

Personal Exposure to Respirable Particles and Other Selected Gases among Cyclists near and Away from Busy Roads of Perth Metropolitan Area

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Abstract : Cycling is often promoted as a means of reducing vehicular congestion, noise and greenhouse gas and air pollutant emissions in urban areas. It is also endorsed as a healthy means of transportation in terms of reducing the risk of developing a range of physical and psychological conditions. However, people who cycle regularly may not be aware that they can become exposed to high levels of Vehicular Air Pollutants (VAP) emitted by nearby traffics and therefore experience adverse health effects as a result. The study will highlight the present scenario of ambient air pollution level in different cycling routes in Perth and also highlight significant contribution to the understanding of health risks that cyclist may face from exposure to particulate air pollution. **Methodology:** This research was conducted in Perth, Western Austral and consisted of two groups of cyclists cycling near high (2 routes) and low (two routes) vehicular traffic roads, at high and low levels of exertion, during the cold and warm seasons. A sample size of 123 regular cyclists who cycled at least 80 km/week, aged 20-55, and non-smoker were selected for this study. There were altogether 100 male and 23 female who were asked to choose one or more routes among four different routes, and each participant cycled the route for warm or cold or both seasons. Cyclist who reported cardiovascular and other chronic health conditions (excluding asthma) were not invited into the study. Exposures to selected air pollutants were assessed by undertaking background and personal measurements along with the measurement of heart and breathe rate of each participant. **Finding:** According to the preliminary study findings, the cyclists who used cycling route close to high traffic route were exposed to higher levels of measured air pollutants Nitrogen Oxide (NO₂) =0.12 ppm, sulfur dioxide (SO₂)=0.06 ppm and carbon monoxide (CO)=0.25 PPM compared to those who cycled away from busy roads. However, we measured high concentrations of particulate air pollution near one of the low traffic route which we associate with the close proximity to ferry station. **Concluding Statement:** As a conclusion, we recommend that cycling routes should be selected away from high traffic routes. If possible, we should also consider that if the cycling route is surrounded by the dense populated infrastructures, it can trap the pollutants and always facilitate in increasing inhalation of particle count among the cyclists.

Keywords : air pollution, carbon monoxide, cyclists' health, nitrogen dioxide, nitrogen oxide, respirable particulate matters

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