

Supplemental Materials

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Supplemental Table 1: Multivariable-Adjusted Linear Regression Models for LSM and Continuous Traits (using different LSM definitions)

	Model	Dichotomous liver fibrosis (LSM > 13.6 vs LSM ≤ 13.6 kPa)			Dichotomous liver fibrosis (LSM ≥ 9.7 kPa vs LSM <9.7 kPa)		
		β	95% CI	P value	β	95% CI	P value
Obesity/Liver related							
Body mass index (kg/m ²)	MV	5.125	(3.657, 6.594)	<0.0001	4.439	(3.586, 5.292)	<0.0001
	MV+CAP	2.432	(1.251, 3.613)	<0.0001	1.772	(1.074, 2.470)	<0.0001
Waist circumference (cm)	MV	5.387	(3.917, 6.857)	<0.0001	4.535	(3.682, 5.389)	<0.0001
	MV+BMI	0.679	(0.090, 1.267)	0.04	0.463	(0.116, 0.810)	0.009
	MV+CAP	2.632	(1.465, 3.800)	<0.0001	1.806	(1.115, 2.496)	<0.0001
CAP (dB/m)	MV	44.204	(29.727, 58.682)	<0.0001	44.267	(35.876, 52.657)	<0.0001
	MV+BMI	13.858	(2.199, 25.517)	0.02	18.380	(11.514, 25.245)	<0.0001
Log alanine aminotransferase (IU/L)	MV	0.478	(0.366, 0.590)	<0.0001	0.268	(0.202, 0.334)	<0.0001
	MV+BMI	0.391	(0.281, 0.501)	<0.0001	0.194	(0.129, 0.259)	<0.0001
	MV+CAP	0.371	(0.264, 0.478)	<0.0001	0.162	(0.099, 0.226)	<0.0001
Log aspartate aminotransferase (IU/L)	MV	0.485	(0.407, 0.563)	<0.0001	0.208	(0.162, 0.254)	<0.0001
	MV+BMI	0.496	(0.418, 0.574)	<0.0001	0.218	(0.171, 0.265)	<0.0001
	MV+CAP	0.469	(0.391, 0.547)	<0.0001	0.193	(0.146, 0.240)	<0.0001
Glucose-related							
Fasting glucose (mg/dl) (n=3168)	MV	15.863	(10.977, 20.749)	<0.0001	12.510	(9.647, 15.374)	<0.0001
	MV+BMI	12.486	(7.697, 17.275)	<0.0001	9.685	(6.852, 12.517)	<0.0001
	MV+CAP	12.521	(7.795, 17.247)	<0.0001	9.122	(6.320, 11.924)	<0.0001
Log hgbA1c (%)	MV	0.060	(0.037, 0.084)	<0.0001	0.052	(0.038, 0.067)	<0.0001
	MV+BMI	0.043	(0.021, 0.066)	0.0001	0.038	(0.024, 0.051)	<0.0001
	MV+CAP	0.044	(0.021, 0.066)	0.0001	0.035	(0.022, 0.049)	<0.0001
Vascular-related							
Systolic blood pressure (mm Hg)	MV	3.730	(0.246, 7.213)	0.04	3.149	(1.108, 5.190)	0.003
	MV+BMI	1.551	(-1.873, 4.974)	0.37	1.187	(-0.835, 3.210)	0.25
	MV+CAP	1.879	(-1.546, 5.305)	0.28	1.195	(-0.833, 3.223)	0.25
Diastolic blood pressure (mm Hg)	MV	0.170	(-2.046, 2.386)	0.88	0.120	(-1.180, 1.420)	0.86
	MV+BMI	-1.187	(-3.368, 0.993)	0.29	-1.128	(-2.416, 0.160)	0.09
	MV+CAP	-0.993	(-3.173, 1.188)	0.37	-1.139	(-2.430, 0.151)	0.08
Cholesterol-related							
Total cholesterol (mg/dl)	MV	-4.24	(-13.314, 4.833)	0.36	-6.558	(-11.865, -1.250)	0.02
	MV+BMI	-4.281	(-13.414, 4.852)	0.36	-6.746	(-12.135, -1.357)	0.01
	MV+CAP	-6.105	(-15.203, 2.992)	0.19	-8.684	(-14.061, -3.308)	0.002
HDL cholesterol (mg/dl)	MV	-7.898	(-12.424, -3.372)	0.0006	-8.157	(-10.799, -5.516)	<0.0001
	MV+BMI	-1.846	(-6.057, 2.365)	0.39	-2.985	(-5.471, 0.499)	0.02
	MV+CAP	-2.898	(-7.142, 1.345)	0.18	-3.221	(-5.732, -0.711)	0.01
Log triglycerides (mg/dl)	MV	0.251	(0.120, 0.382)	0.0002	0.232	(0.155, 0.308)	<0.0001
	MV+BMI	0.093	(-0.030, 0.217)	0.14	0.097	(0.024, 0.170)	0.009
	MV+CAP	0.083	(-0.037, 0.202)	0.17	0.064	(-0.006, 0.135)	0.07

