



UK Health  
Security  
Agency

# Wildfires and public health

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# Are wildfires something we should be concerned about...

- UK 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 © Peter Macdiarmid/LNP

# Potential risks to the public

- Injuries
- Air quality impacts including health effects of smoke exposure
- Impact on water quality
- Impact of soil quality and stability
- Mental health and community resilience
- What you can do



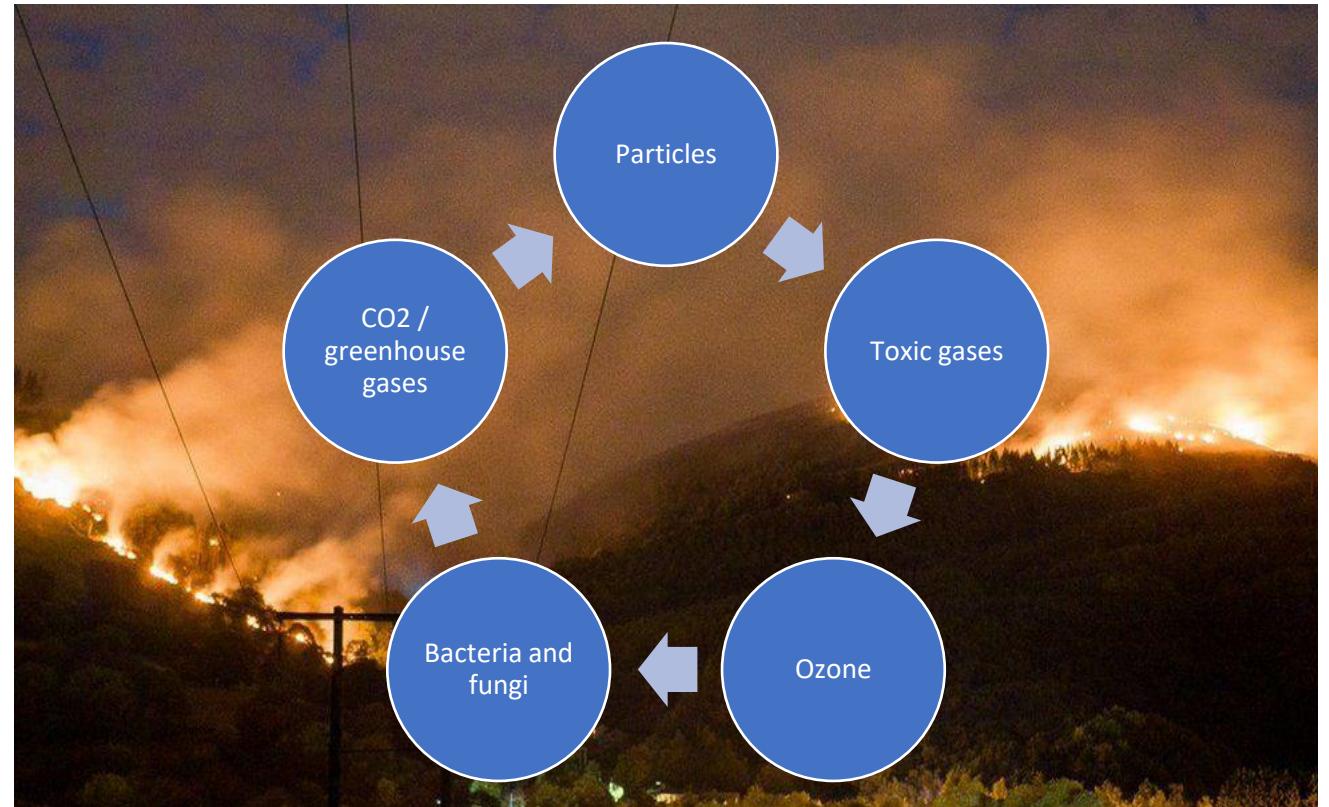
Photograph: Shutterstock

# Injuries

- Wildfires can present a range of hazards
- Suffocation
- Burns
- Electrocutation
- Injuries due to unstable buildings, trees etc
- Hazardous substances from buildings e.g. asbestos
- Smoke can reduce visibility, increasing risk of traffic accidents
- No fatalities reported in the UK but major wildfires in other countries have resulted in high number of fatalities
  - e.g. 2018 forest fire in Greece caused 102 deaths

