Solving for the Indoor Environmental Determinants of Health (IEDOH) in Asthma:

IEDOH Solutions for Asthma During Wildfires

Hosted by

U.S. Environmental Protection Agency (EPA)

August 14, 2024

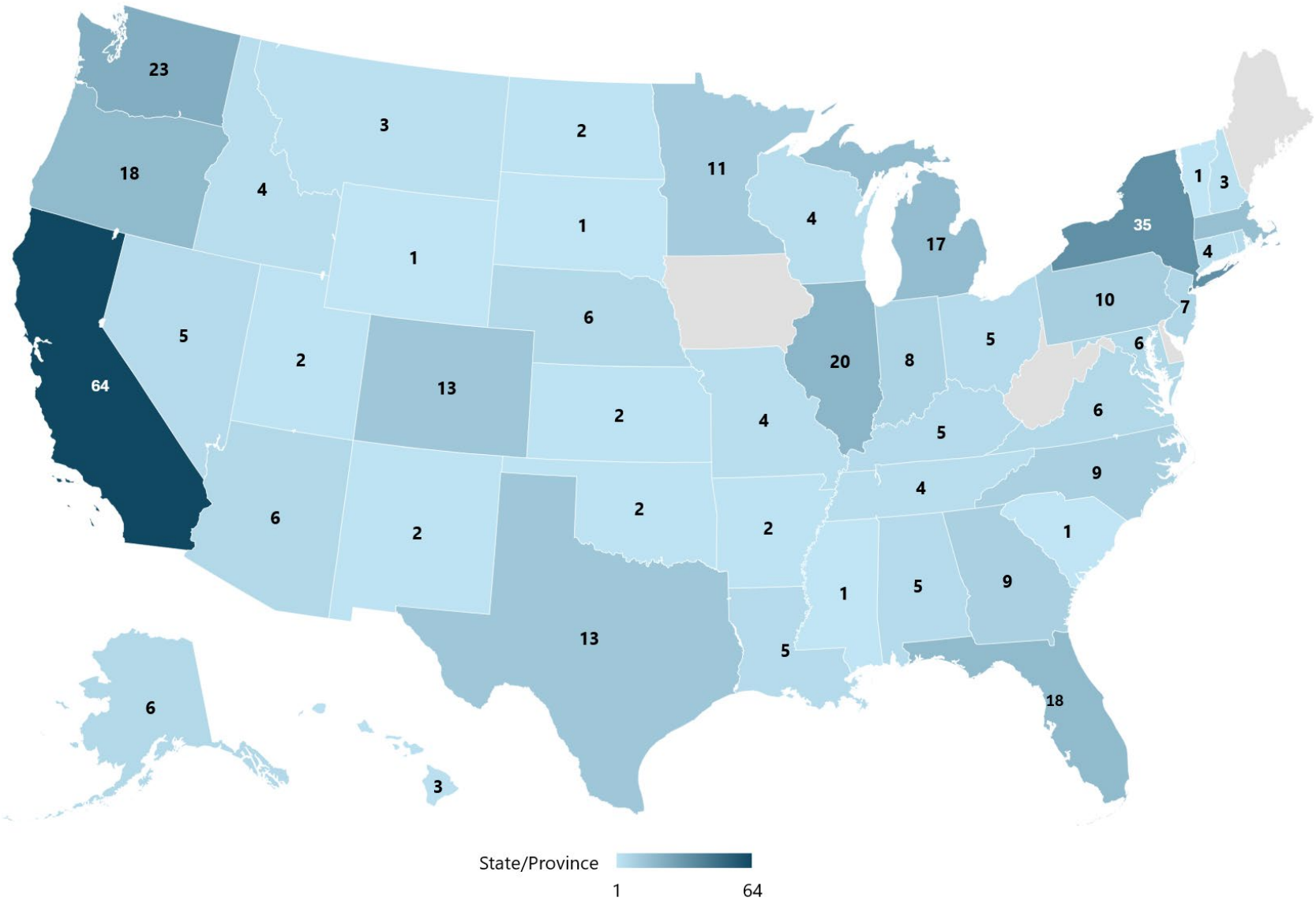
2:00–3:30 p.m. EST

IEDOH Solutions for Asthma in Wildfires

Today, we hope you will learn about—

- Significant and growing nationwide asthma risk from wildfire pollution exposure and associated spikes in urgent health care use.
- Preparedness with data, equipment, and community networks ready to deliver IEDOH interventions for people at greatest risk from wildfires.
- Examples of how to finance and deliver indoor air cleaners, replacement air filters, environmental education, and care to people with asthma during wildfire events.

Who Is Here Today?

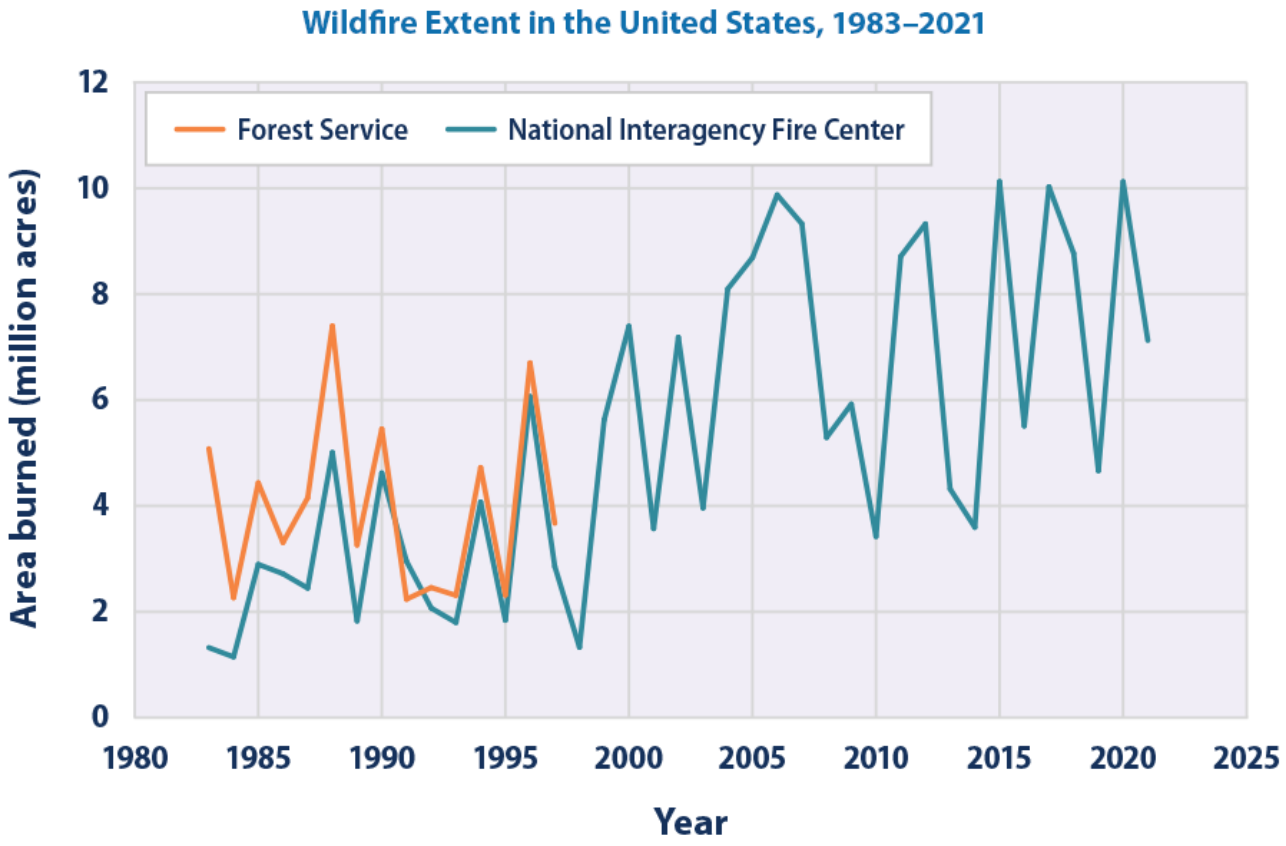


Polling Question 1

How familiar are you with wildfires and asthma and indoor interventions during wildfires for asthma?

