HEALTH EFFECTS OF BUSHFIRE SMOKE

Anjali Haikerwal[1] , Mick Meyer[2], Michael Abramson[1] , Malcolm Sim[1], Martine Dennekamp[1]

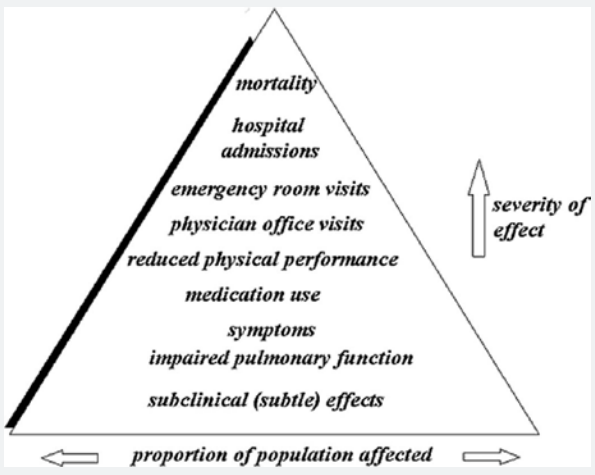
[1] School of Public Health & Preventive Medicine (SPHPM),Monash University, Victoria. [2] CSIRO Marine and Atmospheric Research, Aspendale, Victoria

More frequent and severe extreme events such as bushfires can seriously harm our health

Exposure to smoke from bushfires and prescribed burnings is a serious public health problem and is predicted to get worse in the future.

The air pollutant that increases most significantly as a result of bushfire smoke is **particulate matter** (PM) which has been shown to have an adverse effect on cardio-respiratory health outcomes.

The **population subgroup** most impacted are children, the elderly, and those with pre-existing diseases such as chronic obstructive pulmonary disease (COPD) and asthma.



*Pyramid of air pollution health effects (WHO2006)**

The health risk of bushfire smoke exposure should be an important consideration in the management of bushfires.

Research on the health effects of smoke from bushfires and prescribed burns in the community is very limited.

This justifies further work in this area

AIM

To assess the **cardiovascular and respiratory** health effects from exposure to air pollutants emitted from bushfire smoke and prescribed burning in the rural and urban communities in Victoria.

Methodology

Two studies will be conducted:

Data linkage Study : Study cardiorespiratory health effects from 2006/2007 Victorian bushfires using *previously* collected health data

Associations will be examined between air quality data and health outcomes

Study event: 2006-2007 Victorian bushfires

Data collection site: Victoria

Air exposure data: obtained using the newly developed *air quality models* (resulting from FIRE-DST project developed by CMAR).

De identified health datasets: obtained from Department of Health and Ambulance Victoria

Health outcome measures : ambulance attendances for out of hospital cardiac arrests, hospital admissions and emergency department visits for non traumatic cardiorespiratory health effects

Panel study: Study the cardiorespiratory health effects from future prescribed burning in Victoria. Health data* will be *collected* from the participants (Blood tests, LFT, questionnaires)

Study period: Autumn 2013

Study Population: community dwelling elderly participants (65 years and older).

PM measurements: Obtained from **Fixed** monitoring networks and automated PM and gas samplers

Portable handheld aerosol monitors including a newly developed **nanoparticle monitor** (Aerasense monitor) will also be trialled

Meteorological data : Obtained from BOM

Health outcome measures :* cardiorespiratory symptoms, medication use, hospital service utilisation, lung function and inflammatory biomarkers in the blood (e.g. high sensitivity C - reactive protein, fibrinogen, von Willebrand factor).

Study design and Analysis

Data linkage Study :*Time stratified case cross over study design* will be used to explore association between PM exposure levels and health outcome measures .This association will then be analysed using conditional logistic regression models (OR and 95% CI)

Panel Study: *A prospective cohort study* will be conducted during the prescribed burning season. Generalised additive models along with fixed effects regression will be used to analyse association between PM levels and health outcome measures

Significance

The results from this study will allow for targeted **evidence based advice** to the clinicians, policy makers and members of the community of the measures required to implement appropriate preventive strategies

Reference: *World Health Organization. 2006a. *Health risks of particulate matter from long-range transboundary air pollution.* www.euro.who





CRC

MONASH University

CSIRO