



# **Enhancing Public Health Messaging on Wildfire Smoke**

**NCCEH Webinar – April 29, 2026**

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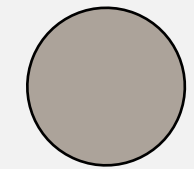
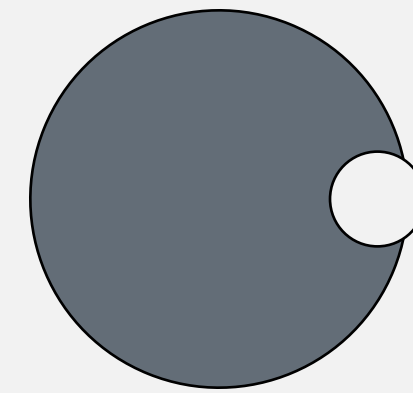
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Eugene, Oregon (August, 2022)



# The Changing Risk Landscape

Canada Wildfire Carbon Emissions (CAMS GFASv1.2)

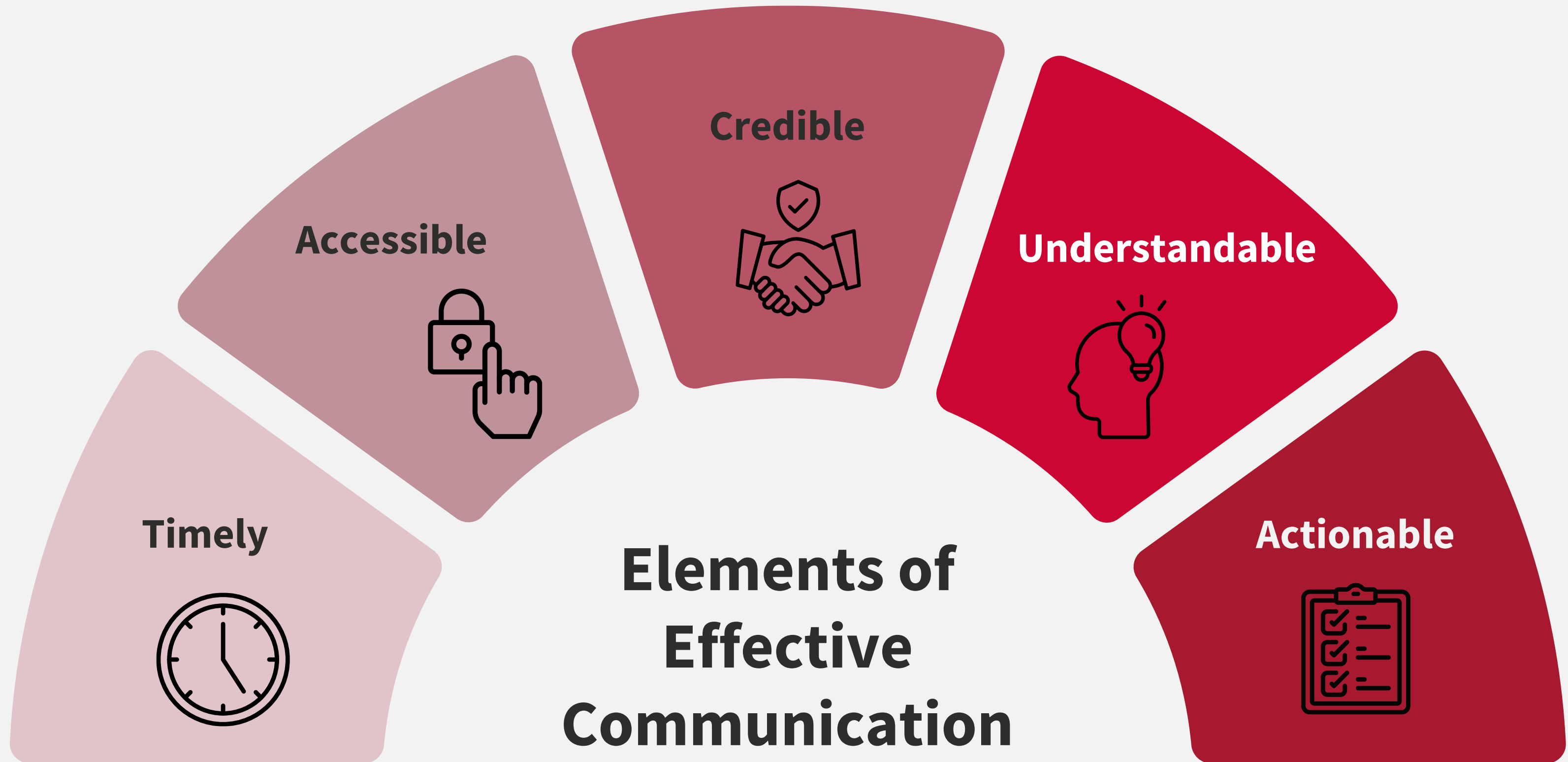
Annual (to 30 November for 2025) total



**The New York Times**  
**Wildfire Smoke Will Kill Thousands More by 2050, Study Finds**  
Pollution from fires, intensified by rising temperatures, is on track to become one of America's deadliest climate disasters.

- Smoke events are becoming more frequent, longer, more intense
- New (less familiar) populations at-risk of exposure
- Reversal of air quality improvement trends – lagging risk perceptions

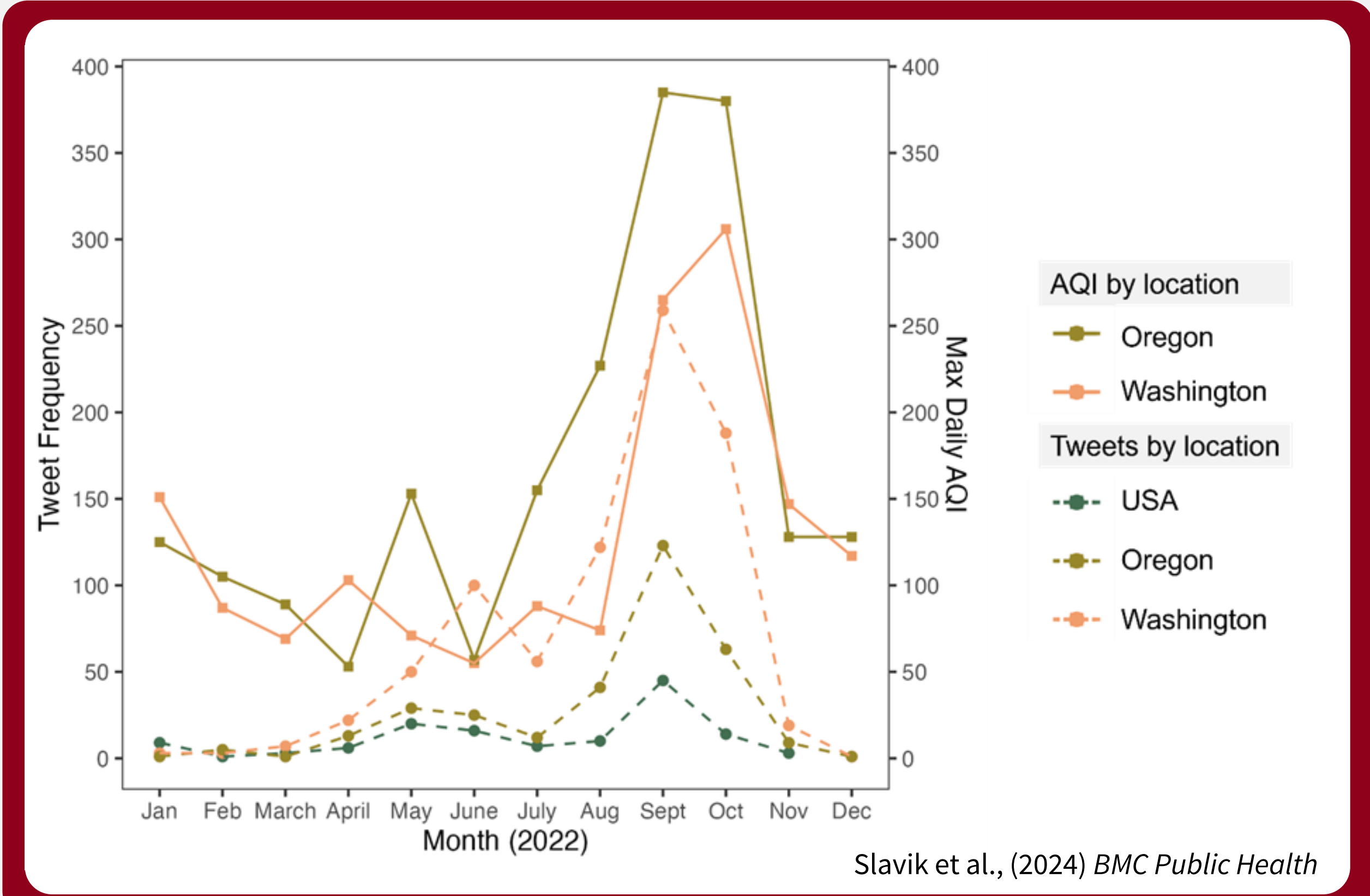
**ARE COMMUNICATIONS MEETING THESE CHALLENGES?**



Adapted from the WHO's Strategic Communications Framework (2017)

