Platform Presentations

1:45- 2:45 PM

Tony Zbysinski
Ionizing Radiation and Mortality:Unraveling Neurocognitive Risks in a Worker Cohort

Colton Castro
Direct-On-Filter Analysis and Limitations of Amorphous Silica Analysis Amongst Sugarcare Workers

Ana de Oliveira Pereira
Strategies in Return to Work in Work-Related Concussions

Channing Bice
Navigating the Breeze: Lessons from the Air Aware Compaign in Shaping Outdoor Workers' Behaviors

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Ionizing Radiation and Neurodegenerative-Related Mortality in the Occupational Context: Co-Exposures and Dose-Response

Tony Zbysinski, Andreas Neophytou, and John Rosecrance

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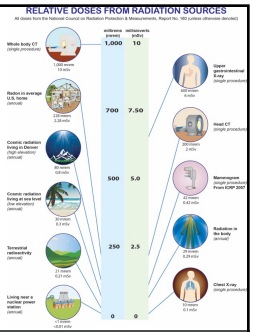
Introduction – Background

- Ionizing Radiation (IR): it is basically everywhere
- Chronic low doses, acute high doses, short term health effects, and chronic diseases
- Previous research of IR and health lacks generalizability
- U.S. Million Person Study and others aim to fill the gap in low-dose IR research



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Introduction –Rationale

- Growing evidence of neurodegenerative disease outcomes
- Many co-exposures are present such as: NO2/HNO3, Machining Fluids, vehicle exhaust, welding fumes, trichloroethylene, asbestos dust, silica dust, coal dust, uranium dust, and tributyl phosphate and kerosene
- Co-exposures may also be associated with the same outcomes, this has not been studied in the context of IR
- Objectives:
  - Evaluate effect modification and confounding by co-exposures on IR's association with neurodegenerative-related mortality
  - Investigate IR's effect on risk of neurodegenerative-related mortality across a range of doses

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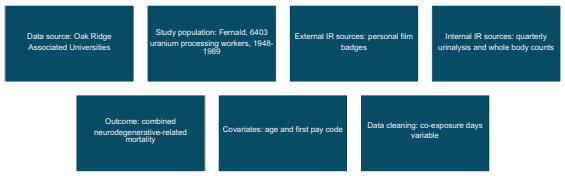
Methods: Data



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Methods: Analysis

- ❑Model: Cox proportional hazards
- ❑Exposure: brain dose, dose weighting factor of 1
- ❑Evaluating confounding: models with and without co-exposure
- ❑Assessing effect modification: p-value for interaction with co-exposure
- ❑Dose-response plot to explore nonlinearity

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Results – Personal Descriptives

N = 6403
85% male
33% alive at end of follow-up
59.6% hourly pay
397 lung cancer deaths
211 neurodegenerative-related deaths
Median 28 years old at start of work
Median 42 follow-up years
Median 74 years old at end of follow-up
Median Brain Dose: 0.92 mGy (IQR: 9.15 mGy)

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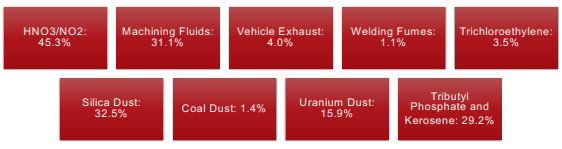
Results – Co-Exposure Descriptives



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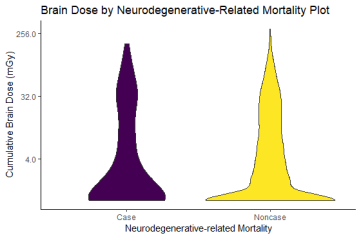
Results – Dose Descriptives



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Results – Analysis, Models

Table 1. Confounding and Effect Modification by Co-Exposures Model Results

Outcome	HR (95%CI)* + Co-Exposure	HR (95%CI)* Without Co-Exposure	HR (95%CI)* With Low Co-Exposure	HR (95% CI)* With High Co-Exposure
Neurodegenerative-Related§ Cause of Death †	1.09 (1.05-1.14)			
HNO3/NO2	1.11 (1.06-1.17)	1.07 (0.96-1.20)	1.09 (0.95-1.26)	1.03 (0.91-1.17)
Machining Fluids	1.09 (1.04-1.14)	1.02 (0.95-1.11)	1.04 (0.91-1.18)	1.21 (1.09-1.34)
Silica Dust	1.09 (1.04-1.14)	1.07 (1.01-1.14)	0.95 (0.81-1.12)	1.12 (1.01-1.25)
TBP/Kerosene	1.10 (1.05-1.15)	1.08 (1.00-1.16)	1.05 (0.94-1.18)	1.03 (0.92-1.14)

