

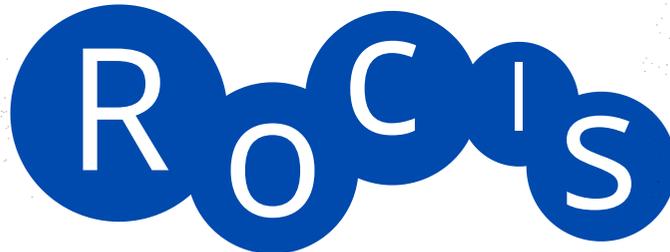
Reducing Outdoor Contaminants in Indoor Spaces

Particle Pollution Solutions for Your Home: A ROCIS Recap

Pittsburgh has a particle pollution problem.

There are actions you can take to protect your indoor air.





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What is particle pollution?

Particles are a major category of air pollution found outdoors and indoors, resulting from many different processes including burning fuel and atmospheric chemical reactions. The chemical makeup of particle pollution varies, and the particles can bind to other kinds of air pollutants.

Why does particle pollution matter?

Fine particles are invisible; smaller than 2.5 microns. These pollutants can travel deep into lungs and even into the bloodstream. Long-term exposure to fine particles has been associated with increased risk of premature death, and health effects including cardiovascular disease and low birth weight.

Is particle pollution a problem in the Pittsburgh region?

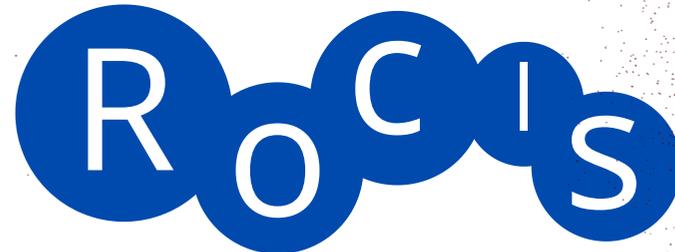
In 2017, the Pittsburgh region suffered an estimated 232 premature deaths related to air pollution, the most of any region outside of California. In 2019, the Pittsburgh region received an 'F' grade from the American Lung Association due to ozone and fine particle pollution.

Can I protect the indoor air I breathe at home?

Most people spend most of their time indoors, and there are a range of actions that can: 1) prevent particles produced by **outdoor sources** from invading your home, and 2) reduce particles produced by **indoor sources** in your home.

Do I have to spend money to minimize particles in my home?

Some solutions only require a change in habits. Other solutions require hiring a professional or investing in a new appliance. First, let's take a look at the lower cost solutions.



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Lower Cost Indoor Particle Pollution Solutions

Filter your Indoor Air Using a Homemade Filter Fan

- Consider using a DIY filter fan made from a furnace filter taped to a box fan. These homemade air filtration devices can be very effective and cost a fraction of portable air cleaners. Instructions for making a DIY filter fan are available [here](#).

Consider indoor and outdoor air quality when opening windows

- When there are obvious indoor sources of particles such as cooking and cleaning, your home may benefit from ventilation via open windows.
- When there are no obvious indoor sources of particles, opening a window can worsen your indoor air quality (unless Pittsburgh's air quality is unusually good). Websites such as Purple Air can help you monitor local air quality to make this decision.
- If you do open a window, consider running a filter fan in the window frame, blowing inside.

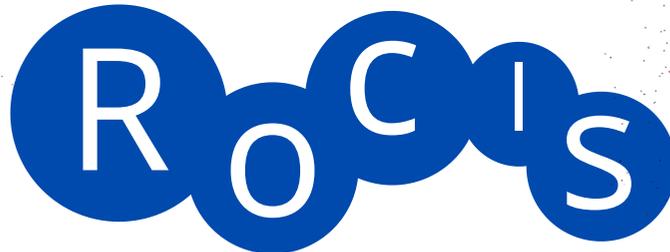
Minimize air particles generated from cooking

- If your stove has a range hood, run it right before, during, and for 15 minutes after cooking.
- Cover pots and pans when cooking on the stove top.
- Consider cooking with canola oil, which emits fewer particles compared to olive oil.

Prevent settled particles from re-suspending into the air

- Use walk-off mats by the entrances but minimize carpeting in the rest of the house. Clean regularly, and avoid accumulating clutter that interferes with the effectiveness of regular cleaning.

