

Greenness and Health among CLSA Participants

Presented by Irmina Kličník, PhD Candidate

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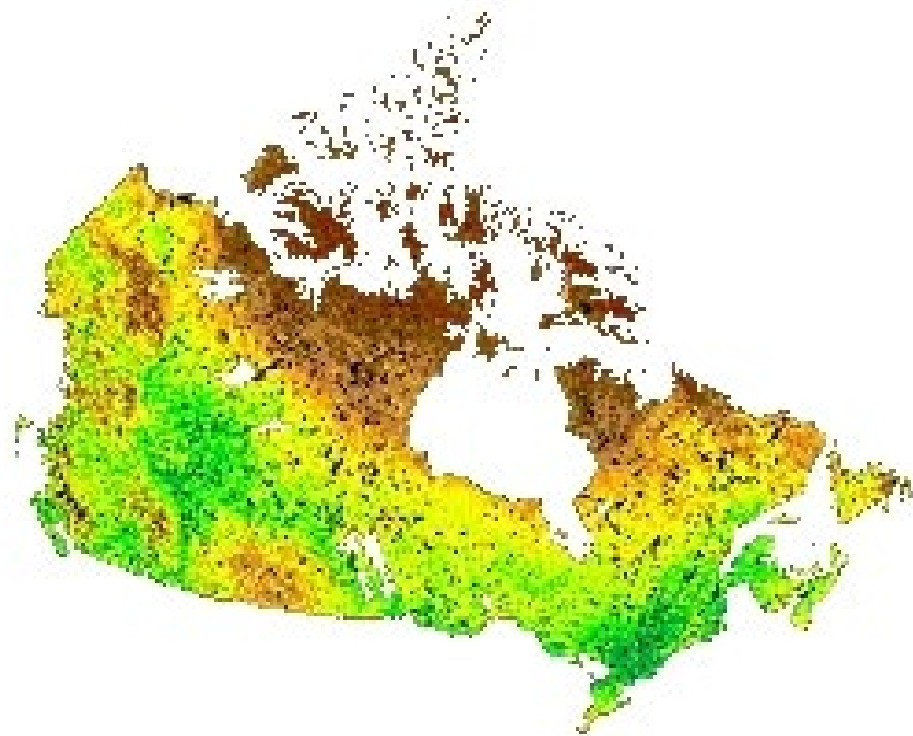
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Land Acknowledgment – Ontario Tech University

