Individualized risk prediction for type 2 diabetes

C-statistics (95% confidence interval) were 65.30 (61.97 68.62) and 60.97 (57.64 64.29) for FPG and Hba1c, respectively, for internal validation. In external validation, the respective C-statistics were 77.21 (68.20 86.21) and 67.11 (55.08 79.13). Noting that the combination of FPG and Hba1c consistently obtained higher C-statistic and index of prediction accuracy compared to the individual variables, we replicated our main analysis with an additional model that was restricted to these two predictors (Table R1)

Table R1. Comparison of the individualized model with standard model.

| **Evaluation statistic1** | **Internal Validation2** | | | **External Validation3** | | |
| --- | --- | --- | --- | --- | --- | --- |
| **FPG + Hba1c** | **Standard** | **Individualized** | **FPG + Hba1c** | **Standard** | **Individualized** |
| Overall | | | | | | |
| AUC | 66.8 (63.6 70.0) | 69.8 (66.7 73.0) | 70.7 (67.6 73.9) | 85.4 (82.8 88.0) | 85.8 (83.3 88.3) | 85.6 (83.0 88.1) |
| IPA | 6.1 | 9.9 | 10.4 | 18.0 | 18.8 | 18.6 |
| Women | | | | | | |
| AUC | 66.0 (62.1 70.0) | 68.4 (64.6 72.3) | 69.6 (65.8 73.4) | 85.5 (81.7 89.4) | 85.9 (82.1 89.7) | 85.7 (81.8 89.5) |
| IPA | 5.6 | 8.2 | 9.1 | 18.8 | 19.2 | 18.9 |
| Men | | | | | | |
| AUC | 69.2 (63.6 74.8) | 72.8 (67.3 78.2) | 73.2 (67.7 78.7) | 85.2 (81.8 88.7) | 85.9 (82.5 89.2) | 85.6 (82.3 89.0) |
| IPA | 7.2 | 13.3 | 13.1 | 17.2 | 18.4 | 18.4 |
| NH-Black Race | | | | | | |
| AUC | 64.9 (55.9 74.0) | 69.1 (60.8 77.5) | 71.6 (63.6 79.7) | 83.9 (78.8 88.9) | 85.4 (80.7 90.1) | 85.2 (80.5 90.0) |
| IPA | 4.0 | 6.7 | 7.1 | 16.8 | 17.5 | 17.4 |
| NH-White Race | | | | | | |
| AUC | 68.9 (64.9 72.8) | 70.9 (67.0 74.8) | 71.2 (67.3 75.2) | 87.4 (83.3 91.5) | 87.8 (83.9 91.6) | 87.5 (83.6 91.4) |
| IPA | 7.4 | 11.0 | 11.5 | 19.2 | 19.9 | 19.7 |
| Hispanic Race | | | | | | |
| AUC | 63.7 (56.0 71.4) | 67.4 (59.8 75.1) | 69.4 (62.0 76.7) | 84.5 (79.4 89.6) | 84.1 (78.6 89.5) | 83.8 (78.3 89.4) |
| IPA | 4.2 | 9.1 | 9.6 | 16.0 | 17.8 | 17.5 |
| Other Race | | | | | | |
| AUC | 61.5 (47.2 75.8) | 65.1 (50.1 80.1) | 69.0 (54.5 83.6) | 85.5 (77.0 94.0) | 85.7 (77.4 94.0) | 85.5 (77.1 93.9) |
| IPA | 1.3 | 7.5 | 8.7 | 21.5 | 21.2 | 20.6 |
| Abbreviations: AUC = Area underneath the receiver-operator characteristic curve; and IPA = Index of prediction accuracy | | | | | | |
| 1Table values are scaled by a factor of 100 for ease of interpretation. | | | | | | |
| 2Internal validation results are based on 10-fold cross-validation in the Diabetes Prevention Program data | | | | | | |
| 3External validation results are based on application of models fitted to the Diabetes Prevention Program data to the Multi-Ethnic Study of Atherosclerosis data. | | | | | | |

We examined the cumulative incidence of diabetes by age groups (age < 55 years, age 55 to 65 years, and age > 65 years) in the DPP. We did not detect a difference in the cumulative incidence curves (Figure R1; p = 0.18). We also did not detect an assocation between continuous age and incident diagnosis of diabetes in a Cox regression model with adjustment for sex, eduction, triglycerides, BMI, Hba1c, fasting plasma glucose, and randomized treatment (p = 0.67). With the same multivariable adjustment, we did not detect a heterogeneous effect of lifestyle intervention or metformin across age groups (p = 0.28).

Figure R1: Cumulative incidence of diabetes diagnosis in the DPP by age group.

