

1 **Supplemental Tables:**

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**Supplemental Table 1. Variable Definitions For OHSUD Victims and Control**

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**Subjects**

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	OHSUD Victims	Control Subjects
	Recorded BMI in most recent	Recorded BMI in most recent
	medical record or calculated as	medical record or calculated as
Body Mass	weight (kg)/height (m <sup>2</sup> ) from	weight (kg)/height (m <sup>2</sup> ) from most
Index (BMI)	most recent same-day weight and	recent same-day weight and height
	height measurements found in	measurements found in medical
	medical records.	records.
Smoker	Any history (current or past) of	Any history (current or past) of
	smoking per medical records.	smoking per medical records.
	Any mention of the terms	ICD-9 and 10 codes:
	‘Coronary Artery Disease	414.01, 414.06, 414.12, 414.2,
	(CAD)’, ‘Atherosclerotic Heart	414.20, 746.85, 429.2, 429.20,
	Disease (ASHD)’, ‘stent’,	V45.82, 414, 410, 414, 410.01,
	‘coronary stent’, ‘Coronary	410.02, 410.1, 410.11, 410.12,
Coronary Artery	Artery Bypass Graft (CABG)’,	410.2, 410.21, 410.22, 410.3,
Disease	‘history of Myocardial Infarction	410.31, 410.32, 410.4, 410.41,
	(MI)’, ‘Atherosclerotic	410.42, 410.5, 410.51, 410.52,
	Cardiovascular Disease’,	410.8, 410.81, 410.82, 410.9,
	‘coronary re-vascularization of	410.91, 410.92, 411.81, 412,
	coronary stent’, ‘PCI’, ‘NSTEMI’	429.79
	or ‘STEMI’ in medical records.	

		ICD-9 and 10 codes:
		401, 401.1, 401.9, 402, 402.01,
		402.1, 402.11, 402.9, 402.91,
	Any mention of the terms	405.19, 405.09, 405.99, 403,
	‘hypertension (HTN)’, ‘high	403.01, 403.1, 403.11, 403.9,
Hypertension	blood pressure’ or ‘hypertensive	403.91, 404, 404.01, 404.02,
	heart disease’ in medical records.	404.03, 404.1, 404.11, 404.12,
		404.13, 404.9, 404.91, 404.92,
		404.93, 405.01, 405.11, 405.91
		ICD-9 and 10 codes
		249, 249.01, 249.1, 249.11, 249.2,
		249.21, 249.3, 249.31, 249.4,
		249.41, 249.5, 249.51, 249.6,
		249.61, 249.7, 249.71, 249.8,
		249.81, 249.9, 249.91, 250,
	Any mention of ‘diabetes’ or	250.01, 250.02, 250.03, 250.1,
Diabetes	‘diabetes mellitus’ in medical	250.11, 250.12, 250.13, 250.2,
Mellitus	records.	250.21, 250.22, 250.23, 250.3,
		250.31, 250.32, 250.33, 250.4,
		250.41, 250.42, 250.43, 250.5,
		250.51, 250.52, 250.53, 250.6,
		250.61, 250.62, 250.63, 250.7,
		250.71, 250.72, 250.73, 250.8,
		250.81, 250.82, 250.83, 250.9,

250.91, 250.92, 250.93, 357.2,  
362.01, 362.02, 362.03, 362.04,  
362.05, 362.06, 366.41

Dyslipidemia      Any mention of ‘dyslipidemia’,  
                         ‘hypercholesterolemia’,  
                         ‘hypertriglyceridemia’,  
                         ‘hyperlipidemia (HLD/HL)’,      ICD-9 and 10 codes:  
                         ‘familial      272,272.1,272.2,272.3,272.4,414.3  
                         hypercholesterolemia(FH)’, ‘high      ,272.8,272.9  
                         LDL’, ‘high cholesterol’,  
                         ‘high/elevated/hyper  
                         triglycerides’, ‘lipid disorder’ in  
                         medical records.

