

Table S1 Characteristics of participants in the present study participants and the total cohort population

Variables	Total cohort (n=33,391)	Study participants (n=25,343)
Age (years) *	50.11±14.35	50.69±14.44
Sex [male, (n, %)] *	14,853 (44.48)	11,569 (45.65)
BMI (kg/m ²) *	25.27±3.59	25.33±3.57
SBP (mmHg) *	129.36±18.93	130.23±19.06
DBP (mmHg)	77.68±11.65	77.58±11.70
Fasting glucose (mmol/L) *	5.40 (5.00,5.91)	5.46 (5.04,6.00)
hsCRP (mg/L)	1.06 (0.65,1.74)	1.06 (0.53,2.17)
TC≥6.2 mmol/L*	4,285(12.83)	3,636(14.35)
TG≥2.3 mmol/L	5,683(17.02)	4,312(17.01)
HDL-C<1.0 mmol/L*	4,795(14.36)	3,465(13.67)
LDL-C≥4.1 mmol/L*	3,113(9.32)	2,672(10.54)
Lp(a)≥300 mg/L (n, %)	4,761(18.28)	4,617 (18.22)
Region (n, %) *		
Hebei	10,427 (31.23)	3,740 (14.76)
Beijing	16,166 (48.41)	15,389 (60.72)
Tianjin	6,798 (20.36)	6,214 (24.52)
Current smokers (n, %)	10,278 (30.78)	7,870 (31.05)
Current drinkers (n, %) *	14,156 (42.39)	10,145 (40.03)
Physical activity (n, %) *		
Low	5,512 (16.51)	3,850 (15.19)
Moderate	21,837 (65.40)	16,559 (65.34)
Vigorous	6,042 (18.09)	4,934 (19.47)
CHD (n, %) *	2,241(6.71)	1,364(5.38)
Family history of CHD (n, %) *	7,132 (21.36)	4,854 (19.15)
Hypertension (n, %)	13,524 (40.50)	10,431 (41.16)
Diabetes mellitus (n, %) *	4,618 (13.83)	3,711 (14.64)

*P<0.05. Abbreviations: BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; hsCRP, high-sensitivity C-reactive protein; TC, total cholesterol; TG, triglyceride; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol; Lp(a), lipoprotein(a); CHD, coronary heart disease.

Table S2 Percentiles and corresponding levels of lipoprotein(a) in the total population

Variables	Lp(a) percentiles					
	25	50	75	80	85	95
Lp(a) (mg/L)	59.0	119.0	236.7	281.2	342.7	607.9

Abbreviations: Lp(a), lipoprotein(a).