GREENNESS



GREENNESS



Greenness and Mortality

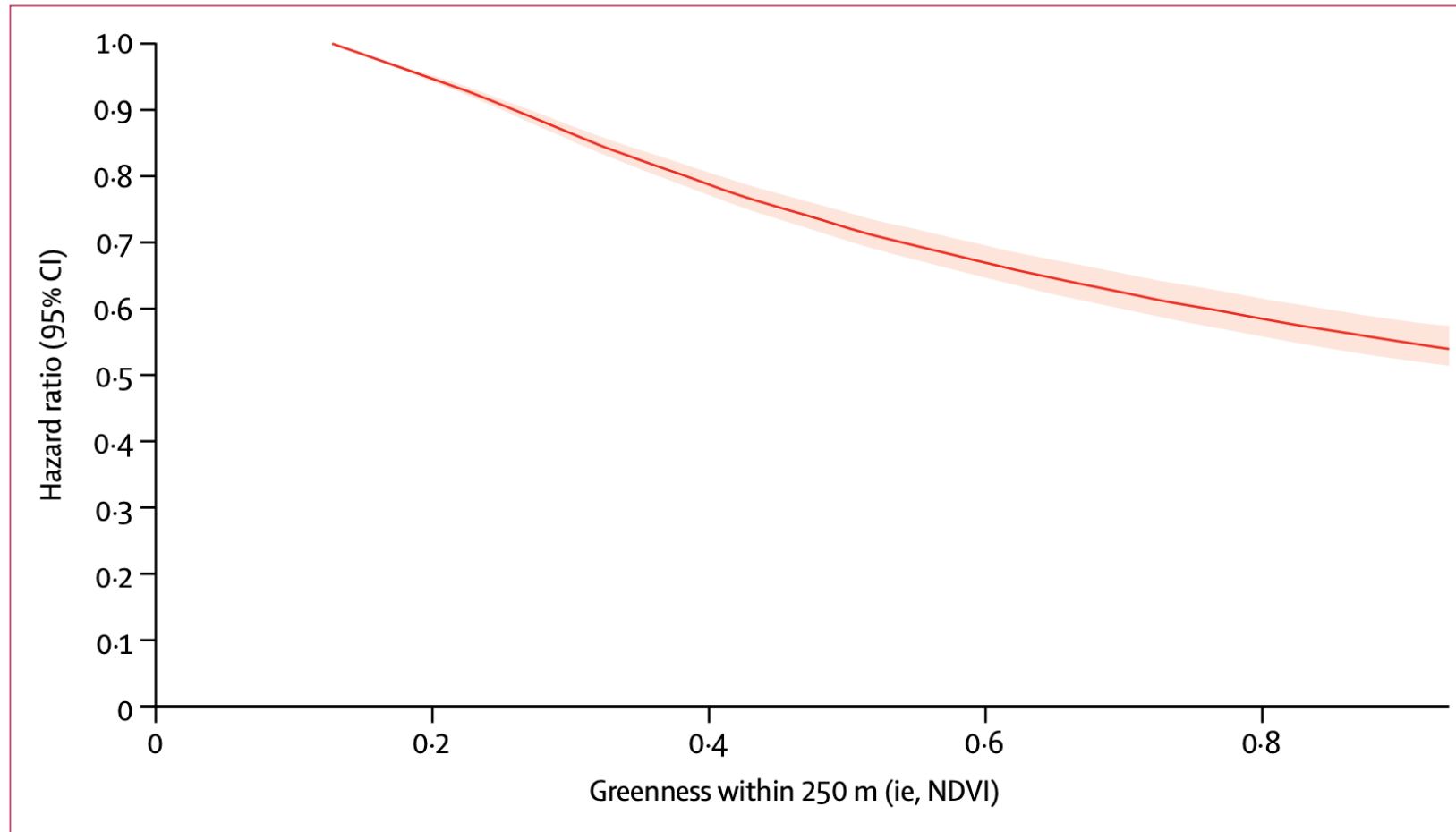
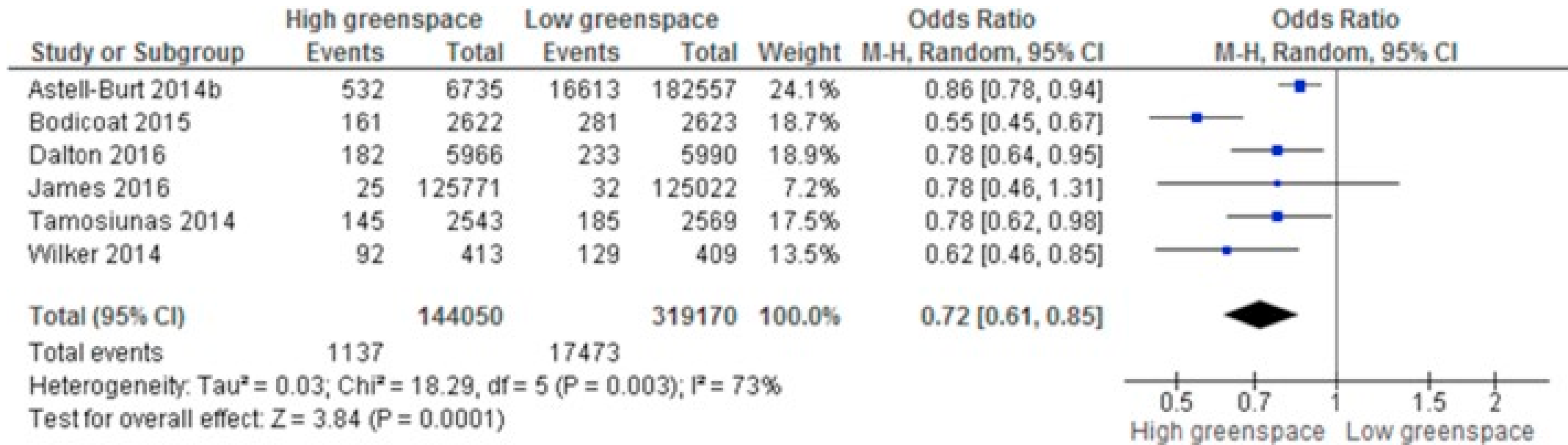