1. Very familiar. I participate in wildfire and asthma efforts.
2. Somewhat familiar. I know wildfires are an asthma risk but do not know about IEDOH interventions for wildfires.
3. A little. I imagine people with asthma struggle with wildfire exposures.
4. Not familiar with wildfire pollution and IEDOH.

Solving for IEDOH in Asthma



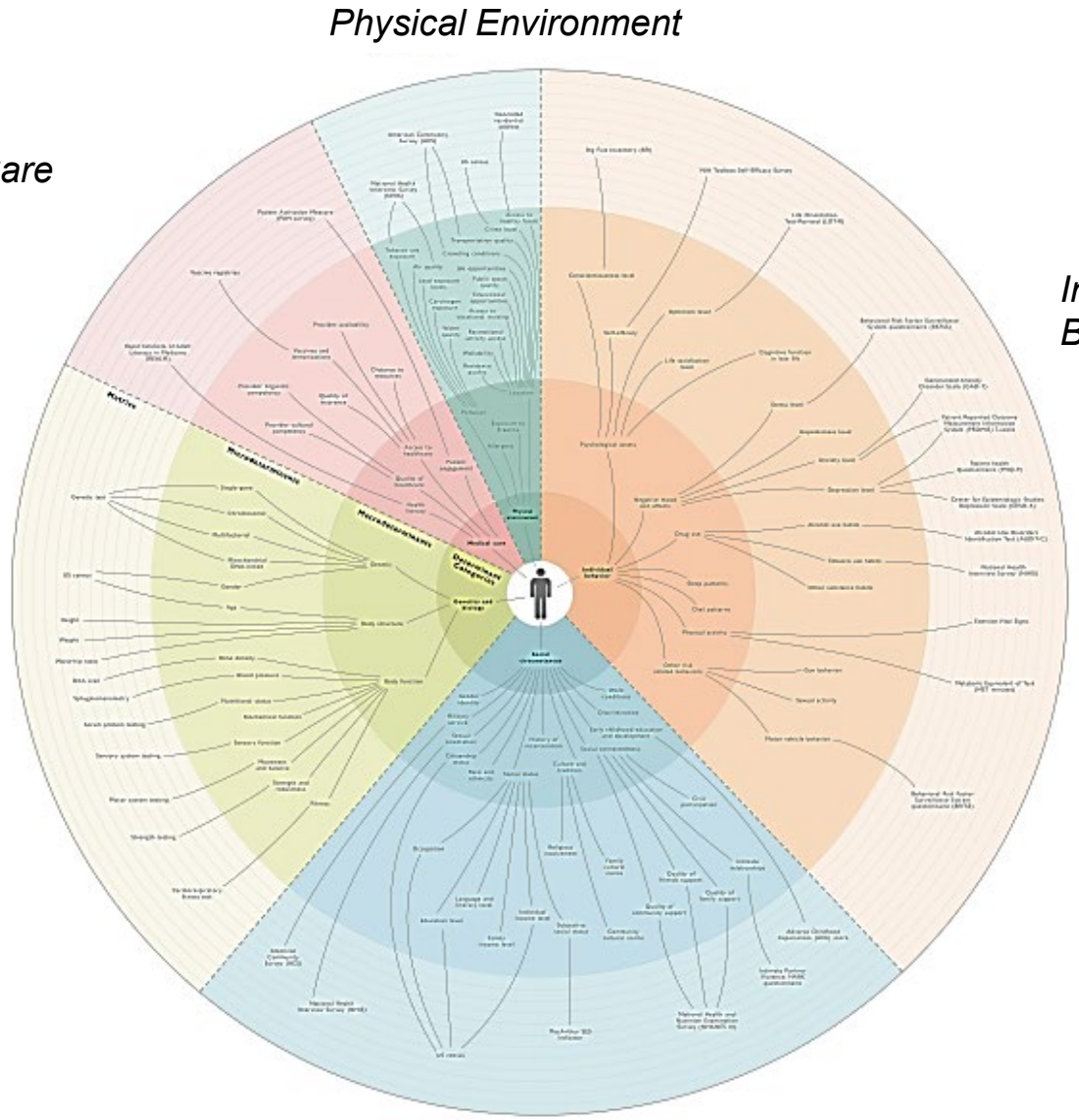
Data sources:
- NIFC (National Interagency Fire Center). 2022. Total wildland fires and acres (1983–2022). Accessed June 2022. www.nifc.gov/fireInfo/fireInfo_stats_totalFires.html.
- Short, K.C. 2015. Sources and implications of bias and uncertainty in a century of U.S. wildfire activity data. Int. J. Wildland Fire 24(7):883–891.

For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climate-indicators.

Increasing wildfire risks bring a focus to the **critical role of in-home environmental interventions** in asthma care.

Children with asthma are at greatest risk from wildfire smoke exposure; **the worse the asthma, the greater the risk**.

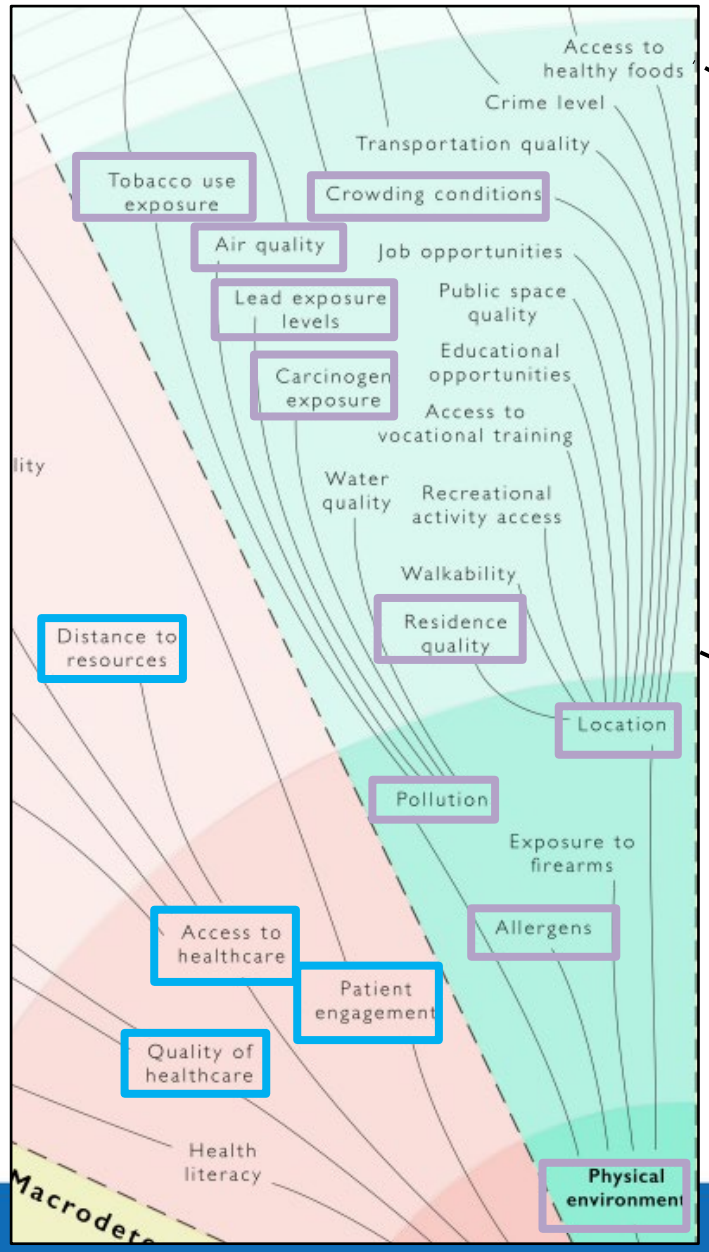
When outdoor air is full of wildfire smoke, **indoor environmental interventions become critical care**.



