

Supplementary Table 1. Demographic data and lipid levels of jaundice cases

Age	Sex	LDLC	HDLC	TC	TG	Diagnosis	Total bilirubin levels (mg/dL)
60	M	22	12	578	369	Alcoholic liver disease	15.34
76	F	64	15	311	215	Cholangiocarcinoma	17.48
58	M	98	19	331	190	Prior to a diagnosis being made	8.80
90	F	39	9	307	116	Prior to a diagnosis being made	15.42
75	M	13	9	260	126	Cholangiocarcinoma	33.14
51	M	152	14	371	161	Liver cirrhosis	11.90
69	M	57	17	321	176	Gall Bladder cancer	25.36
85	F	29	10	486	242	Cholangiocarcinoma	30.54
79	M	25	11	177	160	Cholangiocarcinoma	14.57
56	M	11	15	170	162	Cholangitis	13.95
56	M	21	11	257	152	Prior to a diagnosis being made	40.20
80	F	61	15	261	304	Toxic hepatitis	4.57
31	M	120	13	322	548	Alcoholic liver disease	6.54

Abbreviations: HDLC, high-density lipoprotein-cholesterol; LDLC, LDL-C, low-density lipoprotein-cholesterol; TC, total cholesterol; TG, triglyceride.

Supplementary Table 2. Concordance rate of estimated cholesterol levels using the Friedewald, Martin-Hopkins, extended Martin-Hopkins, and Sampson equations across directly measured LDL cholesterol and TG level bins, respectively

DLDL, mg/dL (N)	FLDL, N (%)	MLDL, N (%)	EMLDL, N (%)	SLDL, N (%)	P value *
< 40 (2,124)	2,051 (96.6)	1,889 (88.9)	1,880 (88.5)	2,000 (94.2)	<0.001 [†]
40–69 (15,195)	10,950 (72.1)	12,653 (83.3)	12,668 (83.4)	12,273 (80.8)	<0.001 [†]
70–99 (16,670)	8,906 (53.4)	11,582 (69.5)	11,582 (69.5)	10,676 (64.0)	<0.001 [†]
100–129 (10,565)	4,950 (46.9)	6,168 (58.4)	6,170 (58.4)	6,061 (57.4)	<0.001 [†]
130–159 (5,367)	2,316 (43.2)	2,772 (51.7)	2,764 (51.5)	2,868 (53.4)	<0.001 [†]
160–189 (2,010)	769 (38.3)	860 (42.8)	853 (42.4)	956 (47.6)	<0.001 [†]
≥ 190 (658)	377 (57.3)	373 (56.7)	373 (56.7)	407 (61.9)	<0.001 [†]
TG levels, mg/dL (N)					
< 100 (20,024)	14,130 (70.6)	13,514 (67.5)	13,514 (67.5)	14,470 (72.3)	<0.001 [†]
100–149 (15,929)	9,818 (61.6)	11,163 (70.1)	11,163 (70.1)	11,110 (69.8)	<0.001 [‡]
150–199 (8,187)	3,971 (48.5)	5,817 (71.1)	5,817 (71.1)	5,224 (63.8)	<0.001 [†]
200–399 (7,438)	2,254 (30.3)	5,189 (69.8)	5,189 (69.8)	4,046 (54.4)	<0.001 [†]
400–799 (1,011)	146 (14.4)	614 (60.7)	607 (60.0)	391 (38.7)	<0.001 [†]

Values are presented as N/N (%).

*P values were calculated using Cochran's Q test; [†]FLDL vs. MLDL, FLDL vs. EMLDL; FLDL vs. SLDL, MLDL vs. SLDL, EMLDL vs. SLDL <0.05; [‡]FLDL vs. SLDL, MLDL vs. SLDL, EMLDL vs. SLDL <0.05; [§]FLDL vs. MLDL, FLDL vs. EMLDL, FLDL vs. SLDL <0.05.

