



IFMSA

International Federation of
Medical Students' Associations

IFMSA Policy Proposal Air Pollution

Proposed by SFGH-UK and IFMSA-Jo

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Policy Statement

Introduction:

Recent evidence has described air pollution as the biggest environmental risk to health, leading to the loss of 7 million lives per year, directly and indirectly, caused by its burden of disease being similar to that of smoking tobacco. Hence, there are multiple strategies in place to mitigate these life-threatening effects – from investment into clean energy and accessible modes of transport, to the reduction of industrial smokestack emissions and increased priority in carbon offsetting.

IFMSA position:

The IFMSA believes the most efficient way to reduce global morbidity and mortality caused by all diseases is to focus on disease prevention. By educating and empowering communities, we can help them build an environment and a lifestyle that optimizes their physical, mental and social well-being. An essential aspect of our environment is the quality of the air we breathe, and it is undeniable that polluted air has a detrimental effect on not just human but all forms of life on the planet. Hence, IFMSA affirms that any discussion and action that aims to improve global public health must consider air quality.

Call to Action:

Therefore, the IFMSA calls on:

The World Health Organization (WHO) to:

- Undertake an international analysis of governmental policies and strategies to reduce air pollution and action towards the Sustainable Development Goals, in particular to those regarding air pollution (SDG 3.9.1, SDG 7.1.2 and SDG 11.6.2) and advocate for a greater emphasis on both;
- Continue the Global Conferences on Air Pollution and Health to ensure sustainable, national accountability towards action to reduce air pollution in alignment of the Geneva Action Agenda to Combat Air Pollution;
- Measure and report the health gains of air pollution reduction offsetting the economic costs of fossil fuel divestment and clean energy investment, to demonstrate the benefits of moving towards clean energy for both health and the economy;
- Update the Global Air Quality Guidelines (AQG);
- Mainstream air pollution reduction in policies to combat non-communicable diseases;
- Ensure the inclusion of vulnerable populations in the empowerment and education on the use of clean fuel for indoor cooking;
- Highlight the threat proposed by air pollution on physical and mental health by disseminating evidence-based information to all member states, via the WHO website and all other digital formats.



The United Nations Environment Programme (UNEP) to:

- Continue to make air pollution a global priority for future environmental policies and strategies.

National governments, according to ability, to:

- Acknowledge the direct and indirect causes of air pollution and their detrimentality to health across the life course;
- Implement policies to reduce air pollution, including divestment of fossil fuels and investment in clean energy resources to mitigate the health and economic impacts of air pollution;
- Establish, adhere to and enforce air quality standards according to WHO Air Quality Guidelines;
- Introduce policies that enforce stricter vehicle emissions; encourage companies to sign up for off-setting and increase the use of clean technologies to help reduce global outdoor air pollution;
- Introduce local policy to prioritize the use of walking, cycling or rapid public transport overuse of private vehicles, including building safe and affordable public transport systems and pedestrian and cycle-friendly networks;
- Sign on to, and work closely with, the BreatheLife Campaign to work in solidarity to reduce global air pollution;
- Ensure access to clean affordable cooking fuels and technologies for cooking, heating and lighting in rural communities to help reduce indoor air pollution;
- Ensure a third-party verification of carbon offsets projects and ensure that the price of offsets match the real cost of climate change;
- Strengthen air quality monitoring, especially in areas close to hospitals, schools, and workplaces.

Local Councils or equivalent to:

- Set limits to the use of cars in highly polluted days;
- Take action to improve domestic, industry and municipal waste management, including sorting, composting and prevention of open burning;
- Encourage the use of landfill gas recovery and alternate wet-dry irrigation in rice paddies;
- Promote plant-based diets to help reduce meat consumption;
- Support projects that reduce greenhouse gas emissions in the short- and/or long-term.

Industrial companies to:

- Commit to use clean technologies to reduce industrial air pollution;
- Sustain research and promotion of passive building design;
- Adopt evidence-based targets which are in line with the Paris Agreement.