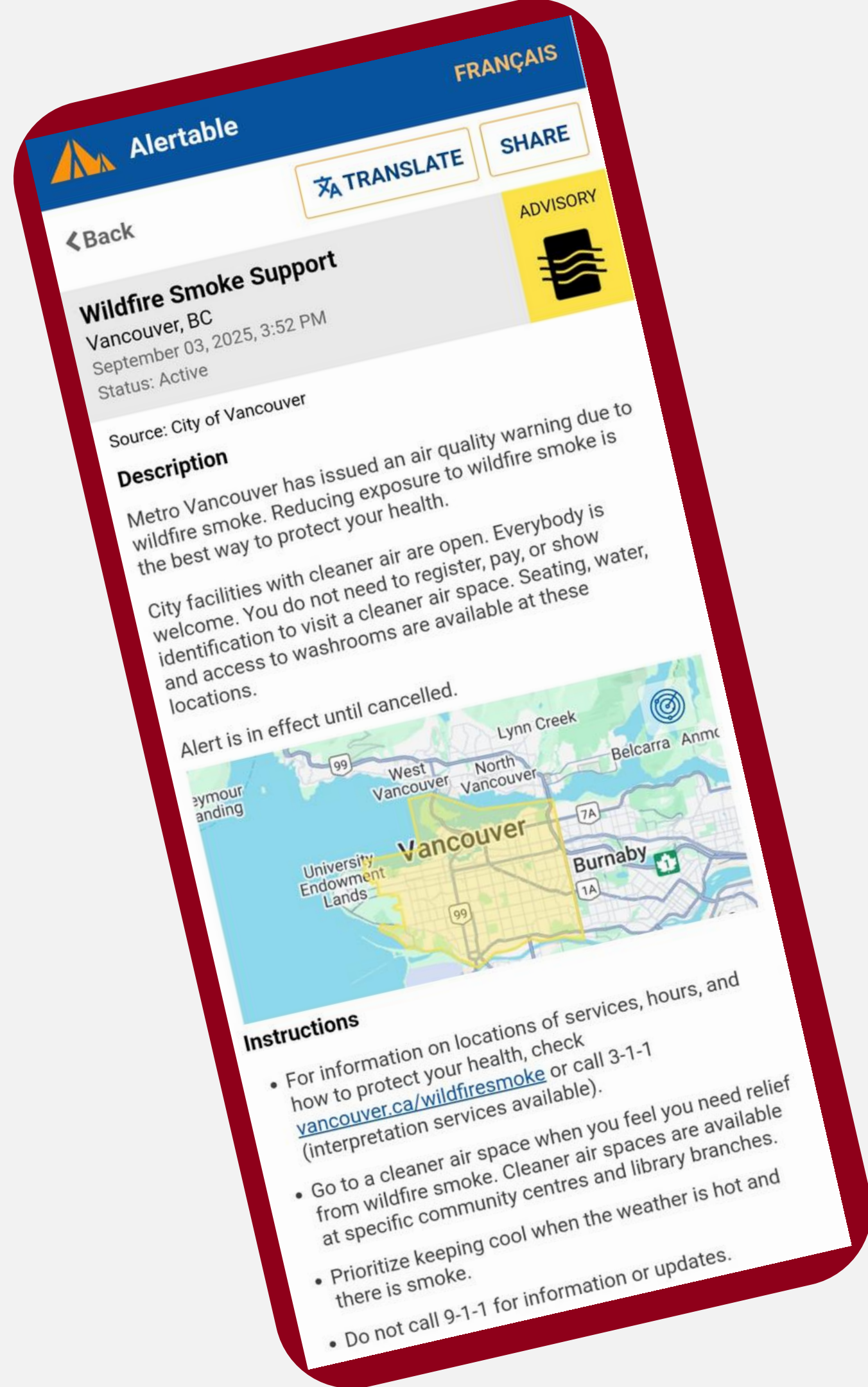
# Are Communications Timely?

- Tend to take a more reactive approach vs. proactive



Slavik et al., (2024) *BMC Public Health*

# Are Communications Accessible?



- Smoke communications are disseminated via multiple channels and formats, across various languages

# Are Communications Credible?

- Sources of health information are highly fragmented by age group (social media vs. traditional media)
- Medical professionals are consistently ranked among the most trustworthy sources of health information



Only 1 in 5 Canadians fully trust news stories about the health effects of wildfires and poor air quality

*CMA (2025) Health and Media Tracking Survey*

# Are Communications Understandable?

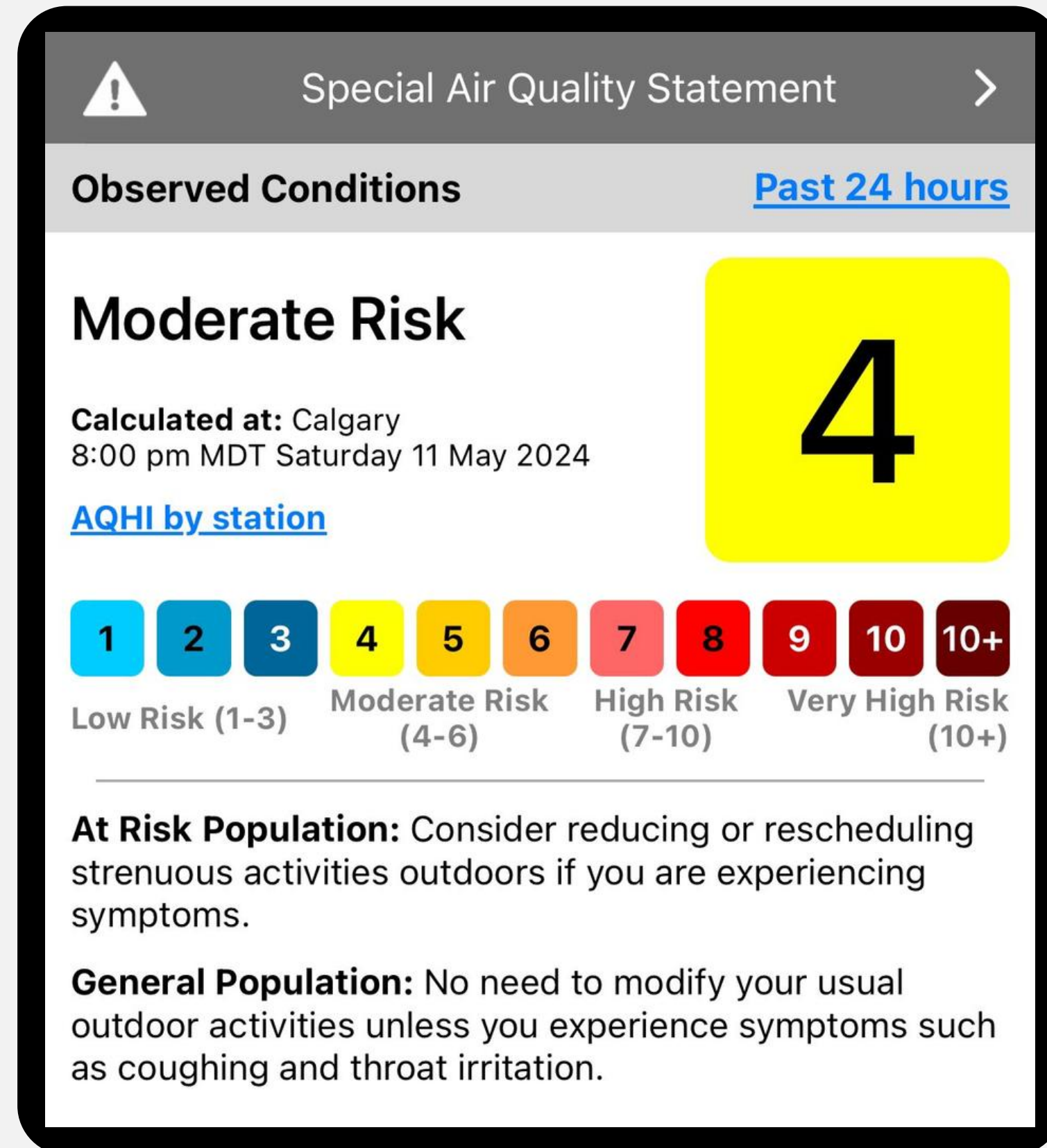
- What key information is missing from this AQHI notification to could help someone make an informed decision?

