



Chronic air pollution and health burden in Dhaka city

To the Editor:

Air quality is usually evaluated by the concentrations of particulate matter and gaseous substances that are present in the air we breathe. Thousands of pollutants are responsible for environmental air pollution, with particulate matter with a 50% cut-off aerodynamic diameter of 2.5 μm ($\text{PM}_{2.5}$), PM_{10} , carbon monoxide, ozone, sulfur dioxide and NO_x being those most frequently evaluated. In developing countries such as Bangladesh, awareness of air pollution is virtually non-existent and, most of the time, ignored even when air quality becomes unbearable to most citizens. Among the sources of particulate matter in Dhaka, the large metropolis that serves as the capital city of Bangladesh, road dust, textile and dying businesses, tanneries, chemical and cement factories, and brick kilns emerge as the most polluting offenders. Substantial evidence has shown that $\text{PM}_{2.5}$ is independently implicated in cardiovascular and respiratory diseases, and cancer, in light of its ability to reach terminal bronchioles and alveolar structures, and even reach the bloodstream [1].

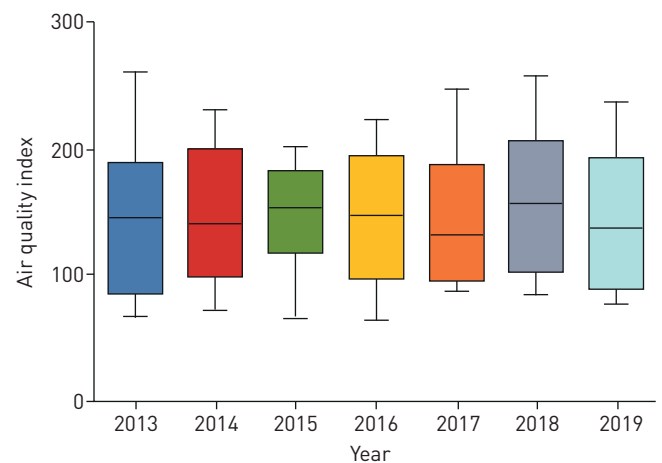


FIGURE 1 Air Quality Index for Dhaka city, 2013–2019.

Air pollution alone accounts for 17.6% of the risk of death and disability in Bangladesh. The annual economic burden of air pollution in Dhaka has been estimated at USD 192 million [2], and few if any effective measures to counteract this serious problem are being taken by the government or any other agency. With approximately 20.6 million people living in an area of 306.38 km^2 , Dhaka is not only one of the largest megacities in the world but also one of the most polluted cities (Air Quality Index (AQI) of 215 on 21 December, 2019). A report ranked Dhaka as the third least livable city in the world, immediately after Damascus and Lagos [3]. It has been estimated that 92% of the global population are nowadays exposed to levels of $\text{PM}_{2.5}$ that are above air quality guidelines [4]. A report by the World Health Organization estimated an annual mortality of 4.2 million as being attributable to outdoor air pollution, with over 2 million deaths occurring in the South-East Asia region [5]. It is clear that uncontrolled industrial growth and persistent disregard of regulations aimed at air quality underlie the fast progression

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Air pollution levels in developing countries such as Bangladesh with a relatively young population pose an inordinate health risk for many years to come unless significant environmental control measures are effectively undertaken <https://bit.ly/3bvzesx>

Cite this article as: Siddiqui SA, Jakaria M, Amin MN, *et al.* Chronic air pollution and health burden in Dhaka city. *Eur Respir J* 2020; 56: 2000689 [<https://doi.org/10.1183/13993003.00689-2020>].

of Dhaka to being one of the most polluted cities in the world [4]. In fact, all cities in the Middle East and more than 95% of all cities in Asia exceeded the upper limits of AQI [6].

Using available software (AirQ+; www.euro.who.int/en/health-topics/environment-and-health/air-quality/activities/airq-software-tool-for-health-risk-assessment-of-air-pollution), we calculated the accrued burden of disease imposed by the current and long-lasting pollution levels in Dhaka city (figure 1). These estimates showed that the mean and increase in prevalence due to the detrimental AQI would be 36% for stroke (95% CI 16.8–46.2%), 40.5% for ischaemic heart disease (95% CI 26.2–60.5%), 35% for COPD (95% CI 22.1–48.1%), and 38.6% for acute lower respiratory tract infections in children (95% CI 30.4–46.3%). In light of the recent infectious epidemics that are already taking a major health toll in Dhaka, if proper measures to effectively reduce the overwhelming ambient pollution are not urgently implemented, major surges in cardiovascular and respiratory mortality and morbidity will impose additional tolls on an already overwhelmed and decompensated healthcare system and economy in Bangladesh. Thus, collaborative, inclusive and immediate environmental policies and action are critically needed for the Asia Pacific region [7].

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Received: 13 March 2020 | Accepted: 19 March 2020

Conflict of interest: None declared.

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