LSM, liver stiffness measurement; BMI, body mass index; CAP, controlled attenuation parameter; HgbA1c, glycosylated hemoglobin; HDL, high density lipoprotein; MV, multivariable

Supplemental Table 2: Multivariable-Adjusted Logistic Regression Models for LSM and Dichotomous Traits (using different LSM definitions)

	Model	Dichotomous liver fibrosis (LSM > 13.6 vs LSM ≤ 13.6 kPa)			Dichotomous liver fibrosis (LSM ≥ 9.7 kPa vs LSM <9.7 kPa)		
		OR	95% CI	P value	OR	95% CI	P value
Obesity/Liver related							
Obesity (BMI ≥ 30 kg/m ²)	MV	4.41	(2.45, 7.93)	<0.0001	3.77	(2.71, 5.25)	<0.0001
	MV+CAP	2.65	(1.26, 5.59)	0.01	2.04	(1.36, 3.07)	0.0006
Hepatic steatosis (CAP ≥ 290 dB/m)	MV	4.16	(2.34, 7.39)	<0.0001	3.84	(2.76, 5.35)	<0.0001
	MV+BMI	2.04	(1.02, 4.10)	0.04	2.07	(1.38, 3.11)	0.0004
Severe hepatic steatosis (CAP ≥ 302 dB/m)	MV	4.40	(2.52, 7.70)	<0.0001	4.18	(3.02, 5.79)	<0.0001
	MV+BMI	2.16	(1.09, 4.28)	0.03	2.26	(1.52, 3.37)	0.0001
Elevated ALT or AST	MV	3.94	(2.02, 7.69)	0.0001	2.03	(1.43, 2.90)	0.0001
	MV+BMI	3.35	(1.71, 6.55)	0.0004	1.77	(1.23, 2.53)	0.002
	MV+CAP	3.14	(1.59, 6.19)	0.0009	1.56	(1.09, 2.24)	0.02
Metabolic syndrome	MV	3.01	(1.72, 5.28)	0.0001	3.26	(2.34, 4.53)	<0.0001
	MV+BMI	1.35	(0.70, 2.63)	0.37	1.64	(1.11, 2.44)	0.01
	MV+CAP	1.35	(0.68, 2.66)	0.39	1.57	(1.06, 2.34)	0.02
Glucose-related							
Diabetes	MV	5.64	(3.09, 10.30)	<0.0001	5.34	(3.65, 7.80)	<0.0001
	MV+BMI	3.16	(1.64, 6.09)	0.0006	3.07	(2.03, 4.63)	<0.0001
	MV+CAP	3.06	(1.60, 5.88)	0.0008	2.85	(1.88, 4.32)	<0.0001
Impaired fasting glucose (n=2992)	MV	1.87	(1.46, 2.38)	<0.0001	1.54	(1.14, 2.07)	0.005
	MV+BMI	1.25	(0.97, 1.62)	0.09	1.06	(0.77, 1.47)	0.72
	MV+CAP	1.27	(0.98, 1.65)	0.07	1.06	(0.77, 1.47)	0.72
Vascular-related							
Hypertension	MV	2.48	(1.40, 4.39)	0.002	2.05	(1.47, 2.87)	<0.0001
	MV+BMI	1.48	(0.81, 2.69)	0.20	1.26	(0.88, 1.81)	0.20
	MV+CAP	1.66	(0.92, 3.01)	0.09	1.36	(0.95, 1.94)	0.09
Cholesterol-related							
Dyslipidemia	MV	1.86	(1.05, 3.29)	0.04	1.22	(0.87, 1.73)	0.25
	MV+BMI	1.40	(0.79, 2.51)	0.25	0.93	(0.65, 1.33)	0.71
	MV+CAP	1.64	(0.86, 2.74)	0.15	1.00	(0.70, 1.42)	0.99
Low HDL cholesterol	MV	2.87	(1.63, 5.05)	0.0003	3.14	(2.24, 4.39)	<0.0001
	MV+BMI	1.61	(0.87, 2.98)	0.13	1.98	(1.38, 2.85)	0.0002
	MV+CAP	1.56	(0.83, 2.94)	0.17	1.82	(1.25, 2.63)	0.002
High triglycerides	MV	1.96	(1.10, 3.50)	0.02	2.58	(1.84, 3.61)	<0.0001
	MV+BMI	1.08	(0.58, 2.02)	0.80	1.63	(1.13, 2.34)	0.008
	MV+CAP	0.94	(0.50, 1.78)	0.85	1.36	(0.94, 1.98)	0.11

