

# Lipoprotein(a) plasma levels and association to cardiovascular disease in a Stockholm County cohort

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## Aim

To investigate the distribution of Lipoprotein(a) [Lp(a)] plasma levels in a Stockholm County cohort and the association to mortality, cardiovascular disease (CVD), other diagnoses and risk factors.

## Conclusions

The initial analysis of Lp(a) in 23 395 patients referred to hospitals or general practitioners show:

- Similar distribution of Lp(a) plasma levels as previously described in general population studies.
- Significantly higher Lp(a) levels in females compared to males.
- Increased all cause mortality and cardiovascular disease mortality in patients with high Lp(a) versus very low Lp(a) levels.

## Results

Lp(a) measurements for 23 395 individual subjects were retrieved from the Karolinska University Laboratory database and combined with clinical data from Swedish National Registers.

Figure 1: Distribution of Lp(a) levels

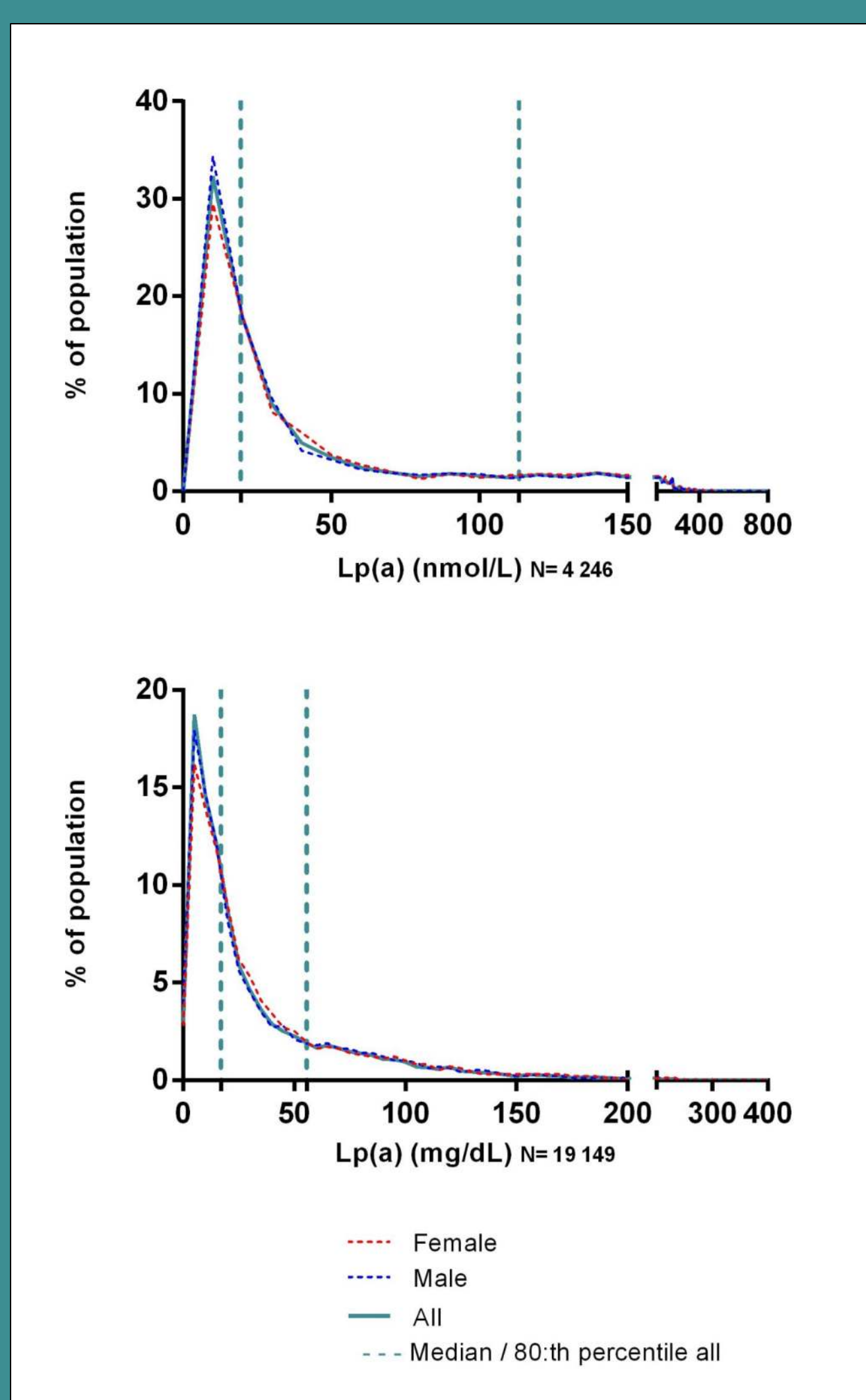


