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Australian Academy of Science

Australian Academy of Science submission on
Australia's Productivity Pitch, Pillar 4: Delivering quality care more efficiently

Poor indoor air quality negatively impacts the health, wellbeing and productivity of Australians. The scientific evidence base for the impacts of indoor air quality is strong and solutions are available with current technologies. Clean indoor air would safeguard public health, promote equity, enhance productivity, strengthen workplace safety and reduce the burden on the health system from pollution-related illnesses.

The Academy recommends national, coordinated action on managing indoor air quality as a population-level prevention initiative to enhance Australia's productivity, including:

- establishing enforceable indoor air quality performance standards, underpinned by health-based guidelines aligned with World Health Organisation (WHO) recommendations and adapted to Australia's context.
- creating a multidisciplinary taskforce to provide expert advice on the development, implementation, and monitoring of indoor air quality standards.
- leveraging and strengthening existing policy mechanisms—such as the National Construction Code, the National Clean Air Agreement, workplace safety obligations and the NABERS rating system—to improve indoor air quality.

This submission focuses on the 'A national framework to support government investment in prevention' area of Pillar 4. While there are many areas that the Academy has expertise in and could comment on in relation to delivering quality care, this submission highlights indoor air quality where the Academy has taken a leading role in evidence-based advocacy and policy development.

Investing in indoor air quality is improving productivity

Poor indoor air quality can expose Australians to harmful pollutants, undermining health, wellbeing, productivity and public safety, with risks highlighted during the COVID-19 pandemic and 2019–20 bushfires.

Air pollution is a well-established threat to human health and wellbeing and most exposure to air pollution occurs indoors, where people spend around 90% of their time.[1] Short-term health impacts include irritation of the eyes, nose, throat and skin and neurobehavioral symptoms (e.g. difficulty concentrating) as well as exacerbation of asthma and allergy symptoms.[2,3] As such, improved indoor air quality can provide immediate improvements to wellbeing, comfort, cognition and performance, and thus productivity. Long-term health impacts include elevated cancer and cardiovascular disease risk.

Airborne transmission of infectious respiratory diseases is another consequence of inadequate indoor air quality, and controlling it is a key health and productivity benefit, particularly in reducing absenteeism. Absenteeism in the early childhood, schools and aged care setting, in particular, is a significant issue with flow on impacts across families and the community. Improving indoor air quality could deliver a benefit-cost ratio of 1.5-3.1 per year, based solely on the prevention of COVID-19 and subsequent long COVID cases.[4] The benefit-cost ratio is likely to be high when considering illnesses caused by other airborne pathogens. The Facilities Management Association of New Zealand estimated total benefits between NZ$776 million and NZ$1.15 billion over ten years from reduced sickness in offices and productivity gains from improved indoor air quality.[5] Improved indoor air quality would also increase the accessibility of indoor spaces for people living with health conditions that increase their risk from airborne pathogens and other air pollutants.

Controlling indoor air quality would reduce the burden on the health system. Exposure to air pollution is a risk factor for certain types of cancer and cardiovascular disease.[2,6,7] There is also evidence that indoor air pollution exacerbates asthma and influences the development of childhood asthma.[8] International data shows a significant health burden from indoor air pollution measured through disability-adjusted life years (DALYs), which measure the number of years lost to ill-health, disability or death in a population.[9,10,11 12] The most recent study found 14.1% of annual DALYs are attributable to exposure to indoor air pollution in residential buildings, costing China approximately US$411 billion or 3.45% of the country's gross domestic product (GDP).[13] In France, a tentative estimate of the cost of indoor air pollution associated with six pollutants in 2004 was €20 billion and represented 1% of GDP.[14]

Policy pathways to improve indoor air quality in Australia

Indoor air quality is a multi-disciplinary, multi-jurisdictional and multi-portfolio issue, spanning environment, health, disability, workplace relations, industry, science, infrastructure and education. It belies neat categorisation and has had no clear home within government and no single authority responsible for it. A framework for government investment in prevention is needed that allows for progress on issues that do not neatly fit within one area of government, in order to urgently achieve meaningful action.

Acting now will future-proof Australia's indoor environments against worsening environmental risks, strengthen workplace safety and build public trust through transparent, evidence-based standards.

The Academy will publish a report later this year expanding on the available policy pathways to improve indoor air quality in Australia.

Introduce enforceable indoor air quality performance standards and monitoring

Australia must establish indoor air quality standards, supported by expert advice to protect public health, boost productivity, and strengthen national resilience.

The Academy recommends the introduction of enforceable indoor air quality performance standards in Australia. These standards should draw on the World Health Organisation guidelines and be adapted to the Australian context. The World Health Organisation's global air quality guidelines are evidence-based, drawing on epidemiological, toxicological, and environmental studies conducted worldwide. They are not mandated but they are considered the best basis for national indoor air quality standards.

Indoor air quality monitoring is essential for controlling and regulating indoor air, and a measurement framework must accompany enforceable standards. A consensus publication by international indoor air quality scientists has proposed a pragmatic blueprint for measuring indoor air quality in public buildings that can underpin enforceable indoor air quality standards.[15] It proposes four key parameters, based on well-established scientific principles, that can be measured using low-cost sensors.

Establish a taskforce to advise on the design and implementation of indoor air quality standards

Expert scientific advice will be a critical input to all investments under a government framework for improving indoor air quality. Indoor air quality is a multidisciplinary challenge, requiring expertise from various fields, including aerosol scientists, engineers, epidemiologists, public health experts, health practitioners, environmental and climate change scientists, occupational health and hygiene specialists, facility managers, economists, and sustainability and energy efficiency experts.

The Academy recommends that a multidisciplinary taskforce be established to provide expert advice on the development, implementation, and monitoring of indoor air quality standards. Similar recommendations have been made by the inquiry into long COVID and repeated COVID infections by the Standing Committee on Health, Aged Care and Sport and leading scientists in the field.[16,17]

Embed in indoor air quality management across portfolios through existing mechanisms

Australia has a range of existing mechanisms that could be enhanced and leveraged to improve indoor air quality spanning multiple portfolios. For example, indoor air quality could be linked to existing work health and safety obligations by mandating a reporting standard for workplace indoor air quality. Similarly, indoor air quality could be acknowledged as an accessibility issue and linked to disability policy. Australia's National Construction Code standards relevant to indoor air quality could be strengthened. To incentivise industry improvements, Australia's National Australian Built Environment Rating System (NABERS) indoor environment rating could be expanded to place greater emphasis on indoor air quality, or a new indoor air quality-specific rating could be developed. Australia could also leverage mechanisms for outdoor air, such as the expanding the National Clean Air Agreement to include indoor air quality.

To discuss or clarify any aspect of this submission, please contact science.policy@science.org.au.

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