Spatio-temporal variations of PM2.5 and Respiratory Deposition Dose (RDD) before and during different COVID-19 lockdown phases at Delhi, India

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Present study explores pre-lockdown (1st January-24th March, 2020) and during lockdown (25th March-20th June, 2020) air quality changes in PM2.5 along with meteorological effects at megacity-Delhi (28.7041°N, 77.1025°E). Alipur (Rural), Okhla (Industrial) and Pusa Road (Traffic dominant area) experienced mean concentrations (S.D.) of PM2.5 as 87.56(±54.06), 124.45(±73.49) and 62.14(±58.64) µg/m³ before lockdown (BL; 1st January-24th March, 2020), while for Lockdown1 (L1; 25th March-14th April, 2020), PM2.5 decreased drastically as 39.26(±16.31), 38.01(±15.16) and 31.03(±12.79) µg/m³ and gradually increased during Lockdown2 (L2; 15th April-3rd May, 2020), Lockdown3 (L3; 4th May-17th May, 2020), Lockdown4 (L4; 18th May-31st May, 2020), respectively. Delhiites were exposed to more fine RDD (walk/sit) before lockdown than during lockdown phases. People in sit mode found less exposed to fine RDD, in comparison to walk condition. The people living indoors were affected by outdoor RDD exposure with windows open condition, while exposed to different indoor pollution sources with windows closed condition during lockdown. Authors suggest avoid use of closed conditioned indoors and ACs; frequent opening of windows to lower the RDD and to minimize the COVID-19 virus transmission via particulates.

Keywords: PM2.5, RDD, COVID-19.