

THE EFFECT OF NO_x POLLUTION ON OXIDATIVE STRESS, IN PREGNANT WOMEN LIVING IN DURBAN, SOUTH AFRICA

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INTRODUCTION

- 2.2 million deaths in African Region p.a. – linked to unhealthy environment (WHO, 2016)
- ~270 000 deaths p.a. – linked to neonatal conditions (WHO, 2016)
- Rapid development and increased road traffic in Durban → Increased ambient air pollution

Oxides of Nitrogen (NO_x)

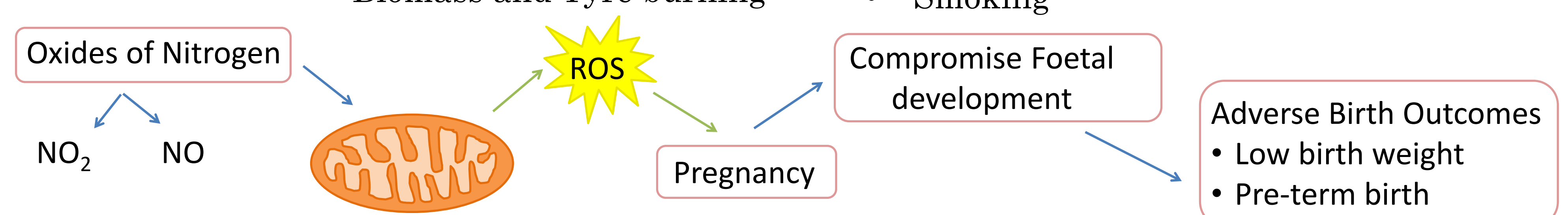
- By-product of combustion
- Highly reactive
- Implicated in adverse birth outcomes

Outdoor Sources

- **Traffic** (~60% total emissions)
- Coal-fired power stations
- Biomass and Tyre burning

Indoor Sources

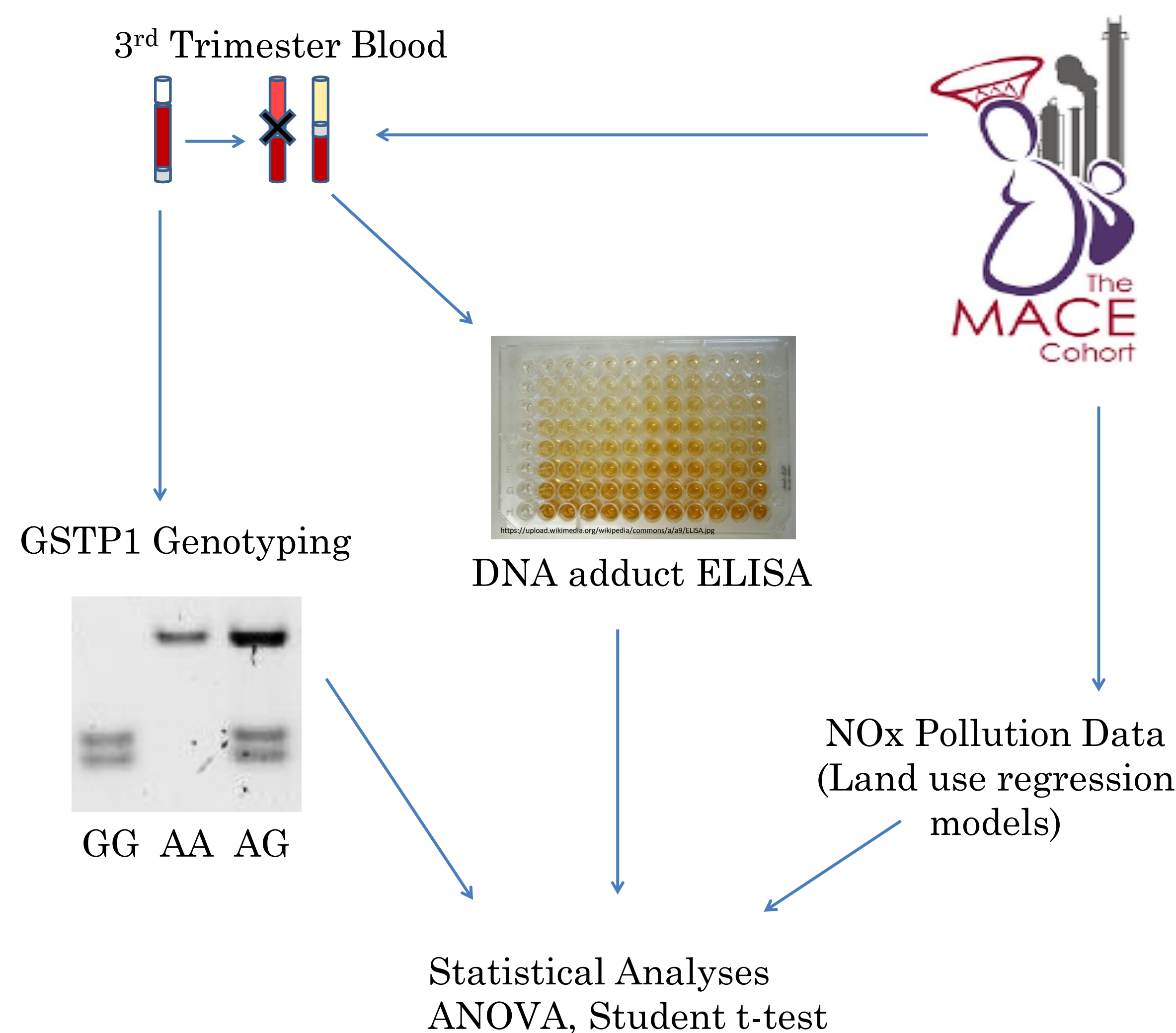
- Domestic fuel burning
- Heating and Cooking
- Smoking



