Advancing Healthy Indoor Air: Five Leading Policy Models from Around the World

Lessons from a Comparative Analysis of the Global Indoor Air Quality Policy Landscape

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Advancing Healthy Indoor Air: Five Leading Policy Models from Around the World

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About the Report

This report is a joint publication of the Brown University Pandemic Center, International WELL Building Institute, and Air Club. Drawing on the Brown Pandemic Center's global survey of the indoor air quality policy landscape, this report maps how different countries govern indoor air quality and identifies five leading policy models for advancing healthy indoor air. This report is intended to support policymakers, government agencies, and advocates who want to advance healthy indoor air policies in their own jurisdictions, whether for issues related to public health, climate resilience, energy transition, or educational outcomes.

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Introduction: Learning from the Global Policy Landscape

Over the past several years, healthy indoor air has emerged as a major global public health priority, fueled by growing awareness of its profound impact on human health, well-being, and economic benefits. As governments, businesses, and communities seek to create healthier, more resilient indoor environments, attention has also turned to policymaking opportunities and designing new policies to accelerate progress. Around the world, policymakers have taken note and have helped establish a growing body of enacted policy, which, collectively, demonstrates a range of policy models for advancing healthy indoor air.

Reimagining Building Policy for Health

For more than two decades, sustainability has been a core focus of building policy, shaping how governments address energy, carbon, water, and resource use. Over the last several years, however, more and more policymakers are asking not only how buildings affect the planet, but also how they affect the people within them. As a result, building policy has expanded beyond a traditional focus on environmental performance to another imperative: improving human health. Across the global building policy landscape, the spaces and places where people spend 90 percent of their lives are now recognized as active determinants of health, influencing well-being, protecting safety, and supporting productivity.

Indoor air quality (IAQ), often seen as the front-door issue for healthy buildings, sits at the center of this expanded building policy agenda focused on supporting health and well-being. Because people spend the vast majority of their lives indoors, the quality of the air they breathe can have a profound impact on health outcomes. In fact, according to the World Health Organization, exposure to poor indoor air quality contributes to more than 3 million premature deaths each year, making it one of the world's most significant, yet often overlooked, indoor environmental risks.

A Growing Wave of IAQ Policy

What began as a handful of disparate policy efforts has evolved today into a growing wave of IAQ policy. Policy activity at both the national and subnational levels shows a diverse array of approaches and models to spur indoor air quality improvements, ranging from transparency to building codes and from incentives to regulatory approaches. While these policies vary in design, approach, and ambition, they share a common objective of working to accelerate the adoption of healthier indoor air while also providing benefits across pandemic preparedness, climate resilience, and economic productivity.

In many ways, these efforts represent a global laboratory of policy innovation, offering valuable insights into different policy mechanisms that support market adoption, change consumer behavior, mobilize investment, or create greater accountability. As governments begin to look to one another for proven solutions, these policies also form a practical menu of strategies that can be adapted, scaled, and replicated across different political, economic, and cultural contexts.

While real-world evidence demonstrates that no single policy or regulatory framework is sufficient to scale healthy buildings, the question isn't which single policy model works best, but rather how different policy approaches can work together to accelerate adoption, reward leadership, raise the floor of performance, and ultimately make these healthy building strategies and interventions more ubiquitous. Thus, this growing diversity of policy approaches represents a strength where these different models are able to reinforce one another and accelerate progress.

Global Initiatives Supporting Policy Coordination

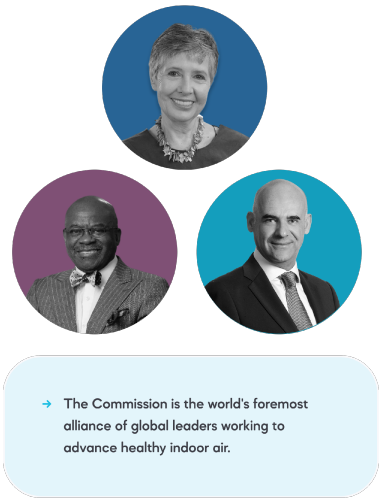
This policy momentum is also reflected in several major international initiatives launched in recent years to elevate healthy indoor air as a global public health and policy priority, most notably the Global Pledge for Healthy Indoor Air and the Global Commission on Healthy Indoor Air. These aligned efforts, both launched at United Nations Headquarters in September of 2025, share the goal of supporting decision-makers as they work to institutionalize healthy indoor air.

The Global Pledge for Healthy Indoor Air

France (H.E. Anne-Claire Amprou) and Montenegro (H.E. Mr Ervin Ibrahimović) signing the Global Pledge

The Global Pledge for Healthy Indoor Air is the first international commitment declaring that clean indoor air is fundamental for protecting health and safeguarding well-being. Government signatories include France, Montenegro, the City of Boston, and the City of Melbourne, alongside more than 270 organizations from across civil society, academia, and industry. Through the Global Pledge, Air Club is driving action at the highest levels of government to create a common platform for governments to signal their commitment to healthy indoor air, exchange best practices, and build international momentum.