*Who is “at-risk”?*

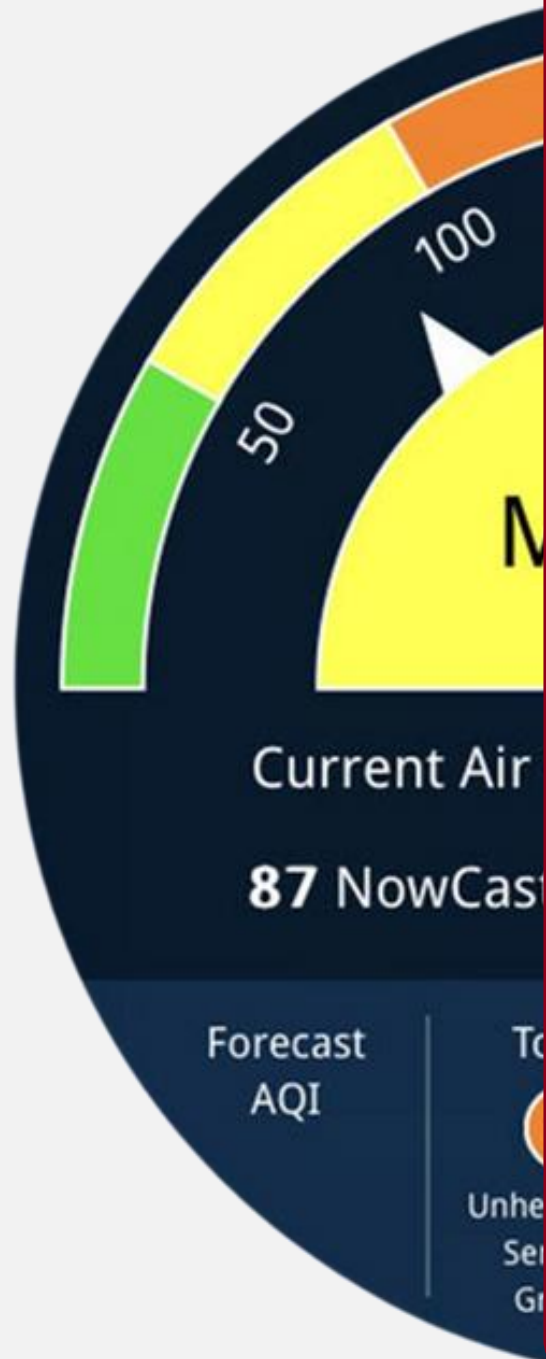
*What constitutes “strenuous”?*

*What can I do if I have to be outside?*

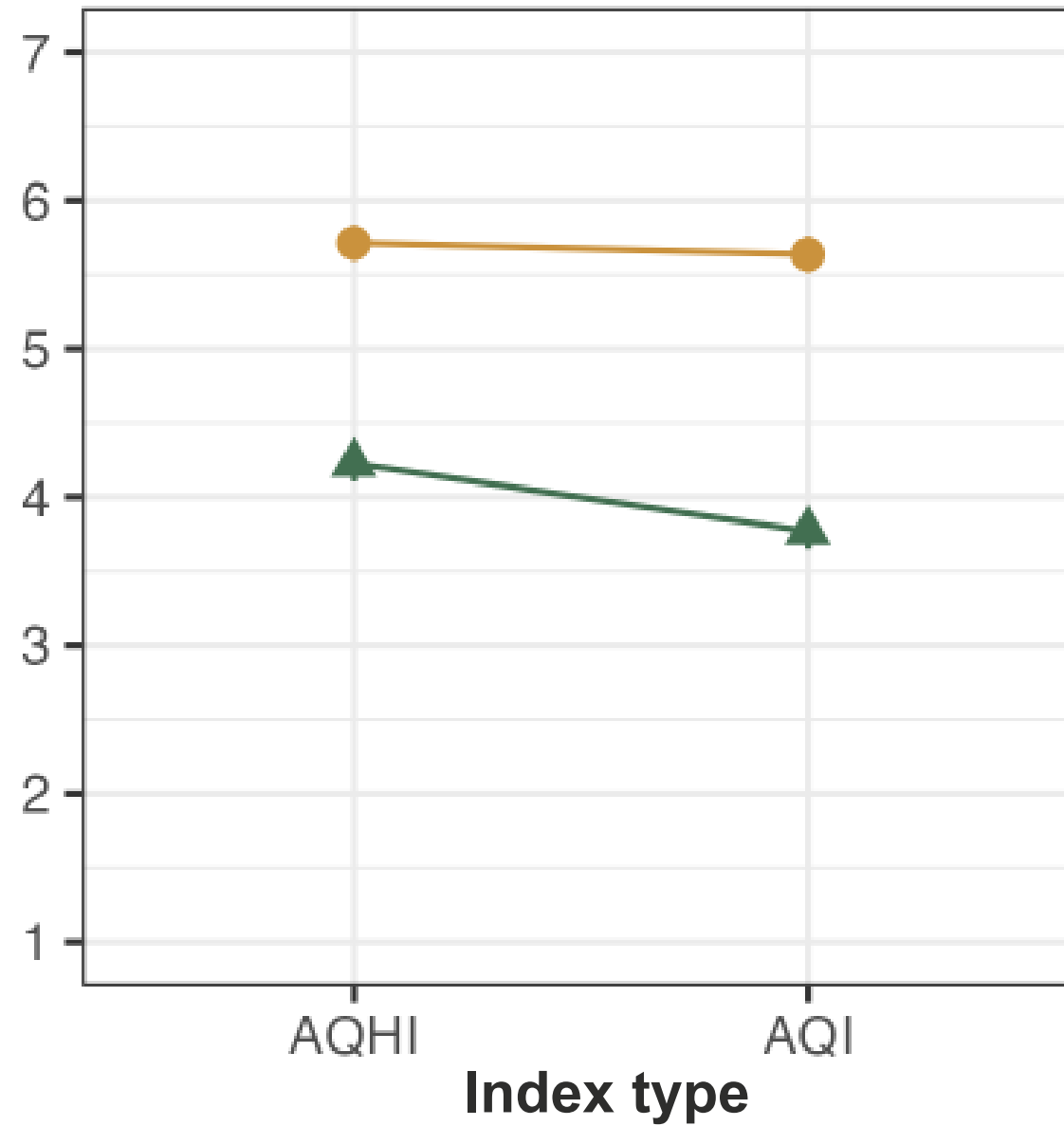
*What’s so bad about wildfire smoke anyway? Coughing and throat irritation doesn’t sound that bad?*



# Are Communications Understandable?



Worry (1 = Not at all worried,  
7 = Very worried)



Wildfire smoke concentrations



Slavik et al. (2024)  
*Environ Res Commun*

Statement

Past 24 hours

4

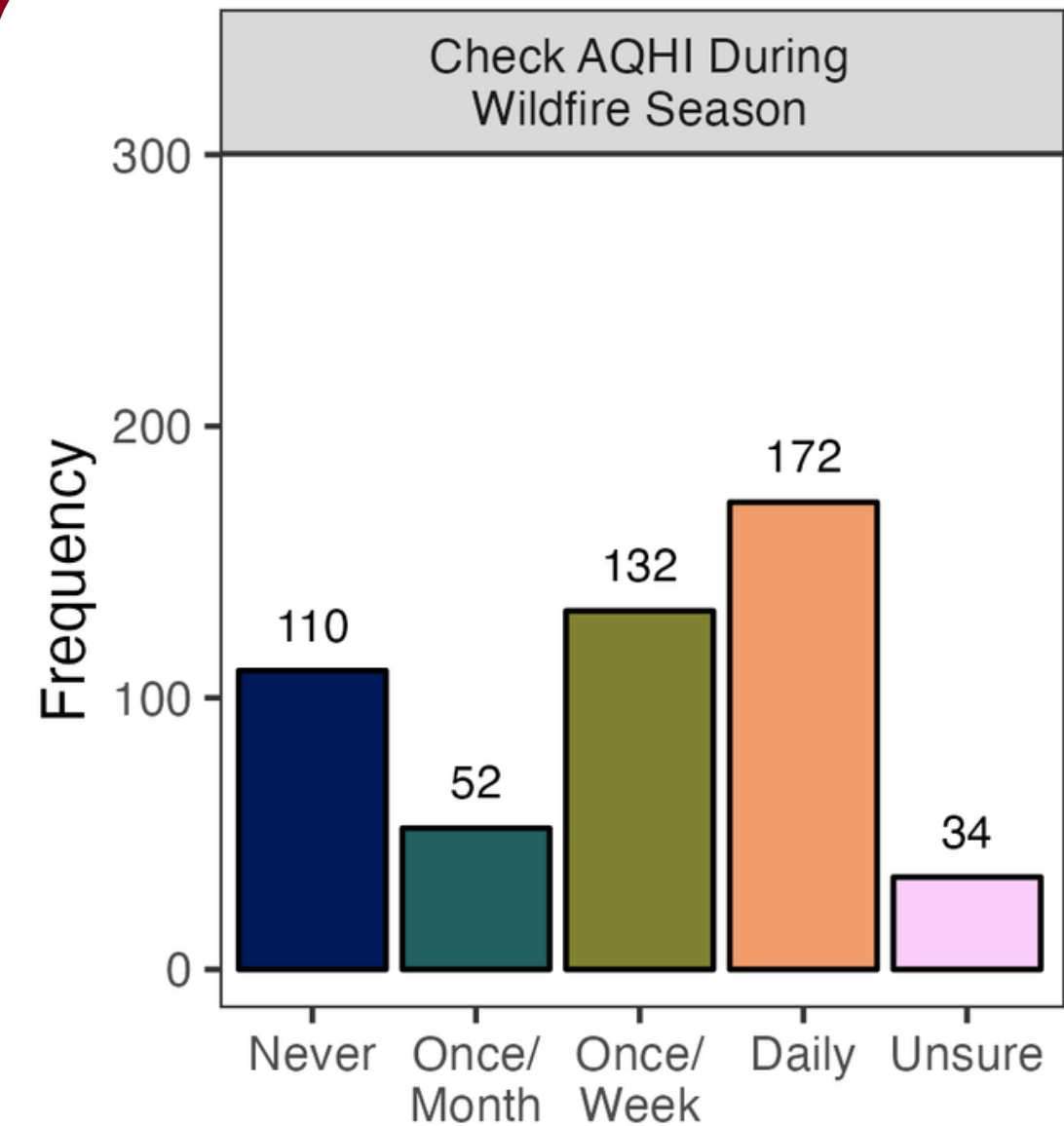
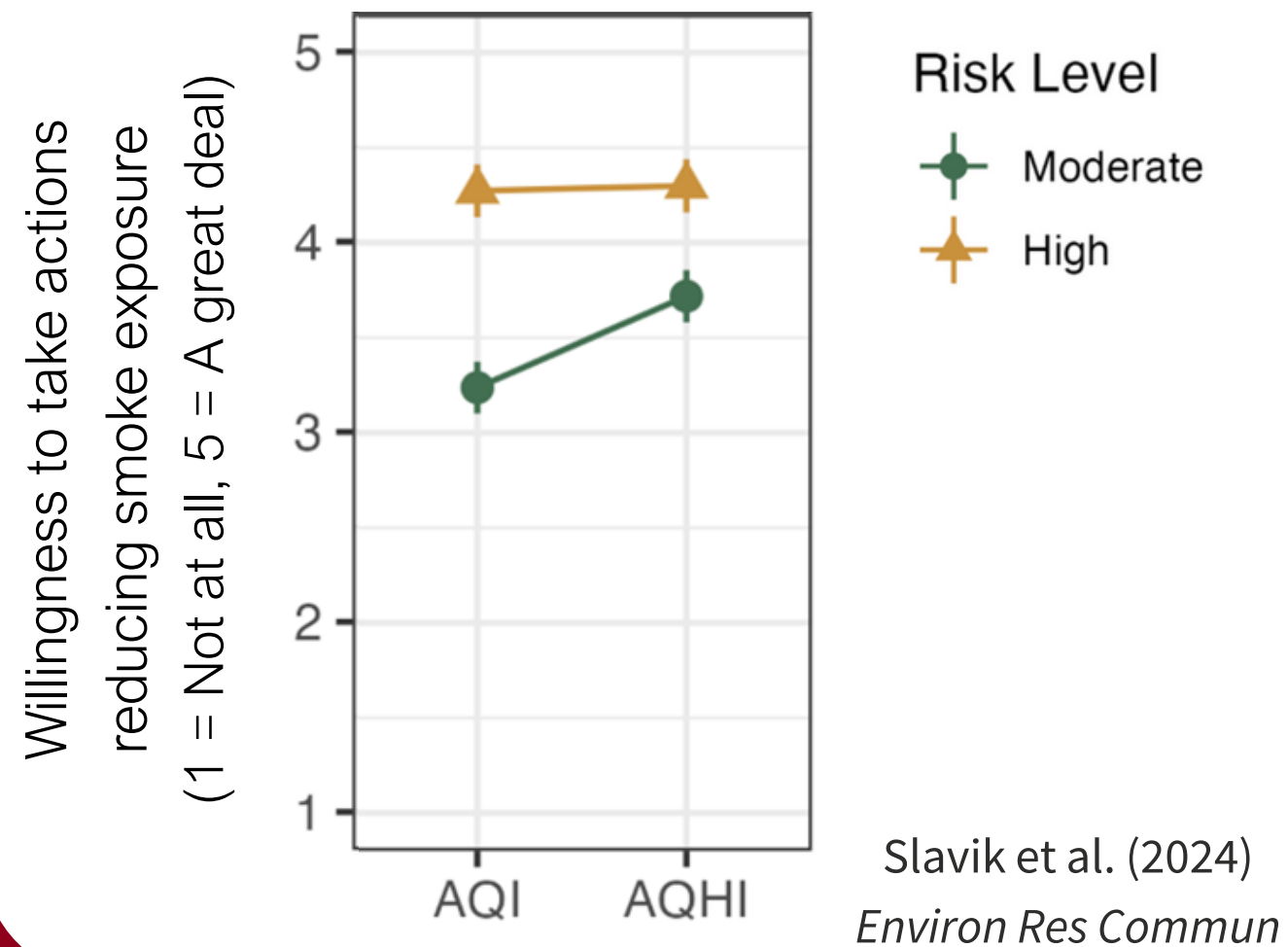
8 9 10 10+  
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# Are Communications Actionable?