Skeptical about whether these actions can really make a difference? See our attached Frequently Asked Questions (FAQs)!



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Higher Cost Indoor Particle Pollution Solutions

Purchase a portable air cleaner

- Invest in a correctly-sized portable air cleaner with a HEPA filter, and run it continuously. Read the EPA's guide to air cleaners in the home [here](#).

Purchase a range hood

- Introduce an effective ducted range hood into your kitchen. Range hoods exhausting to the outside are effective at reducing particles from the stove. Re-circulation or microwave range hoods typically do not work well. A ROCIS guide to ducted kitchen hoods can be found [here](#).

Purchase a vacuum cleaner with a HEPA filter

- Vacuums with High-Efficiency Particulate Air filters can trap extremely small particles.

Consider switching to an induction stove top

- Induction stove tops reduce particle emissions from cooking because they do not have a gas burner or a red-hot burner surface, and allow efficient control of cooking temperature.

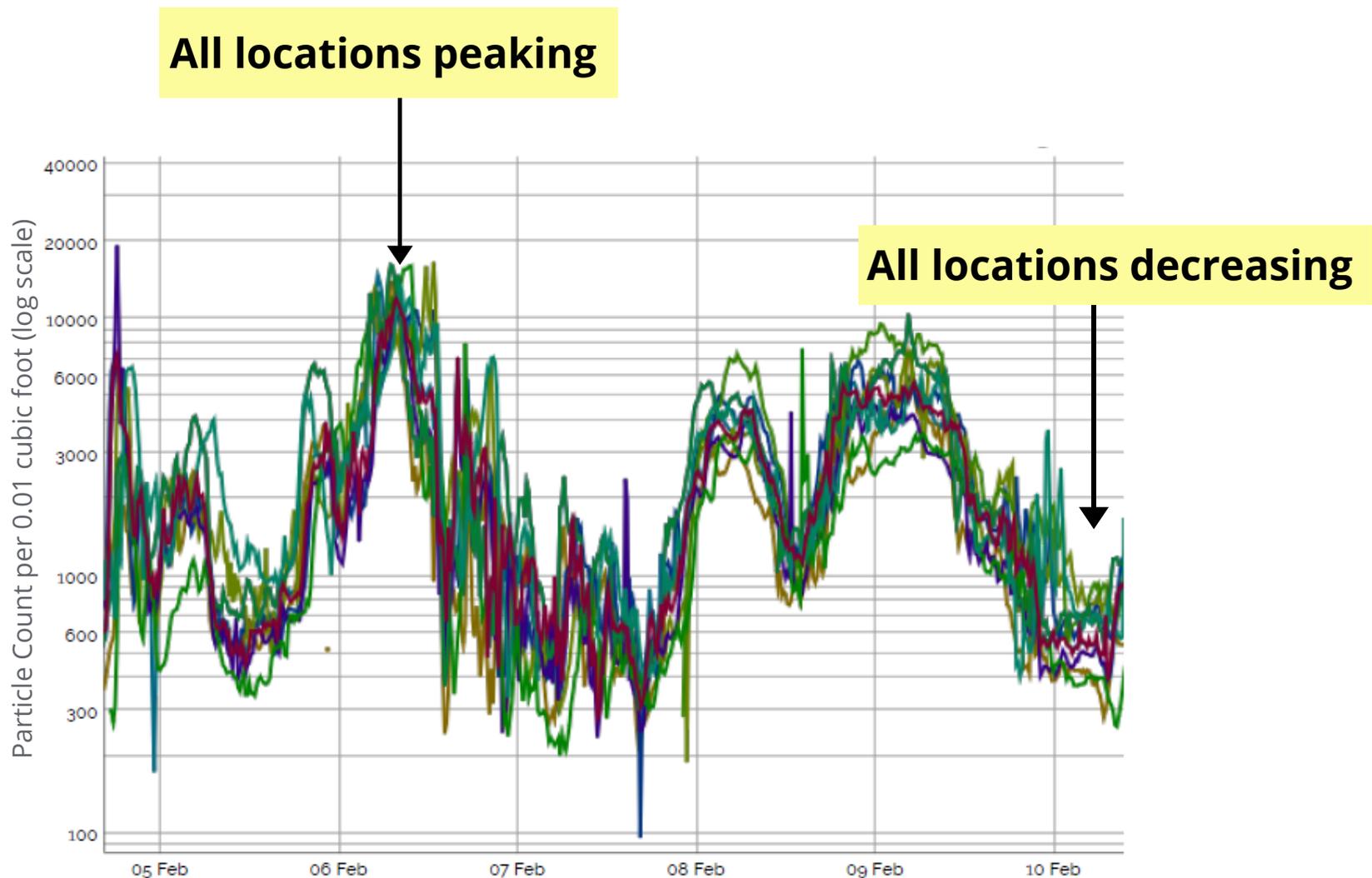
Hire a professional

