

# AN INCREASE IN ALLERGIES CALLS FOR INCREASED



# VENTILATION

## ALLERGIES ARE GETTING WORSE DUE TO CLIMATE CHANGE, INCREASED VENTILATION CAN HELP

### First, What are Allergies?

It's allergy season in North America and millions of people are suffering through the discomforting effects. What exactly are allergies? According to the Asthma and Allergy Foundation of America (AAFA), allergies occur when the body's immune system sees a substance, called an allergen, as harmful and overreacts to it. The immune system then makes an antibody to respond to allergens, which causes an allergic reaction. These reactions can cause various symptoms, including watery eyes, runny nose, sneezing, a rash or hives, trouble breathing and even swelling in the mouth or throat.<sup>1</sup>

There are a variety of allergens that cause allergic reactions. These include:<sup>2</sup>

- drugs (medicines)
- food
- insects that sting (bee, wasp, fire ant), bite (mosquito, tick) or household pests (cockroach, dust mite)
- latex
- pets (dog or cat urine, saliva, dander)
- pollen
- mold

What triggers allergy season? It occurs in the spring and summer when plants produce pollen. And this is no laughing matter because hay fever, which can be caused by pollen, accounts for more than 13 million visits to medical facilities in the U.S. every year.<sup>3</sup> Further, a whopping 15.5% of Americans are sensitive to ragweed pollen, which not only causes hay fever but can also trigger asthma attacks.<sup>4</sup> Additionally, allergies in general affect as many as 30% of adults and 40% of children in the U.S.<sup>5</sup>

### Allergies are on the Rise Due to Climate Change

What's even more concerning is that according to the U.S. Environmental Protection Agency (EPA), climate change is negatively impacting pollen allergies. First, this is because due



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to warmer spring temperatures, some plants start producing pollen earlier, thus lengthening allergy season.<sup>6</sup> Second, warmer temperatures and increased carbon dioxide (CO<sub>2</sub>) concentrations enable ragweed and other plants to produce more allergenic pollen, in larger quantities.<sup>7</sup> Along those lines, a study in the journal *Nature* found that higher levels of CO<sub>2</sub> may increase pollen production by up to 200% by the end of the century.<sup>8</sup>

Furthermore, another allergen, mold, is also on the rise due to climate change. The EPA states that climate change is increasing the frequency and severity of extreme weather events, such as intense precipitation, flooding and storms. This then can bolster indoor dampness and humidity, which leads to more mold.<sup>9</sup> Greater amounts of mold leads to more mold spores in the indoor air, which can worsen allergies.

## Increased Ventilation can Mitigate Increasing Allergies

How can increasing allergies be mitigated? The general advice during allergy season for those who suffer from allergic reactions is to stay indoors as much as possible. But, what if the indoor air is also contaminated with allergens? Further, the indoor air can also be full of other pollutants that are invisible and even deadly, such as airborne virus aerosols. Indeed, the EPA states that Americans spend approximately 90% of their time indoors, where the concentrations of some pollutants are often two to five times higher than typical outdoor concentrations.<sup>10</sup>

That's where increased ventilation that replaces stale and polluted indoor air with fresh and filtered outdoor air can help to enhance indoor air quality (IAQ). This process not only combats allergies but any other problems caused by contaminated indoor air. By providing cleaner and healthier indoor air, occupants will benefit from fewer allergies, better health, added comfort and improved wellbeing. On top of that, a Harvard study found that enhanced IAQ via increased ventilation can even significantly boost the cognitive function of indoor occupants.<sup>11</sup>

In fact, the EPA lists four key ways that are all related to ventilation to improve IAQ and reduce health risks:<sup>12</sup>

- ♦ **Increase ventilation:** Increasing the amount of fresh air brought indoors helps reduce pollutants inside.
- ♦ **Control the sources of pollution:** The most effective way to improve indoor air is to eliminate individual sources or reduce their emissions.
- ♦ **Change filters regularly:** Central heaters and air conditioners have filters to trap dust and other pollutants in the air. Make sure to change or clean the filters regularly.
- ♦ **Adjust humidity:** The humidity inside can affect the concentrations of some indoor air pollutants. For example, high humidity keeps the air moist and increases the likelihood of mold. Keep indoor humidity levels at 30-50%.

