

Sachiko Ohde<sup>1</sup>, Osamu Takahashi<sup>1,2</sup>, Gautam A. Deshpande<sup>1,2,3</sup>, Tsuguya Fukui<sup>1,2</sup>

1.Center for Clinical Epidemiology, St. Luke's Life Science Institute

2.Department of General Internal Medicine, St. Luke's International Hospital;

3.Department of Internal Medicine, University of Hawaii

## Background

While healthy adults should be screened for risk of cardiovascular disease (CVD) risk, overly frequent testing introduces unnecessary costs and risk.

**Japanese Health Checkup:** All employed adult are eligible to receive an annual health check, including CVD risk screening.

**Problem:** Appropriate monitoring, including frequency of re-screening, remains unclear.

**Purpose:** To examine the optimal interval for lipid measurement, stratifying individuals by Framingham score (10-year cardiovascular risk)

## Methods

**Study Design:** Retrospective open cohort study

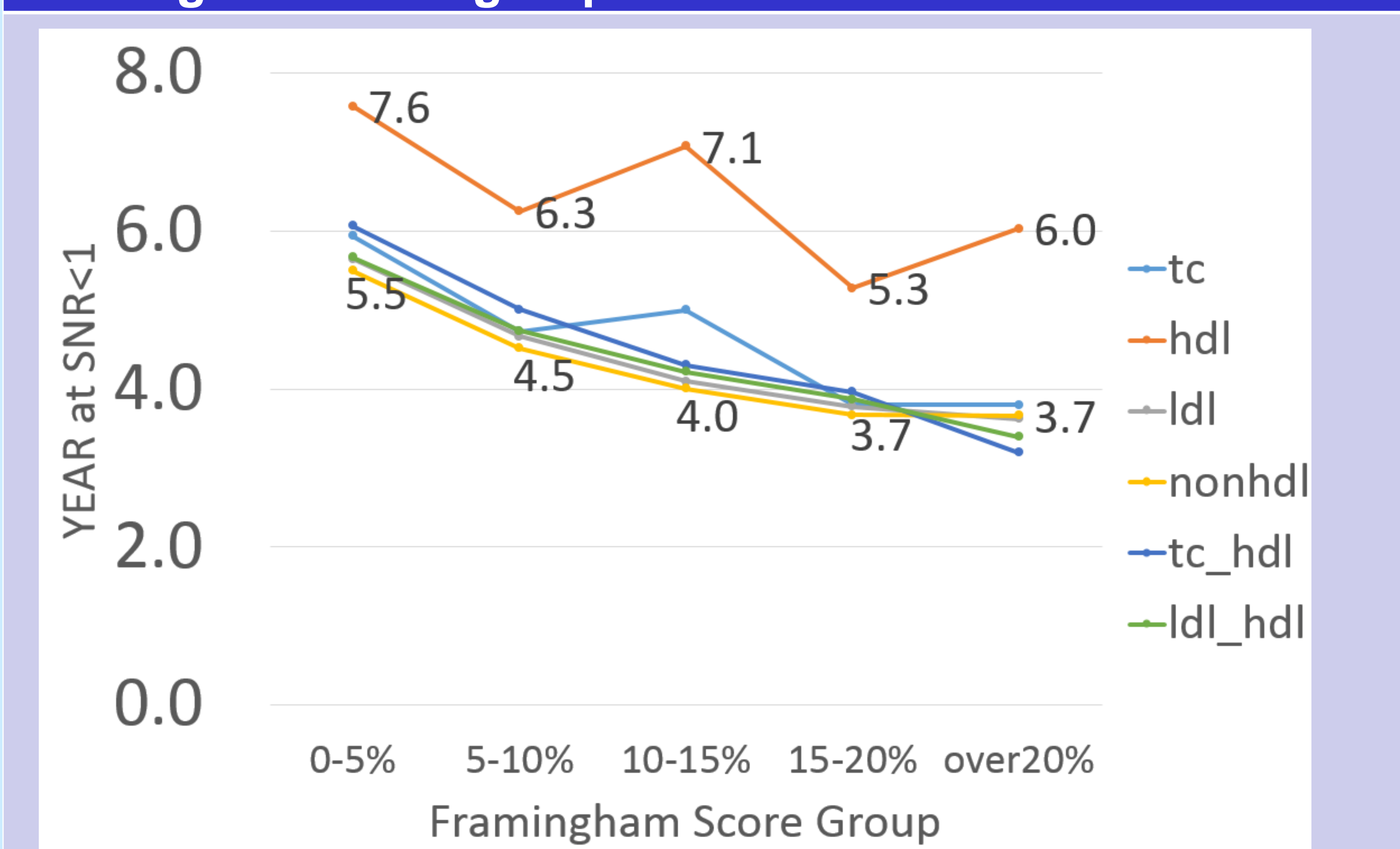
**Study Period:** 1<sup>st</sup> January 2005 - 31<sup>st</sup> December 2010

**Statistics:** Random effects model, adjusted for age, gender, BMI.

### Calculation used in this study

Term	Definition	Calculation
Noise	Short-term within-person variation	variance of the error (residuals)
Signal	Long-term between-person variation	(variance of $\beta_{\text{year}}$ ) <sup>2</sup> x (time) <sup>2</sup>
Optimal Interval	Screening intervals were considered appropriate when SNR >1.	(noise/variance of $\beta_{\text{year}}$ ) <sup>1/2</sup>

**Figure 1: Optimal interval for screening based on Framingham Score group**



## Results

**Table 1: Baseline Characteristics N=56974**

Female	28193 (49.5%)
Age	48.0 (11.5)
TC	5.2 (0.9)
HDL	1.6 (0.4)
LDL	3.0 (0.8)
Non-HDL	3.6 (0.9)
TC/HDL	3.4 (1.0)
LDL/HDL	2.0 (0.8)
SBP	118.1 (17.5)
BMI	22.5 (3.5)
HbA1c	5.1 (0.6)
Smoker	9898 (17.4%)
DM	2474 (4.3%)
Baseline Framingham Score Group	
0-5%	29509 (51.8%)
5-10%	12337 (21.7%)
10-15%	6018 (10.6%)
15-20%	3439 (6.0%)
Over20%	5671 (10.0%)

**Table 2: Yearly change for each Framingham Score group**

	0-5%	5-10%	10-15%	15-20%	Over 20%
TC	0.03	-0.02	-0.04	-0.05	-0.08
HDL	0.00	0.00	0.00	0.01	0.01
LDL	0.03	-0.02	-0.03	-0.04	-0.06
Non-HDL	0.03	-0.02	-0.05	-0.06	-0.09
TC/HDL	0.03	-0.02	-0.04	-0.05	-0.08
LDL/HDL	0.02	-0.01	-0.03	-0.03	-0.05

B for Year adjusted with age gender bmi

**Table 3: Optimal interval based on Framingham Score group (Time at SNR >1)**

	0-5%	5-10%	10-15%	15-20%	Over 20%
TC	5.9	4.7	4.1	3.8	3.8
HDL	7.6	6.3	7.1	5.3	6.0
LDL	5.6	4.7	4.1	3.8	3.6
Non-HDL	5.5	4.5	4.0	3.7	3.7
TC/HDL	6.1	5.0	4.3	4.0	3.2
LDL/HDL	5.7	4.7	4.2	3.9	3.4

## Conclusion

The optimal interval of lipid measurement differs by baseline Framingham score. However, in apparently healthy individuals at any risk group, it should not exceed every 3-5 years.