The Global Commission on Healthy Indoor Air



Launched at the United Nations in 2025, the Global Commission on Healthy Indoor Air is an ambitious, solutions-focused initiative bringing together more than 200 leaders and experts from over 40 countries across public health, science, academia, policy, and industry to improve the quality of our indoor air. The Commission, stewarded by the International WELL Building Institute, is developing the first Global Framework for Action on healthy indoor air, a shared roadmap that establishes a global vision, guiding principles, and strategic priorities and recommendations for improving indoor air quality in buildings around the world. By convening leaders across sectors and disciplines, the Commission seeks to accelerate innovation, inform policy, unlock investment, strengthen public awareness, and advance solutions that improve health, well-being, and economic outcomes. Today, the Global Commission is the world's foremost alliance of leaders dedicated to advancing healthy indoor air as a public health, economic, and societal imperative.

Building on this shared commitment, Air Club, the International WELL Building Institute, and the Brown University Pandemic Center have partnered to better understand lessons emerging from the global policy landscape. The Brown Pandemic Center, building on the International Society for Indoor Air Quality's IAQ Guidelines Database, is developing the first database of indoor air quality policies. This report synthesizes information from the Brown Pandemic Center's database effort to map how different countries govern indoor air quality and identifies innovative policy models shaping progress around the world. The database, which will be released as a public resource shortly, is being built through a systematic review of national laws, regulations, building codes, government-issued guidance documents, and government programs. While not comprehensive, the database currently captures 158 indoor air quality policies across 40 countries, nearly one-third of which—51 policies in 27 countries—were enacted or amended in the last five years (2021–2026), signaling an increased pace of policy activity.

Five Leading Policy Models

Through a global survey of IAQ policies, it became clear that countries have pursued a wide variety of policy pathways, reflecting differences in national contexts, policy dynamics, and

other governance considerations. However, recurring patterns emerged, demonstrating innovative policy designs to address persistent gaps that are often observed in indoor air quality governance.

Common governance gaps for indoor air quality include:

- **Resource constraints** that prevent capital investments to make indoor air quality improvements.
- **Lack of transparency measures** leaving building occupants unaware of pollutant levels in indoor environments.
- **Lack of health-based, performance standards** for indoor air quality that are integrated into building codes, regulations, or legislation.
- **Silos between the various ministries and government agencies** involved in indoor air quality across health, energy, environment, education, housing, and labor.
- **Weak enforcement mechanisms**, resulting in inconsistent implementation of indoor air quality obligations and an exacerbation of health inequities.

Through an initial comparative analysis of these national and subnational policies from all around the world, this report identifies five of the world's leading, high-impact policy models that jurisdictions are using to advance healthy indoor air: 1) high-priority sectors, 2) transparency, 3) health integration, 4) national coordination, and 5) enforcement. Each of the five models corresponds with a well-established policy typology that characterizes government levers used to advance public policy goals, including financial, information, capacity-building, organizational, and regulatory tools (Table 1).[1] The models also vary in the political, institutional, and resource commitments they require, with targeted deployment programs in high-priority sectors offering a more accessible entry point than enforcement mechanisms that require a robust regulatory regime.

In addition, the report identifies leading jurisdictions that exemplify each of the five policy models, helping further illustrate how these approaches have been implemented, and providing lessons to help guide other governments as they consider adopting them. These models and their respective lessons for replication can serve as recommendations for governments, helping them adopt similar policies based on local considerations, goals, and capacity.

1. These policy typologies synthesize two foundational frameworks in the policy design literature: Christopher Hood's NATO typology of governing resources (nodality, authority, treasure, organization) and Schneider and Ingram's behavioral typology of policy tools (authority, incentive, capacity, symbolic/hortatory, and learning).

Table 1. Five Leading Models to Advance Healthy Indoor Air

Model	Core Elements	Policy Lever	Exemplar(s)
High-Priority Sectors	Targeted government/ philanthropic funding for high-priority sectors such as schools, hospitals, and long-term care facilities (actions include indoor air monitoring, air purifier installations, HVAC upgrades).	*Financial tools:* Positive payoffs (e.g., financial subsidies, tax credits) or penalties that change behavior by altering the cost-benefit calculus of a policy solution.	City of Boston, United Kingdom
Transparency	Indoor air quality monitoring to provide public transparency, including through certification and labeling schemes and public dashboards.	*Information tools:* Addresses deficits in information to enable policy actors to make decisions.	Belgium
Health Integration	Health-based considerations for indoor air quality embedded into building codes, energy performance certificates, and renovation requirements.	*Capacity-building tools:* Instruments that provide the means, infrastructure, or technical standards to enable desirable behavior.	European Union, United Arab Emirates
National Coordination	Multi-year national indoor air quality program led by a coordinating authority that aligns stakeholders across government agencies, academia, civil society, and industry.	*Organization tools:* Developing institutional capacity to coordinate, align, and deliver policies across agencies and stakeholders.	Finland
Enforcement	Binding regulation with health-based pollutant standards, mandatory monitoring and public disclosure, inspection authority, corrective orders, and penalties.	*Regulatory tools:* Binding rules that compel compliance through state authority.	South Korea, Taiwan

