

## Supplementary Method

### Permutation test of area under the curve

We performed permutation test of area under the curve (AUC) of clinic-genetic model in obese group to identify whether the AUC is valid or not. First, we permuted diabetes status of obese group and estimated AUC of the data with the permuted disease status 1,000 times. Second, we randomly sampled the same number of obese group from normal and overweight group, and permuted diabetes status. The *P* value of the permutation test is

$$P = \frac{n(\text{permAUC} > \text{oriAUC})}{n\text{Perm}}$$

where *permAUC* is a AUC with permuted diabetes status, and *oriAUC* is AUC of clinico-genetic model in obese group. *n()* is number of *permAUC* > *oriAUC*, and *nPerm* is number of permutation (1,000).

**Supplementary Table 1.** Comparison of sex, age, and BMI between normal and diabetes group

	Total	Control	DM	<i>P</i> value
Sex	6,438/7,588	5,382/6,652	1,056/936	7.27E-12
Age, yr	54.22±9.23	53.77±9.2	56.95±8.31	2.57E-52
BMI, kg/m <sup>2</sup>	24.35±3.09	24.18±3.03	25.38±3.22	1.53E-52

BMI, body mass index; DM, diabetes mellitus.