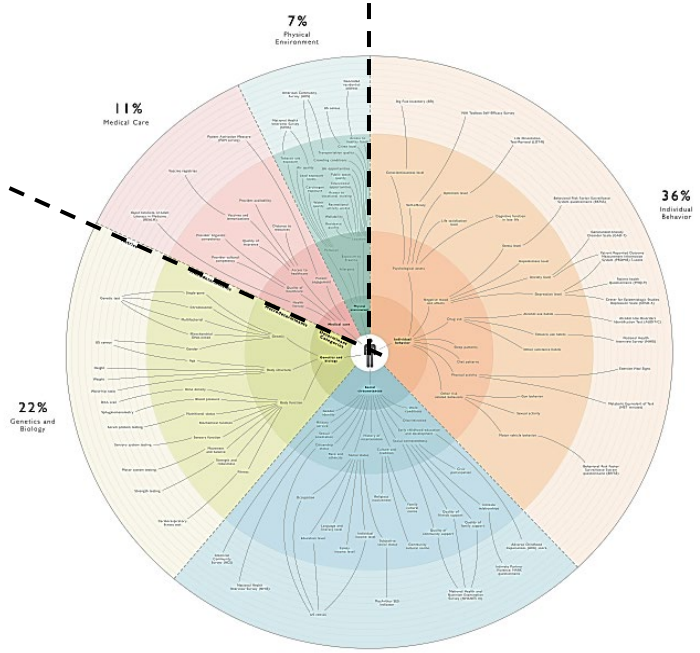
The **social determinants of health (SDOH)** are conditions in environments where people are born, live, work, play, and age that affect health, functioning, and quality-of-life outcomes and risks.

GoInvo infographic:
www.goinvo.com/vision/determinants-of-health/?utm_source=determinant

Solving for IEDOH in Asthma



IEDOH are a subset of SDOH clustered in the physical environment that **covary with housing quality and access to quality medical care**.



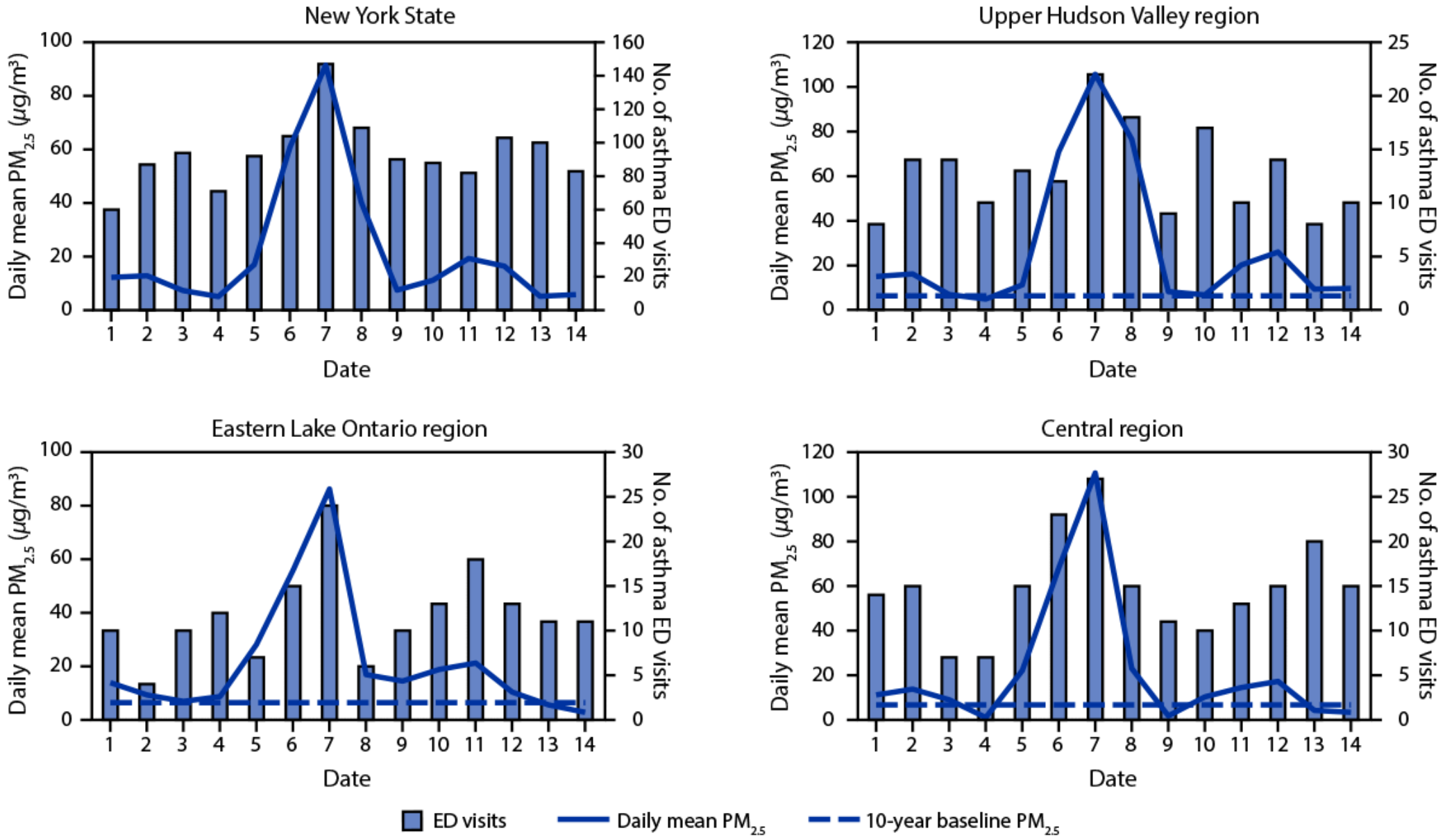
IEDOH are **modifiable environmental factors indoors**—such as household air pollution levels, thermal comfort, presence of pests, mold and moisture, chemicals, irritants, and **infiltration of outdoor wildfire smoke—that influence risk and experience of disease**.

IEDOH Solutions for Asthma in Wildfires

- Who needs IEDOH solutions? Everyone is at risk from wildfire smoke, but smoke poses particular risk for:
  - People with asthma and other respiratory and cardiovascular disease
  - Children younger than 18
  - Pregnant people
  - Older adults
  - Low-income people
  - Outdoor workers

www.epa.gov/wildfire-smoke-course/which-populations-experience-greater-risks-adverse-health-effects-resulting

IEDOH Solutions for Asthma in Wildfires


New York State
Upper Hudson Valley region
Eastern Lake Ontario region
Central region
Daily mean PM2.5 (µg/m³)
No. of asthma ED visits
Date
ED visits
Daily mean PM2.5
10-year baseline PM2.5

IEDOH Solutions for Asthma in Wildfires

- Especially in wildfires, 90–100% of time is spent indoors.
- IEDOH interventions, like air cleaning and enhanced filtration, can reduce $PM_{2.5}$.
- Addressing wildfire smoke in asthma means reaching people at risk, who may have limited clinical access, to deliver IEDOH intervention supplies and education.
- Portable air cleaners can be used alone or with enhanced filters in central air.
- Securing air cleaners, having networks to reach people at risk, and being ready to pay for equipment and staff before events is particularly important for those at-risk.

