# Enhancing Public Health Messaging on Wildfire Smoke

## NCCEH Webinar – April 29, 2026

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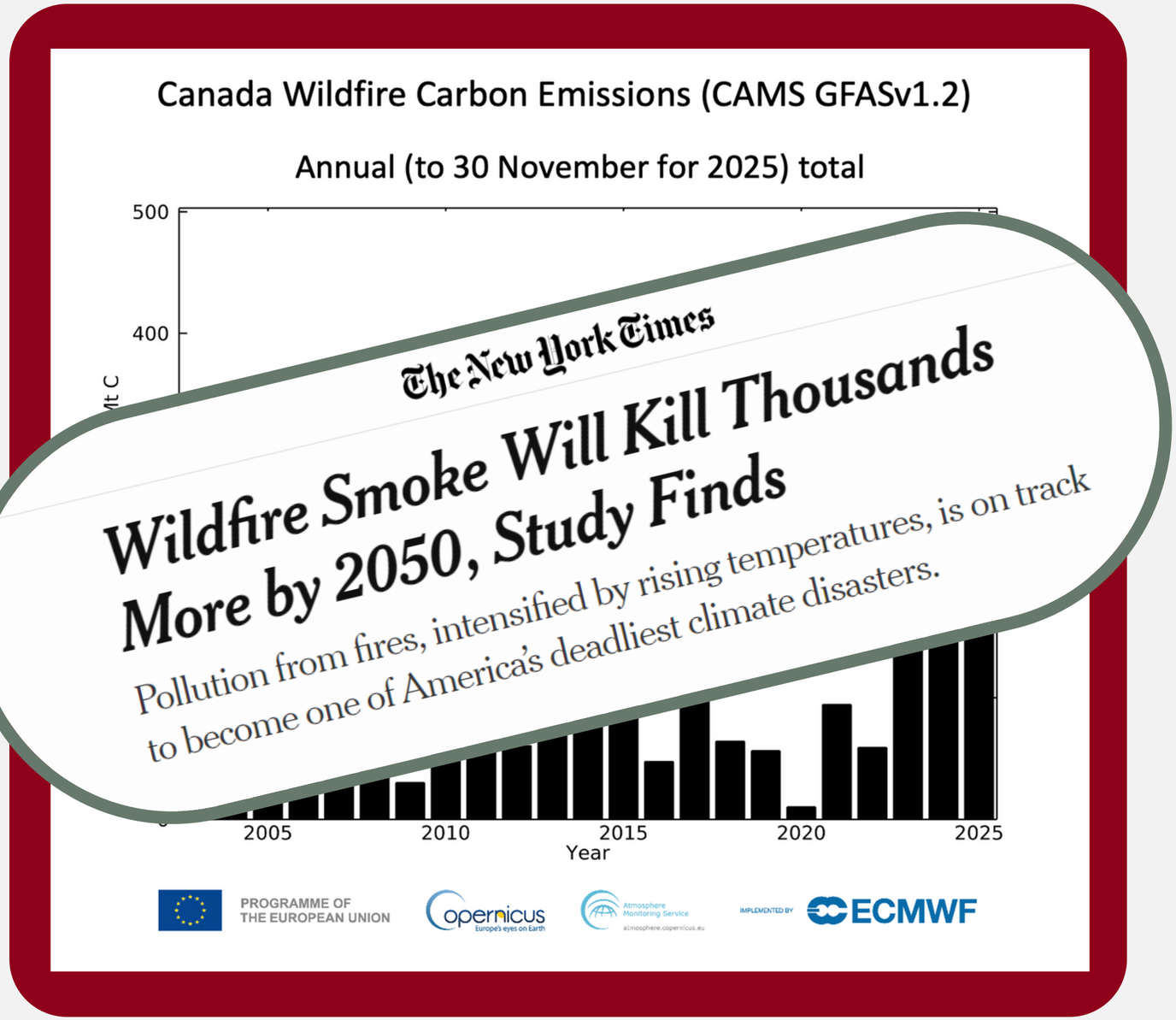
Eugene, Oregon (August, 2022)

# The Changing Risk Landscape




The New York Times

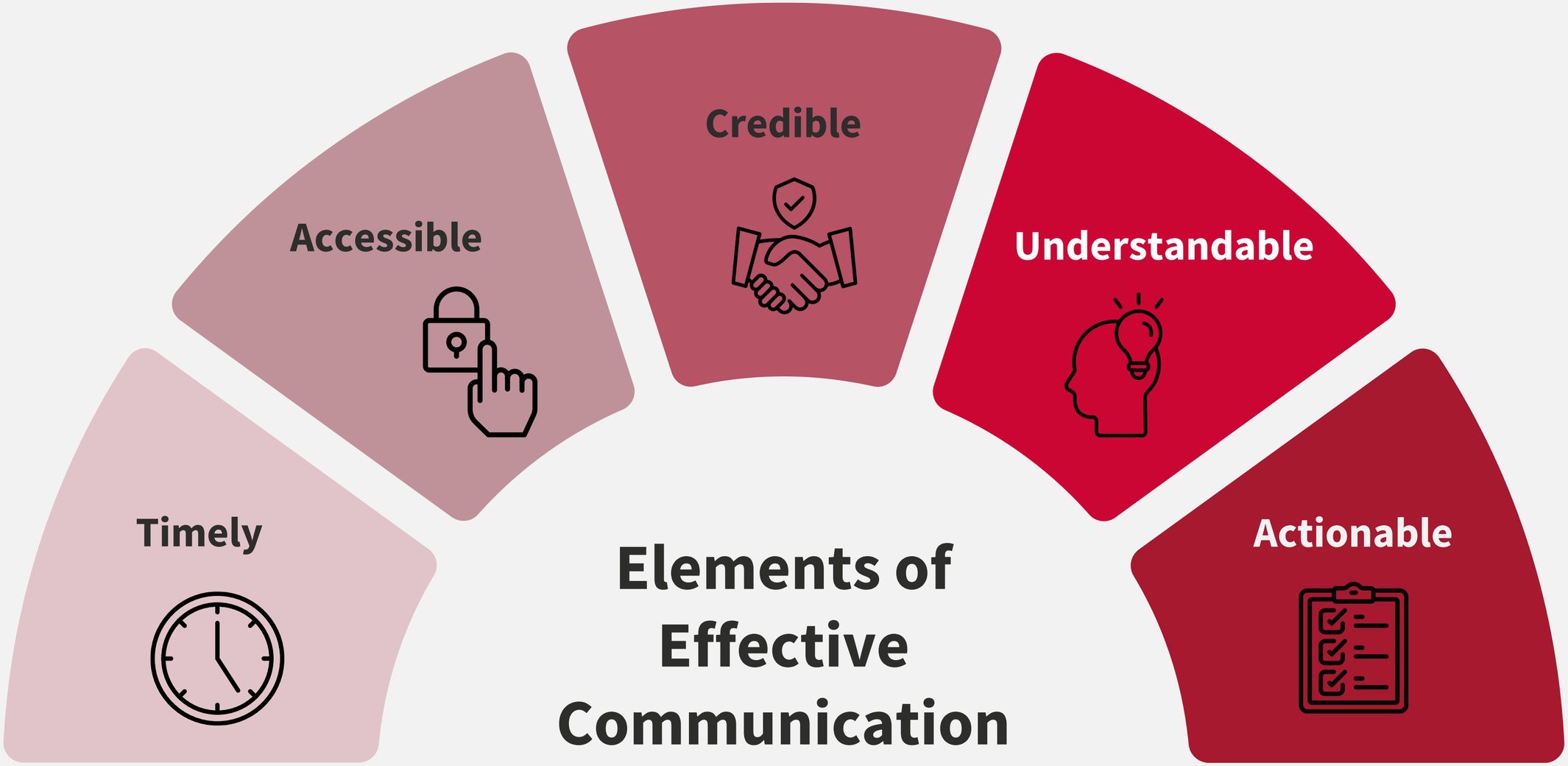
**Wildfire Smoke Will Kill Thousands More by 2050, Study Finds**

