

## **Urban renewal and the risk of exposure to environmental contaminants in a former industrial city, Newcastle, Australia**

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As the global economy transitions from an industrial base to the technology age, cities formerly dominated by heavy industry are undergoing renewal to accommodate new land uses. While some land parcels are often targeted for redevelopment and subsequently contamination assessment, legacy environmental contamination on land that does not undergo formal redevelopment poses a significant health risk. This paper examines an example of urban renewal and associated environmental health exposure risks adjacent to the former heavy industry (steel and coal production) city of Newcastle (450,000 residents), approximately 200 km north of Sydney, Australia. Soil samples collected from around the city in public and private spaces were examined for organic and in-organic contamination.

Soil metal concentrations are highly elevated for lead (public spaces mean = 554 mg/kg, median = 280 mg/kg, n = 103; private spaces mean = 1762 mg/kg, median = 1186 mg/kg, n = 59). The soil lead concentrations exceed the US EPA Hazard Quotient and Hazard Index, the standard international contamination health impact assessment measurement, values by five units for children exposed to soil via the ingestion pathway, indicating health risks are likely to occur in this environment. Soil organic contaminants, Polycyclic Aromatic Hydrocarbons, exceed the the Australian Guidelines carcinogenic risk threshold (3 mg/kg) for the benzo(a)pyrene transformed concentrations (public spaces mean = 4.6 m/kg, median = 3.5 mg/kg, n = 12). The data in this study demonstrate that the transition of an industrial city to an urban city environment is complex and challenging, requiring consideration of the health risks associated with the soil environment.