Table S3 Characteristics of participants according to dichotomous Lp(a) levels

Variables	Total	Lp(a) levels (mg/L)		P
		<300	≥300	
Age (years)	50.69±14.44	50.58±14.32	51.18±14.96	0.0128
Sex [male, (n, %)]	11,569(45.65)	9,607(46.35)	1,962(42.50)	<0.0001
BMI (kg/m ²)	25.33±3.57	25.41±3.59	25.01±3.46	<0.0001
SBP (mmHg)	130.23±19.06	130.59±19.08	128.61±18.85	<0.0001
DBP (mmHg)	77.58±11.70	77.83±11.71	76.45±11.57	<0.0001
Fasting glucose (mmol/L)	5.46(5.04,6.00)	5.43(5.00,6.00)	5.50(5.10,6.00)	<0.0001 [†]
hsCRP (mg/L)	1.06(0.53,2.17)	1.06(0.52,2.16)	1.06(0.55,2.23)	0.1280 [†]
Lp(a) (mg/L)	119.0(59.0,236.7)	94.2(50.3,160.0)	457.7(362.6,628.1)	<0.0001 [†]
TC≥6.2 mmol/L	3,636(14.35)	2,738(13.21)	898(19.45)	<0.0001
TG≥2.3 mmol/L	4,312(17.01)	3,713(17.91)	599(12.97)	<0.0001
HDL-C<1.0 mmol/L	3,465(13.67)	3,026(14.60)	439(9.51)	<0.0001
LDL-C≥4.1 mmol/L	2,672(10.54)	1,997(9.64)	675(14.62)	<0.0001
Region (n, %)				<0.0001
Hebei	3,740(14.76)	3,223(15.55)	517(11.20)	
Beijing	15,389(60.72)	12,083(58.30)	3,306(71.60)	
Tianjin	6,214(24.52)	5,420(26.15)	794(17.20)	
Current smokers (n, %)	7,870(31.05)	6,614(31.91)	1,256(27.20)	<0.0001
Current drinkers (n, %)	10,145(40.03)	8,417(40.61)	1,728(37.43)	<0.0001
Physical activity (n, %)				0.0053
Low	3,850(15.19)	3,212(15.50)	638(13.82)	
Moderate	16,559(65.34)	13,458(64.93)	3,101(67.16)	
Vigorous	4,934(19.47)	4,056(19.57)	878(19.02)	
Family history of CHD (n, %)	4,854(19.15)	3,926(18.94)	928(20.10)	0.0707
CHD (n, %)	1364(5.38)	1,079(5.21)	285(6.17)	0.0085
Hypertension (n, %)	10,431(41.16)	8,656(41.76)	1,775(38.44)	<0.0001
Diabetes mellitus (n, %)	3,711(14.64)	3,088(14.90)	623(13.49)	0.0146

Notes. [†]Wilcoxon rank-sum test. Abbreviations: BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; hsCRP, high-sensitivity C-reactive protein; TC, total cholesterol; TG, triglyceride; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol; Lp(a), lipoprotein(a); CHD, coronary heart disease.

Table S4 Univariate analysis of dichotomous lipoprotein(a) and lipid profiles in the total population

Lipid profiles	Lp(a) (mg/L)		P
	<300	≥300	
TC (mmol/L)			<0.0001
<6.2	17,988(82.87)	3,719(17.13)	
≥6.2	2,738(75.30)	898(24.70)	
TG (mmol/L)			<0.0001
<2.3	17,013(80.89)	4,018(19.11)	
≥2.3	3,713(86.11)	599(13.89)	
HDL-C (mmol/L)			<0.0001
≥1.0	17,700(80.90)	4,178(19.10)	
<1.0	3,026(87.33)	439(12.67)	
LDL-C (mmol/L)			<0.0001
<4.1	18,729(82.61)	3,942(17.39)	
≥4.1	1,997(74.74)	675(25.26)	
Dyslipidemia (n, %)			0.1724
No	12,199(82.06)	2,667(17.94)	
Yes	8,527(81.39)	1,950(18.61)	
Type of dyslipidemia (n, %)			0.0117
Normolipidemia	13,516(81.66)	3,036(18.34)	
One abnormality	3,701(83.15)	750(16.85)	
Two abnormalities	2,844(81.33)	653(18.67)	
≥Three abnormalities	665(78.88)	178(21.12)	

Abbreviations: Lp(a), lipoprotein(a); TC, total cholesterol; TG, triglyceride; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol.

Table S5 Univariate analysis of lipoprotein(a) percentiles and lipid profiles in the total population

