



# Prioritizing Climate Action through a Health and Vulnerability Lens<sup>1</sup>

## About the project

**Funded by:** IGC

**Key counterpart:** Ministry of Finance

### Impact

The Ministry of Finance is interested in learning how development initiatives that aim to improve livelihood opportunities for vulnerable households can be made more sustainable and resilient. We analyze the sources of vulnerability, differently, focusing on environmental risk factors affecting health and women's contribution to household income. We propose a series of policy recommendations to: i) tackle air pollution, focusing on actions that could involve a broader effort to address climate change, to improve quality of life for all Pakistanis, and particularly vulnerable households; and ii) bring women into the labour force that could yield multiple benefits, including increasing resilience of vulnerable households, raising national productivity, and resulting in broader development and welfare gains.

<sup>1</sup> This policy brief draws from the report "The Path to a Successful Pakistan" prepared by a team comprising Kulum Ahmed (Director, Integrated Learning Means (ILM), Fellow Consortium for Development Policy Research (CDPR)), Ijaz Nabi (Chairman, CDPR and Country Director, IGC and former Sector Manager, World Bank), Sarwat Nazim (Assistant Professor, Calby College), Amna Mahmood (Country Economist, IGC), and Farah Said (Assistant Professor, Lahore University of Management Sciences (LUMS)). We are grateful to the International Growth Center (IGC) for funding.

## In brief

- There are many different ways to prioritize action on climate. A compelling way could be to identify action in areas that are high priority from both a reducing greenhouse gas (GHG) emissions perspective and that also yield considerable local national benefits, such as improved health for all Pakistanis, increased productivity, and a reduction in vulnerability of low income households to health-related income shocks.
- Despite lackluster economic growth, Pakistan has succeeded in sharply reducing endemic poverty. However, a large share of low income households, engaged in low productivity occupations, lies just above the poverty line (Jamal 2021). Such households are vulnerable to economic shocks (such as the one associated with COVID 19, sharp energy price increase, food price inflation, health emergencies) and can quickly slip back into poverty.
- An analysis of Pakistan's health burden reveals that air quality significantly increases the risk of mortality and morbidity. Given the existing state of medical knowledge, we cannot cure non-communicable diseases caused by air pollution. These diseases result in a lifetime of illness, requiring constant management with burgeoning health costs and reduced lifespan. Air pollution also has severe economic consequences, including lower physical and cognitive ability, which leads to lower productivity over a lifespan.
- All Pakistani households are affected by air pollution: low income households disproportionately so. Efforts to tackle air pollution should help to improve quality of life for all Pakistanis, but will particularly help the vulnerable households.
- Policies designed to reduce air pollution considerably overlap with policies that address GHG emissions—which cause climate change. Limiting fossil fuel and solid fuel burning or improving their efficiency reduces not only air pollutants (particulate matters, sulfur dioxide) but also GHGs (carbon dioxide, methane).
- This brief describes a six-point policy agenda to tackle air pollution, focusing on actions that could involve a broader effort to tackle climate change.

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## Pakistan's Health Burden

### 1. Introduction

Pakistan's health burden today is a complex mixture of communicable diseases and non-communicable diseases (NCDs). In the last 10 years, there has been a significant increase in ischemic heart disease and strokes (GBD 2019).

### 2. Air Pollution as a Risk Factor

The air pollution risk factor captures both indoor air pollution (IAP) and outdoor air pollution. It is associated with increased risk of ischemic heart disease, stroke, lung cancer, neonatal morbidity, lower respiratory infections, diabetes, chronic obstructive pulmonary

disease, tuberculosis and blindness. A recent paper from Aga Khan University Hospital notes that about 1000 people suffer a stroke every day in Pakistan, of which about 400 people die within 30 days. The authors suggest that by addressing air pollution exposure alone, 30% of strokes in Pakistan could be prevented (Fatmi, Mahmood, and Samad 2020).

Figure 1. What risk factors drive the most death and disability combined in Pakistan?