* All models additionally adjusted for first pay type. All results represent a per 10 mGy unit increase of IR.
§ Neurodegenerative-related includes dementia, Alzheimer's disease, Parkinson's disease, and motor neuron disease.
† Cause of death includes both underlying and contributing causes of death as listed on death

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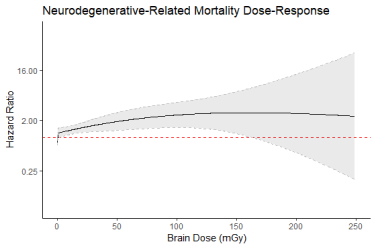
Results – Analysis, Dose-Response



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Discussion – Results Summarized

- ❑Most workers were male, deceased at follow-up, hourly pay and had long follow-up.
- ❑IR exposure was comparable between cases and noncases
- ❑Partial support of effect modification for machining fluids and silica dust, no support for confounding
- ❑IR dose-response plot indicates non-linearity for neurodegenerative-related mortality
- ❑The overall model is consistent with the literature

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Limitations

- Misclassification of co-exposures
- Misclassification of outcomes
- Selection bias and Generalizability

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Future Research Directions

- Characterize exposure and mortality experience by job category
- Pool data for more power
- Develop a hypothetical intervention and manage selection bias

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Conclusions

1. First study to evaluate effect modification of IR and health
2. Important considerations of co-exposures for prior and future research
3. Implications for radiation safety in specific contexts

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Questions

Acknowledgements

This work is supported by the Mountain and Plains Education and Research Center, a NIOSH education and research center for occupational and environmental health and safety.

A special thanks is given to collaborators at Oak Ridge Associated Universities, who manage Department of Energy data, for both access to the data used in the present study and guidance in project development.

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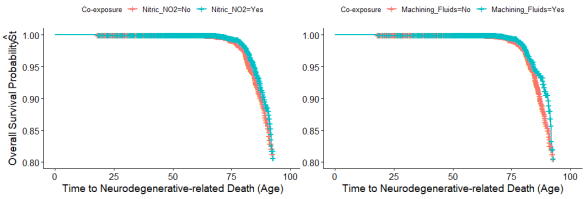
Results – Analysis, Survival Probability



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Estimating Amorphous Silica Exposure in Sugarcane Cutters

Colton Castro, Laura Calvimontes Barrientos, Grant Erlandson, John Adgate, Lee Newman, and Joshua Schaeffer

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Outline of Presentation

1. Context/Background in Guatemala
2. Silica In Sugarcane
3. Method
4. Results
5. Discussion/Limitations
6. Conclusions

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Background in Guatemala

- Partnership with a sugar producer
- Aim: Determine risk factors associated w/CKDu
- Current hypothesized risk factors[7]
  - Chronic heat stress and dehydration
  - Heavy metals and other nephrotoxic chemicals
    - Arsenic, Cadmium, Lead, Silica, etc.
  - Pesticides
    - Glyphosate

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Worker Particulate Exposure

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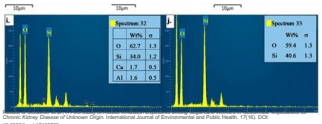
Silica in Sugarcane Particulate Matter

- Exposure studies in cane cutters = high concentrations of PM[8,9,10]
- LeBlonde showed that raw sugarcane has amorphous silica[10]
- Pilot-study determined 17% amorphous silica by weight using BGI cyclones with a 2.5 µm cut point[11]



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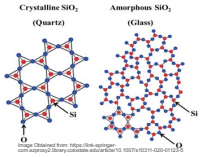
Silica Background

1. Understanding amorphous silica and its potential health effects
   - Amorphous silica is under researched
2. Amorphous silica analysis limitations
   - Amorphous silica has no defined structure
     - Does not diffract X-rays
   - NIOSH 7501
     - Destructive



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Project Aims

- Quantification of amorphous silica in samples using non-destructive methods
  - Direct-On-Filter (DOF) analysis using Fourier-Transformed-Infrared Spectroscopy (FTIR)

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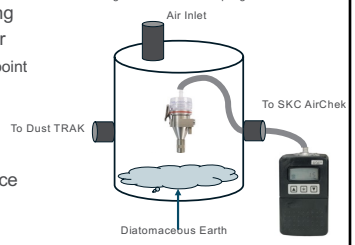
Method Limit of Detection

- Diatomaceous earth sampling in aerosol sampling chamber
  - BGI Cyclone with 4.0µm cut point
- Gravimetric analysis gives amorphous silica mass
- FTIR will determine concentration that absorbance peak is lost