Health sector-based institutions to:

- Integrate air pollution and its threat to health into the medical curriculum and educate health professionals;
- Move towards the use of clean sources of energy to power healthcare facilities to mitigate the burden of disease attributable to air pollution and reduce air pollution-related healthcare costs.

IFMSA NMOs and medical students to:

- Take the lead in increasing public awareness of the underlying determinants and detrimental effects of air pollution as well as its cost to health.



Position Paper

Background information:

In the 2016 WHO report on its burden of disease, air pollution was qualified as the “biggest environmental risk to health” (1). An estimated 7 million people die every year as a result of air pollution, through increased mortality from stroke, COPD, heart disease, lung cancer and acute respiratory infections (2). Among deaths caused by those diseases, one third are attributed to air pollution, which can be both ambient (outdoor air pollution) and inside homes (household air pollution). Particulate matter, arising mainly from fuel combustion and road traffic, is a main air pollutant and hence is used as an indicator for the level of air pollution present. With nitrogen dioxide, sulphur dioxide and ozone at ground level, these microscopic particles slip past our body’s defenses, penetrate our respiratory and circulatory systems and damage the lungs, heart and brain. In terms of burden of disease, their effect is equivalent to that of smoking tobacco (2).

Low-and middle-income countries bear the biggest burden, with over 2 million deaths in both the South-East Asia and the Western Pacific regions, and nearly 1 million in the Africa region. (3) Household air pollution, which accounts for 3.8 million premature deaths every year, results from cooking, lighting and heating where clean affordable technologies are not available. Women and children are the most exposed - 93% of children under 18 live with air pollution levels above WHO guidelines while air pollution causes over half of under 5 child deaths due to acute lower respiratory infections in LMICs (2). Outdoor workers are particularly vulnerable to air pollution as they spend most of the day close to city traffic and machinery pollution.

The fight against air pollution intertwines with the fight against climate change, because it affects both the health of populations and global warming. Meeting the goals of the Paris agreement could save about a million lives by 2050 through reductions in air pollution alone. Its importance in the global agenda is reflected in that air pollution is mentioned in three sustainable development goals. Access to clean energy – particularly clean household fuels and technologies – is highlighted as an indicator for SDG 7 on sustainable energy; air pollution is also cited as an indicator for SDG 11 (urban sustainable development); and mortality due to air pollution is an indicator for the SDG 3 health goal. Fighting air pollution would also have non-negligible economic benefits - today, the health impacts of air pollution are estimated to cost more than 4% of GDP in the 15 countries that emit the most greenhouse gas emissions (2).

Discussion:

The determinants of air pollution

Air pollution is caused when solid and liquid particles, called aerosols, are suspended in the air. These particles are released into the air as a direct result of human usage of electricity, fuels and transportation, among other things. Most of this air pollution we generate is from the burning of fossil fuels to produce electricity and power our vehicles. We also indirectly cause air pollution through the purchasing of goods and services that use energy in their production and delivery. Air pollution is primarily driven by fossil fuels and exacerbated by climate change (4). The rapid rate of urbanization means that globally, we are increasingly exposed to dangerous concentrations and a more diverse range of ambient air pollutants



than ever before (5). Ambient fine particulate matter causes damaging effects on the human body's vital organs; these are compounded over time across the life course and contribute to high total global air pollution deaths (currently reaching 7 million according to WHO) (1). Air pollution ultimately exacerbates health outcomes and puts strains on health systems globally.

Indoor/Outdoor pollution

While it is commonly thought that levels of outdoor air pollution are worse than that of indoor air pollution (IAP), in areas of the world, this is usually not the case. Indoor air quality has become a major concern in the 21st century and levels of IAP are exacerbated by inequality and poverty. In LMICs, there is a high reliance on coal and biomass for domestic energy indoor air pollution. Women and children experience the greatest exposure and therefore are most susceptible to the harmful effects. Burning of these sources indoors significantly increases the risk of chronic obstructive pulmonary disease (COPD) and acute respiratory infections in childhood, which are the leading cause of death among children under 5 in developing countries (6). High levels of IAP have also been associated with the development of other comorbidities across the life course (for example pulmonary tuberculosis, nasopharyngeal/laryngeal and lung cancer) (6).