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?**

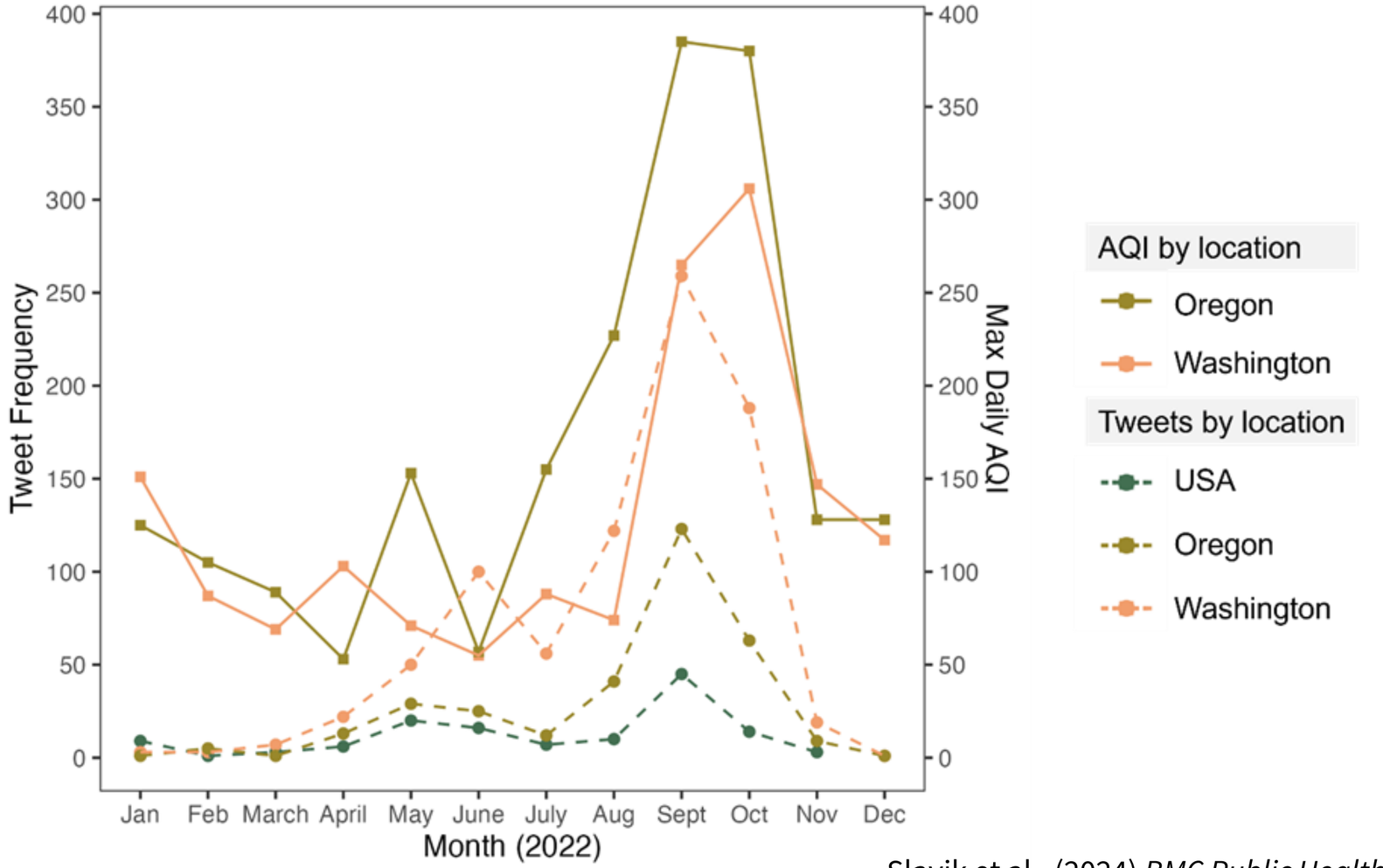
# Elements of Effective Communication




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

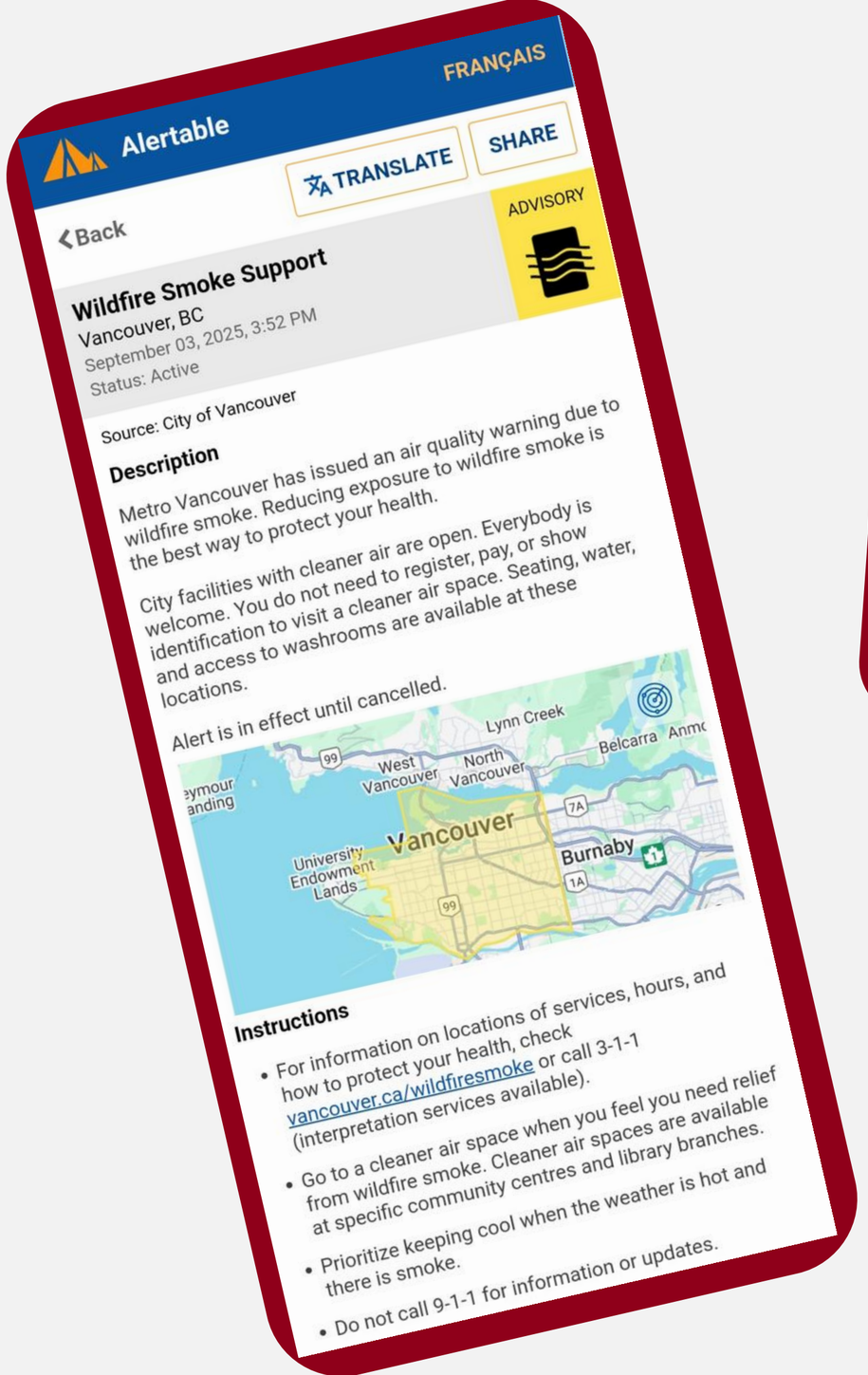
# Are Communications Timely?

- 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

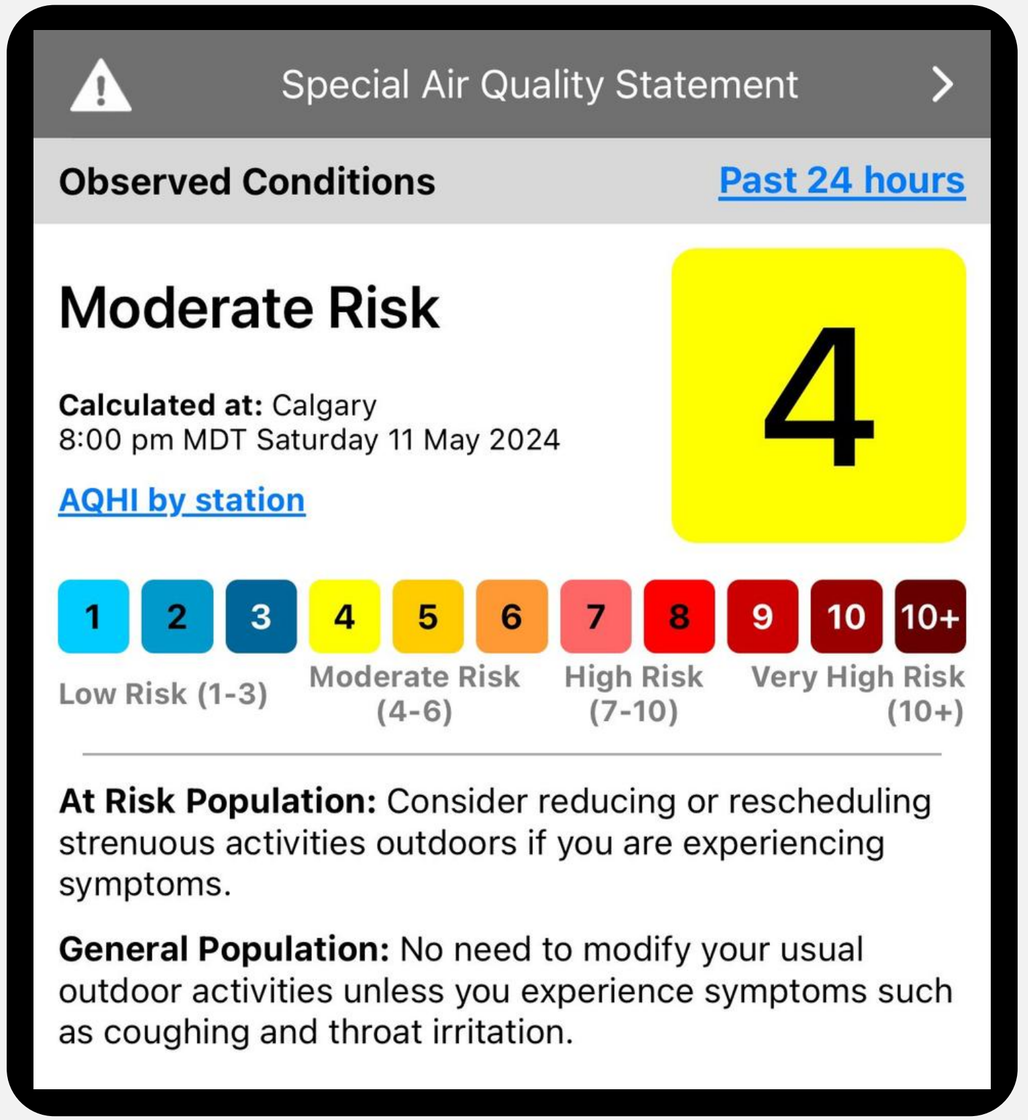
Only 1 in 5 Canadians fully trust news stories about the health effects of wildfires and poor air quality

