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Indoor air pollution in Addis Ababa, Ethiopia

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About 95% of the population of Ethiopia uses biomass fuels to meet household energy needs. Consequently, indoor air pollution is responsible for more than 50,000 deaths annually and causes nearly 5% of the burden of disease in Ethiopia. Very little research exists on indoor air pollution and its health impacts in Ethiopia. This study was therefore undertaken to assess the magnitude of indoor air pollution from household fuel use in Addis Ababa, the capital city of Ethiopia. During the months of January and February, 2012, the concentration of fine particulate matter from 59 households was measured using University of California at Berkeley Particle Monitor (UCB PM). The raw data was analyzed using Statistical Package of Social Science (SPSS version 20.0) software to analyze variance between groups, measure the frequency of distribution and central tendencies. The geometric mean of 24-hours indoor $PM_{2.5}$ concentration is about $818\mu\text{g}/\text{m}^3$ ($SD=3.61$). The highest 24-hour geometric mean of $PM_{2.5}$ concentration observed is nearly $1134\mu\text{g}/\text{m}^3$ ($SD=3.36$) from households using solid fuels followed by kerosene, being about half the concentration from solid fuels. In households using clean fuels such as liquefied petroleum gas (LPG) as the primary source of energy, the concentration is about $335\mu\text{g}/\text{m}^3$ ($SD=2.51$). Although the concentration of $PM_{2.5}$ levels between fuel use type differed statically ($P < 0.05$), post hoc pair-wise comparison showed no significant difference in mean concentration of $PM_{2.5}$ between improved biomass stoves and traditional stoves ($P > 0.05$). The study revealed indoor air pollution is a major environmental and health hazard in Addis Ababa home using solid fuels. Use of clean fuels and efficient cooking stoves are recommended to address the associated problems.

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