



Air quality and wellbeing

REMARK
GROUP

INTELLIGENT BUSINESS TECHNOLOGY



Introduction

A healthy level of indoor air quality is paramount for an individual to be productive within the workplace.

As a well-known factor for affecting an individual's wellbeing, comfort and productivity within the workplace, air quality is now becoming a concern for those wanting to improve the wellbeing and health of their employees.

From headaches and fatigue to eye irritation, issues with poor indoor air quality within office environments are extremely common.

When discussing indoor air quality within this paper, we are referring to the following nine elements:

- Temperature (°C)
- Humidity (% RH)
- Nitrogen Dioxide (NO₂)
- Particulate matter (PM_{2.5})
- Carbon Dioxide (CO₂)
- Carbon Monoxide (CO)
- Ozone (O₃)
- Volatile Organic Compounds (VOCs)
- Air pressure (mBar)

The 'Air Quality and Wellbeing at Work' 2019 survey, has been conducted by intelligent business solutions company the Remark

From this paper, we can understand the impact that poor indoor air quality is having

Group and is supported by environmental psychologist and workplace strategist Dr Nigel Oseland, an honorary senior lecturer at UCL's Institute for Environmental Design and Engineering.

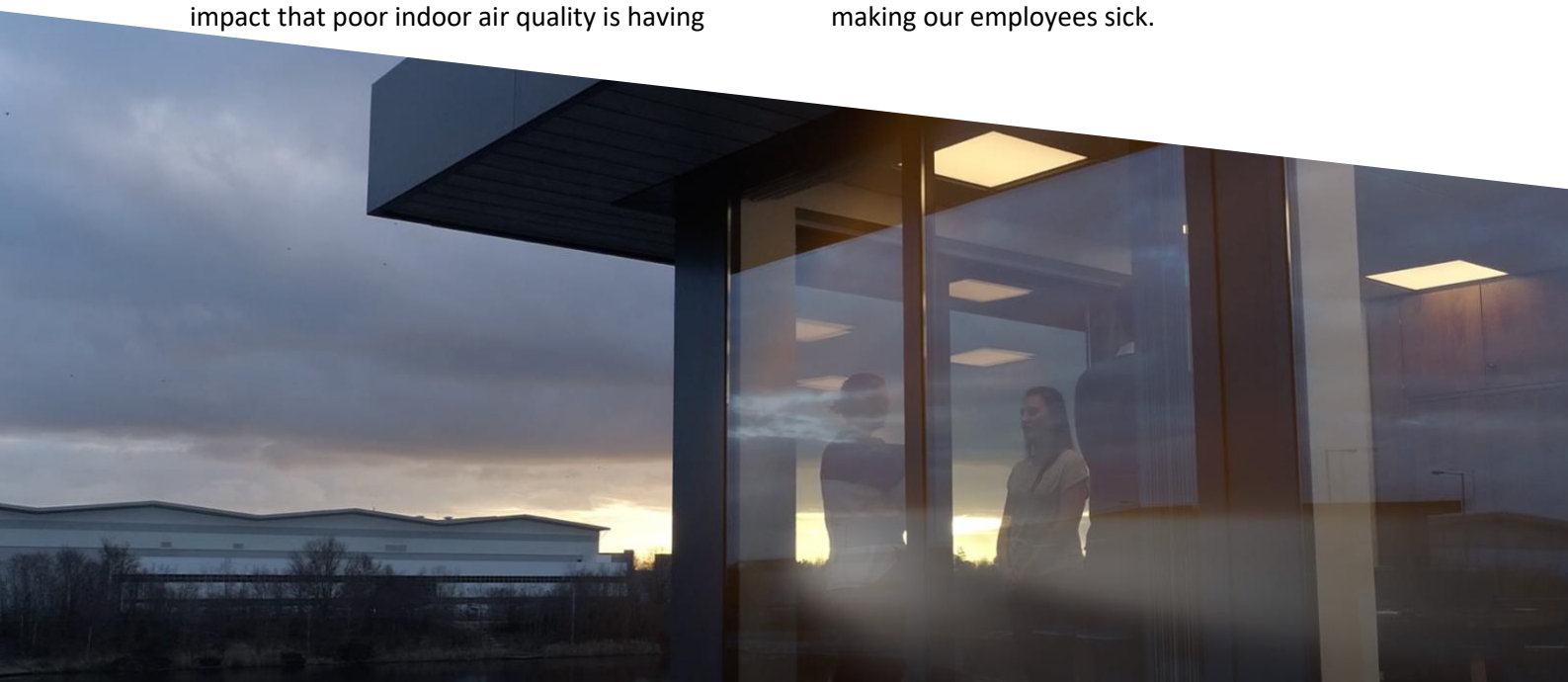
When looking at the results from this survey, it is worrying to see that our meetings are not as productive as we thought and sick buildings syndrome is still prevalent in today's offices.