CMA (2025) *Health and Media Tracking Survey*

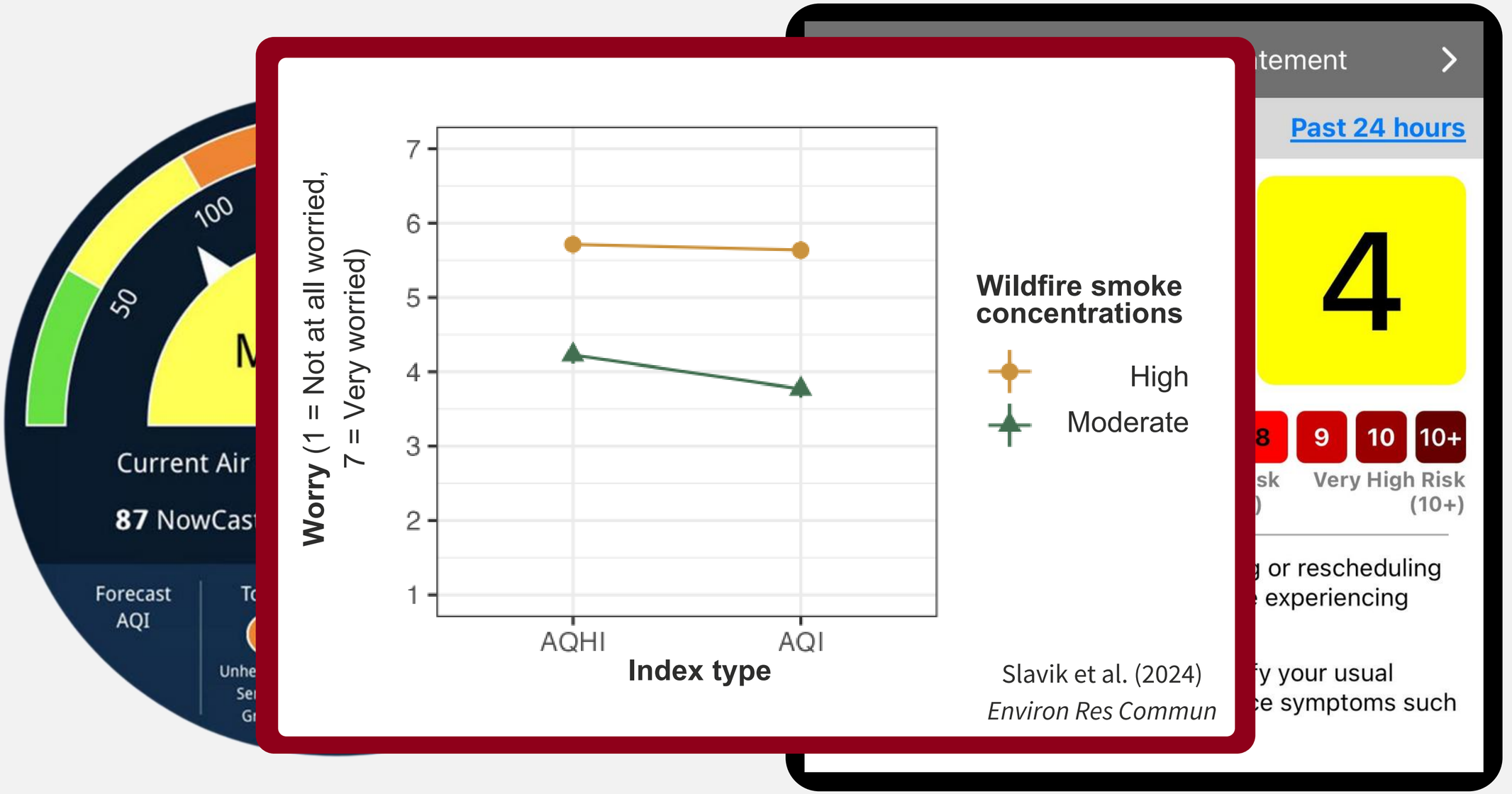
# Are Communications Understandable?

- 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 <u>have</u> to be outside?*
*What’s so bad about wildfire smoke anyway? Coughing and throat irritation doesn’t sound that bad?*