Solving for IEDOH in Asthma:

Providing Free Air Cleaners & Asthma Education to Address Health Disparities

ANNE KELSEY LAMB, M.P.H.
DIRECTOR, REGIONAL ASTHMA MANAGEMENT & PREVENTION (RAMP),
PUBLIC HEALTH INSTITUTE, OAKLAND, CA

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IEDOH Solutions for Asthma During Wildfire Events

August 14, 2024

RAMP's mission is to reduce the burden of asthma with a focus on health equity. Emphasizing both prevention and management, we build capacity, create linkages, and mobilize networks to advocate for policy and systems changes targeting the root causes of asthma disparities.

Today's presentation

- Describe RAMP's guidance for selecting air cleaners for people with asthma
- Share tools for asthma programs, government agencies, and consumers
- Discuss best practices for distributing air cleaners to people with asthma

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"The air is breathable in my house."

- Air cleaner recipient

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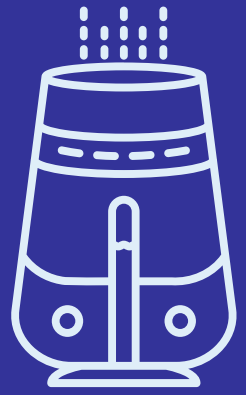
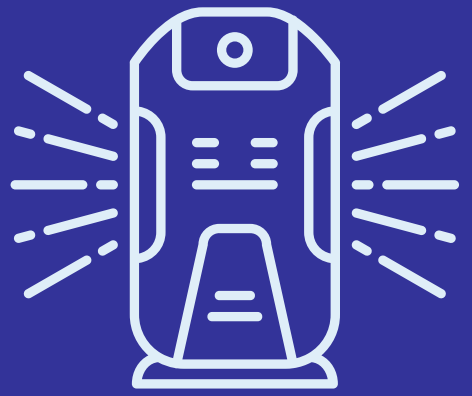
Type

Cost

Room Size





Noise

Weight

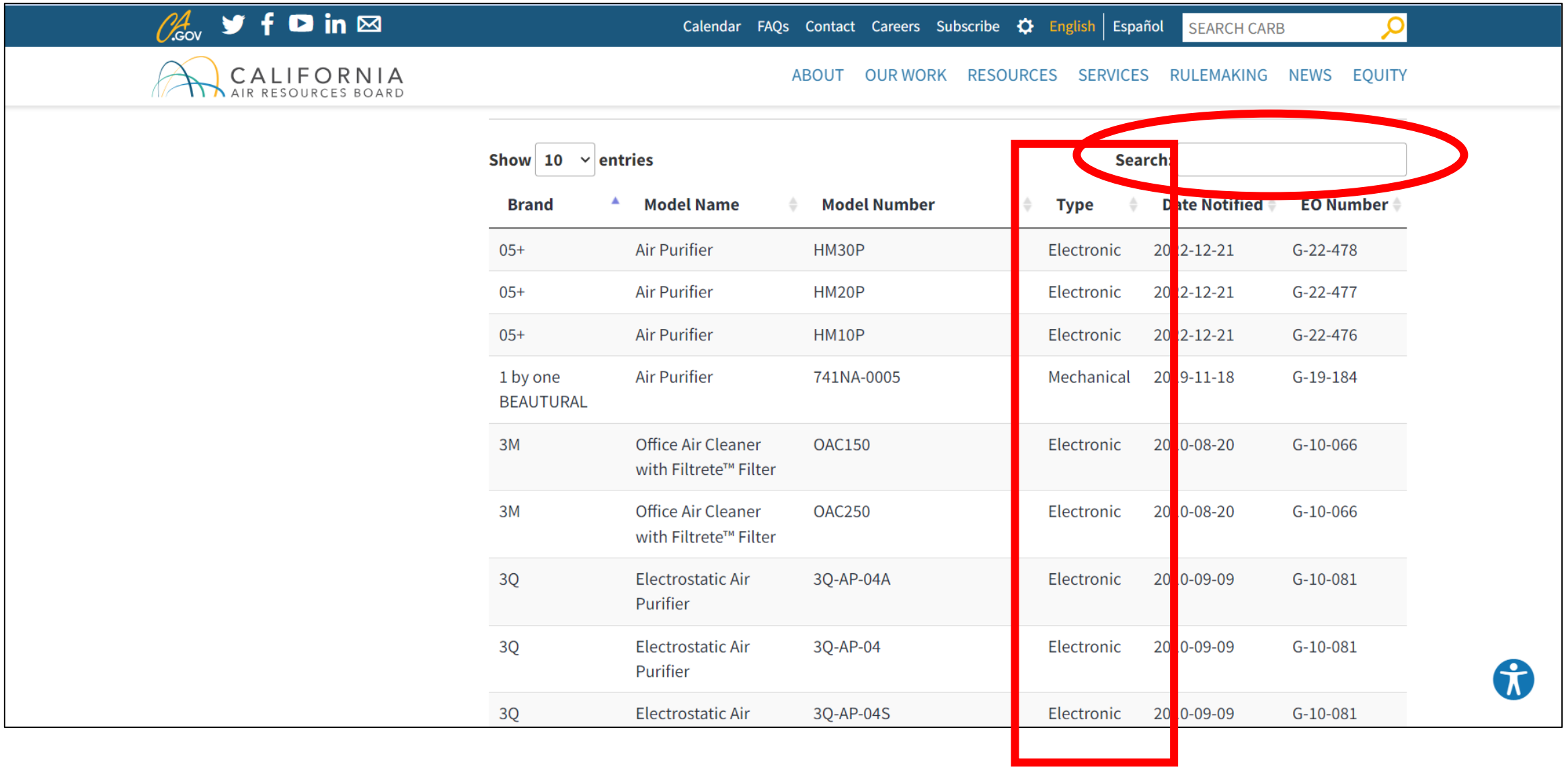
Energy Use

Make sure the air cleaner is certified as a Mechanical Air Cleaner by the California Air Resources Board (CARB).

- Mechanical air cleaners are safe and effectively filter out particles using High-Efficiency Particulate Air (HEPA) or similar filters.
- Electronic air cleaners using ionizers, electrostatic precipitators, photocatalytic oxidizers, hydroxyl generators, and UV lights rely on technologies that can produce ozone or other byproducts harmful to health.

Choose an air cleaner that is the right size for the space where it will be used.

- Air cleaners are made to clean different-sized rooms.
- The clean air delivery rate (CADR) tells you how much air the air cleaner cleans hourly.
- This is measured in cubic feet per minute (cfm).



ww2.arb.ca.gov/list-carb-certified-air-cleaning-devices

Other considerations

- Cost
- Noise level
- Size and weight
- Energy efficiency
- Independent testing
- Other features

Examples of air cleaners for asthma programs

Examples of Air Cleaners

The air cleaners listed in this table are all: 1) CARB certified; 2) Mechanical air cleaners without ionizers; 3) under $250.
Air cleaners are made to clean different sized rooms. It is important to select each air cleaner for the room size where it will be used.