The impact of air pollution on health

Our physical and mental wellbeing relies heavily on the quality of air we breathe. If the air we breathe is polluted, it inevitably affects our health. A huge amount of research has gone into understanding the precise impact of air pollution on our health, which has led to the realization that ambient air pollution is "one of the most crucial contributors to the deteriorating health status worldwide" (7). This research has also identified the key air pollutants responsible for most of the harm, which include PM_{2.5} and PM₁₀, NO₂, SO₂, CO, O₃ and organic compounds (7). Air pollution doesn't just affect a single organ or system but contributes to negative birth outcomes and cardiovascular, respiratory, neurological and psychiatric diseases. Hence "air pollution-induced health risks impose a great danger on the life of billions of people worldwide" (7). However, it must be highlighted that with this great threat comes a great opportunity: we can significantly reduce the global mortality and morbidity caused by health threatening conditions by reducing air pollution (7).

Air pollution and respiratory disease

It is not surprising that if the air we breathe is polluted, one of the first body systems under attack is our respiratory system. Air pollution is associated with the exacerbation and onset of several respiratory conditions including asthma, COPD and lung cancer (8). Indoor and outdoor air pollutants impair children's growing lungs and increase the risk of respiratory infections (9).

Asthma

Asthma is one of the most common childhood chronic conditions and the prevalence of asthma has continuously increased over the latter part of the 20th century (10). According to the 2016 Global Burden of Diseases study, Asthma contributed to a loss of 23.6 Million Disability Adjusted Life Years (DALYs) (11). Air pollution has consistently been shown to exacerbate asthma among school children (10). Specific air pollutants have been identified to play a major role in this by inducing airway inflammation, these include; ozone, nitrogen dioxide and particulate matter < 2.5 micrometers in diameter (PM_{2.5}) (12). It is believed that long term exposure to PM is associated with poorly controlled asthma in adults and children. According to the U.K Committee on the Medical Effects of Air Pollutants (COMEAP), this association is explained by four main mechanisms: oxidative stress and damage, airway



remodeling, inflammatory pathways and immunological responses, and enhancement of respiratory sensitization to aeroallergens (12). In developed countries, the main sources of primary pollutants include nitrogen oxides, fine PM, and ultra-fine PM, whereas secondary pollutants include ozone, nitrates, sulphates and organic aerosols from motor vehicles and power plants. Even short-term exposure to ozone, nitrogen dioxide, PM_{2.5} and traffic-related air pollution (TRAP) is thought to increase the risk of exacerbation of asthma symptoms. Long-term exposure to these pollutants, especially TRAP, can contribute to new-onset asthma in both children and adults. This risk is especially higher for children growing up in economically disadvantaged neighborhoods (12).

Chronic obstructive pulmonary disease (COPD)

COPD is the third leading cause of death worldwide with 90% of the deaths occurring in low- and middle-income countries (13) (14). The prevalence of COPD increased by 44.2% from 1990 to 2015 and deaths from COPD were eight times more common than deaths from asthma (15). COPD is a cause of significant morbidity around the world; it has been associated with several physical and psychological co-morbidities including cardiovascular disease and anxiety respectively. The Global Burden of Diseases report of 2015 found smoking and ambient particulate matter to be the main risk factors for COPD followed by household air pollution, occupational particulates, ozone and secondhand smoke (15). Even though smoking is considered a major risk factor for COPD, 25-45% of patients with COPD have never smoked. Since almost 3 billion people are exposed to biomass smoke whereas only 1.01 billion people smoke tobacco, exposure to the former might be the biggest risk factor for COPD globally (16).

Air pollution and cardiovascular disease

WHO states that "Cardiovascular diseases (CVDs) are the number 1 cause of death globally: more people die annually from CVDs than any other cause" (17). CVDs are caused by a combination of genetic, behavioral and environmental risk factors. Increasing evidence suggests that exposure to ambient air pollution contributes to the risk of cardiovascular events in adults and the elderly (18). Air pollutants associated with cardiovascular diseases include PM, nitrogen dioxide and ozone. PM in particular is associated with the onset of acute cardiovascular events including myocardial infarctions (MI), and chronic conditions such as hypertension and ischemic heart disease (19).

