



## Policy Brief

# REDUCING TRANSBOUNDARY POLLUTION TO IMPROVE HUMAN HEALTH, PROTECT THE ENVIRONMENT AND CLIMATE, AND ENSURE HEALTHY FOOD FOR ALL

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*Task Force 3*

Governing Climate Targets, Energy  
Transition and Environmental Protection

# REDUCING TRANSBOUNDARY POLLUTION TO IMPROVE HUMAN HEALTH, PROTECT THE ENVIRONMENT AND CLIMATE, AND ENSURE HEALTHY FOOD FOR ALL

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**Rachael Kupka** (Global Alliance on Health and Pollution)

**Karti Sandilya** (Global Alliance on Health and Pollution)

**Laura Schaepli** (Global Alliance on Health and Pollution)

**John Kirton** (G20 Research Group, University of Toronto)

# Abstract

Pollution, contaminated air, water and soil, is responsible for 9 million premature deaths globally each year (one in six deaths). About 50 percent of this mortality falls in Group of 20 (G20) members. Transboundary pollution, particularly air pollution and heavy metal contamination, threatens global health, and adversely impacts climate change, biodiversity and ecosystem health. As part of a One Health approach, and aiming to build back better post-COVID-19, G20 members should 1) reduce fine particulate matter (PM2.5) concentrations by 25 percent by 2030, 2) prevent and mitigate exposure to two major transboundary pollutants: lead and mercury, and 3) promote sustainable agricultural practices that ensure safe, toxic-free food.

# Challenges

Pollution, contaminated air, water and soil, is responsible for 9 million premature deaths globally each year (one in six deaths)<sup>1</sup>. About 50 percent of this burden of mortality occurs in Group of 20 (G20) countries<sup>2</sup>. A significant amount of pollution is transboundary. G20 members both contribute to and are affected by transboundary pollution.<sup>3</sup>

Pollution moves across borders through two of the largest, most influential systems in the world: the global ecosystem and the global trade system. Disease-causing toxic substances involved in industrialisation, agriculture, household burning of biomass for cooking or the burning of garbage do not stay where they are generated. They circulate the globe through the earth's atmosphere and oceanic systems. Heavy metals also bioaccumulate up the food chain and are transported across borders through international trade.<sup>4</sup>

Air pollution is the most visible and well-documented form of transboundary pollution. Global air currents transport air pollution across continents and oceans at alarming rates, such that in early April 2022, the World Health Organisation (WHO) stated that 99 percent of people globally breath polluted air – up from 91 percent just two years ago.<sup>5</sup> Between 3.5 million and 6 million deaths every year have been linked to outdoor air pollution.<sup>6</sup> About 20 percent of those deaths result from air polluted while making goods in one location that are sold in other countries.<sup>7</sup> While wealthy countries in Europe and North America have done reasonably well in tackling domestic sources of air pollution in recent decades, air quality across Asia and other parts of the world has become much worse. This affects not only countries where the air is badly polluted but also those farther afield. Global winds transport air pollution from East Asia to North America, from North America to Europe, and from Europe to the Arctic and Central Asia.<sup>8</sup> Data visualisations from NASA illustrate how PM<sub>2.5</sub> particles travel around the world and several scientific publications now document origins of air pollution.<sup>9</sup> For example, a recent European Union study found that significant portion of air pollution exposure in Europe originates from non-European sources.<sup>10</sup> Similarly, air pollution in Malaysia, Singapore, Philippines and Thailand has been linked to illegal burning of peatlands, forests and agricultural land in Indonesia.<sup>11</sup>

Another well-recognised transboundary pollution problem is mercury – such that there is a internationally legally binding convention on the issue. Methylmercury is particularly problematic. This highly toxic form of the element bioaccumulates up the food chain, especially in large pelagic species. Methylmercury causes permanent neurological damage in foetuses, along with cognitive impairment and developmental disabilities in children. A landmark 2019 study by the United States Geological Survey documented the process by

which increased mercury emissions from human sources across the globe, in particular Asia, pollute the rich North Pacific Ocean feeding grounds for tuna and other marine life.<sup>12</sup> According to the United Nations Environment Programme (UNEP), the largest single source of mercury contamination is small-scale gold mining, where the element is used to extract gold from crushed ore.<sup>13</sup> A close second is coal-fired power plants.