Model 1: High-Priority Sectors

Exemplars — *City of Boston, United Kingdom*

Policy lever — *Financial tools*

Healthy indoor air should be prioritized in settings serving vulnerable populations, including schools, daycares, nurseries, and long-term care facilities. Children are especially vulnerable to indoor air pollutants because their bodies are still developing, they breathe in more air relative to their body weight, and they are closer to the ground where pollutants are more concentrated.

As a result, schools are a high-priority sector for action on healthy indoor air. Schools represent one of the largest building sectors, representing 13.6 billion square feet in the United States alone, housing nearly one-fifth of the population every day, including students, teachers, and administrators. Students spend half their waking hours in classrooms, with millions of children and educators facing significant hazards from mold, heat, infectious diseases, pollutant exposure, and insufficient ventilation. These challenges are often compounded by chronic underinvestment spanning every region of the world. In the U.S., for example, school facilities face a nearly $90 billion annual facilities investment gap, demonstrating how difficult it can be to address aging infrastructure. Yet investments in healthy indoor air can drive powerful health and learning benefits, from improving test scores and reducing sick days and absenteeism to helping prevent infectious disease transmission and mitigating chronic disease, including asthmatic symptoms. The evidence is clear that ventilation and filtration interventions in schools deliver measurable gains for student health and learning, and at lower costs than traditional education interventions.

The City of Boston in the United States and the United Kingdom serve as excellent examples of how schools-focused policies can not only drive cost-effective indoor air improvements at scale but also serve as a catalyst for broader healthy indoor air policy.

City of Boston

The City of Boston, a signatory of the Global Pledge for Healthy Indoor Air, has established a comprehensive indoor air quality monitoring and improvement program across its public school system. Boston Public Schools (BPS) installed a district-wide network of 4,400 indoor air quality sensors to cover every classroom, main hallway, and nurse's office in over 120 schools. The sensors provide continuous monitoring data for CO_2, CO, $PM_{2.5}$, PM_{10},

temperature, and humidity. Data from those sensors is reported in real time on a publicly available dashboard to increase transparency.

Importantly, BPS has established an Indoor Air Quality Monitoring and Response Action Plan, with indoor air pollutant threshold limits and guidelines for managing indoor spaces where threshold limits are exceeded. BPS is also leveraging its sensor data to drive evidence-based decision-making for HVAC and facilities improvements. In the end, the monitoring program is saving BPS money by allowing it to both target its capital investments and bring in additional funding through grant programs. BPS has received over $22 million in funding from the Massachusetts Department of Elementary & Secondary Education, Massachusetts Clean Energy Center, Go Green Initiative, and National School Boards Association.

United Kingdom

Schools have been the focus of recent indoor air quality progress in the United Kingdom. The Department for Education (DfE) distributed approximately 300,000 CO_2 monitors between 2021 and 2023 to all state-funded education and care settings. In February 2026, DfE released ventilation and indoor air quality guidance for education and childcare settings, recommending good ventilation as CO_2 levels below 800 ppm, adequate ventilation as levels between 800–1,500 ppm, and poor ventilation as levels above 1,500 ppm.

Complementary initiatives include the Schools' Air Quality Monitoring for Health and Education (SAMHE) program, which deployed low-cost sensors in over 1,300 schools between 2022 and 2024 and continues to publish research from the data. The SAMHE program is a good example of how pilot deployment projects in schools can be paired with research and evidence generation.

At the city level, the Mayor of London, Sadiq Khan, has made clean air policies a central part of his administration's agenda. In October 2025, he launched a £2.7 million program to upgrade air filters to HEPA standard in at least 200 London schools.

Figure 1. *Indoor air quality sensors deployed by the Schools' Air Quality Monitoring for Health and Education program in the United Kingdom. Low-cost sensors measuring carbon dioxide, total volatile organic compounds, particulate matter, temperature, and relative humidity were deployed in over 1,300 schools.*

Credit: samhe.org.uk/resources/media

Lessons for Replication

- Schools are an important setting to prioritize for deployment programs (air purifier installations, air quality monitoring, and filtration upgrades) because benefits extend across health, learning, student absenteeism, pandemic preparedness, and climate resilience.
- Government grant funding and philanthropic funding can target indoor air quality improvements in schools, while broader policy changes are being developed.
- Schools-focused deployments can be designed with research partnerships from the beginning to generate evidence and inform wider scale adoption.
- Governments can publish indoor air guideline values for CO_2, $PM_{2.5}$, CO, ventilation rate, and minimum filtration (e.g., MERV-13 or higher) in schools. In addition, educational resources tailored for students and teachers can help them understand the importance of indoor air quality, monitor readings, and identify options for improving indoor air quality.