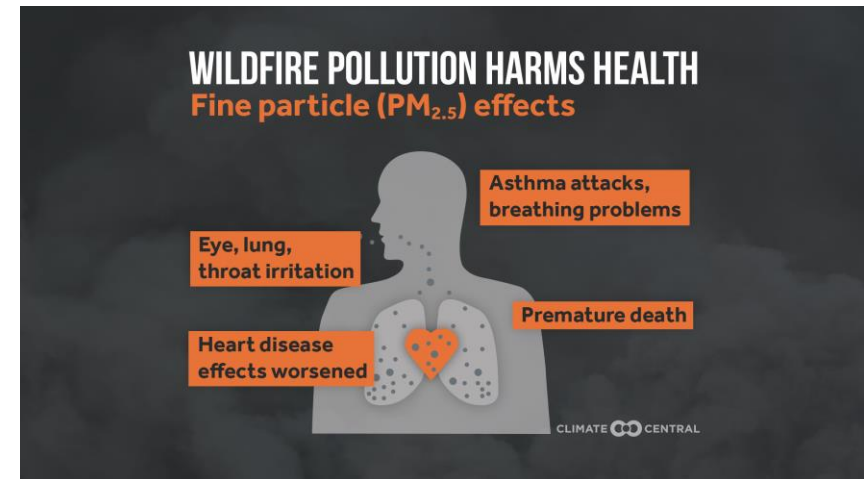
# What is in wildfire smoke?

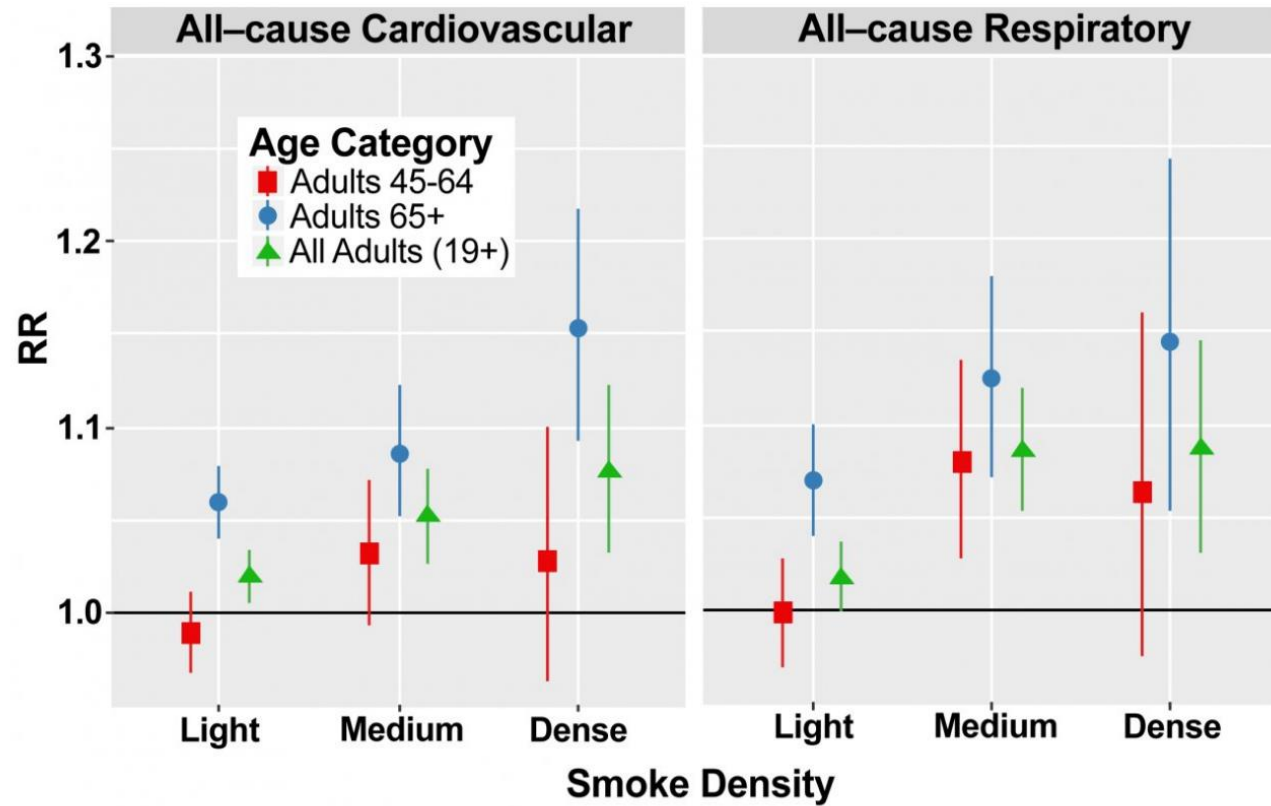
- It is toxic
- Major pollutant is particulate matter (PM2.5)
- Harmful gases such as carbon monoxide, nitrogen oxides, acrolein, formaldehyde and cyanide compounds
- Many pollutants are in higher concentrations than that found in urban air
- Large wildfire events can also generate secondary pollutants such as ozone which are also hazardous.
- Possible risk from exposure to bacteria and fungi?