Top 10 risks contributing of total number of DALYs in 2019 and percent change 2009-2019, all ages combined

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Source: <https://www.healthdata.org/pakistan>

Evidence from other countries suggests that air pollution causes respiratory-related hospitalizations, infant mortality, low birth weight, fetal shock and death, and reduced life span. It also causes reduced labor productivity and reduced human capital outcomes later in life, including reduced performance in academic and cognitive tests, depressed earnings and higher incarceration rates.

Air quality in several Pakistani cities has deteriorated considerably over the years. Cities such as Lahore—Punjab's capital and Pakistan's second largest city with over 10 million residents—rank among some of the

most polluted cities in the world while Pakistan came third in the list of the most polluted countries in 2021 (IQ Air 2021). PM2.5 constitutes the most egregious pollutant. These are tiny particles—smaller than tenth the diameter of a hair strand—which easily enter the bloodstream when inhaled. In all the Pakistani cities where air quality is formally measured, the annual average PM2.5 levels in 2021 exceeded the WHO standard (which is derived taking health impacts into account) by a considerable margin (IQ Air 2021). The Air Quality Life Index—developed by the Energy Policy Institute at the University of Chicago—shows that improving the existing air quality to the WHO standard can increase the

average life expectancy of a Pakistani by 2.7 years and of a Lahori by 5.3 years (EPIC 2020).

According to Pakistan's Social and Living Standards Measurement Survey (PSLM) 2019-2020, only 37% of households have access to clean fuel technology for cooking and lighting. The poor rely on cheap fuel such as biomass and coal to meet their energy demands. Burning such fuels release toxic pollutants causing air pollution inside the household, with levels orders of magnitude higher than outdoor air pollution.

### 3. The Effect of Air Pollution on Vulnerable Households

Since women mostly cook and their children often spend time with them, IAP disproportionately affects women and children in poor households. A study in Mirpurkhas and Nawabshah found that women were 5 to 6 times more at risk of acute coronary syndromes as a result of cooking with solid fuel, compared with women cooking with natural gas (Fatmi et al. 2020).

The risk of developing pneumonia in children is virtually doubled following exposure to air pollution, thereby accounting for approximately one million deaths globally (WHO 2021). Pakistan is one of only four countries in the world where most of these deaths occur. In addition, pneumonia is the number one cause of children's deaths in Pakistan. Further, deaths from pneumonia appear to be correlated with income quintile in Pakistan, with lower income quintiles suffering the most (Chang et al. 2018).

The malnutrition risk factor is also inter-connected with air pollution. Poor intake of adequate nutrition, and/or repeated bouts of diarrhea and lower respiratory infection among children, particularly under the age of 2 years, due to unsafe drinking water and poor sanitation, and poor air quality, result in poor absorption of food leading to stunting that affects future income (World Bank 2008). Physical stunting also is an indication of mental stunting, thus affecting educational attainment in later years (Alam et al. 2020). Further, improved nutrition in later years cannot change the cognitive damage, and these children continue to underperform in educational tests (Sokolovic et al. 2014). This clearly indicates that stunting cannot be cured, only prevented, and that the lower productivity consequences are lifelong.

### 5.1 Work with the Ministry of Energy to develop and implement a household energy strategy.

This is an immediate priority given the impact of use of solid fuels on infant and child mortality and stunting, particularly for low income households, and because this area has been completely ignored in the past. Interventions could be financed partially also by utilizing global climate finance windows, given that reducing solid fuel emissions result in less GHG emissions (see below).

### 5.2 Work with the health sector to create constituencies to advocate for cleaner air and thus facilitate climate actions.

Generally, there is poor understanding of the health impacts of air pollution in Pakistan. It is notable that Punjab's NCD Unit, despite highlighting incidence of strokes, heart disease and cancers as major NCDs in the province, does not link exposure to poor air quality with increased risk of these diseases on their website. Working with the health sector to ensure the new health curriculum on NCDs includes environmental risk factors will create a constituency for change in the health community.

### 5.3 Work with the provinces to improve health outcomes by updating standards to health-based ones and using technology that provides real-time source-specific available pollution data.

