

Understanding and managing the impact of smoke on the eyes of Australian bush firefighters

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Impact of smoke on eyes of bush firefighters

- Smoke irritates the eye surface

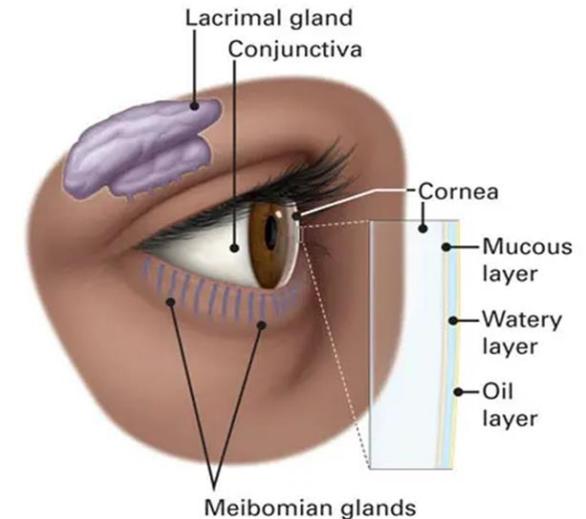


Bush firefighters who present to hospitals with eye injuries.¹



Bush firefighters who report eye irritation to be a problem on the fireground.²

- Protective eyewear can be challenging to use on the fireground
- Lack of consistent methods to aid recovery of eye surface after occupational smoke exposure



Structures of the eye surface

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The Ocular Surface

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Blinded by smoke: Wildfire smoke exposure and eye irritation in Australian wildland firefighters

Sukanya Jaiswal^{a,*}, Isabelle Jalbert^a, Nicholas Olsen^b, Anthea Burnett^a, Blanka Golebiowski^a

1) Squire, B., Chidester, C., & Raby, S. (2011). Medical Events During the 2009 Los Angeles County Station Fire: Lessons for Wildfire EMS Planning. *Prehospital Emergency Care*, 15(4), 464–472. <https://doi.org/10.3109/10903127.2011.598607>



Impact of smoke exposure on eyes at burns

INTERNATIONAL JOURNAL OF ENVIRONMENTAL HEALTH RESEARCH

Research article

Adverse eye effects of smoke exposure at prescribed burns in wildland firefighters

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- ↑ Dryness, discomfort, foreign body sensation
- ↑ Eye Redness
- ↑ Corneal epithelial cell damage

- ↓ Tear film quality



Research questions

- 1) What eye symptoms and/or vision related problems occur in bush firefighters ?
- 2) What are the **existing capabilities** and **resources** within fire and emergency service agencies to improve eye care and protection for bush firefighters?
- 3) Which therapeutic and non-therapeutic strategies can be **operationally implementable** to reduce eye symptoms and mitigate smoke induced eye surface damage?



Project overview

Stage 1: April – Oct 2025

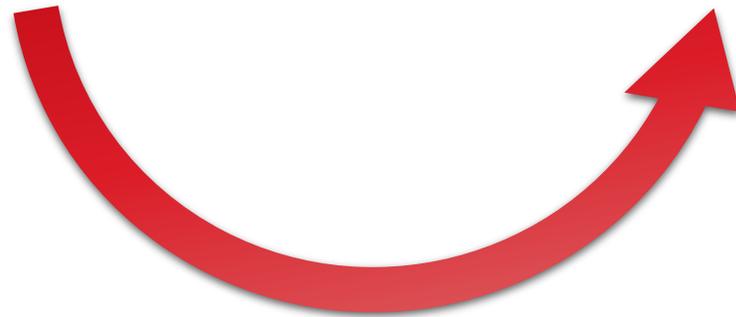
Experience of Australian bush firefighters

- Document analysis
- Observations
- Interviews

Stage 2: Nov 2025 – Jul 2026

Intervention trials: Effectivity of non-goggles based methods in mitigating impact of smoke on eyes

- e.g. rinsing, wipes, eye drops, contact lenses



Stage 1: Qualitative study

Semi-structured interviews

- One-on-one
- Understand the experience of Australian bush firefighters
 - Eye symptoms during and after shifts
 - Impact on operational capability and activities of daily living
 - Recovery strategies
 - Protective eyewear: fitting, effectivity, comfort

