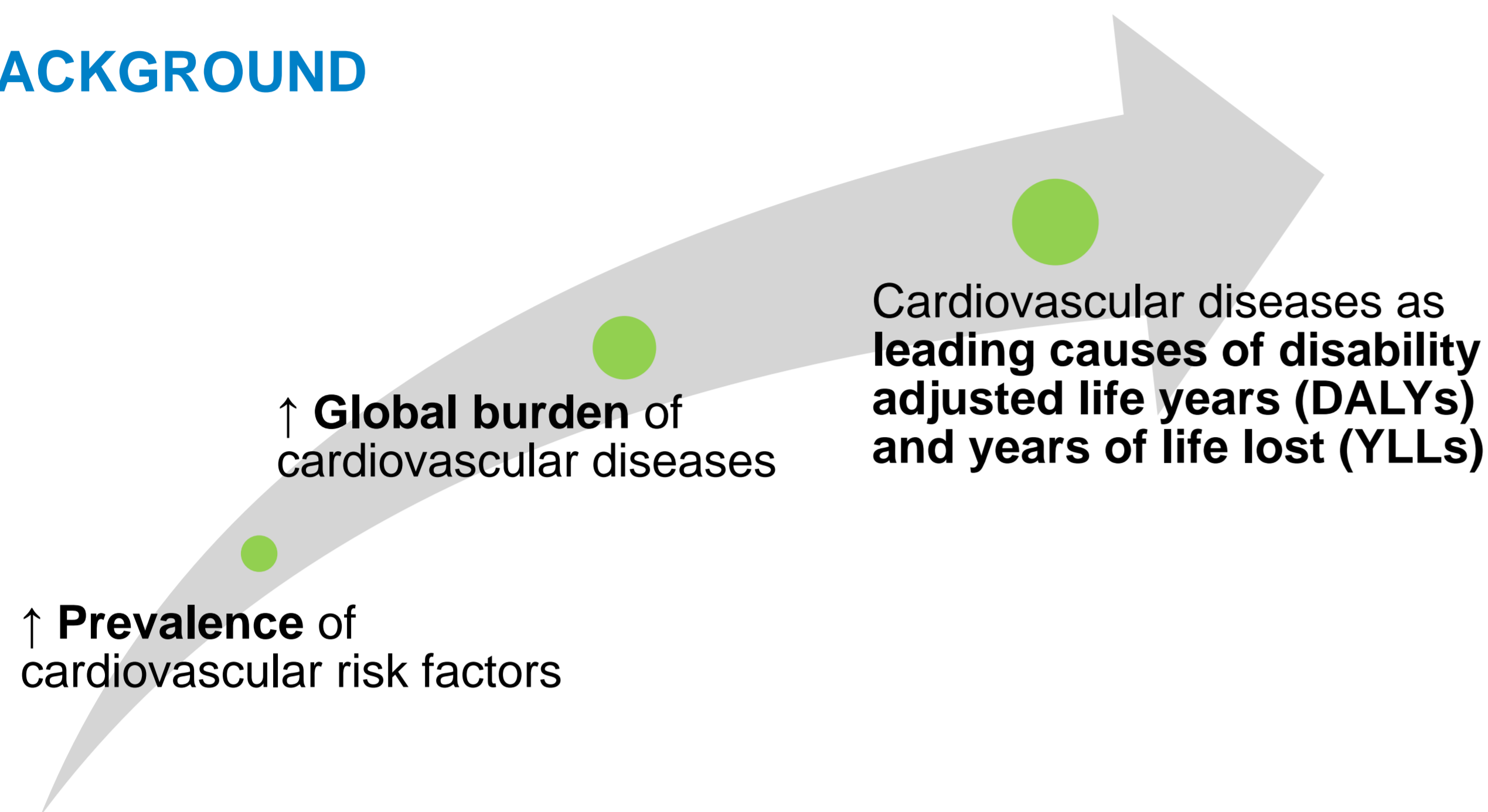


# Association of suPAR with cardiovascular risk factors in a young and healthy population

Niklas Wohlwend <sup>a,b</sup>, Kirsten Grossmann <sup>b,c</sup>, Stefanie Aeschbacher <sup>d</sup>, Ornella C. Weideli <sup>b</sup>, Martin Risch <sup>b,e</sup>, Lorenz Risch <sup>b,c,f</sup>, David Conen <sup>e</sup>

