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Is There a Problem with The PREVENT Cardiovascular Risk Model?

LETTER TO THE EDITOR

To the Editor,

The PREVENT equation of the American Heart Association, developed and validated by Khan et al,[1] enables effective discrimination between cardiovascular, renal, and metabolic diseases in a cohort of over 6 million individuals, taking into account race-independent, age- and sex-specific demographic characteristics. Moreover, by incorporating additional risk factors such as body mass index, estimated glomerular filtration rate, and the social deprivation index, it offers a comprehensive approach to cardiovascular disease (CVD) risk assessment and prevention. In another study by Khan et al,[2] PREVENT was reported to be the current best risk prediction system, accurately and precisely estimating CVD risk. Additionally, in a study aiming to evaluate the performance of PREVENT across different racial and ethnic groups, PREVENT demonstrated good discrimination and calibration in selected subgroups.[3]

The PREVENT calculator, a new CVD risk assessment tool, can be accessed at: https://professional.heart.org/en/guidelines-and-statements/prevent-calculator. The calculator provides estimates for 10-year CVD risk and 10-year atherosclerotic cardiovascular disease (ASCVD) risk.

A simulation study to compare PREVENT with other risk prediction models was conducted. During this study, it was observed that in the 10-year ASCVD risk calculation using the PREVENT equation, the estimated 10-year ASCVD risk increased as total cholesterol (TC) increased while high-density lipoprotein cholesterol (HDL-C) and systolic blood pressure (SBP) remained constant. However, in the 10-year CVD risk calculation, the estimated 10-year CVD risk decreased when TC increased, despite HDL-C and SBP remaining constant, contrary to the expectation (Table 1).

The same inverse relationship was observed in female patients, both smokers and non-smokers. While the 10-year CVD risk was expected to increase with rising TC, it consistently decreased. It was not certain whether this result arises from other parameters not included in the calculation. Nevertheless, such a subtle inverse trend warrants further investigation.

It has been reported that 10-year ASCVD risk results obtained using PREVENT are generally lower than those from other models and that the system incorporates more variables, is easy to apply, and has an impact on medication use and lifestyle modifications.[1,2]

Recent developments have also led to online systems that not only estimate risk using the PREVENT system but also calculate PREVENT "risk age." Comparing individuals' chronological age with their calculated risk age, in addition to evaluating absolute risk scores, may help characterize the effects of risk factors.[4] In studies explaining the effects of cardiovascular risk factors, clinical models are increasingly being evaluated alongside machine learning models to assess risk factors that may influence disease progression, enable early diagnosis, and predict patient outcomes.[5] Based on these findings, such an approach can contribute to the implementation of preventive treatments and decision-making

Yasemin Atıcı[1]
Makbule Beyza Şen[2]
Doğan Yücel[1]

[1]*Department of Medical Biochemistry, Lokman Hekim University, Faculty of Medicine, Ankara, Türkiye*
[2]*Department of Biochemistry, Lokman Hekim University, Faculty of Pharmacy, Ankara, Türkiye*

Corresponding author:
Yasemin Atıcı
✉ yasemin.atici@lokmanhekim.edu.tr

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Table 1. 10-Year Estimated CVD Risk in a 75-Year-Old Man

HDL-C (mg/dL)	Risk of CVD (Age: 75, No Smoking, Male) (%)						SBP (mm Hg)
100	18.6	18.3	17.8	17.4	16.9	16.5	**160**
60	20.3	19.9	19.4	18.9	18.5	18.0	**150**
50	19.9	19.5	19.1	18.6	18.1	17.7	**140**
45	19.2	18.9	18.4	18.0	17.5	17.1	**130**
35	18.9	18.6	18.1	17.6	17.2	16.8	**120**
20	26.5	26.0	25.4	24.8	24.3	23.7	**90**
	130	**160**	**200**	**240**	**280**	**320**	
			Total Cholesterol (mg/dL)				
HDL-C (mg/dL)	**Risk of CVD (Age: 75, Smoking, Male) (%)**						**SBP (mm Hg)**
100	22.9	22.5	22.0	21.4	20.9	20.4	**160**
60	24.8	24.4	23.8	23.2	22.7	22.1	**150**
50	24.4	24.0	23.4	22.8	22.3	21.8	**140**
45	23.6	23.2	22.6	22.1	21.6	21.1	**130**
35	23.2	22.8	22.3	21.7	21.2	20.7	**120**
20	31.8	31.3	30.7	30.0	29.4	28.7	**90**
	130	**160**	**200**	**240**	**280**	**320**	
			Total Cholesterol (mg/dL)				

processes, including lifestyle modifications or appropriate interventions.

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REFERENCES

1. Khan SS, Matsushita K, Sang Y, et al. Development and validation of the American Heart Association's PREVENT equations. *Circulation*. 2024;149(6):430-449. [CrossRef]
2. Khan SS, Lloyd-Jones DM. Statins for primary prevention of cardiovascular disease—with PREVENT, what's a clinician to do? *JAMA*. 2024;332(12):961-962. [CrossRef]
3. Yan X, Bacong AM, Huang Q, et al. Performance of the American Heart Association's PREVENT equations among disaggregated racial and ethnic subgroups. *JAMA Cardiol*. 2025;10(9):876-885. [CrossRef]
4. Krishnan V, Huang X, Perak AM, et al. PREVENT risk age equations and population distribution in US adults. *JAMA Cardiol*. 2025;10(9):962-964. [CrossRef]
5. Kırboğa KK, Küçüksille EU. Identifying cardiovascular disease risk factors in adults with explainable artificial intelligence. *Anatol J Cardiol*. 2023;27(11):657-663. [CrossRef]