The criticality of high-level IAQ for occupant health and wellbeing and for combating allergies is emphasized by the White House Office of Science and Technology Policy (OSTP). It states, "Cleaner indoor air improves cognition and productivity, reduces the spread of other airborne diseases, protects against outdoor air pollutants such as smog and wildfire smoke, and decreases the number of environmental triggers for conditions like asthma and allergies."<sup>13</sup>

## Increase Ventilation Efficiently with Energy Recovery Ventilators (ERVs)

However, the challenge of increased ventilation is the use of more energy, which can boost costs and doesn't help with decarbonization efforts. That's where energy recovery ventilators (ERVs) come in to enhance IAQ energy-efficiently, cost-effectively and sustainably.

This is because ERVs use balanced airflows and recover otherwise-expended total energy. In summer, warm and humid outside air is pre-cooled and dehumidified via the total energy from the outgoing interior air. In winter, cold and dry outside air is preheated and humidified via the total energy from the outgoing interior air. Subsequently, less energy is needed for conditioning and ventilation. The results are cleaner and healthier indoor air, better health and wellbeing for occupants, less energy expended and greater cost savings.

## In Summary

Climate change is causing allergies to grow in incidence and worsen in severity in North America. This is because warmer weather and higher levels of CO<sub>2</sub> in the air lead to the production of more pollen and mold, which are both allergens. One key solution is enhancing IAQ via increased ventilation, which removes pollutants—including allergens—from the indoor air. And to maximize ventilation effectiveness, ERVs should be applied to improve energy efficiency, cost savings and occupant health.

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*For 40 years, RenewAire®, Waunakee, Wis., has been an HVAC industry pioneer for improving human health, cognitive function, productivity and wellbeing by enhancing indoor air quality (IAQ) via energy recovery ventilation (ERV) technologies. This is accomplished energy-efficiently, cost-effectively and sustainably with fifth generation static plate enthalpy core energy recovery ventilators and dedicated outdoor air systems (DOAS). For more information, visit [www.renewaire.com](http://www.renewaire.com), email: [ramarketing@renewaire.com](mailto:ramarketing@renewaire.com) or call (800) 627-4499.*

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<sup>1</sup> All content in this paragraph sourced from: "Allergies," Asthma and Allergy Foundation of America (AAFA), <https://aafa.org/allergies/>.

<sup>2</sup> All content in this paragraph and subsequent bullets sourced from: "Allergies," Asthma and Allergy Foundation of America (AAFA), <https://aafa.org/allergies/>.

<sup>3</sup> "Climate Change Indicators: Ragweed Pollen Season," U.S. Environmental Protection Agency (EPA), <https://www.epa.gov/climate-indicators/climate-change-indicators-ragweed-pollen-season>.

<sup>4</sup> Ibid.

<sup>5</sup> Allergies," Asthma and Allergy Foundation of America (AAFA), <https://aafa.org/allergies/>.

<sup>6</sup> "Climate Change Indicators: Ragweed Pollen Season," U.S. Environmental Protection Agency (EPA), <https://www.epa.gov/climate-indicators/climate-change-indicators-ragweed-pollen-season>.

<sup>7</sup> Ibid.

<sup>8</sup> Yingxiao Zhang, Allison L. Steiner, "Projected climate-driven changes in pollen emission season length and magnitude over the continental United States," Journal of Nature, March 15, 2022, <https://www.nature.com/articles/s41467-022-28764-0>.

<sup>9</sup> All content in this paragraph sourced from: "Indoor Air Quality and Climate Change," U.S. Environmental Protection Agency (EPA), <https://www.epa.gov/indoor-air-quality-iaq/indoor-air-quality-and-climate-change>.

<sup>10</sup> "Indoor Air Quality," U.S. Environmental Protection Agency (EPA), <https://www.epa.gov/report-environment/indoor-air-quality>.

<sup>11</sup> Joseph G. Allen et al., "Associations of Cognitive Function Scores with Carbon Dioxide, Ventilation, and Volatile Organic Compound Exposures in Office Workers: A Controlled Exposure Study of Green and Conventional Office Environments," Environmental Health Perspectives (EHP), June 1 2016, <https://doi.org/10.1289/ehp.1510037>.

<sup>12</sup> All content in this paragraph and subsequent bullets sourced from: "Care for Your Air: A Guide to Indoor Air Quality," U.S. Environmental Protection Agency (EPA), <https://www.epa.gov/indoor-air-quality-iaq/care-your-air-guide-indoor-air-quality>.

<sup>13</sup> Erica Kimmerling, Steph Guerra, Georgia Lagoudas, "Clean Indoor Air Benefits Everyone," White House Office of Science and Technology Policy (OSTP), December 8, 2022, <https://www.whitehouse.gov/ostp/news-updates/2022/12/08/clean-indoor-air-benefits-everyone/>.