Document analysis

- Review PPE and OH&S guidelines from each agency
 - Protective eyewear options
 - Sunglasses use
 - Eyecare on the ground and afterwards



Observation of workspaces

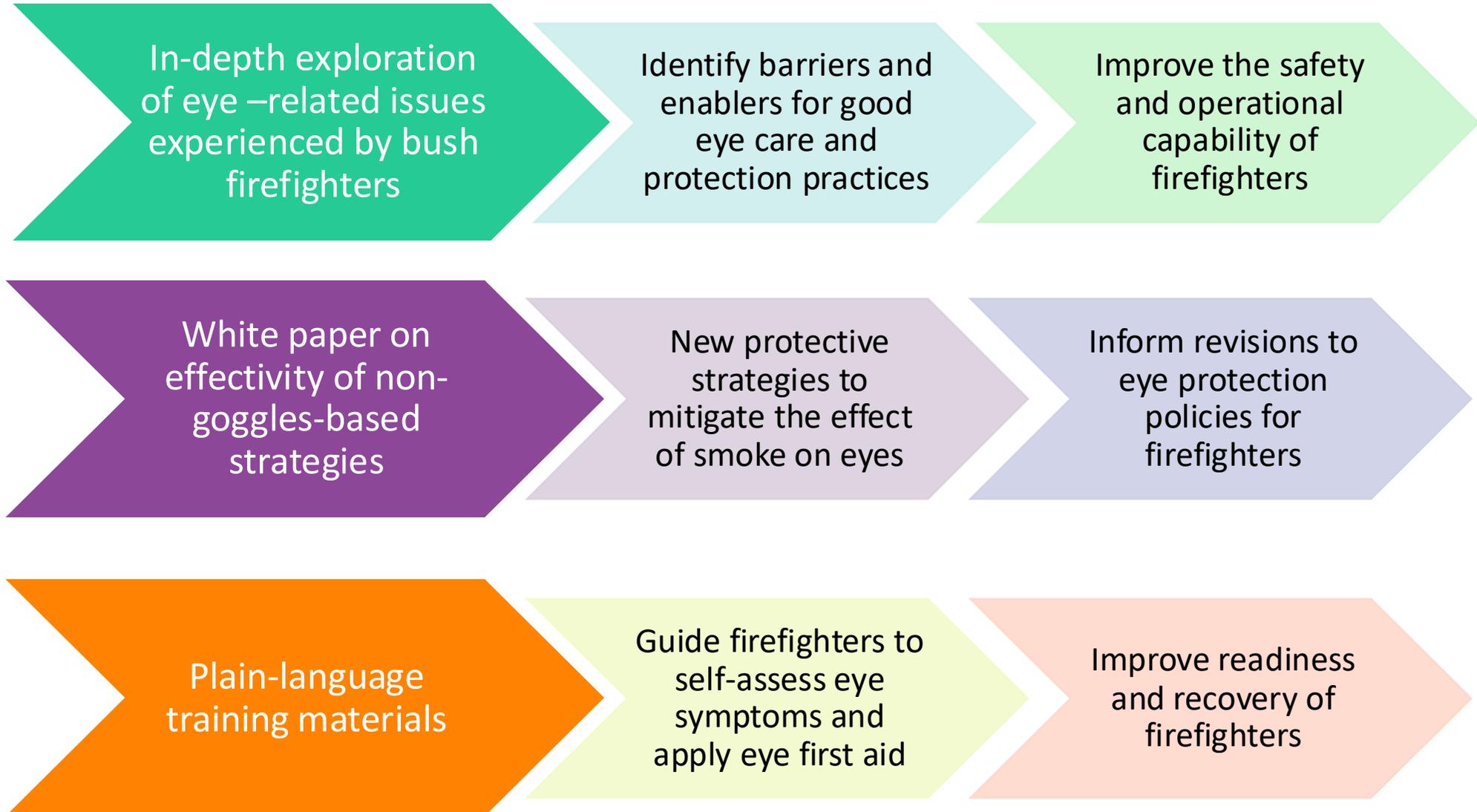
- Existing resources and capabilities e.g. first aid kits, rinsing stations



Outputs

Outcomes

Impacts



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