Lipid profiles	Lp(a) percentiles (mg/L)				P
	<50th (<119.0)	51st-80th (119.0-281.2)	81st-95th (281.2-607.9)	>95th (>607.9)	
TC (mmol/L)					<0.0001
<6.2	11,190(51.55)	6,422(29.58)	3,115(14.35)	980(4.51)	
≥6.2	1,473(40.51)	1,187(32.65)	688(18.92)	288(7.92)	
TG (mmol/L)					<0.0001
<2.3	10,051(47.79)	6,558(31.18)	3,321(15.79)	1,101(5.24)	
≥2.3	2,612(60.58)	1,051(24.37)	482(11.18)	167(3.87)	
HDL-C (mmol/L)					<0.0001
≥1.0	10,562(48.28)	6,737 (30.79)	3,418(15.62)	1,161(5.31)	
<1.0	2,101(60.63)	872(25.17)	385(11.11)	107(3.09)	
LDL-C (mmol/L)					<0.0001
<4.1	11,650(51.39)	6,682(29.47)	3,300(14.56)	1,039(4.58)	
≥4.1	1,013(37.91)	927(34.69)	503(18.82)	229(8.57)	
Dyslipidemia (n, %)					0.7622
No	7,322(49.25)	4,598(30.93)	2,256(15.18)	690(4.64)	
Yes	5,341(50.98)	3,011(28.74)	1,547(14.77)	578(5.52)	
Type of dyslipidemia (n, %)					<0.0001
Normolipidemia	8,083(48.83)	5,128(30.98)	2,532(15.30)	809(4.89)	
One abnormality	2,422(54.41)	1,203(27.03)	635(14.27)	191(4.29)	
Two abnormalities	1,749(50.01)	1,039(29.63)	504(14.41)	208(5.95)	
≥Three abnormalities	409(48.52)	242(28.71)	132(15.66)	60(7.12)	

Abbreviations: Lp(a), lipoprotein(a); TC, total cholesterol; TG, triglyceride; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol.

Table S6 Associations of dichotomous lipoprotein(a) with coronary heart disease according to different lipid profiles

Population	CHD (n, %)	Univariate [†]	Multivariate ^{†‡}
Total	1,364 (5.38)	1.20 (1.05, 1.37)	1.36 (1.17, 1.57)
Normolipidemia	557 (3.75)	1.23 (1.00, 1.51)	1.41 (1.12, 1.77)
Dyslipidemia	807 (7.70)	1.16 (0.97, 1.39)	1.24 (1.02, 1.50)
Type of dyslipidemia			
Normolipidemia	832 (5.03)	1.28 (1.08, 1.52)	1.42 (1.18, 1.70)
One abnormality	267 (6.00)	1.12 (0.81, 1.54)	1.22 (0.86, 1.73)
Two abnormalities	199 (5.69)	0.99 (0.69, 1.44)	1.05 (0.71, 1.54)
≥Three abnormalities	66 (7.83)	1.11 (0.61, 2.02)	1.48(0.75, 2.92)
TC<6.2 mmol/L	1,158 (5.33)	1.23 (1.06, 1.42)	1.38 (1.17, 1.62)
TC≥6.2 mmol/L	206 (5.67)	1.06 (0.77,1.46)	1.33 (0.94, 1.89)
TG<2.3 mmol/L	1,091 (5.19)	1.23 (1.07, 1.43)	1.39 (1.18, 1.63)
TG≥2.3 mmol/L	273 (6.33)	1.10 (0.78,1.56)	1.23 (0.85, 1.79)
HDL-C≥1.0 mmol/L	1,140 (5.21)	1.25 (1.08, 1.44)	1.38 (1.18, 1.62)
HDL-C<1.0 mmol/L	224 (6.46)	0.98 (0.65, 1.48)	1.18 (0.75, 1.84)
LDL-C<4.1 mmol/L	1,198 (5.28)	1.19 (1.03, 1.38)	1.35 (1.15, 1.59)
LDL-C≥4.1 mmol/L	166 (6.21)	1.18 (0.83, 1.68)	1.43 (0.98, 2.10)

Notes: [†] Compared with Lp(a)<300 mg/L. [‡] Adjusted for region, age, sex, BMI, TG, HDL-C, LDL-C, hsCRP, current smokers, current drinkers, physical activity, family history of CHD, hypertension, diabetes mellitus. Abbreviations: CHD, coronary heart disease; TC, total cholesterol; TG, triglyceride; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol; BMI, body mass index; hsCRP, high-sensitivity C-reactive protein.

