PRESS RELEASE

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"Say Hello" to Non-Invasive Screening: New AI Tool Identifies Diabetes Using Voice Analysis

Luxembourg researchers reveal how vocal analysis could revolutionize Type 2 Diabetes screening.

The Luxembourg Institute of Health (LIH) Deep Digital Phenotyping Research Unit has developed a voice-based artificial intelligence algorithm capable of detecting Type 2 Diabetes with remarkable accuracy. By analyzing subtle vocal changes, this non-invasive and cost-effective method could make diabetes screening accessible to millions, especially in underserved communities.

Type 2 Diabetes (T2D) is one of the most pressing current public health problems, with an estimated 400 million undiagnosed cases worldwide. The consequences of delayed diagnosis are severe and can result in further complications like cardiovascular disease and neuropathy, leading to higher healthcare costs and increased mortality. Current screening methods rely on blood tests, which can be costly and logistically difficult in settings with limited resources.

Addressing this challenge, a team of researchers led by Abir Elbeji and Dr. Guy Fagherazzi from the Luxembourg Institute of Health's Deep Digital Phenotyping Unit has developed an original approach that relies on distinguishing subtle changes in one's voice. Using advanced machine learning techniques, they identified vocal biomarkers that correlate with T2D, offering a glimpse into the future of non-invasive, scalable, and affordable health screening where T2D could be diagnosed using a simple voice recording.

[The study, published on 19 December in the journal PLOS Digital Health](#) and part of the larger Colive Voice programme, analyzed speech recordings of over 600 participants in the United States. Using artificial intelligence (AI) algorithms, the team achieved a predictive accuracy comparable to the risk score widely used by the American Diabetes Association (ADA). Notably, detection rates were even better in key demographics, including women over 60 and individuals with hypertension.

"This research represents a major step in diabetes care. By combining AI with digital phenotyping, we are ushering in a more inclusive and cost-effective approach to early diagnosis and prevention. The ability to screen for diabetes using a simple voice recording could dramatically improve healthcare accessibility for millions of people around the world," said Dr. Guy Fagherazzi.

In the future, the researchers aim to refine the algorithm for early detection of prediabetes and undiagnosed T2D cases. Plans are also underway to expand the programme to other populations and languages. The Colive Voice study, a multilingual and inclusive program, has already established itself as an early leader in exploring vocal biomarkers for diagnosing various chronic conditions.

Funding and collaborations

This study was supported by the French-speaking Diabetes Society, the Luxembourg Diabetes Society and the Luxembourg Diabetes Association.

About Colive Voice

Colive Voice is the flagship project from the Department of Precision Health of the LIH. By integrating advanced AI and innovative methodologies, the program seeks to leverage voice as a non-invasive biomarker for screening and monitoring chronic diseases, including diabetes, neurodegenerative conditions, and others. Anyone above the age of 15 can participate and donate their voice: https://www.colivevoice.org

About the Luxembourg Institute of Health (LIH)

The Luxembourg Institute of Health (LIH) is a public biomedical research organisation focused on precision health and invested in becoming a leading reference in Europe for the translation of scientific excellence into meaningful benefits for patients.

The LIH places the patient at the heart of all its activities, driven by a collective obligation towards society to use knowledge and technology arising from research on patient derived data to have a direct impact on people's health. Its dedicated teams of multidisciplinary researchers strive for excellence, generating relevant knowledge linked to immune related diseases and cancer.

The institute embraces collaborations, disruptive technology and process innovation as unique opportunities to improve the application of diagnostics and therapeutics with the long-term goal of preventing disease.

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