



UK Health  
Security  
Agency

# Wildfires and Public Health

Andrew Kibble and [Dr Iestyn Jones](#)

Environmental Hazards and Emergencies Wales

UKHSA Radiation, Chemicals and Environmental Hazards

# UKHSA: Who we are

UK Health Security Agency (UKHSA) **prevents, prepares for and responds** to infectious diseases and environmental, radiological and chemical hazards, to keep all our communities safe, save lives and protect livelihoods.

We provide scientific and operational leadership, working with local, national and international partners to protect the public's health and build the nation's health security capability.

UKHSA is an executive agency, sponsored by the Department of Health and Social Care.

# UKHSA roles and responsibilities in wildfires

- Provide **public health risk assessment** on the effects of wildfire incidents on public health, including coordinating air quality monitoring during initial response phase, if deemed appropriate
- **Lead the public health response** to wildfires including the provision of public health messaging and health advice.
- Provide public health risk assessments into the LRF and cross government command and control structures
- Facilitate and encourage **collaboration** with other Category One responders and researchers into the public health effects of wildfires
- **Raise awareness** of wildfires risks among communities and work with others to increase community resilience to wildfires through education and engagement.

# Are wildfires something we should be concerned about in the UK...

- UK (currently) does not get the large wildfires we see in other countries
- However, we do have a wildfire issue
- Many small wildfires, close to people's homes (the urban/rural interface)
- Climate change may increase the problem