Figure: Concentration-response plot for mortality and greenness

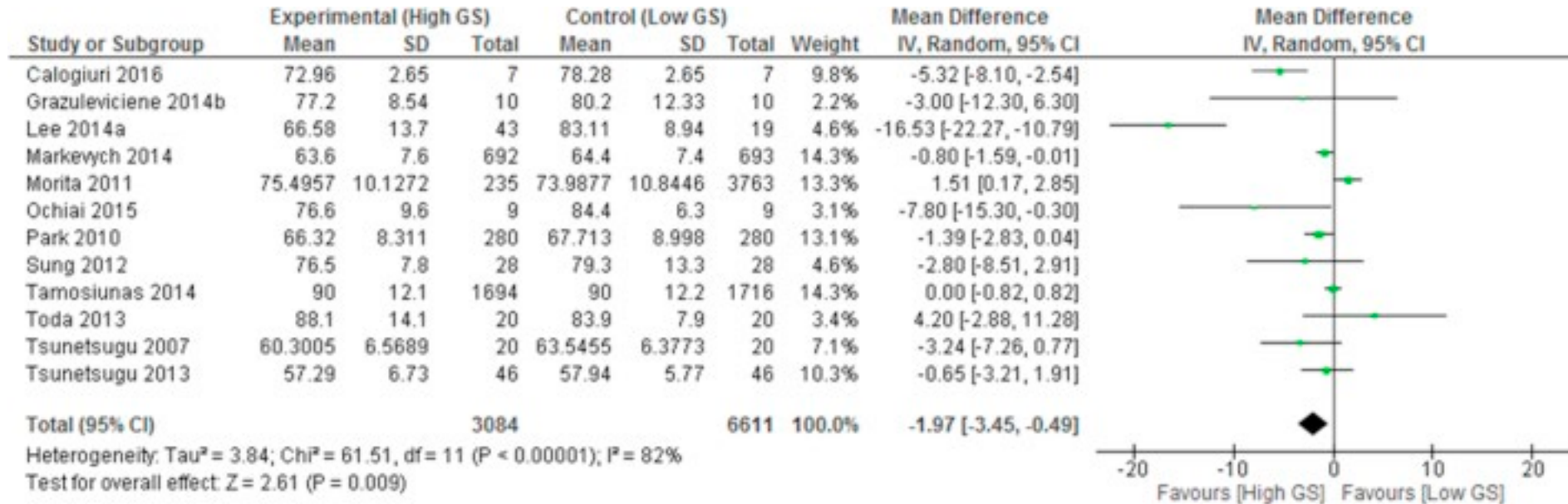
Data are hazard ratios (dark red line) and 95% CIs (light pink shading) for mortality association with greenness within 250 m of participants' residences from model 9 (as described in table 2). NDVI= Normalized Difference Vegetation Index.

Greenness and Health Outcomes

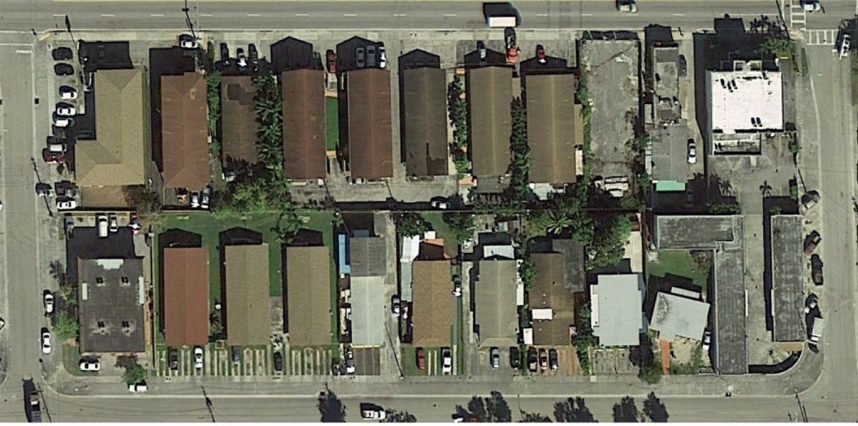


Meta analysis: higher greenness is associated with decreased incidence of T2DM in 6 studies

Greenness and Health Outcomes



Meta analysis: higher greenness is associated with decreased diastolic blood pressure across 12 studies



