

HEALTH IMPACTS OF AIR POLLUTION AND CLIMATE CHANGE

Adil Zareef ^{1✉}

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1: Assistant Professor Public Health, Northwest School of Medicine, Peshawar, Pakistan & Convener for Peshawar Clean Air Alliance (PCCA) Peshawar, Pakistan.
Email✉: adilzareef.az@gmail.com

On Friday 8th October 2021, the United Nations (UN) Human Rights Council in a “historic breakthrough” declared access to an environment without pollution as a fundamental human right. By recognizing that a healthy environment is a human right, the world body has formally added its support to the global fight against climate change and its devastating consequences. The UN declaration is critical for a world where nine million preventable deaths are caused due to environmental crises yearly.

This landmark declaration has firmly established, through research, an association between climate change, environmental degradation and its adverse effects on health. Reversing the level of current greenhouse gas emissions during this decade is crucial to prevent future disasters like extreme heat waves, flooding, tropical storms, rising sea levels supercharged by trapped carbons in the biosphere. As the clock is ticking for the planet's survival, catastrophic health related impacts are equally challenging. The UN Secretary General has termed this emergency as “red code for humanity”.² The planet's ecosystem and environment serve as health determinants for the entire humankind.

The recent surge in dengue in Pakistan, and COVID 19 pandemic underscore increase of zoonotic diseases, comprising various bacteria, parasites, viruses, fungi proliferating wildly and affecting global populations across continents. Research has established that severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) travelled from bats to humans through mutation in intermediate host of an unknown species.³ Unrestrained human activity & climate change figure in the destruction of ecosystems and likelihood of further pandemics.

Likewise, dengue transmission is on rise due to unusual global warming, as various vectors like mosquitoes, previously rare

in this part of the world, are breeding faster. Consequently, the geographical distribution of vector-borne infectious diseases is likely to proliferate with an incremental increase in the duration and intensity of heat and humidity globally.⁴ “Humanity is now standing at a crossroads. We must now decide which path we want to take. How do we want the future living conditions for all living species to be like?” remarked Greta Thunberg.⁵

Reversing these trends would require a herculean effort on part of governments, public health systems and civil society organizations. Whereas, informed policy making is crucial to factor in climate change and public health impacts as a whole, public participation and advocacy campaigns are equally important in creating a critical movement towards a healthier world.

Globally, air pollution remains a major public health problem. According to World Health Organization (WHO) estimates, approximately 92 percent of the human population is exposed to unsafe levels of air pollution.⁶ Air pollution poses a major environmental hazard to human health, alongside climate change.⁷

Pakistan is no exception to the growing hazard of air pollution, as various human activities including vehicular, industrial, brick kilns units result in emissions in critical levels, raising the specter of toxic smog, particularly during the winter season in major cities of the subcontinent. According to World Population Review 2021, “Pakistan has been rated as the second-most polluted country in the world, where the average of PM_{2.5} (particulate matter of 2.5 micrometers diameter) concentration ranges up to 65.81.⁸

On 1st November 2021 the official air quality index (AQI) of Lahore was reported at 289, while international

monitoring bodies reported it as 397. This rating ranked Lahore being the most polluted city in the world, ahead of its traditional rival New Delhi.⁹

During 2019, globally, Pakistan was listed as the second-most polluted country with an average PM_{2.5} concentration of 65.81.¹⁰ AQI levels in Punjab ranged between the “near unhealthy” or “very unhealthy” and touched a high ranking of 484.¹¹

Recent medical research into the health impacts of air pollution is shocking.¹² Firstly, no “safe” levels of air pollution. Air pollution strikes at almost every organ of the human body - not just the respiratory system, like asthma and chronic obstructive pulmonary disease, besides, heart conditions, strokes and even cancer. As a public health professional, it is worrying that young children are particularly at risk of air pollution; new research indicates that air pollution exposure in children adversely impacts their cognitive development.

