THE ROLE OF PHILANTHROPY IN FILLING AIR QUALITY DATA GAPS

Poor air quality is a universal issue. Almost the entire global population (99%) breathes air that exceeds PM2.5 air quality guidelines set by the World Health Organization (WHO), with low- and middle-income countries (LMICs) suffering from the highest exposures.[1]

This has a devastating impact on human health.[2] Air pollution is responsible for approximately 7 million premature deaths each year, causing asthma, strokes, heart attacks and dementia – taking 2.2 years off global average life expectancy.[3] This is more than three times that of alcohol use and unsafe water; six times that of HIV/AIDS; and 89 times that of conflict and terrorism.[3]

Crucial to improving air quality is high-quality, high-density data. Data tells us how much pollution is in the air we breathe, and where that pollution comes from. This provides a foundation for raising awareness of the issue and supporting policymakers to plan, implement and enforce effective policies.

Yet, air quality monitoring networks are often sparse, or non-existent in many parts of the world. Only ~60% of the world's national governments produce ambient air quality data, and even fewer share real-time air quality data publicly.[4]

This problem is especially acute in Low- and Middle- Income Countries (LMICs). For example, only 6% of children in Africa live near a reliable ground-level real-time air quality monitor, compared to 72% of children in Europe and North America.[5] As a consequence, the places where we need the most data – where air pollution is worst – tend to be the places that have the least.

This stark inequality in data availability exists because effective air quality management is currently too expensive to be effectively scaled to more resource-constrained places. This is slowing down effective action on air pollution, with widespread impacts on global public health.

Decreasing the cost and complexity of data collection is therefore crucial. Innovations like low-cost sensors, satellites and modelling have significant potential to transform air quality management, but need considerable finance to scale effectively.
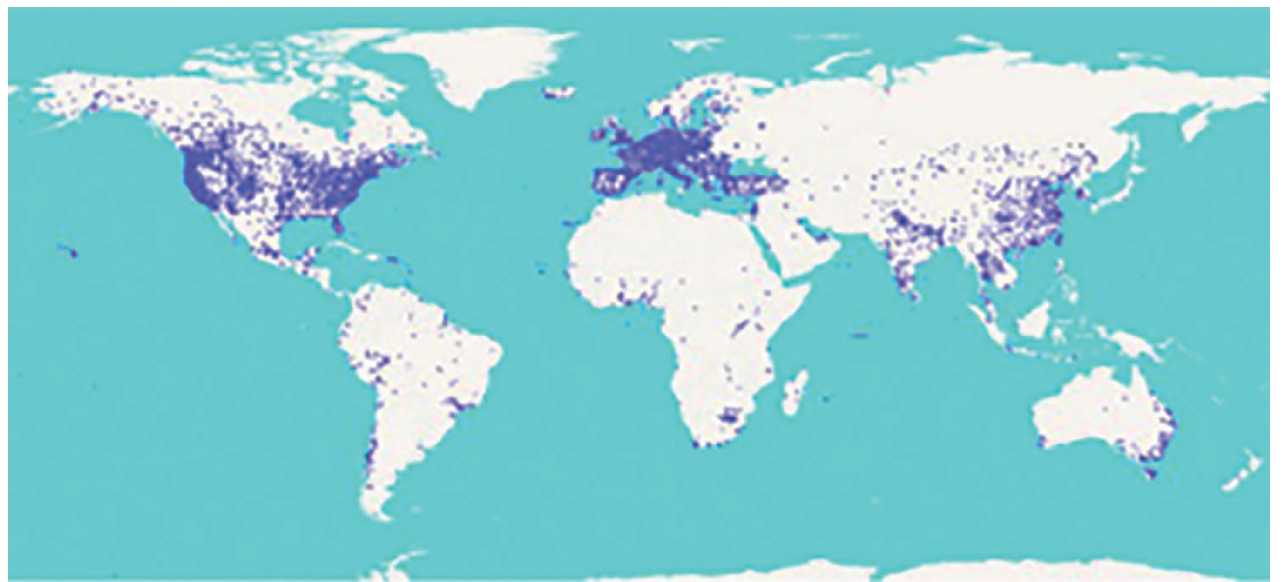

