

1.166 Health impacts and complex drivers of air pollution in the City of Johannesburg, South Africa.

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Abstract:

Gauteng Province in South Africa is the smallest Province in South Africa, but contains the largest population (~14.3 million in 2017). The City of Johannesburg is the largest city in the Gauteng Province, and in fact, in South Africa. From available ambient measurements, it is clear that air quality is poor in the growing City, with many exceedances of the National Ambient Air Quality Standards measured.

The sources of air pollution that impact the City are complex, with impacts from anthropogenic sources (e.g. vehicles, industries, power station) and natural sources (e.g. biomass burning, biogenic, dust). In addition, transboundary sources are important, as the City is surrounded by other populous cities, as well as industrialized areas. Adding to this complexity are a range of community-based sources, such as waste burning and use of domestic fuel, the emissions of which are generally concentrated in vulnerable

communities.

We have used measurements and air quality modelling (CAMx) to assess air pollution and its impacts on health in the City. The modelling used a high-resolution, locally-derived emissions inventory. This assessment was used in the review and development of the City of Johannesburg's Air Quality Management Plan, with an aim to support effective evidence-based air quality management. The analysis found that ozone and particulate matter are major contributors to poor air quality in the City, though their concentrations and impacts on health are spatially highly variable. The assessment of potential public transport interventions found that current public transportation plans for the City would have minimal impact on air quality in the growing City; this highlights the need for ambitious, integrated interventions to improve air quality. This presentation will discuss the findings of the research, and highlight atmospheric chemistry research needs to work towards improving the air quality in South Africa's largest city.