Sick Building Syndrome is the name for symptoms that are caused by being in a particular building, in this case, an office. The symptoms of this syndrome get worse the longer you spend in that sick building. Symptoms include:

- Headaches
- Blocked or runny nose
- Dry, itchy skin
- Dry, sore eyes
- Rashes or irritated skin
- Tiredness and difficulty concentrating

These symptoms are common and don't necessarily mean you have sick buildings syndrome but when looking at the results from 'Air Quality and Wellbeing at Work' it's worrying to see how many employees suffer from these symptoms on a daily basis.

on employees and what actions we need to take to ensure that our buildings are not making our employees sick.



Is air quality affecting the productivity of UK meetings?

Recent researchⁱ has shown that productivity in the UK has dwindled. At one point, the UK had the highest level of productivity within Europe, but since the 1960's, other European companies have shot past the UK in terms of productivity – France and Germany being the main contenders.

In the report from the Bank of England, it was found that Britain has endured the worst decade for productivity growth since the 18th Century, whilst the Office of National Statistics has announced that in January 2018, we saw just 0.1 percent growth in GDP, the slowest growth recorded since 2012.

In the 'Air Quality and Wellbeing at Work' resultsⁱⁱ, it was found that half of UK office workers leave a meeting thinking that it was unsuccessful. When you consider that in the same report, it was found that we are having on average ten meetings a week, each lasting just over an hour per meeting - that's over five hours a week wasted on unsuccessful meetings.

Carbon Dioxide (CO₂) levels are one way to measure indoor air quality and can occur as a result of poor ventilation. In the 'Air Quality and Wellbeing at Work' survey, it was found that less than 40% of meeting rooms have natural ventilation and 34% of UK office workers report that they don't have access to meeting rooms with windows.

High CO₂ levels have been found to impact tiredness or decision-making in a number of studies.ⁱⁱⁱ Nearly 90% of UK office workers say they find themselves nodding off or losing concentration in meetings. One recent lab-based study using simulated decision-making tasks showed CO₂ having a significant detrimental impact (11%-23% worse) at 1,000

parts per million (ppm) compared to 600ppm, despite 1,000ppm being widely considered acceptable^{iv}.

A hot topic, and generally the cause of many arguments in workplaces is temperature. Temperature has also been found to negatively impact on a person's productivity. Surveys^v have shown that not only does productivity decrease in cooler temperatures, it also decreases in warmer temperatures as well.

Research from the Lawrence Berkeley National Laboratory indicates that performance declines by 2% for each degree above 25°C and by 4.7% for each degree below 21°C^{vi}. A third of meeting rooms in the UK do not have air conditioning and less than half of UK employees have access to temperature control within their meeting rooms.

Employers need to think about the working environment to ensure that their employees are at their most productive. Simple solutions like air quality monitors and air purifiers are a great way to monitor the air to reduce harmful pollutant found in the air such as, VOC's and CO₂.

Ensuring that proficient ventilation and access to fresh air is a simple but extremely effective solution to enhance employee's wellbeing. Even allowing for 'fresh air breaks' are a great way to ensure that they are getting frequent access to fresh air and are not sat in a stuffy office all day with high levels of CO₂, causing them a lack of productivity.

Is Sick Building Syndrome making a comeback?

Sick building syndrome (SBS) is largely believed to be a phenomenon of the nineties and since then we haven't heard much about it, but is it making a comeback, or have we merely just pushed it under the carpet and focused on some other phenomenon.

Almost everyone occasionally feels unwell and suffers from one or more of the common symptoms of discomfort such as headaches, dry throat or sore eyes. But there are occasions when, for no obvious reason, people working in particular buildings experience these sorts of symptoms more often than usual.