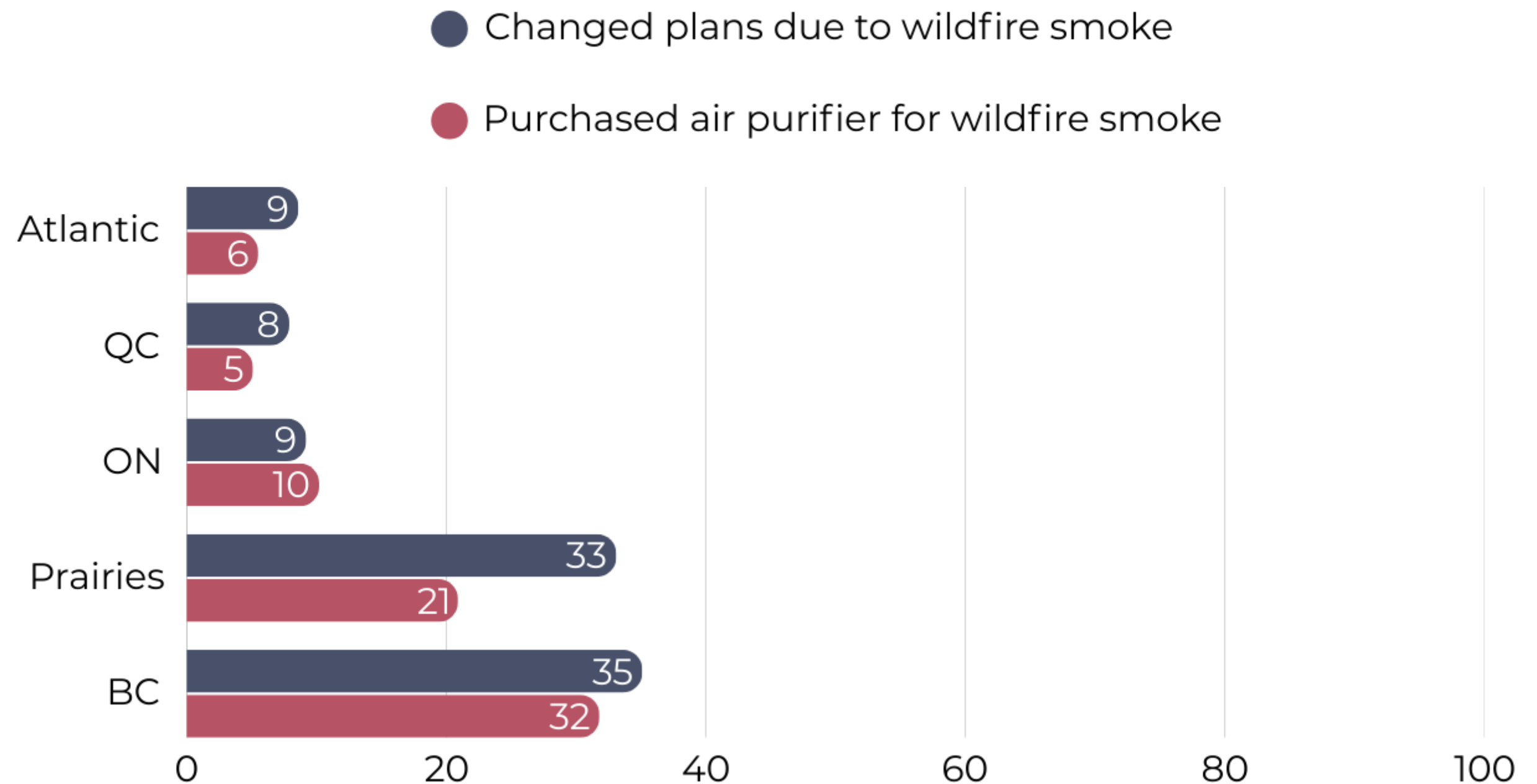
- Air quality indices can motivate actions
- But how frequently are they checked?



# Are Communications Actionable?

- Are (a lack of) communications to blame for these gaps in action?

Percentage of population that took actions against wildfire smoke in the past two years



Nanos Research (July, 2025) *Regional Readiness*

## Why communications matter

1. Have the potential to increase **awareness** about wildfire smoke and **motivate** protective **actions**
2. They are an **intervention** that (when effective) can reduce exposures to hazards like wildfire smoke
3. Present an opportunity to address **misconceptions**, generate **trust**, encourage public **participation** and dialogue

## But...

A clearly defined communication goal is needed

They need to be developed, tested, implemented, evaluated

Messengers matter!