- A professional can determine whether it is possible to modify your furnace and/or central air conditioner to act as tool for reducing indoor particles. Have them check the ducting system pressures, search for duct leakage to the outside, and verify that the fan/motor combination can run efficiently at low speed. You can read more about ROCIS air handler diagnostics [here](#).

Skeptical about whether these actions can really make a difference? See our attached Frequently Asked Questions (FAQs)!

ROCIS FAQ: I live in the suburbs of Pittsburgh - do I really need to pay attention to my outdoor air quality?

Yes. Here's an example from a ROCIS Cohort in February 2020. Each colored line in the graph below represents the outdoor air quality of a different location, including Upper St. Clair, Clairton, Squirrel Hill, and Moon Township. Notice how the air quality rises and falls in unison across the Pittsburgh area.

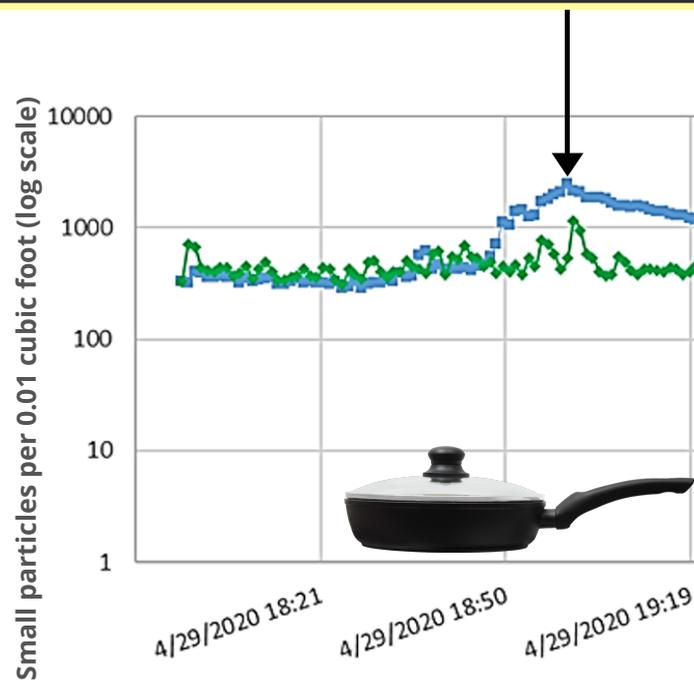


"Our house is on the southern border of Mt. Lebanon next to a small woods...Most of the time, the air looks and smells OK. If I didn't have measurement tools, I wouldn't know it is not very healthy most of the time." - Preston, ROCIS participant

ROCIS FAQ: Does it really make a difference if I cover my pan?

Yes! Here's an example from ROCIS participant Sara, who cooked grilled cheese sandwiches on two different days.