Figure 1. Distribution of air quality measurements ingested by OpenAQ daily. Source: Open AQ (2022) Open Air Quality Data: The Global Landscape 2022.
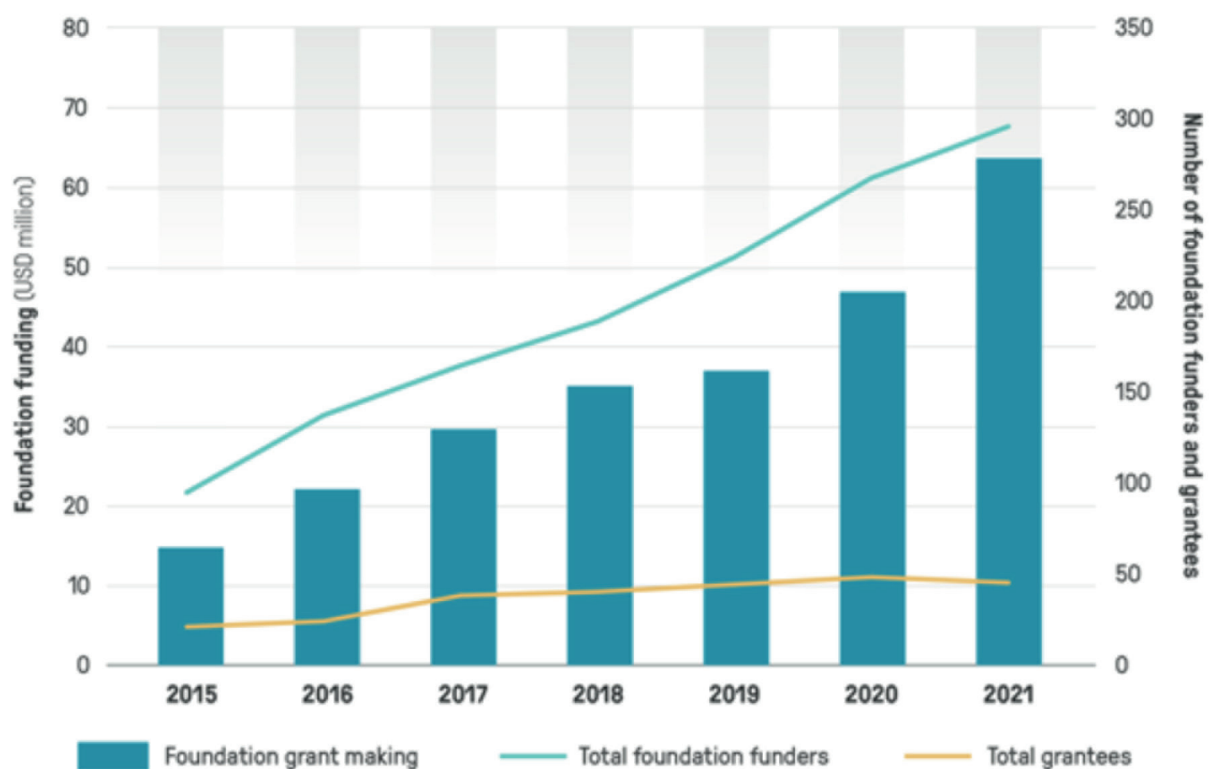

Figure 2. Annual foundation funding to air quality, number of foundation funders and number of grantees, 2015-2021. Source: Clean Air Fund (2022) State of Global Air Quality Funding 2022.

Philanthropy is a growing route to financing solutions to social issues like air pollution. There are over 260,000 philanthropic foundations globally, with assets exceeding $1.5 trillion.[6] Over the past century, philanthropy has played a crucial role in supporting a number of large-scale social transformations, including the near eradication of polio, the widespread adoption of car seats for children, and tobacco control.[7] These examples of social change were propelled by philanthropy – which was able to act as a flexible source of capital, filling gaps left by others.[5]

However, philanthropy has been slow to come to the air quality issue. In 2015, Clean Air Fund tracked just $15m of global philanthropic funding supporting grants to tackle ambient air pollution. This grew to $64m by 2021 – a more than quadrupling – yet this still represents less than 0.1% of total philanthropic finance. What funding has gone to the issue has also been inequitably spent: Africa – home to 17% of the world's population and 16%[8] of all premature deaths from air pollution – received just 0.2% of foundation funding to air quality projects.[9]

Yet, while total funds committed are small, philanthropy can play an important role in tackling air pollution and filling data gaps. Philanthropy can play a role that other funding sources cannot – it can typically take more risk, be more agile, and provide a route for innovation to be piloted out of the lab and find a way to scale.

One example is the Breathe London pilot project: an initiative to demonstrate how lower-cost monitors and mobile monitoring can generate useful data and insights about air pollution, and to package what was learned into an accessible blueprint[10] to help cities achieve their clean air goals.

London was an ideal place to test emerging monitoring technologies. The city already has an extensive regulatory network, comprised of reference-grade air-quality monitors, as well as support from the Mayor of London and existing policies aimed at reducing air pollution. One of these policies is the world-leading Ultra Low Emission Zone (ULEZ), which charges the most polluting vehicles to enter the city centre.

The Breathe London pilot used London as a testbed to advance the science around lower-cost air quality monitoring and help make invisible pollution visible. With 100 lower-cost sensor "pods" and two specially equipped Google Street View cars, the Breathe London pilot project complemented London's existing regulatory network and was used to help measure the impact of the first phase of rolling out ULEZ. The approach has continued to generate useful scientific research and has helped to inform multiple sensor deployment projects in other cities globally[11].