But there are other, less visible and less well-known transboundary pollutants. Used vehicles, many at end-of-life or not meeting air quality standards, and lead scrap are exported to low- and middle-income countries and contribute to ambient air pollution and unsound recycling and production of lead acid batteries.<sup>14</sup> According to UNEP, the EU, Japan and USA are the three largest exporters of used vehicles, which are destined primarily for Africa, Asia, Central America and the Middle East.<sup>15</sup> Many of these vehicles do not meet exporting country emission standards or have valid roadworthy certificates.<sup>16</sup>

Lead, another well-known neurotoxin is particularly alarming, especially because it causes permanent brain damage, among other health impacts. According to the WHO, there is no safe level of lead exposure. Today one in three children is lead poisoned (800 million children)<sup>17</sup>. Further, this toxicant causes 900,000 premature deaths each year.<sup>18</sup>

In the global economic system, food products are often an amalgam of ingredients originating in multiple countries. Contamination can happen anywhere along the production process. Produce can be tainted by unsafe farming practices (e.g. using polluted water for irrigation) in the exporting country.<sup>19</sup> It may occur at the processing and packaging stage, with product adulteration, plastic packaging and ink leaching cadmium, lead and endocrine-disruptors into food. A 2021 US Congressional report showed alarming levels of heavy metals in well-known baby food brands,<sup>20</sup> while arsenic has been found in Chinese and Indian rice<sup>21</sup>, and lead in spices imported into the US from India.<sup>22</sup>

Agricultural imports and exports are a multibillion-dollar industry. Only a tiny fraction of imported food or products can be tested. Rejections of contaminated products from overseas can cause significant economic losses to both the importing and exporting countries.

# Relevance to G20 States

G20 members should focus attention, funding and resources on addressing transboundary pollutants within their own borders, and assist low- and middle-income countries to reduce and control their pollution problems. It is in their interest to do so because:

- All G20 members are impacted by pollution, some severely. A 2019 ranking of global premature pollution-related deaths placed six G20 members – India, China, Indonesia, US, Russia and Brazil – in the top 10, with a combined death toll of over 4.8 million people per year.
- Pollution has implications for several UN Sustainable Development Goals (SDGs) – especially SDG 3 (Good health and well-being), and SDG 3.9 in particular (to substantially reduce, by 2030, the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination). In addition, pollution is involved in SDG 6 (Water and sanitation), SDG 2.4 (Soil quality), SDG 7 (Clean energy), SDG 9.4 (Clean technologies and industrial processes), SDG 11 (Sustainable cities and communities), SDG 12 (Responsible consumption and production), SDG 13 (Climate action), and SDGs 14-15 (Water and land conservation). None of these can be achieved without addressing pollution.
- G20 summits have recently acknowledged the priority of tackling pollution by making commitments on water, soil and air pollution. They now need to commit to action on PM<sub>2.5</sub>, mercury and lead. They should adopt, renew and update the 1997 Group of Seven (7) Declaration on Children’s Environmental Health, which called for G7 countries to tackle lead and air pollution to protect children’s health.
- G20 members and others alike will benefit from the approach and solutions set out above. Addressing international sources of transboundary pollution is critical for G20 members to achieve their own air quality and other pollution-reduction goals, including the EU’s Zero Pollution Action Plan.

# Proposal

Given the complexity of the planet's natural systems and the extent of global trade, intricate supply chains and manufacturing processes, there can be no single approach or solution to transboundary pollution. Nor can pollution imported through food products be checked by relying on increasing regulations and inspections or by imposing tariffs. The only rational and effective way to deal with transboundary pollution is to identify problems at their source, and prevent pollution in the first place. Failure to address pollution at source means pollution will continue causing death and disability and threaten global food safety and security.<sup>23</sup> Addressing pollution at source is the most reasonable strategy for success, and it has the additional merit of tackling transboundary pollution in ways that also deal with domestic pollution with co-benefits for climate change and biodiversity conservation.

The good news is that many of the technical solutions to the principal pollution problems, both transboundary and domestic, are known. These are summarised below:

**Ambient air pollution:** As there is no single source of pollution, there has to be a combination of location-specific solutions. This may include (i) installing scrubbers in smokestacks of coal-fired power plants, (ii) phasing out such power plants, (iii) shifting to renewable energy sources, (iv) converting to electric mobility and (v) finding ways to reduce crop burning.