# Breaking down the communication goal

# Who is the target audience?



A family living in  
Smithers, BC



An outdoor worker in  
Ottawa, ON

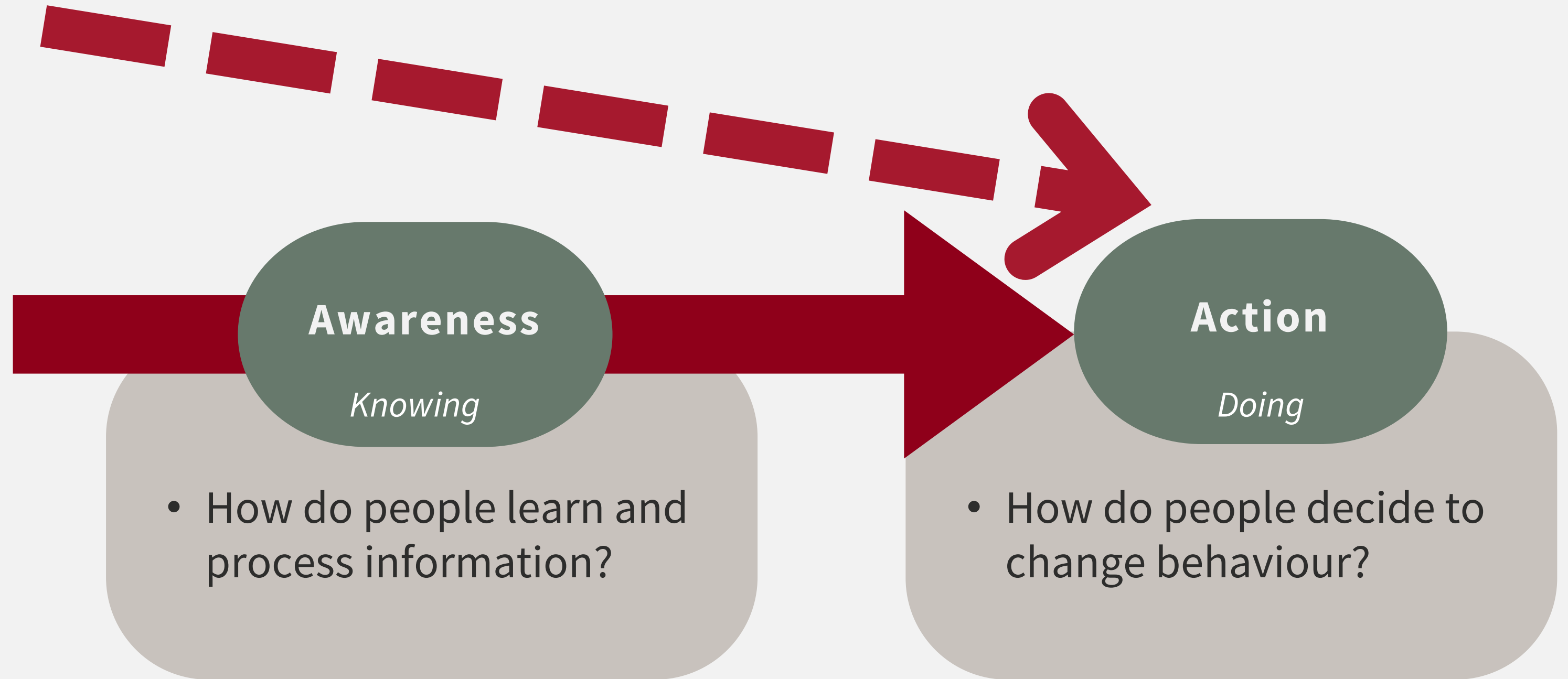


Seniors in a retirement  
community in Yarmouth, NS

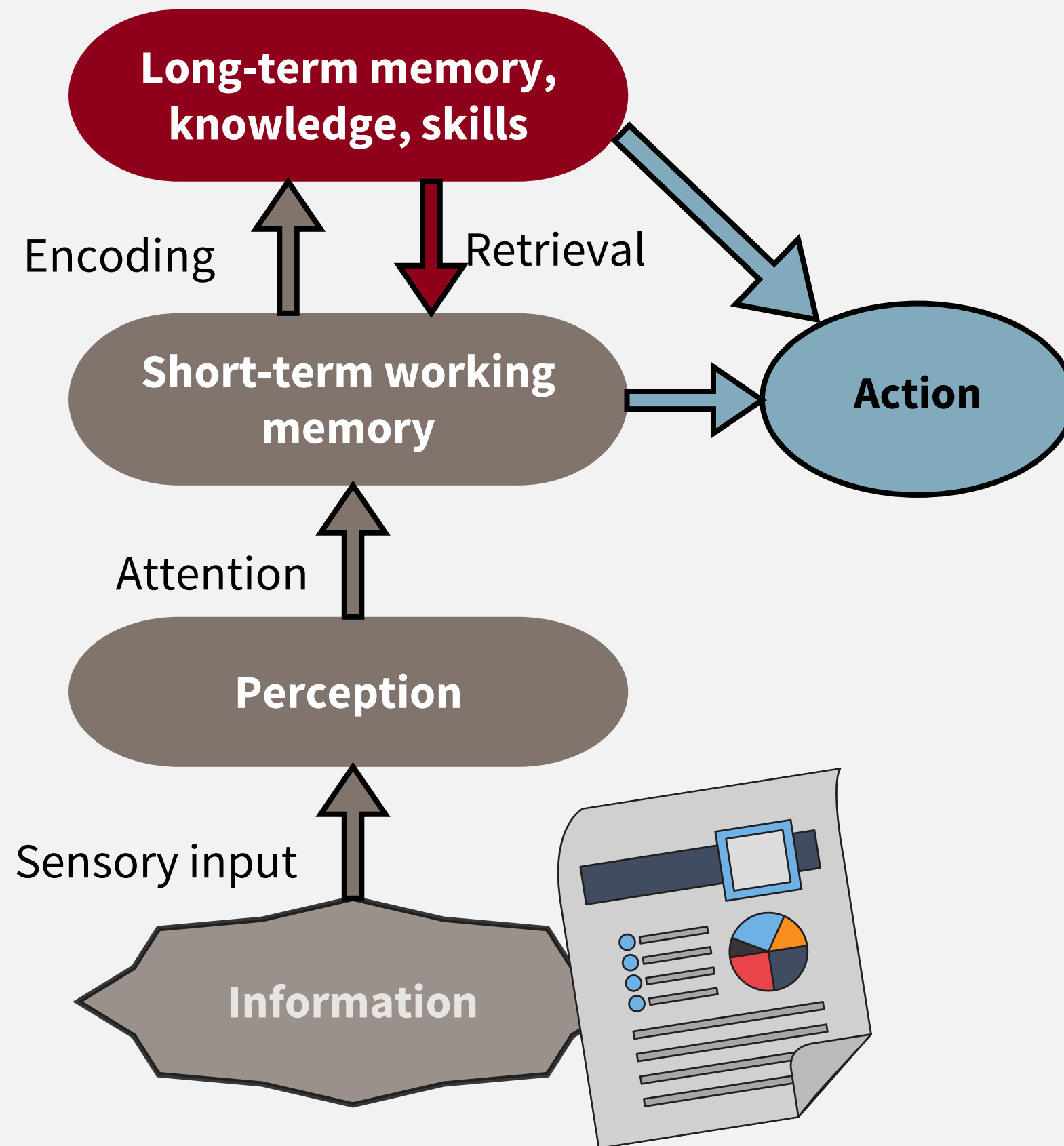


*\*Images AI-generated*

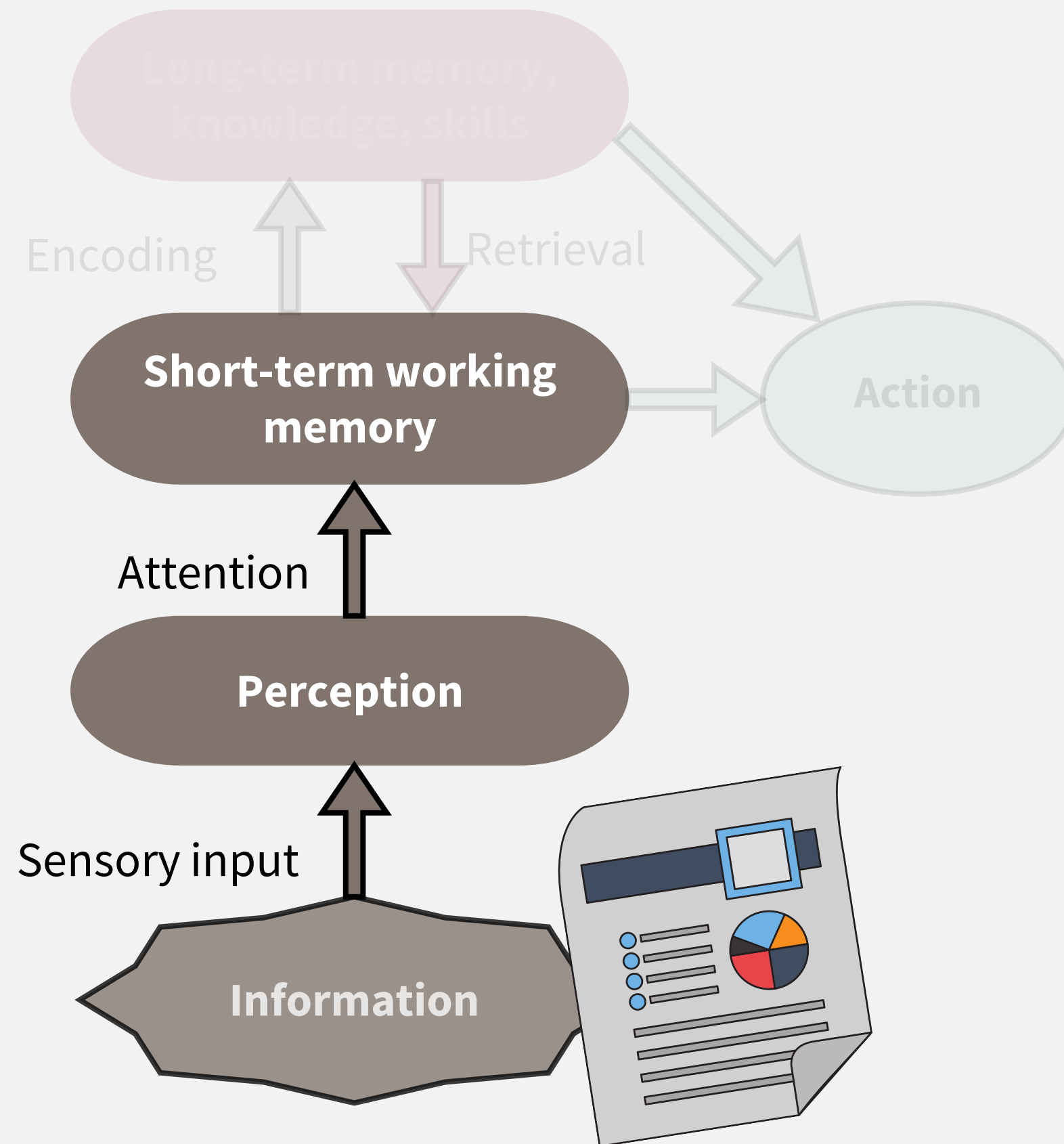
These community members may have different sensitivities and capacities to adapt to smoke exposure



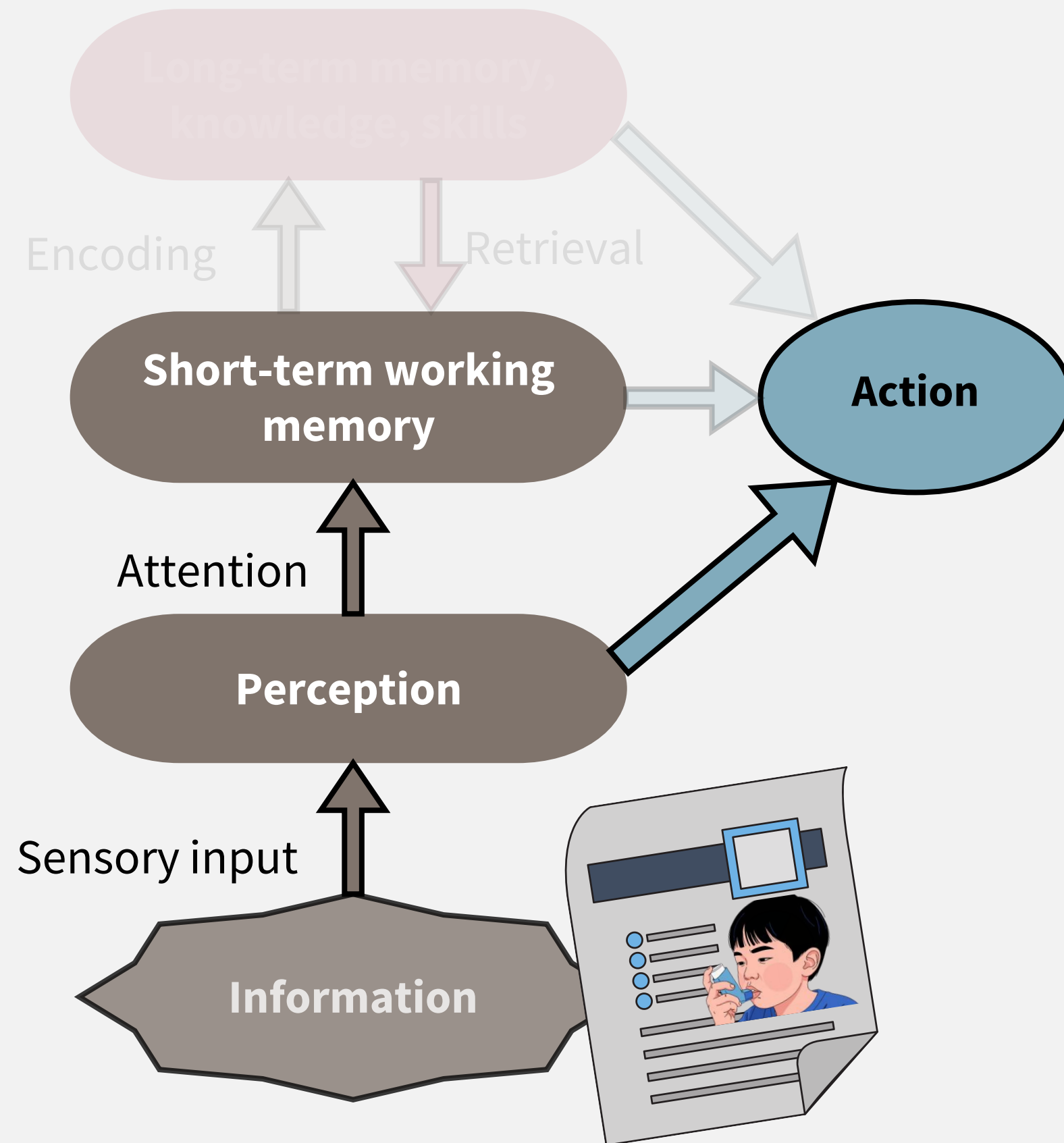
# Two mechanisms that drive information processing



# Two mechanisms that drive information processing



# A mental shortcut can override this process using *feelings*



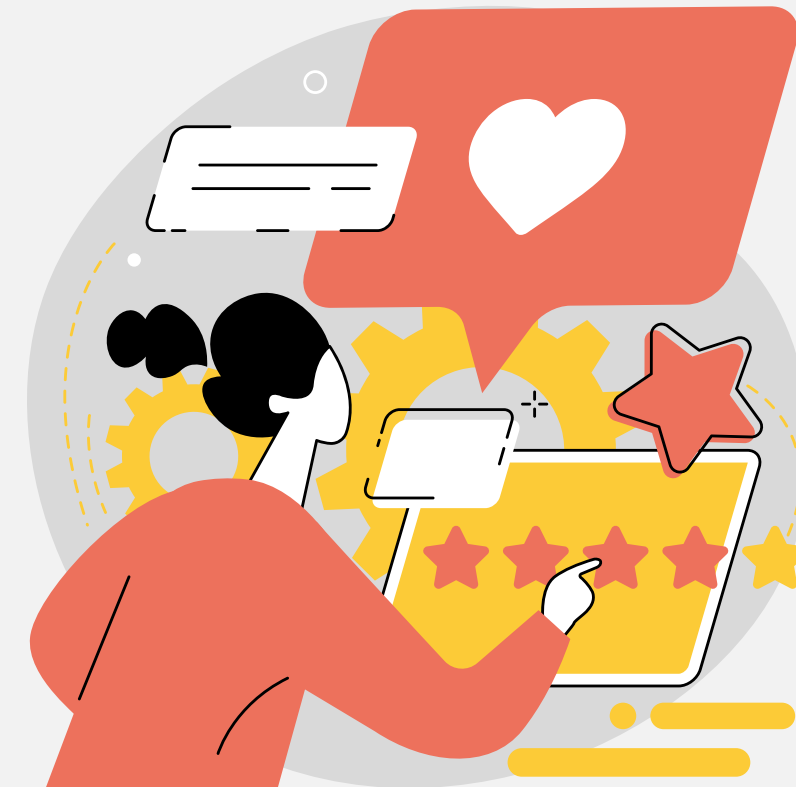
## Affect heuristic

- A mental shortcut leveraging feelings and emotions (e.g., fear, outrage, joy) to make quick judgments about the information presented