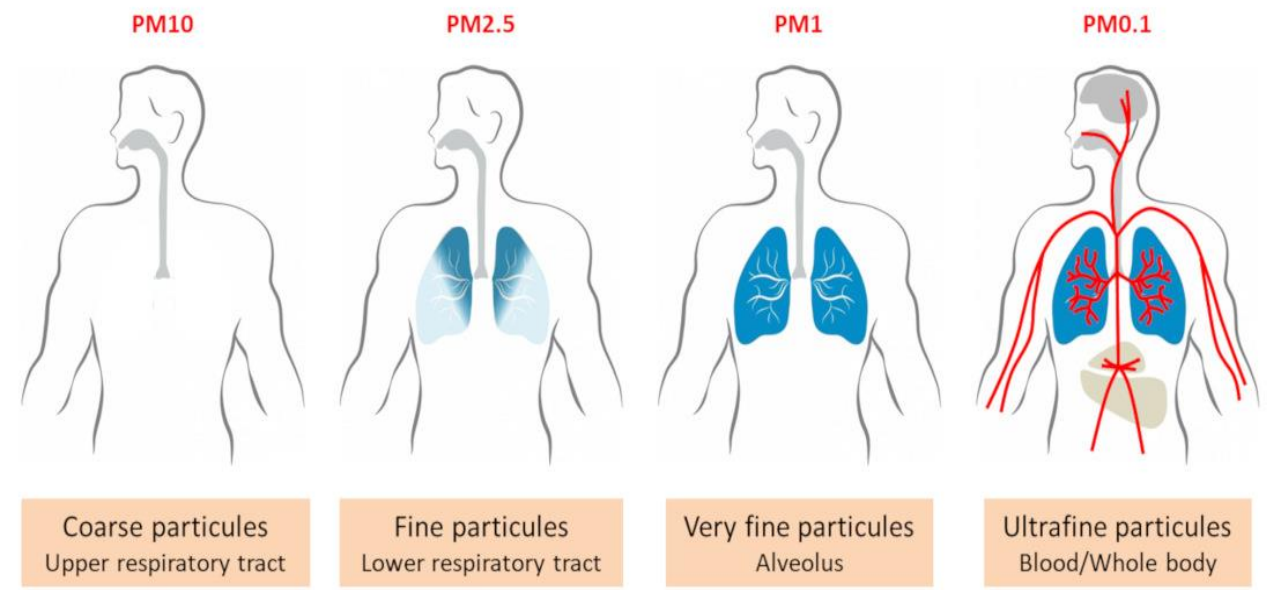
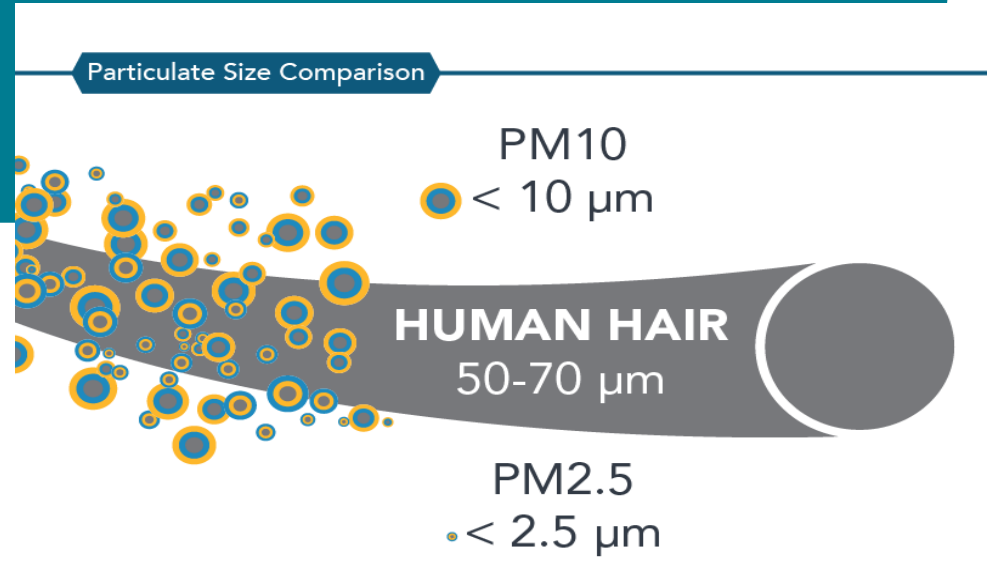