Myocardial infarctions

A systematic review and meta-analysis were conducted to determine the association between air pollution and the risk of MI. The results showed that "all the main air pollutants, with the exception of ozone, were significantly associated with a near term increase in MI risk" (20). A potential mechanism that might explain this is the increase in inflammatory markers caused by exposure to air pollution leading to increased risk of MI (20).

Stroke

The incidence of stroke is rising worldwide. This is attributed to the ageing population in high-income countries, and accumulating risk factors for stroke including hypertension, obesity and smoking in low- and middle-income countries. With this rising incidence, mortality and disability caused by stroke worldwide is also increasing (18). Stroke alone accounts for 5 million deaths each year and according to the WHO, "cerebrovascular accidents (stroke) are the second leading cause of death and the third leading cause of disability" (21). A systematic review of the relationship between short-term exposure to air pollution and stroke revealed that gaseous and particulate pollutants have a strong



association with mortality from stroke and hospital admissions due to stroke. This could be due to a direct or indirect effect of exposure to air pollutants on the vascular tone, endothelial function, thrombosis and myocardial ischemia. Hence, it was suggested that public and environmental policies aiming to reduce air pollution could also reduce the global burden of stroke (18).

Hypertension

We cannot appreciate the impact of cardiovascular diseases without looking at hypertension. Raised blood pressure is not only a risk factor for numerous conditions, but is also estimated to cause 7.5 million deaths, about 12.8% of total deaths - this accounts for 57 million DALYs or 3.7% of total DALYs (20). Research has shown a “positive association between ambient air pollution and increased blood pressure and hypertension” (23).

Pregnancy-associated hypertension

Gestational hypertension and pre-eclampsia are the most common complications of pregnancy, affecting 2-10% of pregnancies after 20 weeks of gestation. Pre-eclampsia and related conditions are a leading cause of maternal morbidity, perinatal death, placental abruption, preterm birth, and child growth restriction. A systematic review that aimed to find the relationship between maternal exposure to air pollution and pregnancy-related hypertensive disorders found that short-term exposure to PM and NO₂ are associated with increased blood pressure in pregnant women (24). Inhalation of air pollutants decreases placental blood flow and reduces transplacental oxygenation leading to oxidative stress and inflammation, which then contributes to hypertensive pregnancy disorders such as pre-eclampsia (24). This review builds on previous evidence linking maternal exposure to air pollution during pregnancy with adverse birth outcomes including low birth weight and preterm birth (24).

Air pollution and the brain: Neurological disease

Some pollutants in the air are small enough to cross the blood brain barrier and affect the structure and function of the brain. They have been shown to lead to diminishing white matter and neurodegeneration, which leads to early onset of Alzheimer's and Parkinson's disease (25). Psychiatric disease Air pollution doesn't just affect our physical health but also contributes to the deterioration of our mental health. Exposure to air pollutants, such as nitric oxide and PM, has been associated with poor mental health (26). Epidemiological data shows an association between poor air quality and psychiatric conditions, including neurodegenerative conditions, depression and suicide attempts (25). Depressive disorders are a cause of significant global mortality and morbidity. They affect 350 million people worldwide - about 5-6% of the world's population. Furthermore, it is estimated that 15% of people with severe depression eventually commit suicide. Depression is a complex condition with several contributing factors, and research suggests air pollution is one such factor (25). “Numerous studies have documented that exposure to particulate matter may be associated with more frequent incidences of depression” (25). There are several theories proposed to explain this association, including the neurodegenerative effect of PM_{2.5} on the brain, however more research needs to be done to understand the exact mechanism behind this association (25). Suicide itself accounts for about one million deaths per year. The link between air pollution and suicides might be through the increased risk of depression, but there is a possibility of a direct link between the two. “It has been shown that the number of suicide attempts is increasing during the period of the highest concentrations of particulate matter in the atmosphere” (25).



