

## Identifying Knowledge Gaps in Incorporating Toxicity of Particulate Matter Constituents for Developing Regulatory Limits on Particulate Matter

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**Abstract :** Regulatory bodies has proposed limits on Particulate Matter (PM) concentration in air; however, it does not explicitly indicate the incorporation of effects of toxicities of constituents of PM in developing regulatory limits. This study aimed to provide a structured approach to incorporate toxic effects of components in developing regulatory limits on PM. A four-step human health risk assessment framework consists of - (1) hazard identification (parameters: PM and its constituents and their associated toxic effects on health), (2) exposure assessment (parameters: concentrations of PM and constituents, information on size and shape of PM; fate and transport of PM and constituents in respiratory system), (3) dose-response assessment (parameters: reference dose or target toxicity dose of PM and its constituents), and (4) risk estimation (metric: hazard quotient and/or lifetime incremental risk of cancer as applicable). Then parameters required at every step were obtained from literature. Using this information, an attempt has been made to determine limits on PM using component-specific information. An example calculation was conducted for exposures of PM<sub>2.5</sub> and its metal constituents from Indian ambient environment to determine limit on PM values. Identified data gaps were: (1) concentrations of PM and its constituents and their relationship with sampling regions, (2) relationship of toxicity of PM with its components.

**Keywords :** air, component-specific toxicity, human health risks, particulate matter

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