Model 2: Transparency

Exemplar — Belgium

Policy lever — Information tools

Most building occupants are unaware of pollutant levels in indoor environments. For years, many indoor air advocates have argued for advancements to "make the invisible visible," an idea that by simply making the quality of indoor air more visible will help drive change. Continuous monitoring of indoor environments do that. Deploying continuous monitoring provides that transparency, which then supports greater public awareness and accountability. While these technologies may have been cost prohibitive in the past, current technology allows for low-cost monitoring of key indoor air quality metrics, including CO_2, $PM_{2.5}$, and CO. However, most countries do not have indoor air quality monitoring networks or guidance for how they could be established. Belgium's Law of 6 November 2022 (The Clean Air Law) offers a model for public transparency and monitoring that other countries can replicate.

Belgium

Belgium's Clean Air Law treats indoor air quality as a right-to-know issue by implementing CO_2 monitoring, certification, and labeling in all closed spaces accessible to the public. Belgium has traditionally treated indoor air quality as a workplace health issue, dating back to the Act of 4 August 1996, which required employers to keep workplace CO_2 below 900 ppm. The Clean Air Law marks a fundamental shift, expanding the legal framework from workplaces to roughly two million indoor spaces accessible to the public.

The Clean Air Law is built on four pillars:

- **Reference levels:** The law defines two reference levels for CO_2 concentration: Level A (below 900 ppm) and Level B (below 1,200 ppm). These levels are initially voluntary but provide a benchmark against which indoor air quality can be assessed.
- **Monitoring and action plans:** Operators are encouraged to install CO_2 monitors, assess indoor air pollution risks, and implement action plans to improve indoor air quality.
- **Certification and labeling:** Each public space must display a label informing occupants that indoor air quality is being measured and controlled, turning monitoring data into public information.
- **Indoor Air Quality Platform:** a permanent advisory body bringing together scientists, public authorities, and industry representatives. The platform provides guidance,

recommends updates to reference levels, and ensures that policy evolves with new evidence and technology.

Critically, the Clean Air Law uses a phased approach. Operators may apply the law on a voluntary basis through the end of 2026, but starting January 1, 2027 the measures will gradually become mandatory. The phased approach lowers implementation barriers, helping the market prepare for adoption and giving building managers time to comply.

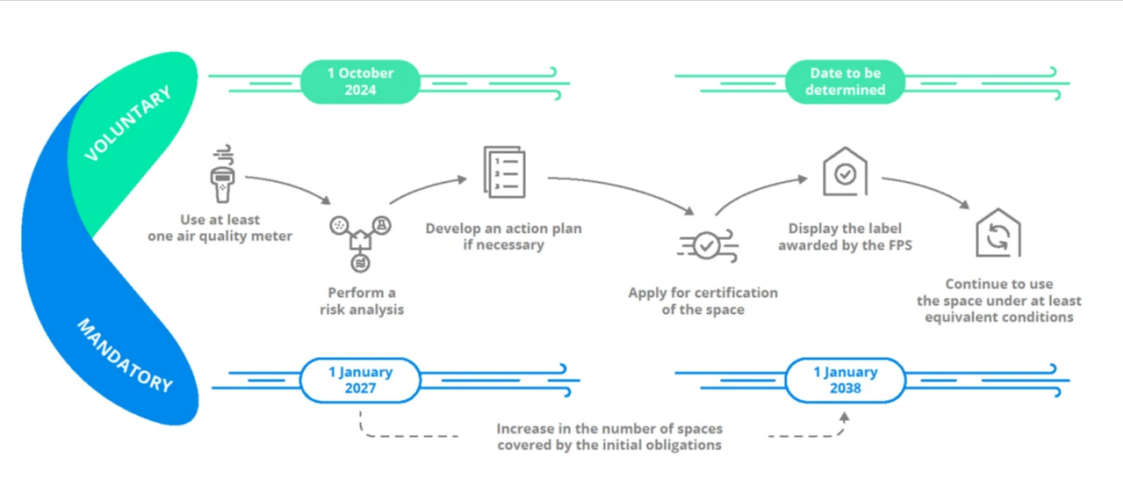


Figure 2. *Obligations and responsibilities of Belgium's Clean Air Law. Belgium is taking a phased approach to implementation with obligations becoming gradually mandatory starting from 1 January 2027.*
Credit: FPS Health, Food Chain Safety and Environment

Lessons for Replication

- CO_2 and $PM_{2.5}$ monitoring are low-cost, scalable technologies to assess indoor environments.
- Make monitoring data public either through dashboards or a certification and labeling scheme to frame indoor air quality as a right-to-know issue that drives public demand for healthy indoor air.
- Pair monitoring data with risk assessments and action plans, so that data leads to actionable improvements in indoor air quality.
- Phased approaches that begin with voluntary indoor air quality improvements and introduce mandatory requirements over time may be more politically feasible and give the market time to adjust.

