



The health paradox of physically demanding work: What is it and should we be concerned?

Avi Biswas, PhD

IWH Speaker Series
May 11th, 2021

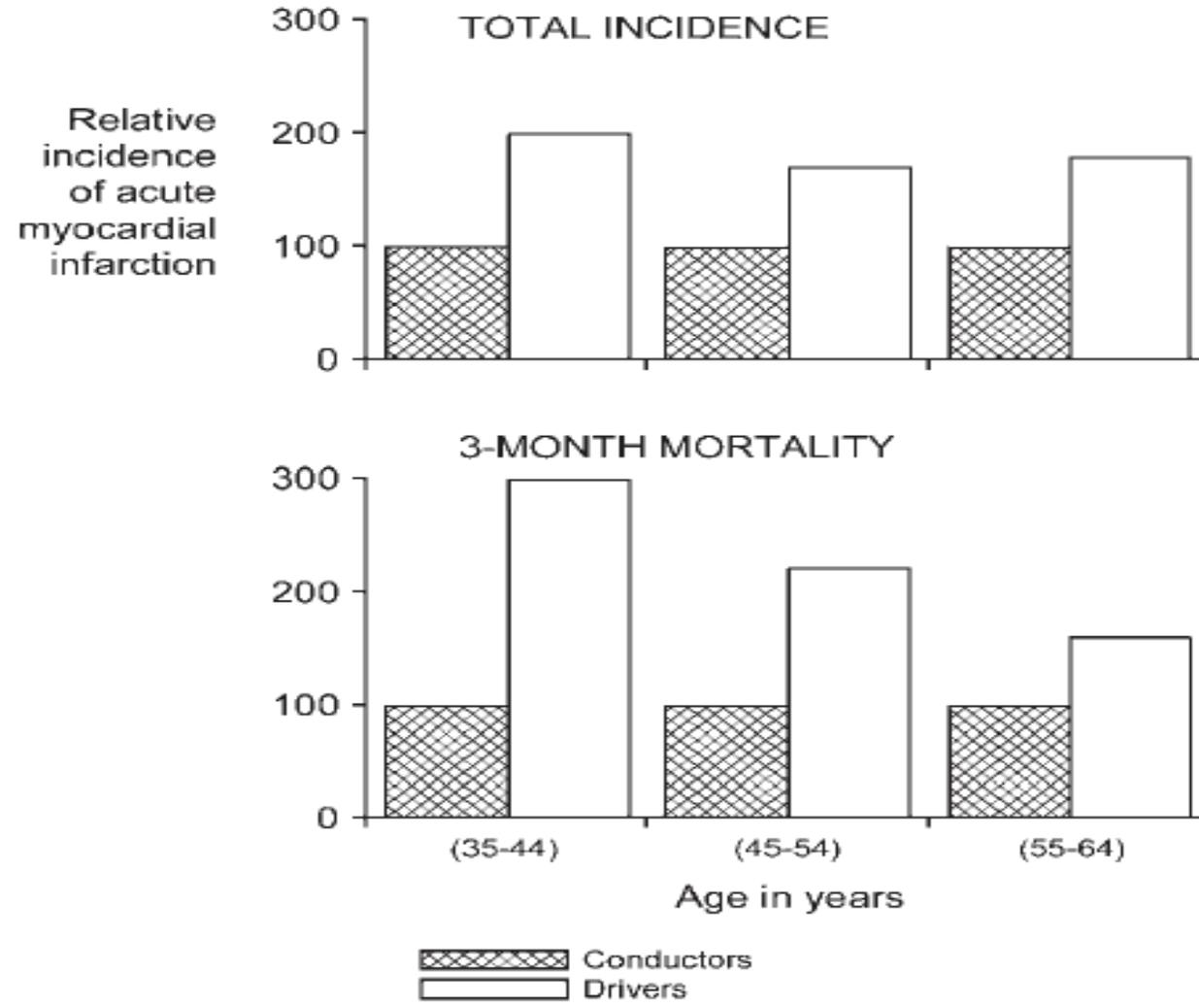
Please type your questions and comments into the chat box. We will address them at the end of the presentation.

