

HDL cholesterol						
Analytical Performance Specification			RCV Calculation			
Matrix	BV Estimate	median CV estimate	lower CI limit	higher CI limit	Comments	Date Updated
Serum/plasma	👤	5.7	5.6	8.8		21/9/2023
Serum/plasma	👥	24.3	18.4	51.4		21/9/2023

Colour Key for References

Included In Meta Analysis Not Included In Meta Analysis

Reference	Dataset	Estimate of CVI	Estimate of CVG	Gender	Age	State of Well Being	Matrix	Sampling Interval
<p>Day-to-day variability of serum cholesterol, trigliceryde, and high-density lipoprotein cholesterol levels</p> <p>Bookstein MS, Gidding S, Donovan M and Smith F, Arch Intern Med, 1653-7, 150, 1990</p> <p>View</p>	<p>View</p>	<p>7.5</p>		Mixed	32.0	Healthy	Serum	3 per Week
<p>Short-term intraindividual variability in lipoprotein measurements: the atherosclerosis risk communities (ARIC) study</p> <p>Chambless LE, McMahon RP, Brown SA, Patsch W, Heiss G and Shen Y, Am J Epidem, 1069-1081, 0136, 1992</p> <p>View</p>	<p>View</p>	<p>4.6</p>		Mixed		Healthy	Plasma	1 per Week
<p>Variation in concentrations of lipids, lipoprotein lipids, and apolipoproteins A-I and B in plasma from healthy women</p> <p>Brown SA, Boerwinkle E, Kashanian FK, Swanson N and Patsch W, Clin Chem, 207-10, 36, 1990</p> <p>View</p>	<p>View</p>	<p>10.0</p>	<p>23.0</p>	Females		Healthy	Plasma	1 per Other
<p>Short-term intraindividual variability in lipoprotein measurements: the atherosclerosis risk</p>								

communities (ARIC) study	<div>View</div>	5.4	Mixed	Healthy	Plasma	1 per Week	
Chambless LE, McMahon RP, Brown SA, Patsch W, Heiss G and Shen Y, Am J Epidem, 1069-1081, 0136, 1992							
View							
Effect of time between measurements on within-subject variability for total cholesterol and high-density lipoprotein cholesterol in women	<div>View</div>	7.4	Females	Healthy	Plasma	2 per Week	
Choudhury N, Lyons Wall PM and Stewart Truswell A, Clin Chem, 710-5, 40, 1994							
View							
Intra-individual variation of serum cholesterol, triglycerides and high density lipoprotein cholesterol in normal humans	<div>View</div>	8.4	Males	32.0	Healthy	Serum	1 per Month
Demacker PNM, Schade RWB, Jansen RTP and Van't Laar A, Atherosclerosis, 259-66, 45, 1982							
View							
Intra-individual variation of serum cholesterol, triglycerides and high density lipoprotein cholesterol in normal humans	<div>View</div>	6.8	Males	32.0	Healthy	Serum	2 per Week
Demacker PNM, Schade RWB, Jansen RTP and Van't Laar A, Atherosclerosis, 259-66, 45, 1982							
View							
Intra-individual variation of serum cholesterol, triglycerides and high density lipoprotein cholesterol in normal humans	<div>View</div>	9.4	Females	32.0	Healthy	Serum	1 per Month
Demacker PNM, Schade RWB, Jansen RTP and Van't Laar A, Atherosclerosis, 259-66, 45, 1982							
View							
Intra-individual variation of serum cholesterol							

