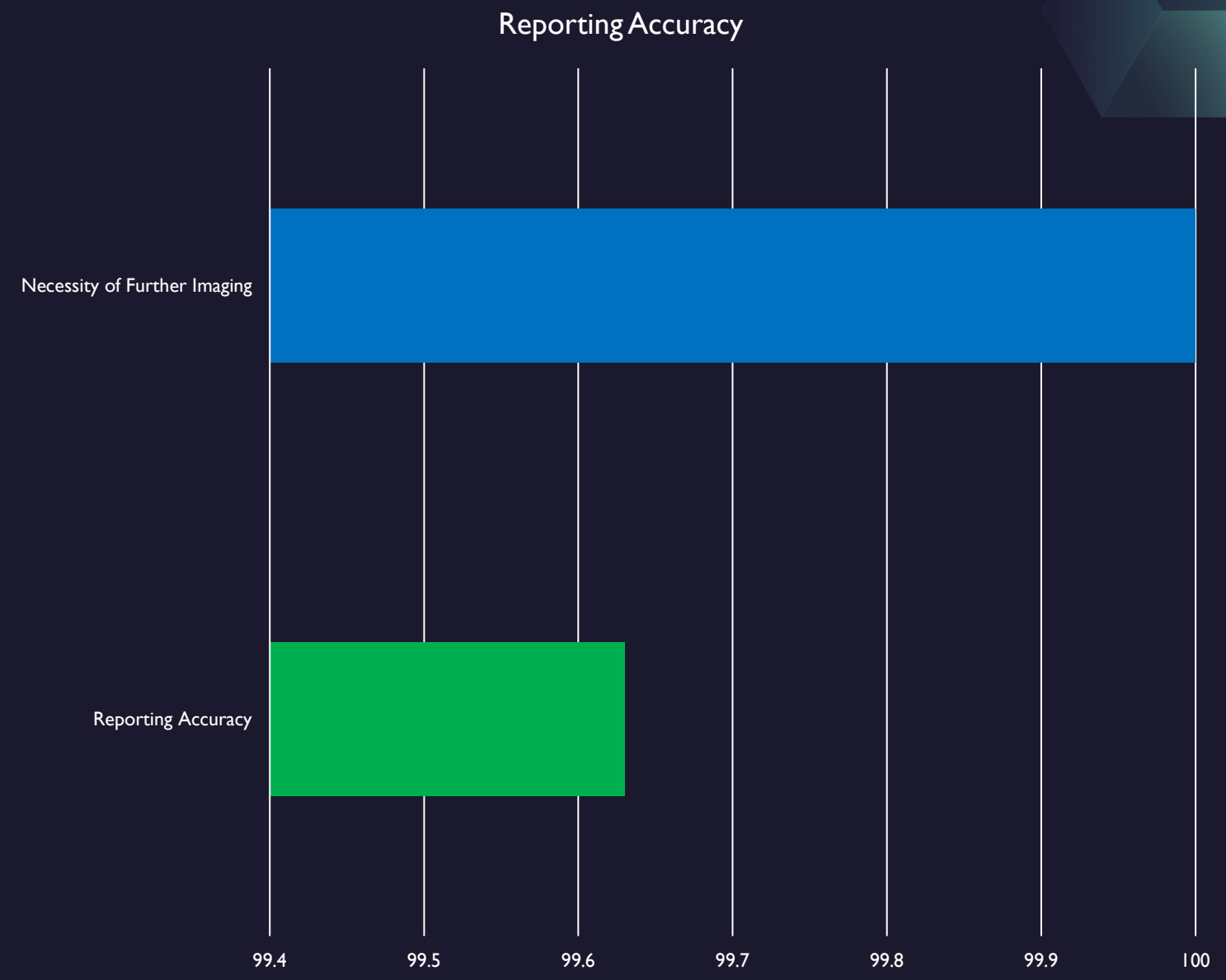
The study utilized Philips tablets, modems, computers, and a 3G network which connected all the equipment.

Most teleradiology solutions transfer lossy images; our challenge was to transfer lossless images which was achieved by modifying the teleradiology algorithm.

THE AGA KHAN UNIVERSITY

Results

- Reporting accuracy was 99.63% for scans performed by midwives, confirming that the training was adequate.
- Image data analysis also showed that no further imaging was necessary after radiologist review.



THE AGA KHAN UNIVERSITY

- Report validation took 15 minutes from time of scan completion. Study success was achieved with a 10-minute scan time and 35-minute maximum scan-to-report turnaround.

No problems arose with the equipment and no difference in transmission time, or image quality deterioration occurred.

THE AGA KHAN UNIVERSITY

Discussion

Study limitations:

- Small catchment area.
- Suboptimal website image quality.

Despite limitations, sufficient sample size for the study.

Technical setup:

- Midwives used high-resolution monitors for reporting images.
- Successful communication via cell phone with radiologists.
- Consistent availability of a stable cell phone signal.
- Distance from the primary hospital had no impact on transmission time or image quality.

Patient outcomes:

- Final outcomes for 220 patients determined through post-delivery tracing.
- 51 patients could not be contacted for final outcomes.

THE AGA KHAN UNIVERSITY

What Next? What More?

- Our project shows that lossless image transfer is possible and scale up projects are underway currently

- Mimba Yangu project being conducted in collaboration with Ministry of Health Kenya. With this we are doing image transfer from 14 sites (as compared to the 3 sites)

- Possibility of discussion with Ministry of Health Kenya for National policy

THE AGA KHAN UNIVERSITY

Lessons Learnt

Training	Training midwives to perform obstetric ultrasound exams can help practically address the shortage of sonologists and sonographers in resource-limited countries.
Collaborating	Collaborating with radiologists and using modern technology like cell phones can be cost-effective and efficient. Future research should focus on scalability, sustainability, and long-term impact.

THE AGA KHAN UNIVERSITY