LSM, liver stiffness measurement; BMI, body mass index; CAP, controlled attenuation parameter; ALT, alanine aminotransferase; AST, aspartate aminotransferase; HDL, high density lipoprotein; MV, multivariable

Supplemental Table 3: Multivariable-Adjusted Linear Regression Models for LSM and Continuous Traits (Using probe specific cut-off of 1 point lower when XL probe used)

	Model	Dichotomous liver fibrosis (LSM \geq 8.2 kPa vs LSM $<$ 8.2 kPa)		
		β	95% CI	P value
Obesity/Liver related				
Body mass index (kg/m ²)	MV	4.830	(4.247, 5.412)	<0.0001
	MV+CAP	2.242	(1.749, 2.735)	<0.0001
Waist circumference (cm)	MV	4.711	(4.126, 5.296)	<0.0001
	MV+BMI	0.286	(0.037, 0.535)	0.008
	MV+CAP	2.046	(1.558, 2.535)	<0.0001
CAP (dB/m)	MV	44.436	(38.673, 50.200)	<0.0001
	MV+BMI	16.920	(12.022, 21.819)	<0.0001
Log alanine aminotransferase (IU/L)	MV	0.239	(0.194, 0.285)	<0.0001
	MV+BMI	0.165	(0.118, 0.211)	<0.0001
	MV+CAP	0.137	(0.092, 0.182)	<0.0001
Log aspartate aminotransferase (IU/L)	MV	0.143	(0.111, 0.175)	<0.0001
	MV+BMI	0.158	(0.125, 0.192)	<0.0001
	MV+CAP	0.130	(0.097, 0.164)	<0.0001
Glucose-related				
Fasting glucose (mg/dl) (n=3168)	MV	8.309	(6.296, 10.322)	<0.0001
	MV+BMI	5.174	(3.137, 7.211)	<0.0001
	MV+CAP	4.813	(2.809, 6.817)	<0.0001
Log hgbA1c (%)	MV	0.033	(0.023, 0.042)	<0.0001
	MV+BMI	0.016	(0.007, 0.026)	0.001
	MV+CAP	0.015	(0.006, 0.025)	0.002
Vascular-related				
Systolic blood pressure (mm Hg)	MV	3.833	(2.405, 5.262)	<0.0001
	MV+BMI	1.712	(0.265, 3.159)	0.02
	MV+CAP	1.917	(0.474, 3.361)	0.009
Diastolic blood pressure (mm Hg)	MV	1.270	(0.358, 2.181)	0.006
	MV+BMI	-0.103	(-1.025, 0.819)	0.83
	MV+CAP	0.019	(-0.901, 0.938)	0.97
Cholesterol-related				
Total cholesterol (mg/dl)	MV	-6.453	(-10.168, -2.739)	0.0007
	MV+BMI	-6.931	(-10.784, -3.077)	0.0004
	MV+CAP	-8.865	(-12.688, -5.041)	<0.0001
HDL cholesterol (mg/dl)	MV	-7.150	(-8.991, -5.310)	<0.0001
	MV+BMI	-1.538	(-3.317, 0.242)	0.09
	MV+CAP	-2.239	(-4.026, -0.453)	0.01
Log triglycerides (mg/dl)	MV	0.190	(0.137, 0.244)	<0.0001
	MV+BMI	0.043	(-0.009, 0.096)	0.10
	MV+CAP	0.021	(-0.029, 0.072)	0.40