Diagram 1: Aerosol sampling chamber



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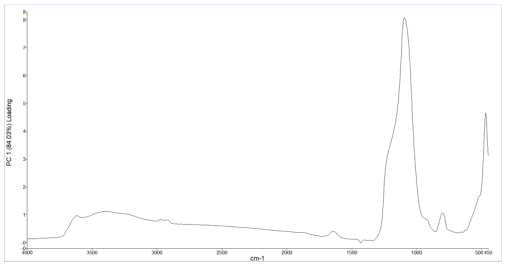
Results of Limit of Detection

Loadings Plot of IR Spectrum in Diatomaceous Earth



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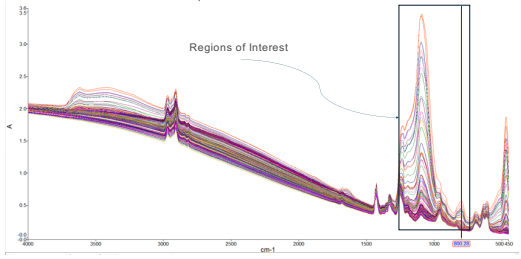
Results of Limit of Detection

Full IR Spectrum of Diatomaceous Earth



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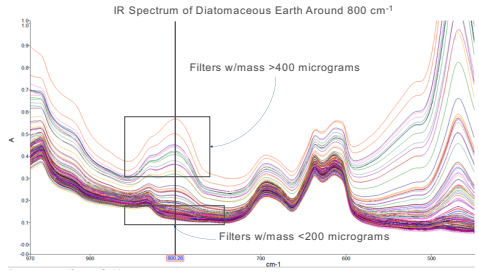
Results of Limit of Detection



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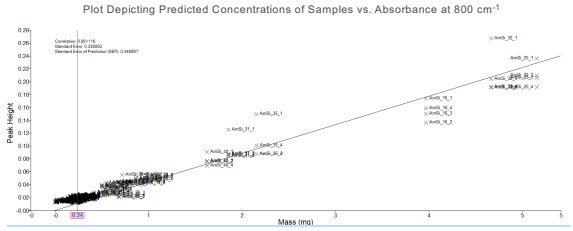
Results of Limit of Detection



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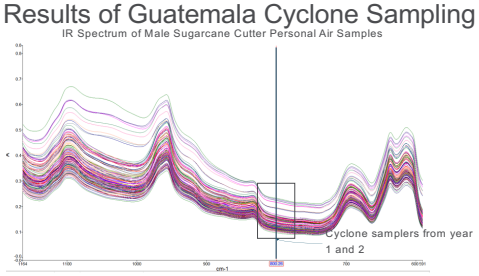
Results of Guatemala Cyclone Sampling



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Discussion

- SKC cyclone samples (~PM_5) do not have a peak
  - Loss in absorbance signal at 800 cm^{-1}
- Amorphous silica LOD (~PM_4) higher than initially thought based on crystalline silica LOD
  - 5 µg in Hart and colleagues in XRD vs. FTIR comparison[13]
  - 6 µg in Ashley and colleagues in FTIR comparison[14]

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Conclusions

- Model unable to quantitate silica in SKC personal samples in these workers
- Quantitation higher than literature
- Future work aimed at refining LOD for silica, heavy metals and other constituents in these samples

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Acknowledgements

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- Pantaleon provided support for the time during the trips down to Guatemala. Support included office space, living space, transportation to and from the sugarcane fields
- Dr. Edmunds for his assistance working with the FTIR

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Questions?

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Strategies for return-to-work in work-related concussions

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Occupational and Environmental Medicine Program Resident
University of Colorado at Anschutz
Research Day
2024

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Purpose

1. Review literature on work-related mild TBIs in adult, civilian populations (18-65 yo)
2. Determine what population of workers are at risk for WRmTBIs and prolonged recovery
3. Determine the evidence for provider follow up and medical interventions
4. Inform strategies for RTW in WRmTBIs

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Definitions

- **Traumatic Brain Injury:**

" Alteration in brain function, or other evidence of brain pathology, caused by an external force"

International and Interagency Initiative toward Common Data Elements for Research on Traumatic Brain Injury and Psychological Health

Classification by Severity:

- ✓ ***Severe*** (GCS ≤ 8)
- ✓ ***Moderate*** (GSC=9-12)
- ✓ ***Mild*** (GCS=13-15)

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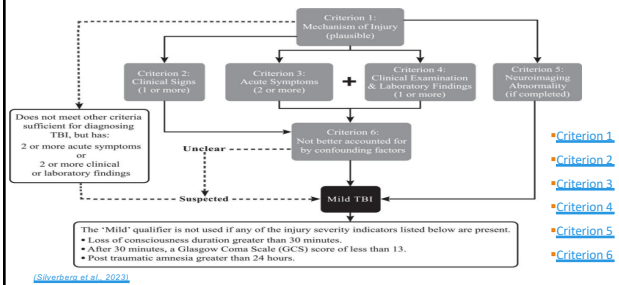
American Congress of Rehabilitation Medicine (ACRM) 1993, revised 2023