Abbreviations: DLDL, directly measured LDL cholesterol; EMLDL, LDL-C cholesterol estimated using the extended Martin/Hopkins equation; FLDL, LDL cholesterol estimated using the Friedewald equation; MLDL, LDL cholesterol estimated using the Martin/Hopkins equation; SLDL, LDL cholesterol estimated using the Sampson equation; TG, tri-glyceride.

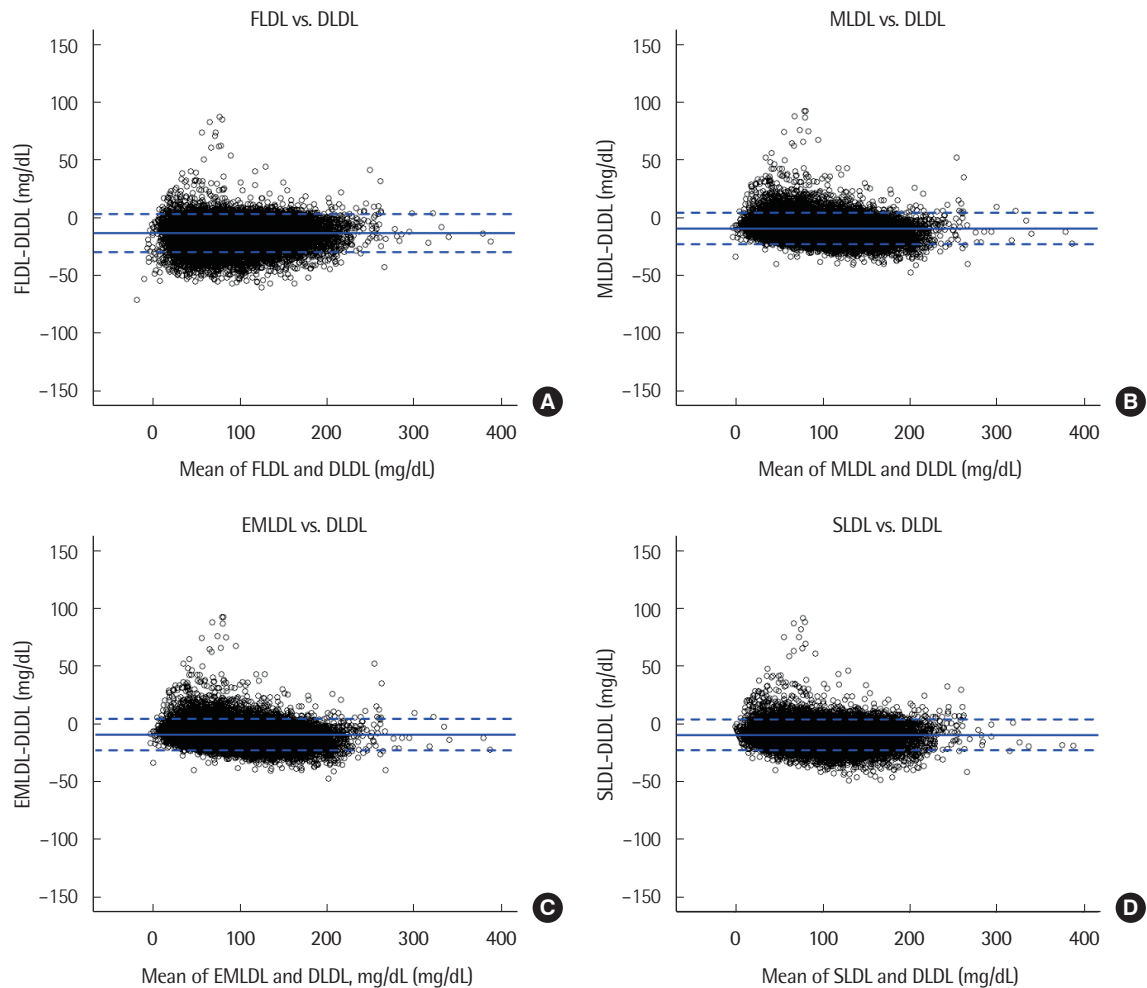
Supplementary Table 3. Concordance rates of estimated cholesterol levels using the Friedewald, Martin/Hopkins, and Sampson equations across directly measured LDL cholesterol level bins for case with triglyceride levels of 150 to 399 mg/dL