LSM, liver stiffness measurement; BMI, body mass index; CAP, controlled attenuation parameter; HgbA1c, glycosylated hemoglobin; HDL, high density lipoprotein; MV, multivariable

Supplemental Table 4: Multivariable-Adjusted Logistic Regression Models for LSM and Dichotomous Traits (Using probe specific cut-off of 1 point lower when XL probe used)

	Dichotomous liver fibrosis (LSM ≥ 8.2 kPa vs LSM <8.2 kPa)			
	Model	OR	95% CI	P value
Obesity/Liver related				
Obesity (BMI ≥ 30 kg/m ²)	MV	4.20	(3.32, 5.30)	<0.0001
	MV+CAP	2.23	(1.69, 2.95)	<0.0001
Hepatic steatosis (CAP ≥ 290 dB/m)	MV	4.66	(3.69, 5.89)	<0.0001
	MV+BMI	2.36	(1.77, 3.13)	<0.0001
Severe hepatic steatosis (CAP ≥ 302 dB/m)	MV	4.45	(3.53, 5.60)	<0.0001
	MV+BMI	2.09	(1.58, 2.77)	<0.0001
Elevated ALT or AST	MV	2.09	(1.63, 2.67)	<0.0001
	MV+BMI	1.84	(1.42, 2.37)	<0.0001
	MV+CAP	1.62	(1.26, 2.09)	0.0002
Metabolic syndrome	MV	3.54	(2.80, 4.47)	<0.0001
	MV+BMI	1.59	(1.21, 2.11)	0.0001
	MV+CAP	1.71	(1.30, 2.24)	<0.0001
Glucose-related				
Diabetes	MV	4.42	(3.29, 5.95)	<0.0001
	MV+BMI	2.40	(1.73, 3.32)	<0.0001
	MV+CAP	2.43	(1.76, 3.35)	<0.0001
Impaired fasting glucose (n=2992)	MV	1.87	(1.46, 2.38)	<0.0001
	MV+BMI	1.25	(0.97, 1.62)	0.09
	MV+CAP	1.27	(0.98, 1.65)	0.07
Vascular-related				
Hypertension	MV	2.34	(1.85, 2.97)	<0.0001
	MV+BMI	1.42	(1.10, 1.84)	0.007
	MV+CAP	1.60	(1.25, 2.06)	0.0002
Cholesterol-related				
Dyslipidemia	MV	1.35	(1.06, 1.72)	0.02
	MV+BMI	1.02	(0.79, 1.32)	0.89
	MV+CAP	1.11	(0.86, 1.43)	0.41
Low HDL cholesterol	MV	2.60	(2.03, 3.33)	<0.0001
	MV+BMI	1.54	(1.17, 2.01)	0.002
	MV+CAP	1.47	(1.12, 1.93)	0.006
High triglycerides	MV	2.12	(1.66, 2.72)	<0.0001
	MV+BMI	1.24	(0.94, 1.62)	0.13
	MV+CAP	1.09	(0.83, 1.43)	0.55

LSM, liver stiffness measurement; BMI, body mass index; CAP, controlled attenuation parameter; ALT, alanine aminotransferase; AST, aspartate aminotransferase; HDL, high density lipoprotein; MV, multivariable

Supplemental Table 5: Multivariable-Adjusted Linear Regression Models for LSM and Continuous Traits (adding ALT and AST to multivariable model)

