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13.-15.10.2020

CONNECTING EXPERTS.





BETTER CONTROL BETTER ENVIRONMENT

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Indoor air quality

Clean air is a basic requirement of life.

The quality of air inside homes, offices, schools, day care centres, public buildings, health care facilities [...] is an essential determinant of healthy life and people's well-being.

WHO Guidelines for Indoor Air Quality – selected pollutants

Of your time **inside** a building

A Resource for Assessing Exposure to Environmental Pollutants (2001) <u>https://pubmed.ncbi.nlm.nih.gov/11477521/</u>

The National Human Activity Pattern Survey (NHAPS)

Coronavirus Lockdowns May Raise Exposure to Indoor Air Pollution

SCIENTIFIC AMERICAN_®

Coronavirus latest: **Indoor air pollution has jumped** since lockdown — here's how to fix it

Coronavirus can float and transmit in air droplets, experts say



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Coronavirus SARS-CoV-2 spreads more indoors at low humidity



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Relative humidity RH %

Ratio between current water content in the air and the maximum amount that can be held

Risks at **high** concentrations: > Mould

Risks at low concentrations:

- Increased airborne diseases transmissibility
- **Impaired** respiratory tract defences
- Increased vitality for some viruses

Relative Humidity control has the biggest impact in reducing infectivity of airborne transmitted diseases



Virus infectivity drops when Relative Humidity reaches above 40%.

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Noti J.D et al. (2013), High humidity leads to loss of infectious influenza virus from simulated coughs.



"Rises in temperature and relative humidity reduce COVID-19 transmissibility: Increases by +1°C and +1% RH make the R reproduction coefficient for drop by 0.0225 e 0.0158 respectively".

High Temperature and High Humidity Reduce the Transmission of COVID-19 – Jingyuan Wang et al. March 9, 2020



"Increased relative humidity was associated with decreased cases in both epidemic phases (c),[...].

Overall, a **decrease in** relative humidity of 1% was associated with an increase in cases of 7–8%"

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Ward MP, Xiao S., Zhang Z., Humidity is a consistent climatic factor contributing to SARS-CoV-2 transmission – Michael P. Ward et al. March 9, 2020

Infection process



Adequately controlling relative humidity can impact positively on all phases of the infection process, greatly reducing the chance of contagion

Ideal relative humidity range for human health is between 40 and 60% RH!

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Sterling Chart (1985) OPTIMUM RELATIVE HUMIDITY RANGES FOR HEALTH

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How can WE from HVAC help?

- 1. Acknowledging the impact that control of indoor air conditions can have
 - 2. Monitoring pollutants inside our buildings

3. Diluting them

4. Preventing infection with proper RH control





Thank you for your attention.