Information can make you think or it can make you feel something

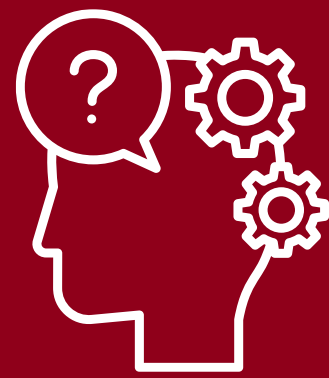


**Systematic processing**  
requires higher cognitive load,  
more effortful



**Heuristic processing**  
relies on mental shortcuts (e.g.,  
affect heuristic) to make quick  
intuitive judgments

**WHY MIGHT WE WANT INFORMATION TO HELP US DO ONE OR THE OTHER?**



# Systematic information processing

## Infographic Wildfire Smoke A Definite Concern for All [Ontario] Workers

Wildfire Smoke is made up of a complex mixture of:

- FINE PARTICLES (PM2.5)
- GASES

...produced when wood, plastics and other materials burn.

The **biggest health concern** from smoke is from fine particles (PM2.5). These microscopic particles can irritate or harm:

- EYES
- RESPIRATORY SYSTEM

Smoke from wildfires can affect you when working both **Indoors** and **outdoors**.

### Signs and Symptoms

- BURNING EYES
- RUNNY NOSE
- PHLEGMY COUGH
- SORE THROAT
- DIFFICULTY BREATHING

### Vulnerable Workers

Some people are more vulnerable than others to harm from the smoke:

- RESPIRATORY CONDITIONS (e.g. Asthma, COPD, COVID)
- HEART CONDITIONS
- OTHER HEALTH CONDITIONS
- OTHER HIGH RISK GROUPS

### Prevention

#### Working Outdoors



CONSULT the Air Quality Health Index (AQHI)\* for your region for recommendations  
[www.airqualityontario.com/aqhi/](http://www.airqualityontario.com/aqhi/)



TAKE BREAKS indoors - in buildings or vehicles (vehicle air filters do filter PM2.5)



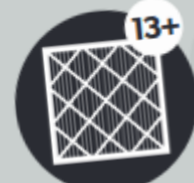
WEAR a tight fitting respirator (N95 or better)



AVOID over exertion

#### Working Indoors

REDUCE exposure to outdoor air:



MAKE SURE air filters in the HVAC system are MERV 13 or higher



CLEAN or REPLACE air filters that are dirty or in poor condition



CHECK that the furnace fan is running



KEEP all windows and doors closed



IMPROVE on mechanical ventilation systems with portable air cleaners (e.g. DIY Corsi-Rossenthal Box)



AVOID air purifiers with ionizers



REPORT ALL questions, concerns and symptoms to your supervisor or Health and Safety Committee / Representative

**REMEMBER**  
People will react differently or have different tolerances for wildfire smoke.



### What it can do:

- Promote long-term **awareness** about the health risks of smoke exposure
- Shift **attitudes** and counter **misinformation**
- Increase **resilience** by teaching people how to make preparations for smoke season

### How to encourage it:

- Tailored** communications to maximize relevance
- Simple, informative** messaging and memorable visuals
- Cues that encourage **pausing** (e.g. asking a question)



## Heuristic information processing

### What it can do:

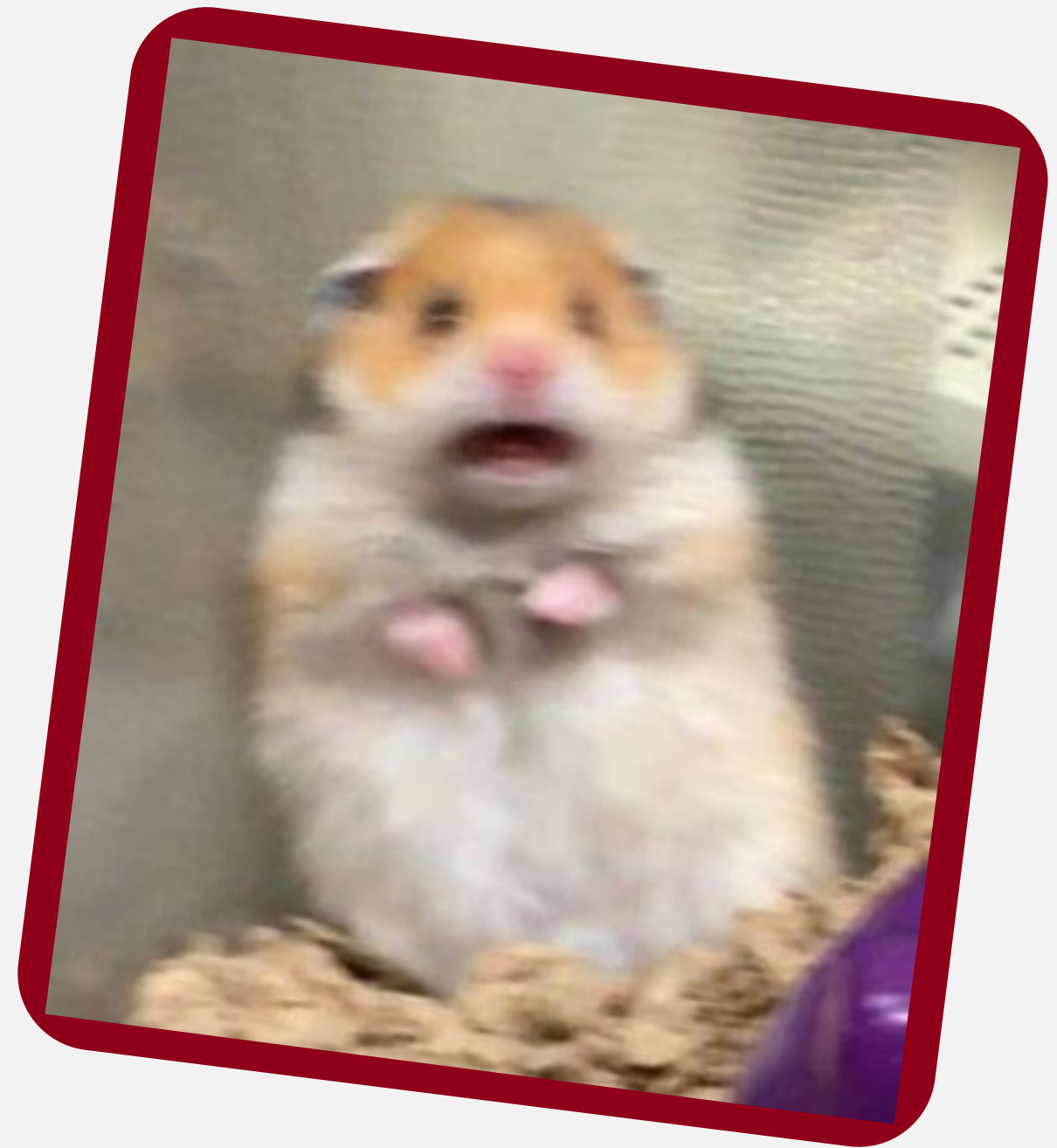
- Enable **quick decisions** by reducing mental effort
- Promote **action adoption** during emergencies like smoke events
- Assist audiences with limited **health literacy** using simple cues

### How to encourage it:

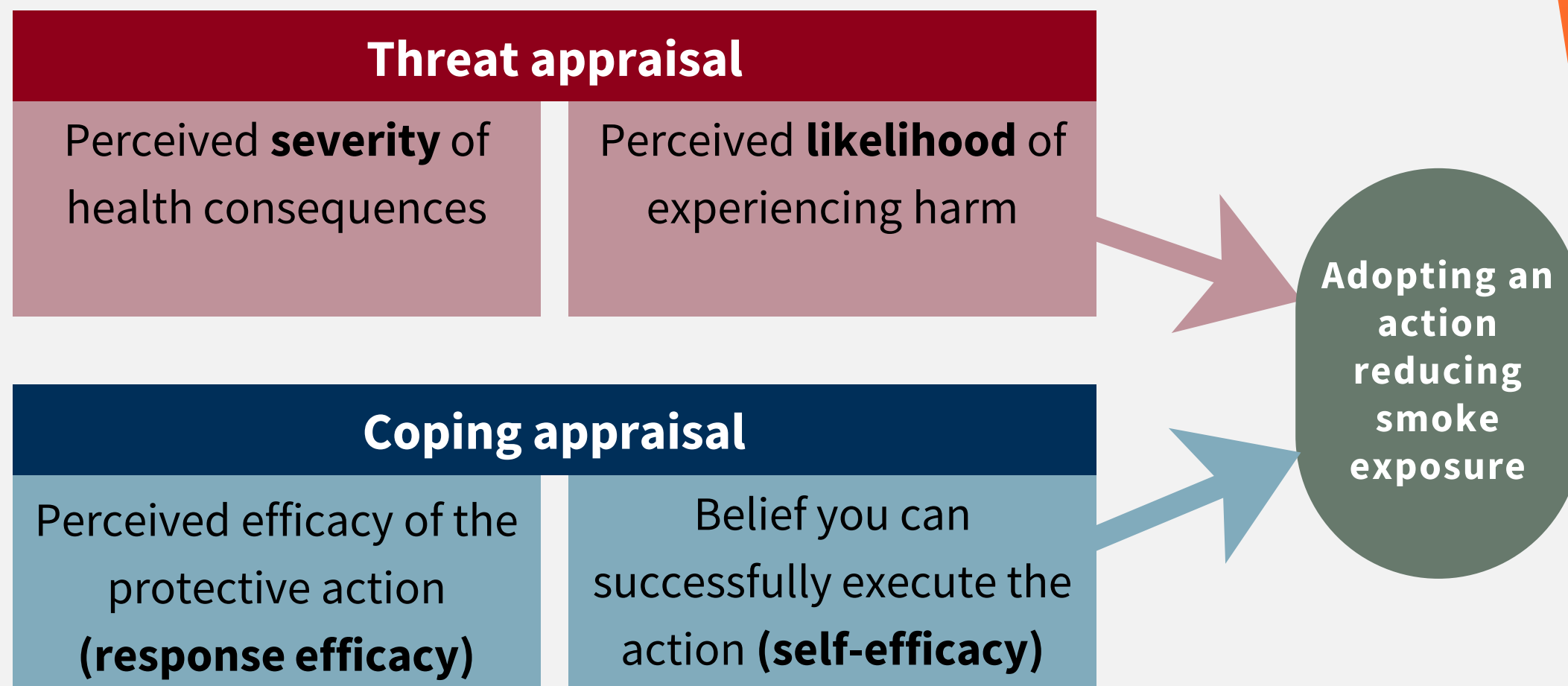
- Emotional **imagery** and vivid **colours** that grab attention
- Simple visuals and infographics that leverage **familiar cues** that quickly convey meaning
- Messaging highlighting **urgency** and **severity** of the situation to heighten **perceptions of risk**