AIM

This study aims to identify the effect of nitrogen oxides (NO_x) on the induction of oxidative stress in pregnant women.

METHODS



RESULTS

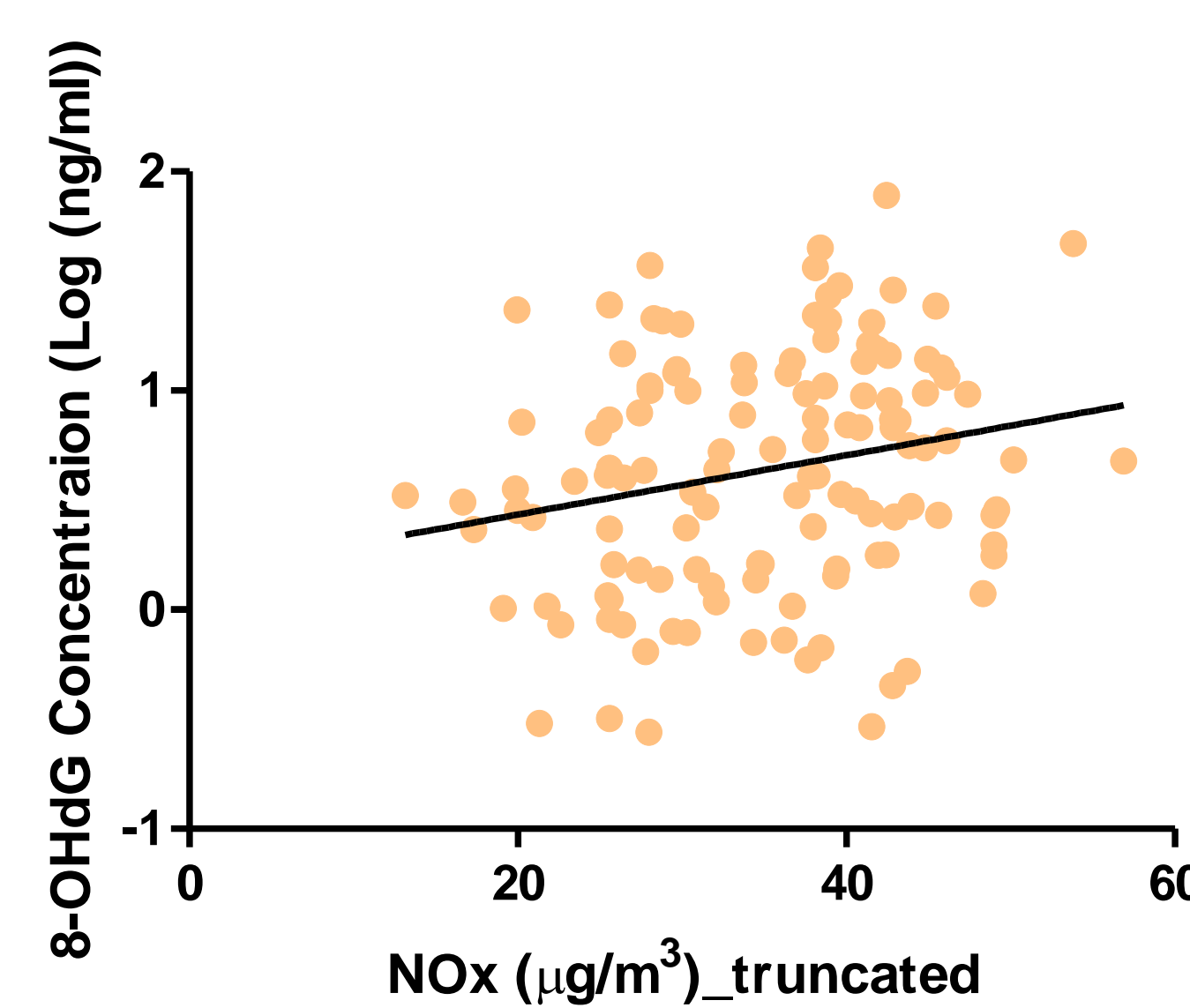


Figure 1: The NO_x (µg/m³)_truncated and the corresponding DNA adduct concentration (*p=0.0121; Spearman r = 0.2229 95% CI 0.04467 to 0.3874)

