

Submission and evidence to the COVID-19 Response Inquiry

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Profession.

I am a registered architect [REDACTED]

I have 50 years experience with both Australian and international commissions.

Principal evidence

More fresh air and sunshine in the built environment should have been the regulatory response to the Covid 19 pandemic, however the opposite was the case with the introduction in 2022 of the National Construction Code, Building Code of Australia and in NSW BASIX that require smaller windows and sealed buildings.

Well Known Facts

Fresh air dilutes the airborne virus and sunshine kills the airborne virus as well as that on surfaces.

Evidence

I live and work in a building that has large openable windows that are not capable of being sealed shut. The building is not airconditioned, requires very little heating in winter.

This is a proven completely Covid free household and environment.

Changes to the National Construction Code, Building Code of Australia 2022 (NCC)

The modifications to the NCC introduced in the 2022 version were intended to reduce the energy consumption of buildings by sealing the external building fabric (reducing fresh air intake) and reducing the amount of ultraviolet light penetration. (reducing the size of windows thus reducing sunlight penetration).

The assumption is that all buildings are air conditioned. Air conditioning systems generally do not provide fresh air. The same air is circulated around and around the building and rooms within a sealed insulated building envelope. With sealed out fresh air that may require additional heating or cooling and no sunlight penetration that will require additional cooling the energy consumption of the air conditioning system is minimised.

These changes to the NCC are based on European algorithms and modelling, however there is absolutely no scientific field evidence in Australia that the algorithms and modelling work in the Australian diverse environment.

It is fundamental that whenever any drug or medical procedure is introduced there are extensive field trials that before that drug or medical procedure is introduced to the public.

Deprivation of fresh air and sunshine is a medical procedure.

There is growing evidence in European Countries and now in Australia that Covid spread more rapidly and lasted longer in communities of so-called energy efficient buildings.

National Construction Code (NCC) new regulation that fails and will continue to fail to address the known requirements for healthy buildings in an on going Covid environment.

"Part F6V1 Verification of indoor air quality

For a Class 2,3,5,6,9b or 9c building or Class 4 part of a building, compliance with F6P3 and F6P4 (a) is verified when it is determined that the building under typical conditions in use is provided with sufficient ventilation with outdoor air such that contaminant levels do not exceed the limits specified in Table F6V1"

From Table F^V1

Pollutant Carbon dioxide, CO₂, maximum air quality value 850ppm (parts per million)

This is fundamental for a healthy Covid free internal environment and has not changed in the current NCC.

By way of background outside fresh air is about 450ppm.

Evidence now suggests that where children in particular are in an environment where CO₂ levels exceeding 1000ppm for periods exceeding 2 hours, there are links to insomnia, anti social behavior and prolonged respiratory illness including Covid.

However, in the new NCC 2022 buildings are now required to be sealed including but not limited to; Part J5D5 Windows and doors *"A door openable window or the like must be sealed- when forming part of the envelope"*

Part J5D7 Construction of ceilings, walls and floors. *"Ceilings, walls, floors and any opening such as a window frame door frame, roof light frame or the like must be constructed to minimise air leakage..."*

This is by way of contrast to similar Sars pandemic of the early twentieth century where they discovered permanent ventilation in all room in all buildings was important.

In particular, classrooms, hotel rooms, nursing homes and hospitals now have sealed unopenable windows, all reliant on some obscure shared ventilation system.

I have measured CO₂ levels in all the above after only 30 minutes occupancy. All exceeded 1000ppm some as high as 5000ppm. This at this time is not monitored or policed for compliance with the requirement not to exceed 850ppm.

In my opinion in the case of nursing home wards with a permanent resident the CO₂ level exceeding 4000ppm contributed to the death of the resident.

BASIX new regulation that fails and will continue to fail to address the known requirements for healthy buildings in an ongoing Covid environment .

The online BASIX certification modelling is a requirement for all residential buildings in NSW, volume builders (project homes) and unit development.

Similar to section J of the NCC, the energy use component of BASIX certification model requires a sealed building, small windows with minimum natural ventilation.

As above, this modelling was never tested in the field before introduction. The CO₂ level of a bedroom sleeping a couple of children easily exceeds 1500ppm. The long term consequences of Covid recovery times with other behavior problems are dire.

REMEDIES

General requirement for corrections to construction codes for healthier building in an on going Covid 19 environment.

- 1) There should be a moratorium on compliance with Section J of the NCC until the current Covid outbreak has passed and there should be a moratorium until there is field evidence that air quality (CO₂) levels can be maintained while still achieving the energy saving objectives.
- 2) There should be a moratorium on compliance with energy component of BASIX until there is field evidence that air quality (CO₂) levels can be maintained while still achieving the energy saving objectives.
- 3) The NCC should be changed requiring the area of windows in classrooms, bedrooms, hospital wards, nursing home wards and the like, where the occupation of the room exceeds 2 hours to be no less than 50% of the floor area, half of which is easily openable by the occupants of the room. (25% of the floor area openable)
Those classrooms, auditoriums that require black out and no windows should not be occupied continuously for more than 2 hours, the ventilation system should be such that the CO₂ level never exceeds 850 ppm and the ventilation system has a particulate filter.
- 4) There should be permanent natural ventilation to all habitable rooms. The minimum permanent ventilation area should be 2% of the floor area of the room.

Suggested additional reading.

Journal of Building Engineering March 2021 Covid 19 and Healthy home preferences
Domain, by Sue Williams. How our energy efficient homes are a breeding ground for Covid 19
Professor Geoff Hanmar, university of NSW and Adelaide. International Code Councils pandemic task force.