Model 3: Integrating Health into Building Performance

Exemplars — European Union, United Arab Emirates

Policy lever — Capacity-building tools

Governments are embedding indoor air quality requirements into existing building performance frameworks, building codes, certification systems, and inspection regimes. Traditionally, building performance frameworks have focused on energy, sustainability, and decarbonization, while the health of building occupants was considered a separate domain or not considered at all. However, governments are bridging the divide between energy efficiency and public health by integrating indoor environmental quality, of which indoor air quality is one part, into building performance.

Building codes, which govern the construction of new buildings, additions, and renovations, are an especially powerful tool that governments can use to ensure that mechanical ventilation standards conform to health-based standards. Governments can also ensure that building codes include operations and maintenance requirements so that ventilation is regularly assessed.

The European Union and the United Arab Emirates are taking actions to integrate health and indoor air quality into building policy.

European Union

In 2024, the EU recast the Energy Performance of Buildings Directive (EPBD) to include, for the first time, explicit requirements for indoor environmental quality (IEQ), including indoor air quality, alongside long-standing priorities of energy efficiency and decarbonization. This marks a landmark policy shift: the EPBD is the first binding energy performance framework at the national or supranational level to explicitly integrate health-relevant indoor air quality considerations into building policy.

The 2024 recast expands the EPBD to provide a legally binding pathway for Member States to reconcile energy performance and public health equally within building design. The recast EPBD requires EU Member States to:

- Establish national standards for indoor environmental quality, including parameters such as ventilation, humidity, temperature, and the presence of contaminants (Article 13).

- Require indoor air quality monitoring and control systems in new non-residential zero-emission buildings, including offices, hospitals, and schools. Monitoring is also required during major renovations where technically and economically feasible (Articles 7 and 13).
- Take into account optimal indoor environmental quality when setting minimum energy performance requirements, "in order to avoid possible negative consequences such as inadequate ventilation" (Article 5).
- Include recommendations for IEQ improvements as part of energy performance certificates (Article 19).

The EPBD does not specify how Member States must meet these requirements, only that they must transpose them into their national laws by May 2026, with some Member States behind on meeting this deadline.

United Arab Emirates

The United Arab Emirates (UAE) has translated national frameworks for indoor air quality into technical regulations that integrate health-based ventilation standards into building codes. The Ministry of Energy and Infrastructure (MoEI) is integrating ASHRAE standards 62.1-2022 and ASHRAE 241 into all government buildings across the UAE. In addition, Dubai is adopting these ASHRAE standards for both retrofits and new constructions.

- **ASHRAE 62.1-2022** sets minimum ventilation requirements to ensure indoor air quality acceptable to human occupants and to minimize adverse health effects in commercial, institutional, and high-rise residential buildings.
- **ASHRAE 241** establishes minimum ventilation requirements to control infectious aerosols to reduce the risk of disease transmission, especially during periods of elevated infection risk.

In 2024, the MoEI completed a pilot project implementing ASHRAE Standards 241 and 62.1-2022 at the Daba Fujairah Court and Prosecution. The pilot project demonstrated improvements in indoor air quality and a 35% reduction in energy use from mechanical ventilation systems, demonstrating health and energy co-benefits from improving indoor air quality.

The UAE's integration of health-based indoor air quality standards into building codes is informed by UAE's National Air Quality Agenda 2031, launched in 2023 by the Ministry of Climate Change & Environment and Cabinet Resolution No. (86) of 2023. The National Air Quality Agenda 2031 outlines four key focus areas for the effective monitoring, management,

and mitigation of air pollution: outdoor air quality, indoor air quality, ambient odor, and ambient noise.

Lessons for Replication

- Governments can lead by example by improving indoor air quality in buildings they own, operate, and fund to create broader market demand for healthy indoor air.
- Rather than creating new policies, indoor air quality can be integrated into existing building performance frameworks, including building codes, energy performance systems, certification schemes, and renovation requirements. Indoor air quality should be considered a core indicator of building performance.
- Indoor air quality can be aligned with energy efficiency and decarbonization goals, creating health and sustainability co-benefits.
- Implementing indoor air quality requirements for retrofits and major renovations can help ensure that improvements extend to the existing building stock, not only new buildings.
- Technical standards developed by bodies like ASHRAE provide useful benchmarks for ventilation and indoor pollutant levels.

Model 4: National Coordination

Exemplar — Finland

Policy lever — Organization tools

Indoor air quality is a broad and cross-cutting topic, with government responsibility often fragmented across multiple agencies responsible for health, energy, environment, education, housing, and labor. An additional layer of complexity is introduced when considering divided responsibilities between national and subnational governance bodies. The fragmented nature of indoor air governance means that oftentimes no single agency is responsible for indoor air quality outcomes, leading to inconsistent implementation and enforcement. To address this challenge some countries have established coordination mechanisms to unify indoor air governance.