<div> <div> of serum cholesterol, triglycerides and high density lipoprotein cholesterol in normal humans </div> <div> View </div> </div>	7.7	Females	32.0	Healthy	Serum	2 per Week
<div> Demacker PNM, Schade RWB, Jansen RTP and Van't Laar A, Atherosclerosis, 259-66, 45, 1982 </div> <div>View</div>						
<div> Intra-individual variation of serum cholesterol, triglycerides and high density lipoprotein cholesterol in normal humans </div> <div> View </div>	6.9	Females	32.0	Healthy	Serum	1 per Month
<div> Demacker PNM, Schade RWB, Jansen RTP and Van't Laar A, Atherosclerosis, 259-66, 45, 1982 </div> <div>View</div>						
<div> Variability of plasma lipids and lipoproteins: the Jerusalem Lipid Research Clinic Study </div> <div> View </div>	12.4	Females	40.0	Healthy	Plasma	1 per Month
<div> Friedlander Y, Kark JD and Stein Y, Clin Chem, 1121-6, 31, 1985 </div> <div>View</div>						
<div> Variability in cholesterol measuraments: comparison of calculated and direct LDL cholesterol determinations </div> <div> View </div>	6.4	Males		Healthy	Serum	1 per Month
<div> Schectman G, Patsches M and Sasse EA, Clin Chem, 732-7, 42, 1996 </div> <div>View</div>						
<div> Variability of plasma lipids and lipoproteins: the Jerusalem Lipid Research Clinic Study </div> <div> View </div>	15.8	Males	40.0	Healthy	Plasma	1 per Month
<div> Friedlander Y, Kark JD and Stein Y, Clin Chem, 1121-6, 31, 1985 </div> <div>View</div>						
<div> Variability of plasma lipids and lipoproteins: the Jerusalem Lipid Research Clinic Study </div> <div> View </div>	15.6	Males	60.0	Healthy	Plasma	1 per Month
<div> Friedlander Y, Kark JD and Stein Y, Clin Chem, 1121-6, 31, 1985 </div> <div>View</div>						

Friedlander Y, Kark JD and Stein Y, Clin Chem, 1121-6, 31, 1985									
View									
Variability of plasma lipids and lipoproteins: the Jerusalem Lipid Research Clinic Study									
Friedlander Y, Kark JD and Stein Y, Clin Chem, 1121-6, 31, 1985	View	11.6		Females	60.0	Healthy	Plasma	1 per Month	
View									
Diurnal and monthly intra-individual variability of the concentration of lipids, lipoproteins and apoproteins									
Wasenius A, Stugaard M, Otterstad JE, Froyshov D, Scand J Clin Lab Invest, 632-42, 50, 1990	View	4.1		Mixed		Healthy	Serum	1 per Week	
View									
Short and long term variability of selected indices related to nutritional status. II. Vitamins, lipids, and protein indices									
Gallagher SK, Johnson AK, Milne DB, Clin Chem, 1449-53, 38, 1992	View	11.9	9.3	Females		Healthy	Serum	1 per Month	
View									
Influence of hypertension and antihypertensive drugs on the biological intra-individual variation of electrolytes and lipids in serum									
Hölzel WGE, Clin Chem, 1485-8, 34, 1988	View	9.0		Males	41.8	Healthy	Serum	1 per Week	
View									
Variación biológica de lípidos y lipoproteínas séricas en individuos sanos y pacientes con enfermedad renal crónica terminal									
Corte Z and Venta R, Rev Lab Clin, 88-95, 7, 2014	View	9.4	51.4	Mixed		Healthy	Serum	1 per Week	

View									
<div>Intra-individual variation of some analytes in serum of patients with insulin-dependent diabetes mellitus</div> <div><div>View</div><div>7.17</div><div>Females</div><div>33.5</div><div>Healthy</div><div>Serum</div><div>1 per Week</div></div> <div>Hölzel WGE, Clin Chem, 57-61, 33, 1987</div>									
View									
<div>Intra-individual variation of some analytes in serum of patients with insulin-dependent diabetes mellitus</div> <div><div>View</div><div>9.0</div><div>Males</div><div>41.8</div><div>Healthy</div><div>Serum</div><div>1 per Week</div></div> <div>Hölzel WGE, Clin Chem, 57-61, 33, 1987</div>									
View									
<div>Age dependence of within-subject biological variation of nine common clinical chemistry analytes</div> <div><div>View</div><div>11.6</div><div>Mixed</div><div></div><div>Healthy</div><div>Serum</div><div>1 per Week</div></div> <div>Carobene A, Graziani MS, Lo Cascio C, Tretti L, Cremonese E, Yabarek T, Gambaro G and Ceriotti F., Clin Chem Lab Med, 841-4, 50, 2012</div>									
View									
<div>Age dependence of within-subject biological variation of nine common clinical chemistry analytes</div> <div><div>View</div><div>6.8</div><div>Mixed</div><div></div><div>Healthy</div><div>Serum</div><div>1 per Week</div></div> <div>Carobene A, Graziani MS, Lo Cascio C, Tretti L, Cremonese E, Yabarek T, Gambaro G and Ceriotti F., Clin Chem Lab Med, 841-4, 50, 2012</div>									
View									
<div>Biological variability of Cholesterol, Triglyceride, Low- and High-density lipoprotein Cholesterol, Lipoprotein(a), and Apolipoproteins A-I and B</div> <div><div>View</div><div>7.5</div><div>Mixed</div><div></div><div>Healthy</div><div>Plasma</div><div>2 per Month</div></div> <div>Marcovina SM, Gaur VP and Albers JJ, Clin Chem, 574-8, 40, 1994</div>									
View									

