General Perspective

Poison in the air: Declining air quality in India

Mayank Mishra

Department of Pulmonary Medicine, All India Institute of Medical Sciences, Rishikesh, Uttarakhand, India

ABSTRACT

Air pollution is a burgeoning environmental problem with potential for climate change. The worst-hit areas are the rapidly developing capital cities of low- and middle-income countries across the globe. Delhi, the capital of India, is no exception. In fact, Delhi was the most polluted of more than 1600 cities in the world according to the WHO’s 2014 database for outdoor air pollution. The recent declaration of a public health emergency in and around the city speaks volumes about the declining air quality in India. Introspection into the various causes and mechanisms responsible for this sorry state of affairs, its impact on human health, and possible solutions to the problem is being reported.

KEY WORDS: Air pollution, Delhi, India

Address for correspondence: Dr. Mayank Mishra, Associate Professor, Department of Pulmonary Medicine, All India Institute of Medical Sciences, Rishikesh - 249 203, Uttarakhand, India. E-mail: virgodrmayank@gmail.com

Air pollution in the capital of India caught much attention last autumn–winter by making waves in international media. This had reason enough because breathing in the city during that time was akin to smoking 50 cigarettes a day. Delhi features among twenty of the world’s most polluted cities and is one of the top two air-polluted capital cities of Asia, the other being Tehran. The dismal air quality during this time every year creates a grave environmental and public health crisis, killing 1.2 million Indians, nearly 35,000 in Delhi alone. Costa Rica ambassador to India rushed to Bengaluru from Delhi citing ill-health due to pollution and appealed to the society and humanity to listen and respond to this wakeup call of our planet. As if this was not enough, the condition had attracted greater negative global focus when Sri Lankan cricket players were seen wearing antipollution facemasks on the field in a test match held at Delhi against India early December. As thick smog engulfed the city, the air quality deteriorated even further and caused a massive public outrage on social media. Consequently, a public health emergency was declared in and around Delhi by the Indian Medical Association on November 7, 2017.

An analysis of the various reasons for Delhi’s grim annual environmental crisis reveals that the biggest contributors are dusty winds coming from the Gulf region (40%), ordinary road dust (up to 38%), stubble burning from neighboring states such as Punjab and Haryana (25%), and four-wheelers (<10%). Other factors playing variable roles include increasing number of vehicles especially polluting ones, use of dirty fuel, garbage burning, mismanaged construction dust, and open landfills. It has been postulated that dusty air coming from the Gulf and East collides with hot smoke coming from neighbouring states of Delhi due to stubble burning and regional smoke emanating from vehicles, factories and garbage. This, together with the adverse local weather conditions and excess moisture, prevents dissipation of pollutants at the ground level, thus forming a stagnant cloud of trapped pollutants called smog.

To understand the severity of the situation, it is important to know about the indices used for measuring air pollution levels. The air quality index (AQI) is one such parameter used by the national government agencies for reporting.
daily air quality.[4] Its method of measurement and interpretation may vary slightly from one nation to another. It is generally calculated and monitored for multiple contaminants such as particulate matter (PM$_{10}$ and PM$_{2.5}$), sulfur dioxide, ground-level ozone, carbon monoxide, and nitrogen dioxide. AQI is measured on a scale of 0–500, with higher values (>100) associated with increasing public health hazards.[4] The peak AQI for India (Delhi) was a whopping 486/500 as on November 9, 2017 which falls in the severe category and may have an adverse respiratory impact even on the healthy population. For the last few years, Delhi has been recording an annual average PM$_{2.5}$ concentration more than ten times the acceptable value of WHO’s air quality guideline.[5]

The ill effects on human health associated with declining air quality due to air pollution could be catastrophic. Deleterious consequences could range from poor visibility and watery eyes to serious cardiovascular, neurological, and dermatological complications. The most dreadful effects could be seen in patients with preexisting respiratory disease who may develop sudden, severe, life-threatening deterioration of their baseline breathing problems.

Delhi’s crisis was taken up by concerned stakeholders and office-bearers, and certain emergency remedial measures were rolled out to put the situation under control. These included advisories against morning walks and going to schools, thereby shutting >4000 primary schools, several times hike in parking fees, and substantial reduction in metro train fares. Adjoining states were directed to take measures to reduce stubble burning in their respective areas.

However, these emergency measures do not look at the problem from a larger, long-term perspective. That pollution is largely a man-made disaster is an undeniable fact and hence it is the collective responsibility of humankind to curb it by putting hands together. The government needs to find ways to a permanent solution to pollution. These could potentially include a foolproof waste management system, integrated air quality monitoring, reporting, management, and compliance mechanisms, and a strengthened public transport system that may help in reducing the number of private vehicles on the road. Pollution from motorised vehicles could also be reduced by using superior quality fuel such as compressed natural gas,[1] reducing the number of diesel vehicles, using battery/solar operated vehicles, and implementing the odd-even system. The government should aim at elimination of crop burning using suitable agricultural measures and incentivizing farmers for not burning the same. Developing countries account for 99% of the world’s biomass fuel use for domestic purposes.[6] Air pollution due to burning of biomass may be reduced by promotion of liquid petroleum gas as cooking fuel. Last but not the least, a blanket ban on deforestation and use of firecrackers could go a long way in curbing this burgeoning, yet neglected, modern day menace.

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