For more news and events from IWH, sign up at iwh.on.ca/subscribe

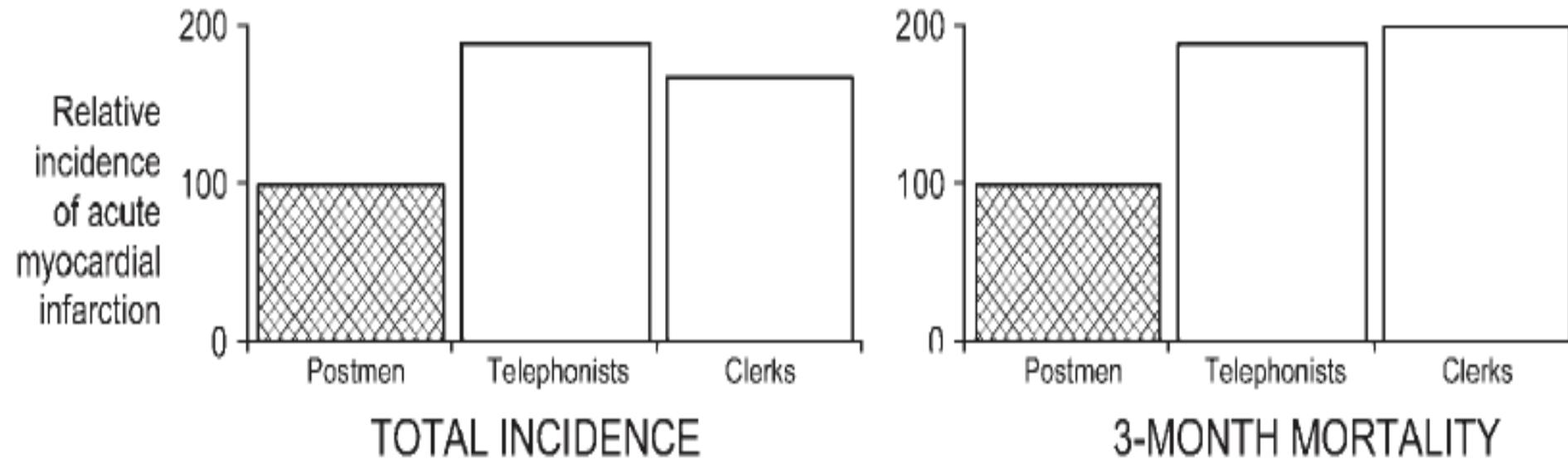
Two takeaway messages

- Growing evidence links physically demanding work to detrimental health outcomes such as heart disease and early death
- Both physical job demands and physical activity recommendations need to be tailored to the needs and capacities of individual workers

The history of physical activity epidemiology



The history of physical activity epidemiology



Poll #1

Recommended physical activity for health benefits

- › **All adults should undertake regular physical activity.**

Strong recommendation, moderate certainty evidence

- › **Adults should do at least 150–300 minutes of moderate-intensity aerobic physical activity; or at least 75–150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous-intensity activity throughout the week, for substantial health benefits.**

Strong recommendation, moderate certainty evidence

- › **Adults should also do muscle-strengthening activities at moderate or greater intensity that involve all major muscle groups on 2 or more days a week, as these provide additional health benefits.**

Strong recommendation, moderate certainty evidence

- › **Adults may increase moderate-intensity aerobic physical activity to more than 300 minutes; or do more than 150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous-intensity activity throughout the week for additional health benefits.**

Conditional recommendation, moderate certainty evidence

Recommended physical activity for health benefits

A healthy 24 hours includes:

PHYSICAL ACTIVITY

Performing a variety of types and intensities of physical activity, which includes:



- **Moderate to vigorous aerobic physical activities** such that there is an accumulation of at least 150 minutes per week
- Muscle strengthening activities using major muscle groups at least twice a week



- Several hours of **light physical activities**, including standing

SLEEP



Getting 7 to 9 hours of good-quality sleep on a regular basis, with consistent bed and wake-up times

SEDENTARY BEHAVIOUR

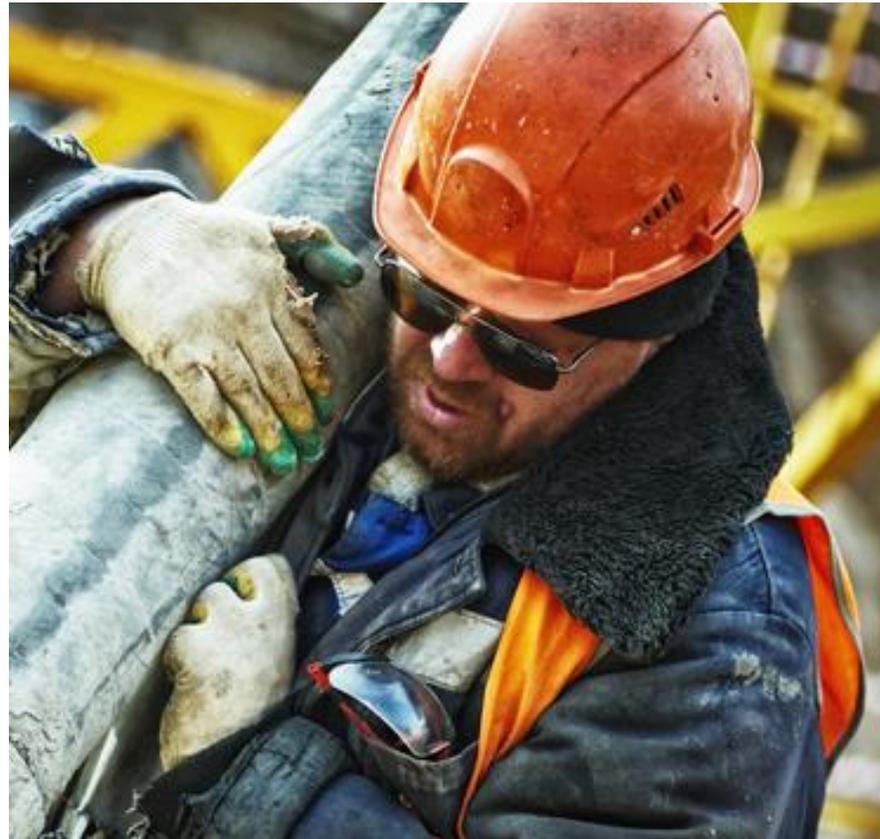


Limiting sedentary time to 8 hours or less, which includes:

