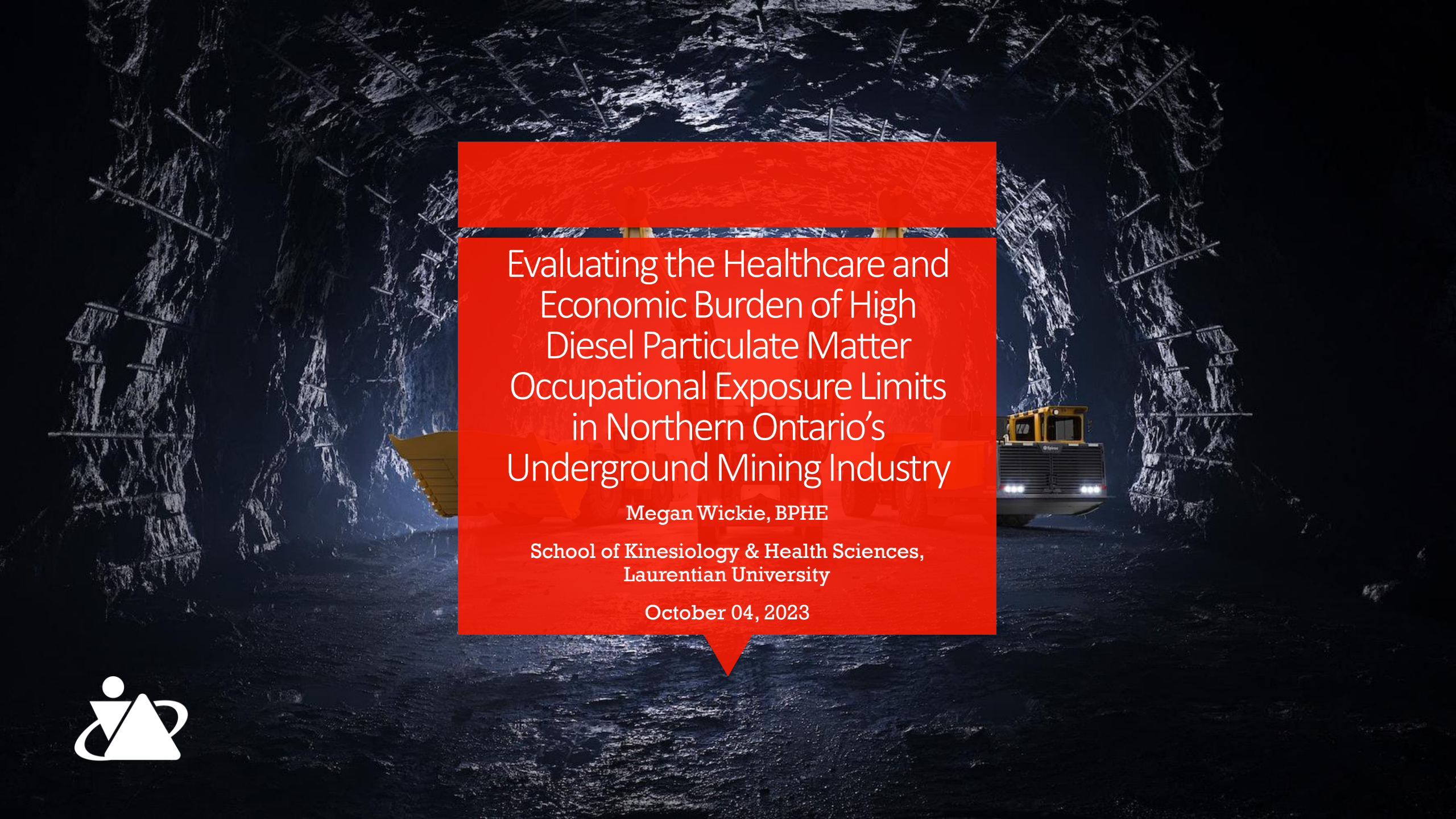

Evaluating the Healthcare and Economic Burden of High Diesel Particulate Matter Occupational Exposure Limits in Northern Ontario's Underground Mining Industry