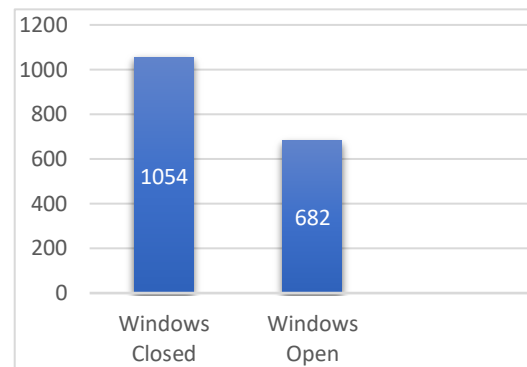
In the 'Air Quality and Wellbeing at Work' report, which surveyed over 1,000 UK office workers, findings revealed that 86% suffer from headaches at work with almost a quarter of people say they get them every day. As well as headaches 91% of office workers reported that they suffer from tiredness or lethargy at work, with 41% saying they feel tired or lethargic on a daily basis.

Other symptoms were also common, with 78% suffering from dry, itchy or watery eyes, 76% with a dry throat and 70% with irritated skin. Sleep also seems to be affected with only 11% of people describing their sleep quality as good during the working week, with a quarter reporting that their sleep quality was poor.

Remark Group conducted research amongst its own employees to determine whether or not poor indoor air quality affected an employee's productivity and

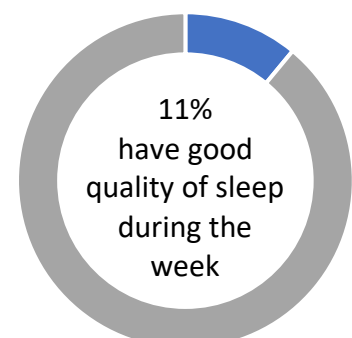
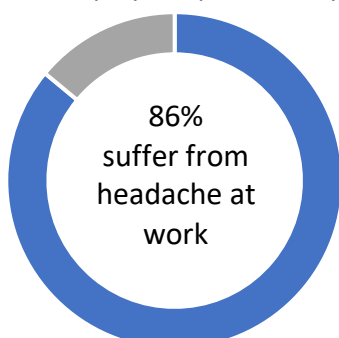
to see whether they suffered from any of the sick building syndrome symptoms.

Results showed a considerable rise in symptoms when CO2 levels were particularly high. The below graph shows the average CO2 levels from the experiment with the window closed vs the windows open. On days with the window closed there was more complaints of dry eyes, irritated skin, headaches and lethargy.



Today's office environments can drain happiness, health and even productivity but ensuring that air quality is regulated can reduce symptoms such as headaches, fatigue and eye irritation, while increasing productivity and general wellbeing.

Symptoms of SBS get worse the longer you're in a particular building and get better after you leave. People can ease symptoms themselves, by opening windows to improve ventilation, reducing workplace stress, taking regular screen breaks and going outside for fresh air during lunchtime and breaks. ^{vii}



Is poor indoor air quality affecting our wellbeing as well as our physical health?

Workplace wellbeing relates to all aspects of working life, from the quality and safety of the physical environment, to how workers feel about their work, their working environment, the climate at work and work organisation.

The aim of measures for workplace wellbeing is to complement OSH (Occupational Safety and Health) procedures to make sure workers are safe, healthy, satisfied and engaged at work.

Employee's wellbeing is a key factor in determining an organisation's long-term effectiveness. Many studies show a direct link between productivity levels and the general health and wellbeing of the workforce.^{viii}

Pollution related diseases due to air pollution continue to rise at an alarming rate and affect people's quality of life but it can also adversely affect our wellbeing.

Indoor air is often five times more polluted than outdoor air and as people spend 90% of their time indoors the importance of indoor air quality is critical to health and wellbeing^{ix}.

