

[Supplementary materials]

Table S1 Effect size of AST/ALT on diabetes in prespecified and exploratory subgroups

		N	Model 1 ^a	P for interaction	Model 2 ^b	P for interaction	Model 3 ^c	P for interaction
Sex				<0.0001		0.2128		<0.0001
Men			0.42 (0.36, 0.50) <0.0001		0.30 (0.25, 0.36) <0.0001		0.86 (0.73, 1.01) 0.0731	
Women			0.20 (0.16, 0.25) <0.0001		0.37 (0.29, 0.46) <0.0001		0.44 (0.35, 0.55) <0.0001	
Age (y)				<0.0001		<0.0001		<0.0001
20 to <30			0.10 (0.04, 0.27) <0.0001		0.14 (0.05, 0.38) <0.0001		0.23 (0.09, 0.61) 0.0033	
30 to <40			0.04 (0.02, 0.06) <0.0001		0.07 (0.04, 0.11) <0.0001		0.10 (0.06, 0.17) <0.0001	
40 to <50			0.09 (0.06, 0.12) <0.0001		0.16 (0.12, 0.23) <0.0001		0.18 (0.13, 0.26) <0.0001	
50 to <60			0.24 (0.18, 0.31) <0.0001		0.42 (0.33, 0.55) <0.0001		0.39 (0.30, 0.51) <0.0001	
60 to <70			0.46 (0.35, 0.60) <0.0001		0.76 (0.58, 0.98) 0.0380		0.73 (0.55, 0.96) 0.0234	
≥70			0.42 (0.29, 0.61) <0.0001		0.64 (0.44, 0.92) 0.0172		0.58 (0.40, 0.84) 0.0038	

BMI (kg/m²)			0.0002	0.7415	0.0215
<18.5	5171	0.63 (0.18, 2.22)	0.72 (0.21, 2.42)	0.63 (0.17, 2.34)	
		0.4680	0.5970	0.4933	
≥18.5, <24	47942	0.43 (0.34, 0.54)	0.41 (0.32, 0.52)	0.51 (0.40, 0.64)	
		<0.0001	<0.0001	<0.0001	
≥24, <28	26134	0.73 (0.61, 0.88)	0.43 (0.35, 0.53)	0.77 (0.64, 0.93)	
		0.0010	<0.0001	0.0076	
≥28	6898	0.91 (0.69, 1.21)	0.38 (0.27, 0.53)	0.83 (0.62, 1.10)	
		0.5298	<0.0001	0.1955	
FPG (mmol/l)			<0.0001	0.1735	0.0044
<6.1	83472	0.33 (0.28, 0.39)	0.24 (0.20, 0.29)	0.60 (0.51, 0.72)	
		<0.0001	<0.0001	<0.0001	
≥6.1	2673	0.62 (0.51, 0.75)	0.29 (0.24, 0.37)	0.87 (0.72, 1.06)	
		<0.0001	<0.0001	0.1764	
SBP			<0.0001	<0.0001	<0.0001
<140	77054	0.23 (0.20, 0.27)	0.28 (0.23, 0.33)	0.51 (0.44, 0.60)	
		<0.0001	<0.0001	<0.0001	
≥140	9091	0.77 (0.63, 0.94)	0.48 (0.38, 0.61)	1.34 (1.10, 1.64)	
		0.0093	<0.0001	0.0033	
DBP			<0.0001	0.4360	0.0280
<90	79154	0.29 (0.25, 0.33)	0.32 (0.27, 0.38)	0.67 (0.58, 0.77)	
		<0.0001	<0.0001	<0.0001	
≥90	9091	0.60 (0.45, 0.79)	0.37 (0.27, 0.50)	0.94	
		0.0002	<0.0001		

			(0.72, 1.24)		
			0.6831		
Smoking statue			0.2021	0.7571	0.5540
Current smoker	4081	0.53 (0.32, 0.87)	0.38 (0.23, 0.61)	1.01 (0.62, 1.64)	
		0.0119	<0.0001	0.9724	
		0.27 (0.08, 0.90)	0.21 (0.06, 0.72)	0.60 (0.19, 1.89)	
Ever smoker	972	0.0339	0.0131	0.3833	
		0.30 (0.22, 0.42)	0.30 (0.21, 0.42)	0.69 (0.50, 0.95)	
		<0.0001	<0.0001	0.0211	
Never smoker	16471	0.29 (0.26, 0.34)	0.33 (0.28, 0.39)	0.70 (0.60, 0.81)	
		<0.0001	<0.0001	<0.0001	
Drinking statue			0.4455	0.7440	0.6206
Current drinker	596	0.70 (0.24, 2.06)	0.31 (0.11, 0.88)	1.19 (0.40, 3.58)	
		0.5134	0.0277	0.7521	
		0.23 (0.11, 0.48)	0.30 (0.15, 0.60)	0.55 (0.28, 1.10)	
Ever drinker	3750	<0.0001	0.0008	0.0931	
		0.31 (0.23, 0.41)	0.28 (0.21, 0.38)	0.78 (0.58, 1.04)	
		<0.0001	<0.0001	0.0888	
Never drinker	17205	0.29 (0.26, 0.34)	0.34 (0.29, 0.40)	0.70 (0.60, 0.81)	
		<0.0001	<0.0001	<0.0001	
No record	64621				
Family history of diabetes			0.2141	0.1175	0.7714

