

## Publication

Short-Term Effects of PM<sub>10</sub>, NO<sub>2</sub>, SO<sub>2</sub> and O<sub>3</sub> on Cardio-Respiratory Mortality in Cape Town, South Africa, 2006-2015

## JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

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The health effect of air pollution is rarely quantified in Africa, and this is evident in global systematic reviews and multi-city studies which only includes South Africa.; A time-series analysis was conducted on daily mortality (cardiovascular (CVD) and respiratory diseases (RD)) and air pollution from 2006-2015 for the city of Cape Town. We fitted single- and multi-pollutant models to test the independent effects of particulate matter (PM<sub>10</sub>), nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>) and ozone (O<sub>3</sub>) from co-pollutants.; daily average concentrations per interquartile range (IQR) increase of 16.4 µg/m<sup>3</sup>; PM<sub>10</sub>, 10.7 µg/m<sup>3</sup>; NO<sub>2</sub>, 6 µg/m<sup>3</sup>; SO<sub>2</sub> and 15.6 µg/m<sup>3</sup>; O<sub>3</sub>; lag 0-1 were positively associated with CVD, with an increased risk of 2.4% (95% CI: 0.9-3.9%), 2.2 (95% CI: 0.4-4.1%), 1.4% (95% CI: 0-2.8%) and 2.5% (95% CI: 0.2-4.8%), respectively. For RD, only NO<sub>2</sub> showed a significant positive association with a 4.5% (95% CI: 1.4-7.6%) increase per IQR. In multi-pollutant models, associations of NO<sub>2</sub> with RD remained unchanged when adjusted for PM<sub>10</sub> and SO<sub>2</sub>; but was weakened for O<sub>3</sub>. In CVD, O<sub>3</sub> estimates were insensitive to other pollutants showing an increased risk. Interestingly, CVD and RD lag structures of PM<sub>10</sub>, showed significant acute effect with evidence of mortality displacement.; The findings suggest that air pollution is associated with mortality, and exposure to PM<sub>10</sub> advances the death of frail population.

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