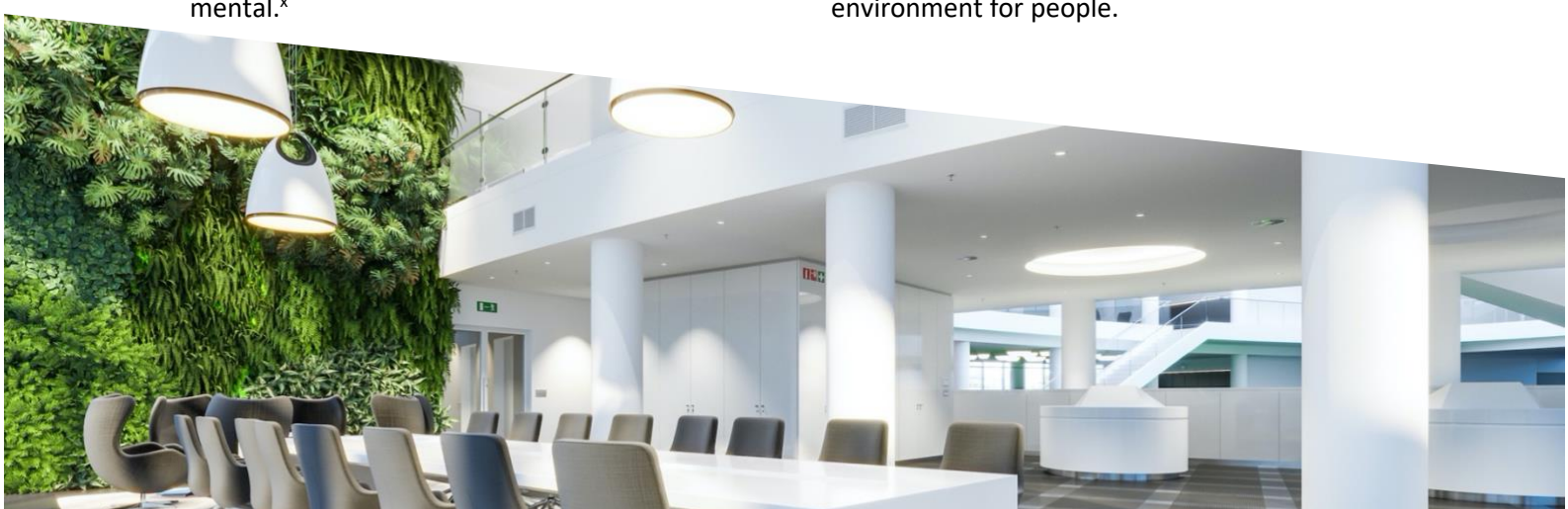
In the 'Air Quality and Wellbeing at Work' survey results it was found that 80% of UK office workers think that poor indoor air quality could be having a negative impact on their health, whether this be physical or mental.^x

Further to that, 57% of UK office workers think that poor indoor air quality is affecting their mental health and 56% are worried about the air quality in the area that they work. That's over half the workforce whose mental wellbeing is being affected by poor indoor air quality.

For wellbeing to be enhanced and increased in the workplace, we seriously need to think about the working environment and consider what employers can do to ensure that their employees are at their most healthy and therefore productive.

We need to be creating working environments where the employees come first, this means designing offices with indoor air quality in mind and creating a comfortable working environment.

As previously mention, air quality sensors and purifiers are a great way to reduce pollutants found in the air. Another effective method to reduce these pollutants and to increase wellbeing within the workplace is biophilic design. Biophilic design is an approach to architecture that seeks to connect building occupants more closely to nature. Biophilic designed buildings incorporate things like natural lighting and ventilation, natural landscape features and other elements for creating a more productive and healthier built environment for people.



References

- i <https://www.bmmagazine.co.uk/news/britain-suffers-worst-decade-of-growth-since-18th-century/>
- ii <https://www.remark-group.co.uk/videos-and-literature/literature/air-quality-and-wellbeing-at-work-results-2019>
- iii <http://centaur.reading.ac.uk/14118/1/CENTAUR-Ventilation-Rates-in-Schools-and-Pupils-Performance.pdf>
- iv <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3548274/>
- v <https://indoor.lbl.gov/sites/all/files/lbnl-60946.pdf>
- vi <https://eta.lbl.gov/sites/default/files/publications/lbnl-53191.pdf>
- vii <https://www.nhs.uk/conditions/sick-building-syndrome/>
- viii https://www.rand.org/content/dam/rand/pubs/research_reports/RR1000/RR1084/RAND_RR1084.pdf
- ix <https://www.epa.gov/report-environment/indoor-air-quality>
- x <https://www.remark-group.co.uk/videos-and-literature/literature/air-quality-and-wellbeing-at-work-results-2019>



INTELLIGENT BUSINESS TECHNOLOGY