A longitudinal study of the biological variability of plasma lipoproteins in healthy young adults

Mjøs O, Rao S,Bjørn, Henden T, Thelle D,Førde O and Miller N, Atherosclerosis, 75-81, 34, 1979

View

9.42

Females

28.0

Healthy

Serum

1 per Other

View

Within-person fluctuations of serum cholesterol and lipoproteins

Mogadam M, Ahmed S, Mensch A and Godwin I, Arch Intern Med, 1645-8, 150, 1990

View

5.8

Mixed

Healthy

Serum

1 per Week

View

Significance of various parameters derived from biological variability for lipid and lipoprotein analyses

Pagani F and Panteghini M, Clin Biochem, 415-20, 26, 1993

View

4.7

18.4

Mixed

Healthy

Serum

1 per Week

View

Essential data derived from biological variation for establishment and use of lipid analyses

Ford RP, Ann Clin Biochem, 281-5, 26, 1989

View

5.5

27.2

Mixed

Healthy

Serum

1 per Week

View

Biological variation of glucose, insulin and lipids in lean, insulin-sensitive and obese, insulin-resistant chinese males without diabetes

Rizi EP, Baig S, Toh SA and Khoo CM, Pathology , 510-2, 48, 2016

View

23.0

23.6

Males

Healthy

Serum

1 per Week

View

A longitudinal study of the biological variability of plasma lipoproteins in healthy young adults

Mjøs O, Rao S,Bjørn, Henden T, Thelle D,Førde O and Miller N, Atherosclerosis, 75-81, 34, 1979

View

8.42

Males

28.0

Healthy

Serum

1 per Other

View									
The EuBIVAS: within- and between-subject biological variation data for electrolytes, lipids, urea, uric acid, total protein, total bilirubin, direct bilirubin and glucose	View	5.67	25.1	Mixed		Healthy	Serum	1 per Week	
Aarsand AK, Diaz-Garzón J, Fernández-Calle P, et al, Clin Chem, 1380-93, 64(9), 2018									
View									
Biological variation of lipids and lipoproteins in fingerstick blood	View	8.9		Mixed	40.3	Healthy	Serum	1 per Month	
Kafonek SD, Donovan L, Lovejoy KL and Bachorik PS, Clin Chem, 2002-7, 42, 1996									
View									
Biological variation data applied to the selection of serum lipid ratios used as risk markers of coronary heart disease.	View	7.1	22.7	Males		Healthy	Serum	1 per Month	
Ortolá J, Castiñeiras MJ, Fuentes-Arderiu X., Clin Chem, 56-9, 38, 1992									
View									
Intra-individual variation: significant changes in parameters of lipid and carbohydrate metabolism in the individual and intra-individual variation in different test populations	View	9.0		Mixed		Healthy	Serum	1 per Week	
Godsland IF, Ann Clin Biochem, 618-24, 22, 1985									
View									
The variability of and associations between measures of blood coagulation, fibrinolysis and blood lipids	View	9.9	19.0	Males	21.2	Healthy	Serum	1 per Month	
Marckmann P, Sandström B, Jespersen J., Atherosclerosis, 235-44, 96, 1992									