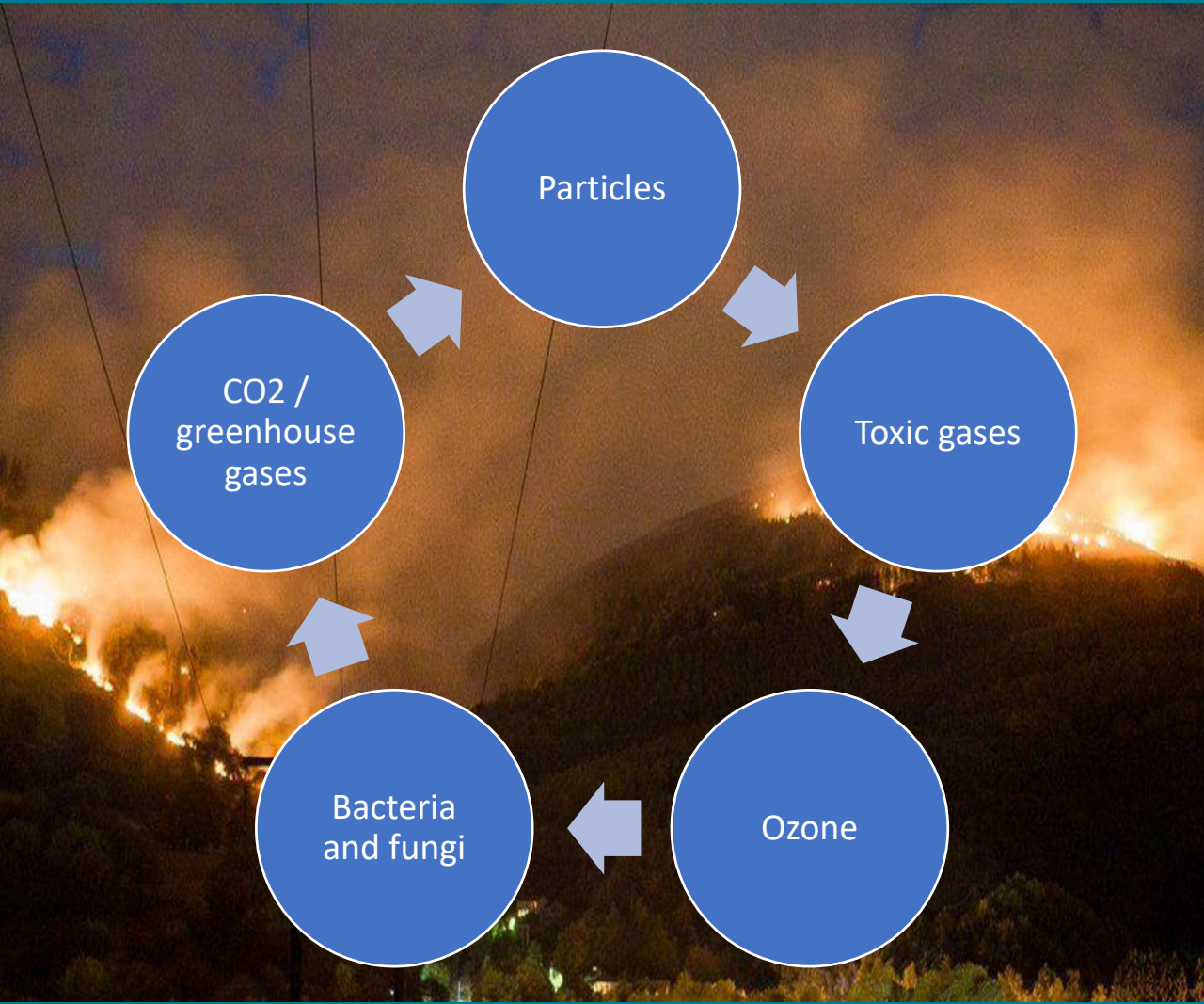