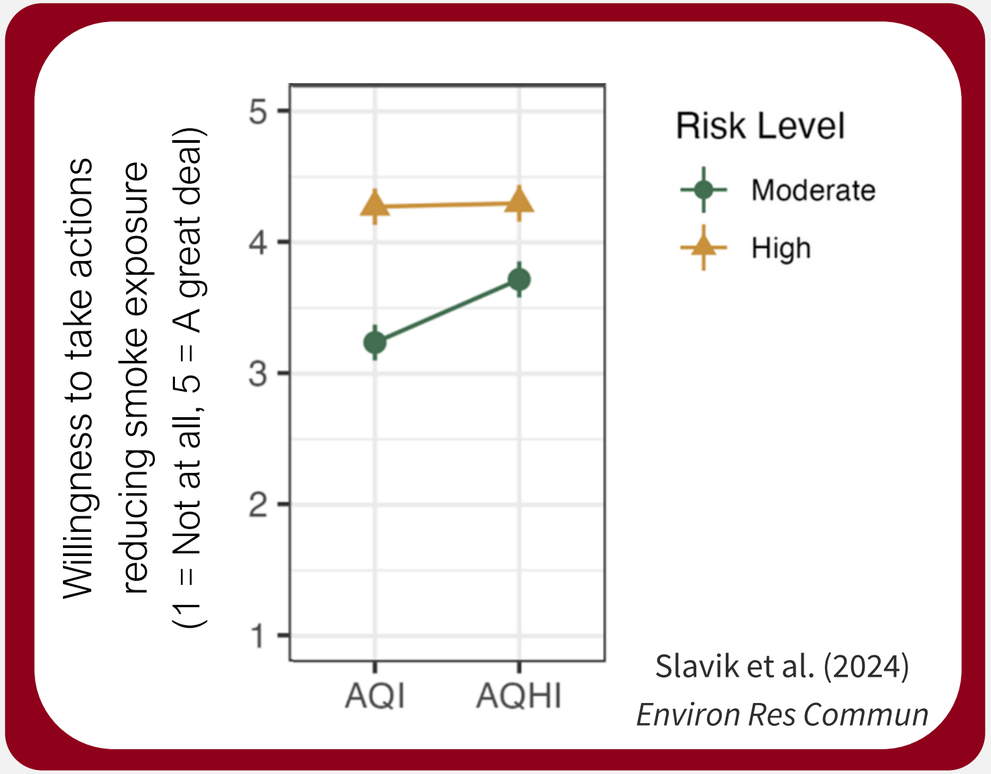


# Are Communications Understandable?

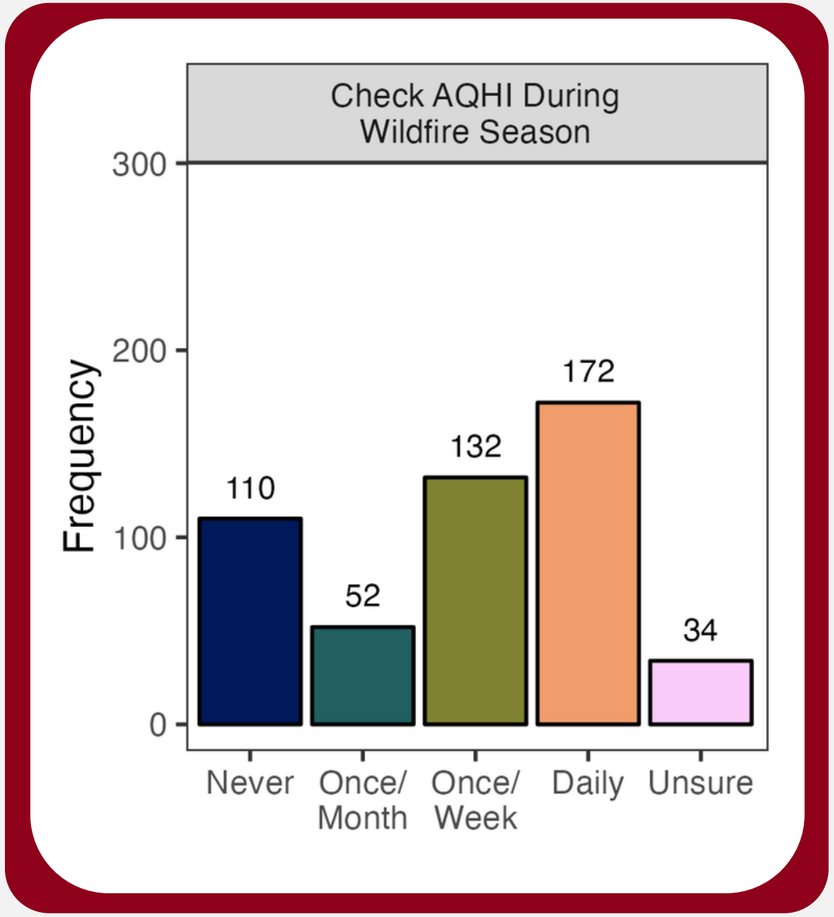


# Are Communications Actionable?

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

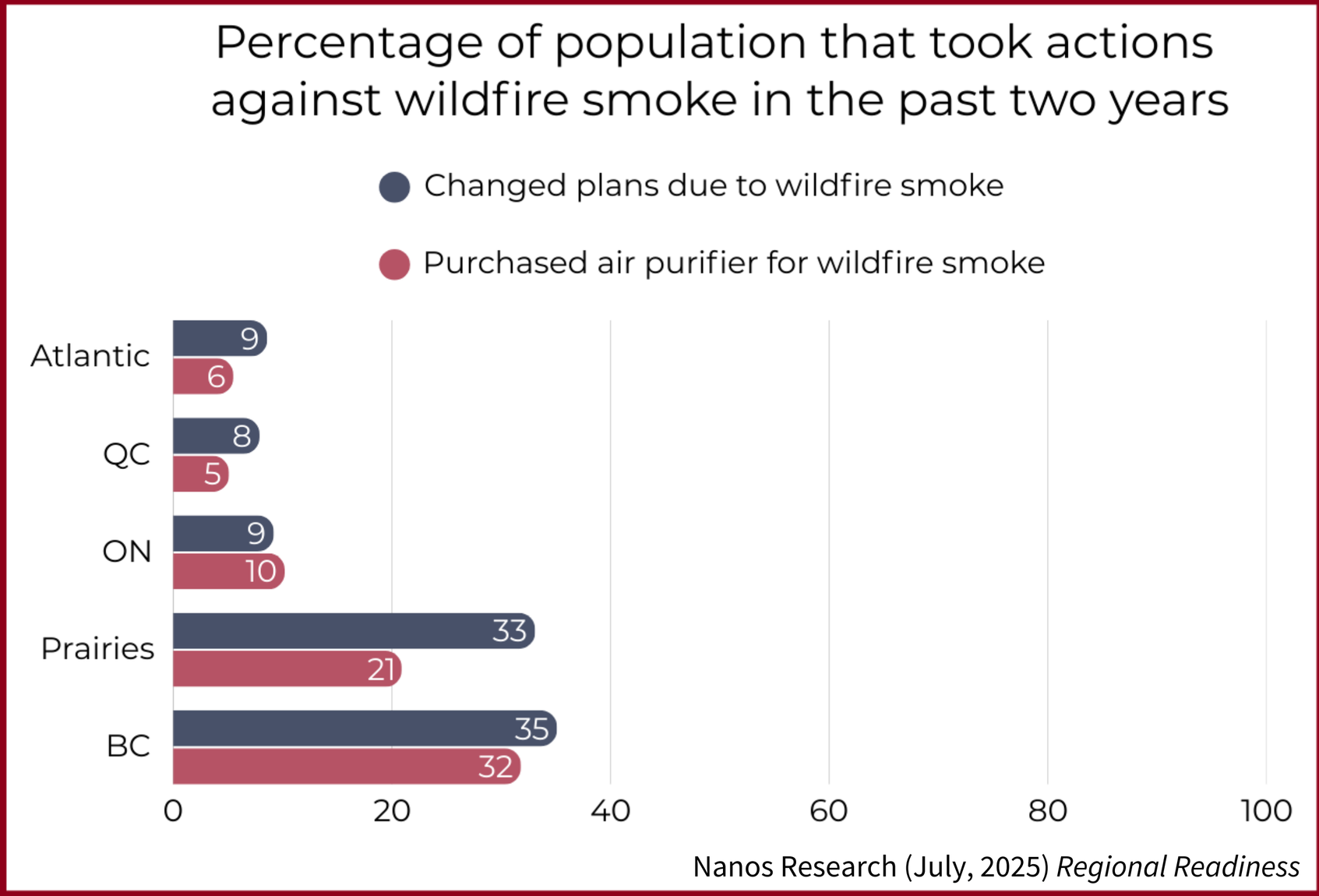



Slavik et al. (2024)
*Environ Res Commun*



# Are Communications Actionable?

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




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

**Awareness**

*Knowing*

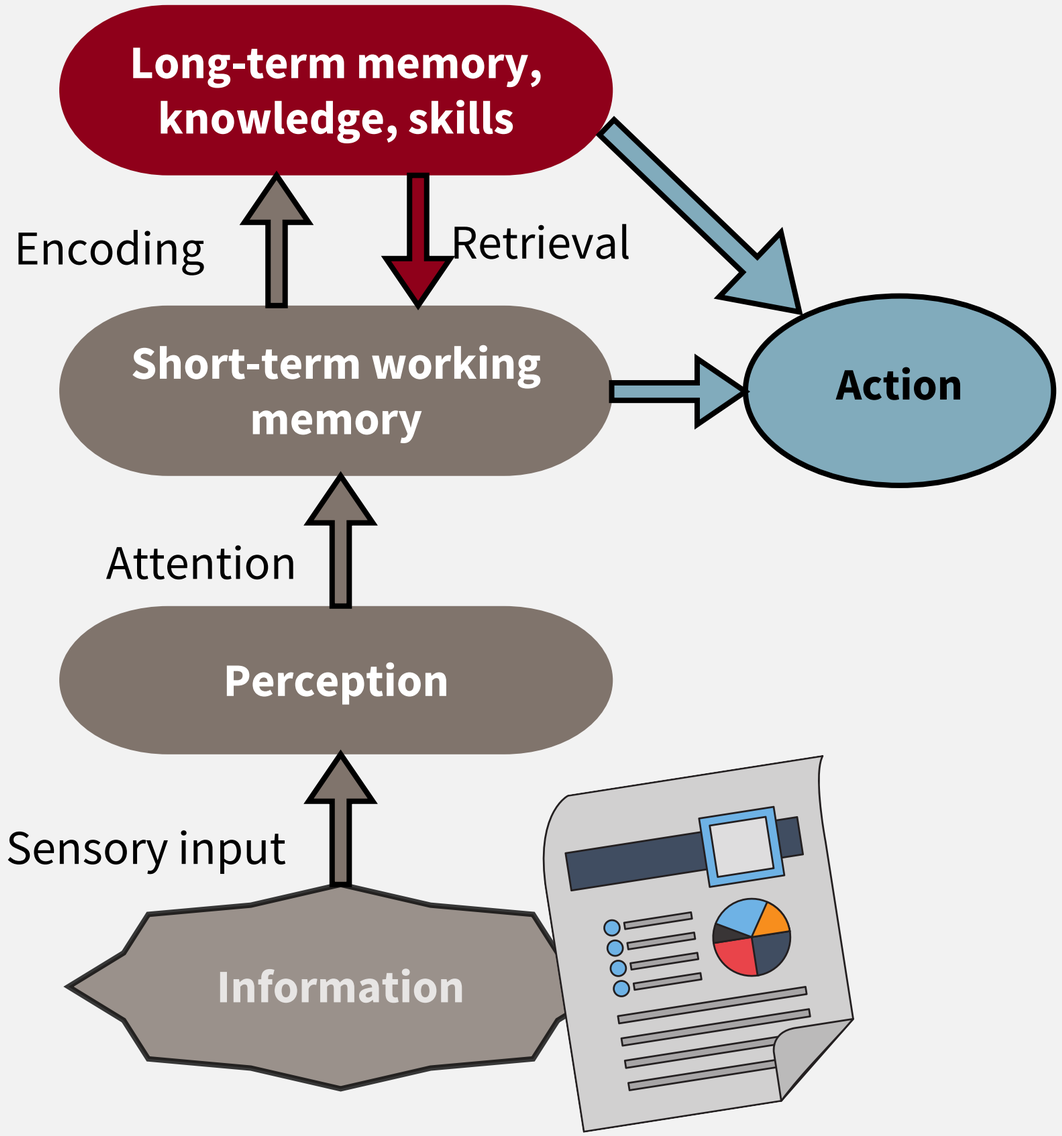
- How do people learn and process information?