DLDL (mg/dL)	N	FLDL	MLDL	SLDL	P value*
< 40	515	439 (95.7)	392 (76.1)	462 (89.7)	<0.001 [†]
40–69	3,753	1,964 (52.3)	3,227 (86.0)	2,897 (77.2)	<0.001 [†]
70–99	4,859	1,720 (35.4)	3,694 (76.0)	2,848 (58.6)	<0.001 [†]
100–129	3,443	1,065 (30.9)	2,128 (61.8)	1,716 (49.8)	<0.001 [†]
130–159	1,937	573 (29.6)	1,029 (53.1)	853 (44.0)	<0.001 [†]
160–189	807	246 (30.5)	363 (45.0)	321 (39.8)	<0.001 [†]
≥ 190	311	164 (52.7)	173 (55.6)	173 (55.6)	<0.001 [†]

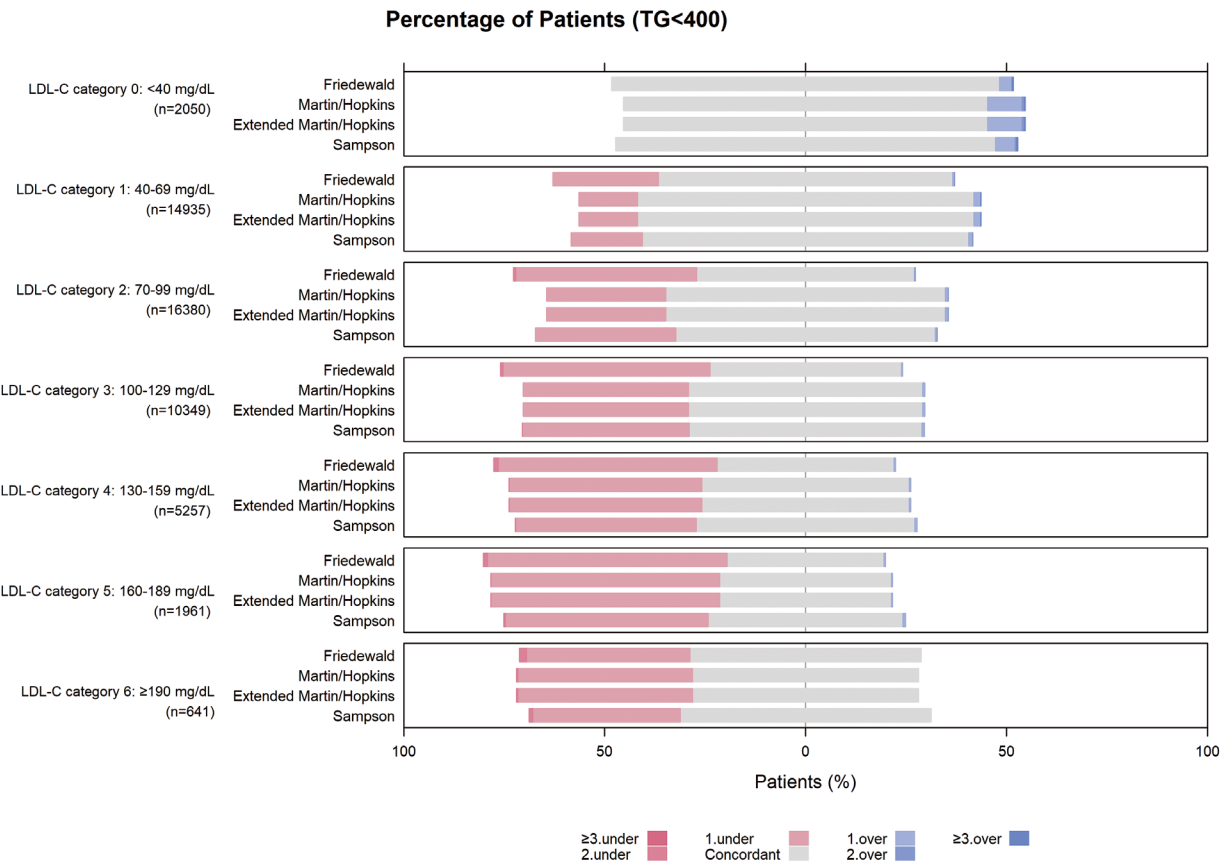
Values are presented as n/N (%).

