



The quality of the air we breathe is affected by the amount and type of chemical substances put into the atmosphere. Often, these chemicals can have harmful effects and can lead to impacts on human health and our environment. In Mpumalanga there are a number of different things that may cause poor air quality, including veld fires, industry, agriculture, mining, power generation and vehicle use. Air quality is also affected by climate. In winter the atmosphere is stable and the air does not mix much. This can lead to periods where air pollutants become trapped in a layer just above the surface of the earth called an inversion layer. This doesn't happen in summer, when the air mixes and pollutants are dispersed easily.

The air quality in Mpumalanga is measured through five indicators:

- Trends in household energy use;
- Electricity generation from coal-fired power stations;
- Ambient sulphur dioxide concentration;
- Ambient particulate concentration; and
- Quarterly clinic admissions for respiratory infections.

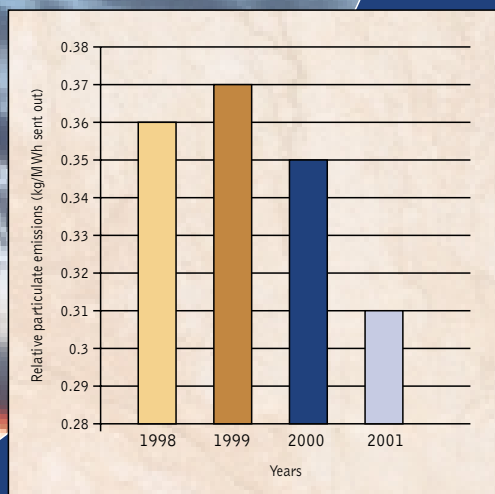
Trends in household energy use

The type of energy used in the home will have an impact on the quality of the air you breathe. Using electricity is clean, there is no pollution released into your home (the pollution is generated at the power station). If you use other types of energy the air you breathe may not be quite so clean. In Mpumalanga approximately 60% of households use electricity in their homes. Roughly 20% use candles for lighting, and about 20% use wood for cooking and heating. Only 10% of households use paraffin for cooking and heating.

Electricity generation from coal-fired power stations

There are 11 Eskom power stations in South Africa that use coal to produce electricity, eight of these stations are found in Mpumalanga. These eight stations produce approximately 70% of South Africa's electricity. Electricity sales in South Africa have steadily increased since 1998, most likely due to the increasing number of homes that now have electricity.

Producing electricity from coal is dirty business, but Eskom is making it cleaner each year. Since 1999 there has been a decrease in the amount of particulate matter (dust) released during electricity generation. Unfortunately, because most of the power stations that use coal are found in Mpumalanga, a lot of this pollution ends up in Mpumalanga.



Relative particulate emissions during Eskom power generation (Eskom)

Ambient sulphur dioxide concentration

This indicator measures the amount of sulphur dioxide in outdoor or ambient air. Sulphur dioxide is an air pollutant that can cause negative health effects if you inhale too much. Health effects include wheezing, coughing and constriction of the lungs.

Sulphur dioxide is monitored in Mpumalanga by Eskom and Sasol. Both sets of data show that the sulphur dioxide concentration is below the World Health Organisation guideline values. These guidelines have been set to protect human health. Only one station recorded concentrations above the 24-hour guideline value, however this was only for 2% of the time during May to October 2002.

Ambient particulate concentration

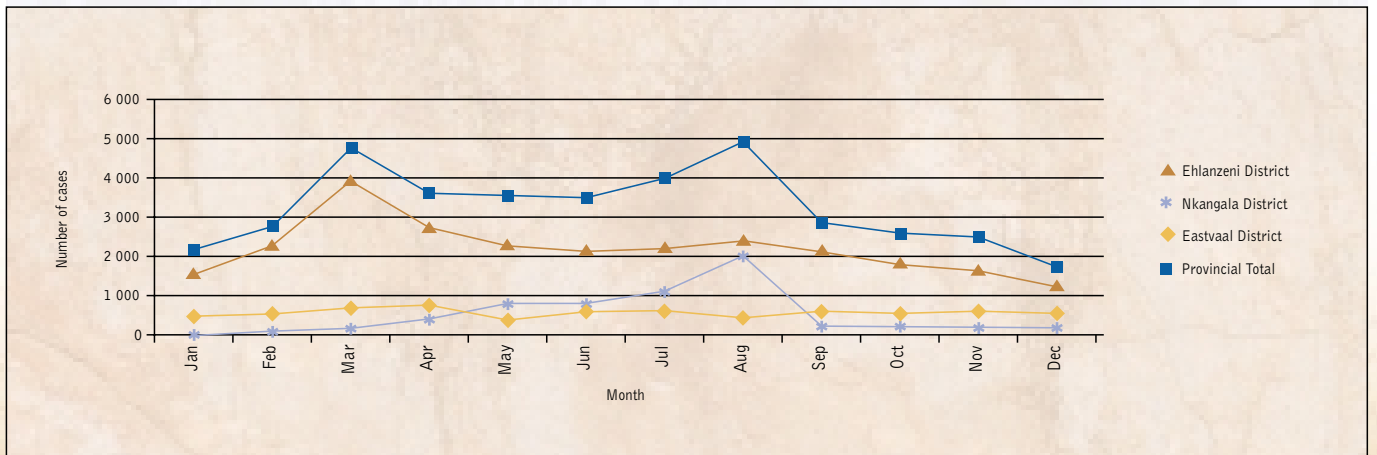
Outdoor particulate concentration is also monitored by Eskom and Sasol. Particulate matter is the solid and liquid particles that are found in air, and that we sometimes breathe in. Particulate matter can be various sizes, the smaller particles are inhaled deep into the lungs and can cause persistent coughs, wheezing and excess phlegm.

The Eskom monitoring stations measure larger particles (PM₁₀) while the Sasol stations measure smaller particles (PM_{2.5}).

The concentrations measured at Eskom stations show some concentrations above the United States Environmental Protection Agency standard for PM₁₀, mainly at Leandra and Kendal. The Sasol monitoring station at Langverwacht had 20% of the readings above the United States Environmental Protection Agency standard for PM_{2.5}. Other stations were below the standard.

Quarterly clinic admissions for respiratory infections

Clinics in Mpumalanga had no information on this indicator. Information on lower respiratory tract infections in Mpumalanga was provided by a Medical Doctor at the University of Pretoria. This study showed that respiratory infections in children under 5 years were more common in winter months and in polluted areas. The Ehlanzeni District showed the highest number of cases.



Lower respiratory infections in children below 5 years in Mpumalanga - 2000 (Dr A. Beke, University of Pretoria)