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**Supplemental Table 2. Comparison Between Mean Values (in mg/dL) and Odds of OHSUD Associated with LDL-C and LDL/HDL, Using Both Calculated and Direct LDL (n=1,091) vs. Using Only Calculated LDL Values (N=481) for OHSUD Victims and Controls<sup>a,b</sup>**

	Mean (Standard Deviation)				Odds Ratio (95% Confidence Interval)			
	OHSUD Victims		Controls		Model 1 <sup>c</sup>		Model 2 <sup>d</sup>	
	All LDL (n=135)	Calculated LDL (n=128)	All LDL (n=914)	Calculated LDL (n=353)	All LDL	Calculated LDL	All LDL	Calculated LDL
LDL	90.9 (39.6)	90.8 (40)	109.6 (35.2)	108.9 (35.3)	0.30 (0.18- 0.5)	0.31 (0.19- 0.57)	0.32 (0.18- 0.56)	0.32 (0.17- 0.59)
LDL/ HDL	2.1 (1.2)	2.1 (1.22)	2.2 (1)	2.1 (1)	0.94 (0.78- 1.13)	0.95 (0.78- 1.16)	0.88 (0.72- 1.07)	0.88 (0.71-1.1)

<sup>a</sup>OHSUD (Out-of-Hospital Sudden Unexpected Death); NHANES (National Health and Nutrition Examination Survey); HDL (High-density Lipoprotein); LDL (Low-density Lipoprotein); TG (Triglycerides); TC (Total Cholesterol)

<sup>b</sup>SI conversion factors: to convert mg/dL to mmol/L multiply by 38.67

<sup>c</sup> Model 1 – Unadjusted

<sup>d</sup> Model 2 - Adjusted for age, sex

**Supplemental Table 3. Odds Ratios (95% Confidence Interval) of Out-of-Hospital Sudden Unexpected Death Associated with Different Lipid Measures Adjusted for Age and Sex (Model 2) vs. Adjusted for Age, Sex and Race (Black and White Races Only)**

	Adjusted for Age, Sex	Adjusted for Age, Sex, Race
Total Cholesterol (highest vs. lowest quartile)	0.43 (0.25-0.74)	0.43 (0.25-0.75)
Triglycerides (highest vs. lowest quartile)	1.00 (1.00-1.00)	0.84 (0.48-1.48)
HDL-Cholesterol (highest vs. lowest quartile)	0.64 (0.37-1.13)	0.67 (0.38-1.18)
LDL-Cholesterol (highest vs. lowest quartile)	0.32 (0.18-0.56)	0.31 (0.18-0.56)
Non-HDL Cholesterol (highest vs. lowest quartile)	0.45 (0.27-0.75)	0.44 (0.26-0.74)
TG/HDL (per unit increase)	1.08 (1.03-1.12)	1.08 (1.03-1.13)
TC/HDL (per unit increase)	1.04 (0.9-1.19)	1.04 (0.9-1.2)
LDL/HDL (per unit increase)	0.88 (0.72-1.07)	0.87 (0.71-1.06)

<sup>a</sup>HDL (High-density Lipoprotein); LDL (Low-density Lipoprotein); TG (Triglycerides); TC (Total Cholesterol)

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**Supplemental Table 4. Odds Ratios (95% Confidence Interval) of Out-of-Hospital Sudden Unexpected Death Associated with Different Lipid Measures, Stratified by Age<sup>a</sup>**

	Overall (n=1107)		Age ≤45 (OHSUD n=16; Local Controls n=302)		Age >45 (OHSUD n=123; Local Controls n=666)	
	Model 1 <sup>b</sup> (95% CI)	Model 2 <sup>c</sup> (95% CI)	Model 1 (95% CI)	Model 2 (95% CI)	Model 1 (95% CI)	Model 2 (95% CI)
Total Cholesterol (highest vs. lowest quartile)	0.4 (0.25-0.65)	0.43 (0.25-0.74)	1.36 (0.38-4.91)	0.99 (0.26-3.77)	0.46 (0.28-0.77)	0.37 (0.19-0.70)
Triglycerides (highest vs. lowest quartile)	1.00 (1.00-1.00)	1.00 (1.00-1.00)	3.61 (0.87-15.04)	2.72 (0.62-11.91)	0.83 (0.48-1.42)	0.66 (0.34-1.27)
HDL-Cholesterol (highest vs. lowest quartile)	0.43 (0.27-0.70)	0.64 (0.37-1.13)	0.81 (0.19-3.35)	1.43 (0.29-7.00)	0.42 (0.25-0.70)	0.51 (0.26-0.98)
LDL-Cholesterol (highest vs. lowest quartile)	0.30 (0.18-0.50)	0.32 (0.18-0.56)	0.71 (0.16-3.1)	0.47 (0.1-2.19)	0.24 (0.14-0.43)	0.34 (0.18-0.64)
Non-HDL Cholesterol (highest vs. lowest quartile)	0.46 (0.28-0.73)	0.45 (0.27-0.75)	0.49 (0.11-2.12)	0.84 (0.21-3.35)	0.35 (0.21-0.58)	0.42 (0.23-0.77)

lowest quartile)