**TARGETING ONLY PERCEPTIONS OF RISK  
DOES NOT MOTIVATE ACTION**



# Protection Motivation Theory: Balancing threats with solutions



Adapted from Rogers (1983)  
*Social Psychophysiology*



# How could we improve smoke communications using PMT?

**Social cues**  
(friends, family, neighbours)

**Environmental cues**  
(sights, smells, sounds)

## Threat appraisal

### Risk severity

- **Health consequences:** coughing, headaches, shortness of breath, asthma exacerbation
- **Hazard description:** PM2.5, air quality
- **Magnitude of threat:** verbal (severe, harmful, etc.) and numeric (#days affected)

### Risk likelihood

- **Probability:** certainty, chance of exposure
- **Vulnerable populations:** children, elderly, pregnant people, outdoor workers, etc.

## Coping appraisal

### Response efficacy

- **Effectiveness** of various actions
- Consider a **good, better, best approach** when suggesting solutions

### Self-efficacy

- Encouraging messaging highlighting **ease** of implementing actions
- Addressing perceived barriers (e.g., costs, distance to clean air space, etc.)

Adapted from Slavik et al. (2024)

*BMC Public Health*

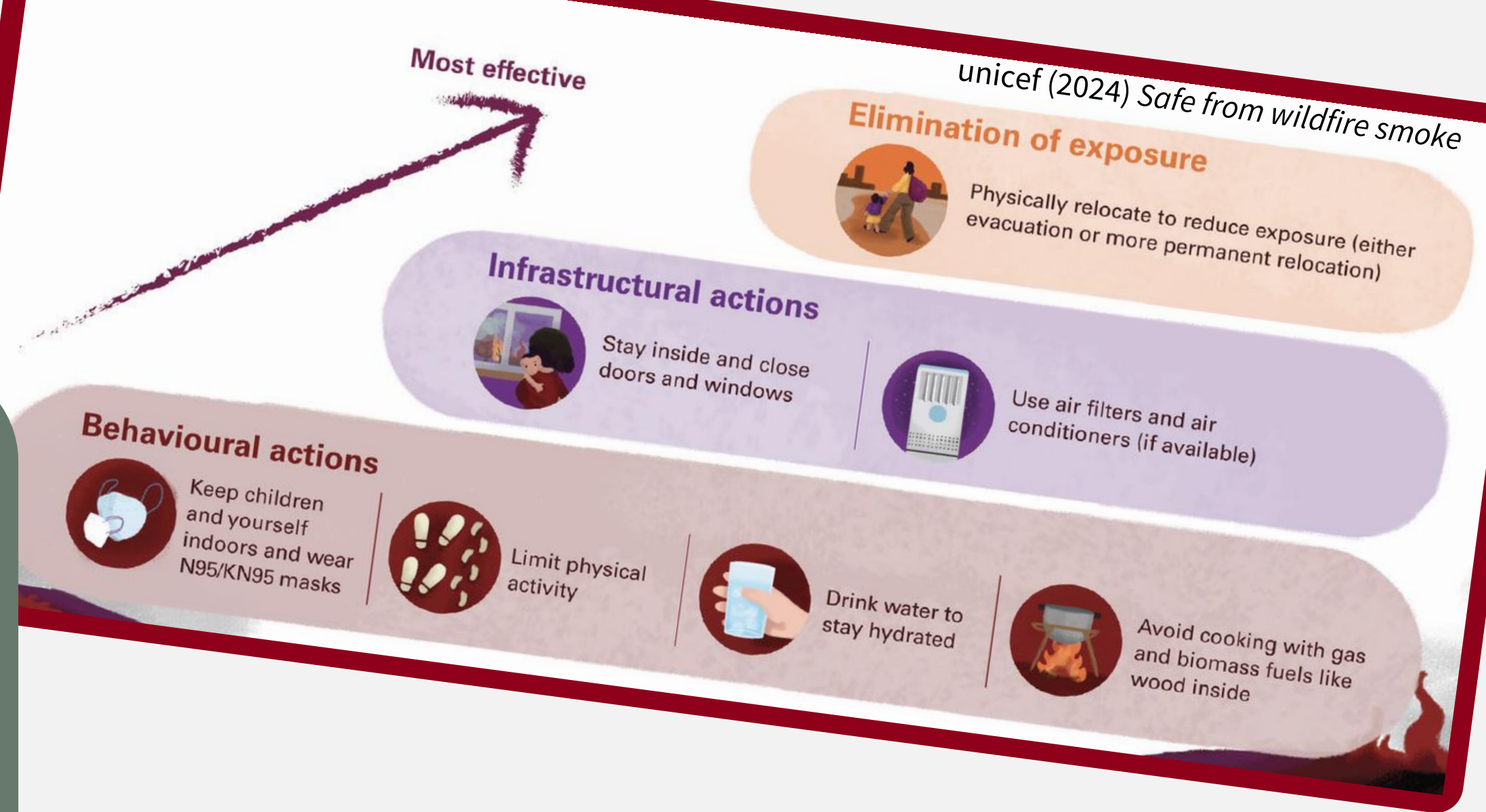


**What does the current state of evidence tell us about wildfire smoke communications?**

# Messaging

## Do's:

- Issue health **advisories/alerts** - they work\*! (Kolbe et al., 2009; Saberian et al., 2017; D'Antoni et al., 2017)
- Highlight which protective actions are most **effective** and why (Shellington et al., 2022)
- Describe how an action can **easily** be **adopted**
- Continue to provide advice for both “at-risk” and general population, while highlighting that even **healthy individuals** can experience symptoms and health impacts (Duan & Bombara, 2023; Delmas & Kohli, 2020)



*During heavy smoke conditions, **everyone is at risk** regardless of their age or health. Some people are more likely to experience symptoms or health effects when exposed to wildfire smoke because of their life stage, existing illness, or health conditions...*

*-Health Canada (2024) *Wildfire smoke and your health**

# Messaging

## Don't's:

- Skip information about **health effects** (Marfori et al, 2020; D'Evelyn et al., 2023)
- Rank **relocation** and visiting **clean air shelters** as a top recommended action (Rappold et al., 2019; Marfori et al., 2020)
- Shy away from **narrative messages** and stories to promote engagement (Aminpour et al., 2022)

## Why take action?

Wildfire smoke contains fine, inhalable particles called PM2.5, as well as dangerous levels of heavy metals and other toxins. It may be as much as 10 times more dangerous for kids than other forms of air pollution.

Wildfire smoke can increase emergency room visits for asthma and upper respiratory infections in kids. It can also reduce immune function, lead to cardiovascular and lung diseases later in life, and create long-term cancer risks.

## Keep Kids Safe from Wildfire Smoke

### Things you can do:

- Check local Air Quality Index at [Airnow.gov](https://airnow.gov).
- Move events indoors.
- Avoid outdoor exercise or other activities that cause you to exert yourself.
- Postpone events.
- Move events to cleaner air.



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# Messaging



Hayward Watts (2022) *Telling the story of wildfire smoke risks*  
Art installation at Winthrop Public Library, Washington.



<https://www.instagram.com/reel/DKdUUqeRz2b/>

# Visual risk communication

## Do's:

- Consider showing the **line graph** depiction of the AQHI to improve risk comprehension (Rosen et al., 2021; Slavik et al., 2024)
- Use **icons** to enhance recall (VanderMolen et al., 2024)
- Leverage **simple maps** to highlight areas affected by smoke and forecasted changes (Cao et al., 2017)

## Don't's:

- Use solely **negative imagery** (e.g., burning houses) (Byerly Flint et al., 2022)
- Rely on a single visual format; use **multiple types of media** (e.g., videos, images, infographics) to suit different dissemination channels and platforms (Vien et al., 2024)



# Numeric risk communication

## Do's:

- Communicate **numbers** in formats people are **familiar** with (e.g., 30% chance of smoke tomorrow)
- Make numbers meaningful by making **comparisons** (Peters et al., 2025)