Finland

Finland's action on indoor air quality is organized through the Indoor Air and Health Programme 2018–2028, which serves as a coordinating body led by the Finnish Institute for Health and Welfare to provide information to the public, manage indoor air in buildings, improve the treatment and support of illnesses associated with indoor environments, and educate and train professionals. The Finnish Indoor Air and Health Programme is being implemented in phases with the second phase currently underway:

- **Phase 1 (2018–2022):** Implemented actions across four areas: informing the public through evidence-based tools and guidance; improving how indoor air problems in buildings are managed; supporting people with indoor air-related symptoms and illnesses, including through new rehabilitation clinics; and training healthcare professionals, occupational health specialists, employees, and indoor environment experts.
- **Midterm Evaluation (2023):** Found measurable reductions in indoor-air health complaints, an increase in public knowledge, and increased satisfaction with municipalities' indoor air actions.
- **Phase 2 (2023–2028):** Focused on ensuring that the large number of guidelines and training materials produced in phase 1 will be integrated by municipalities, healthcare systems, and the private sector. A final assessment will be conducted in 2028.

The program, while led by the Finnish Institute for Health and Welfare, was designed with consultation from over 25 state agencies and civil society organizations. In addition,

programme functions are implemented by multiple Finnish ministries, municipal governments, research institutions, and private sector partners. For example, the programme steering group has representation across 15 distinct Finnish ministries and NGOs, the expert group has representation across various healthcare professionals, and the programme secretariat has representation across 8 different ministries and organizations. The Finnish Indoor Air and Health Programme serves as a best practice for how to successfully coordinate across different stakeholders who all have responsibilities over various aspects of the indoor air quality ecosystem.

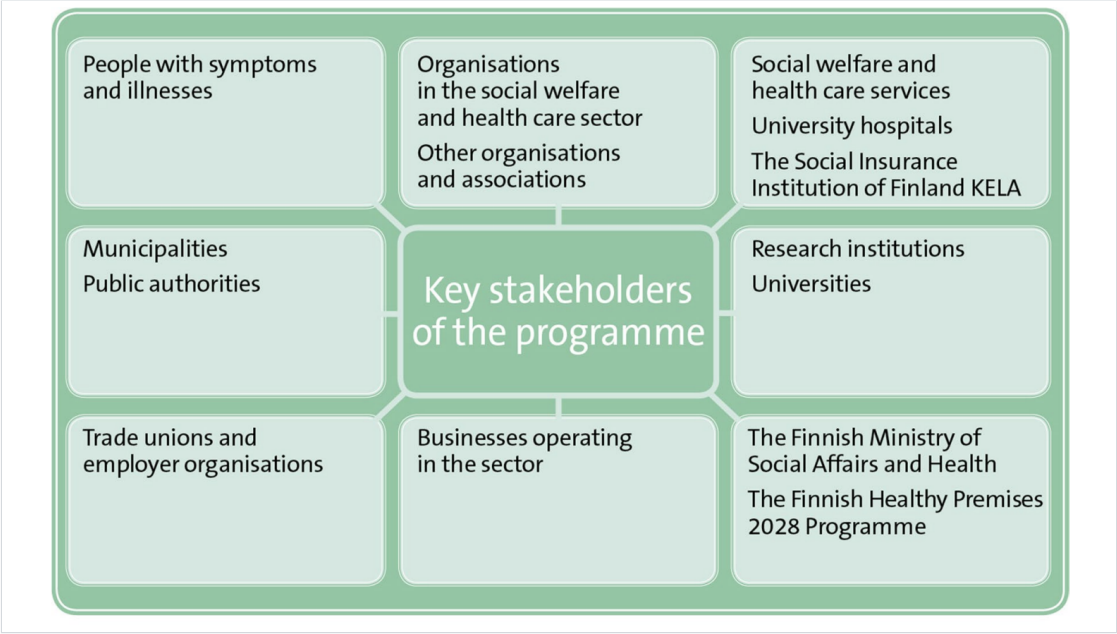


Figure 3. *Key Stakeholders of the Finnish Indoor Air and Health Programme.*
Credit: Finnish Institute for Health and Welfare 2019

Lessons for Replication

- Designate an indoor air quality coordinator or establish a dedicated indoor air quality program to ensure coordination across government agencies.
- Develop a multi-year national strategy for indoor air quality, with actions assigned to specific government agencies and program evaluation criteria.
- Engage a broad range of stakeholders in the development of indoor air quality programs, from across government agencies, industry, civil society, and academia.

Model 5: Dedicated Indoor Air Quality Law with Enforcement

Exemplars — *South Korea, Taiwan*

Policy lever — *Regulatory tools*

Indoor air quality legislation with binding health-based pollutant standards, supported by enforcement and monitoring mechanisms, represents one of the most robust pathways for advancing healthy indoor air. Currently, global frameworks for indoor air quality are largely based on voluntary guidelines and standards, resulting in a compliance gap where compliance is left to the discretion of employers and facility managers. Binding indoor air quality legislation can ensure health equity by empowering government authorities to monitor and enforce uniform compliance with regulatory frameworks.

