Epidemiological studies that have examined associations between long-term exposure to traffic-related air pollution and type 2 diabetes mellitus in adults are inconsistent, and studies on insulin resistance are scarce. We aimed to assess the association between traffic-related air pollution and insulin resistance in children. Fasting blood samples were collected from 397 10-year-old children in two prospective German birth cohort studies. Individual-level exposures to traffic-related air pollutants at the birth address were estimated by land use regression models. The association between air pollution and HOMA of insulin resistance (HOMA-IR) was analysed using a linear model adjusted for several covariates including birthweight, pubertal status and BMI. Models were also further adjusted for second-hand smoke exposure at home. Sensitivity analyses that assessed the impact of relocating, study design and sex were performed. In all crude and adjusted models, levels of insulin resistance were greater in children with higher exposure to air pollution. Insulin resistance increased by 17.0% (95% CI 5.0, 30.3) and 18.7% (95% CI 2.9, 36.9) for every 2SDs increase in ambient NO2 and particulate matter<=10 μm in diameter, respectively. Proximity to the nearest major road increased insulin
Traffic-related air pollution may increase the risk of insulin resistance. Given the ubiquitous nature of air pollution and the high incidence of insulin resistance in the general population, the associations examined here may have potentially important public health effects despite the small/moderate effect sizes observed.