Philanthropic capital can also help to empower affected communities. For example, in 2022, the UrbanBetter initiative delivered a campaign called Cityzens4CleanAir (C4CA). This youth-led citizen science initiative equipped passionate advocates in South Africa, Nigeria and Ghana with low-cost wearable sensors to gather data and raise awareness of air pollution. Informed by the data stories they generated, these citizen scientists were trained in advocacy and developed policy calls for decision makers. They also ran advocacy campaigns in the build up to and during COP27, reaching almost two million people. Whilst a relatively small pilot campaign, C4CA was successful in directly engaging local policymakers on the issue - highlighting the potential of coupling lower-cost, decentralised air quality measurements with community advocates in raising awareness and promoting more ambitious action on air pollution.

With such stark data gaps for locally generated air quality, particularly in the global south, we need to urgently demonstrate how more cost effective, lower barrier technologies can be scaled to support air quality management. While philanthropy cannot be the sole route to solving the problem, it can provide an important route to increasing awareness and demonstrating potential approaches.

Matt Whitney is Interim Project Director at Clean Air Fund

Reference

1. WHO (2022) 'Billions of people still breathe unhealthy air: new WHO data'

2. WHO (2021) Global Air Quality Guidelines

3. AQLI (2022) Air Quality Life Index. Annual Update

4. OpenAQ (2022) Open Air Quality Data: The Global Landscape 2022

5. UNICEF (2019) Silent Suffocation in Africa: Air Pollution is a Growing Menace, Affecting the Poorest Children the Most.

6. Johnson (2018) Global Philanthropy Report: Perspectives on the global foundation sector

7. Wolf Ditkoff and Grindle (2017) Lessons from 15 world changing initiatives

8. Health Policy Watch (2022) Africa Faces 1.1 Million Deaths Annually from Air Pollution – Second Largest Risk After Malnutrition

9. Clean Air Fund (2022) The State of Global Air Quality Funding 2022

10. https://globalcleanair.org/files/2021/02/EDF-Europe-BreatheLondon_Blueprint-guide.pdf
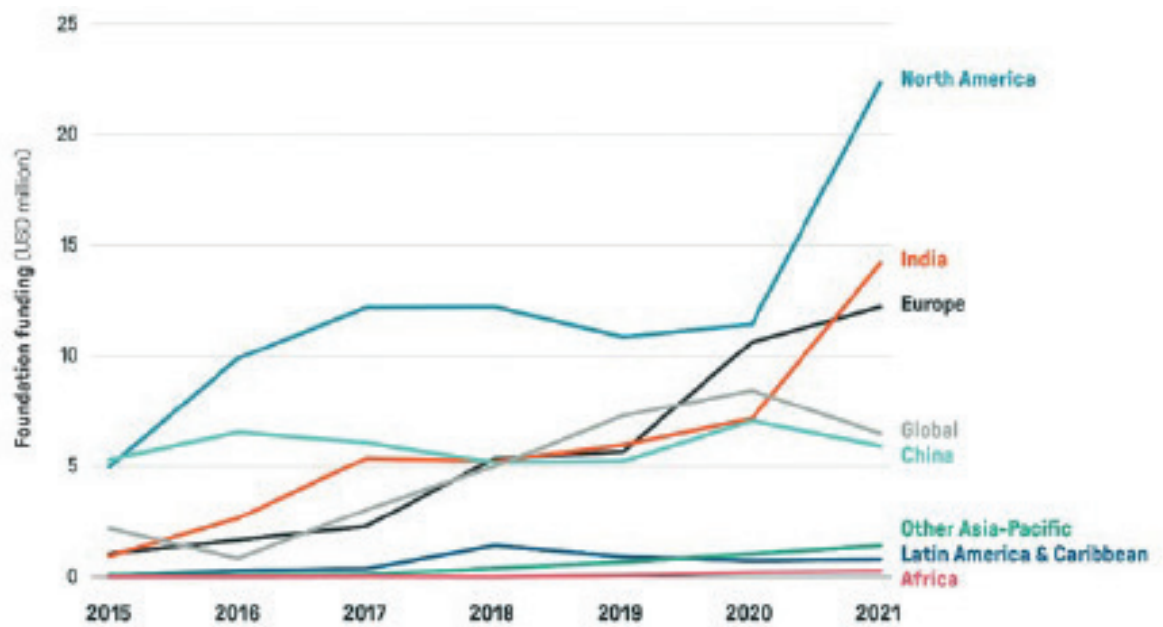
11. For example: https://pubs.acs.org/doi/full/10.1021/acs.est.2c08096

Figure 3. Annual foundation funding be region, 2015-2021. Source: Clean Air Fund (2022) The State of Global Air Quality Funding 2022.

Figure 4. Cityzens 4 Clean Air runners in Lagos, Nigeria.   photo credit: Onome Ofoman

Author Contact Details

Matt Whitney • Clean Air Fund

• Address: 20 St Thomas Street, London, SE1 9RS, United Kingdom

• Tel: +44(0)208 0756 200 • Email: info@cleanairfund.org • **Web: www.cleanairfund.org**

CLEAN AIR FUND