View									
<div>Intra-individual variation of serum cholesterol, triglycerides and high density lipoprotein cholesterol in normal humans</div> <div>Demacker PNM, Schade RWB, Jansen RTP and Van't Laar A, Atherosclerosis, 259-66, 45, 1982</div>									
<div>View</div>	7.7		Males	32.0	Healthy	Serum	2 per Week		
View									
<div>Biological variation of lipids and lipoproteins in fingerstick blood</div> <div>Kafonek SD, Donovan L, Lovejoy KL and Bachorik PS, Clin Chem, 2002-7, 42, 1996</div>									
<div>View</div>	6.5		Mixed	40.3	Healthy	Whole blood	1 per Month		
View									
<div>Analytical and biological variability in biomarker measurement in the Hispanic Community Health Study/Study of Latinos</div> <div>Thyagarajan B, Howard AG, Durazo-Arvizu R, Eckfeldt JH, Gellman MD, Kim RS, Liu K, Mendez AJ, Penedo FJ, Talavera GA, Youngblood ME, Zhao L and Sotres-Alvarez D, Clin Chim Acta, 129-137, 463, 2016</div>									
<div>View</div>	25.7		Mixed		Healthy	Serum	1 per Month		
View									
<div>The EuBIVAS: within- and between-subject biological variation data for electrolytes, lipids, urea, uric acid, total protein, total bilirubin, direct bilirubin and glucose</div> <div>Aarsand AK, Diaz-Garzón J, Fernández-Calle P, et al, Clin Chem, 1380-93, 64(9), 2018</div>									
<div>View</div>	5.66	20.4	Males	35.0	Healthy	Serum	1 per Week		
View									
<div>Biological variability of lipoproteins and apolipoproteins in patients referred to a lipid clinic</div> <div>Kaplan ND, et al, J Clin Lipidol, 16(1), 2012</div>									
<div>View</div>	7.1		Mixed	28.0	Non-healthy	Plasma	"No Sampling Intervals"		

Katonek SD, Derby CA and
Bachorik PS, Clin Chem, 864-
72, 38, 1992

View

Intra-individual variation
of serum cholesterol,
triglycerides and high
density lipoprotein
cholesterol in normal
humans

View

4 . 5

Males

32.0

Healthy

Serum

3 per
Hour

Demacker PNM, Schade RWB,
Jansen RTP and Van't Laar A,
Atherosclerosis, 259-66, 45,
1982

View

Biological variability of
lipoproteins and
apolipoproteins in
patients referred to a
lipid clinic

View

7 . 7

Males

51.0

Non-
healthy

Plasma

"No
Sampling
Intervals"

Kafonek SD, Derby CA and
Bachorik PS, Clin Chem, 864-
72, 38, 1992

View

The EuBIVAS: within-
and between-subject
biological variation data
for electrolytes, lipids,
urea, uric acid, total
protein, total bilirubin,
direct bilirubin and
glucose

View

6 . 24

21 . 1

Females

34.0

Healthy

Serum

1 per
Week

Aarsand AK, Diaz-Garzón J,
Fernández-Calle P, et al, Clin
Chem, 1380-93, 64(9), 2018

View

Biological variability of
lipoproteins and
apolipoproteins in
patients referred to a
lipid clinic

View

8 . 3

Females

9.0

Non-
healthy

Plasma

"No
Sampling
Intervals"

Kafonek SD, Derby CA and
Bachorik PS, Clin Chem, 864-
72, 38, 1992

View

Intra-individual variation
of serum cholesterol,
triglycerides and high
density lipoprotein
cholesterol in normal
humans

View

5 . 1

Females

32.0

Healthy

Serum

4 per Day

Demacker PNM, Schade RWB, Jansen RTP and Van't Laar A, Atherosclerosis, 259-66, 45, 1982

View

Prognostic utility of biochemical markers of cardiovascular risk: impact of biological variability

View

9.1

27.0

Mixed

Healthy

Serum

2 per Week

Alexander KS, Kazmierczak SC, Snyder CK, Oberdorf JA and Farrell DH, Clin Chem Lab Med , 1875-82, 51(9), 2013

View

Prognostic utility of biochemical markers of cardiovascular risk: impact of biological variability

View

11.1

25.2

Mixed

Healthy

Serum

1 per Month

Alexander KS, Kazmierczak SC, Snyder CK, Oberdorf JA and Farrell DH, Clin Chem Lab Med , 1875-82, 51(9), 2013

View

The EuBIVAS: within- and between-subject biological variation data for electrolytes, lipids, urea, uric acid, total protein, total bilirubin, direct bilirubin and glucose