**Action**

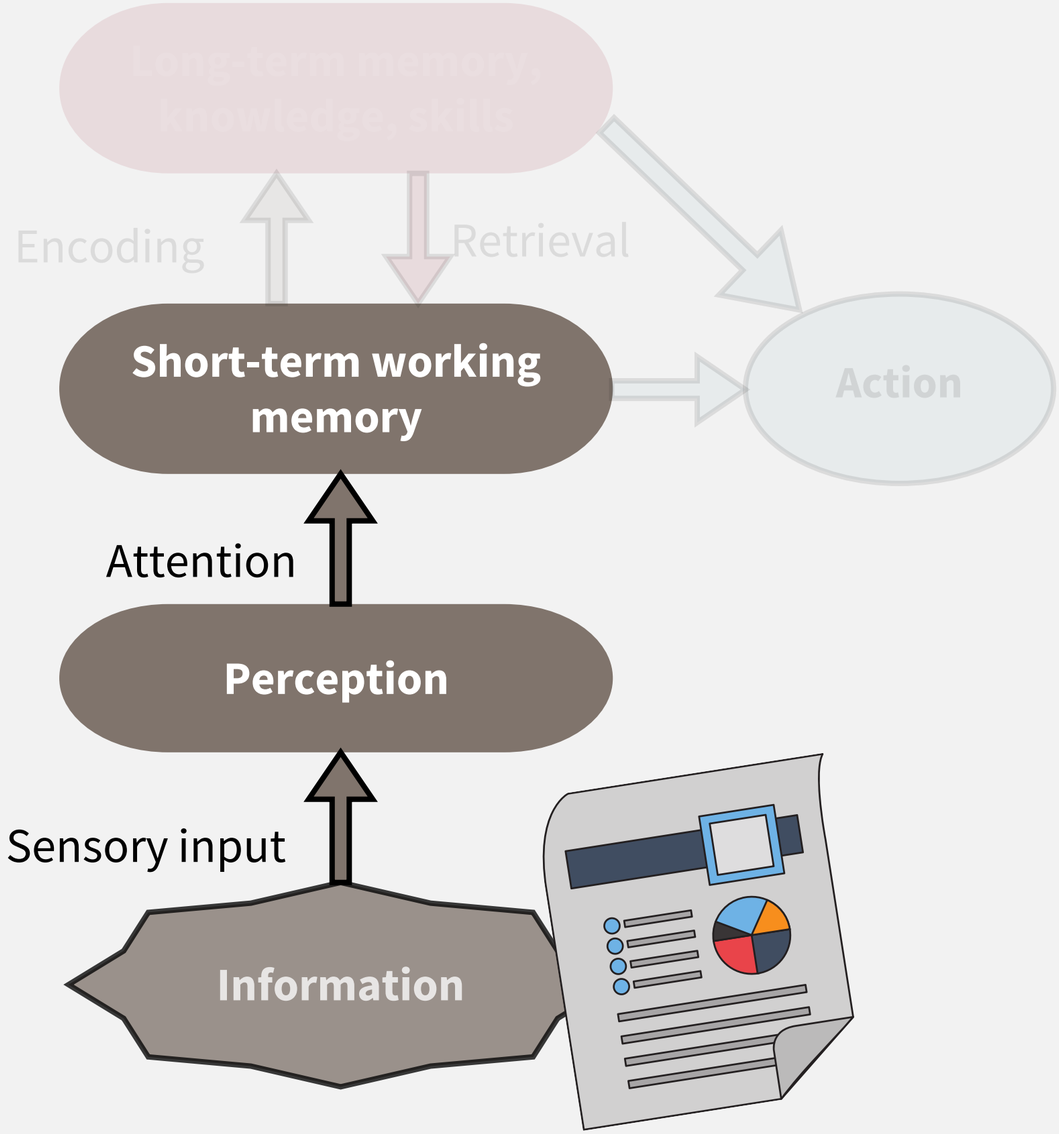
*Doing*

- How do people decide to change behaviour?

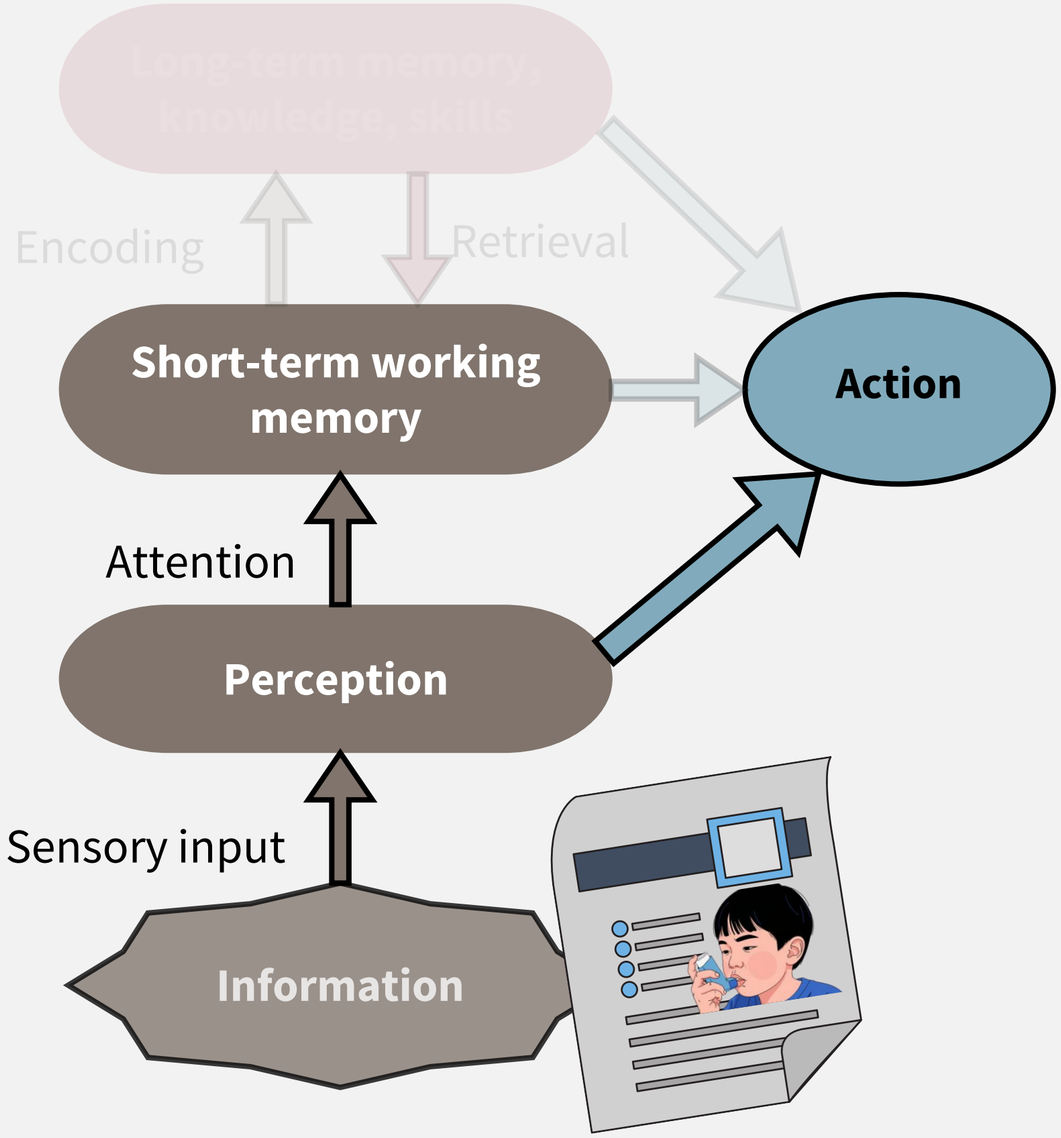
# Two mechanisms that drive information processing