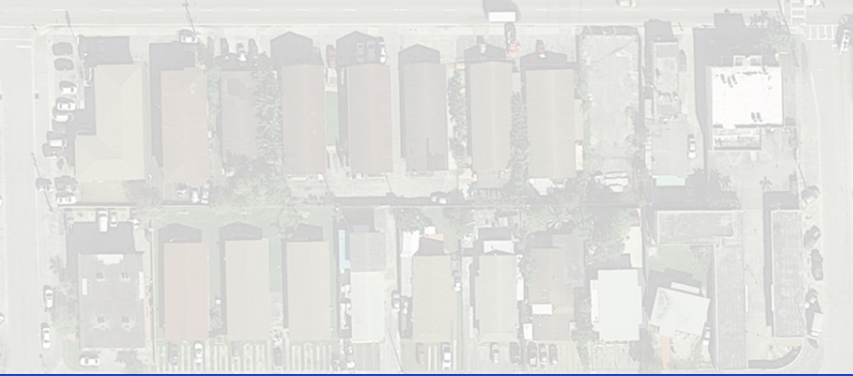
Low tertile



Middle tertile



High tertile



Health outcome variables (models):	Model 1 ^a		Model 2 ^b		Model 3 ^c		Model 4 ^d	
	Odds ratio (95% CI)	P-value	Odds ratio (95% CI)	P-value	Odds ratio (95% CI)	P-value	Odds ratio (95% CI)	P-value
Depression diagnosis								
Low NDVI	reference		reference		reference		reference	
Medium NDVI	0.64 (0.61,0.67)	<0.0001	0.74 (0.71,0.77)	<0.0001	0.76 (0.72,0.79)	<0.0001	0.92 (0.88,0.96)	0.0004
High NDVI	0.48 (0.46,0.51)	<0.0001	0.64 (0.61,0.67)	<0.0001	0.69 (0.66,0.73)	<0.0001	0.84 (0.79,0.88)	<0.0001
P-value linear trends ^e		<0.0001		<0.0001		<0.0001		<0.0001



