

Urban pollution: Clearing the air

Written by: Clara Young, OECD Observer

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Air pollution in African cities is a major health and environmental challenge that must become a focus of urban policies. It's hard to breathe in Onitsha, a major river port in Nigeria. The air is dark with car fumes. Old freighters on the River Niger expel smoke. Burning rubbish dumps outside the city's many sprawling markets thicken the air even further. Add to that diesel generators, and open coal, oil and wood fires, and this southeastern port town in Nigeria becomes handily the world's biggest producer of small particulate matter (PM10). When these minuscule pollutants are inhaled deep down into the lungs, they do lethal damage: lung cancer, stroke, heart disease, and chronic and acute asthma.

According to the World Health Organisation (WHO) Global Urban Ambient Air Pollution Database released in May 2016, Onitsha is the city with the highest PM10 count in the world. It has 30 times more than the WHO recommended levels of PM10. It is just one of four Nigerian cities in the WHO's top 20 air-polluters, a list that includes Kaduna, Aba and Umuahia.

Nigeria may be a particularly tough case, though the African continent as a whole needs to grapple with the startling increase in premature deaths from air pollution. According to the Global Burden of Disease Study 2013, (Institute for Health Metrics and Evaluation IHME, 2015)

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nearly 250,000 people died in Africa in 2013 of diseases attributable to ambient PM pollution; that is, air pollution from industry, power generation and road transport. Household air pollution, mainly from inefficient fuel stoves for indoor cooking, were contributing factors to diseases that resulted in the premature deaths of over 450,000 people that year.

Indoor and outdoor air pollution is not the only environmental risk factor in premature deaths. Childhood undernutrition, poor sanitation and unsafe water are other killers. And, though these last three factors have fallen since last measured by the IHME in 1990, they have by no means been vanquished: in 2013, 400,000 people died due to unsafe sanitation, 550,000 from unsafe water and 275,000 from childhood undernutrition.

Not only must Africa fight a multi-front war on these risk factors to health, its time frame for doing so is short. According to Climate Change News, Africa comprises 16% of the world's total population and only 3% of all motor vehicles, though road transport still accounts for 50% of premature deaths due to ambient pollution. The rate of industrialisation has been, with some exceptions, slow and has even reversed in some countries. Despite this, deaths from outdoor pollution rose by 36% between 1990 and 2013 to 250,000 and those from indoor pollution by 18% to over 450,000. Half of the world's population growth in the next 30 years is expected to take place in Africa. If measures aren't taken to control air pollution now, these numbers will skyrocket.

Though the WHO designated Onitsha as the city with the most befouled air, there was one problem with its data: Onitsha has only one monitoring station. This compromises the statistical reliability of the information. To get serious about tackling air pollution, African cities need ground-monitoring stations that collect information on different emissions over longer periods of time, and various sources.

With a more detailed inventory of emissions, policy-makers can begin to explore ways to solve air pollution problems. Some ideas can come from what advanced economies have successfully implemented. To improve decision-making, the cost of air pollution and different ways to solve it need to be quantified. Currently, the cost of deaths due to air pollution in Africa is roughly US\$450 billion.

Cost-benefit analysis can be applied to different proposals based on how much one is willing to pay to reduce the risk of premature deaths, called Value of Statistical Life (VSL). The OECD determined in 2012 from multiple surveys that

individuals were willing to pay \$30 to reduce the annual risk of dying from air pollution from 3 in 100,000 people to 2 in 100,000. This establishes \$3 million for every 100,000 people as a base amount for calculating the VSL for each country. This provides an important tool for calculating which air pollution policies yield the best value for money ratio for each country.

Of the panoply of air pollution measures in play, reforming fuel subsidies must be seriously considered in Africa. A working study by the International Monetary Fund (IMF) and OECD in 2015 claims that removing energy subsidies in sub-Saharan African countries would cut deaths from air pollution by over 50%. In North Africa, removing petroleum subsidies would reduce deaths from air pollution by roughly 80%.

Singling out car emissions, particular in North Africa with its growing vehicle congestion, would have an immediate health benefits, as well as help fight against climate change. Nigeria and South Africa have imposed emissions standards roughly equivalent to those introduced in Europe in 1996. But for emissions standards to work, three things are needed: cleaner fuel, more fuel-efficient cars and better enforcement capabilities. Significant investments need to be made to upgrade refineries so that they can remove sulfur from fuel. Cheap old cars brought in from developed countries need to be phased out—governments could slap tariffs on secondhand car imports or ban them outright. And governments need to have the wherewithal to enforce emissions standards, whether on individual cars or industrial installations and power plants.

Household biomass fuel is another target area, particularly in sub-Saharan Africa. Here, candles and kerosene lamps are frequently the sole sources of lighting because there is no access to electricity or supply is unreliable. Coal, candle and kerosene burning emits PM 2.5 particular matter. There are initiatives to replace candle and kerosene with clean solar lamps, but this needs to be more widespread. Upgrading kitchens with more efficient cooking and heating fuels would lower particulate matter even further, as projects in Niger reported in this magazine have shown. Senegal, Cameroon and Ghana have supported the switch from biomass to liquefied petroleum gas. Kenya has passed a law whereby new buildings must be equipped with solar water heating systems.

Africa is urbanising, so now is a good time to build effective ways of tackling air pollution into well-designed city planning. From organising rubbish collection to reduce refuse burning and investing in public transport systems to piping natural gas to homes and replacing leaky stoves, to upgrading electricity grids and doing away with dirty diesel generators: it is possible to clear the air in African cities. It requires good planning and budgeting, strong co-operation among stakeholders and investors, and political will to succeed.

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