Embargoed until Friday, June 5, 2026, at 6:30 p.m. CT

Machine Learning Model Accurately Predicts Long-Term Risk of Type 2 Diabetes

Study of Over Three Million Patients for Risk of Type 2 Diabetes Demonstrates Potential for More Advanced Approach to Early Identification

NEW ORLEANS, La. (June 5, 2026) – A novel electronic health record-based prediction model successfully identified patients who were at the highest risk of developing type 2 diabetes up to 10 years later. Researchers presented the findings in a general poster session and an e-Poster Theater session at the 2026 Scientific Sessions of the American Diabetes Association® (ADA) in New Orleans.

Over 60% of U.S. adults have risk factors for type 2 diabetes, far more than current diabetes prevention programs can realistically serve. Since diabetes often develops gradually over many years without clear warning signs, it can be difficult for healthcare systems and professionals to identify those most at risk who would benefit from prevention programs or early treatment.

The retrospective cohort study included 3,365,464 adults aged 18–70 receiving care at Kaiser Permanente Northern California from 2012 to 2024. The median patient age was 39, and 55% of patients were female. The study used a hazard-based super learning approach that combined multiple survival-analysis models to estimate each patient's risk of developing type 2 diabetes over the next one, three, and 10 years. The model used clinical and demographic information routinely collected at medical visits, such as age, weight, blood glucose (blood sugar) levels, medical history, and medications, along with publicly available data such as access to healthy food and walkable areas.

During a median follow-up of 5.4 years, the study found a type 2 diabetes incidence of 10.7/1,000 person-years. The training model effectively identified adults at high risk for type 2 diabetes with an area under the curve of 0.886 (95% CI: 0.883–0.888). The validation model scored 0.883 (95% CI: 0.88–0.886). The one-year follow-up resulted in a near-ideal calibration (mean predicted risk 1.03% vs. observed 1.01%). At the threshold defining high risk (>1.2% risk), the model had a sensitivity of 74% and a specificity of 82% over up to 10 years of follow-up.

"These findings represent a potential advancement over existing approaches for identifying individuals at risk of developing type 2 diabetes by enabling earlier, more precise detection and supporting a more targeted, proactive approach to prevention," said Luis A. Rodriguez, PhD, MPH, RD, lead author of the study. "Our model has the

potential to create an opportunity for clinicians and health systems to focus prevention efforts on the high-risk individuals often missed by traditional screening who have the most to gain from prevention and treatment."

The authors intend to test the model in a clinical setting to see if it helps increase engagement in type 2 diabetes prevention programs and reduce diabetes incidence.

Research Presentations Details

2321-P - Machine-Learning Modeling for T2DM Prediction in over 3 Million Adults [Board No. 2321]

- Luis A. Rodriguez, PhD, MPH, RD
- General poster session
- Saturday, June 6 from 12:30-1:30 p.m. CT
- Ernest N. Morial Convention Center, Poster Hall (Halls D-E)

2321-P - Machine-Learning Modeling for T2DM Prediction in over 3 Million Adults [Board No. 2321]

- Luis A. Rodriguez, PhD, MPH, RD
- e-Poster Theater - Diabetes Risk and Prediction: One Size Does Not Fit All
- Sunday, June 7 from 12:30-1:30 p.m. CT
- Ernest N. Morial Convention Center, ePoster Theater B (Halls B1-C)

###

About American Diabetes Association's 2026 Scientific Sessions
The ADA's 2026 Scientific Sessions, the world's largest scientific meeting focused on diabetes research, prevention, and care, will be held in New Orleans, LA, from June 5-8. Thousands of leading physicians, scientists, and healthcare professionals from around the world are expected to convene both in person and virtually to unveil cutting-edge research, treatment recommendations, and advances toward a cure for diabetes. Attendees will receive exclusive access to thousands of original research presentations and take part in provocative and engaging exchanges with leading diabetes experts. Join the Scientific Sessions conversation on social media using #ADASciSessions.

About American Diabetes Association
The American Diabetes Association (ADA) is the nation's leading voluntary health organization fighting to end diabetes and helping people thrive. This year, the ADA celebrates 85 years of driving discovery and research to prevent, manage, treat, and ultimately cure diabetes—and we're not stopping. There are over 155 million Americans living with diabetes or prediabetes. Through advocacy, program development, and education, we're fighting for them all. To learn more or to get involved, visit us at diabetes.org or call 1-800-DIABETES (800-342-2383). Join us in the fight on Facebook (American Diabetes Association), Spanish Facebook (Asociación Americana de la Diabetes), LinkedIn (American Diabetes Association), and Instagram

(@AmDiabetesAssn). To learn more about how we are advocating for everyone affected by diabetes, visit us on X (@AmDiabetesAssn). (@AmDiabetesAssn). To learn more about how we are advocating for everyone affected by diabetes, visit us on X (@AmDiabetesAssn).