- No more than 3 hours of recreational screen time
- Breaking up long periods of sitting as often as possible



Occupational physical activity

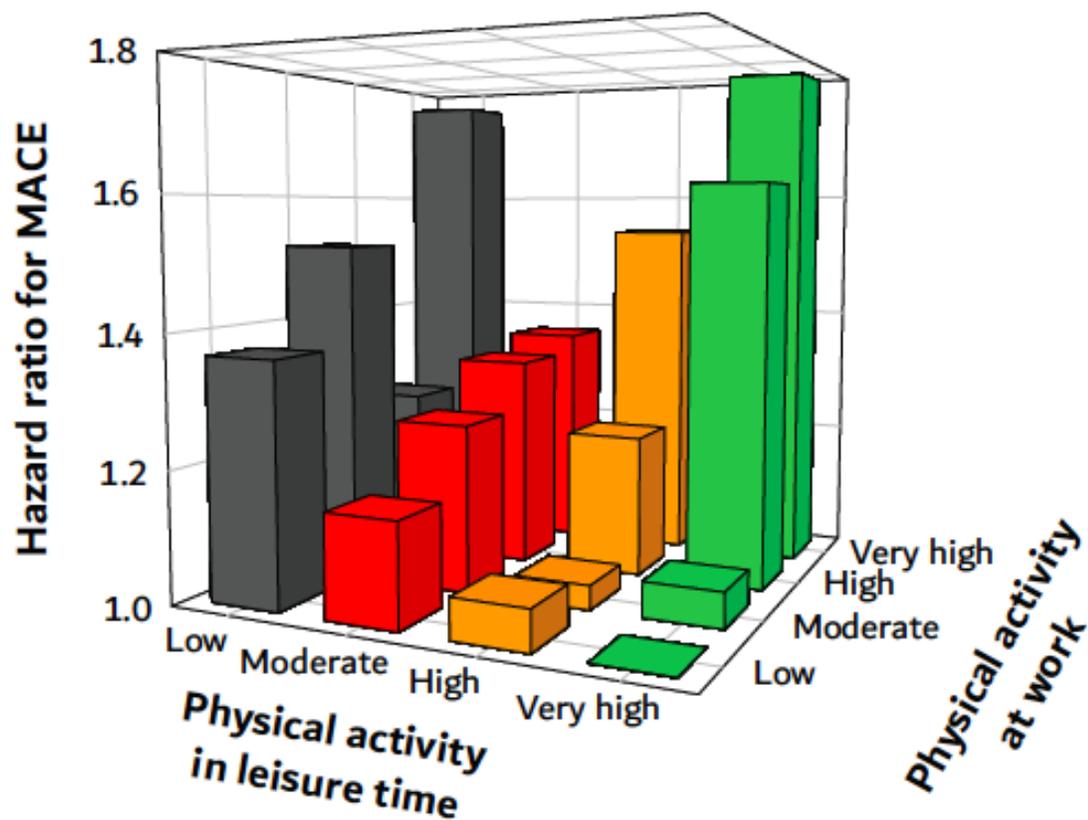


Occupational physical activity

- Work involving static loading, heavy lifting, monotonous and awkward working postures performed over long periods with insufficient recovery time
- Physiological effects:
 - No benefits to cardiorespiratory fitness
 - Increased heart rate and blood pressure
 - Increased inflammation