TG/HDL (per unit increase)	1.10 (1.05-1.15)	1.08 (1.03-1.12)	1.15 (1.00-1.33)	1.13 (0.98-1.30)	1.08 (1.03-1.14)	1.06 (1.00-1.13)
TC/HDL (per unit increase)	1.12 (0.99-1.26)	1.04 (0.9-1.19)	1.31 (0.94-1.84)	1.16 (0.79-1.69)	1.07 (0.93-1.22)	1.06 (0.90-1.25)
LDL/HDL (per unit increase)	0.94 (0.78-1.13)	0.88 (0.72-1.07)	1.01 (0.57-1.77)	0.84 (0.45-1.57)	0.91 (0.75-1.11)	0.93 (0.74-1.18)

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<sup>a</sup>OHSUD (Out-of-Hospital Sudden Unexpected Death); HDL (High-density Lipoprotein); LDL (Low-density Lipoprotein); TG (Triglycerides); TC (Total Cholesterol)

<sup>b</sup>Model 1 – Unadjusted

<sup>c</sup>Model 2 - Adjusted for age, sex

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**Supplemental Table 5. Odds Ratios (95% Confidence Interval) of Out-of-Hospital Sudden Unexpected Death Associated with Different Lipid Measures Stratified by Sex<sup>a</sup>**

	Male (n=525)		Female (n=582)	
	Model 1 <sup>b</sup>	Model 2 <sup>c</sup>	Model 1	Model 2
	(95% CI)	(95% CI)	(95% CI)	(95% CI)
Total Cholesterol (highest vs. lowest quartile)	0.56 (0.30-1.03)	0.65 <sup>d</sup> (0.33-1.28)	0.31 (0.14-0.72)	0.21 <sup>d</sup> (0.09-0.51)
Triglycerides (highest vs. lowest quartile)	1.03 (0.54-2.00)	0.87 (0.41-1.82)	0.92 (0.41-2.09)	0.72 (0.31-1.7)
HDL-Cholesterol (highest vs. lowest quartile)	1.02 (0.53-1.99)	0.96 (0.46-2.01)	0.56 (0.23-1.37)	0.53 (0.20-1.36)
LDL-Cholesterol (highest vs. lowest quartile)	0.3 (0.16-0.57)	0.39 (0.20-0.79)	0.3 (0.12-0.74)	0.22 (0.09-0.57)
Non-HDL Cholesterol (highest vs. lowest quartile)	0.41 (0.22-0.74)	0.54 (0.28-1.04)	0.47 (0.21-1.03)	0.35 (0.15-0.8)
TG/HDL (per unit increase)	1.08 (1.02-1.14)	1.08 (1.03-1.14)	1.09 (1.00-1.17)	1.06 (0.97-1.15)
TC/HDL (per unit increase)	1.03	1.07	0.99	0.96



	(0.88-	(0.91-	(0.76-1.3)	(0.74-
	1.20)	1.27)		1.25)
LDL/HDL (per unit increase)	0.87	0.95	0.74	0.72
	(0.70-	(0.75-	(0.50-	(0.48-
	1.09)	1.20)	1.09)	1.06)

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<sup>a</sup>OHSUD (Out-of-Hospital Sudden Unexpected Death); HDL (High-density Lipoprotein);

LDL (Low-density Lipoprotein); TG (Triglycerides); TC (Total Cholesterol)

<sup>b</sup>Model 1 – Unadjusted

<sup>c</sup>Model 2 - Adjusted for age, sex

<sup>d</sup> $P < 0.05$

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**Supplemental Table 6. Odds Ratios (95% Confidence Interval) of Out-of-Hospital Sudden Unexpected Death Associated with Different Lipid Measures Stratified by a Diagnosis of Coronary Artery Disease (CAD)<sup>a</sup>**