# Key findings – air quality

- Increasingly strong evidence base around wildfire smoke and health outcomes
- Evidence strongest for a link with respiratory effects
  - Hospital admissions for asthma
  - GP referrals
  - Increased use of medication
- Weaker evidence for cardiovascular effects
- Most studies from USA, Australia etc. Very few from UK
- Evidence consistent with established evidence around air pollution and health

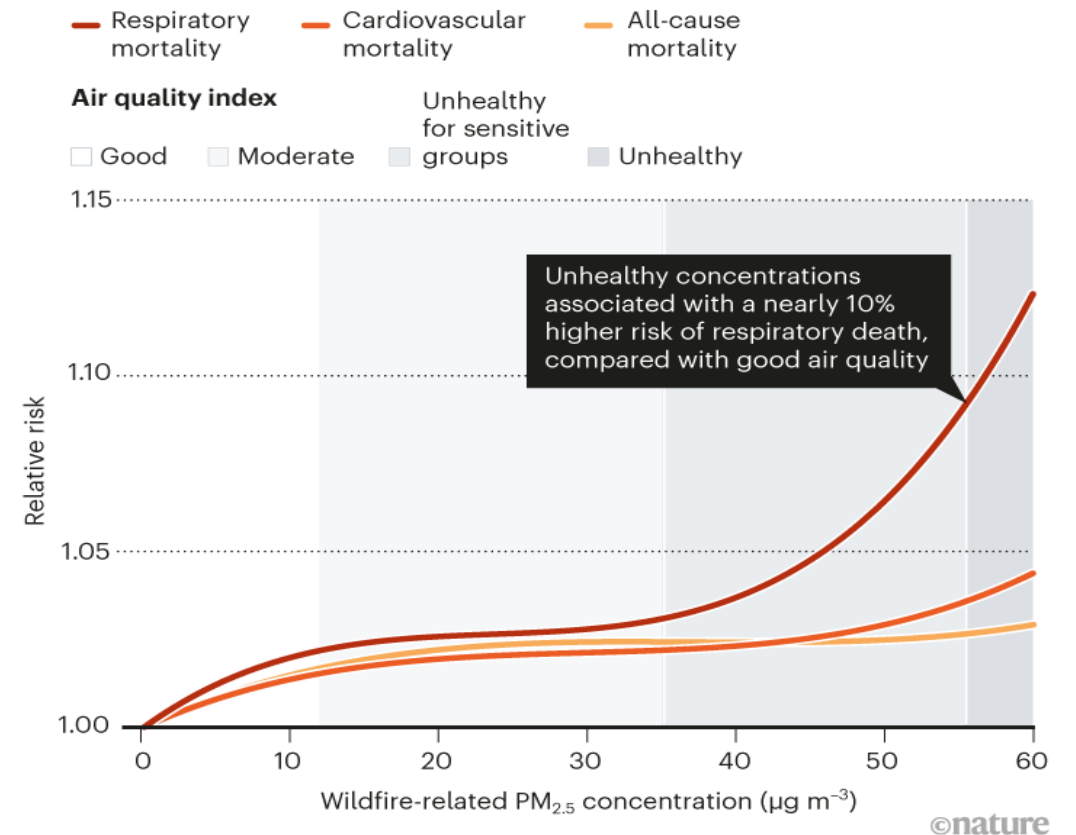




**Figure 2.** Relative risk (RR) and 95% confidence intervals for emergency department visits for all cardiovascular and respiratory outcomes relative to smoke free days, at lag 0 days, stratified by age. Source: Adapted from Wettstein et. al. (2018).