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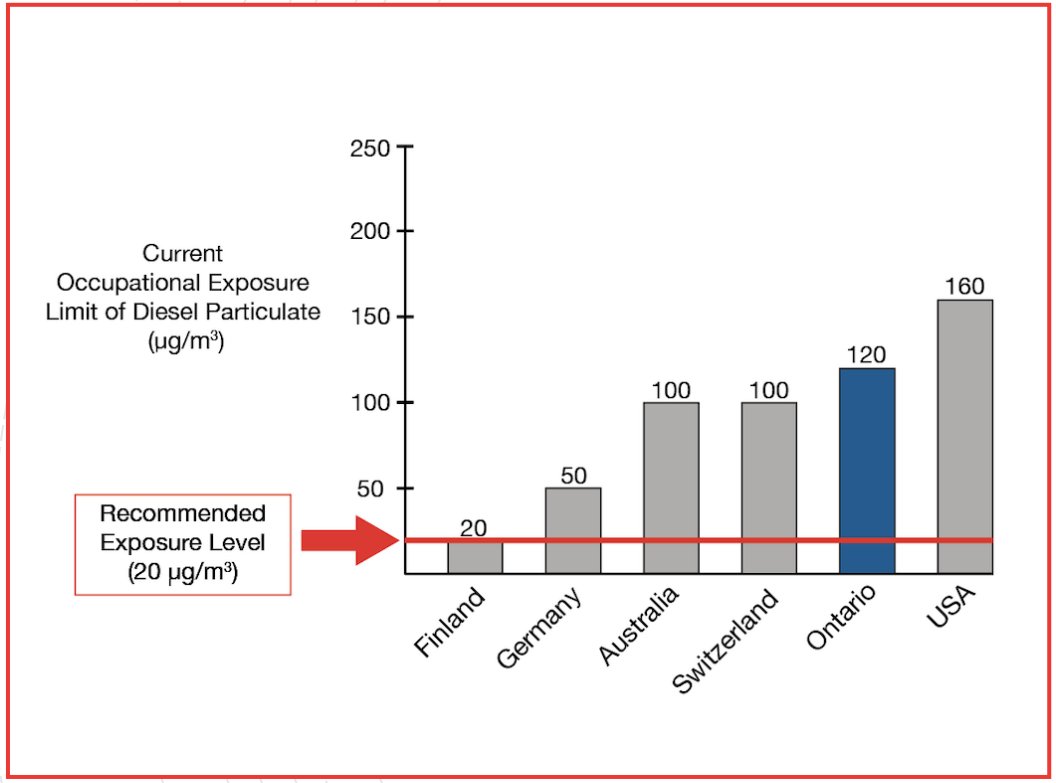
Presentation Overview

- Introduction
- Project Background
- Objectives/Goals
- Theoretical Framework
- Methodology
- Data Source Selection
- ICD-10 Codes
- Estimation of YPLL & DALY
- Future Plans
- Acknowledgments

Introduction

- Exploring the Link: Diving deep into the connection between chronic health conditions and the mining community in Northern Ontario.
- Gratitude: Honoured to be a recipient of the MDEC Scholarship Fund, which supports and emphasizes the importance of such research endeavors.
- Significance: This study not only investigates health impacts but also underlines the economic implications, ensuring that the welfare of miners remains at the forefront.
- End-goal: Aims to offer insights and contribute to policies and practices that prioritize the health and well-being of the mining community.

Project Background



- Problem:
  - High occupational exposure limit (OEL) for diesel particulate matter (DPM) in Ontario mines
  - Increased risk of lung cancer, bladder cancer, CVD, etc. among mine workers (Khan & Gillies, 2019).
- Need for study:
  - Limited understanding of healthcare and economic burden costs associated with DPM exposure in Northern Ontario
  - Evidence to support lowering the OEL for improved worker safety
- Novelty and contribution:
  - Comprehensive assessment of health-related costs in the context of Northern Ontario's mining industry
  - Informs policy and decision-making for occupational health and safety
  - Enhances knowledge of the impacts of DPM exposure on worker health and the healthcare system

Objectives & Goals

1

Quantify Health Outcomes: Evaluate the prevalence of chronic conditions like lung cancer, bladder cancer, and coronary artery disease in mining communities.

2

Economic Evaluation: Assess the direct and indirect economic burdens related to these health conditions.

3

DPM Exposure Analysis: Examine the levels of Diesel Particulate Matter exposure and its correlation with health outcomes.

4

Policy Assessment: Investigate existing occupational health policies and identify gaps or areas for improvement.