(Silverberg et al., 2023)

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Incidence

- **Traumatic Brain Injury** *(Silverberg, 2020;Moore & Sandsmark, 2023)*
  - ✓ Global/ United States Incidence: 30-50 million cases a year/ 3-4 million cases/ year
  - ✓ Global TBI costs: Estimated $400 billion annually
- **Mild Traumatic Brain injuries (mTBIs)** *(Marshall et al., 2015; Andreae et al., 2023; Schneider et al., 2022)*
  - 70%–90% of all treated TBIs
  - Total cases estimated= 600/100,000 yearly in Canada
  - Emerging risk factor for dementia

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Incidence

- **Work-related mTBIs (WRmTBIs)**
  - ✓ Estimated 1 out of 4 mTBIs
  - **6.3%** of all workplace injuries
  - ✓ Limitations:
    - Workers do not report/seek care.
    - Providers do not identify cases as work injury.
    - Patient/ Providers/ Coworkers do not identify mTBI event.
    - No national US WC database to estimate WRmTBIs statistics.

(Nanwa et al., 2022; Andreae et al., 2023)

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WRTBIs

Toccalino et al. (2021): Systematic review and metanalysis of global WRTBIs burden and risk factors in adults from 2014-2020. ***n=55***

- Mechanisms of Injury
- Most common Industries
- Sex: Male (76.4%)
- Average age: 40.4 yo
- mTBIs Incidence= 17.9% of all TBIs (up, despite decreasing TBIs)

Limitations:
- ✓ Source studies from province/ state-level WC data collection.
- ✓ Some poor-quality source studies

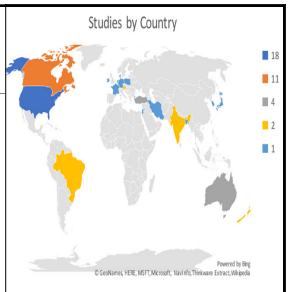

Figure 8. Included studies by country
(Toccalino et al., 2021)

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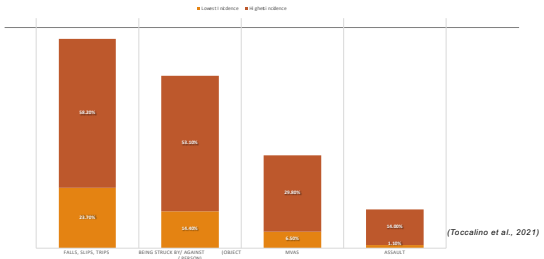
WRTBIs Most Common MOIs Worldwide



(Toccalino et al., 2021)

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WRTBIs

- **Most common Industries** *(Toccalino et al., 2021)*
  - ✓ **Healthcare & social assistance** (9.2- 40.9%)
  - ✓ **Construction** (8.3 -33.6%)
  - ✓ **Education & training** (4.7-16.0%)
  - ✓ **Transportation** (2.2 -12.0%)
  - ✓ **Manufacturing**
- **In the US rural settings** *(Daugherty et al., 2022)*
  - ✓ Qualitative study among rural HCP providers:
    - WRmTBIs → 3rd MCC of mTBI (farming, ranching, coal miners)

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WRTBIs

Torres et al. (2020): A survey study in a Southwest US Fire Department (n=60) followed by validated TBI assessment tools testing revealed:

75% reported at least one lifetime head injury

62% met mTBI symptom criteria.

20% of mTBIs were WRmTBIs

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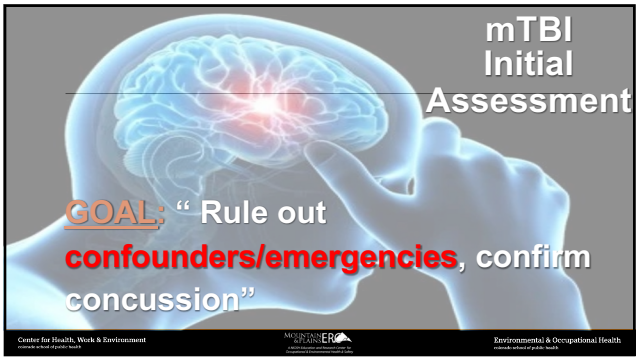

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mTBIs Initial Assessment

I. **At workplace**

II. **Healthcare facilities**

1) **Initial assessment**

A. **ED/ Urgent Care**: 54% initial visits

B. **Outpatient Clinics**: 46 % initial visits

mTBI → Isolated injury (46.5% cases)

mTBI → With other injuries (53.5% cases)

(Andreae et al., 2023)

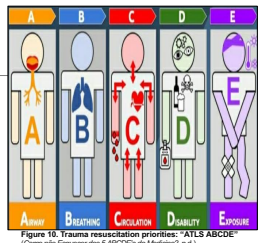

Figure 10. Trauma resuscitation priorities: "ATLS ABCDE"
(Como não Esquecer dos 5 ABCDE's da Medicina?, n.d.)