The cost of air pollution

The actions we take to mitigate the effects of air pollution present a significant opportunity for global health. Air pollution is a leading cause of global disease burden, especially in low-income and middle-income countries (27), emerging as the fourth-leading risk factor for death worldwide (28). Figures from the Global Burden of Disease Study suggest that air pollution (indoor and outdoor) causes approximately 7 million premature deaths every year, with exposure to PM_{2.5} representing the fifth leading risk factor for death worldwide, accounting for 4.2 million deaths and 103 million DALYs in 2015 (29). This represents 7.6% of total global deaths and 4.2% of global DALYs, 59% of these being in East and South Asia (29). To put that in perspective, air pollution causes twice the number of deaths as AIDS, malaria, and TB combined (30).

According to the World Bank, the damage to health caused by ambient air pollution costs the global economy over 5.7 trillion dollars every year, equivalent to 4.8% of global GDP in 2016 (28). In the 15 countries that emit the most greenhouse gases, the health impacts of air pollution are estimated to cost more than 4% of their GDP (28); for example, in China, the economic cost of the 1.23 million deaths related to air pollution amounted to 9.7-13.2% of China's GDP in 2010 (31). Replacing fossil fuels with low-carbon renewable energy resources would help to mitigate this effect and undeniably has large benefits for public health.

In regard to investment in the energy sector, policymakers are often focused on the upstream side of the equation, concerned only about the increased cost of clean and renewable energy sources relative to cheaper fossil fuels. However, the health costs are much bigger. For every ton of carbon dioxide emitted, hazardous pollutants including harmful particulate matter are also released. Projections suggest that global average monetized health co-benefits from avoided mortality due to air pollution range from 50 to 380 dollars per ton of carbon dioxide removed, and exceed abatement costs in 2030 and 2050; in East Asia, air-quality related health benefits are even greater, projected to be 10 to 70 times the abatement costs in 2030 (32). This is supported by estimates from the US Environmental Protection Agency, who evaluated the cost versus benefit of the Clean Air Act and estimated that for every dollar spent on reducing air pollution there is a return of 30 dollars (33). In places like China and India with very high pollution levels of PM_{2.5} and ozone, the benefit will be even greater. The health benefits of clean energy therefore also translate economically.

Another concern presented by policymakers in support of fossil fuel investment is the idea that moving away from fossil fuels will lead to a loss of jobs. However, the 2017 US Energy and Employment Report estimated that there are 1 million US jobs in renewable energy, which is 5 times more employment than in coal, oil and gas used for power combined (34). Further, if we divest fossil fuels and move towards cleaner renewable energy sources, even more jobs will be created in this industry. Importantly, jobs and income translate to better health.

Another critical consideration in the market costs of air pollution is reduced labor productivity in working-age men and women, due to increases in air pollution-related morbidity and mortality (35). Productivity is an outcome easily monetized, and its cost to society is therefore easily calculated. For example, in the agricultural industry ozone was found to be associated with decreases in productivity, even at relatively low levels well within current air quality standards; approximate calculations suggested that across the US 10 parts per billion reductions in the ozone standard would translate into an annual cost saving of around 700



million dollars in labor expenditure for the agricultural sector alone (36). Furthermore, labor income losses for countries in South Asia were found to total more than 66 billion dollars in 2013, the equivalent of nearly 1% of all GDP (28).

Without action, by 2060 outdoor air pollution alone could cause 6 to 9 million premature deaths a year and cost 1% of global GDP – around 2.6 trillion US dollars annually - due to sick days, medical bills, and reduced agricultural output (productivity and crop yield) (35). The consequent reduction in global economic output equates to approximately 330 US dollars per person, with annual healthcare costs related to air pollution rising to 176 billion from 21 billion US dollars in 2015, and the number of work days lost to air-pollution-related illnesses increasing to 3.7 billion from 1.2 billion US dollars. The significant economic consequences of air pollution are undeniable. With the number of lives lost increasing and higher costs each year, air pollution is a challenge we can't ignore, emphasizing the need for strong policy action.

