

# Prediction of Type 2 Diabetes by Hemoglobin A1c in Two Community-Based Cohorts

## Background

- Hemoglobin A1c (HbA1c) level has been adopted as a diagnostic criterion for type 2 diabetes (T2D).<sup>1,3</sup>
- HbA1c has several advantages over traditional fasting glucose testing; it reflects average blood glucose level over time, but does not require a fasting blood sample.
- However, the use of HbA1c for assessing T2D risk in various clinical and non-clinical (eg, pharmacy, point-of-care testing at a medical center) settings has not been thoroughly evaluated.
- **Objective:** The investigators evaluated the association of HbA1c with incident T2D in the context of 4 “real-world” clinical and non-clinical scenarios.

## Methods

- The study population included 11,244 white and 2,294 black middle-aged, non-diabetic participants from 2 community-based studies. The Framingham Heart Study (FHS) included white participants, and the Atherosclerosis Risk in Communities (ARIC) Study included white and black participants.
- The association of HbA1c with incident T2D, defined as fasting glucose  $\geq 126$  mg/dL or T2D medication use, was determined for 4 scenarios adjusting for different sets of risk factors:
  - Scenario 1: age and sex
  - Scenario 2: age, sex, and fasting laboratory tests (fasting glucose, high-density lipoprotein, and triglyceride levels)
  - Scenario 3: age, sex, and clinical data (body mass index, blood pressure, and T2D family history)
  - Scenario 4: all of the covariates listed above
- Statistical analyses included logistic regression analysis, generalized estimating equations, and random-effects meta-analysis.

## Results

- In all 4 scenarios, each 1% increase in HbA1c level was associated with an increased T2D risk for both white and black study participants (2.7- to 4.5-fold).
- HbA1c improved the predictive performance in both studies:
  - FHS: In scenarios 1 and 3
  - ARIC: In all 4 scenarios and in both races
- HbA1c level was associated with higher T2D risk in both white and black study participants in the short term (within 8 years of baseline visit) and in the long term (more than 8 years after baseline visit).

## Conclusions

- HbA1c predicted T2D risk independently of clinical and laboratory factors (including fasting glucose) that are routinely collected in clinical and non-clinical settings.
- HbA1c is a useful tool for identifying and targeting high-risk populations for preventive care.

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### Webpage

<http://care.diabetesjournals.org/content/early/2017/10/24/dc17-0607>

### References

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