

Supplementary Table S1. Distribution of Lipid-related Index among American.

Index	N	Mean	Standard	Min	25% digits	50% digits	75% digits	Max
TG/HDL	6530	2.07	1.69	0.23	0.98	1.55	2.53	16.26
TC/HDL	6530	3.39	1.12	1.41	2.62	3.15	3.94	25.1
LDL/HDL	6530	1.98	0.89	0.27	1.36	1.80	2.43	21.3

Supplementary Table S2. Normality test of Lipid-related Index among American.

		Method	Statistic	P
TG/HDL				
		Anderson-Darling normality test	392.61	<0.01
		Cramer-von Mises normality test	69.65	<0.01
		Lilliefors (Kolmogorov-Smirnov) normality test	0.16	<0.01
		Pearson chi-square normality test	4473.68	<0.01
TC/HDL				<0.01
		Anderson-Darling normality test	139.35	<0.01
		Cramer-von Mises normality test	23.33	<0.01
		Lilliefors (Kolmogorov-Smirnov) normality test	0.098	<0.01
		Pearson chi-square normality test	1483.39	<0.01
LDL/HDL				<0.01
		Anderson-Darling normality test	114.55	<0.01
		Cramer-von Mises normality test	19.14	<0.01
		Lilliefors (Kolmogorov-Smirnov) normality test	0.09	<0.01
		Pearson chi-square normality test	1197.94	<0.01

Supplementary Table S3 Interaction analysis of the association of lipid levels and immunity from Hepatitis B vaccination

Index			Model 1		Model 2		Model 3		
			OR (95% CI)	P for interaction	OR (95% CI)	P for interaction	OR (95% CI)	P for interaction	
Log2-LDL/ HDL	Age	<40	0.77 (0.70,	0.9347	0.79 (0.72, 0.87)	0.7805	0.88 (0.80,	0.8599	
			0.85)				0.98)		
		≥40	0.77 (0.64,		0.81 (0.68, 0.97)		0.87 (0.72,		
			0.91)		1.04)				
	Sex	male	0.74 (0.66,	0.6991	0.86 (0.77, 0.97)	0.4774	0.92 (0.81,	0.4989	
			0.83)				1.04)		
		female	0.72 (0.64,		0.81 (0.72, 0.92)		0.87 (0.77,		
			0.80)		0.98)				
	BMI	<25	0.88 (0.78,	0.0986	0.95 (0.84, 1.08)	0.4030	0.94 (0.83,	0.4236	
			1.00)				1.07)		
		25-30	0.70 (0.59,		0.82 (0.69, 0.98)		0.82 (0.69,		
			0.83)		0.97)				
≥30	0.83 (0.70,	0.89 (0.75, 1.06)		0.89 (0.75,					
	0.98)	1.06)							

Log2-TG/ HDL	Smoking	No	0.72 (0.66, 0.79)	0.6385	0.84 (0.76, 0.92)	0.7913	0.89 (0.81, 0.99)	0.8635
		Yes	0.76 (0.63, 0.90)					
	PIR	< 1.5	0.71 (0.63, 0.80)	0.9899	0.83 (0.73, 0.94)	0.8679	0.89 (0.78, 1.01)	0.8520
		1.5-3.5	0.71 (0.62, 0.83)					
		≥ 3.5	0.72 (0.62, 0.84)					
	Race /Ethnicity	Mexican	0.69 (0.58, 0.84)	0.2475	0.81 (0.67, 0.97)	0.3771	0.86 (0.71, 1.05)	0.3481
		American	0.51 (0.38, 0.70)					
		Other Hispanic	0.72 (0.63, 0.82)					
		Non-Hispanic	0.75 (0.65, 0.88)					
		White	0.79 (0.59, 1.05)					
		Non-Hispanic	0.77 (0.69, 0.86)					
		Black	0.83 (0.77, 0.89)					
	Age	<40	0.82 (0.76, 0.88)	0.0350	0.90 (0.83, 0.96)	0.1193	0.96 (0.90, 1.03)	0.0665
		≥40	0.84 (0.86, 1.02)					
	Sex	male	0.81 (0.73, 0.90)	0.8722	0.87 (0.79, 0.97)	0.7530	0.87 (0.78, 0.97)	0.7795
		female	0.89 (0.80, 0.99)					
	BMI	<25	0.84 (0.80, 0.89)	0.0811	0.93 (0.87, 0.98)	0.2005	0.97 (0.91, 1.03)	0.0434
		25-30	0.75 (0.66, 0.84)					
		≥30	0.79 (0.73, 0.85)					
	Smoking	No	0.84 (0.80, 0.89)	0.0760	0.81 (0.72, 0.92)	0.0557	0.84 (0.74, 0.96)	0.4179
		Yes	0.75 (0.66, 0.84)					
	PIR	< 1.5	0.85 (0.78, 0.93)	0.4062	0.94 (0.86, 1.03)	0.3822	0.91 (0.84, 0.99)	0.4179
		1.5-3.5	0.83 (0.75, 0.91)					
		≥ 3.5	0.83 (0.75, 0.91)					