Solutions and strategies to mitigate air pollution

Solutions to reduce air pollution are directly linked to climate change mitigation, which is achieved “by limiting or preventing greenhouse gas emissions and enhancing activities that remove these gases from the atmosphere” (37). A cross-sectoral approach is essential because of the variety of air pollution sources and must include reductions in both greenhouse gas (GHG) emissions of the energy supply sector and the demand in energy of end-use sectors (transport, industry, buildings, etc.) (38). Decarbonizing electricity generation requires investing in the renewable energy sector and distributed energy generation such as rooftop solar-power generation, which still largely depend on direct or indirect governmental support. Carbon dioxide capture and storage (CCS) technologies are also largely researched and developed to reduce the lifecycle GHG emissions of fossil fuel power plants. For all countries but especially those with high urbanization rates, investing in more efficient, accessible and cheaper modes of shared transportation is a top priority to reducing air pollution. Developing low-emitting and cost-efficient transports such as electric buses and expanding mass transit systems like rail inter-urban freight and passenger travel are some of the solutions explored (39). Safe paths like bicycle lanes and large sidewalks are essential in encouraging inhabitants to adopt alternative modes of transportation and encourages physical activity at the same time. In parallel, setting emission standards and zones without cars while providing economic incentives for cleaner vehicles supports progress towards the reduction of air pollution in cities and a less harmful environment for its inhabitants (40).

Passive building design is increasingly used to reduce households' carbon footprint. It involves for instance orienting houses depending on the sun or building ventilation systems using the outside air. In developing countries, the priority is the spread of modern low-emission stoves and fuels, which prevent the indoor air from being constantly polluted due to cooking. Because lifestyle and culture also contribute to carbon emissions, behavioral change in terms of electricity consumption and sustainable lifestyle choices (recycling and reusing products) can have a considerable influence on associated emissions (40).

Solutions also exist when looking at waste management: capturing methane gas emitted from waste sites is used as an alternative to incineration and later reused as biogas (41). In countries with large amounts of rice paddies, alternate wet-dry irrigation allows cutting of methane emissions, while manure can be used as fertilizer to improve crop production and moderate methane release or go through waste digesters that extract methane to convert emissions into a clean energy source (40). In the industrial sector, the adoption of clean



technologies that reduce industrial smokestack emissions is seen as a priority, while improving early gas-leak detection, coke ovens and brick kilns are other emission-reducing strategies (40). The Science-Based Targets Initiative for example, a collaboration between CDP, WRI, WWF and UNGC, helps companies reduce their GHG emissions by adopting targets that are evidence-based and in line with the Paris Agreement, boosting their competitive advantage in the transition to the low-carbon economy (42).

Compensating for carbon emissions by supporting projects that reduce GHG emissions in the short- or long-term is what carbon offsetting is about. Projects can be related to renewable energy, energy efficiency, destruction of industrial or agricultural pollutants, and so on (43). But voluntarily offsetting alone cannot have the desired impact: companies typically offset a very small part of their emissions and critics of carbon offsetting often point out that only a fraction of the money goes directly to the projects funded (44). On a more ethical note, carbon offsetting is sometimes seen as a way for businesses to find an easy way out. Even a small use of carbon offsetting by GHG-emitting firms, however, could represent a tangible impact on the climate - in 2014, the reported 140 MtCO_{2e} in offsets was said to have the equivalent impact of taking 30 million cars off the road for a year (45). What is at stake would then be to encourage more companies to sign up and raise the price of offsets to match the real cost of climate change while ensuring that offsets provide the desired additional environmental benefits through an independent and diligent assessment of projects.

Overall, the adoption of political targets and legal provisions at a national and intergovernmental level is essential in providing incentives to adopt such practices and penalize the biggest polluters. Doing so also encompasses recommended strategies within a broader long-term plan, which tracks the progress made and ensures that commitments are kept. Adopting mandatory emission-reduction policies is one of the key approaches and the one with the most significant results. As an example, the European Union Emission Trading Scheme is based on “allowances”, capping the allowed carbon emissions of participating institutions. If emissions exceed what is permitted, institutions must purchase additional allowances. If they are lower than what is allowed, they can sell their leftover credits (46). The State of California has adopted a similar cap-and trade system. In any case, the transition towards cleaner energy production and use must be done as equitably as possible and inclusive of all communities, especially those who are the most exposed to air pollution and climate change (38). The Californian law for instance requires that 25% of the money coming from the allowance system goes into the state’s Greenhouse Gas Reduction Fund to be spent on reducing pollution in disadvantaged communities disproportionately affected by bad air quality (47).

