

# THE HEATCHECK

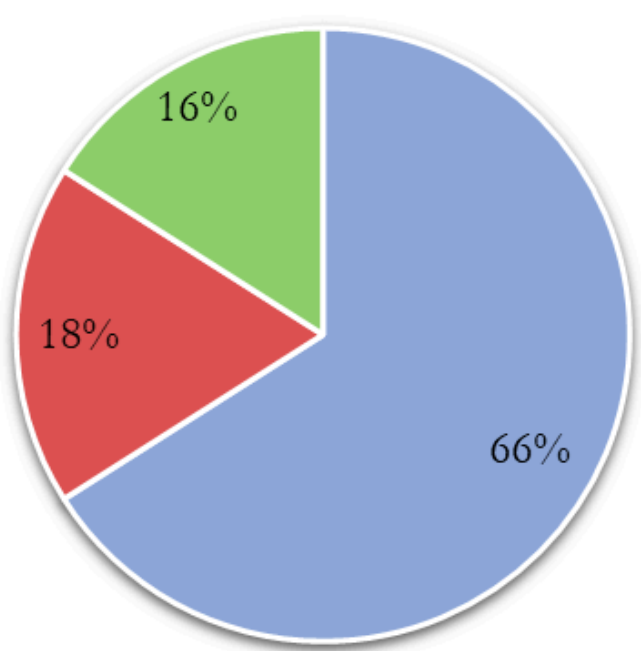


## Real-Time Firefighter Health Monitoring

How might we monitor firefighter health without disrupting their duties?

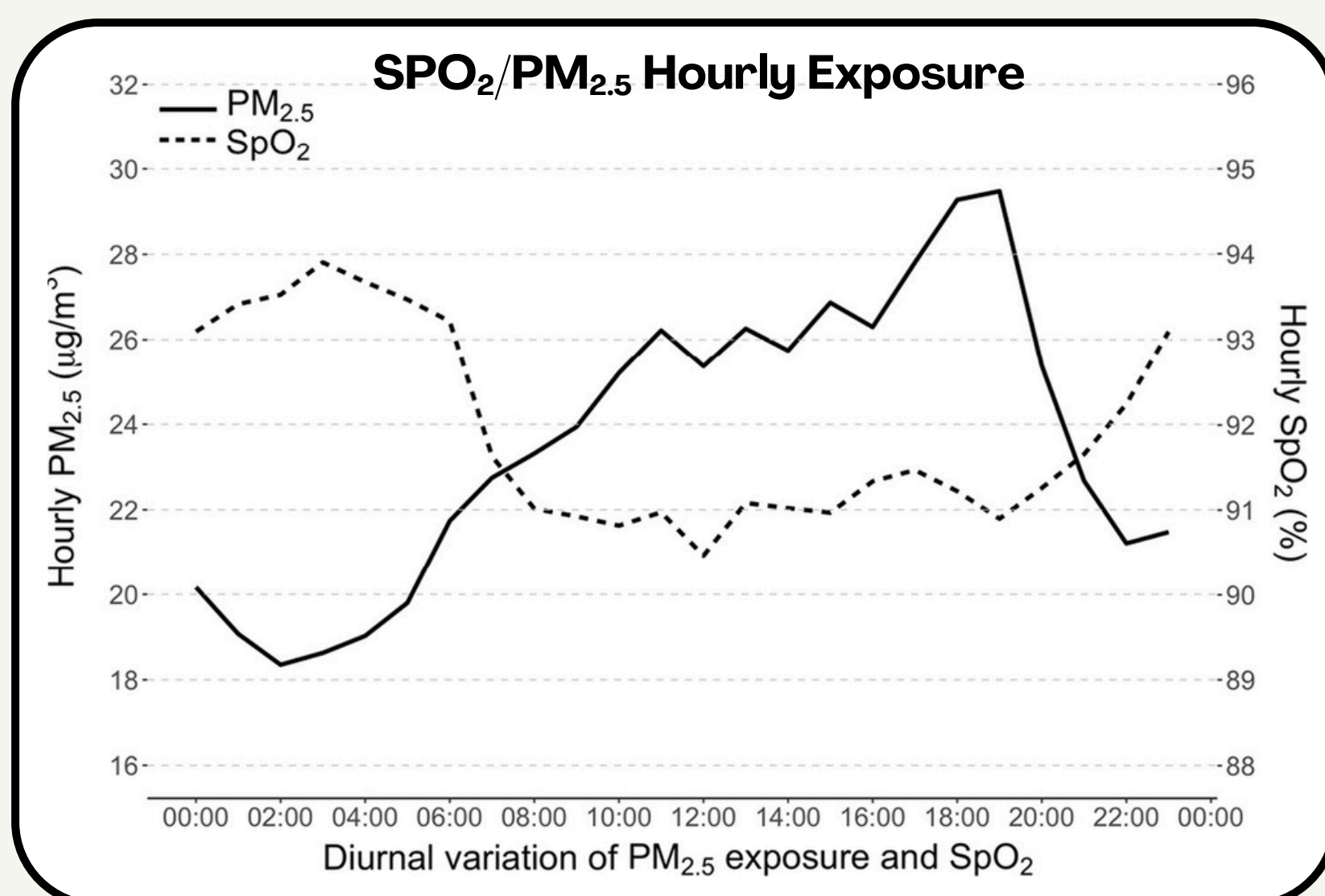
### Problem

Leading Causes of Career Line-of-Duty Firefighter Deaths from 2002-2019



#### Cancer Risk

- **Carcinogen exposure**
- Policy insufficient: masks removed



#### Current Solution Issues

- Intermittent rehab monitoring left **unanalyzed**
- Stigma around seeking help
- **Lack of accountability** in fitness watches

#### Cardiac Risk

- Physical + mental strain
- Dehydration
- Smoke Exposure
- Lifestyle

### Demo/Experiment

#### Prototype System includes:

- MAX30102
- Arduino Nano ESP32
- **Wifi Relay** to Command Center
- Deployed on **wrist** (least inhibitive)

### Solution

- Tracks:
  - **SpO<sub>2</sub>** (blood oxygen)
  - **Heart Rate**
- Sends **real-time data** to fire chief and EMS
- **Flags abnormalities**
  - Visually, Audibly
- Measures **distance** from command center

### System Overview



**Track**



**Relay**



**Act**

### Subsidizing Costs: Government Grants

#### FEMA

Federal Emergency Management Agency

#### AFG

Assistance to Firefighters

**Equipment Costs**

#### FP&S

Fire Prevention & Safety

**Research Funding**

### Further Development

#### First Users:

- **Rural** departments, **underfunded** + low tech

#### Scalability & Cost:

- **\$55-\$120** per unit
- Bulk manufacturing = lower cost

#### Next Steps:

- **Testing with fire departments**
- Sensor improvement
  - Noise + signal strength

### Risks

#### Accountability:

- Distance dashboard → essential for incident commanding

#### Accuracy

- Metrics aid decision-making but cannot diagnose