A report by United Nations International Children's Emergency Fund titled “Children's Climate Risk Index” states that one billion children, or half of global 2.2 billion child population, classified as living in the “extremely high risk” countries, will suffer the extreme consequences of climate change as they face “multiple and often overlapping shocks”. Pakistan is also listed among other “vulnerable” countries in the South Asian region. As activist Thunberg warned world leaders that, “science does not lie!”

According to a new Organization for Economic Co-operation and Development (OECD) report, “By the year by 2060, 6 to 9 million premature deaths can be caused by ambient air pollution which shall impact economic growth in terms of monetary losses, around 1% of the global GDP approximately USD 2.6 trillion annually these are estimates of

total sick days, medical bills and reduced agricultural output".¹⁴

A recent research report on association between energy and clean air, "Costs of air pollution from fossil fuels, both human and economic", states that three times as many deaths occur due to burning gas, coal and oil, as compared to deaths reported as road traffic accidents worldwide. The impact of global economic cost due to air pollution is \$2.9 trillion, approximately 3.3 percent of the global GDP.¹⁵

A 2018 report stated an average of PM_{2.5} pollution was associated with 4.5 million deaths, 4 million new cases of asthma in children and 2 million preterm births, besides, loss of livelihoods of 1.8 billion days".¹⁵ The ambient air pollution poses a huge economic cost in terms of health impacts on global population. Exposure to air pollution disproportionately affects older individuals.¹⁶

Most recent study published in October 2021, South Asia Climate Roadmap 2021-2025 states "the quality of life in Pakistan is set to decline by 4% to 5% by 2030, mainly due to Pakistan's increased vulnerability as a consequence of climate change". It states that 49 m reside in "high risk" areas where their health and wellbeing is directly affected by water scarcity, disease outbreak and water & food insecurity. The damage is amplified, being the fastest urbanizing country in South Asia".¹⁷

Peshawar has also been one of the leading cities with unhealthy air quality. The World Economic Forum 2016 report states, "amongst the 3,000 cities in the WHO's air quality database, Peshawar ranked in second place, followed by Zabol in Iran".¹⁸

An ongoing research by Prof Dr Mohmammad Rafique, "Welfare impact of dust pollution on human health in district Khyber, Khyber Pakhtunkhwa, Pakistan", was conducted on a population bordering industrial estate near Hayatabad Township. The analysis of air pollution the Pakistan Council of Scientific and Industrial Research (PCSIR) report on 26 December 2018 concluded hazardous levels of 2450 ppm as against EPA permissible 150 ppm level. It was ground level estimation

as against customary elevated level measurement. On that particular day, as per PCSIR measurement of analysis it was "16 times higher meaning it was extremely hazardous" for human health.

Another study titled, "Health costs of brick kilns emissions in Peshawar: A Policy Analysis" estimated, "Total welfare benefit in terms of health cost for district Peshawar is PKR 6692.985 million or (PKR 6.7 billion) per annum with air quality mitigation to a safer level. Besides, 36 days per annum is estimated as the productivity loss by individuals. For each household the monetary benefit to avoid the restricted day of working is PKR 198, whereas the monetary benefit for the Peshawar city is PKR 107.935 million of bringing down the PM10 level".^{4,19}

Globally, the vision for clear blue skies and pollution free world is gaining momentum. A two day UN summit on Climate Change (COP26), comprising 120 heads of state & governments at Glasgow, to find ways towards a cleaner world and reducing global warming. "The climate crisis has already been solved. We already have all the facts and solutions. All we have to do is to wake up and change." urged the 17 year old activist Greta Thunberg.

It is through interactive partnerships with civil society, academia, and public health experts and government that the vision for healthy Peshawar and Pakistan can achieve successful outcomes. Public health specialists need to generate more evidence based research into the health impacts of air pollution to meet the challenges of climate change and environmental degradation.

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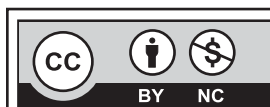
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CONFLICT OF INTEREST

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KMUJ web address: www.kmu.jkmu.edu.pk
Email address: kmuj@kmu.edu.pk