No	84423	0.31 (0.27, 0.35) <0.0001	0.33 (0.29, 0.38) <0.0001	0.72 (0.63, 0.83) <0.0001
Yes	1722	0.20 (0.10, 0.40) <0.0001	0.18 (0.09, 0.39) <0.0001	0.66 (0.34, 1.26) 0.2056
Triglyce ride (mmol/l)			0.0072	0.8620
<0.82	28504	0.34 (0.23, 0.48) <0.0001	0.36 (0.24, 0.52) <0.0001	0.55 (0.39, 0.80) 0.0014
≥0.82, <1.38	28879	0.48 (0.38, 0.61) <0.0001	0.37 (0.29, 0.48) <0.0001	0.78 (0.62, 0.99) 0.0402
≥1.38	28762	0.62 (0.52, 0.73) <0.0001	0.40 (0.33, 0.48) <0.0001	0.92 (0.78, 1.09) 0.3519
HDL-c (mmol/l)			0.8035	0.8507
<1.34	23656	0.32 (0.26, 0.39) <0.0001	0.33 (0.26, 0.42) <0.0001	0.67 (0.54, 0.84) 0.0004
≥1.34	62489	0.31 (0.26, 0.36) <0.0001	0.32 (0.27, 0.38) <0.0001	0.78 (0.67, 0.91) 0.0015
LDL (mmol/l)			<0.0001	0.0288
<2.8	64277	0.24 (0.20, 0.28) <0.0001	0.29 (0.24, 0.35) <0.0001	0.63 (0.53, 0.74) <0.0001
≥2.8	21868	0.48 (0.40, 0.59) <0.0001	0.40 (0.32, 0.50) <0.0001	0.83 (0.68, 1.01) 0.0691
SCR (umol/l)			<0.0001	0.0191
				<0.0001

		0.14 (0.11, 0.19) <0.0001	0.26 (0.19, 0.34) <0.0001	0.40 (0.31, 0.51) <0.0001
<63.00	27512			
≥63.00, <78.00	26967	0.38 (0.31, 0.47) <0.0001	0.41 (0.33, 0.52) <0.0001	0.85 (0.70, 1.04) 0.1231
≥78.00	28214	0.50 (0.40, 0.62) <0.0001	0.33 (0.26, 0.41) <0.0001	0.92 (0.75, 1.13) 0.4096

a Adjusted for: None.

b Adjusted for: sex, age, FPG, family history of diabetes

c Adjusted for: age, sex, fasting plasma glucose, BMI, family history of diabetes, smoking status, drinking status, HDL cholesterol, triglycerides, LDL, SBP, DBP, BUN, SCR. All the models are not adjusted for the variable itself in each stratification.

Table S2 E value to assess unmeasured confounding for incident diabetes.

Outcome	E value	E value Upper Limit
Incident diabetes	3.97	3.33

E value interpretations: For the incident diabetes, the reported hazard ratio could be explained away by an unmeasured confounder that was associated with both the exposure and the outcome by a risk ratio of 1.49-fold each.

Table S3 Collinearity of the diagnosis between the variables

Variable	Statistical tolerance	VIF
Age (y)	0.772	1.295
Sex	0.448	2.234
BMI (kg/m ²)	0.659	1.518
AST/ALT	0.700	1.428
FPG (mmol/l)	0.863	1.159
SBP (mmHg)	0.469	2.131
DBP (mmHg)	0.501	1.995
Triglyceride (mmol/l)	0.789	1.268
HDL-c (mmol/l)	0.900	1.111
LDL (mmol/l)	0.923	1.084
BUN (mmol/l)	0.858	1.166
SCR (umol/l)	0.520	1.924
Smoking statue	0.325	3.072
Drinking statue	0.327	3.059
Family history of diabetes	0.973	1.028

Supplementary Figure S1. Flowchart of study participates

According to the data source article

