

Indoor Air Quality and Health

After the Crimean War (1853-1856) there was a hygienic revolution during which scientists undertook to discover the causative agents of ill health and infection. This led to the discovery of micro-organisms as the agents that cause many infective ailments, so called germ theory, and great focus and attention was placed on building ventilation to ensure that internal air remained fresh.

Because it was not possible to measure the amount of microbes and other organic matter in the air, carbon dioxide levels were used as a 'tracer gas' to describe the presence of breathing occupants – the source of 'bad air', a practice that continues today.

The quality of air today also contains compounds that are given off by the flooring, furniture and furnishings of a building. These airborne compounds and their derivatives are generally considered to be deleterious to health, further reducing the freshness of internal air.

Studies during the last 150 years indicate that IAQ plays a major role from a public health point of view. Today, as before, we still suspect organic and microbially produced compounds to be causative, but it has not been possible to show which compounds are the important agents.

Evidence for poor health caused by poor IAQ

Poor IAQ is linked with respiratory problems like asthma, hypersensitivity reactions and sick building syndrome, indeed in the developed world the incidence of allergies in many regions has practically doubled every 15 years during recent decades. This is considered, in part, to be down to the amount of time people spend in poorly ventilated rooms, being exposed to allergens for long periods.

Damp and humidity is a common consequence of poor ventilation and can compound health problems.

It is well known that there is a clear seasonal increase in mortality in the UK during winter. However it is unclear how this correlates to temperature as the winter increase in mortality does not seem to correlate with the 'coldness' of the winter. Such that mortality rates in a mild winter are similar to a very cold winter.

Deaths related to respiratory problems rise considerably during the winter, and more so during outbreaks of influenza – so perhaps there is a link with IAQ, which is typically poorer in the winter, though only circumstantial evidence exists. Little work has been done in this field, and the information that is available is often contradictory due to other contributing factors.

Interestingly, Sweden and Iceland do not see an increase in mortality rates during the winter, why this should be the case when in the UK mortality rates rise in the winter is unknown. It could be because they are better able to afford to heat their homes appropriately and it equally could be due to better ventilation. Certainly Sweden's building regulations for ventilation rates are more stringent compared to the UK. Further research is required in this field to better understand, quantitatively, the impact of poor IAQ on health.

High CO₂ levels are indicative of poor IAQ and therefore risks to health are increased.

IAQ can be monitored using the NVDataLogger

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