Occupational physical activity paradox

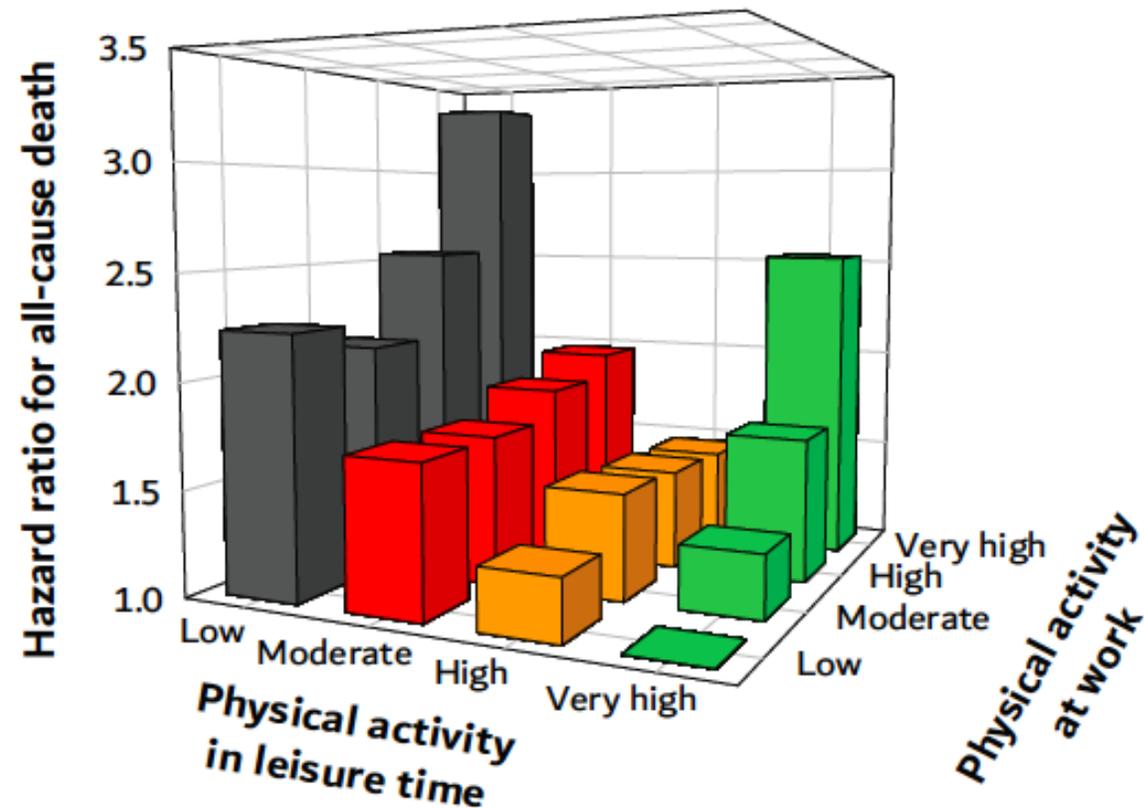
A Major adverse cardiovascular events



Test for interaction: P=0.40

B

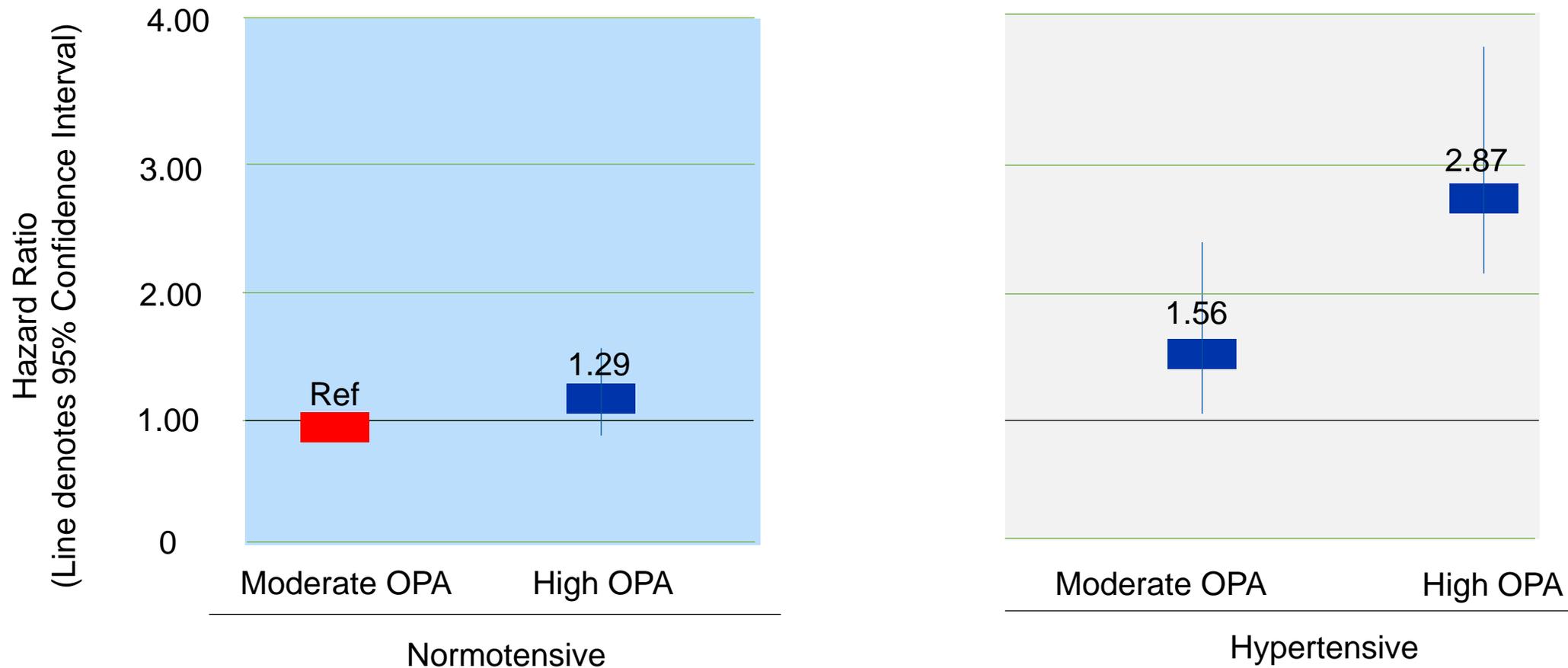
All-cause mortality



Test for interaction: P=0.31

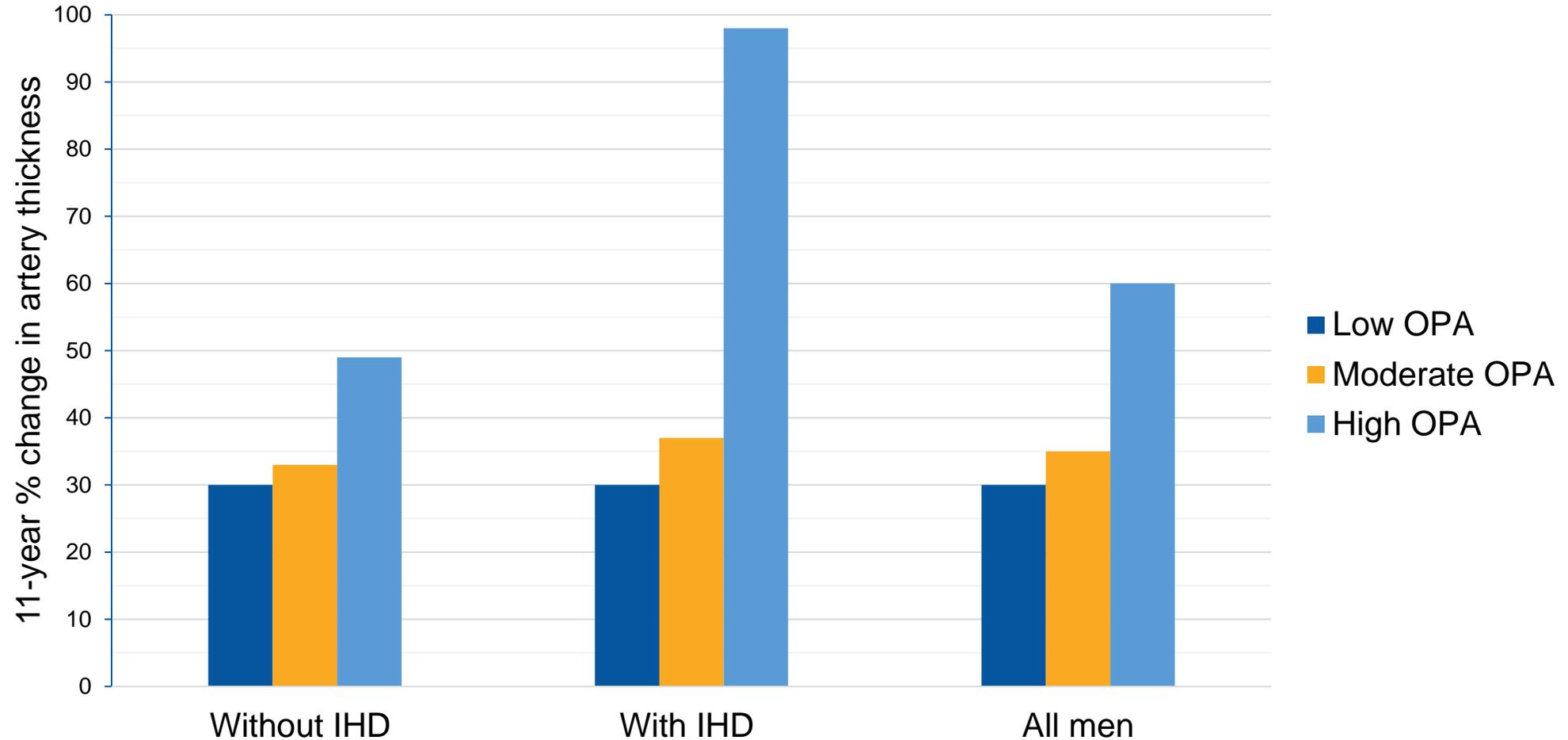
Occupational physical activity paradox

Risk of heart disease according to OPA and hypertension status



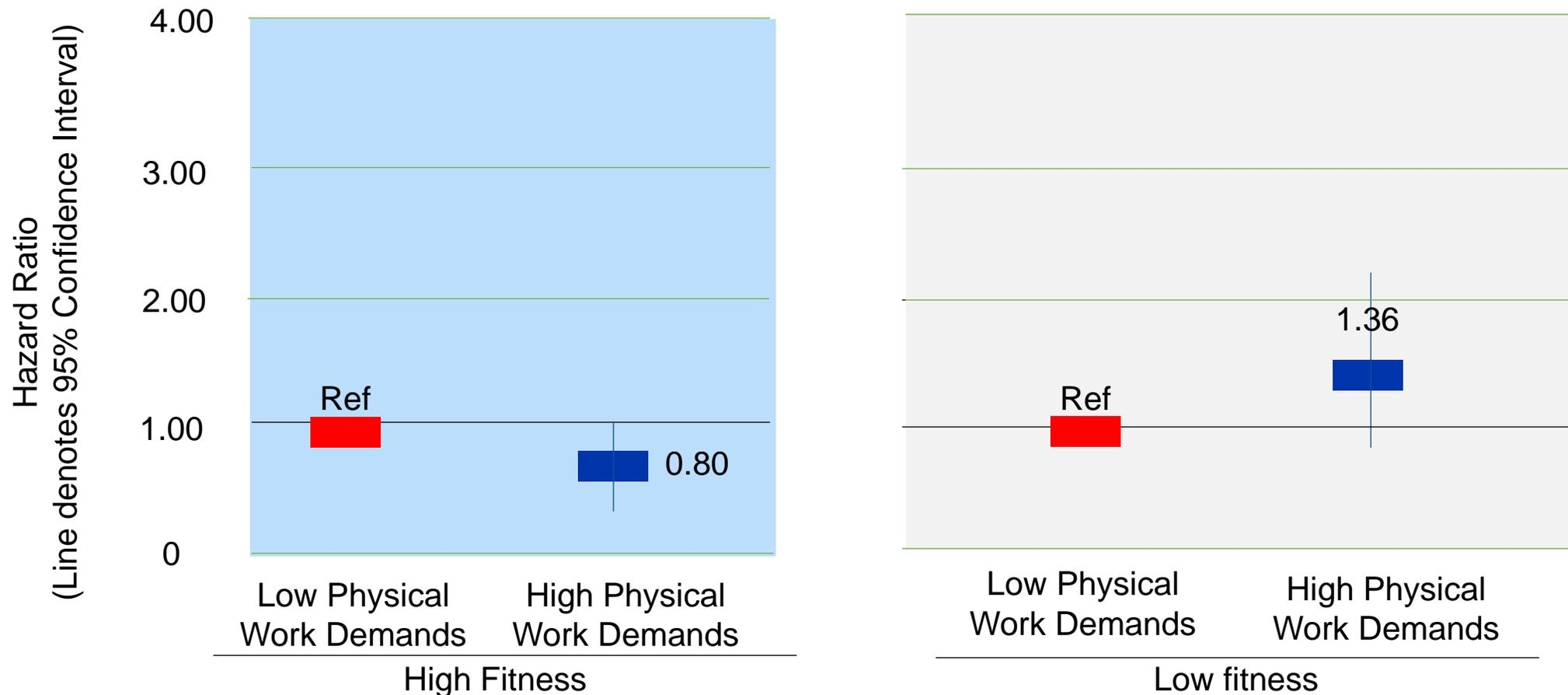