Political stances on air pollution

An increased knowledge of the devastating effects of air pollution, as a standalone entity, at both a national and international level has led many organizations, NGOs and industries to take action. At an international level, the World Health Organization (WHO) and United Nations Environment Programme, for example, have decided to address the challenges faced from air pollution.

In order to help address these challenges, the First WHO Global Conference on Air Pollution and Health was organized and held in late 2018 in Geneva (48). This conference was organized in response to resolutions from the 68th and 69th WHO Assemblies, where many health ministers asked for a “major scaling-up” in the action taken by health sectors to “prevent air pollution diseases, exposure to air pollution and their costs to society” (48). The



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conference saw the launch of the Geneva Action Agenda to Combat Air Pollution (48), which included elements such as improving the sustainability of cities to improve urban air quality, reduce burning in any form, and protection of vulnerable populations – namely children and the elderly.

The United Nations Environment Assembly (UNEA), the world's highest-level decision-making body on the environment and a subsection of the United Nations Environment Programme, organized its fourth session in March 2019. In line with its previous Resolutions (49) (50), the UNEA has committed to improve national environmental air monitoring technologies to encourage the development of national environmental data management capacities (51).

Air pollution, and its subsequent effect on air quality, is also closely linked to the Sustainable Development Goals (SDGs) (52). The 17 SDGs “provide a shared blueprint for peace and prosperity for people and the planet, now and into the future” (53). Therefore, making an effort to reduce air pollution would directly contribute to reaching some of the targets set out in the SDGs. There are four SDGs, in particular, that air pollution has a direct effect upon. Firstly, Goal 3, which focuses on good health and well-being for all. As mentioned, air pollution has deleterious effects on many different aspects of physical and mental health so reducing air pollution would help ameliorate those effects. Secondly, Goal 7, which ensures access to clean and affordable energy. Currently, 3 billion people heat their homes and cook with unclean fuels. The resultant air pollution causes 4.3 million deaths every year (54). So, clean, renewable energy would help reduce air pollution and save lives. Thirdly, Goal 11, which focuses on sustainable cities and communities in an ever-growing urban world. In 2016, over half of those living in urban areas were exposed to outdoor air pollution levels at least 2.5x above the WHO safe levels. Therefore, policies that ensure urban areas are more sustainable and greener can help reduce air pollution and improve the health of those living there. Finally, Goal 13, which tackles climate change. Many of the indoor and outdoor air pollutants also have an impact on climate change. So, policies and actions taken to reduce those pollutants would help address the climate emergency (54).

Many governments are starting to understand the enormity of the problem we face due to air pollution and have begun to act. The BreatheLife campaign, a partner of the WHO, Climate and Clean Air Coalition (CCAC), UNEP and The World Bank, exists to combine “public health and climate change expertise with guidance on implementing solutions to air pollution in support of global development goals” (55). The BreatheLife campaign has four main strategies: provide a platform to connect cities, increase monitoring of air pollution, accelerate solutions to reduce air pollution and empower individuals to take action (55). So far, 76 cities across Africa, the Americas, Asia and Europe have signed up to this initiative, impacting 295 million citizens (56). Whilst this is a good start, there is still a long way to go before the majority of countries are hitting the WHO's Air Quality guidelines by 2030. Therefore, there is still a lot of work that needs to be done. Even with international policies on outdoor air pollution, 90 out of 193 countries (46.6%) do not have vehicle emissions standards, and 86% of countries practice open burning of agriculture and/or municipal waste. Furthermore, only 12% of cities have air quality measures that meet WHO standards (57). This data goes to show that whilst existing policies have made some reduction in air pollution, further action needs to occur to bring air quality to much safer levels.



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