5

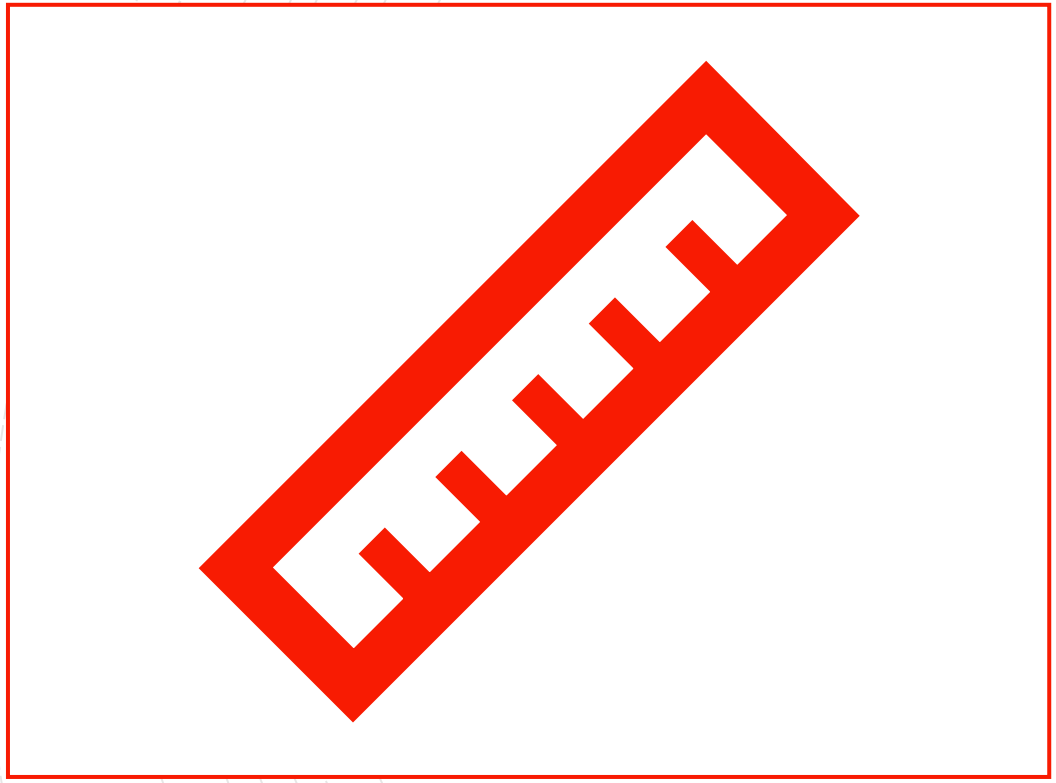
Recommendations: Propose evidence-based interventions and policy changes to protect miners' health and reduce associated economic burdens.

Theoretical Framework

Applying The Theory of Environmental Justice (TEJ)

- Focus on fair distribution of risks and benefits
- Addresses occupational health disparities
- Extends to workplace environments
- Emphasizes the equitable treatment of workers
- Frames high DPM exposure as an issue of injustice
- Advocates for policy changes to reduce the burden
- Identifies stakeholders and emphasizes ethics

Methodology



1. Data Acquisition
2. Identify Relevant Parameters
3. Calculating YPLL (Years of Potential Life Lost)
4. Calculating DALY (Disability-Adjusted Life Years)
    1. Years of Life Lost (YLL)
    2. Years Lived with Disability (YLD)
5. Data Interpretation
6. Refinement and Continuous Monitoring

Data Source Selection: CPCD vs. CMDB

1. Canadian Patient Cost Database (CPCD)

- Nature: Patient record data.
- Coverage: Limited to ON, AB, NS.
- Advantage:
  - More precise estimates.
- Limitation:
  - Only ~10% of acute care hospitals in Canada report to CPCD.
  - Not inclusive of all inpatient cases in Ontario.

2. Canadian MIS Standards Database (CMDB)

- Nature: Aggregate data; Use of CSHS * RIW for cost estimation.
- CSHS: Cost per Standard Hospital Stay.
- RIW: Resource Intensity Weight.
- Advantage:
  - Inclusive of all hospitals.
- Limitation:
  - Provides only estimated costs.