Log2-Chol /HDL	Race /Ethnicity		0.91)			1.06)	
		Mexican	0.84 (0.75,		0.93 (0.83, 1.04)	0.97 (0.86,	
		American	0.94)			1.09)	
		Other Hispanic	0.79 (0.66,		0.89 (0.74, 1.07)	0.93 (0.77,	
			0.95)			1.12)	
		Non-Hispanic	0.80 (0.73,		0.90 (0.82, 0.98)	0.95 (0.87,	
		White	0.87)	0.5423		1.04)	0.6161
		Non-Hispanic	0.83 (0.75,		0.91 (0.81, 1.01)	0.96 (0.86,	
		Black	0.92)			1.07)	
	Age	Other Race -					
		Including	0.70 (0.58,		0.79 (0.66, 0.96)	0.82 (0.68,	
		Multi-Racial	0.84)			0.99)	
		<40	0.67 (0.58,		0.69 (0.60, 0.79)	0.82 (0.71,	
			0.76)	0.6071		0.96)	
		≥40	0.62 (0.48,		0.69 (0.53, 0.89)	0.77 (0.59,	0.6347
			0.80)			0.99)	
		male	0.61 (0.52,		0.78 (0.66, 0.92)	0.86 (0.72,	
	Sex		0.72)	0.6618		1.03)	
		female	0.58 (0.49,		0.72 (0.61, 0.86)	0.80 (0.67,	0.5721
			0.69)			0.96)	
	BMI	<25	0.81 (0.67,		0.93 (0.76, 1.14)	0.92 (0.75,	
			0.99)			1.13)	
		25-30	0.57 (0.45,	0.0838	0.72 (0.56, 0.92)	0.71 (0.56,	0.2871
	Smoking		0.73)			0.92)	
		≥30	0.72 (0.57,		0.83 (0.65, 1.06)	0.82 (0.64,	
			0.91)			1.06)	
		No	0.60 (0.53,		0.77 (0.67, 0.88)	0.85 (0.73,	
	PIR		0.69)	0.8372		0.98)	0.5346
		Yes	0.59 (0.45,		0.71 (0.55, 0.93)	0.77 (0.59,	
			0.76)			1.01)	
		< 1.5	0.56 (0.47,		0.72 (0.60, 0.86)	0.80 (0.66,	
	Race /Ethnicity		0.67)			0.97)	
		1.5-3.5	0.60 (0.48,	0.8495	0.76 (0.61, 0.94)	0.83 (0.66,	0.7897
			0.74)			1.04)	
		≥ 3.5	0.60 (0.48,		0.80 (0.63, 1.00)	0.88 (0.70,	
			0.75)			1.12)	
	Race /Ethnicity	Mexican	0.58 (0.45,		0.74 (0.56, 0.96)	0.81 (0.62,	
		American	0.76)			1.07)	
		Other Hispanic	0.39 (0.25,		0.54 (0.35, 0.84)	0.58 (0.37,	
			0.61)	0.4939		0.91)	0.5480
		Non-Hispanic	0.59 (0.49,		0.79 (0.65, 0.96)	0.89 (0.73,	
		White	0.71)			1.09)	
	Race /Ethnicity	Non-Hispanic	0.61 (0.48,		0.74 (0.58, 0.94)	0.83 (0.65,	
		Black	0.77)			1.07)	