Trait	Model	Dichotomous liver fibrosis (LSM ≥ 8.2 kPa vs LSM <8.2 kPa)			Continuous Log LSM (per unit increase)		
		β	95% CI	P value	β	95% CI	P value
Obesity/Liver related							
Body mass index (kg/m ²)	MV	3.665	(3.022, 4.309)	<0.0001	3.855	(3.335, 4.375)	<0.0001
	MV+CAP	1.909	(1.368, 2.449)	<0.0001	1.979	(1.534, 2.425)	<0.0001
Waist circumference (cm)	MV	3.613	(2.968, 4.257)	<0.0001	3.634	(3.112, 4.156)	<0.0001
	MV+BMI	0.274	(0.001, 0.547)	0.05	0.119	(-0.108, 0.345)	0.31
	MV+CAP	1.805	(1.271, 2.340)	<0.0001	1.692	(1.25, 2.133)	<0.0001
CAP (dB/m)	MV	30.519	(24.258, 36.780)	<0.0001	33.270	(28.204, 38.337)	<0.0001
	MV+BMI	10.548	(5.262, 15.834)	0.0001	12.622	(8.254, 16.991)	<0.0001
Glucose-related							
Fasting glucose (mg/dl) (n=3168)	MV	8.132	(5.918, 10.346)	<0.0001	6.722	(4.916, 8.527)	<0.0001
	MV+BMI	6.209	(3.994, 8.423)	<0.0001	4.697	(2.868, 6.525)	<0.0001
	MV+CAP	6.150	(3.965, 8.335)	<0.0001	4.526	(2.725, 6.328)	<0.0001
Log hgbA1c (%)	MV	0.028	(0.018, 0.039)	<0.0001	0.028	(0.019, 0.036)	<0.0001
	MV+BMI	0.018	(0.008, 0.029)	0.0006	0.017	(0.008, 0.026)	<0.0001
	MV+CAP	0.019	(0.008, 0.029)	0.0004	0.017	(0.008, 0.026)	<0.0001
Vascular-related							
Systolic blood pressure (mm Hg)	MV	3.026	(1.439, 4.612)	0.0002	3.373	(2.074, 4.673)	<0.0001
	MV+BMI	1.483	(-0.101, 3.067)	0.07	1.795	(0.482, 3.108)	0.007
	MV+CAP	1.818	(0.236, 3.400)	0.02	2.092	(0.782, 3.402)	0.002
Diastolic blood pressure (mm Hg)	MV	0.488	(-0.520, 1.495)	0.34	0.726	(-0.101, 1.553)	0.09
	MV+BMI	-0.456	(-1.463, 0.552)	0.38	-0.265	(-1.100, 0.571)	0.53
	MV+CAP	-0.253	(-1.259, 0.753)	0.62	-0.082	(-0.915, 0.752)	0.85
Cholesterol-related							
Total cholesterol (mg/dl)	MV	-9.012	(-13.155, -4.868)	<0.0001	-7.352	(-10.743, -3.962)	<0.0001
	MV+BMI	-8.801	(-13.020, -4.582)	<0.0001	-7.227	(-10.722, -3.732)	0.0001
	MV+CAP	-10.089	(-14.282, -5.895)	<0.0001	-8.650	(-12.117, -5.182)	<0.0001
HDL cholesterol (mg/dl)	MV	-5.576	(-7.603, -3.550)	<0.0001	-6.069	(-7.721, -4.416)	<0.0001
	MV+BMI	-1.659	(-3.602, 0.284)	0.09	-2.006	(-3.615, -0.397)	0.01
	MV+CAP	-2.466	(-4.416, -0.515)	0.01	-2.736	(-4.349, -1.124)	0.0009
Log triglycerides (mg/dl)	MV	0.116	(0.058, 0.174)	<0.0001	0.159	(0.111, 0.206)	<0.0001
	MV+BMI	0.018	(-0.039, 0.074)	0.54	0.058	(0.011, 0.105)	0.01
	MV+CAP	0.012	(-0.043, 0.066)	0.68	0.047	(0.002, 0.092)	0.04

LSM, liver stiffness measurement; CAP, controlled attenuation parameter; HgbA1c, glycosylated hemoglobin; HDL, high density lipoprotein; MV, multivariable

Supplemental Table 6: Multivariable-Adjusted Logistic Regression Models for LSM and Dichotomous Traits (adding ALT and AST to multivariable model)