South Korea

South Korea has implemented legislation on indoor air quality dating back to 1996, making it the first country in Asia to legislate on the topic. South Korea's current indoor air quality framework is grounded in the Indoor Air Quality Control Act, which was originally enacted in 1996 as the "Air Quality Control in Underground Locations Act," expanded in 2004 to cover "Indoor Air Quality Control in Public Use Facilities," and renamed and most recently updated in 2024.

The Act applies to general public facilities, facilities serving sensitive populations, and newly constructed multi-family housing. It establishes two tiers of control: maintenance standards for general public facilities and more stringent recommended standards for sensitive populations. Key requirements include:

- **Mandatory monitoring** of pollutants subject to maintenance standards (e.g., particulate matter, carbon dioxide, formaldehyde, total bacteria counts, and carbon monoxide) and semi-annual monitoring of additional pollutants, with records retained for 10 years.
- **Inspection authority** allowing government officials to request monitoring records or enter regulated spaces to gather pollutant data.
- **Public disclosure** of inspection results when pollutant levels exceed legislated standards.
- **Improvement orders** that require facility owners to take corrective action, such as upgrading air purifiers or ventilation equipment, within a specified time frame.

- **Penalties** both in the form of criminal repercussions (imprisonment with prison labor for up to one year) and administrative fines (up to $13,000 USD for certain violations).

The Seoul Metropolitan Government has established even more comprehensive regulations for indoor air quality through the "Indoor Air Quality Control at Public Use Facilities: Clean Air for All," including a Clean Indoor Air Certification System and an Indoor Environment Management System that publicly discloses air quality data in all public use facilities. Seoul has also deployed indoor air quality sensors ($PM_{2.5}$, PM_{10}, CO_2, temperature, and humidity) and air purifiers across its metro system. Sensor data is publicly shared via a dashboard and integrated into building management systems to make dynamic ventilation adjustments.

South Korea demonstrates many of the aspects necessary for a robust enforcement system: statutory obligations, monitoring, inspection capacity, public disclosures, corrective orders, and escalating penalties.

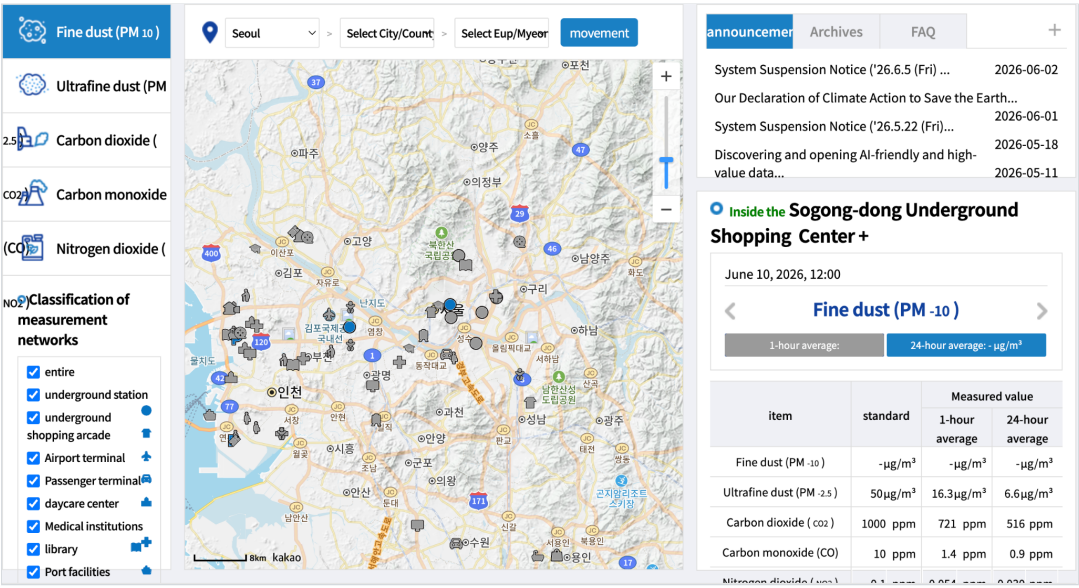


Figure 4. *Snapshot of indoor air quality monitoring dashboard across metro stations, theaters, and other public spaces in Seoul, South Korea.*
Credit: inair.or.kr/info

Taiwan

Taiwan has also enacted dedicated indoor air quality legislation, with the Indoor Air Quality Management Act (2012) establishing a binding national framework that combines enforceable pollutant standards, continuous monitoring, public disclosure, and direct government enforcement.