ICD-10 Codes

- ICD-10 Overview: An internationally standardized system for disease classification.
- Purpose in Study: Identification of cases with specific diseases linked to DPM exposure.
- Diseases in Focus:
  - Lung Cancer: (C34)
  - Bladder Cancer: (C67)
  - Coronary Artery Disease: (I25)
- Data Source: CIHI's databases.
- Benefits:
  - Precision: Accurate identification of disease cases.
  - Consistency: Allows for comparison with other studies and national averages.

Estimation of YPLL & DALY

Year of Potential Life Lost (YPLL)

- For each case:
  - Identify the age at death (using data for those who've died due to the disease).
  - Subtract this from the expected age at death (using life expectancy tables for Northern Ontario).
  - Sum the results for all cases to obtain the total YPLL for each disease.

Disability-Adjusted Life Years (DALY)

- Years of Life Lost (YLL): This is essentially the YPLL which we've already calculated.
- Years Lived with Disability (YLD):
- For each case:
  - Multiply the number of years lived post-diagnosis (up to recovery or death) with a disease-specific disability weight (obtained from existing literature or global health databases).
  - Sum the results for all cases to obtain the total YLD for each disease.
  - To obtain the DALY for each disease: DALY = YLL + YLD.

Future Plans

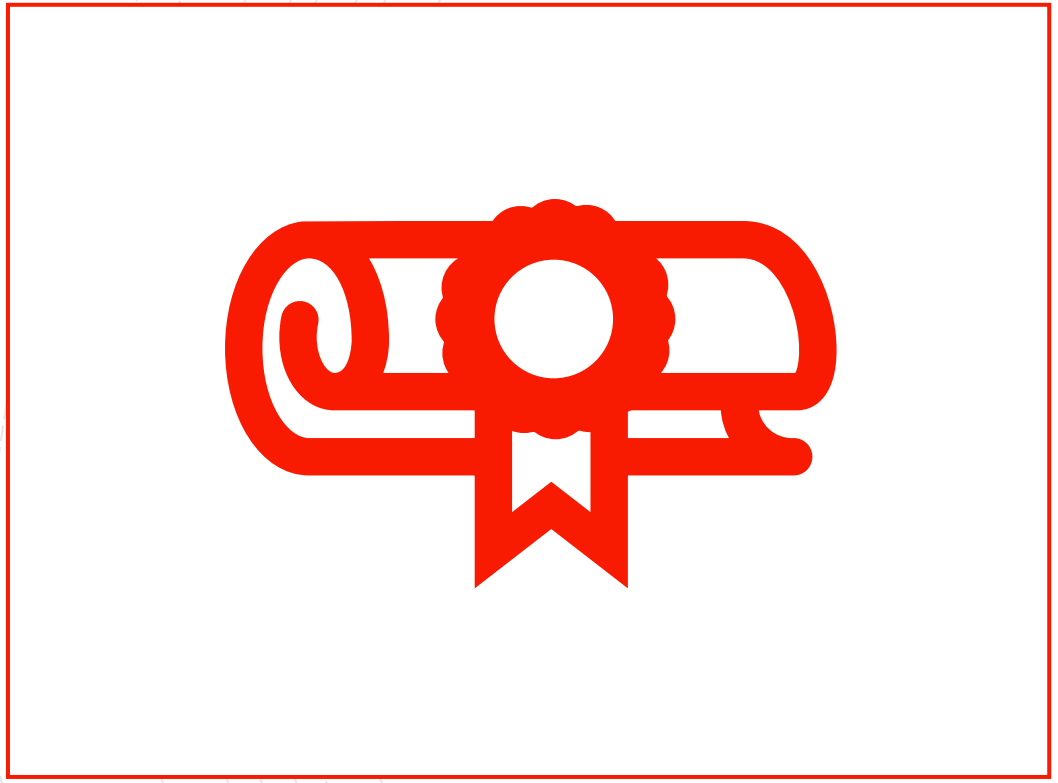
Data Collection and Analysis:

- Awaiting comprehensive datasets from CIHI to delve deeper into healthcare and economic burdens.
- Application of rigorous statistical analyses to refine our understanding of the impact of DPM exposure.

Public Health Advocacy:

- Use the research findings to advocate for stricter regulations on DPM exposure levels.
- Engage with communities, enlightening them about the risks and driving community-level change.

Acknowledgements



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