Occupational physical activity paradox

Atherosclerosis progression according to OPA and ischaemic heart disease



Occupational physical activity paradox

Risk of heart disease according to OPA and fitness status



Comparisons with snow shovelling (sorry!)



Photo by [Filip Mroz](#) on [Unsplash](#)

Why is the evidence mixed?

- Are the risks biologically plausible?
- Work involving static loading, heavy lifting, monotonous and awkward working postures performed over long periods with insufficient recovery time
 - Physiological effects:
 - **No benefits to cardiorespiratory fitness**
 - Increased heart rate and blood pressure
 - **Increased inflammation**

Research question

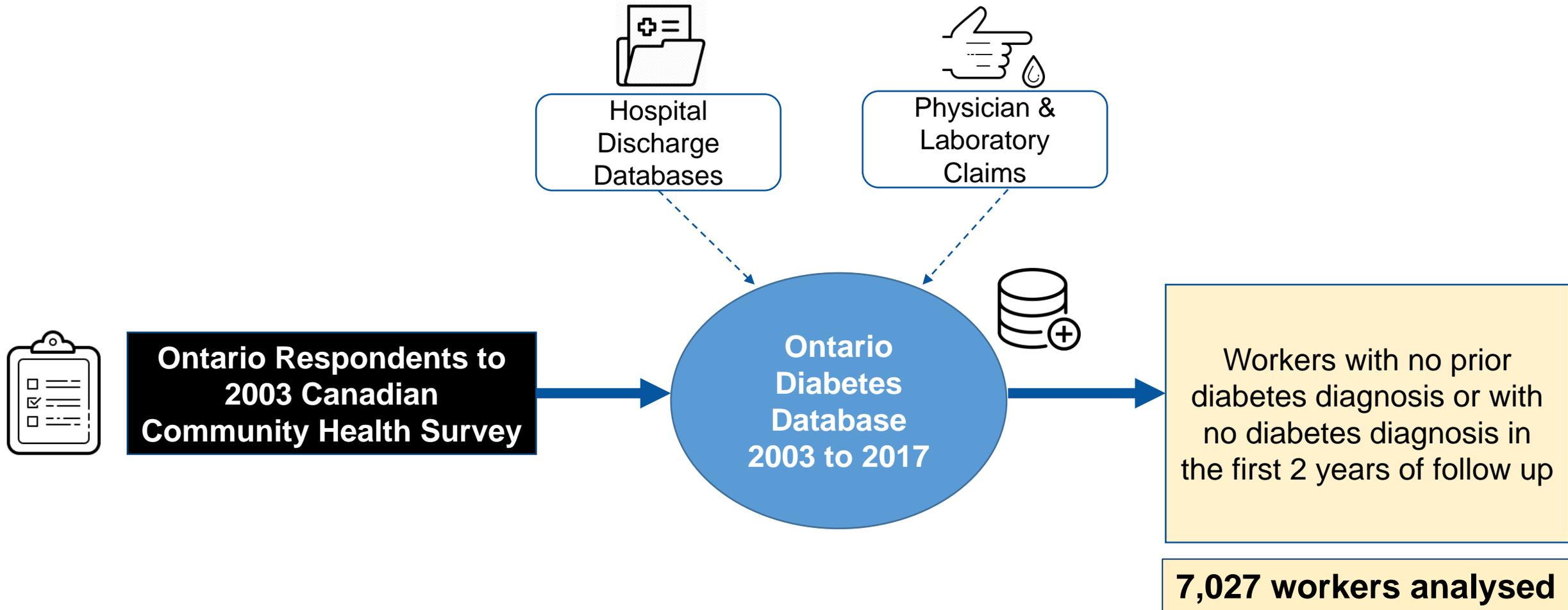
What are the separate and combined associations of Occupational Physical Activity and Leisure Time Physical Activity on the future diabetes risk of workers?