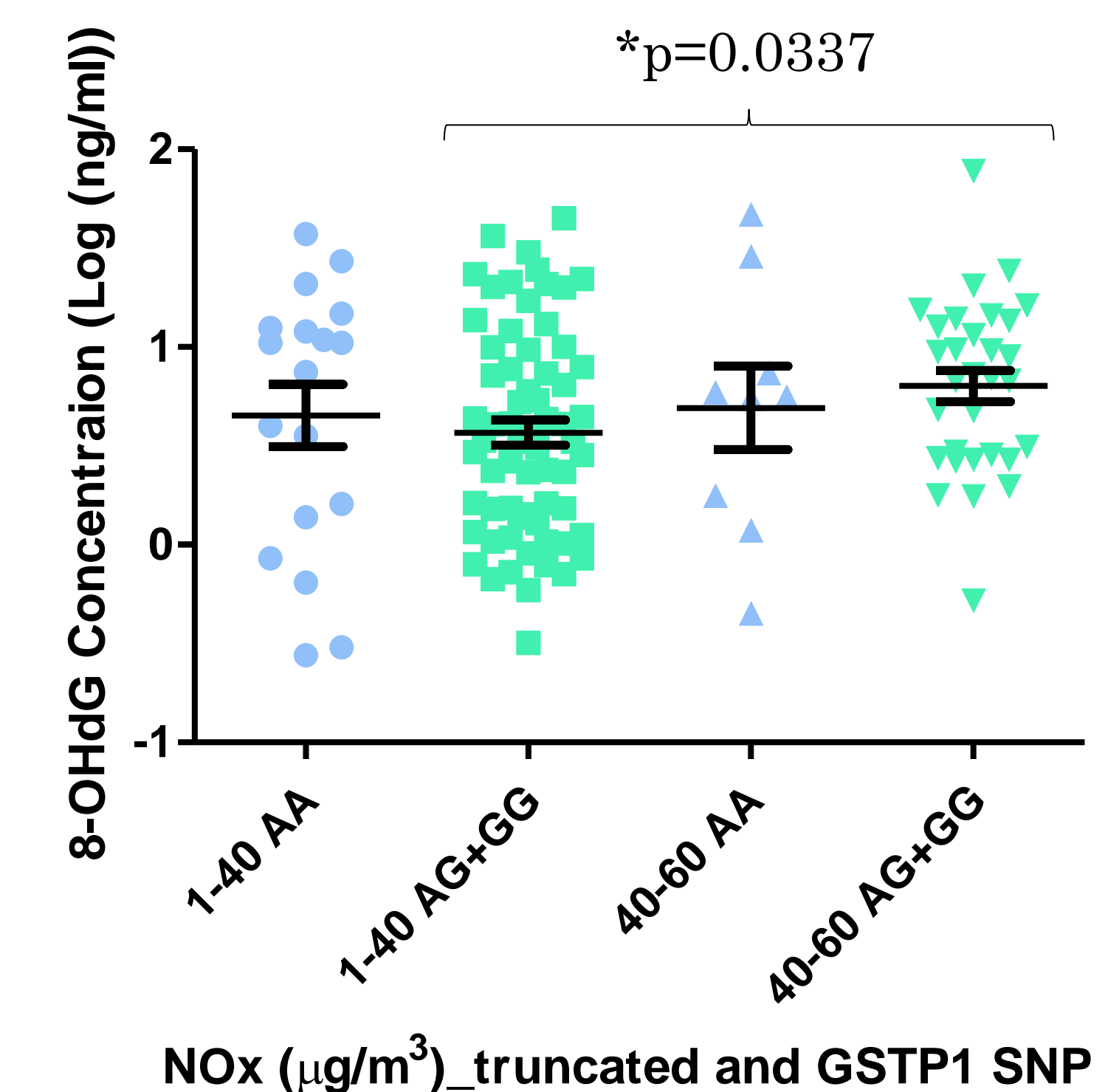


Figure 3: The NO_x concentration, divided into low and high levels, and GSTP1 genotypes with the corresponding DNA adduct concentration (*p=0.0337)