**Household air pollution:** While clean cooking stoves help, cleaner fuel (liquified petroleum gas or LPG) may offer a superior interim solution, until all cooking can be electric.

**Lead:** Like ambient air pollution, there are multiple sources of lead exposure. These include unsound recycling of used lead acid batteries (ULABs), adulterated spices (to add bright color), lead-glazed pottery, metal cookware that leaches lead, cosmetics (again for color) and herbal medicines, enamel-based paints, incense and religious powders. The major sources vary by country, but at minimum should cover ensuring sound ULAB recycling by well-regulated smelters and battery manufacturers; clean-up of lead-contaminated sites; enforcement of lead level standards for food, cookware, cosmetics and traditional medicines; and promotion of affordable lead-free pottery glazes. Given the permanent neurological and cognitive damage that lead can cause foetuses and children, there is a strong case for governments to begin testing populations for lead in blood, to identify individuals for treatment and work to eliminate sources of exposure. G20 countries should adopt blood level reference values for lead poisoning with the aim of reducing them over time (i.e. from 10ug/dl to 5ug/dl to 3.5 ug/dl<sup>24</sup>) to enable countries to reasonably reduce levels over time starting with the worst-affected children. However the aim should be to reduce levels down to zero,

as even low levels of exposure are associated with negative health outcomes, including cardiovascular disease in adulthood.

Mercury: Small-scale gold miners need to be trained in methods of extracting gold from crushed ore that do not require the use of mercury. Such non-toxic methods exist, are affordable and can even be more efficient (i.e. extract more gold) but need to be promoted aggressively, as well as linked to a market for certified mercury-free gold, together with monitoring and enforcement of safeguarding practices. In addition, the closing down of coal-fired power plants will also help reduce mercury contamination.

To address these myriad sources of transboundary pollution, a multi-pronged approach is required that can be encapsulated in specific commitments by G20 members. Accordingly, it is proposed that G20 leaders embrace the priority of pollution, the One Health approach, and the strategy and solutions recommended here, and minimise transboundary pollution by committing to:

- Reducing fine particulate matter (PM<sub>2.5</sub>) concentrations by at least 25 percent by 2030 in the G20 2022 Communique and in the G20 Health Ministers Commitments
- Investing in robust monitoring and surveillance systems to track fine particulate matter (PM<sub>2.5</sub>) concentrations and blood lead levels
- Adopting updated blood level reference values for lead poisoning and identifying the worst-affected children and necessary actions to reduce lead exposure
- Prioritising, mainstreaming and funding prevention and mitigation of exposures to lead and mercury
- Promoting sustainable agricultural practices that protect nature and human health, while providing safe, toxic-free food for all.

More specifically, a multi-pronged approach could comprise the following components<sup>25</sup>:

1. Making pollution control a priority in the global and G20 agendas. Countries that are most affected should focus on solutions at the local and national level.
2. Developing mechanisms to trace exposures back to the source. These should support people living at the source of pollution to reduce their toxic exposure, and that of the broader population that they inadvertently affect. Most large corporations pay close attention to supply chains. Their best practices should be modelled to devise mechanisms that allow for tracking toxins back to their source.

3. Expanding imports testing, not to close off imports but to provide the evidence base for cooperation between countries. Ideally, testing should integrate a mechanism for prevention and source reduction into agency responses.
4. Implementing projects that prevent and reduce pollution at the source. Places like Mexico City, Beijing and Bangkok have paved the way by successfully implementing programmes to reduce air pollution. Bangladesh has successfully cracked down on adulteration of turmeric with the addition of lead chromates at processing points, protecting millions of people from a key source of lead exposure. These interventions can be replicated elsewhere.
5. Regulate the export and import of potentially toxic products or used goods, including used vehicles to ensure second-hand goods meet air quality standards and climate emissions requirements. UNEP recommends labelling used vehicles to show consumers fuel consumption and emissions or roadworthiness, as well as the adoption of emission standards for vehicles.
6. Expanding research into toxins and prevention. Research is urgently needed to better understand the health impacts and costs to global society of known toxins and newer chemical pollutants, such as endocrine disruptors. This should include analyses that define the burden of disease for various toxic exposures.
7. Finding ways to enable consumers to monitor what they eat and consume for toxic contamination. Consumer protection boards and not-for-profits can help test local products (e.g., supporting local schools and communities to do low-cost testing for toxins in food and products) and provide clean-up solutions at the source of the pollution.

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