Biswas A, Gilbert-Ouimet M, Mustard C, Glazier R, Smith P.

Combined Associations of Work and Leisure Time Physical Activity on Incident Diabetes Risk.

American Journal of Preventive Medicine (2021). 60(3):e149-e158

Methods



Physical activity variables

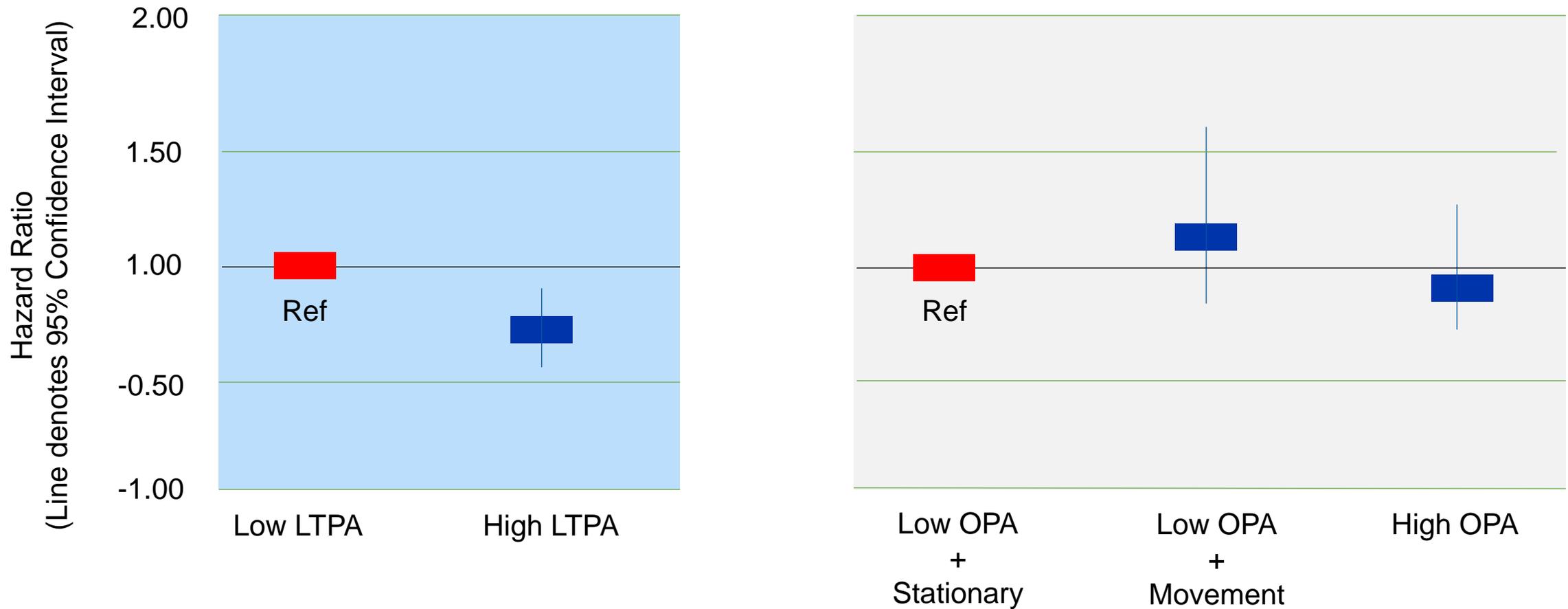
- Leisure Time Physical Activity (LTPA)
 - Based on self-reported survey data.
 - Did the person do ≥ 150 minutes of mod-vig. intensity physical activity?
 - 1) Low LTPA (<150 minutes of LTPA a week)
 - 2) High LTPA (≥ 150 minutes of LTPA a week)

