

Inexpensive interventions to improve ventilation to resident rooms in long-term care facilities



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CATEGORY: **Epidemiology and Laboratory Capacity (ELC)**

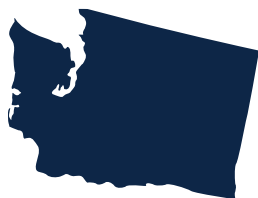
The Washington State Department of Health utilized funding to assess the improvement in ventilation rates in long-term care facility resident rooms through low-cost interventions.



The “What”

Many long-term care facilities (LTCFs) occupy aging buildings with limited ventilation in resident rooms. The cost of upgrading these ventilation systems is prohibitive for many of these facilities. The Washington State Department of Health’s (WADOH) Healthcare-Associated Infections and Antimicrobial Resistance Section program utilized Epidemiology and Laboratory Capacity for the Prevention and Control of Emerging Infectious Diseases (ELC) funding to assess potential improvements in ventilation rates in resident rooms through low-cost interventions. The assessment used carbon dioxide as a tracer gas for determining the ventilation rate of the room at baseline conditions compared to the rate following the interventions. This approach is a proven study design developed by researchers at the Harvard T.H. Chan School of Public Health¹.

WADOH assessed ventilation rates in two (2) skilled nursing facilities in Washington State. They tested three (3) different low-cost interventions alone and in combination. These included 1) opening the door; 2) opening the window; and 3) running a box fan in the window.



These results illustrate that **low-cost interventions are successful** in improving resident room ventilation rates



The “So What”

Both facilities assessed had no ducted heating, ventilation, and air conditioning (HVAC) system within resident rooms. All rooms had bathroom fans. Although, some were not functional, and those that were provided very low flow rates. Bathroom fans are designed to only provide ventilation for the bathroom, not the entire resident room.

The Washington State Standard (WAC 388-97-4040) requires resident rooms in newly built LTCFs to have a minimum of two (2) air changes per hour (ACH). However, research has indicated that minimum targets of “good” or “excellent” ventilation rates of 4-6 ACH can be effective in reducing the spread of SARS CoV-2¹.

In the 177 ventilation measurement trials recorded in this assessment, it was determined that:

- Opening the room door or window provided enough ventilation to surpass the Washington State standard minimum ventilation rate.
- Adding a box fan in the window was effective in increasing the ventilation rate to “good” or “excellent”.
- Combining all three low-cost interventions (door and window open with a box fan in the window) resulted in ventilation rates that exceeded “excellent”.

These results illustrate that low-cost interventions are successful in improving resident room ventilation rates and provide useful information for LTCFs seeking to improve airflow in resident rooms.

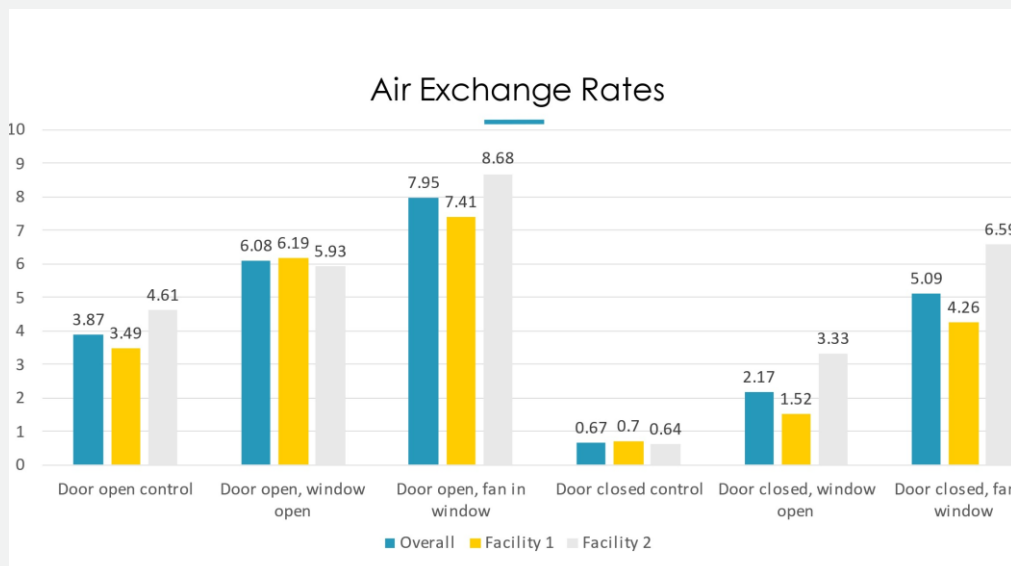


Figure 1. Air exchange rates at facilities using various low-cost interventions.

The “Now What”

While this study was effective in identifying inexpensive ways to improve ventilation, improvements rely heavily on the ability to open residents’ windows. Opening windows may not always be an appropriate option. Certain times of the year may be too cold, causing exorbitant heating costs. Other times of the year may be impacted by the increasing prevalence of wildfires and/or excessive heat events.

Moving forward, WADOH can utilize ELC funding to continue to build partnerships with LTCFs, share best practices and resources, and assess additional low-cost interventions to address healthy living conditions. These potential interventions can not only address communicable disease transmission, but also ways to keep rooms cool and free of harmful wildfire smoke when a ventilation system does not provide conditioned air to individual rooms.

¹Allen J, Spengler J, Jones E, Cedeno-Laurent J. 2020. 5 Step Guide to Checking Ventilation Rates in Classrooms. Schools For Health, Harvard TH Chan School of Public Health [Internet]. <https://schools.forhealth.org/ventilation-guide/>

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