

Strengthening India's Ambient Air Quality Standard-Setting Process

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Introduction

The National Ambient Air Quality Standards (NAAQS) provide the basis for assessing air quality nationally, determining pollution control priorities, and defining what we consider to be acceptable air quality to protect public health. They are framed and issued by the Central Pollution Control Board (CPCB) under the Air Act (1981)¹. The NAAQS are enforced in the states by the respective State Pollution Control Boards (SPCBs). Established initially in 1982 and updated in 1994 and 1998, the current NAAQS stemmed from a revision to the standards in 2009². Taking into account background levels of air pollution (including particulate matter, gases, hydrocarbons and metals), these standards were significantly more lenient than levels considered acceptable by the World Health Organization (WHO)^{3,4}.

When the NAAQS were last revised in 2009, the health evidence base in India was scant, with only a handful of studies documenting the harmful effects of air pollution⁵. Whether these studies were factored into the debate around determining the air quality standards remains unclear. In the time since, there has been a substantial growth in the health evidence base with studies conducted by Indian and international institutions documenting the effect of air pollution on cardiovascular, respiratory, and metabolic diseases, adverse pregnancy and birth outcomes, hospital admissions, and premature mortality⁶⁻⁹. Many of these Indian studies have been included by the WHO in its revision of global air quality guidelines released earlier this year¹⁰.

In August 2021, the CPCB announced that a revision of the NAAQS would be undertaken over the next year under the leadership of faculty from IIT Kanpur, with representatives from other institutions¹¹. The wide-ranging remit for this committee includes revisiting the existing standards for criteria pollutants, potentially expanding the base of pollutants being measured, determining the effects of air pollution on human health and vegetation, designing, and setting up of monitoring networks, and reviewing the air quality index. These revisions generally take into account background levels of air pollution among other economic and environmental factors before settling on new standards that are marginally more stringent than previous iterations. While welcoming the commitment by the CPCB to update the NAAQS, we believe that there are several considerations that, if taken into account, could strengthen an otherwise ad-hoc process.

These revisions to the NAAQS will serve to define the discussion around air pollution for the next decade in India. Making the standards more ambitious will be based on our understanding of risk associated with exposure and how that has evolved over time. It will have implications for how that risk is communicated by the government to citizens through the Air Quality Index (AQI) and will provide a basis for regulating certain point sources. More ambitious standards can also provide a useful benchmark against which to measure the progress of our initiatives to improve air quality.

Given the import of these standards as a means of protecting public health, engaging in risk communication, and tracking progress against our air quality goals, it is essential that the process followed by the NAAQS revision committee is clearly laid out and guided by a series of fundamental principles. These include ensuring their relevance by committing to predefined periodic reviews, basing policy decisions on a solid foundation of science by engaging a broad range of experts, centering health in air quality policy making, and building trust with civil society and other stakeholders.

Reinforcing institutional processes are a long-term challenge, and we recognize that significantly altering the parameters of work of a committee whose work is already underway may not be possible. The principles and actions laid out here can form the basis for future work in this area by the CPCB. In our recommendations below, we have also outlined several immediate actions that can be taken by the CPCB and the NAAQS committee as they proceed with the revision of the NAAQS.



Fig. 1. Step-wise approach to strengthen the standard-setting process

Integrate health frame in policymaking

The fundamental purpose for the existence of environmental laws is for the protection of the public commons, foremost among them being the health of the populace. Health, or more importantly health science or epidemiology, however, does not feature in environmental policymaking in any meaningful way³. In the case of air quality, the objective of the notification of air quality standards is to ensure that we meet them to protect public health. Without the integration of science around the impacts of air quality on health in such a process, it is impossible to meaningfully set such standards.

Making health science or epidemiological expertise, not merely medical expertise, central to this process is therefore essential to providing the missing health frame. Such experts would bring a greater depth of understanding to the health evidence as the committee conducts an integrated science and risk assessment. The lack of this perspective in environmental policymaking and fundamental misinterpretations of the science has also led to public discourse centered around answering the wrong questions with respect to the health impacts of air pollution¹².

Epidemiologists who conduct and publish such work would also be better placed to contribute to broader policy implications including on the role of the health sector in enhancing awareness of the harmful effects of air pollution exposure^{13,14}. Prior experience has also shown that they would bring a very different perspective on the choices we need to make on policy with an explicit focus on reducing exposures, not just ambient concentrations⁵. The growth of expertise in air pollution epidemiology across academic and non-profit institutions over the last decade provides a large pool of experts for the CPCB to choose from.