	Model	Dichotomous liver fibrosis (LSM ≥ 8.2 kPa vs LSM <8.2 kPa)			Continuous Log LSM (per unit increase)		
		OR	95% CI	P value	OR	95% CI	P value
Obesity/Liver related,							
Obesity (BMI ≥30 kg/m ²)	MV	3.05	(2.33, 3.99)	<0.0001	4.41	(3.44, 5.65)	<0.0001
	MV+CAP	1.98	(1.44, 2.71)	0.0001	2.75	(2.08, 3.62)	<0.0001
Hepatic steatosis (CAP ≥ 290 dB/m)	MV	3.25	(2.48, 4.26)	<0.0001	3.94	(3.06, 5.07)	<0.0001
	MV+BMI	1.88	(1.36, 2.62)	0.0003	1.98	(1.49, 2.64)	0.001
Severe hepatic steatosis (CAP ≥ 302 dB/m)	MV	3.01	(2.30, 3.95)	<0.0001	5.14	(3.82, 6.92)	<0.0001
	MV+BMI	1.60	(1.16, 2.22)	0.002	2.37	(1.70, 3.30)	<0.0001
Metabolic syndrome	MV	2.43	(1.85, 3.19)	<0.0001	3.53	(2.73, 4.56)	<0.0001
	MV+BMI	1.26	(0.91, 1.73)	0.03	1.73	(1.30, 2.29)	0.0007
	MV+CAP	1.41	(1.04, 1.92)	0.004	2.02	(1.53, 2.67)	0.0001
Glucose-related							
Diabetes	MV	4.21	(3.04, 5.83)	<0.0001	5.67	(3.98, 8.07)	<0.0001
	MV+BMI	2.57	(1.81, 3.66)	<0.0001	3.32	(2.30, 4.79)	<0.0001
	MV+CAP	2.78	(1.97, 3.92)	<0.0001	3.69	(2.56, 5.32)	<0.0001
Impaired fasting glucose (n=2992)	MV	1.41	(1.03, 1.92)	0.03	1.67	(1.30, 2.15)	0.0001
	MV+BMI	1.00	(0.71, 1.39)	0.98	1.16	(0.89, 1.52)	0.27
	MV+CAP	1.05	(0.75, 1.46)	0.78	1.24	(0.95, 1.62)	0.11
Vascular-related,							
Hypertension	MV	1.78	(1.35, 2.33)	<0.0001	2.13	(1.68, 2.71)	<0.0001
	MV+BMI	1.19	(0.89, 1.59)	0.23	1.41	(1.09, 1.82)	0.008
	MV+CAP	1.38	(1.04, 1.82)	0.03	1.65	(1.28, 2.11)	0.0001
Cholesterol-related,							
Dyslipidemia	MV	1.18	(0.90, 1.55)	0.23	1.24	(0.98, 1.57)	0.07
	MV+BMI	0.96	(0.72, 1.28)	0.79	1.00	(0.78, 1.28)	0.99
	MV+CAP	1.06	(0.80, 1.40)	0.69	1.11	(0.87, 1.41)	0.41
Low HDL cholesterol	MV	2.09	(1.58, 2.77)	<0.0001	2.54	(1.96, 3.28)	<0.0001
	MV+BMI	1.41	(1.04, 1.90)	0.03	1.68	(1.28, 2.21)	0.0002
	MV+CAP	1.42	(1.05, 1.92)	0.02	1.70	(1.29, 2.22)	0.0001
High triglycerides	MV	1.64	(1.23, 2.19)	0.0007	2.14	(1.65, 2.76)	<0.0001
	MV+BMI	1.10	(0.81, 1.50)	0.54	1.41	(1.07, 1.85)	0.01
	MV+CAP	1.04	(0.77, 1.42)	0.79	1.32	(1.00, 1.75)	0.05

LSM, liver stiffness measurement; BMI, body mass index; CAP, controlled attenuation parameter; ALT, alanine aminotransferase; AST, aspartate aminotransferase; HDL, high density lipoprotein; MV, multivariable

Supplemental Table 7: Multivariable-Adjusted Linear Regression Models for LSM and Continuous Traits (Excluding heavy alcohol use and history of liver disease)