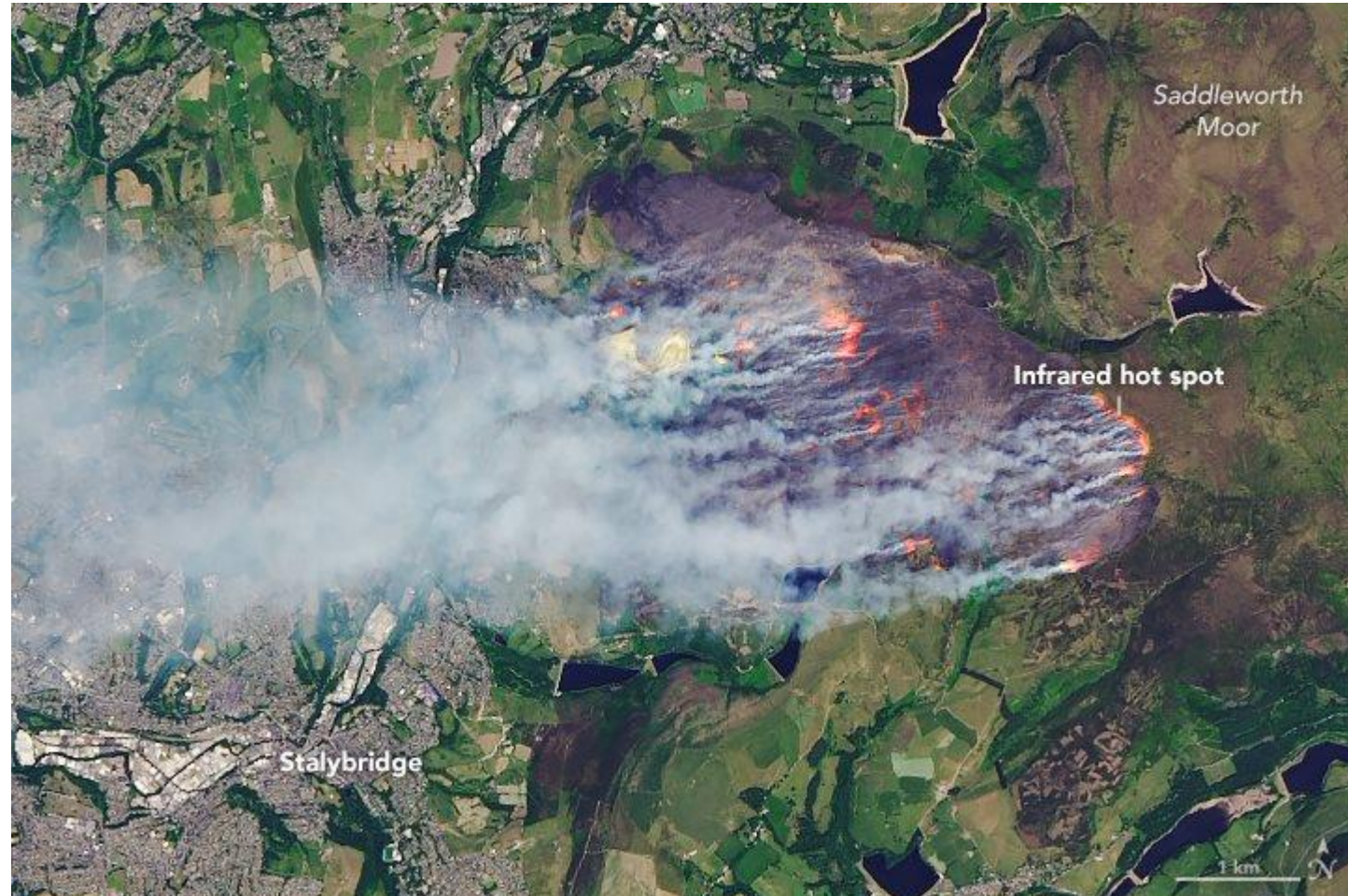
## RISKY EXPOSURES

An analysis of more than 65 million deaths in 43 countries found an increased risk of death from all causes soon after exposure to particulates (PM<sub>2.5</sub>) from wildfire smoke.



