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Commentary

India's Steps Towards Carbon Dioxide Monitoring in Public Assembly Spaces for Ventilation Measurement for Airborne Infection Control and Other Factors

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This commentary describes the work done by the Indian National Green Tribunal by instructing the Central Pollution Control Board to formulate guidelines and issue directions for important matters related to Indoor Air Quality and Airborne Infection Control. What started as a Public Interest Litigation in the Hon'ble Delhi High Court led to an application in the National Green Tribunal for three matters. The first is the monitoring of Carbon Dioxide in enclosed air-conditioned spaces of a public assembly nature, as Carbon Dioxide is a surrogate for ventilation in a space. The second is including inclusions in Split Air Conditioners, as they simply recirculate the indoor air without any fresh air intake, which increases the probability of airborne infection spread apart from other issues. The last is having an appropriate window design in building byelaws to promote the openability of windows with a wire mesh so that fresh air intake is possible for airborne infection control.

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In India, the Judiciary is the guardian of the Citizen's right to Life, which includes the Right to a Healthy Environment under Article 21 of the Constitution of India[1][2][3]. The first author was the sole petitioner in the Delhi High Court for the implementation of dilution ventilation in public assembly buildings, which was directed by the Hon'ble Court to be treated as a representation to government authorities, including the Ministry of the Environment, the Ministry of Housing, the standard-making body, and the pollution control boards, among others[3]. One of the respondents, the Delhi Pollution Control Committee, stated that the Indoor Air is not within the Air (Prevention and Control of Pollution) Act, 1981, and hence not within the committee's mandate[4]. To clear the position of the law, on the basis of an application by the first author, the National Green Tribunal adjudicated in this matter and ruled that Indoor Air is within the purview of the Air Act, 1981[5]. In another application before the

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National Green Tribunal, which is India's fast-track environmental statutory court, the first author prayed for the inclusion of compulsory carbon dioxide monitoring in assembly buildings, among others, as a surrogate for the ventilation in a space. The Hon'ble Tribunal has directed a committee in the Central Pollution Control Board to issue guidelines/norms in this matter[6].

What is important to note is the significance of carbon dioxide measurement, which is recognised as a surrogate measure for the level of ventilation in an occupied space and is recognised as such in the National Building Code of India[7]. This level of carbon dioxide in a space, as a biomarker, has also been related to airborne infection risk, and models have been developed for predictive and retrospective modelling in this regard[8][9][10][11][12][13].

The problem stated by the second author in a news feature of Nature is that 'the general public has no idea' about the fact that a high carbon dioxide concentration in a space is 'a sign that the room has poor ventilation and could pose a risk for COVID-19 infection.'[13]

The solution to this issue of ventilation and its relation to the spread of airborne diseases like Tuberculosis and COVID-19, among others, can be mandatory carbon dioxide monitoring in enclosed public spaces and the display of the values in a conspicuous position so that all the inhabitants are aware of the levels and an awareness regime is started. Governments and municipalities around the world should take a cue from the work done by the judiciary in India in order to implement the groundwork so that we can ensure healthy indoor environments for our citizens.

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