Machen mountain fire, 2021 © BBC  
The fire's proximity to housing is "quite sobering", one resident says



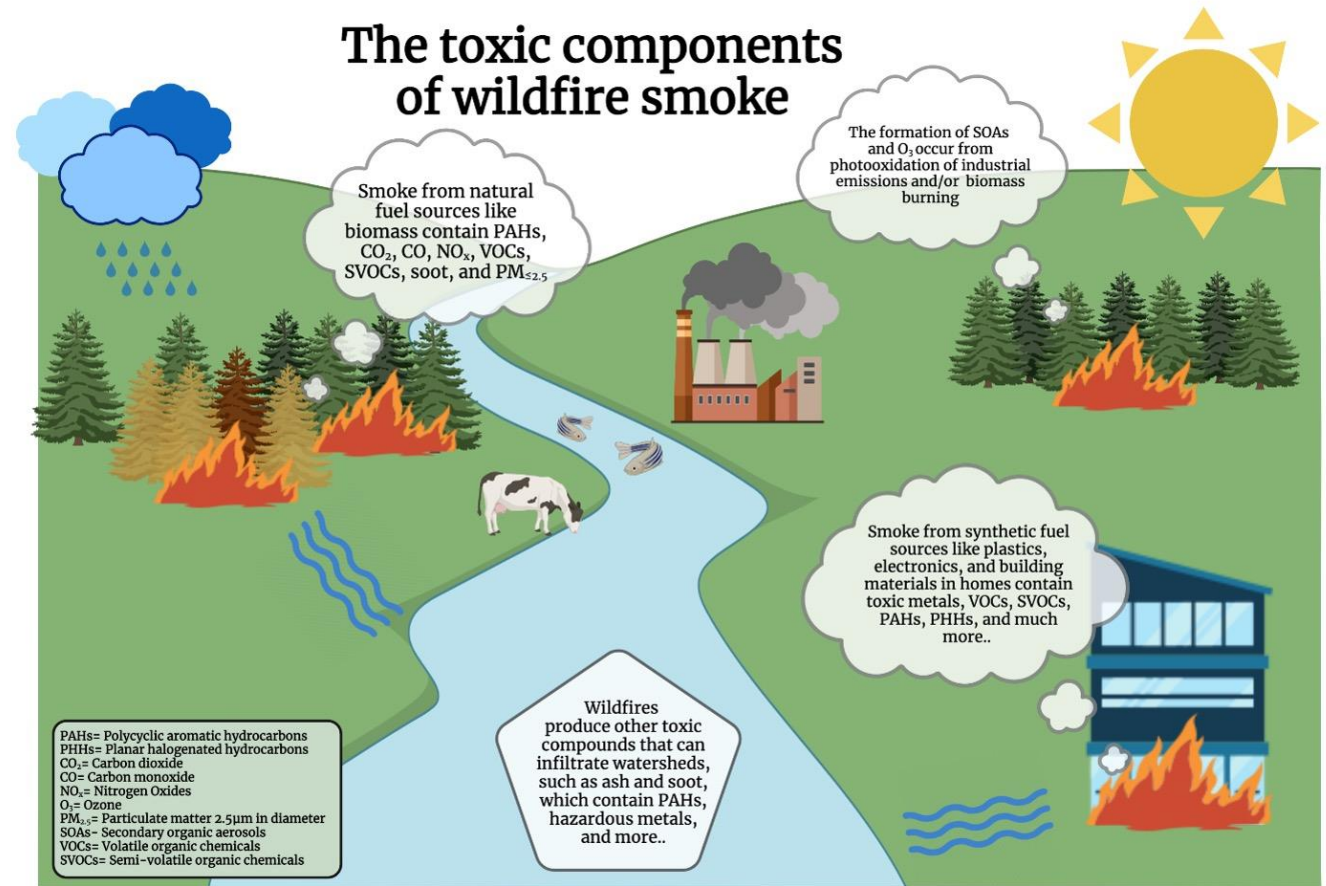
A row of houses on fire in the village of Wennington, Essex 2022 © Peter Macdiarmid/LNP