Table 3: Lp(a) median and 80:th percentile

		All	Female	Male	P-value
Lp(a) median*	nmol/L	19.5 (7.8-83.1)	21.7 (8.6-92.7)	18.2 (7.4-74.5)	0.008
Lp(a) 80:th perc.#	nmol/L	113.3	125.6	100.3	<0.001
Lp(a) median*	mg/dL	17.0 (6.7-44.0)	17.8 (7.2-44.6)	15.9 (6.0-43.3)	<0.001
Lp(a) 80:th perc.#	mg/dL	55.6	55.6	55.6	NS

\*Data are median (Inter Quartile Range)

#Data are 80:th percentile; NS: non-significant

Table 1: Laboratory parameters

		All (N=23 395)	Female (N=12 160)	Male (N=11 235)
Age	years	76 (12.5)	77 (12.5)	75 (12.5)
Cholesterol	mmol/L	5.3 (1.4)	5.5 (1.3)	5.1 (1.4)
HDL-C	mmol/L	1.5 (0.5)	1.6 (0.5)	1.3 (0.4)
LDL-C	mmol/L	3.2 (1.1)	3.3 (1.1)	3.1 (1.1)
Triglycerides*	mmol/L	1.1 (0.8-1.7)	1.0 (0.7-1.5)	1.3 (0.9-1.9)
ApoA1	g/L	1.6 (0.3)	1.7 (0.3)	1.5 (0.3)
ApoB	g/L	1.0 (0.3)	1.0 (0.3)	1.0 (0.3)
Creatinine	μmol/L	101 (115)	83 (80)	118 (138)
HbA1c (n=5199)	mmol/mol	43.7 (13.3)	42.9 (13.7)	44.2 (13.0)
HbA1c (n=7580)	MonoS %	4.9 (1.0)	4.9 (0.9)	5.0 (1.0)

Data are mean (±standard deviation)

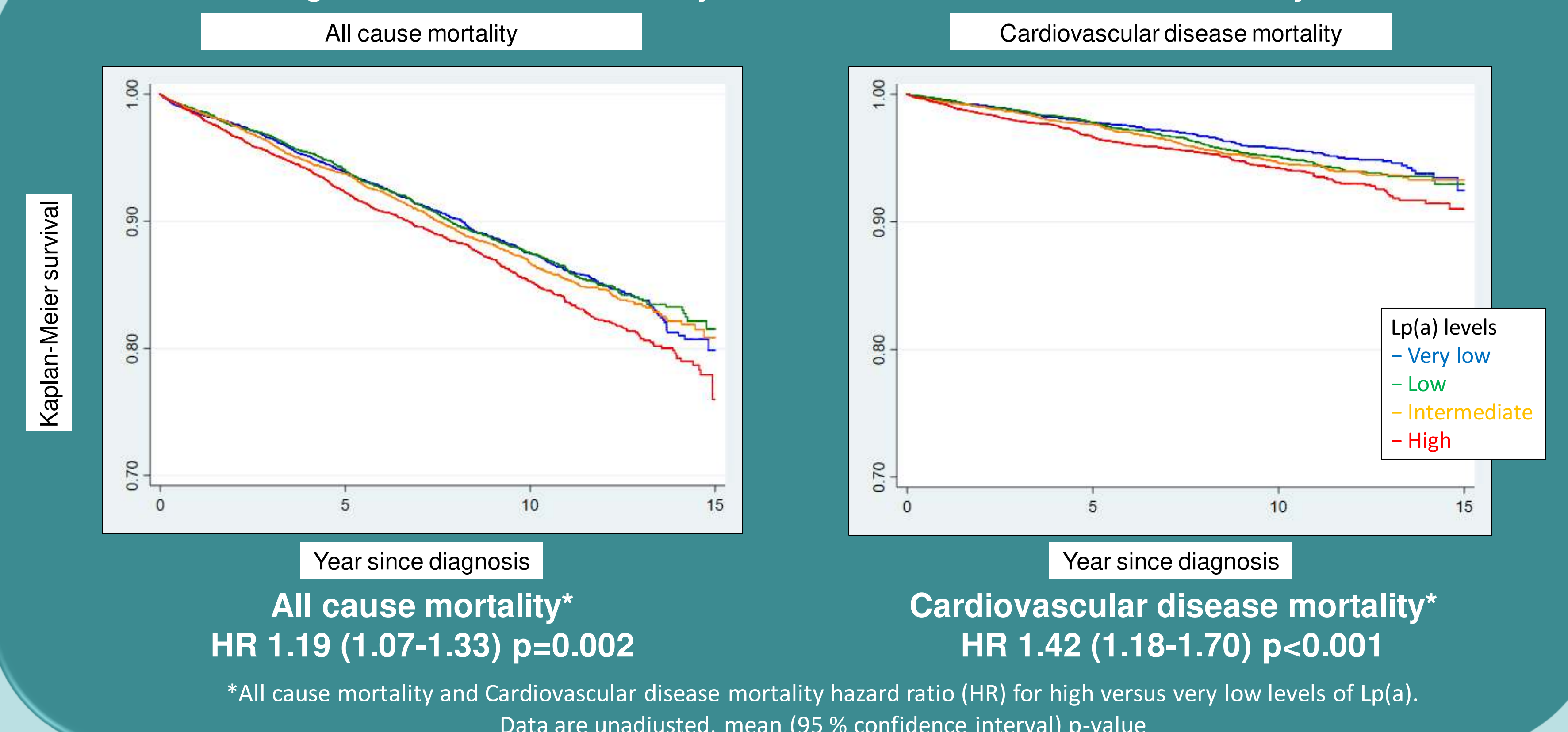
\* Data are median (Inter Quartile Range)