Table S7 Associations of lipoprotein(a) percentiles with coronary heart disease according to different lipid profiles

Lipid profile and Lp(a) percentiles	CHD (n, %)	OR (95%CI)
Dyslipidemia & Lp(a)		
Dyslipidemia (-) & Lp(a) (<50th)	264(3.61)	1.00
Dyslipidemia (-) & Lp(a) (51st-80th)	166(3.61)	1.06 (0.86, 1.31)
Dyslipidemia (-) & Lp(a) (81st-95th)	90(3.99)	1.25 (0.96, 1.62)
Dyslipidemia (-) & Lp(a) (>95th)	37(5.36)	2.07 (1.41, 3.03)
Dyslipidemia (+) & Lp(a) (<50th)	399(7.47)	1.40 (1.18, 1.67)
Dyslipidemia (+) & Lp(a) (51st-80th)	229(7.61)	1.46 (1.20, 1.77)
Dyslipidemia (+) & Lp(a) (81st-95th)	129(8.34)	1.68 (1.33, 2.12)
Dyslipidemia (+) & Lp(a) (>95th)	50(8.65)	1.81 (1.29, 2.54)
TC & Lp(a)		
TC (-) & Lp(a) (<50th)	578(5.17)	1.00
TC (-) & Lp(a) (51st-80th)	330(5.14)	1.09 (0.94, 1.27)
TC (-) & Lp(a) (81st-95th)	175(5.62)	1.24 (1.02, 1.50)
TC (-) & Lp(a) (>95th)	75(7.65)	1.96 (1.49, 2.59)
TC (+) & Lp(a) (<50th)	85(5.77)	0.73 (0.54, 0.99)
TC (+) & Lp(a) (51st-80th)	65(5.48)	0.74 (0.53, 1.03)
TC (+) & Lp(a) (81st-95th)	44(6.40)	1.03 (0.71, 1.51)
TC (+) & Lp(a) (>95th)	12(4.17)	0.65 (0.34, 1.25)
TG & Lp(a)		
TG (-) & Lp(a) (<50th)	506(5.03)	1.00
TG (-) & Lp(a) (51st-80th)	324(4.94)	1.03 (0.88, 1.20)
TG (-) & Lp(a) (81st-95th)	185(5.57)	1.24 (1.02, 1.49)
TG (-) & Lp(a) (>95th)	76(6.90)	1.66 (1.27, 2.19)
TG (+) & Lp(a) (<50th)	157(6.01)	0.96 (0.79, 1.18)
TG (+) & Lp(a) (51st-80th)	71(6.76)	1.24 (0.94, 1.65)
TG (+) & Lp(a) (81st-95th)	34(7.05)	1.33 (0.90, 1.96)
TG (+) & Lp(a) (>95th)	11(6.59)	1.64 (0.85, 3.16)
HDL-C & Lp(a)		
HDL-C (-) & Lp(a) (<50th)	522(4.94)	1.00
HDL-C (-) & Lp(a) (51st-80th)	345(5.12)	1.08 (0.93, 1.26)
HDL-C (-) & Lp(a) (81st-95th)	193(5.65)	1.27 (1.06, 1.53)
HDL-C (-) & Lp(a) (>95th)	80(6.89)	1.75 (1.34, 2.28)
HDL-C (+) & Lp(a) (<50th)	141(6.71)	1.25 (1.01, 1.56)
HDL-C (+) & Lp(a) (51st-80th)	50(5.73)	1.26 (0.91, 1.75)
HDL-C (+) & Lp(a) (81st-95th)	26(6.75)	1.56 (0.99, 2.44)
HDL-C (+) & Lp(a) (>95th)	7(6.54)	1.44 (0.62, 3.34)
LDL-C & Lp(a)		
LDL-C (-) & Lp(a) (<50th)	594(5.10)	1.00
LDL-C (-) & Lp(a) (51st-80th)	345(5.16)	1.09 (0.94, 1.27)
LDL-C (-) & Lp(a) (81st-95th)	183(5.55)	1.24 (1.03, 1.50)
LDL-C (-) & Lp(a) (>95th)	76(7.31)	1.93 (1.47, 2.53)
LDL-C (+) & Lp(a) (<50th)	69(6.81)	0.82 (0.63, 1.09)
LDL-C (+) & Lp(a) (51st-80th)	50(5.39)	0.76 (0.56, 1.04)
LDL-C (+) & Lp(a) (81st-95th)	36(7.16)	1.10 (0.76, 1.60)
LDL-C (+) & Lp(a) (>95th)	11(4.80)	0.69 (0.36, 1.31)