	Model	Dichotomous liver fibrosis (LSM ≥ 8.2 kPa vs LSM <8.2 kPa)			Continuous Log LSM (per unit increase)		
		β	95% CI	P value	β	95% CI	P value
Obesity/Liver related							
Body mass index (kg/m ²)	MV	3.931	(3.256, 4.605)	<0.0001	4.039	(3.506, 4.571)	<0.0001
	MV+CAP	1.711	(1.155, 2.267)	<0.0001	1.758	(1.307, 2.208)	<0.0001
Waist circumference (cm)	MV	3.845	(3.168, 4.521)	<0.0001	3.813	(3.277, 4.349)	<0.0001
	MV+BMI	0.234	(-0.044, 0.513)	0.10	0.100	(-0.126, 0.326)	0.38
	MV+CAP	1.561	(1.011, 2.112)	<0.0001	1.451	(1.005, 1.897)	<0.0001
CAP (dB/m)	MV	37.262	(30.608, 43.916)	<0.0001	39.060	(33.804, 44.315)	<0.0001
	MV+BMI	14.466	(8.970, 19.963)	<0.0001	16.107	(11.661, 20.553)	<0.0001
Log alanine aminotransferase (IU/L)	MV	0.207	(0.155, 0.258)	<0.0001	0.264	(0.223, 0.304)	<0.0001
	MV+BMI	0.145	(0.093, 0.196)	<0.0001	0.208	(0.167, 0.249)	<0.0001
	MV+CAP	0.121	(0.071, 0.172)	<0.0001	0.181	(0.141, 0.222)	<0.0001
Log aspartate aminotransferase (IU/L)	MV	0.137	(0.101, 0.173)	<0.0001	0.164	(0.135, 0.192)	<0.0001
	MV+BMI	0.147	(0.110, 0.183)	<0.0001	0.180	(0.151, 0.209)	<0.0001
	MV+CAP	0.126	(0.089, 0.162)	<0.0001	0.157	(0.128, 0.187)	<0.0001
Glucose-related							
Fasting glucose (mg/dl), n=3012	MV	9.179	(6.872, 11.487)	<0.0001	7.672	(5.830, 9.515)	<0.0001
	MV+BMI	6.676	(4.381, 8.971)	<0.0001	5.114	(3.256, 6.972)	<0.0001
	MV+CAP	6.312	(4.046, 8.578)	<0.0001	4.641	(2.806, 6.476)	<0.0001
Log hgbA1c (%)	MV	0.034	(0.023, 0.045)	<0.0001	0.034	(0.025, 0.043)	<0.0001
	MV+BMI	0.022	(0.011, 0.033)	<0.0001	0.021	(0.013, 0.030)	<0.0001
	MV+CAP	0.020	(0.010, 0.031)	0.0001	0.019	(0.011, 0.028)	<0.0001
Vascular-related							
Systolic blood pressure (mm Hg)	MV	3.697	(2.083, 5.311)	<0.0001	3.970	(2.675, 5.266)	0.0001
	MV+BMI	1.986	(0.379, 5.593)	0.02	2.265	(0.959, 3.571)	0.0007
	MV+CAP	2.102	(0.494, 3.711)	0.01	2.346	(1.038, 3.654)	0.0004
Diastolic blood pressure (mm Hg)	MV	0.865	(-0.156, 1.885)	0.10	1.099	(0.278, 1.919)	0.009
	MV+BMI	-0.248	(-1.263, 0.767)	0.63	-0.040	(-0.865, 0.786)	0.93
	MV+CAP	-0.174	(-1.190, 0.842)	0.74	0.010	(-0.816, 0.837)	0.98
Cholesterol-related							
Total cholesterol (mg/dl)	MV	-7.694	(-11.878, -3.509)	0.0003	-5.758	(-9.111, -2.404)	0.0008
	MV+BMI	-8.133	(-12.398, -3.867)	0.0002	-6.291	(-9.755, -2.827)	0.0004
	MV+CAP	-9.605	(-13.851, -5.359)	<0.0001	-7.899	(-11.348, -4.450)	<0.0001
HDL cholesterol (mg/dl)	MV	-6.260	(-8.320, -4.200)	<0.0001	-6.794	(-8.436, -5.152)	<0.0001
	MV+BMI	-1.798	(-3.750, 0.155)	0.07	-2.286	(-3.871, -0.702)	0.005
	MV+CAP	-2.178	(-4.142, -0.213)	0.03	-2.595	(-4.190, -1.001)	0.001
Log triglycerides (mg/dl)	MV	0.157	(0.096, 0.217)	<0.0001	0.201	(0.153, 0.249)	<0.0001
	MV+BMI	0.035	(-0.023, 0.092)	0.24	0.080	(0.033, 0.127)	0.0008
	MV+CAP	0.013	(-0.043, 0.069)	0.64	0.054	(0.008, 0.099)	0.02

LSM, liver stiffness measurement; BMI, body mass index; CAP, controlled attenuation parameter; HgbA1c, glycosylated hemoglobin; HDL, high density lipoprotein; MV, multivariable

Supplemental Table 8: Multivariable-Adjusted Logistic Regression Models for LSM and Dichotomous Traits (Excluding heavy alcohol use and history of liver disease)