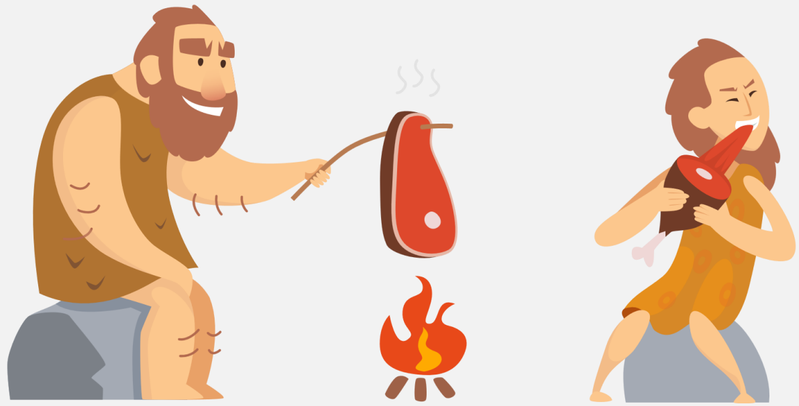


# Two mechanisms that drive information processing



# 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


## 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

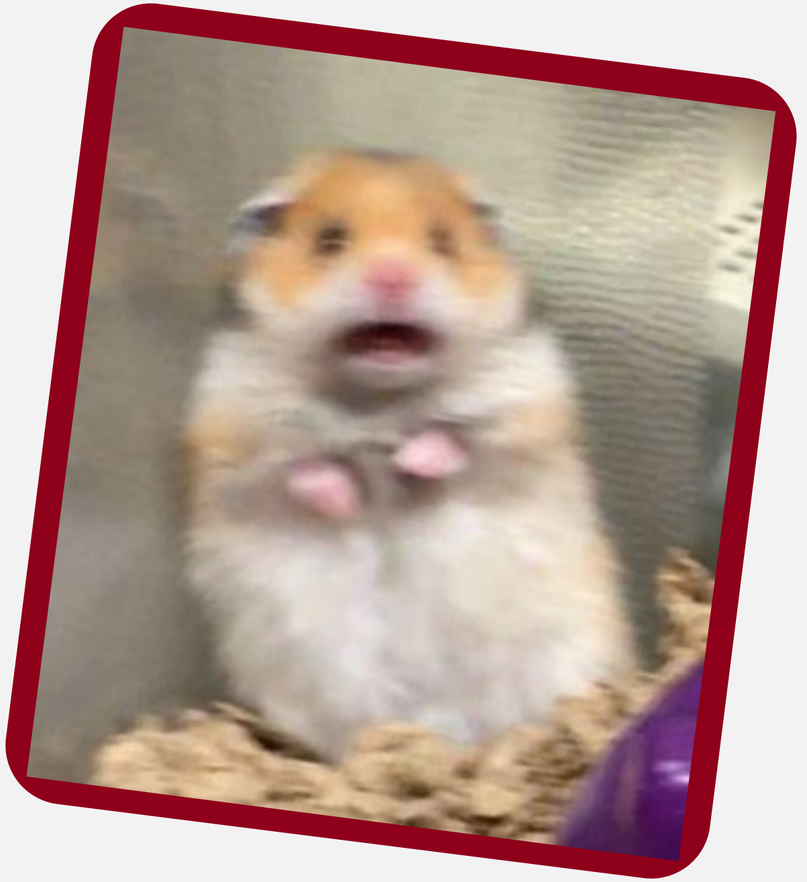
**What it can do:**

- 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

| **Threat appraisal** | |
|---|---|
| Perceived **severity** of health consequences | Perceived **likelihood** of experiencing harm |

| **Coping appraisal** | |
|---|---|
| Perceived efficacy of the protective action **(response efficacy)** | Belief you can successfully execute the action **(self-efficacy)** |