Dyslipidemia (-): without dyslipidemia; Dyslipidemia (+): with dyslipidemia. TC (-): TC<6.2 mmol/L; TC (+): TC≥6.2 mmol/L. TG (-): TG<2.3 mmol/L; TG (+): TG≥2.3 mmol/L. HDL-C (-): HDL-C≥1.0 mmol/L; HDL-C (+): HDL-C<1.0 mmol/L. LDL-C (-): LDL-C<4.1 mmol/L; LDL-C (+): LDL-C≥4.1 mmol/L. Lp(a) (<50th): <119.0 mg/L; Lp(a) (51st-80th): (119.0-281.2) mg/L; Lp(a) (81st-95th): (281.2-607.9) mg/L; Lp(a) (>95th): >607.9 mg/L. Abbreviations: CHD, coronary heart disease; Lp(a), lipoprotein(a); TC, total cholesterol; TG, triglyceride; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol.

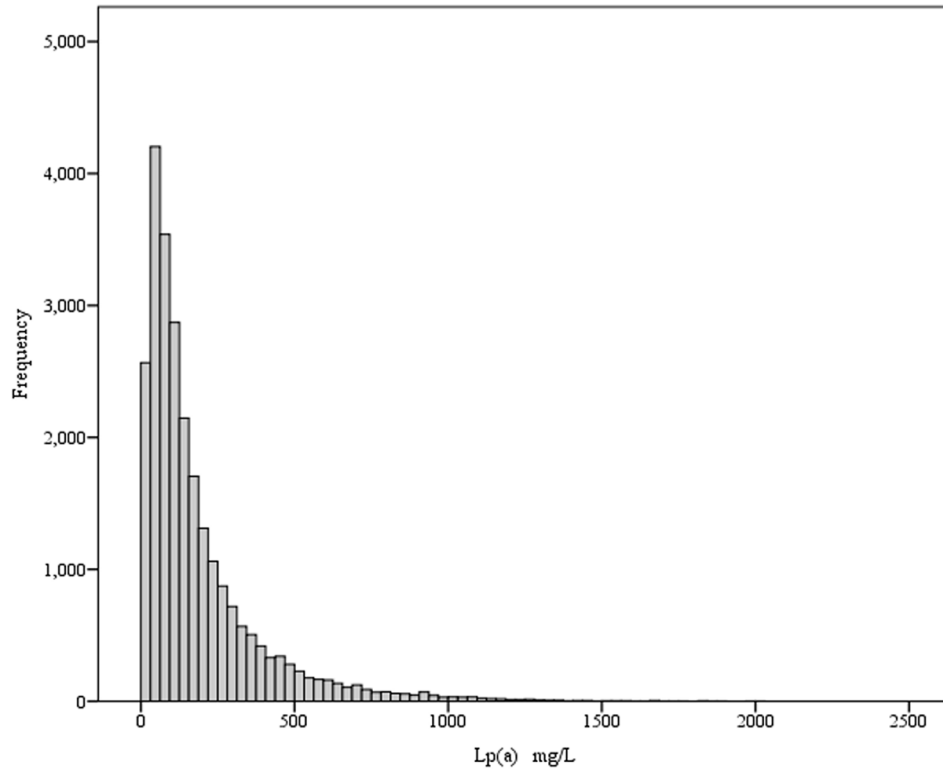


Figure S1 Distribution of serum lipoprotein(a) levels in the total population. Lp(a), lipoprotein(a).