	Model	Dichotomous liver fibrosis (LSM ≥ 8.2 kPa vs LSM <8.2 kPa)			Continuous Log LSM (per unit increase)		
		OR	95% CI	P value	OR	95% CI	P value
Obesity/Liver related							
Obesity (BMI ≥ 30 kg/m ²)	MV	3.21	(2.47, 4.16)	<0.0001	4.42	(3.48, 5.62)	<0.0001
	MV+CAP	1.89	(1.38, 2.59)	0.0001	2.47	(1.89, 3.24)	<0.0001
Hepatic steatosis (CAP ≥ 290 dB/m)	MV	3.53	(2.72, 4.57)	<0.0001	4.39	(3.44, 5.60)	<0.0001
	MV+BMI	2.05	(1.49, 2.82)	<0.0001	2.23	(1.68, 2.94)	<0.0001
Severe hepatic steatosis (CAP ≥ 302 dB/m)	MV	3.44	(2.65, 4.46)	<0.0001	6.06	(4.55, 8.09)	<0.0001
	MV+BMI	1.87	(1.36, 2.56)	0.0001	2.98	(2.17, 4.10)	<0.0001
Elevated ALT or AST	MV	1.90	(1.44, 2.50)	<0.0001	2.33	(1.86, 2.97)	<0.0001
	MV+BMI	1.71	(1.29, 2.26)	0.0002	2.14	(1.70, 2.70)	<0.0001
	MV+CAP	1.54	(1.16, 2.04)	0.003	1.90	(1.51, 2.39)	<0.0001
Metabolic syndrome	MV	2.66	(2.04, 3.46)	<0.0001	3.91	(3.05, 5.02)	<0.0001
	MV+BMI	1.35	(0.98, 1.86)	0.06	2.14	(1.47, 2.56)	0.0007
	MV+CAP	1.38	(1.01, 1.88)	0.04	2.02	(1.53, 2.67)	0.0001
Glucose-related							
Diabetes	MV	4.54	(3.29, 6.27)	<0.0001	5.50	(3.92, 7.71)	<0.0001
	MV+BMI	2.67	(1.87, 3.79)	<0.0001	3.27	(2.30, 4.66)	0.0001
	MV+CAP	2.68	(1.89, 3.79)	<0.0001	3.32	(2.33, 4.73)	<0.0001
Impaired fasting glucose (n=2843)	MV	1.48	(1.08, 2.02)	0.01	1.80	(1.40, 2.31)	<0.0001
	MV+BMI	1.03	(0.73, 1.44)	0.88	1.21	(0.93, 1.58)	0.15
	MV+CAP	1.02	(0.73, 1.43)	0.89	1.24	(0.95, 1.62)	0.12
Vascular-related							
Hypertension	MV	2.04	(1.56, 2.67)	<0.0001	2.44	(1.93, 3.09)	<0.0001
	MV+BMI	1.33	(1.00, 1.78)	0.05	1.57	(1.22, 2.02)	0.0004
	MV+CAP	1.45	(1.10, 1.93)	0.009	1.73	(1.35, 2.22)	<0.0001
Cholesterol-related							
Dyslipidemia	MV	1.29	(0.98, 1.69)	0.07	1.33	(1.06, 1.67)	0.02
	MV+BMI	1.00	(0.75, 1.34)	0.98	1.03	(0.81, 1.31)	0.81
	MV+CAP	1.07	(0.81, 1.43)	0.62	1.10	(0.87, 1.40)	0.43
Low HDL cholesterol	MV	2.36	(1.79, 3.10)	<0.0001	2.81	(2.19, 3.61)	<0.0001
	MV+BMI	1.53	(1.13, 2.06)	0.006	1.84	(1.41, 2.39)	<0.0001
	MV+CAP	1.46	(1.08, 1.98)	0.01	1.74	(1.33, 2.27)	<0.0001
High triglycerides	MV	1.88	(1.42, 2.49)	<0.0001	2.29	(1.78, 2.93)	<0.0001
	MV+BMI	1.18	(0.87, 1.60)	0.29	1.45	(1.11, 1.89)	0.006
	MV+CAP	1.04	(0.76, 1.42)	0.80	1.27	(0.96, 1.67)	0.09

LSM, liver stiffness measurement; BMI, body mass index; CAP, controlled attenuation parameter; ALT, alanine aminotransferase; AST, aspartate aminotransferase; HDL, high density lipoprotein; MV, multivariable