**Adopting an action reducing smoke exposure**


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

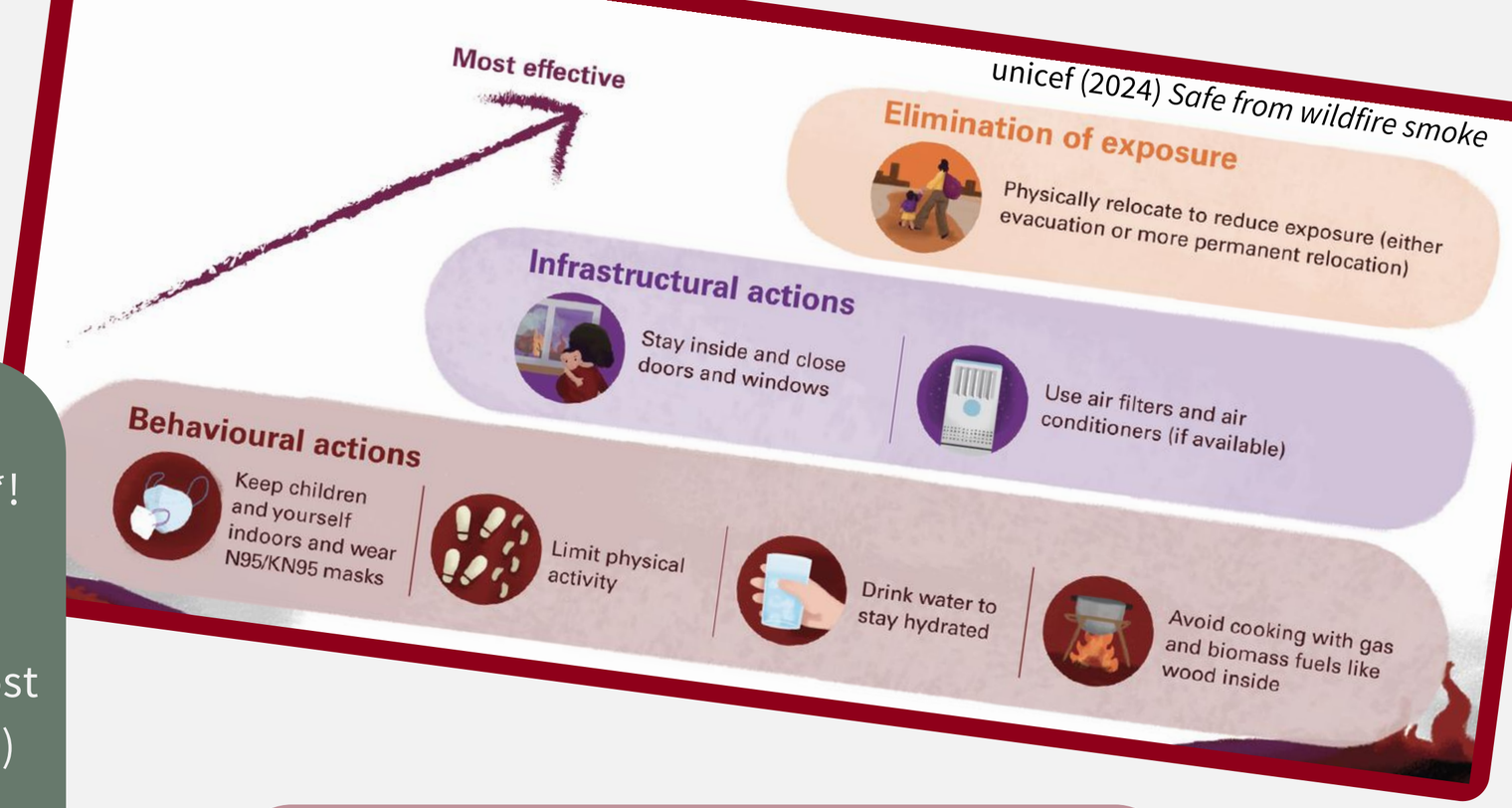
### Self-efficacy

- 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




unicef (2024) *Safe from wildfire smoke*

**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)

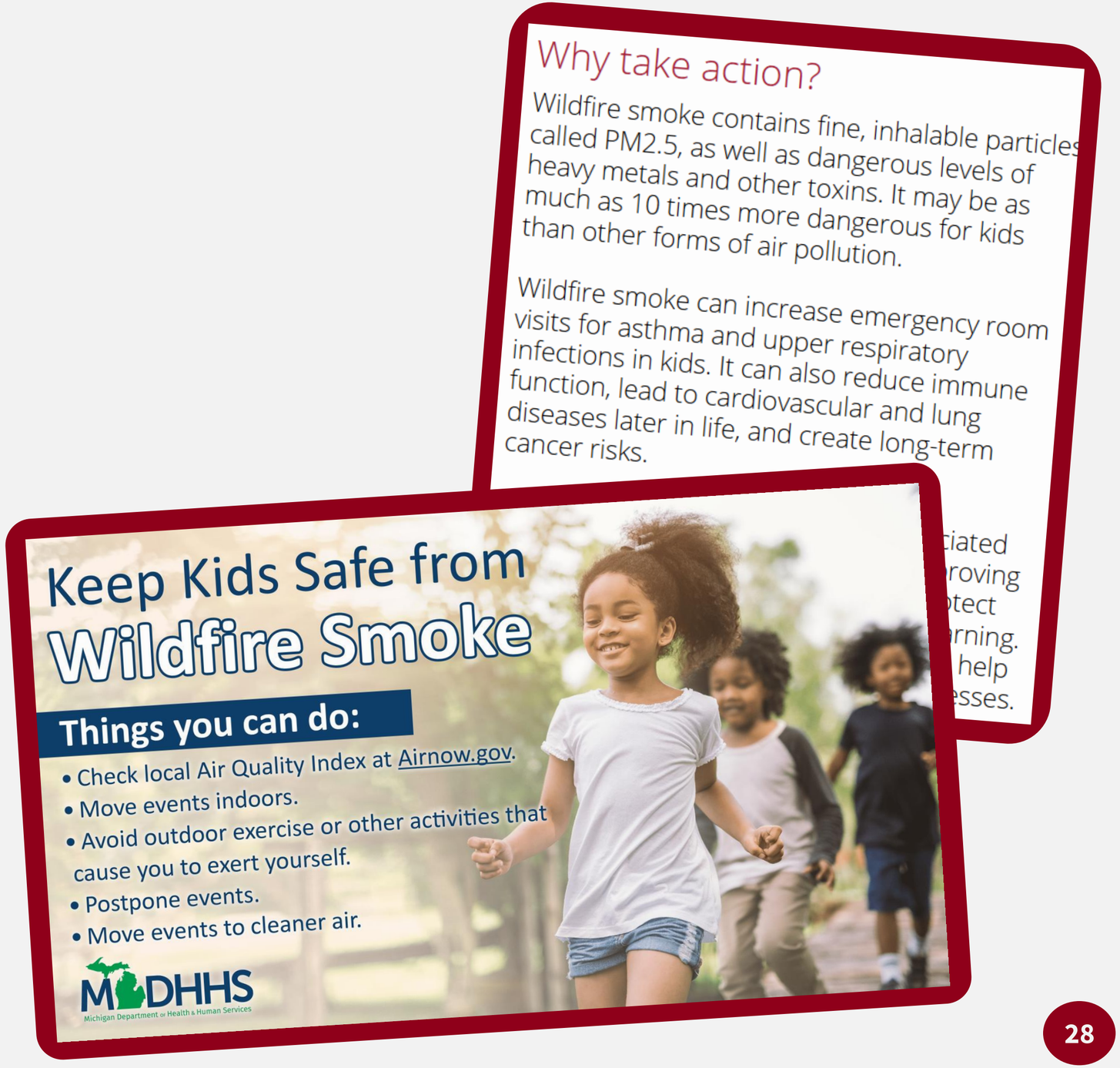
*During heavy smoke conditions,* ***everyone is at risk*** *regardless of their age or health. Some people are more likely to experience symptoms or health effects when exposed to wildfire smoke because of their life stage, existing illness, or health conditions...*

-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)



