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AI-Enabled Ultrasound Revolutionizes Gestational Age Estimation in Low-Resource Settings

CHAPEL HILL, N.C., August 1, 2024 – A groundbreaking study published today in the Journal of the American Medical Association (JAMA) demonstrates that artificial intelligence (AI) can enable novice users to estimate gestational age as accurately as expert sonographers, potentially transforming pregnancy care in low-resource settings.

Researchers from the University of North Carolina at Chapel Hill and the University of Zambia have shown that an AI-enabled, low-cost ultrasound device can provide accurate gestational age estimates when used by healthcare workers with minimal training. This innovation could significantly improve pregnancy care in areas where access to expert sonographers and high-end ultrasound machines is limited.

"This study represents a major step forward in our ability to provide quality prenatal care globally," said Dr. Jeffrey S. A. Stringer, lead author and professor of obstetrics and gynecology at UNC. "By combining AI with portable ultrasound technology, we're bringing expert-level diagnostics to regions that have long lacked access to such resources."

Key findings of the study include:

- The AI-enabled device produced gestational age estimates equivalent to those of expert sonographers using high-end machines between 14 and 37 weeks of pregnancy.
- Novice users could operate the device effectively after just one day of training.
- The technology performed well across diverse populations in Zambia and North Carolina, including in patients with high body mass index.

The study enrolled 400 pregnant individuals across sites in Zambia and North Carolina. The AI tool was integrated into the Butterfly IQ+ handheld ultrasound device, allowing for real-time, on-device analysis without the need for internet connectivity.

Dr. Margaret P. Kasaro, senior author and Country Director at UNC Global Projects Zambia, emphasized the potential impact: "In many low- and middle-income countries, women often don't receive an ultrasound during pregnancy. This technology could change that, helping to identify high-risk pregnancies and improve outcomes for mothers and babies."

The researchers note that while the tool performs well up to 37 weeks gestation, it is not recommended for use after that point. Future studies will explore its effectiveness in high-risk pregnancies and additional geographic locations.

This research was funded by the Bill and Melinda Gates Foundation. Butterfly Network, Inc. donated the Butterfly IQ+ ultrasound devices used in the study and collaborated closely with the researchers to integrate the AI model into the device software.

About the University of North Carolina at Chapel Hill: The University of North Carolina at Chapel Hill, the nation's first public university, is a global higher education leader known for innovative teaching, research and public service. Its Division of Global Women's Health, housed within the Department of Obstetrics and Gynecology, has a more than 20 year research collaboration with the Women and Newborn Hospital in Lusaka.

About the University of Zambia: The University of Zambia is the largest and oldest public university in Zambia, known for its commitment to excellence in teaching, research, and community service. It plays a crucial role in addressing national and regional development challenges through innovative research and education.

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