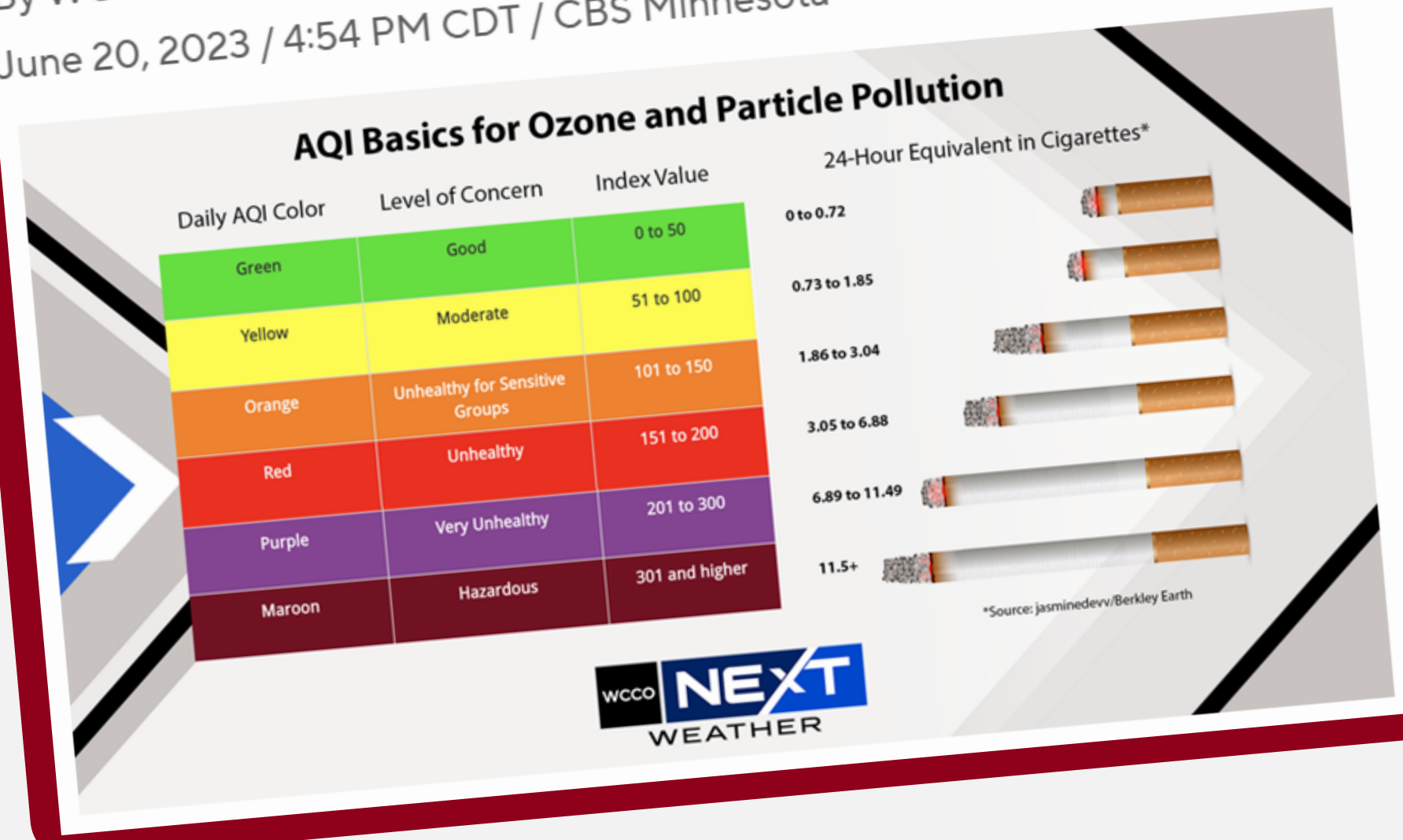
## Don't's:

- Solely rely on **verbal descriptors** of risk (e.g., very likely) – they're rated by users as less informative (Norman et al., 2020)

## Minneapolis' worst air quality day was equivalent to smoking half pack of cigarettes

By WCCO Staff, Reg Chapman, Derek James

June 20, 2023 / 4:54 PM CDT / CBS Minnesota



# Environmental cues

## Do's:

- Remind people that smoke is dangerous even if you can't **see/smell** it (Slavik et al., 2025)
- Highlight how wildfire smoke **risk is changing** (getting more intense, more frequent, etc.) to discourage habituation (Sacks et al., 2025)

## Don't's:

- Don't neglect **social norms**; messaging that highlights community smoke-preparedness activities can motivate action through FOMO (Stephens et al., 2022)

*There's **no known safe level of exposure** for some of these pollutants. This means that smoke can impact your health even at very low levels. As smoke levels increase, your health risk increases. **Air quality may be poor even if you can't see or smell smoke.***

-Health Canada (2024) *Wildfire smoke and your health*



# Uncertainty

## Do's:

- Communicate **what we know** about the **effectiveness** of protective actions (Beckman et al., 2025)
- Acknowledge that we're learning more and more about the health impacts to **normalize uncertainty** and **evolving guidance**

## Don't's:

- Apply overly **technical or complex language** to describe risks (Keegan & Rahman, 2021)
- Give **conflicting advice** across agencies and communicators (Santana et al., 2021; Joe et al., 2024)

# Protect Yourself from Wildfire Smoke

Staying inside away from smoke is best.

If you must go outside, wear a snug respirator or mask to help filter smoke.

					
Respirator / Mask	<b>N95<sup>®</sup> or P100<sup>®</sup> Respirator</b>	<b>KN95 Respirator</b>	<b>Surgical Mask</b>	<b>Cloth Mask</b>	<b>Scarf</b>
Level of protection	✓✓✓✓	✓ — ✓✓✓*	✓✓	✓	Limited to None
Reusable?	Yes. Don't reuse if dirty or wet. May not fit well after five uses, affecting protection.		Yes. May provide some protection up to a few days of use. Don't reuse if dirty or wet.	Yes. Wash them after use to keep clean.	

Respirators should not be used by children under 2.

\* KN95 respirators may have variable performance.



For more information about staying safe from wildfire smoke, scan the QR code or visit <https://www.cdc.gov/wildfires/safety/how-to-safely-stay-safe-during-a-wildfire.html>.



For more information about how to use an N95, visit <https://www.cdc.gov/niosh/ppe/php/n95-use/index.html>.



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**Who should be  
communicating?**

## Healthcare providers

- Vulnerable populations tend to seek information from healthcare providers (Jiao et al, 2025)
- **Co-creation** of communication materials strengthens engagement (Chalgren et al, 2025)



Open access

### Educating families about the impacts of wildfire smoke on children's health: opportunities for healthcare professionals

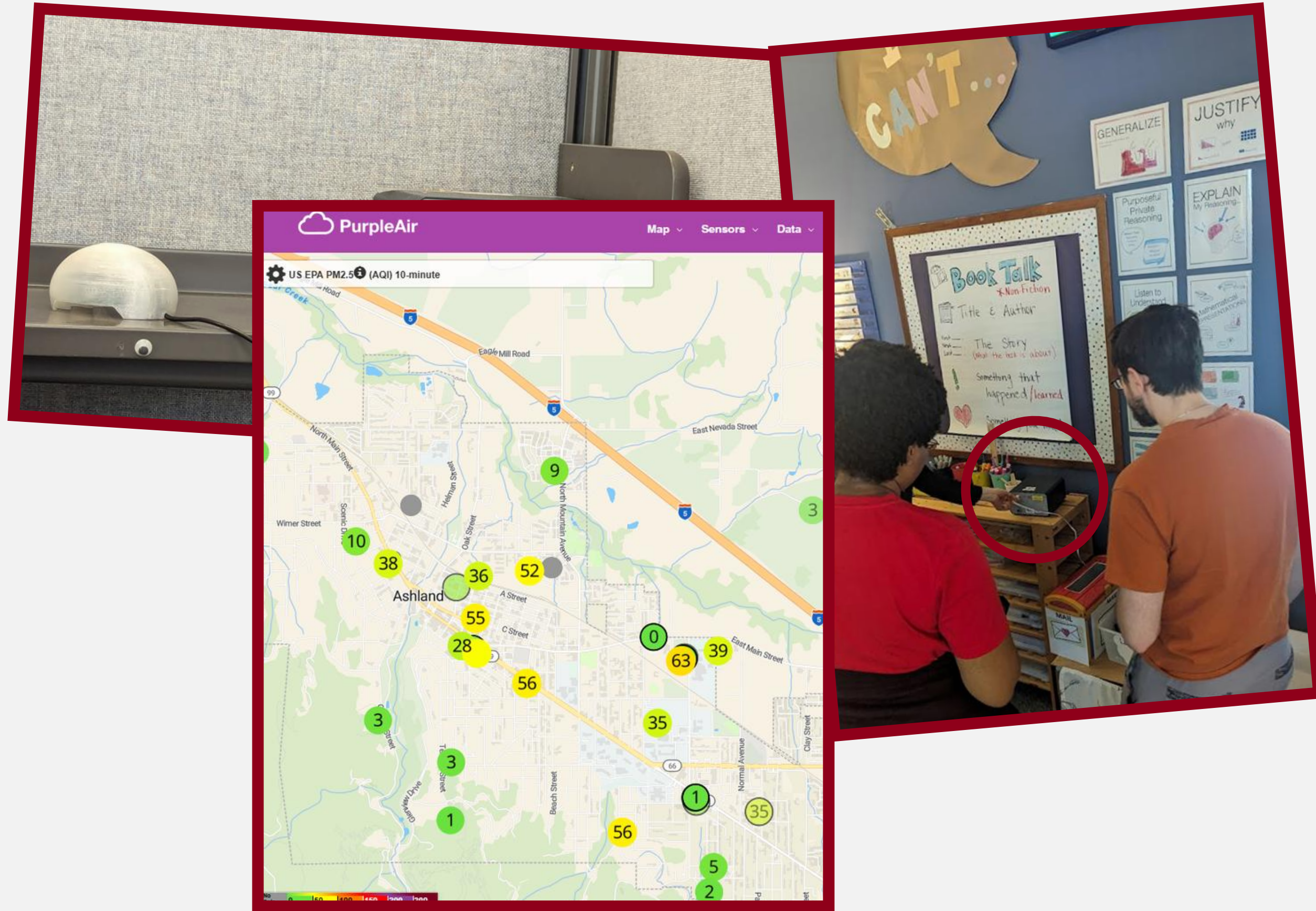
Catherine E Slavik <sup>1</sup>, Rebecca Philipsborn <sup>2,3</sup>, Ellen Peters <sup>1,4</sup>

**BMJ**

Slavik CE, et al. *BMJ Paediatrics Open* October 2023 Vol 7 No 1

# Schools and educators

- Opportunities for data co-creation using air monitors in classrooms to track wildfire smoke exposure and engage teachers and parents about the importance of checking air quality monitoring data
- Experiential learning interventions can teach students about wildfire smoke risks (and other climate change risks)



# Community organizations



- Local fire departments, faith-based organizations, library staff are well-respected community members – **meet people wherever they are!**
- DIY box fan air filter **workshops** offer opportunities for learning by *doing*



**What are we still missing?**

## Other ways of communicating

- Platforms like TikTok can be highly effective for public education and disaster risk communication and offer **real-time risk messaging** (Stimpson et al., 2025)
- **Virtual and immersive technologies** could offer experiential learning opportunities

**NEWER WAYS OF COMMUNICATING ARE POPPING UP... LET'S TEST THEM!**



## Other forms of smoke

- How do we increase **support** and **tolerance** for *some* kinds of smoke?
- **Dual message**: Will communicating the benefits of prescribed fires or cultural burning impact perceptions of harm for other sources of wildfire smoke?
- **Early, transparent** and **culturally relevant** communication is important



## Six communication tips to keep in mind

1. **Choose one goal at a time** (e.g., awareness vs. action). You can't communicate it all!
2. Decide whether that goal aligns better with a **systematic** or **heuristic** processing approach.
3. Choose **messages** and **visual** cues that enable effective information processing.
4. Communicate the **WHY** and **HOW**, not just the WHAT; people want to know why they are being asked to do something and how it's going to help.
5. Leverage various **trusted communicators** to help you reach a wide audience across diverse communities.
6. **Know your audience**. Communications are a big responsibility – you're influencing **real people's** decisions!



**Thank you!**

Questions?

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