# What is in wildfire smoke?



# Composition and toxicity of wildfire smoke

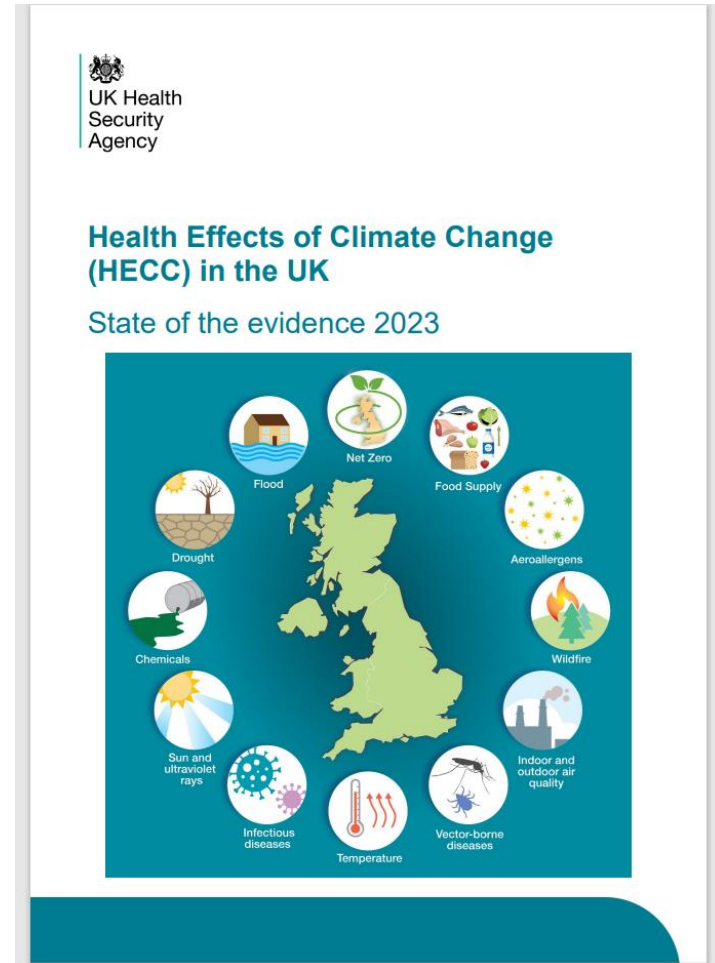
- Will vary depend on
  - fuel type (vegetation)
  - combustion (flaming or smouldering)
  - weather conditions etc
- Lack of data on composition of UK wildfire smoke
- May encroach into urban areas and involve building materials that can result in a wide variety of pollutants in the smoke
- Particulate matter in wildfire smoke may contain more toxic components than non-fire (urban) particulate matter



