

# IAQ Evolution

## and the Next Possible Stepping Stone

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International IAQ standards are ushering in a new world of occupant health focussed building practices in both residential and non-residential settings, but what is their natural next stepping stone?

IAQ guidelines at their core must be malleable with time, evolving with the ever-increasing scientific background into sickness caused by common pollutants. You only need to look to the WHO Air Quality Guidelines (AQG) to see how the IAQ targets have changed over the course of a number of years, with the 2021 AQG recommending generally lower thresholds than its predecessor in 2005. An informative and recent review of IAQ guidelines by Guanqiong Wei et al [1] holds a comparative light on the global efforts on improving IAQ across an array of residential and non-residential buildings. A total of 26 different standards and certifications (including both versions of the WHO AQG) were considered. The review notes that different countries experience a broad range of pollution issues, and this is reflected in the target pollutants present in each different set of standards. Because of this, a blanket single standard will likely never be perfectly applicable, but a lot of similarities are shared on some core pollutants. It is worth noting that many private organisations (not just governmental organisations) are contributing immensely to driving the narrative of IAQ management currently, i.e. WELL and RESET® [2, 3].

But in creating a more common focussed approach globally, Guanqiong Wei et al put forth that a potentially very important feature has yet to be introduced into the general thought practice. And that is with respect to epidemic IAQ-related issues.

As the world comes to terms with the aftermath of the Covid-19 pandemic, much of the IAQ-relevant information around epidemics has yet to filter into the general guidelines and standards. A variety of Covid-19 guidelines were published to help with the spread of the disease, all aimed at IAQ-relevant practices. And although this information is relatively new, it most definitely can fit in with today's IAQ guidelines, even if just as functional additions for specific scenarios. Examples of epidemic-related changes to IAQ management focussed around simple alterations to the norm, such as increased fresh air exchange (reduce recirculating air processes), and less focus on cost-saving practices for short periods of time, instead increasing active times for fans and filter units etc.

But this is not to say the current standards are not already extremely powerful in protecting building occupants from diseases like Covid-19. A recently published report by Haddrell et al [4] details how the survivability of SARS-Cov-2 variants in the air is heavily affected by the presence of CO<sub>2</sub>, a common inorganic pollutant referenced by many building

standards as one of the primarily targeted pollutants. Improved ventilation and air cleanliness strategies aimed at CO<sub>2</sub> mitigation are therefore already likely having a huge effect on diseases with similar transportation mechanics to Covid. And you only need to look to a recent real-world study by Antonopoulos et al [5] to see these benefits in recently constructed homes in the US. Adopting newer ventilation strategies with equipment capable of meeting the ASHRAE 62.2-2010 standard requirements [6], there was a significant positive effect on CO<sub>2</sub> levels (and other pollutants).

The overall picture is that of evolving practices, each piggybacking off of one another, and each furthering the initial goal – ensuring the living security of residents – with an eye to the next most practical problems. Implementation of epidemic-level strategies are the next most natural step in IAQ standards, and will likely stand as a functional augmentation rather than overhauling contemporary methods or limits. And this is already becoming a reality, as ASHRAE has just recently become one of the first to develop and release its own set of standards to safeguard indoor spaces from disease transmission - ASHRAE Standard 241-Control of Infectious Aerosols [7]. But even in instances where this level of care is slow to be implemented, we are safe in the knowledge that even contemporary methodologies will go a long way to drastically improving the health of all occupants, even when dealing with the spread of disease.

## References

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