

Risk Assessment of Particulate Matter (PM10) in Makkah, Saudi Arabia

Authors : Turki M. Habeebullah, Atef M. F. Mohammed, Essam A. Morsy

Abstract : In recent decades, particulate matter (PM10) have received much attention due to its potential adverse health impact and the subsequent need to better control or regulate these pollutants. The aim of this paper is focused on study risk assessment of PM10 in four different districts (Shebikah, Masfalah, Aziziyah, Awali) in Makkah, Saudi Arabia during the period from 1 Ramadan 1434 AH - 27 Safar 1435 AH. samples was collected by using Low Volume Sampler (LVS Low Volume Sampler) device and filtration method for estimating the total concentration of PM10. The study indicated that the mean PM10 concentrations were 254.6 (186.1 - 343.2) $\mu\text{g}/\text{m}^3$ in Shebikah, 184.9 (145.6 - 271.4) $\mu\text{g}/\text{m}^3$ in Masfalah, 162.4 (92.4 - 253.8) $\mu\text{g}/\text{m}^3$ in Aziziyah, and 56.0 (44.5 - 119.8) $\mu\text{g}/\text{m}^3$ in Awali. These values did not exceed the permissible limits in PME (340 $\mu\text{g}/\text{m}^3$ as daily average). Furthermore, health assessment is carried out using AirQ2.2.3 model to estimate the number of hospital admissions due to respiratory diseases. The cumulative number of cases per 100,000 were 1534 (18-3050 case), which lower than that recorded in the United States, Malaysia. The concentration response coefficient was 0.49 (95% CI 0.05 - 0.70) per 10 $\mu\text{g}/\text{m}^3$ increase of PM10.

Keywords : air pollution, respiratory diseases, airQ2.2.3, Makkah

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