

# ENVIRONMENTAL AND LIFESTYLE FACTORS AFFECTING BIOMONITORING OF BENZENE UPTAKE AMONG RESIDENTS NEARBY A PETROCHEMICAL PLANT

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**Background and Aims:** Biomonitoring urinary excretion of benzene, we inquired into factors affecting benzene uptake in a general population sample living nearby a petrochemical plant.

**Methods:** Our study population included a random sample of 143 subjects: 33 workers of a petrochemical plant (W), 30 residents within 2 km from the plant (2kmR) and 26 residents from 2 to 4 km from the plant (4kmR), and 54 large city residents 25 km apart (25kmR). Exposure to benzene was evaluated by personal air sampling and urinary benzene (BEN-U) monitoring (specimens collected before and at the end of air sampling).

**Results:** Median air benzene exposure was 25, 9, 7 and 6  $\mu\text{g}/\text{m}^3$  benzene among W, 2kmR, 4kmR, and 25kmR respectively, with the highest levels in W and no difference among the other groups. Median BEN-U was 3 to 10-fold higher in smokers compared to non-smokers; among non-smokers BEN-U was the highest in W (median 236 ng/L), and lower in 2kmR (48 ng/L) and 4kmR (63 ng/L) than in 25kmR (120 ng/L). Among non-smoking general population individuals the inverse association between BEN-U and distance of residence from the petrochemical plant was significant ( $p < 0.001$ ), and possibly related to urban traffic increasing with the distance from the plant. A multiple linear regression analysis performed among non-occupationally exposed subjects showed that up to 73% of BEN-U variability was accounted for by active smoking, air benzene, urinary creatinine and distance from the plant (for each  $p \leq 0.002$ ); marginal influences of personal characteristics and environmental tobacco smoking were also observed ( $p \leq 0.074$ ).

**Conclusions:** Our study showed that benzene uptake is the highest among petrochemical workers. Among subjects non-occupationally exposed, smoking and urban traffic currently contribute to benzene exposure more than living in the proximity of a petrochemical plant.