

## Changes in Air Quality inside Vehicles and in Working Conditions of Professional Drivers during COVID-19 Pandemic in Paris Area

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**Abstract :** We evaluated the impact of the first lockdown restriction measures (March-May 2020) in the Paris area on (1) the variation of in-vehicle ultrafine particle (UFP) and black carbon (BC) concentrations between pre-and post-lockdown period and (2) the professional drivers working conditions and practices. The study was conducted on 33 Parisian taxi drivers. UFP and BC were measured inside their vehicles with DiSCmini® and microAeth®, respectively, on two typical working days before and after the first lockdown. The job-related characteristics were self-reported. Our results showed that after the first lockdown, the number of clients significantly decreased as well as the taxi driver's journey duration. Taxi drivers significantly opened their windows more and reduced the use of air recirculation. UFP decreased significantly by 32% and BC by 31% after the first lockdown, with a weaker positive correlation compared to before the lockdown. The reduction of in-vehicle UFP was explained mainly by the reduction of traffic flow and ventilation settings, though the latter probably varied according to the traffic condition. No predictor explained the variation of in-vehicle BC concentration between pre-and post-lockdown periods, suggesting different sources of UFP and BC. The road traffic was not anymore the dominant source of BC post-lockdown. We emphasize the role of traffic emissions on in-vehicle air pollution and that preventive measures such as ventilation settings will help to better manage air quality inside a vehicle in order to minimize exposure of professional drivers, as well as passengers, to air pollutants.

**Keywords :** black carbon, COVID-19, France, lockdown, taxis, ultrafine particles

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