# 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)

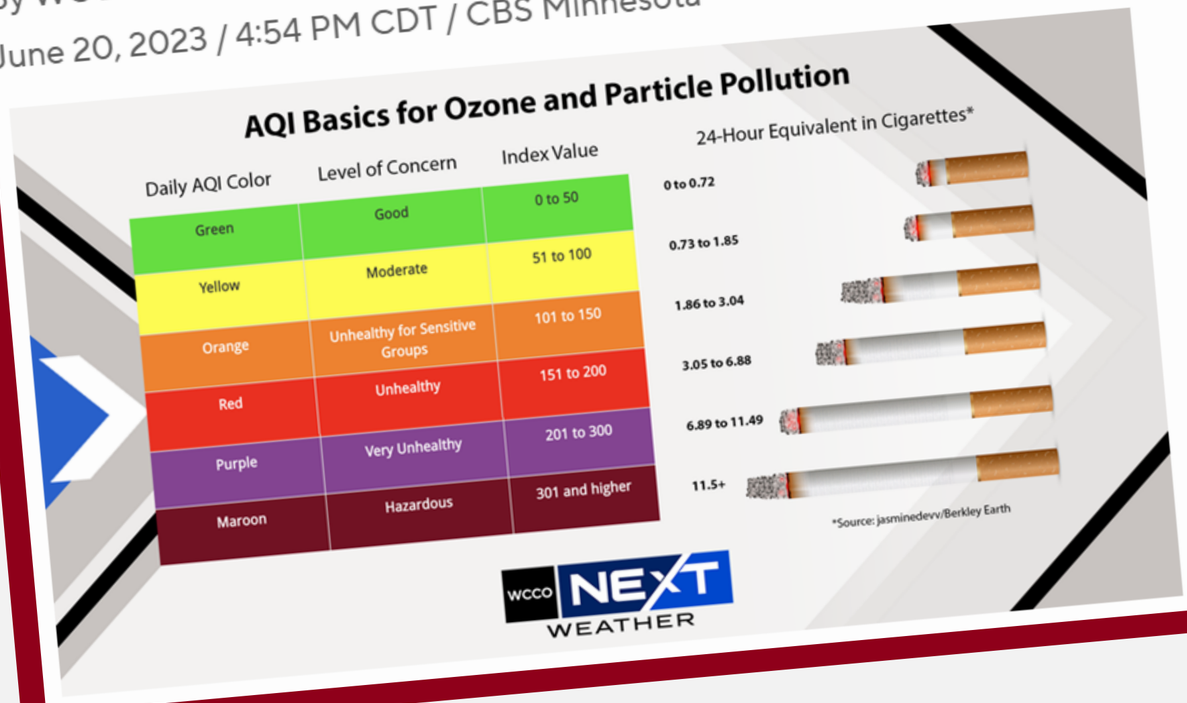
**Don't's:**

- 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*

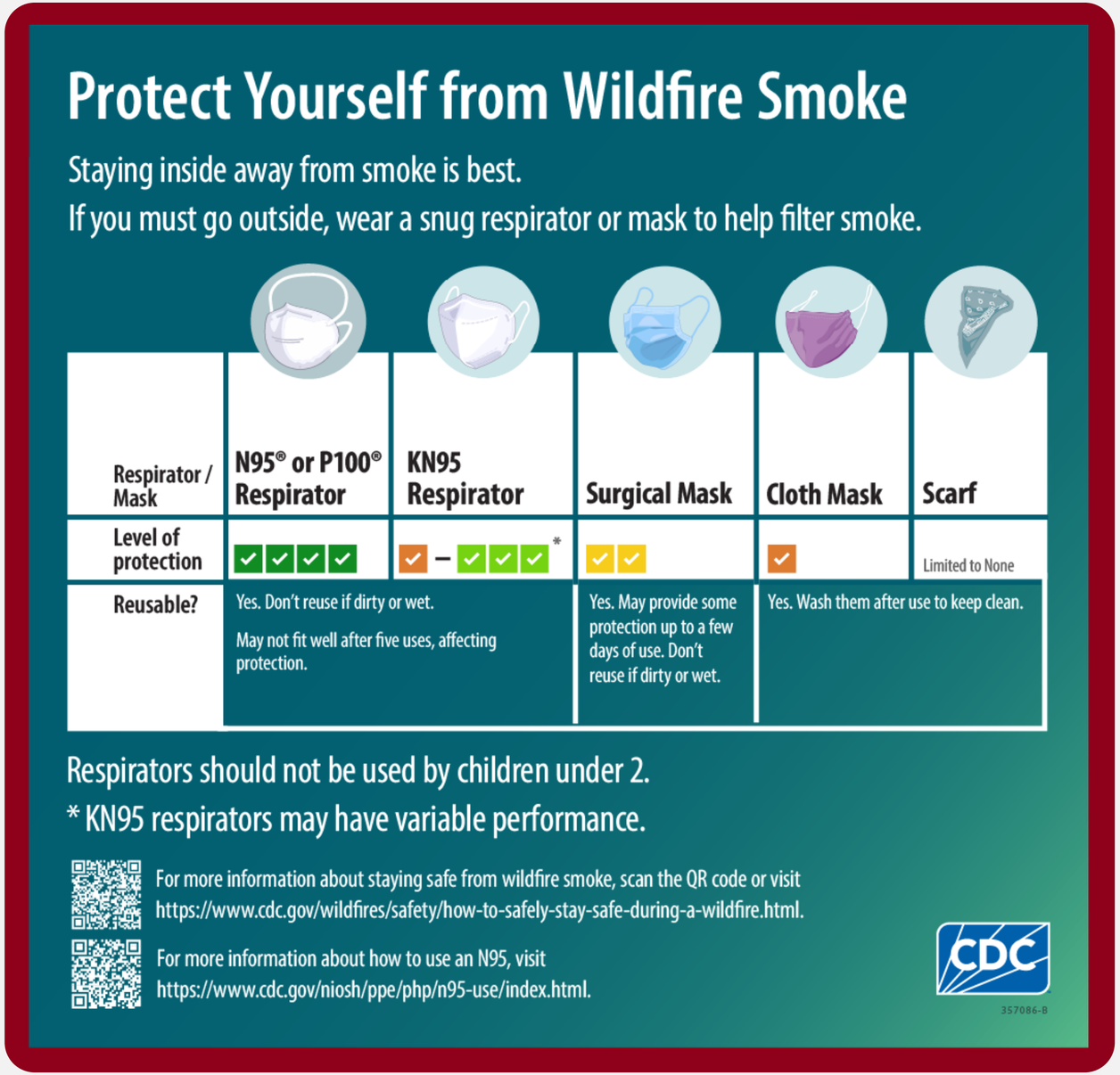
# Uncertainty

**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:**

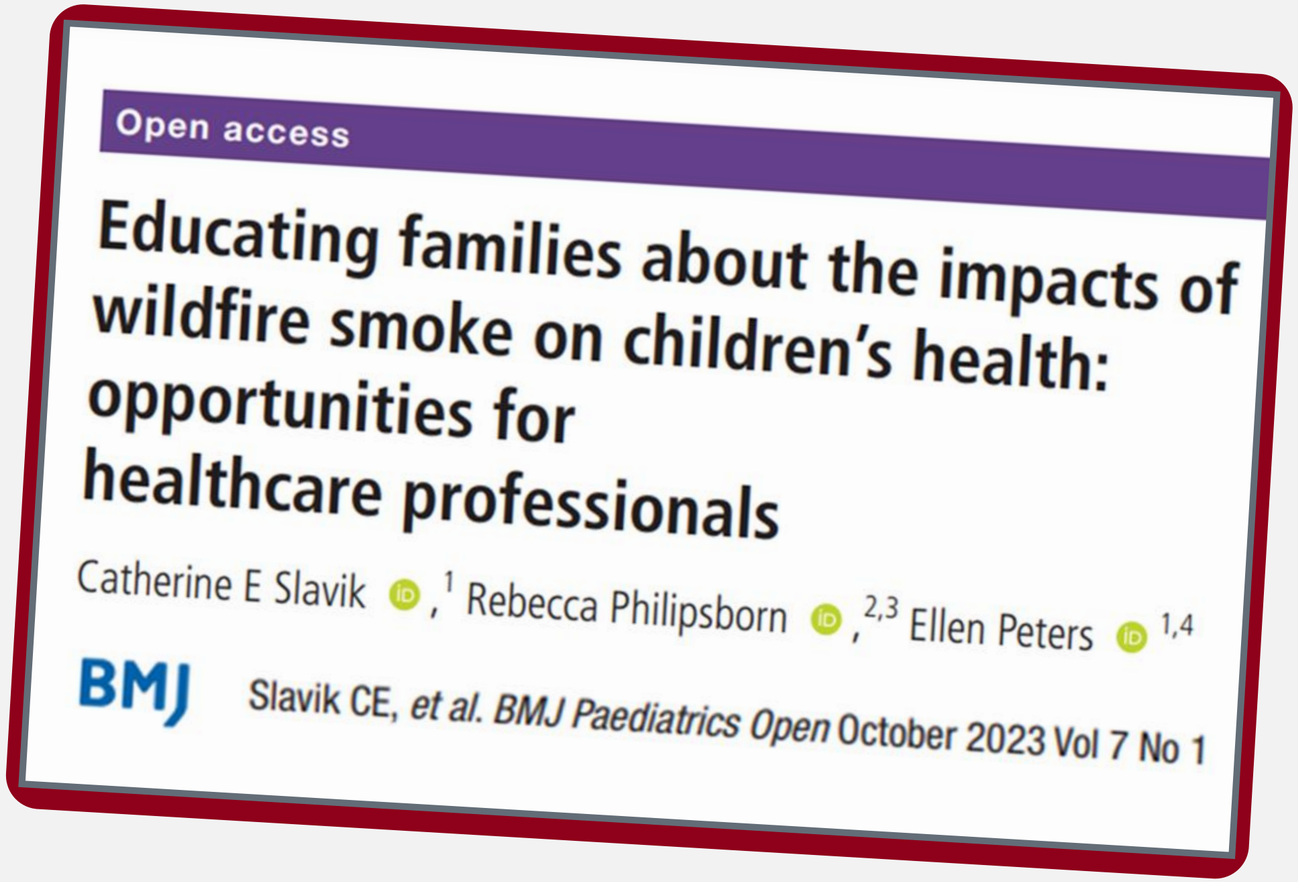
- Apply overly technical or complex language to describe risks (Keegan & Rahman, 2021)
- Give conflicting advice across agencies and communicators (Santana et al., 2021; Joe et al., 2024)



# 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

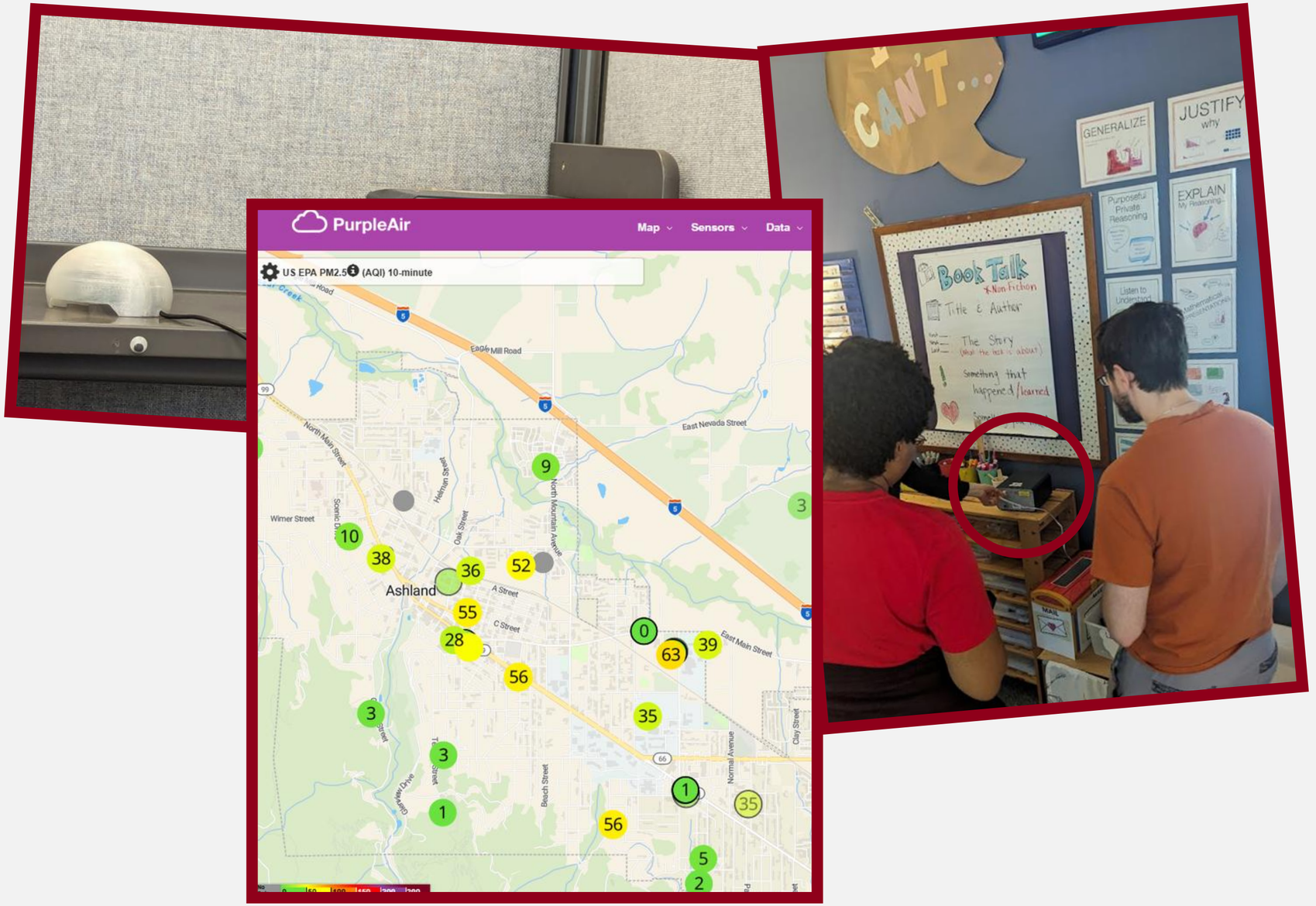
Catherine E Slavik [1], Rebecca Philipsborn [2,3], Ellen Peters [1,4]

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

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

- 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

# 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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