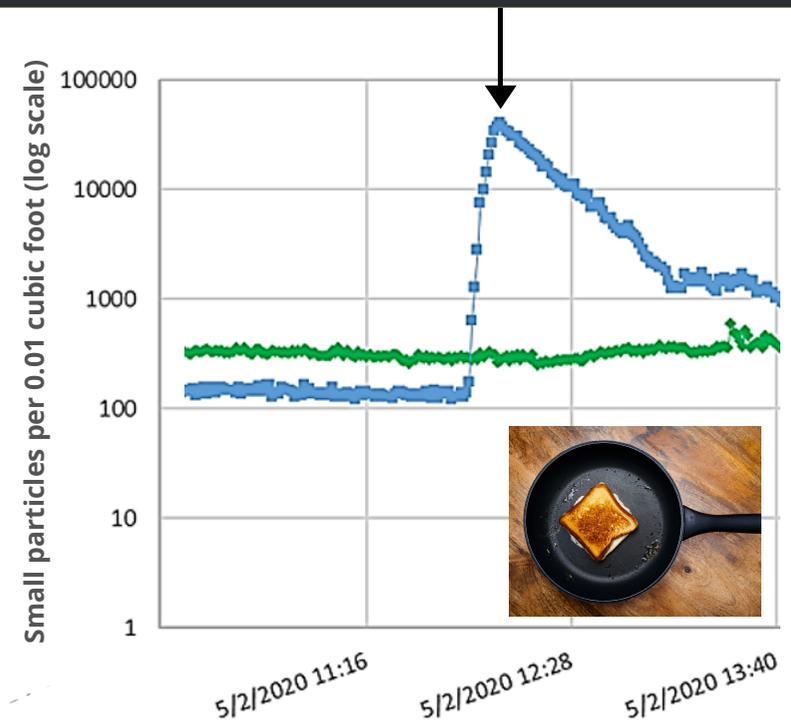
Indoor particles peaked at 2,500 with a grilled cheese sandwich in a covered pan



4/29/2020:

- windows open
- range hood running
- one **covered** pan with grilled cheese sandwich

Indoor particles peaked at 40,750 with a grilled cheese sandwich in an uncovered pan



5/2/2020:

- windows open
- range hood running
- one **covered** pan with a grilled cheese sandwich
- one **uncovered** pan with a grilled cheese sandwich

"After reflecting on both of these cooking experiences and looking at the data for particle counts, it seems that covering the cooking surface may make a bigger difference in keeping particles from escaping into the indoor environment than some of the other actions. I recognize the importance of these behavior changes more than before and will consciously try to use them moving forward." - ROCIS participant Sara

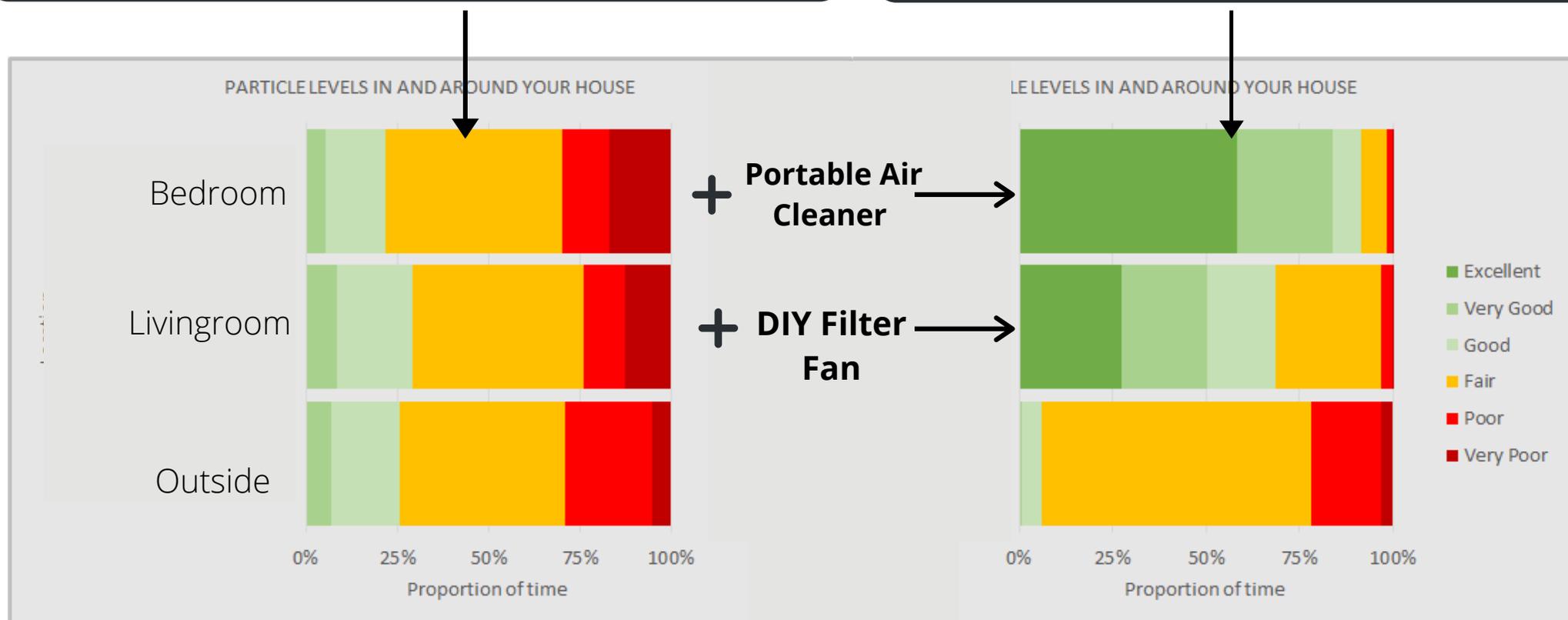
ROCIS FAQ: Can using a DIY filter fan or a portable air cleaner really make a difference?