*P values were calculated using Cochran's Q test.; [†]FLDL vs. MLDL, FLDL vs. SLDL, MLDL vs. SLDL <0.05; [†]FLDL vs. MLDL, FLDL vs. SLDL <0.05.

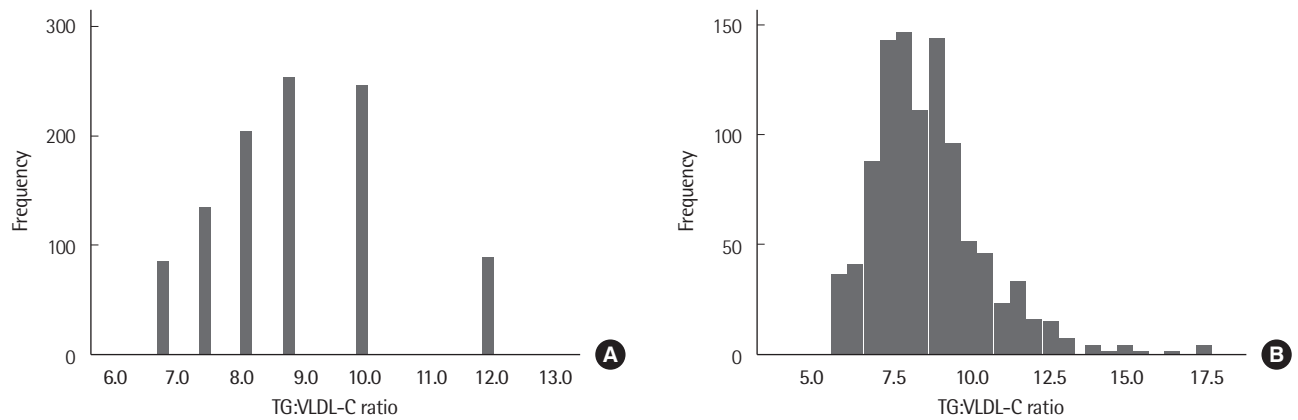
Abbreviations: DLDL, directly measured LDL cholesterol; FLDL, LDL cholesterol estimated using the Friedewald equation; MLDL, LDL cholesterol estimated using the Martin-Hopkins equation; SLDL, LDL cholesterol estimated using the Sampson equation.



Supplementary Fig. 1. Bland–Altman plots that compare directly measured LDL-C (DLDL) levels with those calculated from the Friedewald equation (A), Martin/Hopkins equation (B), extended Martin/Hopkins equation (C), or Sampson equation (D) for TG levels <400 mg/dL. Abbreviations: LDL-C, LDL cholesterol; TG, triglyceride; DLDL, directly measured LDL cholesterol; EMLDL, LDL-C cholesterol estimated using the extended Martin/Hopkins equation; FLDL, LDL cholesterol estimated using the Friedewald equation; MLDL, LDL cholesterol estimated using the Martin/Hopkins equation; SLDL, LDL cholesterol estimated using the Sampson equation.



Supplementary Fig. 2. Proportion of misclassified participants per estimation method in each estimated LDL-C category, with TG levels <400 mg/dL. Graphs represent the total percentage of patients who were underclassified and overclassified within each LDL-C level category. Abbreviations: LDL-C, LDL cholesterol; TG, triglyceride.



Supplementary Fig. 3. Distribution of TG/VLDL-C ratios of the study population using the original (A) and extended Martin/Hopkins methods (B). Abbreviations: TG, triglyceride; VLDL-C, very low-density lipoprotein cholesterol.