

Epidemiological Study on Respiratory Health of School Children of Rural Sites of Malwa Region (India) During Post-harvest Stubble Burning Events

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Abstract: A study on effects of particulate matter fractions (PM₁₀, PM_{2.5} and PM₁) on health of school children was done from September 2014 to December 2015 covering one wheat and two rice crop seasons. The study was undertaken at 3 rural sites in the districts of Patiala, Fatehgarh Sahib and Sangrur (Malwa region of Punjab). The monthly average values of PM₁₀, PM_{2.5} and PM₁ were about 3–4 times higher than the National Ambient Air Quality Standards (NAAQS) given by Central Pollution Control Board during the crop residue burning periods. The MODIS data images of crop residue burning events confirmed the active fire operations over the region. The lung function parameters (Forced Vital Capacity, Forced Expiratory Volume in one second) of children (10–16 years) decreased with increase in particulate matter concentration while no significant effect was observed on Oxygen saturation level of children. The decrease in Forced Vital Capacity was slightly more in male subjects as compared to the female population. The sharp decrease in Pulmonary Function Test parameters during the crop residue burning period indicated the severity of the episodic burning events on the health of the children.

Keywords: Air pollution; Crop residue burning; Rural environment; Particulate matter; Effect on children's health; Spirometry