Week 1:

- Windows opened occasionally
- No portable air filter
- No filter fan
- Air quality indoors similar to outdoors

Week 2:

- Windows opened occasionally
- Portable air filter
- Filter fan
- Air quality indoors better than outdoors

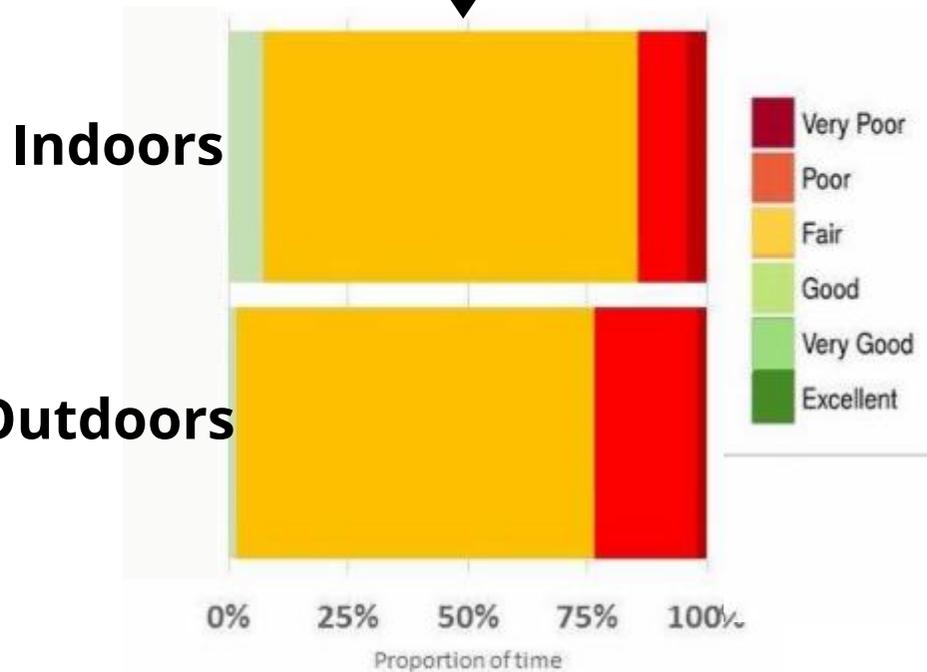


"We noticed a marked difference with the use of both the fan filter and portable air cleaner. We observed our baseline particle counts were lower overall...We also observed that our particle counts lowered more quickly with both interventions after cooking, which was our biggest source of high indoor particle counts."