<sup>a</sup> Faculty of Medicine, University of Bern, Bern, Switzerland; <sup>b</sup> Dr Risch Medical Laboratory, Vaduz, Liechtenstein; <sup>c</sup> Faculty of Medical Sciences, Private University in the Principality of Liechtenstein, Triesen, Liechtenstein; <sup>d</sup> Cardiovascular Research Institute Basel and Division of Cardiology, University Hospital Basel, University of Basel, Basel, Switzerland; <sup>e</sup> Division of Laboratory Medicine, Cantonal Hospital Graubünden, Chur, Switzerland; <sup>f</sup> Department of Laboratory Medicine, Institute of Clinical Chemistry, Inselspital Bern University Hospital, University of Berne, Berne, Switzerland; <sup>g</sup> Population Health Research Institute, McMaster University, Hamilton, Canada.

## BACKGROUND



- Importance of biomarkers as predictors of individual cardiovascular risks
- Chronic low-grade inflammation is contributing to the development of cardiovascular diseases
- Soluble urokinase plasminogen activator receptor (suPAR) as correlate for low-grade inflammation

## AIMS

- **Primary objective:**  
→ Correlation of suPAR plasma levels with cardiovascular risk factors?
- **Secondary objective:**  
→ Correlation of suPAR plasma levels with the healthy lifestyle score and the Framingham score?

## MATERIALS AND METHODS

### Study population:

- Young and healthy adults (n = 2036) from the GAPP (Genetic and phenotypic determinants of blood pressure and other cardiovascular risk factors) study

### Investigated parameters:

- Dependent variable: Soluble urokinase plasminogen activator receptor (suPAR)
- Independent variables: BMI, physical activity, alcohol consumption, smoking status, blood pressure parameters (office and ambulatory), glucose status, lipid levels, healthy lifestyle score\* and Framingham score\*\*

### Statistical analyses:

- Baseline characteristics and analyses were done separately for male and female participants
- Comparison of independent variables amongst sex-specific suPAR plasma levels with ANOVA-analysis
- Sex-specific multivariable linear regressions of dependent variable with all independent variables separately adjusted for following potential confounders: office systolic blood pressure, age, BMI, physical, HbA1c, GFR, LDL, HDL, smoking status, high sensitivity c-reactive protein.

\*Healthy lifestyle score: Ranging from 0-7; 1 point for each health metric fulfilled (including: BMI, blood pressure, LDL levels, HbA1c, smoking status, nutrition, extent of physical activity)

\*\*Framingham score: Ranging from 0-36 points for male and 0-38 points for female participants; estimate of 10-year risk of cardiovascular incident (including: age, blood pressure, HDL, total cholesterol, HbA1c/glucose levels, smoking status)

