



The health impact of dampness and mould in the home

Poor indoor air quality – caused in part by dampness and mould – is recognised globally as a common problem and a major cause of ill health.^{1,2}

In Australia, people spend about 90% of their time indoors³ – even more during the ongoing COVID-19 pandemic. The quality of the air we breathe is an important determinant of health and wellbeing.

Dampness and mould in homes are exacerbated by extreme weather conditions such as storms, heavy rainfall, and flooding. These events are set to increase as a result of the climate crisis, making the need to reduce dampness and mould in homes increasingly important.⁴

What is dampness and mould?

Dampness

The presence of excessive moisture. An increase in damp indoor conditions encourages mould growth.

Mould

Moulds are microscopic fungi that can grow on surfaces. There are many different species of mould. Some are considered toxic because the chemicals they release affect human health.

Both dampness and mould are affected by:

- the indoor and outdoor environment (temperature, humidity)
- building characteristics (ventilation, dwelling construction type, building materials, quality of build)
- occupants' behaviour (whether people use the extractor fan while cooking or bathing).⁴

Mould is naturally present in all indoor and outdoor spaces and usually poses no problem to humans. When mould grows where it is unwanted, such as inside a house, it is considered a form of microbial pollution.⁴

How do dampness and mould affect health?

Many of us know someone whose asthma is triggered by exposure to mould. While the lungs are an obvious target for this airborne irritant, they are not the only system affected by mould.

Mental health

Living with mould or living in a damp house has been associated with negative mental health effects, with studies showing that people who live in mouldy homes report more severe depression and anxiety symptoms.⁷⁻⁹ Of course, this association is likely partly to do with a range of factors correlated with living with damp and mould including poor housing condition, odour, and deterioration in health – nonetheless these indirect pathways are important.

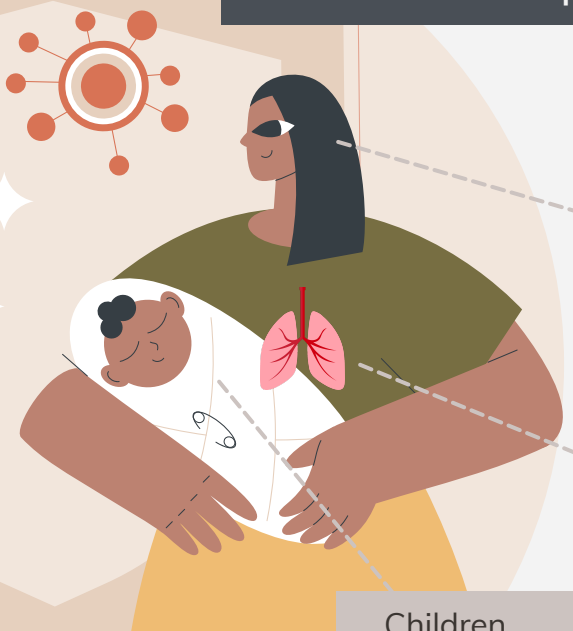
Children

Early exposure to indoor mould in childhood has been associated with the development of asthma, allergy, nasal obstruction, and poorer cognitive function.^{10,11} It is estimated that 7.9% of asthma in Australian children is caused by indoor dampness.¹²

Since asthma and allergies are on the rise, dampness and mould are having a corresponding increase in impact.¹³

Respiratory

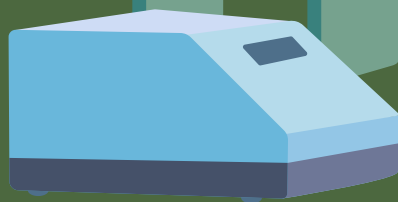
Evidence demonstrates that exposure to dampness and mould in the home is associated with a range of adverse health outcomes, including increased risks of asthma, respiratory infections and symptoms, hypersensitivity pneumonitis, allergic alveolitis, and immunological reactions.^{5,6}



Measuring dampness and mould

There is a lack of consistent, evidence-based guidelines for the assessment of mould in Australia.¹ The main methods for assessing the presence of mould are:

- physical inspection
- air sampling
- surface sampling



However, there is no current global consensus on what level of mould exposure is tolerable or acceptable. The World Health Organization (WHO) stipulates that no level of exposure is considered safe.⁵

Unequal impacts: who is most affected?

Dampness and mould are likely to be particularly prevalent in:

- poorly maintained, low-income housing⁵
- private rental and social housing tenures where dwellings are in a poor state of repair

Poor housing conditions are more common among people who already experience health issues. Improving housing will likely lead to a significant improvement in public health.