# Saddleworth moor fires (June 2018)

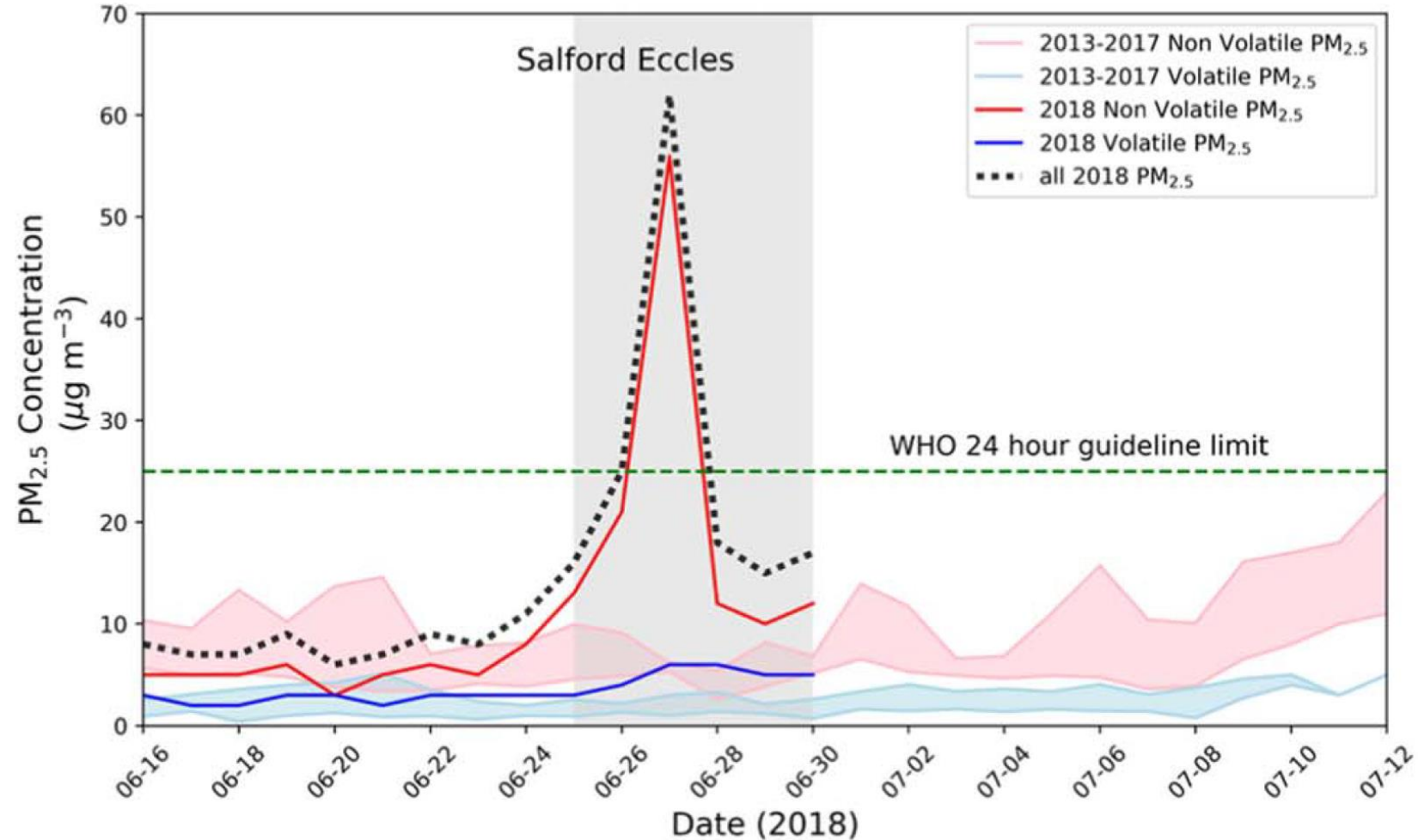
- Burnt for 3 weeks
- Large amounts of smoke which drifted over Greater Manchester
- As many as 4 million people may have been exposed to poor air quality
- Economic cost due to health impacts estimated to be approx. £21 million



View of the Saddleworth Moor fire on 27 June, taken by NASA's Landsat 8 satellite



# Impact on local air quality – Saddleworth Moor fires



# Other potential health impacts

- Evidence that large wildfires can impact water quality and soil quality
- Fire water run-off can contaminated water supplies.
- Wildfires can impact both the chemistry and physical quality of soils and can result in the formation of more toxic forms of some chemicals in soil.
- Exposure to microbes/spores and pollutants in soil dust
- Can result in instability, erosion, landslide, and flooding.