© Environmental Health Sciences Centre, UC Davis

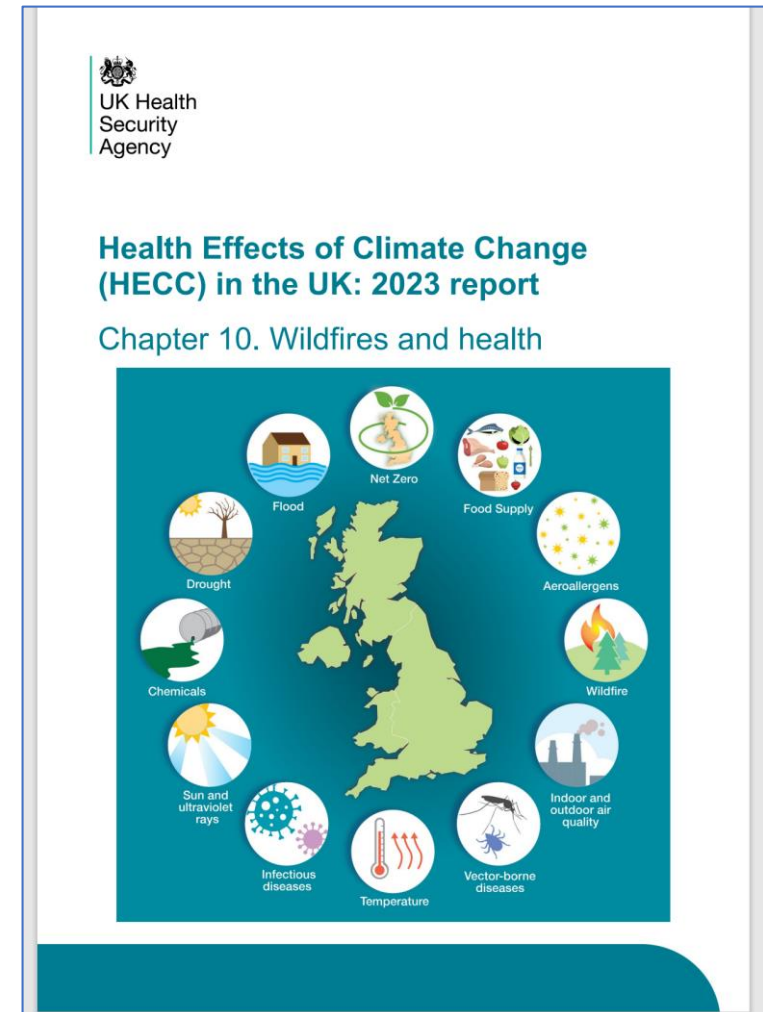
# Health Effect of Climate Change Report 2023

- First published in 2012
- Regularly updated to reflect changes in science and evidence
- 4<sup>th</sup> Edition published in December 2023
- Brings together up to date evidence to inform policies and actions
- Recommendations for research and evidence gathering
- 15 Chapters, 90 authors from UK and international academic institutes and UKHSA
- Wildfires included for the first time



# Health Effect of Climate Change Report 2023

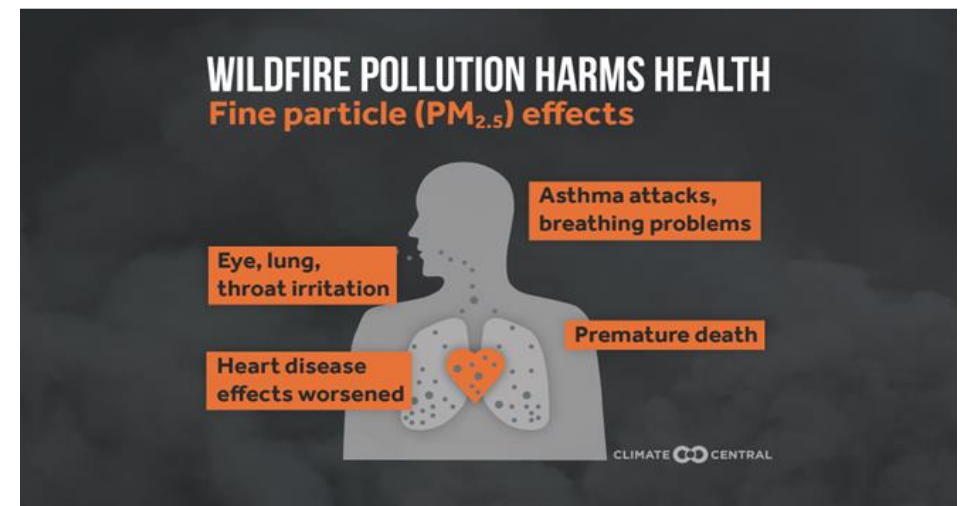
- Authored by the UKHSA
- External reviewers from academia, other stakeholders and Government Agencies
- Covers
  - Injuries
  - Air pollution (wildfire smoke)
  - Mental health and community resilience
  - Impact on water quality
  - Impact of soil quality and stability
  - Floods and landslides
  - Co-exposures (heat, drought, ozone)
- Research and knowledge gaps
- Recommendations