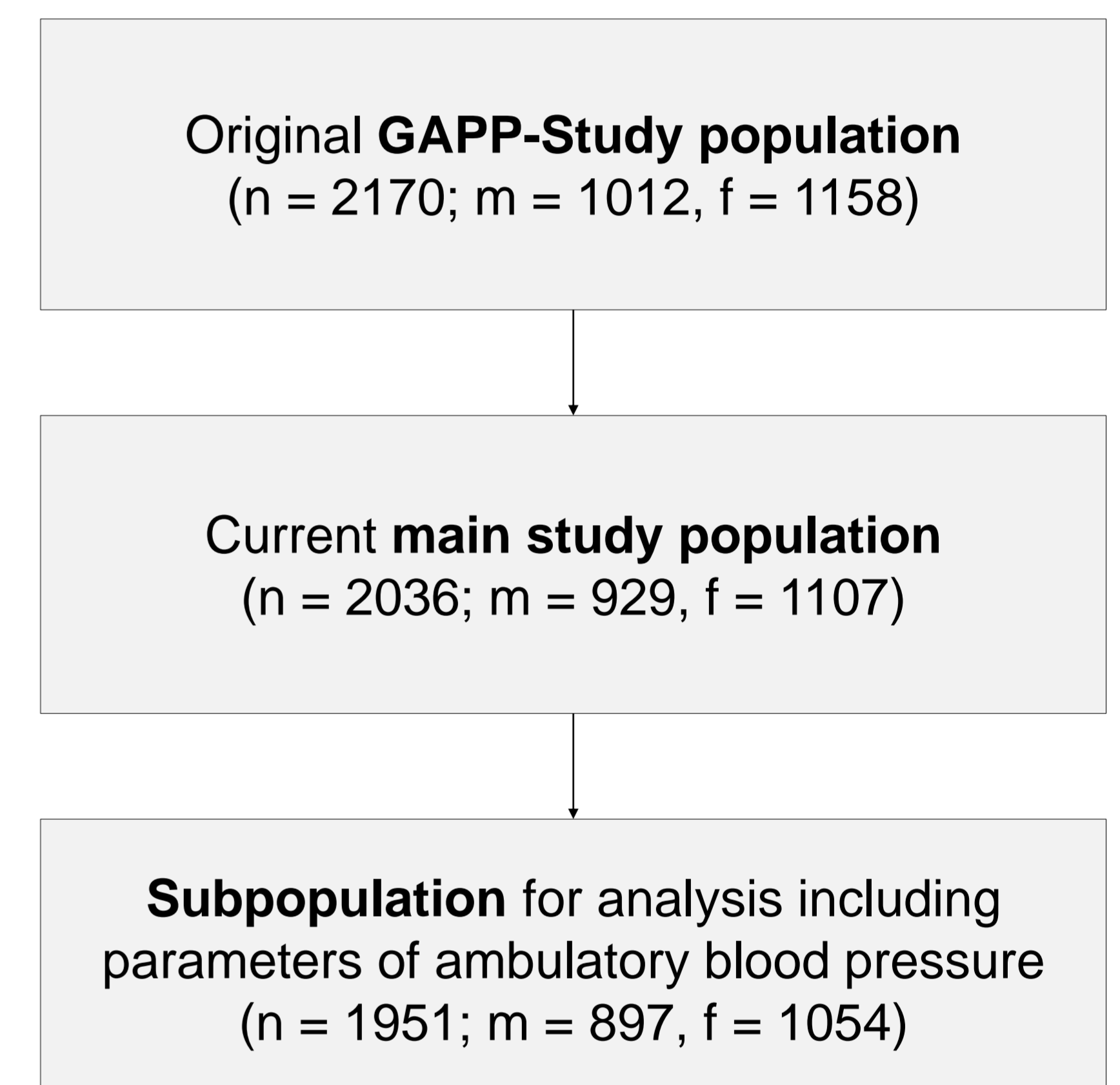


Figure 1: Study population flow chart

## RESULTS

### Baseline characteristics:

- Sex-ratio: 46% male and 54% female participants
- Mean age in male and female study population: 37 years (31 – 40)
- suPAR is lower in male (1.50 ng/ml ± 0.61) than in female (1.73 ng/ml ± 0.98; p-value < 0.001) participants
- Higher prevalence of cardiovascular risk factors in male compared to female participants

| Correlating cardiovascular risk factors and cardiovascular risk scores |         |                 |         |
|--|---------|-----------------|---------|
| Male   |         | Female          |         |
| Variable   | p-value | Variable        | p-value |
| HDL  | <0.001  | HDL             | <0.001  |
| Current smoking  | <0.001  | Current smoking | <0.001  |
| Healthy lifestyle score  | <0.001  | HbA1c           | <0.001  |
| Framingham Score   | <0.001  | Cholesterol     | 0.001   |

Table 1: Comparison of sex-specific quartiles of suPAR plasma level with one-way ANOVA

| Correlating cardiovascular risk factors and cardiovascular risk scores |   |                 |   |
|--|---|-----------------|---|
| Male   |   | Female          |   |
| Variable   | standardized $\beta$ -coefficient (p-value) | Variable        | standardized $\beta$ -coefficient (p-value) |
| HDL  | -0.155 (<0.001)                             | HDL             | -0.114 (<0.001)                             |
| Current smoking  | 0.267 (0.001)                               | Current smoking | 0.076 (0.017)                               |
| Healthy lifestyle score  | -0.129 (0.001)                              | HbA1c           | 0.081 (0.008)                               |
| Framingham Score   | 0.161 (<0.001)                              | Cholesterol     | -0.094 (0.001)                              |

Table 2: Multivariable linear regression analyses

## CONCLUSION

- suPAR plasma levels are strongly associated with cardiovascular risk factors, however sex-specific differences were found
- These sex-specific differences might be explained by the higher prevalence of cardiovascular risk factors in male participants and a comparatively young study population → possible age-specific correlation of suPAR plasma levels and cardiovascular risk in female study population
- Laboratory testing in GAPP follow-up visits should again incorporate plasma suPAR levels to evaluate potential longitudinal age-specific differences

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