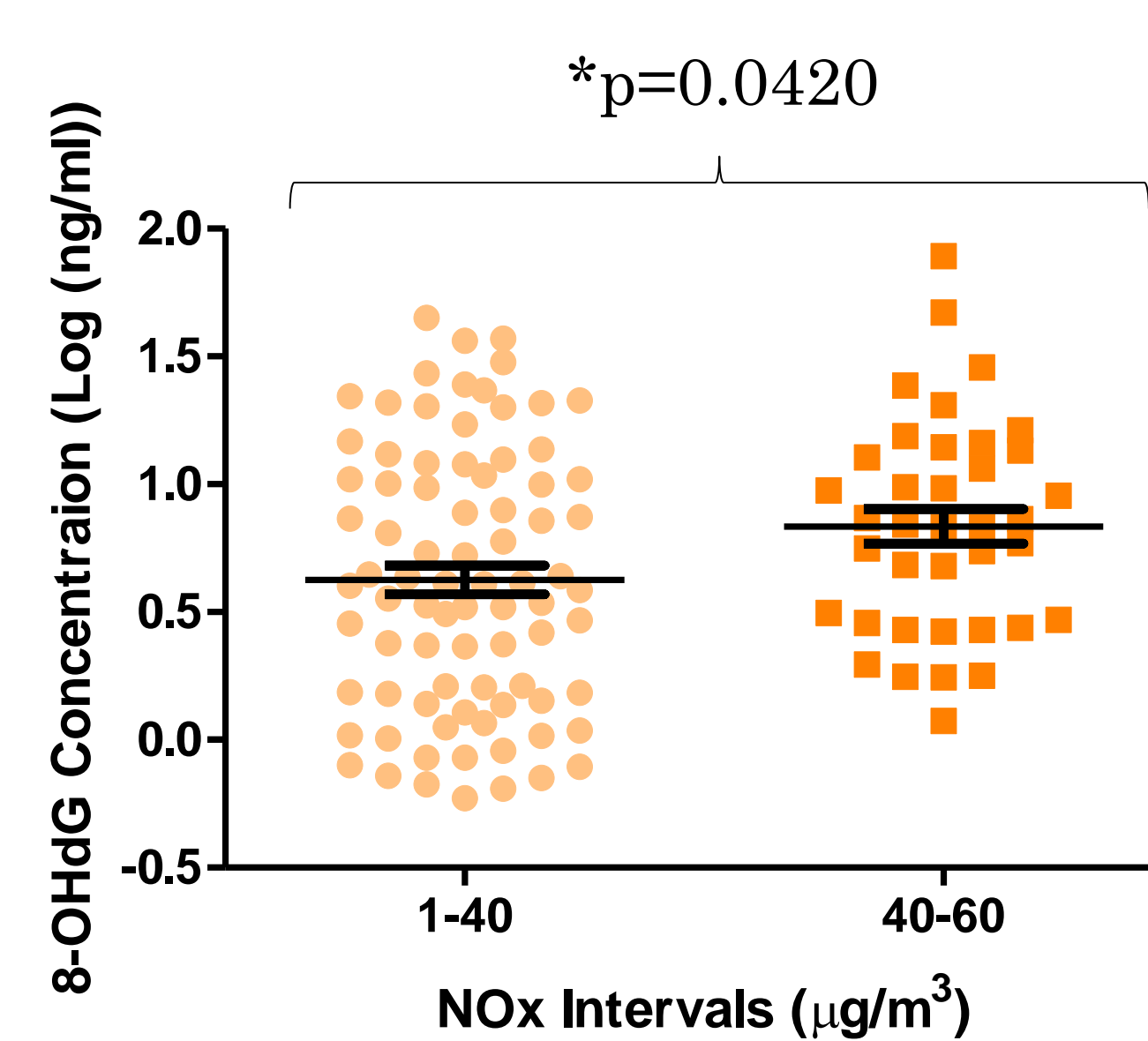


Figure 2: The NO_x concentration, divided into low and high levels, and the corresponding DNA adduct concentration (*p=0.0420)

↑ NO_x → ↑ Oxidative stress

GSTP1 AG+GG genotype

- ↓ Susceptibility of OS at low NO_x
- ↑ Susceptibility of OS at high NO_x

DISCUSSION

- Increasing NO_x levels induce increasing oxidative stress in pregnant women as observed through increased 8-OHdG adduct formation.
- The GSTP1 variant differentially influences oxidative stress (OS); at low NO_x the variant is capable of reducing OS whilst at high NO_x the variant increases the susceptibility of OS in pregnant women; possibly due to the variant's reduced binding site specificity.
- The increase in oxidative stress is currently being investigated to determine whether it impacts negatively on foetal growth in the cohort.