ACTION FOR NAAQS COMMITTEE:

- Ensure that health forms the basis of decision-making on the revised NAAQS by allowing the health evidence to guide decisions on new standards, and not just concerns around feasibility from an economic or technological perspective.
- Engage with experts on health science or environmental epidemiology (not just physicians) that can aid in demystifying the science.
- Revise the currently lenient AQI to more closely reflect the health impacts of various levels of exposure.

Institute and conduct a science review mechanism

The last revision of the NAAQS in 2009 was released through a gazette notification. No additional information was provided publicly either during or on completion of the process as to what evidence was reviewed, what considerations were factored into decision-making, or most importantly, on the composition of the panel of experts engaged. International best practice dictates that such processes must be guided by a panel of scientific experts that span multiple fields including environmental engineering, atmospheric science, epidemiology, social science, and

public policy¹⁵. Such a panel of experts does not currently exist and must be constituted. Carrying out their work in the five or ten-year period between revisions, this board would be tasked with:

- a. Compiling information on various sources of air pollution through available source apportionment and emissions inventory data
- b. Assessing background levels of ambient air pollution through the extensive national and state monitoring networks
- c. Conducting an integrated science and risk assessment that would gather the best available policy-relevant air quality and health evidence nationally and globally
- d. Summarizing the implications of their scientific review on current standards and propose policy revisions as needed, with a special emphasis on the regions and sources that may require special attention from the Central and State Pollution Control Boards (e.g., severely or critically polluted industrial clusters, non-attainment urban and rural areas). This could be done in the form of a summary for policymakers similar to the policy-relevant documents released by the Intergovernmental Panel on Climate Change.

Conducting such an exercise with a diverse board membership would ensure that further decisions on standard-setting are based on a solid foundation of science and policy. It would also ensure that a multi-faceted issue like air pollution that cuts across spheres of environmental, social, economic, industrial and health policy receives the interdisciplinary attention it deserves.

ACTION FOR NAAQS COMMITTEE:

- Invite additional members to the committee that represent the fields of health science or environmental epidemiology, public policy, and social science.
- Engage in a wide-ranging science review taking stock of the latest air quality and health evidence and release the findings of this review publicly.
- Develop and release a shorter summary for policymakers that includes policy implications viz. NAAQS and pollution control in industrial clusters/non-attainment areas.

Establishing a process for periodic review

The NAAQS were first defined in 1982, with subsequent revisions in 1994, 1998 and 2009². To ensure that the standards remain relevant with respect to the latest science on air quality, and follow some measure of periodicity, a time-frame for their review must be established at this instance. Most nations review and if necessary, revise their air quality standards at five or ten-year intervals, with clearly laid out work plans for the interim periods¹⁶⁻¹⁸. These reviews are often statutory mechanisms and provide a structure to the process. The clear framework for action provides regulators with the opportunity to engage external experts in more thorough and ongoing reviews of the latest scientific evidence¹⁵. It also allows for the government and civil society to evaluate progress towards achieving these standards within the periods between revisions.

ACTION FOR NAAQS COMMITTEE:

- Recommend in its report that the process be recurring at five or ten-year time intervals.

Build public trust through engagement

Public trust in law and policy making processes is fundamental to their effective implementation. Recent moves to dilute public participation in environmental policymaking must be eschewed in favour of a more consultative process that includes diverse voices from civil society¹⁹. By ensuring the timely release of various documents including science and policy assessments through the interim period between revisions, the process of setting the air quality standards can become far more inclusive and accessible. Introducing a public consultation period before

the notification of any new standards and taking into consideration the feedback received would also ensure that there is greater opportunity for members of the public to engage with a process that impacts every citizen of the country.

ACTION FOR NAAQS COMMITTEE:

- Promote greater transparency in decision-making by ensuring timely release of key documents including the science review, policy recommendations, meeting minutes, and other relevant material.
- Engage actively with civil society and the broader public through a consultation period and integrate their perspectives in defining the final standards.

Substantial global and national change in understanding the health impacts of air quality has led to a redefinition of globally acceptable norms for acceptable exposure to air pollution. As we embark on this process nationally, our approach must align with global best practices in standard-setting. Aligning our process with the core principles outlined above will ensure that a measure of structure will be brought to an otherwise extemporaneous activity.

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