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Decoding new WHO air quality guidelines for India

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Clean air is essential for sustainable development. Every year, millions of people die globally because of exposure to air pollution, and hence, air pollution is considered one of the top health risk factors. The World Health Organization (WHO) air quality guidelines (AQGs) are meant to protect global health and guide the countries to set their own standards.

New AQGs recommended by the WHO

Since the previous AQGs by the WHO set in 2005, several epidemiological studies were conducted (primarily in developed countries), which showed evidence of health impacts at relatively low exposure levels. At the same time, studies continued to strengthen evidence of impacts on many diverse health outcomes in a wide range of exposure levels. These pieces of new evidence propelled the WHO to revise the existing AQGs and proposed new standards last month. The annual AQG levels for particulate matter smaller than 2.5 (PM_{2.5}) and 10 (PM₁₀) μm are lowered to 5 and 15 $\mu\text{g}/\text{m}^3$ from the existing levels of 10 and 25 $\mu\text{g}/\text{m}^3$, respectively. These AQGs are recommended for both outdoor and indoor conditions, and the health implications should be interpreted for that pollutant only, and not for a mixture of pollutants.

Interpreting the new AQGs for India

India has set their own national ambient air quality standard (NAAQS) in 2009. For example, the annual PM_{2.5} standard was set at 40 $\mu\text{g}/\text{m}^3$, four times higher than the previous WHO AQG. In 2016, India launched its own air quality index (AQI) to represent the overall air quality in view of the relative abundances of major criteria pollutants, and health advisory is provided for various AQI levels. In 2017, India launched the National Clean Air Program (NCAP), where 102 non-attainment cities were identified (later upgraded to 130+) based on ground-based measurement. However, the ground-based monitoring network in India is highly inadequate, and satellite-based estimates suggest that more than 75% of India was non-attainment in 2017, while almost the entire nation does not meet the new AQGs. Moreover, India does not specify any standard for indoor air quality, and even though people spend most of their time indoors, indoor air quality does not receive much attention.

The new AQGs (particularly for PM) without doubt implies that meeting our NAAQS does not guarantee safe conditions, and the burden of disease will continue to be very high unless we aim to reduce air pollution further. The

value of human life is the same irrespective of geographic location. Therefore, NAAQS should mention that the ultimate target should be meeting the WHO AQG.

What India should do

Prioritize intervention measures. The city-centric approach to reduce air pollution in non-attainment cities is not going to work, and we must develop an air shed management plan through inter-state coordination. The intervention measures outlined in the NCAP implementation plan need to be prioritized based on the cost-effectiveness and the expected benefits. The sectors that co-emit air pollutants and greenhouse gases should be given more attention as emission reductions from these sectors are expected to result in climate co-benefits.

Revisiting the NAAQS and AQI. Given the new AQGs, India should revisit the NAAQS, and the ball has started rolling. In addition to NAAQS, India should set interim targets. The NCAP target may be argued as an interim target, but interim targets are absolute levels of air pollution and not relative. For example, 30% reduction in annual $PM_{2.5}$ in Delhi is much larger than the 30% reduction in annual $PM_{2.5}$ in Chennai, and therefore, the health benefits would be very different in the two cities if they both meet the relative targets by 2024. Further, India should commission health studies, or at least follow the epidemiological studies in the literature that guided the WHO in setting the new AQGs, to set these interim targets and the NAAQS. The same philosophy should be applied to define the AQI levels, as current thresholds have no robust scientific backing.

Formulate standards for indoor air quality. Indoor air quality is equally bad in India. The exposure levels in the households using solid fuel are 3-5 times higher than the ambient levels. Though the household exposure is on the decline due to the LPG rollout under the Pradhan Mantri Ujjwala Yojana, the levels are still comparable with the ambient condition. The urban households and the indoor microenvironments are no exception either. After the COVID pandemic, indoor air quality received considerable attention as it has been shown that the virus is airborne. Therefore, India should formulate standards for indoor air quality, or at least specify whether the ambient standards are applicable for indoor conditions, too, (following the WHO AQG) and recommend ventilation protocols for different microenvironments.

Invest in new frontiers of research. Given the high background dust concentration, India may never meet the new AQG for $PM_{2.5}$ and PM_{10} . However, very little is known about the differential health impacts of individual PM species, including dust. The WHO AQGs are not applicable for a mixture of air pollutants and can only be interpreted in the context of individual pollutant markers. Therefore, while we continue our efforts to meet the NAAQS first and then the WHO interim targets, we should invest in developing India-specific evidence to define our NAAQS and interim targets (and AQI levels) with more confidence.