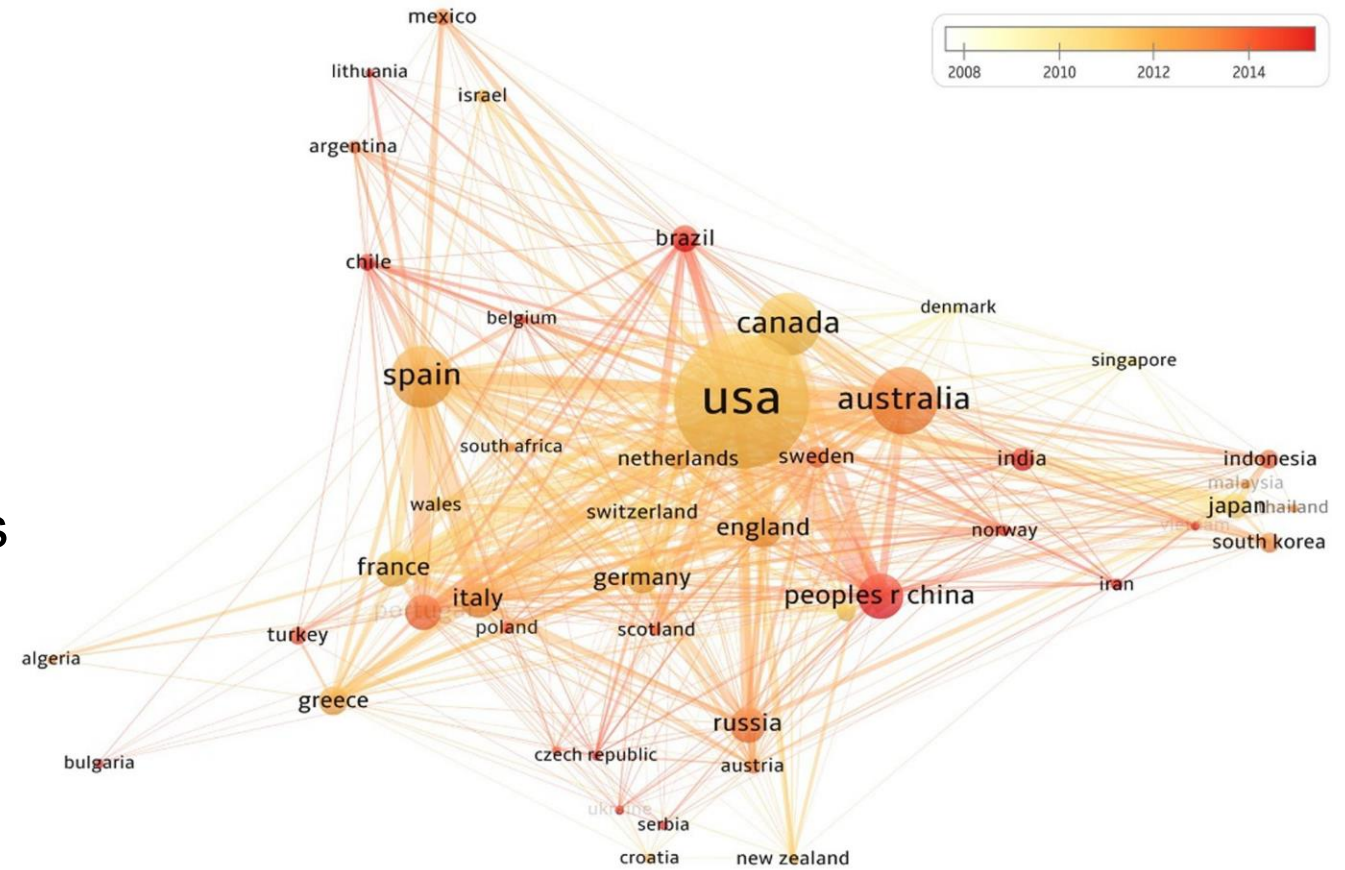
# HECC Report – Key findings

- Threat to life
- Wildfire smoke is toxic
- Link with adverse health outcomes especially respiratory and cardiovascular effects
- Can have significant impacts on water and soil quality
- Potential impacts on mental health and community resilience
- Co-exposures with other environmental / climate hazards



# HECC report - Research and knowledge gaps

- Strong evidence base from other countries
- Limited evidence in UK
- Difficult to extrapolate from other countries to the UK
- Research priorities
  - Smoke composition and emissions
  - Improved exposure assessment
    - Air monitoring
    - Modelling
  - Health studies
  - Impact on water quality



Haghani et al. Safety Science 2022  
<https://doi.org/10.1016/j.ssci.2022.105797>

# HECC report – recommendations for public health / UKHSA

- Need for public health guidance to improve response
- Better understanding of exposure to smoke to inform risk assessment
- Help communities prepare for, respond and recover from wildfires
- Raising awareness of the public health risks
- Strong collaboration and coordination across Govt and non-govt stakeholders

# UKHSA work – strengthening our response

- UKHSA wildfire working group
- Updating public health guidance
  - Improved risk assessment
  - Public health interventions – shelter v evacuation
- Health messaging
  - Key messages for the public, public health professionals and other partners
  - Social media
  - Infographics
  - Building on work by the Wales Wildfire Board
- Due March 2025

“Wildfire smoke can irritate airways, the skin and eyes, causing coughing, wheezing, breathlessness and chest pain.”



# Public facing messaging

- Will be looking at experiences from other countries
- Linked to initiatives to improve air quality messaging
- Health advice
- Key actions
- Other impacts



## Wildfire Smoke & Health

Smoke is an air pollutant

Mostly particles, but also:



Use common sense to protect health



Limit time outdoors & avoid outdoor exercise



People with heart or lung issues should be especially careful



Call your doctor if you have symptoms: coughing, wheezing, chest pain, or nausea



Stay hydrated & get enough sleep



Keep windows closed, unless it's very hot



Run AC with fresh air intake closed & the filter clean



Turn off your whole house fan



Avoid skin contact with ash



Don't stir up ash

Fires **inside** or **outside** the county can send smoke and ash into our air

However, visible smoke plumes don't always mean that ground-level air quality is affected

Find hourly air quality readings



MendoAir.org



# Improving our understanding of exposure to smoke

- UKHSA is developing its own air monitoring capability
- Particulate and gas monitoring
- Can be deployed to large prolonged wildfires
- Review of environmental monitoring in other countries including potential use of low-cost sensor technology
  
- Working with UK Atmospheric Dispersion Modelling Liaison Committee (ADMLC) to run a wildfire air dispersion modelling workshop Feb 2025
  
- Satellite imagery to map risks to public health from fire and smoke



# Working with others and raising awareness

- EWWF
- Home Office Wildfire Working Group
- Wales Wildfire Board and Wales Wildfire Charter
- Contributed to UK Parliament POST report
- Training and presentations for public health networks and local resilience forums in England, Wales and Scotland
- CPD training for National Forestry Commission



# Thank you

Contact me:

[iestyn.jones@ukhsa.gov.uk](mailto:iestyn.jones@ukhsa.gov.uk)

[andrew.kibble@ukhsa.gov.uk](mailto:andrew.kibble@ukhsa.gov.uk)

[chemicalscardiff@ukhsa.gov.uk](mailto:chemicalscardiff@ukhsa.gov.uk)

Health Effects of Climate Change 2023

<https://www.gov.uk/government/publications/climate-change-health-effects-in-the-uk>