

# We can't ignore the air pollution crisis in Africa's fast-growing megacities

By [Mathew Evans](#)

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Residents of [London](#), [Los Angeles](#) and [Beijing](#) often complain about air pollution. And they're right to - their concerns are backed by lots of data. However, not all cities are measured as rigorously. Notably, the air quality in many African cities is almost completely unmonitored. By 2050, both Lagos and Kinshasa [will exceed 30m people](#) - shouldn't we know more about pollution in this fast-growing part of the world?



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The World Health Organisation calculates air quality is responsible for [more than 500,000 deaths a year](#) in Africa from both indoor and outdoor air pollution. To put this into perspective, around [11,000 people died](#) in the recent Ebola epidemic.

Yet the WHO's ability to make these estimates is limited both by the lack of air measurements and the lack of medical studies linking pollution to deaths in Africa. It seems unlikely that the current air quality [impact studies](#) based on the populations of Los Angeles or London can be directly transferred to Lagos or Kinshasa.

London and Lagos have entirely different air quality problems. In cities such as London, it's mainly due to the burning of hydrocarbons for transport. A complicated problem for sure, but one that can be addressed by tackling petrol usage through electric vehicles, car free zones, and so on.

African pollution isn't like that. There is the burning of rubbish, [cooking indoors](#) with inefficient solid fuel stoves, millions of small diesel electricity generators, cars which have had the catalytic converters removed and petrochemical plants, all pushing pollutants into the air over the cities.

It's not even obvious what source to tackle first. Compounds such as sulfur dioxide, benzene and carbon monoxide that [haven't been issues](#) in Western cities for decades may be a significant problem in African cities. We simply don't know.

Nature isn't helping here either. Compounds such as hydrocarbons which may be inoffensive in themselves are emitted into the atmosphere and a complex web of chemical reactions process them into harmful products such as ozone and aerosols. These reactions are driven by the sun, and Africa has that in spades.



A fire burns on a rubbish dump in Lomé, Togo. Nic Bothma / EPA

Natural sources of harmful compounds also abound. Sahara sand storms can cloak cities with [choking dust](#). Chemicals emitted by trees in Africa's vast forested areas may magnify the impact of human emissions in the same way as they do in the [southern US](#), and smoke from seasonal forest fires can drift over population centres.

The relative importance of these natural sources compared to the human sources, and, even how we separate out the natural versus human are hotly debated by scientists. How much of the forest burning we see is due to natural courses such as lightning strikes and how much is linked to agricultural practices? Again without improved observations it is hard to tell.

These air pollutants also harm vegetation and crops. In Asia it is estimated that around 10% of the food crop is [destroyed by pollutants](#). For Africa we've got no good idea. First because we don't have the same controlled field experiments on Africa's staple crops such as cassava or millet as we do for Europe and North America's crops. Second, because if we know little about air quality in cities, we know even less about what is happening in agricultural areas.

## Growing pains

The need to focus on air quality in Africa's new megacities is the topic of a new paper, which I co-authored, in the journal [Nature Climate Change](#). Not only is pollution in these cities killing local residents, we found these emissions may even be altering the climate along the coast of West Africa, leading to changes in the clouds and so potentially to rainfall with devastating effects.

Things aren't going to get better any time soon. Half of the global population growth between [2015 and 2050](#) will occur in Africa, and the continent is becoming [increasingly urbanised](#).

Economic development will put increased strain on resources. A 2012 [OECD report](#) suggests successes in dealing with other problems such as access to drinking water and malaria is likely to make air quality the dominant environmental risk for premature deaths globally by 2030, if it isn't already. Africa will not be far behind.

Scientists can help. The latest generation of satellites is providing [high-resolution information](#) about these pollutants on an [unprecedented scale](#), and cheap new sensors can monitor the composition of the air over cities.

Couple this with the revolution in big data and the decades of research that has been undertaken in North American, European and now Asian cities and we should soon be able to understand the air quality problems of African cities. And once we've understood the problem, science will be able to suggest solutions. Then it will be up to African cities to implement changes needed to prevent the deaths of thousands of their citizens.

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