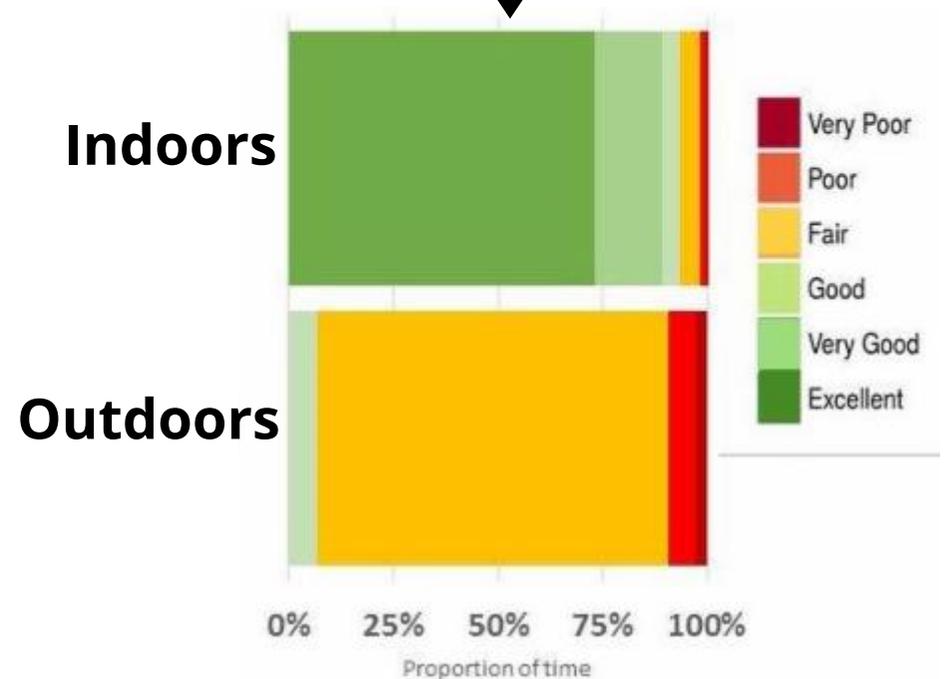
- Val, ROCIS Participant

ROCIS FAQ: Can opening my window really make my indoor air quality worse?

This house in Pittsburgh had open windows. As a result, the indoor and outdoor air quality were similar.



This house in Pittsburgh had closed windows, and used air filtration 24 hours a day. The indoor air quality was much better than outdoors.



Read more about open windows and indoor air quality [here](#).

ROCIS FAQ: Can professional modifications to my air handler really make a difference?

Furnace Before

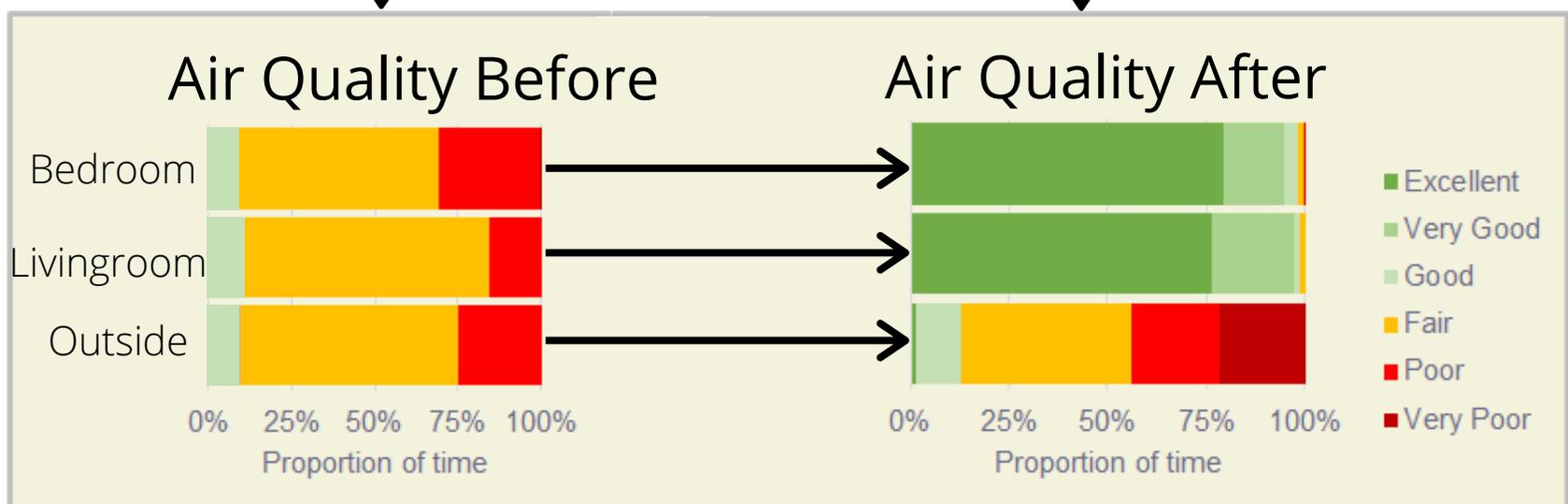


16x25x1 MERV 12

Furnace After



20x25x4 MERV 13





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