

AMBIENT POLLUTION AND BIRTH OUTCOMES

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Background and Aims: Environmental and personal factors acting during pregnancy may result in adverse birth outcomes, and consequently ill-health in the growing infant. This pilot tested methods for sample selection, field instruments, biological testing and exposure assessment for a future birth cohort study investigating the association of respiratory health and ambient pollution.

Methods: Pregnant women selected from public sector antenatal clinics in the industrially polluted south Durban (n=50) and the less industrialised, north Durban (n=50) were interviewed about their health status, obstetric history, exposure, smoking and nutritional history. Maternal tests for oxidative stress, allergy, atopy and genetic polymorphisms, together with cord blood for heavy metals and neonatal genetic testing, were conducted. Birth outcomes were assessed at the time of delivery. We describe the early analysis of data from this study.

Results: Mean age among participants did not differ from the south (25.1 years) compared to the north (25.7 years). There was minimal evidence of chronic diseases, with prevalences of TB, asthma, chronic bronchitis, emphysema, hypertension and diabetes less than 1%. There were two stillbirths and 8.7% low birthweight (<2.5kg) newborns. Unadjusted risks for low birthweight were increased for those living among higher industrial pollution (RR=3.5, 95% CI: 0.9 - 14.47) and those exposed to motor vehicle fuel or exhaust emissions (RR=3.8, 95%CI: 1.16- 12.1). Biochemical evidence of oxidative stress did not vary between north and south (Malondialdehyde was 0.06 μ M and 0.07 μ M between north and south respectively, while mitochondrial depolarisation was 43.9% and 44.5% respectively). These markers were not associated with low birthweight.

Conclusions: This pilot study successfully tested methodological challenges in preparation for a birth cohort study investigating ambient pollution and respiratory outcomes. Although not a primary focus of the pilot, preliminary data analysis suggests environmental exposure related risks for low birthweight outcomes.