

EXPOSURE ASSESSMENT OF PHTHALATES IN CHINA USING GEOGRAPHIC INFORMATION SYSTEMS

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Background: As one kind of environmental endocrine disruptors, phthalates are widely used as plasticizers in a number of day-life products, exerts both short-term and long-lasting effects on reproduction and development of organisms. With increasing data of phthalates exposure and their relationship with human diseases, there is an emerging need for a thorough exposure assessment of phthalates in China.

Methods: Geographic information system (GIS) was used to map phthalate levels and distributions in China based on published data of environmental phthalates exposure during the past twenty years. The total daily intake (TDI), inner absorbed level and blood lipid concentration of phthalates was calculated by different models to evaluate human body burden of phthalates in China.

Results: Phthalates exposure in Chinese environment varied in geographical patterns. Mean levels of phthalates in atmosphere ranged through 300 ng/m³ in winter and 600 ng/m³ in summer, while those levels in water were in range of 5-50 µg/L. Severer phthalates pollution were found in soil and food samples, with concentrations of up to 100 mg/g d.w. TDI of phthalates was 103.9mg/d for people residing in Pearl River Delta area, significantly higher than those residing in Yangtze River Delta area (6.8mg/d).

Conclusions: Phthalate are ubiquitous in China. Food is the main source of phthalate intake for humans. DEHP accounts for over 70% of phthalate body burden in humans. People residing in Pearl River Delta area have relatively higher body burden of phthalate than those in other areas, which suggests that decision-maker in China be considering the potential health effects of phthalates on humans, especially children and elders, in this area.

Key words: phthalate; exposure assessment; GIS; body burden; DEHP