

Prioritizing Climate Action through a Health and Vulnerability Lens¹

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Summary

We can prioritize climate action in several ways in Pakistan. One compelling way is to identify actions in areas that not only reduce greenhouse gas (GHG) emissions but also yield considerable local benefits such as better health for all citizens, higher productivity, and lower 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 lies just above the poverty line (Jamal 2021). Such households are vulnerable to economic shocks—such as the recent COVID 19 pandemic, sharp energy price hikes, food price inflation, and 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.

Air pollution affects all Pakistani households but low-income households disproportionately so. While efforts to tackle air pollution will improve all Pakistanis' quality of life—particularly, they will lead to substantial gains for 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

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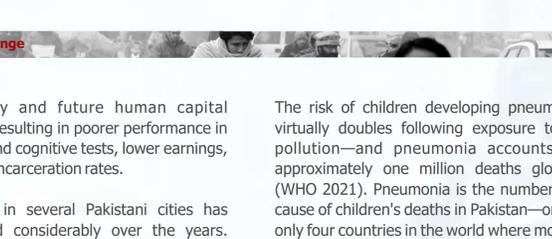
not only air pollutants (particulate matters, sulfur dioxide) but also GHGs (carbon dioxide, methane).

This brief describes a six-point policy agenda to tackle air pollution, focusing on actions in a broader effort to tackle climate change.

1. Introduction: Pakistan's Health Burden

Pakistan's health burden today is a complex mixture of communicable diseases and non-communicable diseases (NCDs). In the last 10 years, Pakistan has witnessed a significant increase in NCDs such as ischemic heart disease and strokes (GBD 2019). These NCDs form 60 percent of our health burden today (GBD, 2019). We cannot cure NCDs; we can either prevent them or manage them

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 See related publication: [https://doi.org/10.1016/S0140-6736\(20\)30752-2](https://doi.org/10.1016/S0140-6736(20)30752-2)

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

Evidence from other countries shows that air pollution causes respiratory-related hospitalizations, infant mortality, low birth

weight, and fetal shock and death. These factors combine to reduce average lifespan. Exposure to poor quality also reduces labor

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productivity and future human capital outcomes, resulting in poorer performance in academic and cognitive tests, lower earnings, and higher incarceration rates.

Air quality in several Pakistani cities has deteriorated considerably over the years. Cities such as Lahore—Pakistan's second largest city with over 10 million residents—ranks among some of the most polluted cities in the world, while Pakistan itself ranked third in the list of the most polluted countries in 2021 (IQ Air, 2021). PM2.5 constitutes the most egregious pollutant, comprising tiny particles—smaller than a tenth the diameter of a hair strand—which easily enter the bloodstream when inhaled. In 2021, the annual average PM2.5 levels in all Pakistani cities that formally measure air quality exceeded the WHO standard—which accounts for health impacts—by a considerable margin (IQ Air, 2021). The Air Quality Life Index (AQLI)—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).

3. The Effect of Air Pollution on Vulnerable Households

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

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 who cooked with solid fuel were 5 to 6 times more at risk of acute coronary syndrome compared to women who cooked with natural gas (Fatmi et al., 2020).

The risk of children developing pneumonia virtually doubles following exposure to air pollution—and pneumonia accounts for approximately one million deaths globally (WHO 2021). Pneumonia is the number one cause of children's deaths in Pakistan—one of only four countries in the world where most of these deaths occur. Deaths from pneumonia also correlate with income quintiles in Pakistan, with individuals in the lower quintiles suffering the most (Chang et al. 2018).

The malnutrition risk factor also relates to air pollution. Repeated bouts of diarrhea and lower respiratory infection among children—particularly those under the age of 2 years—because of unsafe drinking water, poor sanitation, and poor air quality result in poor nutrient absorption, leading to physical and mental stunting (World Bank 2008). This affects future education attainment and incomes (Alam et al., 2020). Improved nutrition in later years cannot change earlier cognitive damage, thus these children continue to underperform in educational tests (Sokolovic et al., 2014).