Model	Room size	Unit cost*	Replacement Filter cost (1 yr)**	Noise (decibels)	Unit size (inches)	Weight (lbs)	Energy Star	Special features
ISINLIVE vortex V2	Small	$40	$80	55	9*9*14.8	8.09	No	Air quality monitor
Airthereal APH230C	Small	$90	$40	49	20*13*7.5	10	No	Child lock, optional timer, filter reset indicator, silent mode
Renpho RP-AP088	Small	$90	$56	52	8.5*8.5*14.25	N/A	No	Timer, filter replacement indicator, night light, sleep mode, child lock
Levoit Core 300	Small	$100	$60	50	8.7*8.7*14.2	7.5	Yes	Timer, filter replacement indicator, sleep mode, quiet mode
3M Filtrete FAP-C03BA-G2	Small	$108	$43	55	21.3*15*11	14	No	Fan speeds, set a run timer, dim the control panel lights, and reset the filter change indicator, handle to carry
Levoit Vital 100	Small	$120	$64	50	12.8*6.4*16.1	9.3	No	Sleep mode
Okaysou Air Max 10L Pro	Small	$130	$100	51	13.2*7.2*19	12.78	No	Air quality monitor, auto mode, filter replacement indicator, timer, child lock
Honeywell HPA100	Small	$134	$68	65	13.5*8.9*13.94	7.74	Yes	Filter replacement indicator, timer, panel dimmer
Storebary C350	Small	$136	$27	50	8*68.6*13.5	7.7	No	Filter replacement indicator, PM 2.5 monitor, child lock, auto mode, timer, sleep mode, display off
Medify Air MA-25	Small	$160	$100	52	13.5*8*8	7.3	Yes	Filter replacement indicator, child lock, sleep mode, timer
IKEA STARKVIND	Small	$180	$30	53	7*20*21	13	No	Filter replacement indicator, auto mode detects the particles (PM2.5) in the air and then adjusts the fan speed

rampasthma.org/wp-content/uploads/2023/09/Examples-of-Air-Cleaners-for-Asthma-Programs.pdf

Tools for organizations, schools, and consumers

How to Choose a Safe & Effective Air Cleaner

Air cleaners, sometimes called air purifiers, can help clear out wildfire smoke particles and improve indoor air quality.

What type of air cleaner is best?

Mechanical air cleaners with High-Efficiency Particulate Air (HEPA) filters or filters rated MERV-13 and higher are best. Electronic air cleaners may produce ozone or other byproducts in the air that can be harmful to health. You can avoid electronic air cleaners by avoiding products that use terms like: ionizer, electrostatic precipitator, plasma, photocatalytic oxidation, hydroxyl generator, or UV light. Some air cleaners have both a HEPA filter *and* an electronic component, such as an ionizer. If your air cleaner has both, we recommend turning the ionizer function off.

Why is room size important?

Air cleaners are made to clean different sized rooms. It is important to use one that is powerful enough to clean the amount of air in the room where it will be used. The clean air delivery rate (CADR) tells you how much air the air cleaner cleans hourly. This is measured in cubic feet per minute (cfm). Use an air cleaner with a CADR up to 200 cfm for a small room, 200-300 cfm for a medium-sized room, and more than 300 cfm for a large room.

Is it CARB certified?

All air cleaners sold in California must be certified by the California Air Resources Board (CARB) and you can check their list here. Even if you don't live in California, your healthiest choice will likely be a CARB-certified air cleaner. CARB certifies both mechanical and electronic air cleaners. We recommend choosing mechanical air cleaners.

When choosing an air cleaner, make sure :

- ✓ It is a mechanical air cleaner with a HEPA filter
- ✓ It is the right size for the room where it will be used
- ✓ It is CARB certified

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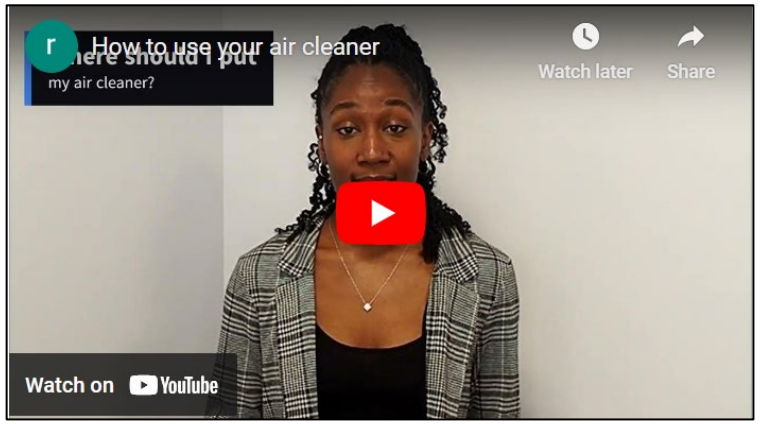

rampasthma.org/air-cleaners-for-asthma-programs/


Tips to Help People with Asthma Stay Safe During Wildfires
SWIPE TO SEE TIPS
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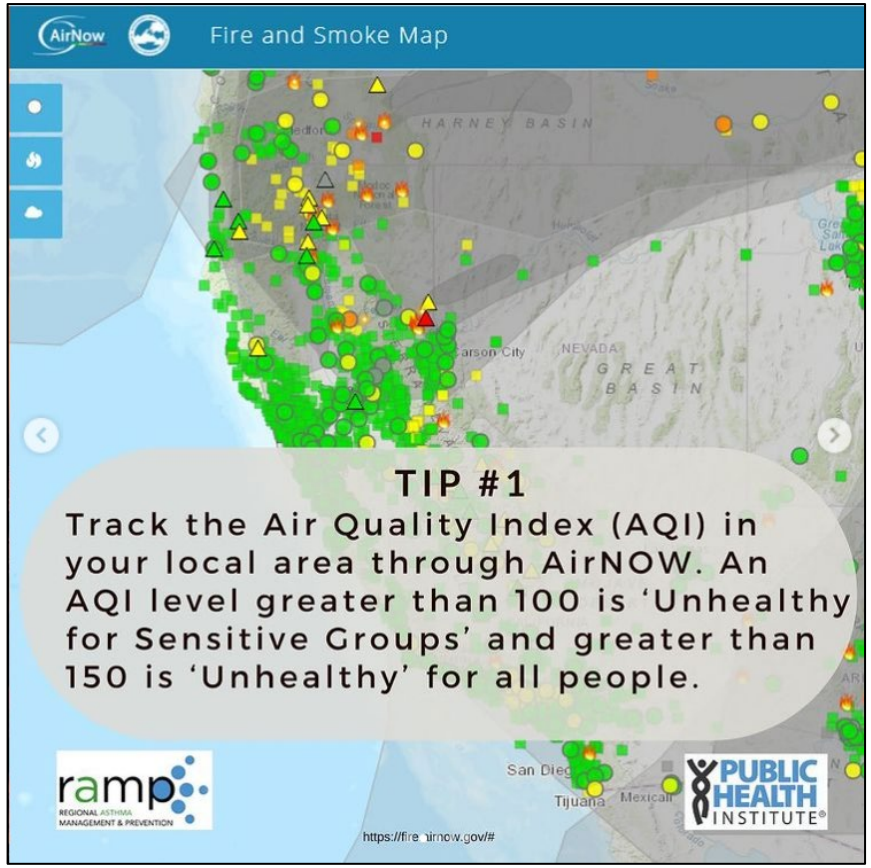
AirNow
Fire and Smoke Map
HARNEY BASIN
NEVADA
GREAT BASIN
Carson City
TIP #1
Track the Air Quality Index (AQI) in your local area through AirNOW. An AQI level greater than 100 is 'Unhealthy for Sensitive Groups' and greater than 150 is 'Unhealthy' for all people.
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Tijuana
Mexicali
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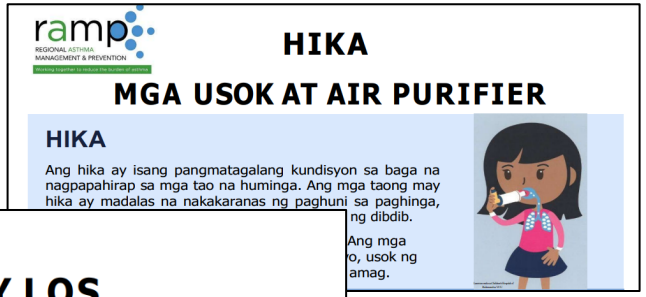
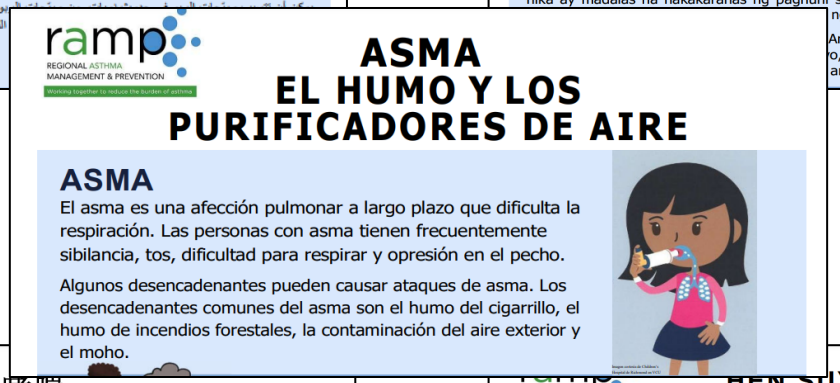
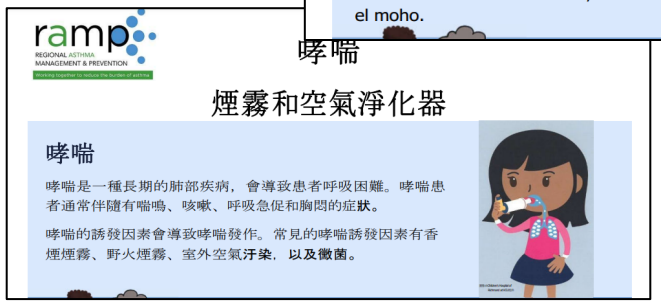
https://fire.airnow.gov/#

