



Air pollution in South Africa

Why are the 2021 World Health Organization Air Quality Guidelines important?

What is air pollution?

Air pollution is any chemical, physical, or biological agent that changes the air around us. Examples are chemical fumes coming from cleaning products, small pieces of metal or dust suspended in the air or even pollen coming from trees. Smoke caused by wildfires is also air pollution.

When inhaled, many air pollutants cause serious health problems, such as respiratory or even cardiovascular illnesses. Poor air quality kills about 7 million people across the globe every year. Air pollution is particularly bad in cities, where many people live and where traffic is bad, or in industrial hubs, where factories and power stations pollute the air we breathe.

In South Africa, many people rely on coal- or wood burning to heat and cook. The smoke created by this burning process causes air pollution inside people's homes. About 2.6 billion people around the world rely on polluting cooking systems, and this is a big health problem.

What are the health impacts of air pollution?

Air pollution affects our health differently, depending on how much time we spend breathing in a specific pollutant, how high the levels (or concentration) of the pollutants are, and what the pollutants are made of (heavy metals, for example).

People most at risk from breathing polluted air are children (because their lungs are still developing), the sick (people who already have lung diseases like asthma), and the elderly. Impacts from breathing in polluted air are, for example, coughing, sore or scratchy throats, inflamed airways, decreased lung function, irregular heartbeats, nonfatal heart attacks, and even premature death in people with heart or lung disease.

What is air pollution like in South Africa and how do we manage it?

South Africa has many sources of air pollution. Some of the main pollution sources are:

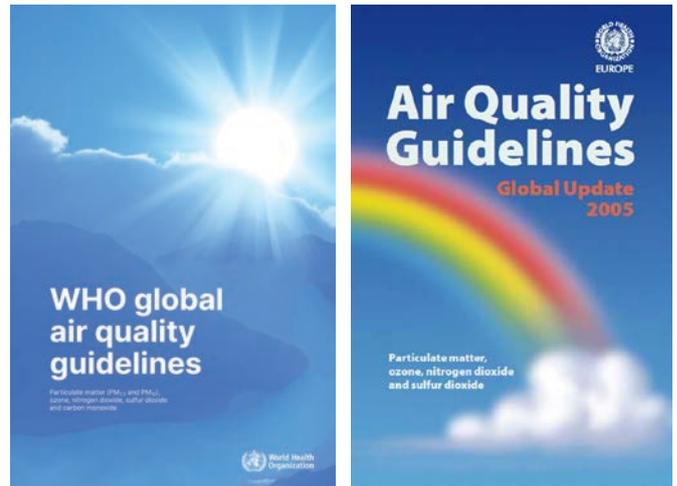
- Vehicle emissions, especially in cities
- Waste burning, especially in informal communities
- Industrial activities in industrial hubs
- Mining for coal and other resources
- Power generation at our coal-fired power stations
- Domestic burning in low-income households for cooking and heating
- Sand and dust storms

The Department of Environment, Forestry and Fisheries declared three Air Quality Priority Areas in the country, where many industrial activities (like power generation or mining) emit tons of pollutants into the air every single year, causing high pollution levels on the ground impacting on humans and the environment.

To make sure that the air that people breathe on the ground is not harmful to their health, South Africa has put in place **National Ambient Air Quality Standards (NAAQS)**. The NAAQS regulations govern which levels of pollution are deemed safe to breathe or not. Different air pollutants have different standards, which are represented by specific limit values. When these limit values are exceeded, the air is considered unsafe to breathe.

Who is the World Health Organization and what are the new Air Quality Guidelines all about?

The World Health Organization (WHO) is a special agency, which forms part of the United Nations and which is responsible for international health issues or public health. The WHO guides the world in how to control and manage diseases (like COVID-19). Because air pollution contributes to millions of deaths, the WHO developed **Air Quality Guidelines (AQGs)** using latest scientific evidence. The WHO AQGs help countries reduce air pollution levels in a step-by-step manner by using ‘interim targets’ (IT-1, IT-2, IT-3, IT-4).

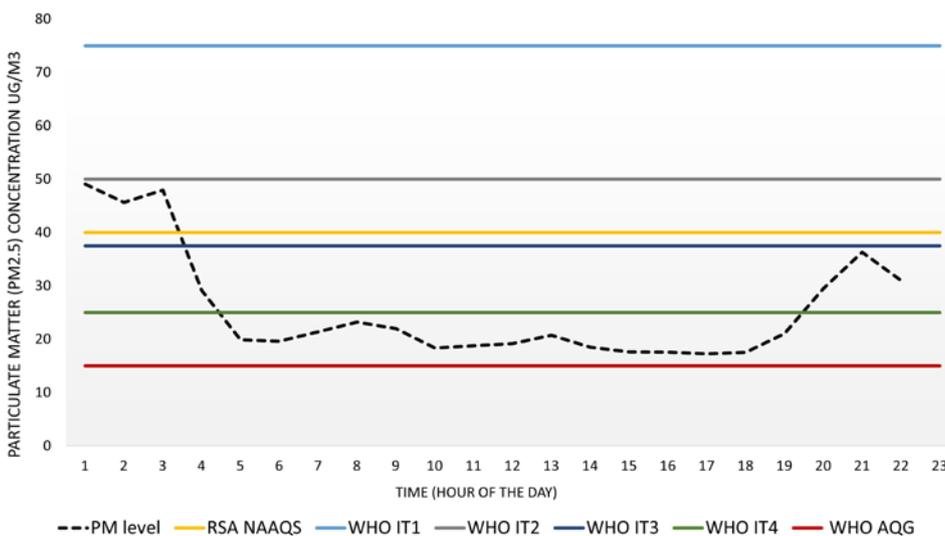


In September 2021 the new AQGs (left) were released, updating the old AQGs from 2005 (right). The full World Health Organization Air Quality Guidelines 2021 report is available online: <https://apps.who.int/iris/handle/10665/345329>

Why should South Africa seriously consider the new WHO AQGs?

South Africa has air quality management plans in place to ensure that air pollution is managed to stay below the NAAQS values. However, our NAAQS may not be strict enough to protect human health. South Africa is reviewing its NAAQS and will probably use the ITs as stepping stones to bring air pollution levels down. Some companies will have to install equipment to reduce the pollution they emit. Households need electricity so they can live in a healthy environment.

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Hourly PM_{2.5} concentrations measured in Alexandria, Johannesburg on 3 December 2021

The NAAQS vs the AQGs using particulate matter pollution (PM_{2.5}, which represents particles with an aerodynamic diameter of less than 2.5 microns) on one day in Alexandria, Johannesburg. The current daily NAAQS lies between the WHO IT-2 and IT-3 target values. The hourly pollution levels fluctuate between different target values throughout the day. The pollution levels are mostly considered safe to breathe according to the South African NAAQS, but not according to the WHO AQGs.

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