Gaps in current guidance

In its recently released *Housing and Health Guidelines*, the WHO recommends that dampness and mould are prevented or fixed early to minimise harmful exposure.⁵

This guidance is particularly relevant in Australia, where the WHO suggests that anywhere between 10–50% of households are impacted by this issue.⁴

Building standards

Australian state and territory governments provide advice on dealing with dampness and mould in the home, but current building codes do not focus on preventing dampness.¹⁴

Without mandated standards, we continue to see practices in design, building and maintenance that exacerbate dampness and mould.¹⁵

Rental regulations

Tenancy regulations vary across Australia. Some states and territories have begun to address the issue of dampness and mould in rental housing. For example, in 2021 Victorian law was changed to mandate that premises 'must be free from mould and damp caused by or related to the building structure' and allows tenants to log an urgent repair request where structural issues (such as leaking roofs or plumbing) lead to mould.¹⁶

Poor ventilation and cold housing are both causes of mould. Future government regulations could reduce dampness and mould by introducing standards for ventilation, heating, and thermal efficiency. The New Zealand Government introduced standards along these lines that took effect in July 2021.¹⁷ Thermally efficient homes have the added benefit of using less energy to heat and cool, leading to reduced resource consumption.



References

1. House of Representatives Standing Committee on Health, A.C.a.S., *Inquiry into Bioterrorism-related Illnesses in Australia*. 2018, Parliament of the Commonwealth of Australia: Canberra.
2. WHO Regional Office for Europe, *Environmental burden of disease associated with inadequate housing: methods for quantifying health impacts of selected housing risks in the WHO European Region*. M. Braubach, Jacobs, D.E., Ormandy, D., Editor. 2011, WHO Regional Office for Europe.
3. Jackson, W., et al., *Australia state of the environment 2016: overview*, independent report to the Australian Government Minister for the Environment and Energy. 2017. Australian Government Department of the Environment and Energy: Canberra.
4. World Health Organization, *WHO guidelines for indoor air quality: dampness and mould*. 2009, WHO Regional Office for Europe.
5. World Health Organization, *WHO Housing and Health Guidelines*. 2018.
6. Ratnaseelan, A.M., I. Tsilioni, and T.C. Theoharides, *Effects of Mycotoxins on Neuropsychiatric Symptoms and Immune Processes*. *Clin Ther*, 2018. 40(6): p. 903-917.
7. Liddell, C. and C. Guiney, *Living in a cold and damp home: frameworks for understanding impacts on mental well-being*. *Public Health*, 2015. 129(3): p. 191-199.
8. Howieson, S., *The Great Scottish Housing Disaster: The Impacts of Feudalism, Modernism, Energy Efficiency and Vapour Barriers on Indoor Air Quality, Asthma and Public Health*. *Sustainability*, 2018. 10(1): p. 18.
9. Ige, J., et al., *The relationship between buildings and health: a systematic review*. *J Public Health*, 2018. 41(2): p. 121-e132.
10. Jedrychowski, W., et al., *Cognitive function of 6-year old children exposed to mold-contaminated homes in early postnatal period. Prospective birth cohort study in Poland*. *Physiol Behav*, 2011. 104(5): p. 989-95.
11. Zhang, G., et al., *Exposure to Airborne Mould in School Environments and Nasal Patency in Children*. *Indoor Built Environ*, 2012. 22(4): p. 608-617.
12. Knibbs, L.D., et al., *Damp housing, gas stoves, and the burden of childhood asthma in Australia*. *Med J Aust*, 2018. 208(7): p. 299-302.
13. Heseltine, E., Rosen, J., *WHO guidelines for indoor air quality: dampness and mould*. 2009.
14. Nath, S., M. Dewsbury, and J. Douwes, *Has a singular focus of building regulations created unhealthy homes?* *Archit Sci Review*, 2020. 63(5): p. 387-401.
15. Moore, T., S. Berry, and M. Ambrose, *Aiming for mediocrity: The case of Australian housing thermal performance*. *Energy Policy*, 2019. 132: p. 602-610.
16. Victorian Government, *Guide to rental law changes in Victoria*. 2021; Available from: www.consumer.vic.gov.au/housing/renting/changes-to-renting-laws/guide-to-rental-law-changes.
17. Ministry of Housing and Urban Development, *Healthy Homes Standard*. Available from: www.hud.govt.nz/residential-housing/renting/healthy-homes-standards/.