COMMUTERS' HEALTH RISK TO ULTRAFINE PARTICLES IN JAKARTA

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Background and Aims: Latest developments in epidemiological studies indicated that particles might be responsible for increases in the symptom of cardiovascular and respiratory diseases and several adverse health outcomes, including mortality, reduction of lung function, exacerbation of asthma, and an increase in emergency room visits. Public concern over air quality is enhanced by its effect on children, especially on associations with incidence and prevalence of asthma. In Jakarta, emissions of particles are expected to increase, especially its contribution from transportation. Both urban population size and the fraction of the population that owns a private vehicle are increasing. Objective of the study to determine the numbers of ultrafine particulate matter (particles with an aerodynamic diameter of 0.1 □m or less, or $PM_{0.1}$) inhaled by elementary school children, commute workers with private car and commute workers with public transport.
Methods: A *cross-sectional study design* is implemented for assessing ultrafine particulate matter concentrations inhaled by targeted population groups in Jakarta involving ten elementary school children, ten commuters with private car and ten commuters with public transports.
Results: Concentration of ultrafine particulate matter (average) of elementary school children at home, on the road and at school is 29,254/cm^3, 147,897/cm^3 and 61,033/cm^3 respectively. For those commuters with private car at home, on the road and at office is 29,213/cm^3, 310,179/cm^3 and 42,496/cm^3 respectively. For those commuters with public transport, the concentration average of at home, on the road and at office is found higher: 35,332/cm^3, 453,547/cm^3, and 69,867/cm^3 respectively.
Conclusions: School children and commuters with both private car and public transport are at high-risk to have respiratory diseases, reduction of lung function, exacerbation of asthma, and even death especially when they are on the road.
Recommendations: It is suggested that commuters should reduce their length of time during trip on the road and avoid traffic jam during on the road. Providing adequate ventilation and air circulation at home as well as in the office are needed for healthier breathing. Improving management of transportation to reduce traffic jams is also strongly recommended to local government.

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