The evidence on stunting clearly indicates that we cannot cure it; we can only prevent it. Stunting also lowers productivity, which carries lifelong consequences. Pakistan's Demographic and Health Survey (DHS) 2017 – 2018 found that in the lowest income quartile up to 57 percent of children under the age of 5 years are stunted. This percentage decreases with rising incomes, yet we observe 22 percent stunting in the highest income quintile. This indicates that repeated bouts of disease caused by poor air and water quality play a bigger role in stunting than just lack of adequate nutritional intake.

4. Greenhouse Gases and Air Pollution

Policies to combat air pollution overlap with those that target greenhouse gases (GHGs)—emissions such as black carbon or methane, which accumulate in the atmosphere and warm the planet. 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).

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Interventions that improve air quality often lower GHG emissions, and thus become eligible for climate finance. Examples of such interventions include improving solid waste management, using cleaner fuels for household energy, curbing transport-related emissions in cities, and eliminating crop and solid waste burning.

5. Policy Recommendations

The 18th Amendment made air quality management a provincial responsibility. Mechanisms for federal oversight of this provincial mandate are currently non-existent. Thus, the burden to hold provincial government accountable for meeting air quality outcomes mostly lies with citizens. But citizens cannot effectively play this role since many do not understand or comprehend air pollution's health and cognitive effects—even though the constitution guarantees the right to a clean and healthy environment.

We suggest six policy actions for federal and provincial government consideration which should encourage a better understanding of air quality and its health and productivity consequences as well as help generate preliminary interventions to reduce air pollution. These actions also align with broader climate action for Pakistan.

1) Devise and Implement a household energy strategy. Solid fuels—mostly used by low-income households—are the main source of indoor air pollution, which significantly increases the risk of child mortality and stunting. The government must devise a strategy that increases awareness of vulnerable households of this health impact and offer a series of options that help them shift towards cleaner alternatives. They must also work with the Ministry of Energy to incentivize households to ultimately transition to cleaner fuels. Strategy implementation could be financed by tapping into global climate finance funds given that reducing solid fuel emissions results in lower GHG emissions.

2) Create constituencies to advocate for cleaner air. Most citizens do not understand air pollution's health impacts. Despite highlighting strokes, heart disease, and cancer as major NCDs in the province, Punjab's NCDs unit does not offer any

information on its website linking exposure to poor air quality with increased risk of these diseases. The government must work with the health sector to ensure that the new health curriculum on NCDs includes environmental risk factors, creating a constituency for change in the health community.

3) Link standards to health outcomes and disseminate source-specific emissions data. Emission standards lose their salience when delinked from health outcomes. Citizens can realize better health outcomes if the provincial environment departments revised their air quality standards based on health needs in specific cities.

Regulators can improve compliance through new monitoring technologies—such as the Continuous Emission Monitoring System (CEMS)—that transmit real-time pollution data from sources. They can use this data to target non-compliant polluters and disseminate it to create public pressure on sources to improve compliance.

4) Tackle air quality in select major urban areas first. Focusing on major cities—such as Lahore, Karachi, Peshawar—initially will yield important lessons that other cities could draw on and local information to help coordinate across different sectors and stakeholders. Also, urban infrastructure is an investment that cities cannot easily adjust in the short run, yet it has an enormous bearing on air pollution. This makes planning to minimize air pollution and stakeholder buy-in of the potential future levels of air pollution crucial for all urban development projects and the creation of cleaner cities.

5) Address transport-related air pollution. Existing studies—though imprecise—identify transport as the largest source of local pollutants. Interventions include: a) scaling-up existing public transportation projects; b) implementing the national EV policy with a particular focus on two-wheelers and commercial vehicles; c) setting stringent vehicular emission standards, at least until EV adoption picks up; and d) enforcing congestion taxes within cities.

6) Develop fiscal instruments for abating air pollution. Working with the Ministry of Finance, the government should establish a unit dedicated to developing fiscal responses to improve air quality. These could incentivize better environmental quality with related health outcomes. Tools such as direct emission taxes, beneficial property taxes, tax credits for adopting renewables and EVs could incentivize better environmental quality and health outcomes as well as generate 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 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.

Besides the six policy actions above, Pakistan requires a program of climate policy coordination across relevant ministries. Such a program ideally needs to leverage climate finance to fund projects that reduce GHG emissions—including increasing the share of renewables in the energy mix— as well as carry spillover benefits such as air pollution reduction.

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