Tylorstown landslip © RCT



The 2016 Fort McMurray wildfire burned along the Athabasca River, damaging the drinking water supplies for tens of thousands of people. ROYAL CANADIAN MOUNTED POLICE

# Mental health and community resilience

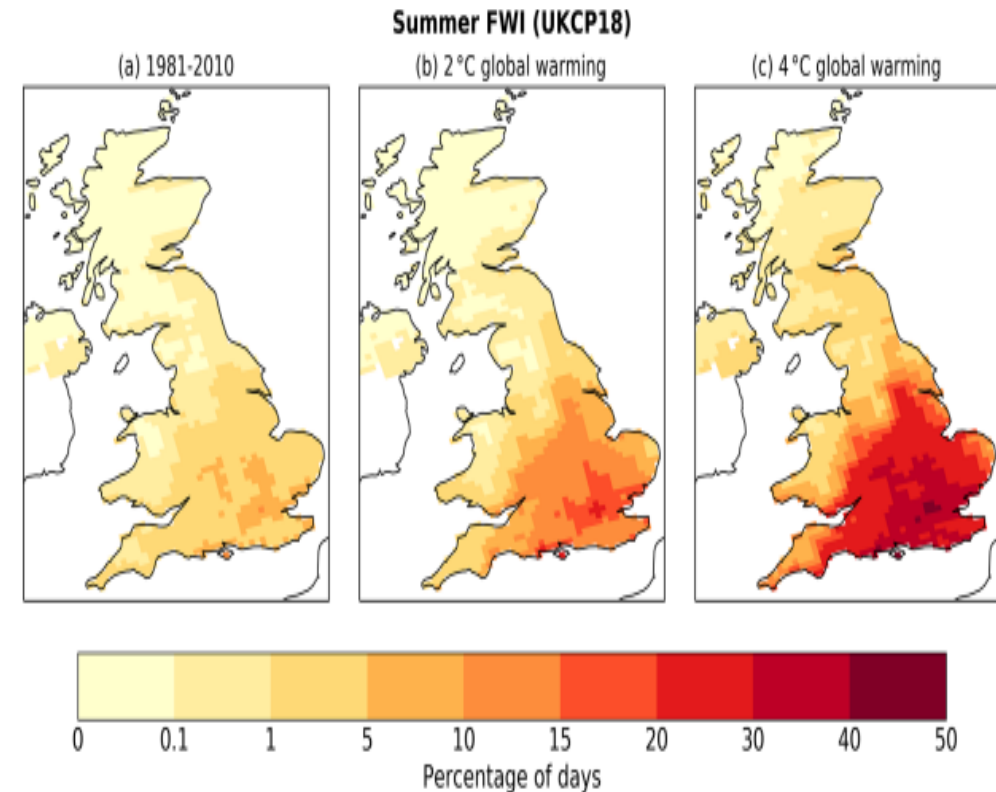
- Extreme events such as wildfires can have a significant impact on mental health
- Affected communities have elevated rates of PTSD, anxiety and depression
- Wellbeing aspects such as fear, stress and uncertainty.
- Solastalgia (the feeling of a 'loss of place') from watching a home burn, causing community disconnect and isolation.
- The level of community resilience depends on the amount of individual and community support provided
- Need for clear communication, engagement and involvement in preparedness and response.



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# How will climate change impact wildfires in the UK?

- Climate change will double the number of days with very high fire danger in UK
- Increase in exceptional danger days across UK by 2080
- Drivers temperature but also relative humidity
- Longer fire season, more late summer fires
- Possibly large, more severe fires
- Wider geographical spread
- Human factors? Arson, urban/rural interface etc



**Figure 10.** Percentage of summer days with very high fire danger (FWI > 17.35) over the UK, based on the UKCP18 12 km data averaged over the 12 ensemble members. (a) Historical period (1981–2010), (b) 2°C global warming and (c) 4°C global warming. The colour bar is the same as in Fig. 8b.

# What can you do

- Be aware of the risks from wildfires
- Speak with your children about the dangers of setting fires
- Protect your home and garden
- Stay safe during wildfire fires
  - Avoid smoke
  - Stay indoors, keep doors and windows close
  - Listen to advice from emergency services
- If you have health concerns / pre-existing respiratory or heart conditions
  - Make sure you have and take your medication
  - Seek health advice (GP, NHS 111) if you symptoms worsen

# Health Effects of Climate Change Report

- Wildfires will be part of the update to the UK Health Effects of Climate Change Report
- Will raise awareness of the risks
- Review of current evidence on wildfires and public health
- Focus on UK situation
- Start of a debate/discussion around raising awareness of the public health impacts

# Summary

- Wildfires can present a potentially serious risks to health
- Air quality impacts especially important
- Situation likely to get worse due to climate change
- Be aware of the risks