Table 2: Lp(a) quartiles

Lp(a) category		Lp(a) mg/dL	Lp(a) nmol/L
Very low	1:st Quartile (N)	0 - 6.65 (4789)	0 - 7.8 (1069)
	2:nd Quartile (N)	6.66 - 17 (4813)	7.9 - 19.5 (1057)
Intermediate	3:rd Quartile (N)	17.1 - 44 (4773)	19.6 - 83.1 (1059)
	4:th Quartile (N)	44.1 - 462.7 (4774)	83.2 - 777.7 (1061)

Lp(a) levels divided by quartiles into very low, low, intermediate and high.

Figure 2: All cause mortality and Cardiovascular disease mortality



All cause mortality\*  
HR 1.19 (1.07-1.33) p=0.002

Cardiovascular disease mortality\*  
HR 1.42 (1.18-1.70) p<0.001

\*All cause mortality and Cardiovascular disease mortality hazard ratio (HR) for high versus very low levels of Lp(a). Data are unadjusted, mean (95 % confidence interval) p-value

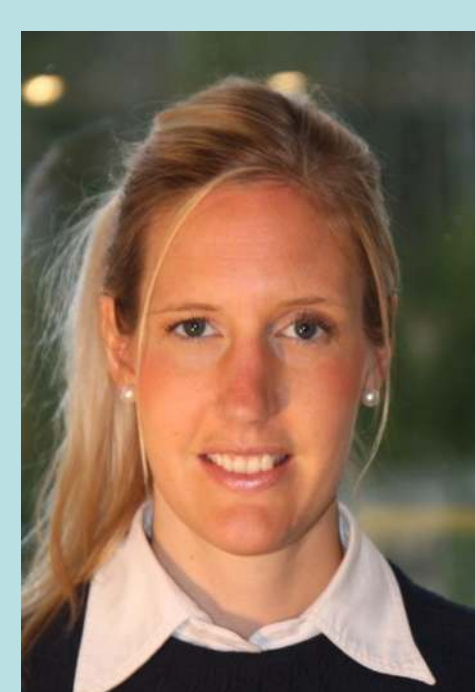
## Method

- Lp(a) measurements 2007-2013 were retrieved from the Karolinska University Laboratory database.
- Lp(a) results and laboratory data for each patient were combined with data from Swedish National Quality Registers on CVD (Swedeheart, Swedvasc, RIKS-stroke) and National Board of Health and Welfare Registers (causes of death, diagnosis and prescribed drugs).
- Lp(a) was measured with two different assays that reported concentration in mass or molar.
- Lp(a) levels were divided by quartiles into very low, low, intermediate and high. (Table 2)

## Further perspectives

Data analysis is ongoing.

Results from this study will contribute to further understanding of Lp(a), its association to CVD and other diagnoses and to identify Lp(a) levels that indicates increased risk.



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Financial Disclosure:

This is an Investigator Initiated Study where Paolo Parini, Mats Eriksson and Jonas Brinck have received an unrestricted research grant from Amgen



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