The Act establishes clear standards and requirements for maintaining indoor air quality in controlled public and private premises (e.g., entertainment venues, government offices, transportation hubs, etc.) across Taiwan. The Taiwan Government has gradually increased the number of controlled spaces the Act applies to, allowing facilities time to comply with the new requirements. The Taiwan Environmental Protection Administration (EPA) is responsible for setting and periodically updating indoor air quality standards based on the latest scientific research and public health needs. The standards include permissible limits for pollutants such as CO_2, CO, $PM_{2.5}$, PM_{10}, formaldehyde, total volatile organic compounds (TVOCs), bacteria, fungi, and ozone.

Under the Act, building owners and facility managers of controlled spaces must:

- Establish indoor air quality maintenance and management plans, designating personnel responsible for compliance.
- Conduct regular indoor air quality inspections and measurements through certified laboratories.
- Maintain records and make them available to EPA inspectors.
- Publicly disclose indoor air quality conditions in controlled spaces.

The Taiwan EPA can conduct on-site inspections, review measurement records, and impose fines for non-compliance. Continuous monitoring is required in high-priority locations such as schools, hospitals, and transportation hubs, with results displayed publicly. Taiwan's requirement for continuous monitoring in high-priority spaces goes a step beyond South Korea's periodic monitoring model.

Lessons for Replication

- Anchor legislation in mandatory, health-based standards for key pollutants ($PM_{2.5}$, CO_2, CO, NO_2, and TVOCs).
- Phase in coverage, starting with high-priority sectors, such as schools, hospitals, transportation hubs, childcare centers, eldercare facilities, and other spaces serving sensitive populations, before expanding to a wider range of public spaces.
- Prioritize continuous monitoring in high-priority spaces, paired with public disclosure (on-site display, dashboards, or certification systems) and inspection authority to verify measurements and identify non-compliance.
- Integrate enforcement and implementation infrastructure into legislation: corrective orders, criminal and administrative penalties, workforce training, dedicated funding, and compliance guidance.

Conclusion: Strengthening the Policy Ecosystem for Healthy Indoor Air

Indoor air quality governance is advancing through a diverse set of models. As noted, these models are not meant to be mutually exclusive. Rather, these models reinforce one another and, together, help strengthen the policy ecosystem for healthy indoor air. Most jurisdictions will require some combination of approaches from each of the models depending on existing legal frameworks, political feasibility, and resource constraints.

Model approaches from Belgium's monitoring and public transparency policy; the City of Boston's and United Kingdom's schools-focused deployment; the European Union and United Arab Emirates' integration of health into building performance frameworks; South Korea's and Taiwan's comprehensive legislation; and Finland's national coordination program show that indoor air quality advancements can be made through a variety of approaches. Each of these models represents a powerful strategy for driving awareness, accountability, investment, and ultimately market adoption. By highlighting these important examples of innovative policymaking, the report equips policymakers with proven strategies, informs future policy development, and supports the adoption of similar approaches in other countries.

Moving forward, this initial comparative analysis will be expanded through a deeper examination of the global IAQ policy database, exploring how indoor air quality governance varies across policy instruments, objectives, and outcomes. By uncovering broader trends and transferable lessons, we aim to equip policymakers with a stronger foundation for informed decision-making. In addition, the forthcoming publication of the global database will create opportunities for future research. Beyond supporting comparative analysis, a database of country IAQ policies can also provide a platform for research that examines how different policy architectures translate into real-world implementation and improvements in health outcomes.

About the Partners

The Brown University Pandemic Center works to prevent and reduce the harms of pandemics and other biological emergencies by generating evidence, strengthening decision-making, and translating research into effective policy and practice. Uniquely positioned at the intersection of public health, national security, economics, and other disciplines, the Center takes a whole-of-society approach to pandemic preparedness, response, and resilience. Through partnerships with governments, nonprofit organizations, the private sector, and the media, it aims to advance practical solutions that save lives, improve equity, and reduce catastrophic biological risks in the United States and around the world. This report is a product of the Clean Indoor Air Initiative at the Pandemic Center, launched in 2024 with the recognition that clean indoor air is essential for health, productivity, and economic growth.

The International WELL Building Institute (IWBI) is a public benefit corporation and the global authority for transforming health and well-being in buildings, organizations, and communities. In pursuit of its public-health mission, IWBI mobilizes its community through the development and administration of the WELL Building Standard (WELL), WELL for residential, WELL Community Standard, its WELL ratings, and management of the WELL AP credential. IWBI also translates research into practice, develops educational resources, and advocates for policies that promote people-first places for everyone, everywhere. More information on WELL can be found here.

Air Club is a global coalition of indoor air quality champions working to make indoor air healthy. It's a global movement. Air Club launched the Global Pledge for Healthy Indoor Air, which calls on governments and organizations to prioritize this crucial issue. Air Club aims to add indoor air quality to the agenda of major international gatherings and meetings, to ensure leaders everywhere are brought into the movement and become inspired to act. Air Club is a community that encourages the sharing of information, experiences, insights and lessons learned. Whether you serve in government, conduct research, spread awareness, develop innovative solutions, work with policymakers, or play another crucial role in indoor air quality, you are invited to join Air Club. Learn more and join at airclub.org.