Can AI-enhanced heart screening address health disparities?

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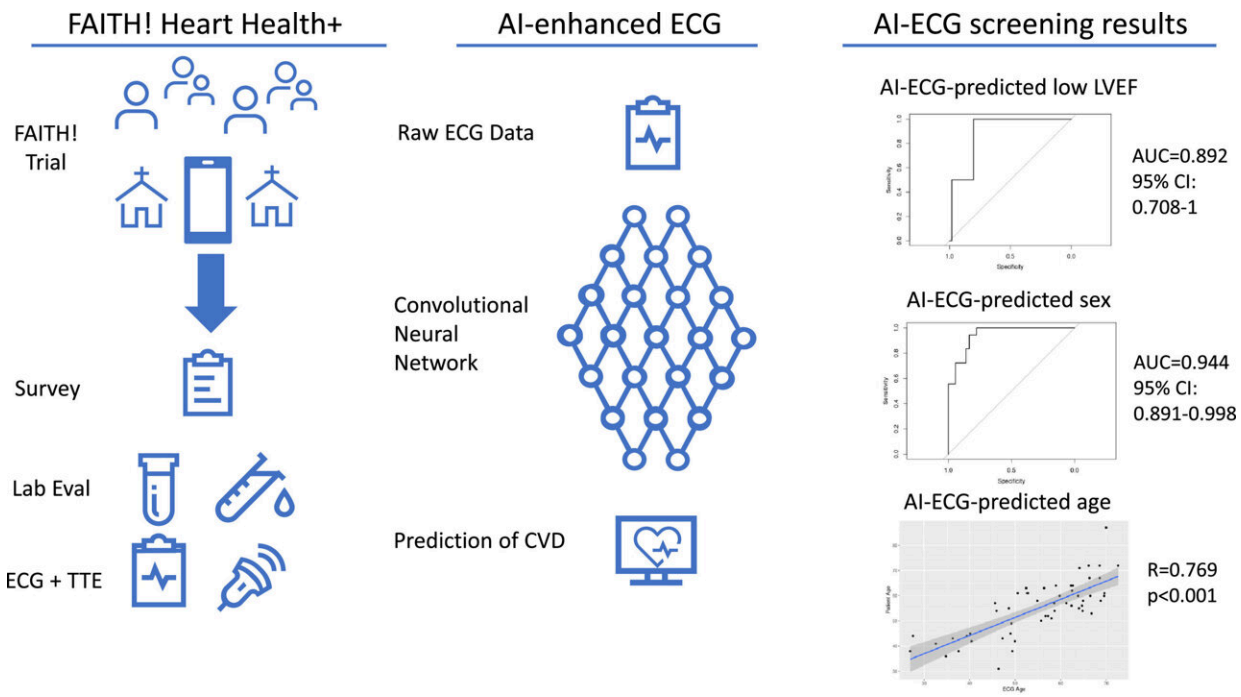

Successful community-based approach to cardiovascular disease screening by artificial intelligence-enhanced electrocardiograms in an underserved population of African-Americans. Credit: *American Journal of Preventive Cardiology* (2022). DOI: 10.1016/j.ajpc.2022.100431

Clinicians and researchers around the world are combining artificial intelligence, known as AI, with health care to help identify patients at greater risk of cardiovascular diseases, such as stroke and heart failure.

However, as use of these AI-enhanced tools grows, researchers at Mayo Clinic are asking, "Do these tools work reliably for people of color?" and "Are they accessible in community health care settings?"

"AI-based health interventions are frequently developed and deployed without race-specific data analysis or validation," says David Harmon, M.D., Mayo Clinic cardiology fellow. "It's important to make sure these tools are reliable and accessible to all, particularly people of color who are disproportionately affected by cardiovascular disease."

Dr. Harmon is first author of a recently published proof-of-concept study examining the use of AI-enhanced electrocardiograms, known as AI-ECGs, for cardiovascular health screening among African Americans. The researchers found that the AI-ECG "demonstrated excellent performance" in this population and that administering it in a community-based setting showed promise.

Signals and patterns a human might not perceive

ECGs record electrical signals from the heart, which are interpreted to check for heart disease. AI can help enhance the interpretation and diagnostic efficiency of ECGs, using algorithms trained to detect signals and patterns in ECGs a human might not be able to perceive.

In this study, each participant underwent a standard ECG and a limited transthoracic echocardiogram. Then, both a trained human interpreter and an AI-ECG tool analyzed the results. Comparing these analyses, the researchers found that the delivery of the AI-ECG worked reliably in a community setting. Participants indicated high enthusiasm and interest, and 86% were able to complete the screening within the study period.

Dr. Harmon says the study provides a promising proof-of-concept with significant implications for patient care and future research. Since ECGs

are already routine procedures in most clinical settings, using AI to enhance diagnostic efficiency has the potential to improve the early diagnosis of cardiovascular disease for everyone, particularly for the people and communities at greatest risk. The study also establishes a framework for larger studies to identify risk factors that could affect the performance of AI-ECGs and other AI-enhanced screening tools.

The study, published in the *American Journal of Preventive Cardiology*, was part of a clinical trial and a community-driven research program called Fostering African American Improvement in Total Health, known as FAITH! Led by LaPrincess Brewer, M.D., a Mayo preventive cardiologist, FAITH! aims to address cardiovascular health disparities in African American communities. Brewer is the senior author of the proof-of-concept study.

New clarity at a community gathering

Clarence Jones, a community health advocate and co-author of the study, was in the audience when Mayo researchers presented the results of the AI-ECG research at a community gathering. "It was like the AI light was switched on for many people about what had been accomplished, how they could continue to be involved, and what expanded cardiovascular exams could mean for their health," says Jones.

Jones is proud of what Mayo researchers and community members have achieved together. "Community members are getting to see that their participation is important and can make a difference in addressing their health and the health of their community," he says.

More information: David M. Harmon et al, Community-based participatory research application of an artificial intelligence-enhanced electrocardiogram for cardiovascular disease screening: A FAITH! Trial ancillary study, *American Journal of Preventive Cardiology* (2022). DOI:

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