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mTBIs Initial Assessment- Outpatient

1) **Use validated concussion assessment tools**
   - **Baseline for symptoms and progression monitoring**
     - ✓ Eg: ACE, RPQ
     - ✓ Depression, Pain, Anxiety, Cognition Questionnaires
2) **Review Mental Health History**
3) **Stabilization/Discharge home if GCS=15→ Education (Verbal/Written)**
   - ✓ Symptoms
   - ✓ Expected recovery
   - ✓F/U recommendations



(Colorado Division of Worker's Compensation, 2018; *Colorado Division of Worker's Compensation, 2019; Madhok et al., 2022)*

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mTBI Course

Return to activities: *Individualized*

- Physical and Cognitive rest for 24 h
- Graded resumption as tolerated
- Neurologic dysfunction symptoms may only manifest when individuals resume work or life activities *(Moore & Sandsmark, 2023).*

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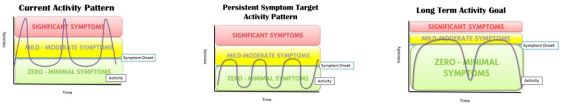
Resuming Activities

- **In symptomatic patients(Parkwood pacing graphs)***(Ontario Neurotrauma Foundation, 2018):*



- **Manitoba Adult Concussion Network Post-concussion Education Sheet**

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mTBI Course

Recovery *(Losoi et al., 2016; Madhok et al., 2022)*

- In previously healthy patients: **67.7% in 1 month** , and **88.9% in 6 months.**
- **TRACK-TBI,** n=991, initial GCS=15, normal CT (M= 631 / F=360)
  - ✓ 27% patients with Functional recovery at 2 weeks (GOS-E and RPQ)
  - ✓ 44 %patients with Functional recovery at 6 months
  - ✓ 56% patients with incomplete recovery at 6 months

Prolonged symptoms
(Colorado Division of Worker's Compensation, 2019; Silverberg et al., 2020; Vlegel et al., 2021)

10-25% of mTBIs

- History of ICU admission during mTBI episode (PCS/ PTSD)
- Patients with **many symptoms** after mTBI are at higher risk for prolonged symptoms

"MORE SYMPTOMS EARLY= MORE SYMPTOMS LATE"

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Prolonged Recovery Predictors in mTBIs

INDIVIDUAL		ENVIRONMENTAL
• **Female**	• **> 40 yrs old.**	• Poor social support
• **Previous psychiatric history**	• Initial GCS <15	• Being told by initial HCP to miss work
• Caused by assault (2X risk) or alcohol intoxication	• Less years of education	• Medicaid insurance/uninsured
• Non-native language speaker *(Senthanar et al., 2021)*	• History of sleep disorder	• Not receiving mTBI information in ED
• Marital status (divorced)	• Coexisting orthopedic injuries	• Delayed RTW after injury
• Genetic? ***APOE 4 gene***	• Pre-injury migraines/ headaches	• Concurrent life stressors
• Skull Fractures	• Multiple Concussion symptoms *(Marshall, 2023)*	• Demanding or stressful vocations
• Litigation/ Malingering	• **WRmTBI**	• Short employment history at current job

(Ponsford et al., 2019; Booker et al., 2019; Colorado Division of Worker's Compensation, 2019; Madhok et al., 2022; Andreae et al., 2023)

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Positive RTW Outcome predictors

1. Positive expectations of recovery
2. Larger employer / accommodations
3. Predominantly female workplace
4. Employment before mTBI
5. Managerial role with high autonomy
6. Good health-related QoL

Watkin et al., 2020; Andreae et al., 2023

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mTBIs Follow up

If Symptomatic *(Gaudet & Weyandt, 2017; Silverberg, 2020)*

- **First Visit within 1-2 weeks from injury**
  - ✓ Serial questionnaires & physical exam progress
  - ✓ Screening for anxiety and depression
  - ✓ ***Cognitive symptoms:*** SUBJECTIVE **may not match** OBJECTIVE in:

1. **ADHD**	2. **Learning disability**	3. **Pain**	4. **Depression**	5.**Substance misuse**

  - ✓ **Symptom-targeted therapy**

1. **Posttraumatic Headaches**	2. **Abnormal Sleep**	3. **Pain**	4. **Psychological distress**
5. **Balance**	6. **Vision**	7. **Cognitive**	

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mTBIs Follow up/Referrals

Treatment as usual:
- Referral usually after 6-8 weeks of symptoms

Visit at 4-6 weeks from injury:
- **IF *significant*** persistent symptoms→ Specialist referral early
  - ✓ Eg: Neuropsychological testing