View

5.39

11.4

Females

60.0

Healthy

Serum

1 per Week

Aarsand AK, Diaz-Garzón J, Fernández-Calle P, et al, Clin Chem, 1380-93, 64(9), 2018

View

Estimate of biological variation of laboratory analytes based on the third National Health and Nutrition Examination Survey

View

12.4

Males

40.0

Healthy

Serum

2 per Month

Lacher DA, Hughes JP and Carroll MD, Clin Chem, 450-2, 51, 2005

View

Intra-individual variation of serum cholesterol, triglycerides and high density lipoprotein

cholesterol in normal humans	View	4.0		Females	32.0	Healthy	Serum	3 per Hour
Demacker PNM, Schade RWB, Jansen RTP and Van't Laar A, Atherosclerosis, 259-66, 45, 1982								
View								
Variability of plasma lipids and lipoproteins: the Jerusalem Lipid Research Clinic Study	View	13.2		Males	17.0	Healthy	Plasma	1 per Month
Friedlander Y, Kark JD and Stein Y, Clin Chem, 1121-6, 31, 1985								
View								
Variability of plasma lipids and lipoproteins: the Jerusalem Lipid Research Clinic Study	View	13.2		Females	17.0	Healthy	Plasma	1 per Month
Friedlander Y, Kark JD and Stein Y, Clin Chem, 1121-6, 31, 1985								
View								
Covariance of metabolic and hemostatic risk indicators in men and women.	View	8.1	23.2	Females	36.71	Healthy	Serum	2 per Day
Riese H, Vrikkotte TGM, Meijer P, Kluft C, De Geus EJC, Fibrinolysis & Proteolysis, 1-12, 14, 2001								
View								
Covariance of metabolic and hemostatic risk indicators in men and women.	View	5.4	23.0	Females	30.19	Healthy	Serum	2 per Day
Riese H, Vrikkotte TGM, Meijer P, Kluft C, De Geus EJC, Fibrinolysis & Proteolysis, 1-12, 14, 2001								
View								
Short and long term variability of selected indices related to nutritional status. II. Vitamins, lipids, and protein indices	View	16.3	2.7	Females		Healthy	Serum	1 per Day
Gallagher SK, Johnson AK, Milne DB, Clin Chem, 1449-53, 38, 1992								
View								

<div>Circadian rhythmic variations in serum concentrations of clinically important lipids</div> <div>Rivera-Coll A, Fuentes-Arderiu X and Díez-Noguera A, Clin Chem, 1549-53, 40, 1994</div> <div>View</div>	5.3		Mixed	29.5	Healthy	Serum	4 per Hour
<div>Short and long term variability of selected indices related to nutritional status. II. Vitamins, lipids, and protein indices</div> <div>Gallagher SK, Johnson AK, Milne DB, Clin Chem, 1449-53, 38, 1992</div> <div>View</div>	10.6	19.7	Females		Healthy	Serum	1 per Week
<div>Intra-individual variation of some analytes in serum of patients with chronic renal failure</div> <div>Hölzel WGE, Clin Chem, 670-3, 33, 1987</div> <div>View</div>	9.5		Mixed		Non-healthy	Serum	"No Sampling Intervals"
<div>Diurnal and monthly intra-individual variability of the concentration of lipids, lipoproteins and apoproteins</div> <div>Wasenius A, Stugaard M, Otterstad JE, Froyshov D, Scand J Clin Lab Invest, 632-42, 50, 1990</div> <div>View</div>	3.5		Mixed		Healthy	Serum	3 per Hour
<div>Pediatric within-day biological variation and quality spcifications for 38 biochemical markers in the CALIPER cohort</div> <div>Bailey D, Bevilacqua V, Colantonio DA, Pasic MD, Perumal N, Chan MK and Adeli K, Clin Chem, 518-29, 60, 2014</div> <div>View</div>	2.9	22.2	Mixed		Healthy	Serum	3 per Hour
<div>Intra-individual variation of some analytes in</div>							