Tools in multiple languages







Providing air cleaners to the people with asthma

- Asthma home-visiting programs
- Government agencies
  - Air district pilot project
  - Medicaid policies
- Recommendations and lessons learned

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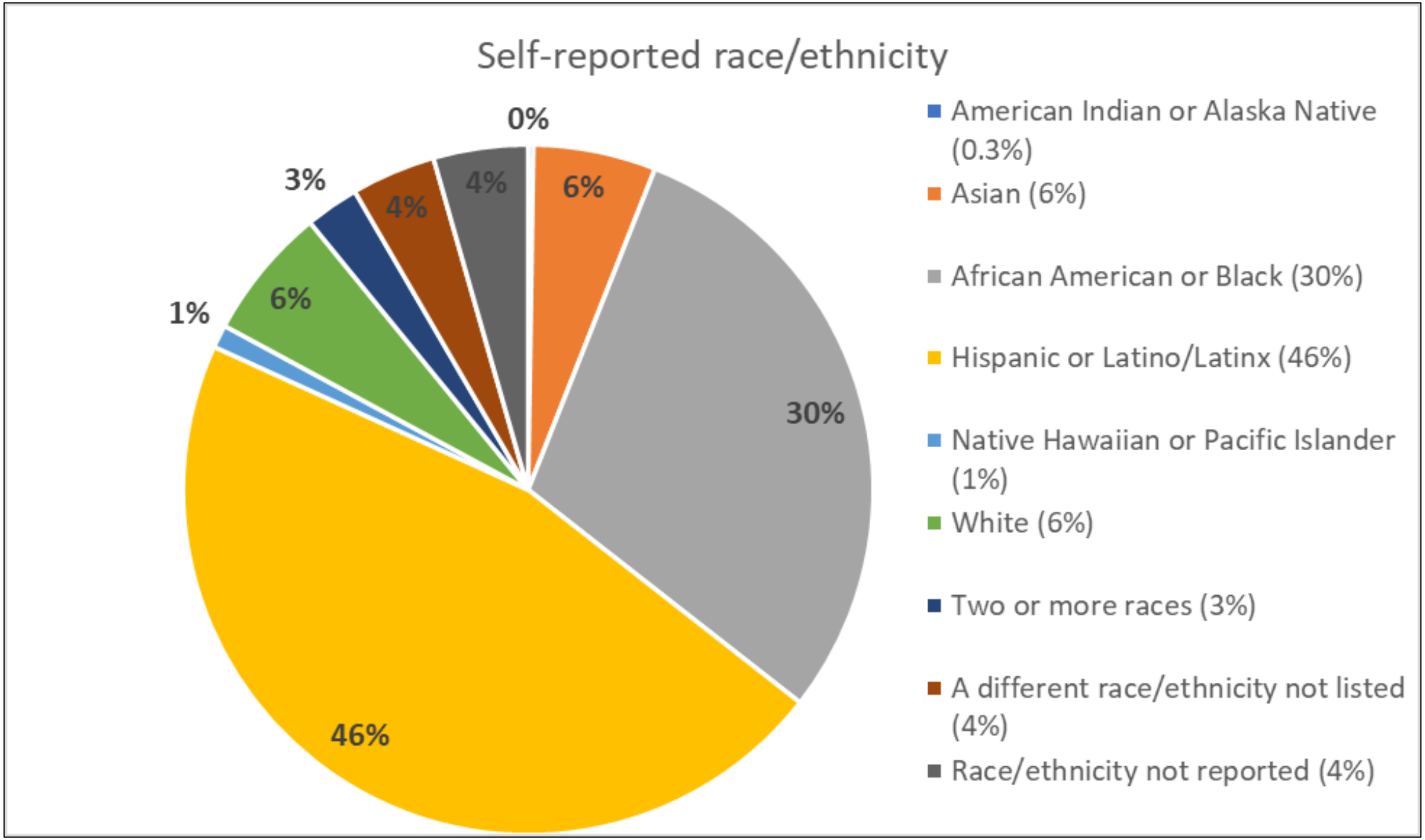
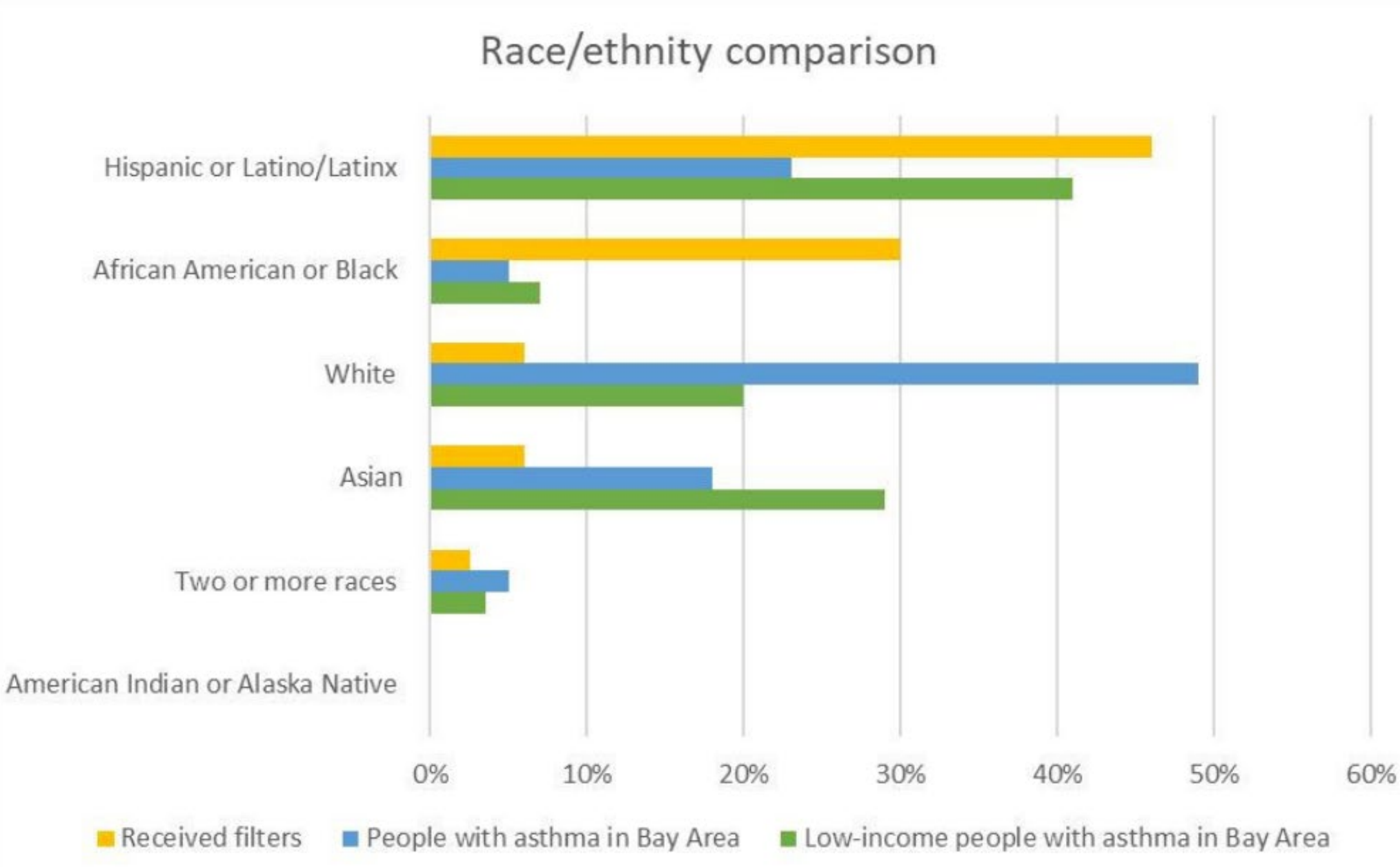
"The ability to provide this resource to patients (that have limited financial means) has had a significant impact on improving patient health outcomes surrounding asthma."

