World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:12, No:11, 2018

The IVAIRE Study: Relative Performance of Energy and Heat Recovery Ventilators in Cold Climates

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Abstract : This paper describes the results obtained in a two-year randomized intervention field study investigating the impact of ventilation rates on indoor air quality (IAQ) and the respiratory health of asthmatic children in Québec City, Canada. The focus of this article is on the comparative effectiveness of heat recovery ventilators (HRVs) and energy recovery ventilators (ERVs) at increasing ventilation rates, improving IAQ, and maintaining an acceptable indoor relative humidity (RH). In 14% of the homes, the RH was found to be too low in winter. Providing more cold and dry outside air to under-ventilated homes in winter further reduces indoor RH. Thus, low-RH homes in the intervention group were chosen to receive ERVs (instead of HRVs) to increase the ventilation rate. The installation of HRVs or ERVs led to a near doubling of the ventilation rates in the intervention group homes which led to a significant reduction in the concentration of several key of pollutants. The ERVs were also effective in maintaining an acceptable indoor RH since they avoided excessive dehumidification of the home by recovering moisture from the exhaust airstream through the enthalpy core, otherwise associated with increased cold supply air rates.

Keywords : asthma, field study, indoor air quality, ventilation
Conference Title : ICHB 2018 : International Conference on Healthy Buildings
Conference Location : London, United Kingdom
Conference Dates : November 19-20, 2018