	CAD (n=82)		No CAD (n=1,025)	
	Model 1 <sup>b</sup> (95% CI)	Model <sup>c</sup> (95% CI)	Model 1 (95% CI)	Model 2 (95% CI)
Total Cholesterol (highest vs. lowest quartile)	0.74 (0.24-2.34)	0.63 (0.18-2.27)	0.45 (0.25-0.81)	0.45 (0.24-0.83)
Triglycerides (highest vs. lowest quartile)	0.28 (0.06-1.24)	0.19 (0.03-1.20)	1.07 (0.61-1.90)	0.73 (0.39-1.35)
HDL-Cholesterol (highest vs. lowest quartile)	1.41 (0.23-8.5)	0.91 (0.1-7.90)	0.63 (0.36-1.09)	0.91 (0.49-1.71)
LDL-Cholesterol (highest vs. lowest quartile)	1.05 (0.28-3.94)	0.63 (0.14-2.91)	0.32 (0.18-0.59)	0.3 (0.16-0.57)
Non-HDL Cholesterol (highest vs. lowest quartile)	0.84 (0.27-2.64)	0.73 (0.20-2.60)	0.48 (0.28-0.83)	0.42 (0.24-0.76)
TG/HDL (per unit increase)	1.08 (0.97-1.2)	1.14 (0.99-1.31)	1.07 (1.02-1.12)	1.06 (1.01-1.11)
TC/HDL (per unit increase)	1.1 (0.84-1.45)	1.23 (0.89-1.69)	1.04 (0.89-1.21)	0.95 (0.8-1.13)
LDL/HDL (per unit increase)	1.14 (0.75-1.73)	1.11 (0.68-1.80)	0.9 (0.73-1.13)	0.81 (0.64-1.03)

<sup>a</sup>CAD (Coronary Artery Disease); HDL (High-density Lipoprotein); LDL (Low-density Lipoprotein); TG (Triglycerides); TC (Total Cholesterol)

<sup>b</sup>Model 1 – Unadjusted; <sup>c</sup>Model 2 - Adjusted for age, sex

**Supplementary Table 7. Odds Ratios (95% Confidence Interval) of Out-of-Hospital Sudden Unexpected Death Associated with Different Lipid Measures Among OHSUD Victims Meeting World Health Organization (WHO) Criteria for Sudden Cardiac Death (witnessed unexpected death within 1 hour of symptom onset, or death occurring less than 24 hours of the victim last being seen alive) vs. OHSUD Victims Not Meeting WHO Criteria (Non-WHO)<sup>a,e</sup>**

	OHSUD Victims Meeting WHO Criteria (n=40)		OHSUD Victims Not Meeting WHO Criteria (n=99)	
	Model 1 <sup>b</sup> (95% CI)	Model 2 <sup>c</sup> (95% CI)	Model 1 (95% CI)	Model 2 (95% CI)
Total Cholesterol (highest vs. lowest quartile)	0.31 (0.12-0.80)	0.38 (0.14-1.01)	0.44 (0.25-0.76)	0.44 (0.24-0.81)
Triglycerides (highest vs. lowest quartile)	3.29 <sup>d</sup> (1.18-9.13)	1.79 (0.62-5.16)	0.86* (0.49-1.50)	0.54 (0.29-1.03)
HDL-Cholesterol (highest vs. lowest quartile)	0.24 (0.09-0.60)	0.4 (0.14-1.11)	0.55 (0.32-0.94)	0.78 (0.41-1.50)
LDL-Cholesterol (highest vs. lowest quartile)	0.23 (0.08-0.63)	0.26 (0.09-0.72)	0.32 (0.18-0.58)	0.34 (0.18-0.63)
Non-HDL Cholesterol (highest vs. lowest quartile)	0.52 (0.23-1.16)	0.49 (0.22-1.13)	0.43 (0.25-0.75)	0.42 (0.23-0.78)
TG/HDL (per unit increase)	1.16 (1.09-1.24)	1.13 (1.05-1.21)	1.08 (1.03-1.13)	1.07 (1.02-1.12)
TC/HDL (per unit increase)	1.35 <sup>d</sup> (1.12-1.64)	1.24 <sup>d</sup> (1.01-1.53)	1.01 <sup>d</sup> (0.86-1.19)	0.93 <sup>d</sup> (0.78-1.11)

LDL/HDL	1.14	1.02	0.86	0.81
	(0.83-1.56)	(0.73-1.41)	(0.69-1.08)	(0.63-1.03)

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<sup>a</sup>OHSUD (Out-of-Hospital Sudden Unexpected Death); HDL (High-density Lipoprotein); LDL (Low-density Lipoprotein); TG (Triglycerides); TC (Total Cholesterol); WHO (World Health Organization)

<sup>b</sup>Model 1 – Unadjusted

<sup>c</sup>Model 2 - Adjusted for age, sex

<sup>d</sup> $P < 0.05$

<sup>e</sup>All control subjects are the reference group for OHSUD victims both meeting and not meeting WHO criteria

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