– Asthma home visitor

Recipient eligibility requirements

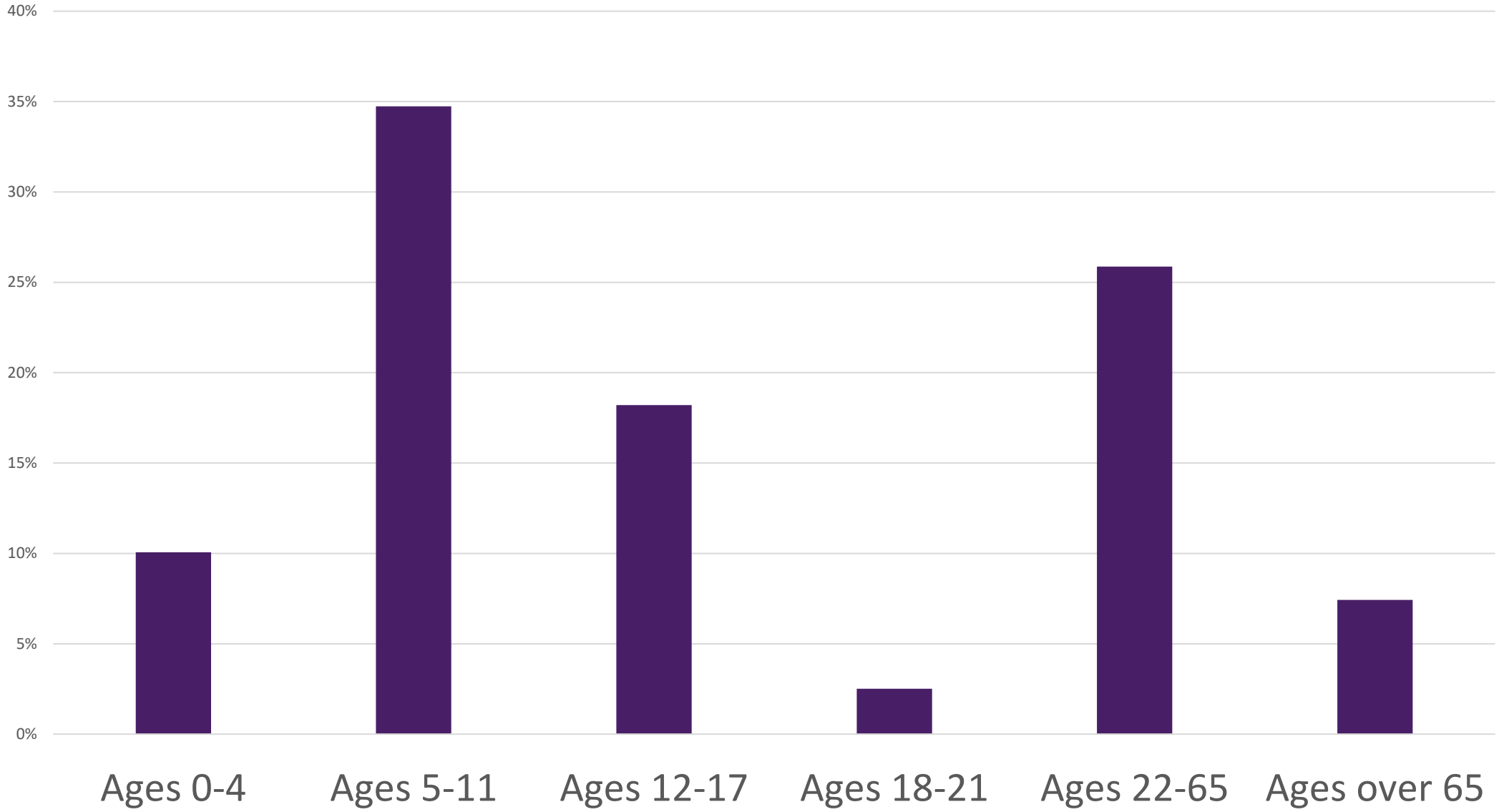
- **Poorly controlled asthma**
  - Asthma-related ED visit or hospitalization, or two urgent care asthma-related visits in the past 12 months, or
  - A score of 19 or lower on the Asthma Control Test, or
  - The recommendation from a licensed physician, nurse practitioner, or physician assistant, and
- **Medi-Cal recipients**


Self-reported race/ethnicity
0%
6%
30%
46%
1%
6%
3%
4%
4%
American Indian or Alaska Native (0.3%)
Asian (6%)
African American or Black (30%)
Hispanic or Latino/Latinx (46%)
Native Hawaiian or Pacific Islander (1%)
White (6%)
Two or more races (3%)
A different race/ethnicity not listed (4%)
Race/ethnicity not reported (4%)