Lower cost assessments earlier post concussion
- ✓ Decrease assessment costs in 27.9%
- ✓ Decrease days off work (mean 49.5 vs 70.1)
- ✓ Decrease healthcare visits (15 vs 15.9)

(Thompson et al., 2019; Silverberg et al., 2020; Andreae et al., 2023)

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RTW Process

Gradual

- When patients can fulfill basic ADLs at home
- Most workers can RTW in 1 week to modified duty (if available)
- Avoid cognitive and physical stress
- Consider risks of safety-sensitive jobs ***(2nd Impact Syndrome)***
- HCP must consider job demands x clinical signs:
  - ✓ Reduced hours
  - ✓ Reduced task assignments
  - ✓ Scheduled rest breaks
  - ✓ Decreased physical demands if activity exacerbates symptoms

(Colorado Division of Worker's Compensation, 2019; Andreae et al., 2023)

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RTW Process

Concurrent HCP follow up (Q3-4 weeks)

- Monitoring symptoms
- Documenting clinical progress
- Specialist referral, therapies if needed (OT, PT, vestibular etc)
- Education/ Reassurance
- Decrease restrictions as tolerated

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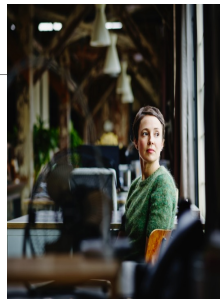
WRmTBI and RTW outcomes

- Presenteeism (decreased productivity)
- Absenteeism
- Unemployment
- Disability
- Partial RTW (with restrictions)
- Decreased job competitiveness
- Change job
- WRmTBI vs mTBI (Median recovery time):6 wks *vs* 3 wks

(Gaudet et al., 2019)



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Outcomes mTBIs vs WRmTBIs

- Most mTBIs recover < 3 mo.
- **WRmTBI**
  - ✓ Overuse healthcare resources,
  - ✓ > PTSD rates

✓3.5x more likely to be unemployed at 1 year

(Andreae et al., 2023)

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WRmTBIs Research Gaps

1. WRmTBI in vulnerable populations
2. Non-native language speaker workers difficult to recruit for studies and assess needs *(Nowrouzi-Kia et al., 2020)*
3. National and global incidence of reported WRmTBIs
4. Job retention after WrmTBI
5. Incidence and outcomes of WrmTBIs in rural Workers
6. Use of functional MRI to predict mTBI outcomes

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CONCLUSIONS

- True incidence of **WRmTBI is unknown**
- **WRmTBIs can be unrecognized or misclassified**
- WRmTBI recovery is **longer** than other mTBIs.
- **NO** single **confirmatory test** for concussion/ **GOLD STANDARD TEST** for all concussion symptoms *(Gaudet & Weyandt, 2017; Barnes et al., 2022)*
- Poor HCP adherence to **medical guidelines.**

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CONCLUSIONS

- Identify high risk patients for **early interventions**
- **National WC** concussion reporting system
- Evidence based **occupational guidelines** are needed.
- We need a **validated prognostic tool** *(Booker et al., 2019)*

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AIR AWARE
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Navigating the Breeze

Lessons Learned from the *Air Aware* Campaign in Shaping Outdoor Workers' Behaviors

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Background

- Front Range communities are increasingly **vulnerable to health effects of poor air quality exposure**
- Raising **awareness and encouraging preventive behaviors** requires audience-specific communication
- Limited air quality communication efforts tailored to **outdoor workers**

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Project Goal

Develop air quality communication that resonates with outdoor workers' lived experiences and immediate work environment to motivate health protective behaviors

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Project Overview

Phase 1: Summer-Fall 2022
Formative Research
- Statewide outdoor worker survey
- Focus groups with employees
- Interviews with supervisors

Phase 2: Winter-Spring 2023
Campaign Development
- Development of social marketing strategy for outdoor workers
- Conduct site visits to identify opportunities for workplace communication
- Plan and develop campaign materials

Phase 3: Summer 2023-Present
Implementation & Evaluation
- Implement the campaign in treatment worksites
- Collect data to evaluate the campaign's effectiveness

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Theory of Planned Behavior

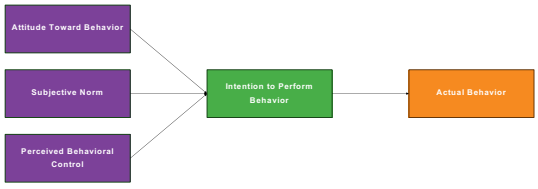

Figure adapted from Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), Article 2. https://doi.org/10.1016/0749-5978(91)90020-T