<div>serum of patients with insulin-dependent diabetes mellitus</div> <div>Hölzel WGE, Clin Chem, 57-61, 33, 1987</div> <div>View</div>	<div>View</div>	<div>7.73</div>		<div>Males</div>	<div>38.7</div>	<div>Non-healthy</div>	<div>Serum</div>	<div>1 per Week</div>
<div>Variación biológica de lípidos y lipoproteínas séricas en individuos sanos y pacientes con enfermedad renal crónica terminal</div> <div>Corte Z and Venta R, Rev Lab Clin, 88-95, 7, 2014</div> <div>View</div>	<div>View</div>	<div>11.4</div>	<div>51.56</div>	<div>Mixed</div>		<div>Non-healthy</div>	<div>Serum</div>	<div>1 per Month</div>
<div>Covariance of metabolic and hemostatic risk indicators in men and women.</div> <div>Riese H, Vrikkotte TGM, Meijer P, Kluft C, De Geus EJC, Fibrinolysis & Proteolysis, 1-12, 14, 2001</div> <div>View</div>	<div>View</div>	<div>8.9</div>	<div>29.9</div>	<div>Males</div>	<div>45.23</div>	<div>Healthy</div>	<div>Serum</div>	<div>2 per Week</div>
<div>Biological variability of lipoproteins and apolipoproteins in patients referred to a lipid clinic</div> <div>Kafonek SD, Derby CA and Bachorik PS, Clin Chem, 864-72, 38, 1992</div> <div>View</div>	<div>View</div>	<div>7.1</div>		<div>Females</div>	<div>52.0</div>	<div>Non-healthy</div>	<div>Plasma</div>	<div>"No Sampling Intervals"</div>
<div>Influence of hypertension and antihypertensive drugs on the biological intra-individual variation of electrolytes and lipids in serum</div> <div>Hölzel WGE, Clin Chem, 1485-8, 34, 1988</div> <div>View</div>	<div>View</div>	<div>8.71</div>		<div>Males</div>	<div>46.8</div>	<div>Non-healthy</div>	<div>Serum</div>	<div>1 per Week</div>
<div>Short and long term variability of selected indices related to nutritional status. II. Vitamins, lipids, and protein indices</div> <div>Gallagher SK, Johnson AK, Milne DB, Clin Chem, 1449-52, 34, 1988</div> <div>View</div>	<div>View</div>	<div>8.4</div>	<div>11.5</div>	<div>Females</div>		<div>Healthy</div>	<div>Serum</div>	<div>1 per Week</div>

Wille DB, Clin Chem, 1443-55, 38, 1992

View

Intra-individual variation of some analytes in serum of patients with insulin-dependent diabetes mellitus

View

9.4

Females

31.8

Non-healthy

Serum

1 per Week

Hölzel WGE, Clin Chem, 57-61, 33, 1987

View

Estimate of biological variation of laboratory analytes based on the third National Health and Nutrition Examination Survey

View

28.3

Males

40.0

Healthy

Serum

"No Sampling Intervals"

Lacher DA, Hughes JP and Carroll MD, Clin Chem, 450-2, 51, 2005

View

Analytical and biological variability in biomarker measurement in the Hispanic Community Health Study/Study of Latinos

View

6.4

Mixed

Healthy

Serum

1 per Month

Thyagarajan B, Howard AG, Durazo-Arvizu R, Eckfeldt JH, Gellman MD, Kim RS, Liu K, Mendez AJ, Penedo FJ, Talavera GA, Youngblood ME, Zhao L and Sotres-Alvarez D, Clin Chim Acta, 129-137, 463, 2016

View

Biological variation of glucose, insulin and lipids in lean, insulin-sensitie and obese, insulin-resistant chinese males without diabetis

View

15.0

21.9

Males

Non-healthy

Serum

1 per Week

Rizi EP, Baig S, Toh SA and Khoo CM, Pathology , 510-2, 48, 2016

View

Short and long term variability of selected indices related to nutritional status. II. Vitamins, lipids, and protein indices

View

17.4

0.8

Females

Healthy

Serum

1 per Month

Gallagher SK, Johnson AK,
Milne DB, Clin Chem, 1449-53,
38, 1992

[View](#)

Biological variability of
lipoproteins and
apolipoproteins in
patients referred to a
lipid clinic

[View](#)

6.9

Males

9.0

Non-
healthy

Plasma

"No
Sampling
Intervals"

Kafonek SD, Derby CA and
Bachorik PS, Clin Chem, 864-
72, 38, 1992

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