Physical activity variables

- Occupational Physical Activity (OPA)
 - Based on job title classifications of minimum strength and body postures at work
- 1. Low OPA and generally stationary:
Librarians, Administrative professionals, Managers, Researchers
- 2. Low OPA with movement:
Storekeepers, Manufacturing supervisors, Retail salespersons
- 3. High OPA:
Paramedics, Nurse orderlies, Postal carriers, Air transport attendants, Machinists, Labourers

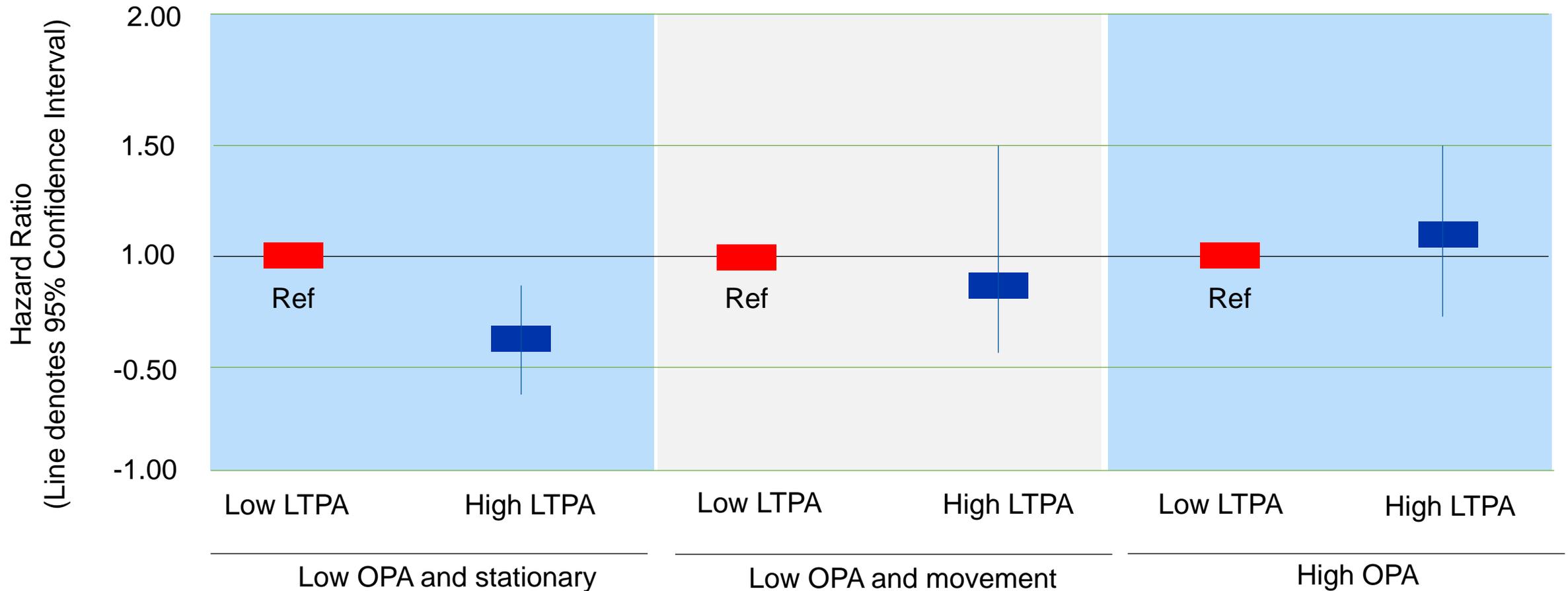
Results

Separate Effects of LTPA and OPA on Diabetes Risk (2003 to 2017)



Results

LTPA Exposure and Diabetes Risk by OPA Level (2003 to 2017)



Main Findings

- Meeting physical activity recommendations has the greatest benefit to reducing future diabetes risk
- But – the benefits of meeting recommendations may be most effective for sedentary workers – workers with more physically demanding work might benefit less

Why is the evidence mixed?

- Does the heart health and fitness of workers play a role in their risk?



Why is the evidence mixed?

- Are work-related movements accurately measured in studies?

21 In the PAST 12 MONTHS did this person get -
a. Married? Yes No
b. Widowed? Yes No
c. Divorced? Yes No

22 How many times has this person been married?
 Once
 Two times
 Three or more times

23 In what year did this person last get married?
Year

27 When did this U.S. Armed I
in which this p
period.
 Septemb
 August 19
Persian G
 May 1975 t
 Vietnam era
 February 10



Poll #2

Guidance for a healthier workplace

- Tailor physical activity recommendations to the needs and capacities of individual workers
- Promote workplace practices that increase the overall physical activity capabilities and health of workers



Thank you

Avi Biswas, PhD

Associate Scientist, Institute for Work & Health



abiswas@iwh.on.ca



_avibiswas

For the latest research and news from IWH, sign up for our monthly e-alerts, event notifications and more: iwh.on.ca/subscribe

For information on the IWH Speaker Series visit: iwh.on.ca/events/speaker-series