

論文の内容の要旨

論文題目 Effects of short-term exposure to ambient particulate matter and temperature on lung function of school children in Dhaka, Bangladesh
 (ダッカにおける大気中粒子状物質及び気温への短期曝露が就学児童の肺機能に及ぼす影響)

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Short-term exposure to ambient particulate matter (PM) and temperature plays a significant role in human health. The current study investigated the effects of short-term ambient PM and temperature on lung function in children and seasonal variation in these associations in Dhaka, Bangladesh. Additionally, this research explored the asthma prevalence in the study schools.

The study was conducted in three schools located in three cities inside and around Dhaka, Bangladesh, within 1km of existing continuous air-monitoring stations (CAMS). A cross-sectional questionnaire survey for all school children and a panel study of a subgroup of children ($n=314$) involving the repeated measurement of lung function was conducted in 2013. Linear mixed-effects models adjusted for potential confounders were used to examine the effect of the exposure variables on lung function.

In the panel of 314 children, short-term exposure to high ambient $PM_{2.5}$, large diurnal temperature range (DTR) and low ambient temperature were associated with a significant decrement in children's lung function. Our analysis also demonstrated significant seasonal variation in these associations, as the estimated effects of high $PM_{2.5}$ on lung function measures were generally stronger in summer than in winter, while the estimated adverse effects of low daily mean temperature on lung function measures were only evident in winter. Although the magnitude of the effects varied between winter and summer, this study provides evidence that increase in $PM_{2.5}$, DTR and decrease in temperature are independent risk factor to the health of children.