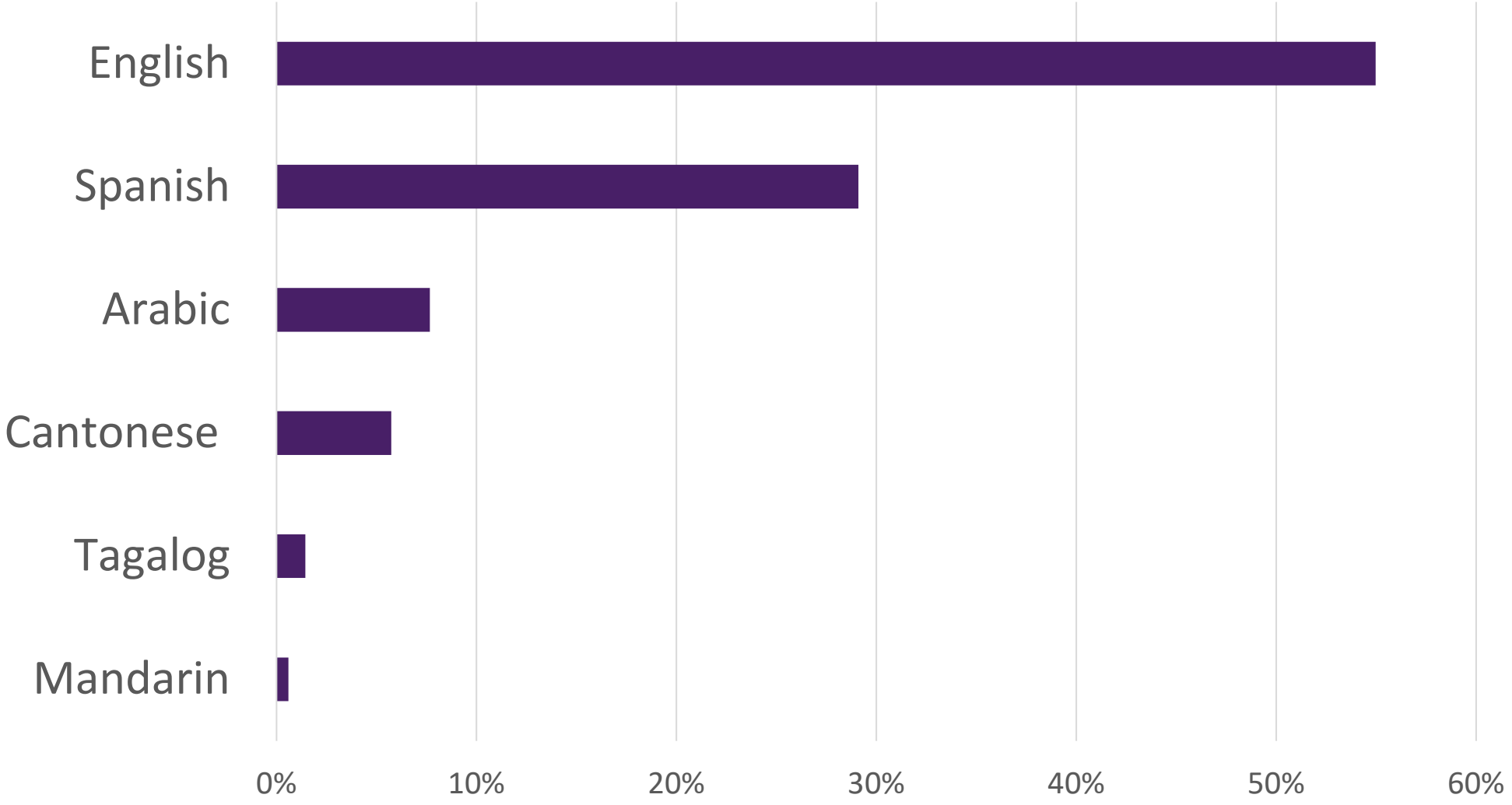

Race/ethnity comparison
Hispanic or Latino/Latinx
African American or Black
White
Asian
Two or more races
American Indian or Alaska Native
0%
10%
20%
30%
40%
50%
60%
Received filters
People with asthma in Bay Area
Low-income people with asthma in Bay Area

Geographic Reach

Age of Recipients



Primary language of recipients



Case Study highlights, lessons, and tips

rampasthma.org/wp-content/uploads/2023/09/Case-Study-Air-Cleaner-Distribution.pdf

Air cleaners for Medi-Cal's Asthma Remediation clients

- Asthma Remediation covers minor to moderate environmental remediation
  - Lifetime cap of $7,500 per beneficiary

Supplies

- Mattress and pillow dustcovers
- HEPA filtered vacuums
- De-humidifiers
- Air cleaners and replacement filters

Services

- Minor mold removal and remediation services
- Ventilation improvements
- Integrated Pest Management (IPM)

*Other interventions identified to be medically appropriate and cost effective.

Oregon: Air Conditioner and Air Filter Deployment Program

HEALTH SYSTEMS DIVISION
Medicaid Programs

Oregon Health Authority

Air Conditioner and Air Filter Deployment Program

Protecting the health of at-risk Oregonians during extreme heat and wildfires

Section 7 of Senate Bill 1536 (2022 Regular Session) directed the Oregon Health Authority (OHA) to create Oregon's Air Conditioner and Air Filter Deployment Program. This program:

- Provides portable air conditioner (AC) units and air filtration devices to protect Oregonians from extreme heat and wildfire smoke.
- Is only for people who qualify for medical assistance through OHA, Oregon Department of Human Services (ODHS) or Medicare, or people who have received medical assistance services in the past 12 months.

This year OHA will be able to provide around 3,000 AC units and 4,700 air filtration devices. OHA also works with partner organizations around the state to help install AC units for members who need help.

Lessons learned and recommendations

- Air cleaners are important and effective tools for reducing exposure to wildfire smoke.
- The asthma field should pilot and, ultimately, systematize and scale air cleaner distribution.
- Asthma programs should learn from one another to identify best practices.

Thank you.

Anne Kelsey Lamb, M.P.H., Director

anne@rampasthma.org

Panel Discussion and Question-and-Answer Session

Queen Eze, Project Manager,
Esperanza Community Housing

BJ Biskupiak, Health Education Specialist,
Montana Asthma Control Program, Montana Department of Public Health & Human Services

Mary Anderson, Wildfire Smoke Coordinator
Chronic Disease Prevention & Health Promotion Bureau, Montana Department of Public Health & Human Services

Polling Question 2

How familiar are you with wildfires and asthma and indoor interventions during wildfires for asthma?

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2. Somewhat familiar. I know wildfires are an asthma risk but do not know about IEDOH interventions for wildfires.
3. A little. I imagine people with asthma struggle with wildfire exposures.
4. Not familiar with wildfire pollution and IEDOH.

Where Can I Learn More?

- Preparing for Fire Season: www.epa.gov/wildfire-smoke-course/preparing-fire-season#aircleaner
- Wildfires and Indoor Air Quality (IAQ) (available in nine languages): www.epa.gov/indoor-air-quality-iaq/wildfires-and-indoor-air-quality-iaq
- Indoor Air Quality: www.epa.gov/indoor-air-quality-iaq
- How Outdoor Air Enters a Home: www.youtube.com/watch?v=na3RR848m-c
- Protect Yourself From Smoke and Extreme Heat: document.airnow.gov/protect-yourself-from-smoke-and-extreme-heat.pdf

Where Can I Learn More?

Join the Asthma Community Network at www.asthmacommunitynetwork.org.

Three-Part Webinar Series: ***Technical Solutions for Addressing the Indoor Environmental Determinants of Health***

- Innovations in Financing Environmental Asthma Home Visits Within Medicaid
- Population Health Situational Awareness: Getting the Data You Need to Build Equity in Child Asthma Outcomes
- Reimagining Asthma Care, Climate Resilience and Equity in Contra Costa, California: Partnering Health Care With Weatherization to Address the Indoor Environmental Determinants of Health

Three-Part Webinar Series: ***Solving for the Indoor Environmental Determinants of Health (IEDOH) in Asthma***

- Solving for Indoor Environmental Determinants of Health (IEDOH) in Asthma: Using Data to Prioritize In-Home IEDOH Interventions
- Weatherization's Effects on Pediatric Asthma: Evidence From a Natural Experiment
- Indoor Environmental Determinants of Health (IEDOH) Solutions for Asthma During Wildfire Events