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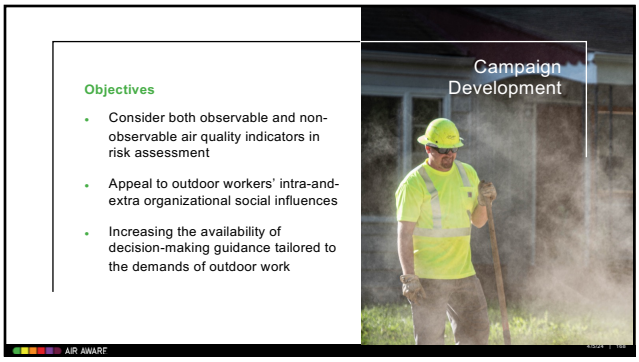

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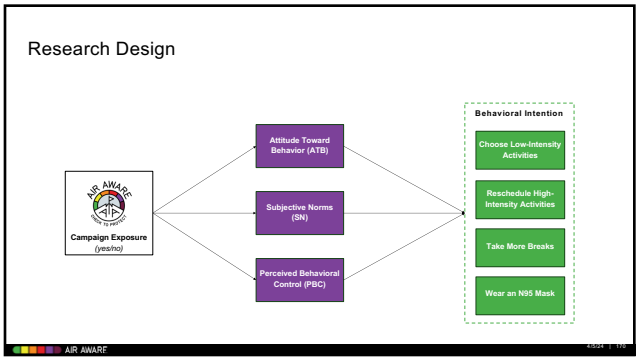

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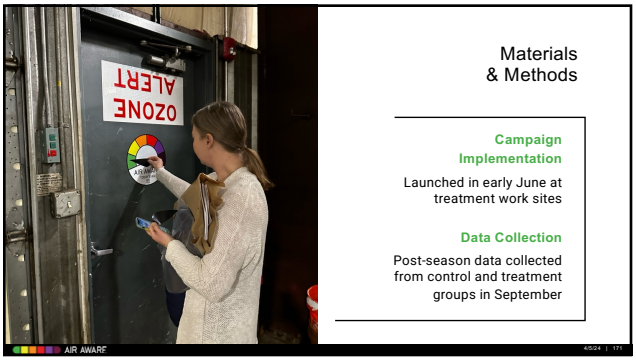

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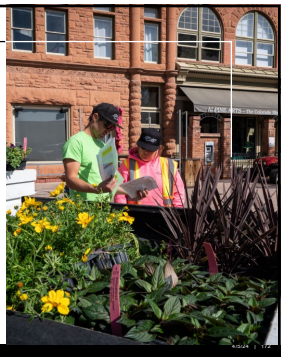
Data Analysis

- Those **exposed to the campaign reported more favorable** attitudes toward behavior, subjective norms, and perceived behavioral control
- Four **mediation models** analyzed to understand campaign effects



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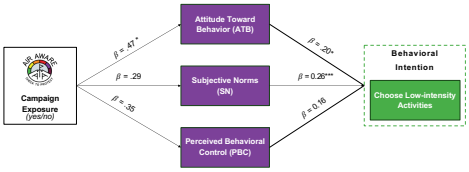
Results: Choosing Low-Intensity Activities



Note. * = p<0.05, ** = p<0.01, *** = p<0.001.

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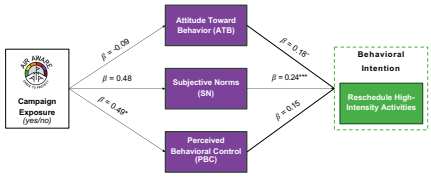
Results: Rescheduling High-Intensity Activities



Note. * = p<0.05, ** = p<0.01 *** = p<0.001

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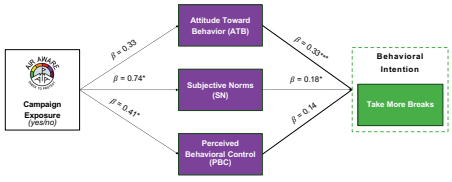
Results: Take More Breaks



Note. * = p<0.05, ** = p<0.01, *** = p<0.001

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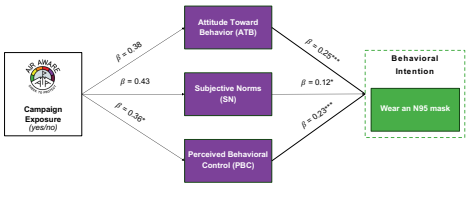
Results: Wearing an N95 Mask



Note. * = p<0.05, ** = p<0.01, *** = p<0.001

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Study Contributions

- Extends application of the TPB to climate-related occupational hazard exposures in the workplace
- Offers a framework for identifying groups within organizations that may be more or less receptive to air quality information
- Findings highlight the importance of accounting for worker attitudes, and the influences of social and structural factors in the workplace

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Future Research Agenda

- Qualitative evaluation of the effectiveness of the campaign
- More in-depth exploration of how these variables influence behavior formation across occupational sectors
- Exploration of how social influences providing information about risks motivates the adoption of protective behaviors
- Interplay of air quality and extreme heat risks.