HDL	Age	Other Race - Including Multi-Racial	0.59 (0.38, 0.90)		0.80 (0.51, 1.23)		0.84 (0.54, 1.30)	
		<40	1.01 (1.01, 1.02)	0.0201	1.01 (1.00, 1.01)	0.0379	1.00 (1.00, 1.01)	0.0296
		≥40	1.02 (1.01, 1.03)		1.02 (1.01, 1.02)		1.01 (1.01, 1.02)	
	Sex	male	1.01 (1.01, 1.02)	0.8878	1.01 (1.00, 1.01)	0.2040	1.00 (1.00, 1.01)	0.2124
		female	1.01 (1.01, 1.02)		1.01 (1.01, 1.02)		1.01 (1.00, 1.01)	
	BMI	<25	1.01 (1.00, 1.01)		1.01 (1.00, 1.01)		1.01 (1.00, 1.01)	
		25-30	1.01 (1.00, 1.02)	0.4278	1.01 (1.00, 1.02)	0.5664	1.01 (1.00, 1.02)	0.5951
		≥30	1.01 (1.00, 1.02)		1.01 (1.00, 1.02)		1.01 (1.00, 1.02)	
	Smoking	No	1.01 (1.01, 1.02)	0.3674	1.01 (1.01, 1.01)	0.5200	1.01 (1.00, 1.01)	0.4451
		Yes	1.02 (1.01, 1.02)		1.01 (1.00, 1.02)		1.01 (1.00, 1.02)	
	PIR	< 1.5	1.01 (1.01, 1.02)		1.01 (1.00, 1.01)		1.01 (1.00, 1.01)	
		1.5-3.5	1.01 (1.00, 1.01)	0.1266	1.01 (1.00, 1.01)	0.0526	1.00 (1.00, 1.01)	0.0394
		≥ 3.5	1.02 (1.01, 1.02)		1.02 (1.01, 1.02)		1.02 (1.01, 1.02)	
	Race /Ethnicity	Mexican	1.00 (1.00, 1.01)		1.00 (0.99, 1.01)		1.00 (0.99, 1.01)	
		American						
		Other Hispanic	1.02 (1.00, 1.03)		1.01 (1.00, 1.03)		1.01 (1.00, 1.02)	
		Non-Hispanic White	1.02 (1.01, 1.02)	0.0671	1.01 (1.01, 1.02)	0.1387	1.01 (1.01, 1.02)	0.1352
		Non-Hispanic Black	1.01 (1.00, 1.02)		1.01 (1.00, 1.02)		1.01 (1.00, 1.01)	
		Other Race - Including Multi-Racial	1.02 (1.01, 1.04)		1.02 (1.00, 1.03)		1.02 (1.00, 1.03)	

Supplementary Table S4. Sensitivity analysis.

Exposure	Model 1		Model 2		Model 3	
	OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
HDL (mg/dL)						

Q1	Reference		Reference		Reference	
Q2	1.18 (1.02, 1.36)	0.02	1.09 (0.95, 1.26)	0.23	1.04 (0.89, 1.20)	0.64
Q3	1.42 (1.24, 1.64)	<0.01	1.27 (1.10, 1.46)	<0.01	1.16 (1.00, 1.34)	0.06
Q4	1.57 (1.37, 1.81)	<0.01	1.39 (1.20, 1.61)	<0.01	1.24 (1.06, 1.45)	<0.01
P for Trend	<0.01		<0.01		0.01	
TG (mg/dL)	Reference		Reference		Reference	
Q1	Reference		Reference		Reference	
Q2	1.03 (0.89, 1.18)	0.71	1.08 (0.94, 1.24)	0.29	1.12 (0.97, 1.29)	0.12
Q3	0.98 (0.86, 1.13)	0.82	1.14 (0.99, 1.32)	0.07	1.22 (1.05, 1.41)	<0.01
Q4	0.63 (0.55, 0.72)	<0.01	0.82 (0.71, 0.95)	<0.01	0.92 (0.78, 1.07)	0.28
P for Trend	<0.01		0.01		0.08	
TG/HDL	Reference		Reference		Reference	
Q1	Reference		Reference		Reference	
Q2	0.99 (0.87, 1.14)	0.94	1.04 (0.90, 1.20)	0.57	1.08 (0.94, 1.25)	0.27
Q3	0.83 (0.72, 0.95)	0.01	0.94 (0.82, 1.09)	0.42	1.01 (0.87, 1.17)	0.87
Q4	0.62 (0.54, 0.71)	<0.01	0.80 (0.70, 0.93)	<0.01	0.91 (0.78, 1.07)	0.25
P for Trend	<0.01		0.01		0.08	
Chol/HDL	Reference		Reference		Reference	
Q1	Reference		Reference		Reference	
Q2	0.87 (0.75, 0.99)	0.04	0.91 (0.79, 1.04)	0.17	0.92 (0.80, 1.06)	0.25
Q3	0.84 (0.73, 0.97)	0.02	0.96 (0.83, 1.11)	0.58	1.03 (0.89, 1.19)	0.68
Q4	0.55 (0.48, 0.63)	<0.01	0.73 (0.63, 0.85)	<0.01	0.82 (0.70, 0.97)	0.02
P for Trend	<0.01		<0.01		0.03	
LDL/HDL	Reference		Reference		Reference	
Q1	Reference		Reference		Reference	
Q2	0.91 (0.79, 1.04)	0.17	0.94 (0.82, 1.08)	0.41	0.96 (0.83, 1.10)	0.56
Q3	0.86 (0.75, 0.99)	0.04	0.97 (0.84, 1.12)	0.68	1.03 (0.89, 1.19)	0.67
Q4	0.62 (0.54, 0.71)	<0.01	0.81 (0.70, 0.93)	<0.01	0.91 (0.78, 1.06)	0.21
P for Trend	<0.01		0.01		0.29	