

INTERNATIONAL INDOOR AIR QUALITY GUIDELINES – A REVIEW

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INTRODUCTION

Poor indoor air quality (IAQ) has been linked to the development of health conditions such as asthma, and cancer¹, with 3.2 million deaths across the globe attributed to household air pollution in 2020².

Australia, amongst other countries, lacks comprehensive IAQ guidelines. This poster summarises selected existing international residential and non-occupational IAQ guidelines, alongside recommended pollutant exposure times and concentrations globally, with the aim of assisting in informing an Australian regulatory framework.

METHODOLOGY

This review has been conducted using qualitative research via review of grey and peer-reviewed literature including policy documentation, government websites, and peer-reviewed journal articles.

RESULTS

Of the countries assessed, 9 were selected for final review.

Many international recommended exposure times were found to be guided by the World Health Organisation guidelines for selected indoor air pollutants (2010) and household fuel combustion (2014). Despite this, significant variation was observed across global recommended exposure times.

RESULTS Continued

Through results found, the following pollutants were deemed to be of high relevance and subsequent focus for this review;

- particulate matter (e.g. PM₁₀, PM_{2.5}),
- ultra fine particles,
- nitrogen dioxide (NO₂),
- VOCs e.g. benzene, toluene, ethylbenzene, xylene,
- formaldehyde,
- carbon dioxide, and
- carbon monoxide.

Pollutant	Averaging time	No. of Guidelines	Minimum / maximum
PM2.5	24 hours	5	25µg/m ³ / 75µg/m ³
	1 hour	1	100µg/m ³ / 100µg/m ³
Formaldehyde	24 hours	1	100 µg.m-3 / 100 µg.m-3
	1 hour	2	100 µg/m ³ / 123 µg/m ³
Carbon Monoxide	24 hours	4	7 mg/m ³ / 11.5 mg/m ³
	1 hour	7	10 mg/m ³ / 35 mg/m ³

Table 1 Guidelines and range of recommended pollutant concentrations dependent on exposure time, for PM_{2.5}, Formaldehyde, and Carbon Monoxide.

CONCLUSION

Many countries rely upon WHO guidelines.

There were nine countries with independent indoor air quality guidelines for a range of pollutants which could be relevant and adopted in Australia.

Further regulatory efforts are required to ensure safe IAQ exposure in households around the world.

Due to variation in recommended exposure limits across the globe, guidelines that exist in regions with climates similar to those within Australia, could be of highest relevance when informing a potential Australian regulatory outcome.

References: 1. Victorian State Government Department of Health. (2018). *Your health: Report of the Chief Health Officer, Victoria, 2018*. <https://www.health.vic.gov.au/your-health-report-of-the-chief-health-officer-victoria-2018> 2. World Health Organisation. (2022). *Household air pollution*. [https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health#:~:text=Household%20air%20pollution%20exposure%20leads,\(COPD\)%20and%20lung%20cancer.](https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health#:~:text=Household%20air%20pollution%20exposure%20leads,(COPD)%20and%20lung%20cancer.)

Images 1 and 2: Combustion activities are a common source of household pollutants such as particulate matter, and carbon monoxide.



Image 1. ABC Science. (2022). *Cooking with gas? Research finds health and emission risks even when stoves are off*. [image]. <https://www.abc.net.au/news/science/2022-01-27/gas-cooker-methane-leak-climate-change-asthma/100777076>



Image 2. Wyoming Department of Health. (2020). *Hand lighting candle* <https://health.wyo.gov/hand-lighting-candle/>