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Thank you!

Are there any questions?

linktr.ee/channingbice

Scan the QR code to access my contact information, and more about my research. ☺

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- Attitudes toward behaviors are more urgent when **observable cues** are present
- **Felt confident** that supervisors would address health and safety concerns, if raised.
- A variety of **social influences** motivate the health protective behaviors at work
- Goals of **productivity** and **protecting health** are often in direct conflict
- Climate-related OHS policies are **new to the organization's repertoire**

Formative Research Findings

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Research Question

Does exposure to the ***Air Aware*** campaign influence outdoor workers' behavioral intention to take health protective actions while working during periods of poor air quality?

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Descriptive statistics for attitude items

Attitude Toward Behavior (ATB): *Rate your level of agreement/disagreement with the following statements.*	**Control** *M*, (SD)	**Treatmen t** *M*, (SD)
ATB1. Choosing less intense activities outdoors reduces risks from poor air quality.	3.22 (1.12)	3.66 (1.16)
ATB2. Rescheduling strenuous tasks to a time when air quality improves lessens risk from poor air quality.	3.46 (1.18)	3.48 (1.17)
ATB3. Taking breaks from high-intensity outdoor work reduces risk from poor air quality.	3.45 (1.07)	3.84 (1.12)
ATB4. Wearing an N95 lessens risks from poor air quality caused by	3.29	3.88

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Descriptive statistics for subjective norm items

Subjective Norms (SN): *How discouraging/supportive is your workplace of you taking the following actions when air quality is poor and you are working outdoors?*	Control *M*, (SD)	Treatment *M*, (SD)
SN1. Choosing low-intensity activities	4.02 (1.37)	4.44 (1.57)
SN2. Rescheduling high-intensity activities	3.87 (1.43)	4.44 (1.69)
SN3. Taking breaks more frequently	4.00 (1.52)	4.72 (1.72)
SN4. Wearing an N95 mask	4.47 (1.54)	5.09 (1.38)
Overall SN	4.10 (1.17)	4.65 (1.41)

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Descriptive statistics for perceived behavioral control items

Perceived Behavioral Control (PBC): *How easy or difficult is it for you to take the following actions when air quality is poor and you are working outdoors?*	Control *M*, (SD)	Treatment *M*, (SD)
PBC1. Choose low-intensity activities	2.42 (1.10)	2.78 (1.17)
PBC2. Reschedule high-intensity activities	2.37 (1.07)	2.79 (1.22)
PBC3. Take breaks more frequently	2.48 (1.19)	2.84 (1.27)
PBC4. Wear an N95 mask	2.52 (1.29)	2.88 (1.45)
Overall PBC	2.45 (0.90)	2.82 (1.11)

*Response options on a 5-point Likert scale from very difficult (1) to very

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Descriptive statistics for behavioral intention items

Behavioral Intention (BI): *If you knew that air quality was unhealthy or very unhealthy on a day you planned to work outside, how likely is it that you would...*	Control *M*, (SD)	Treatment *M*, (SD)
BI1. Choose low intensity work tasks	2.62 (1.13)	3.00 (1.08)
BI2. Reschedule work tasks to a time when air quality improves	2.38 (1.06)	2.81 (1.04)
BI3. Take breaks more frequently	2.77 (1.17)	3.07 (1.12)
BI4. Wear an N95 mask	1.91 (1.02)	2.00 (1.01)
Overall BI	2.41 (0.91)	2.72 (0.86)

*Response options on a 5-point Likert scale from very unlikely (1) to

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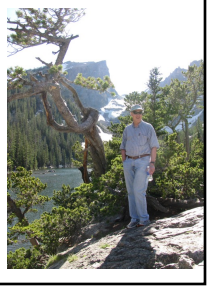
In Memoriam: Dr. Stephen Reynolds



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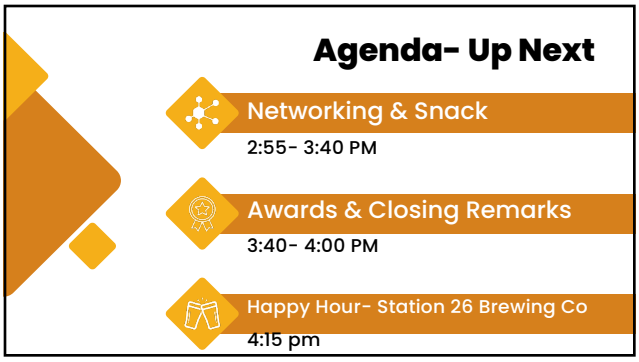

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