Pakistan has strong pollution rules and regulations on paper but continues to experience hazardous air quality because of lack of health-based standards, weak monitoring and enforcement. Health outcomes could be improved significantly if provincial environment departments revised standards based on health needs in specific cities and across different provinces. In addition, compliance could be improved by using new monitoring technologies—such as the Continuous Emission Monitoring System (CEMS) adopted by pollution regulators in several Indian state governments—that transmit real-time pollution data from sources. Regulators can use this data to target non-compliant polluters or calculate pollution taxes for sources under a pollution tax regime. Access to source-specific pollution readings will also create public pressure on sources to improve compliance and incentivize researchers to help the regulator in designing better air quality measures and interventions.

### 5.4 Focus on tackling air quality in 2-3 major urban areas e.g. Lahore, Peshawar and Karachi.

damages—which appeals to citizens' sense of fairness; 2) it leads to cost-effective abatement since the tax equalizes marginal abatement costs across sources; 3) it yields a "double-dividend" -- pollution abatement as well as revenue for the government, which it can allocate to other public projects.

### 4. Greenhouse Gases (GHGs) and Air Pollution

There is considerable overlap between air pollutants and GHGs that warm the atmosphere (such as black carbon or methane). Limiting fossil fuel and solid fuel burning or improving their efficiency reduces not only air pollutants (particulate matters, sulfur dioxide) but also GHGs (carbon dioxide, methane).

Hence often interventions that improve air quality also help to reduce GHG emissions, and therefore may also be eligible for climate finance. Examples of such interventions include better handling of solid waste to reduce methane emissions, using cleaner fuels for household energy, reducing emissions from transport in cities, and eliminating burning of agricultural or solid waste residues.

### 5. Policy Recommendations

Air quality management is a provincial responsibility under the 18th Amendment. Given that the mechanism for federal oversight of provincial mandates is still evolving in Pakistan, accountability currently only lies with citizens in a province putting pressure on their provincial governments. Yet, lack of understanding and awareness of the health effects of air quality in Pakistan means that the citizens cannot play this role effectively, even though the right to a clean and healthy environment is already a Constitutional right.

These six policy actions, despite not being comprehensive, will begin to encourage a better understanding of air quality and its consequences on health and productivity, as well as help to generate preliminary interventions to reduce air pollution. At the same time, the proposed actions are consistent with elements of a climate action plan for Pakistan.

### 5.5 Address transport related air pollution where provinces can realize large gains in air quality.

Existing studies—though imprecise—identify transport as the largest source of local pollutants. Though we do not have studies that apportion GHGs across sources in Pakistan, transport is an important source of GHGs in most countries. Therefore, tackling emissions in the transport sector can limit both local and global damages. Areas of intervention include: scaling-up existing public transportation projects such as the MetroBus and Orange Line in Lahore; implementing the national EV policy with a particular focus on two-wheelers and commercial vehicles; setting stringent vehicular emission standards, at least in the short run until EV adoption picks up; and enforcing congestion taxes within cities.

### 5.6 Work with Ministry of Finance to set up a Unit in MOF that focuses on the development of fiscal instruments for abating air pollution.

These could incentivize better environmental quality with related health outcomes, such as carbon taxes, beneficial property taxes, tax credits for household renewables/EVs, etc. This will help the shift in the right direction, but also yield revenues.

Such a unit could also help design and implement pollution taxes in the long run to achieve abatement at lower costs. Since regulators enforce uniform emission standards, marginal abatement costs can substantially differ across sources—especially across old and new plants. This leads to compliance at a considerably higher cost to society. Taxing source per unit of emission achieves several benefits: 1) it rests in the "polluter pays principle"—pollution causes damages to society hence you must pay for these

In addition to the six policy actions, a program of policy coordination across several ministries will be needed to prepare grounds for accessing climate finance for reducing Green House Gas emissions (including increasing the share of renewables in the energy mix) with spillover benefits of lowering health costs associated with air pollution.

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