Middle tertile



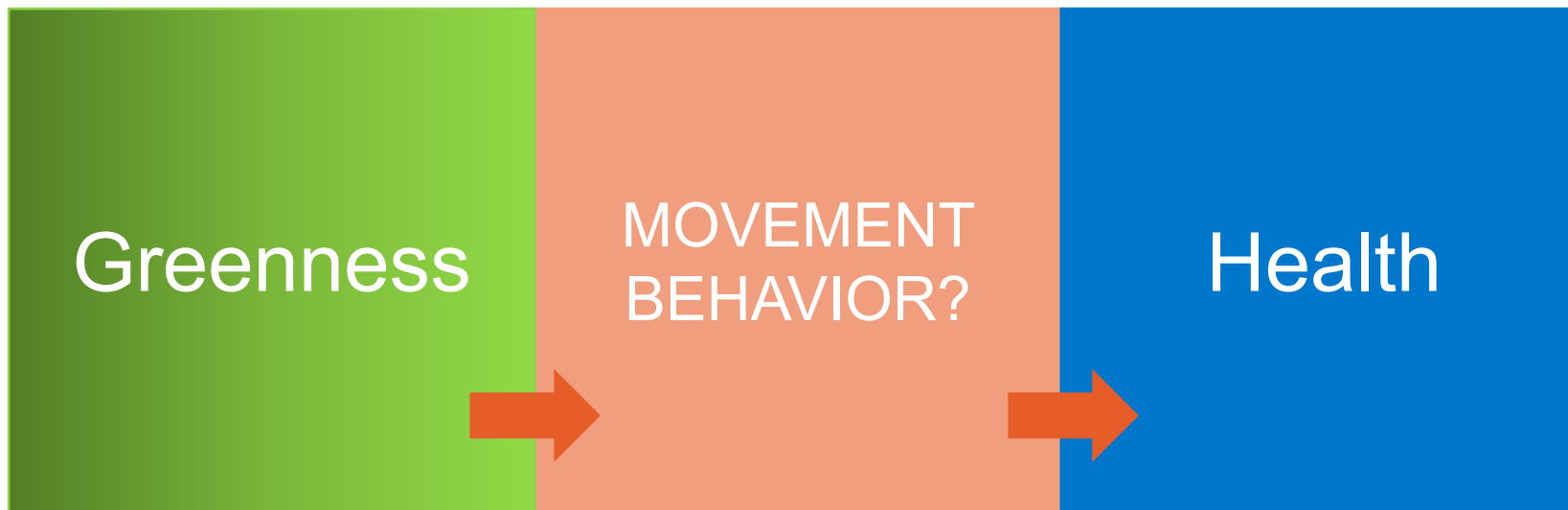
High tertile

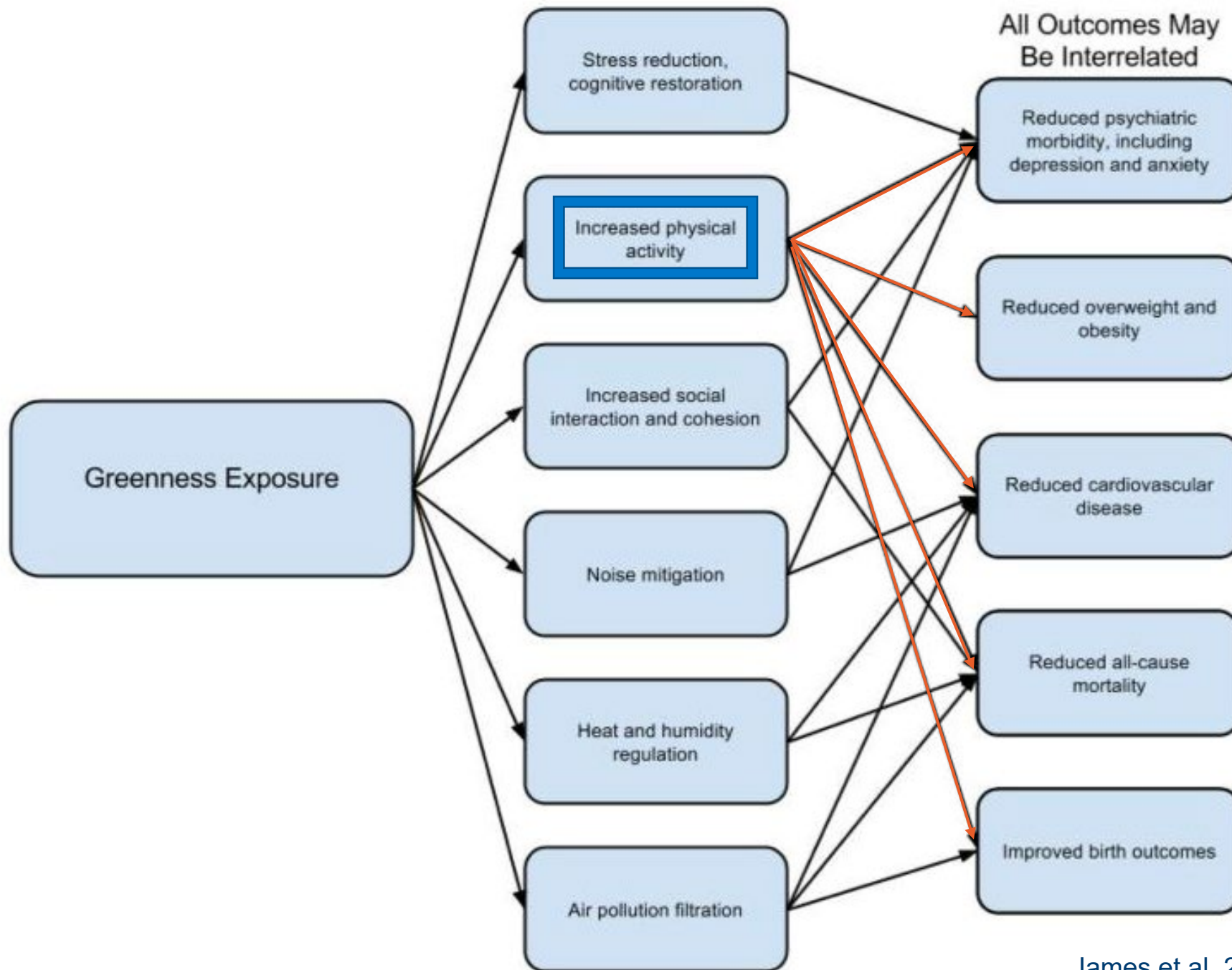
Older adults living in areas of higher greenness had 8% and 16% lower likelihood of depression than those in the lowest level



Greenness

Health





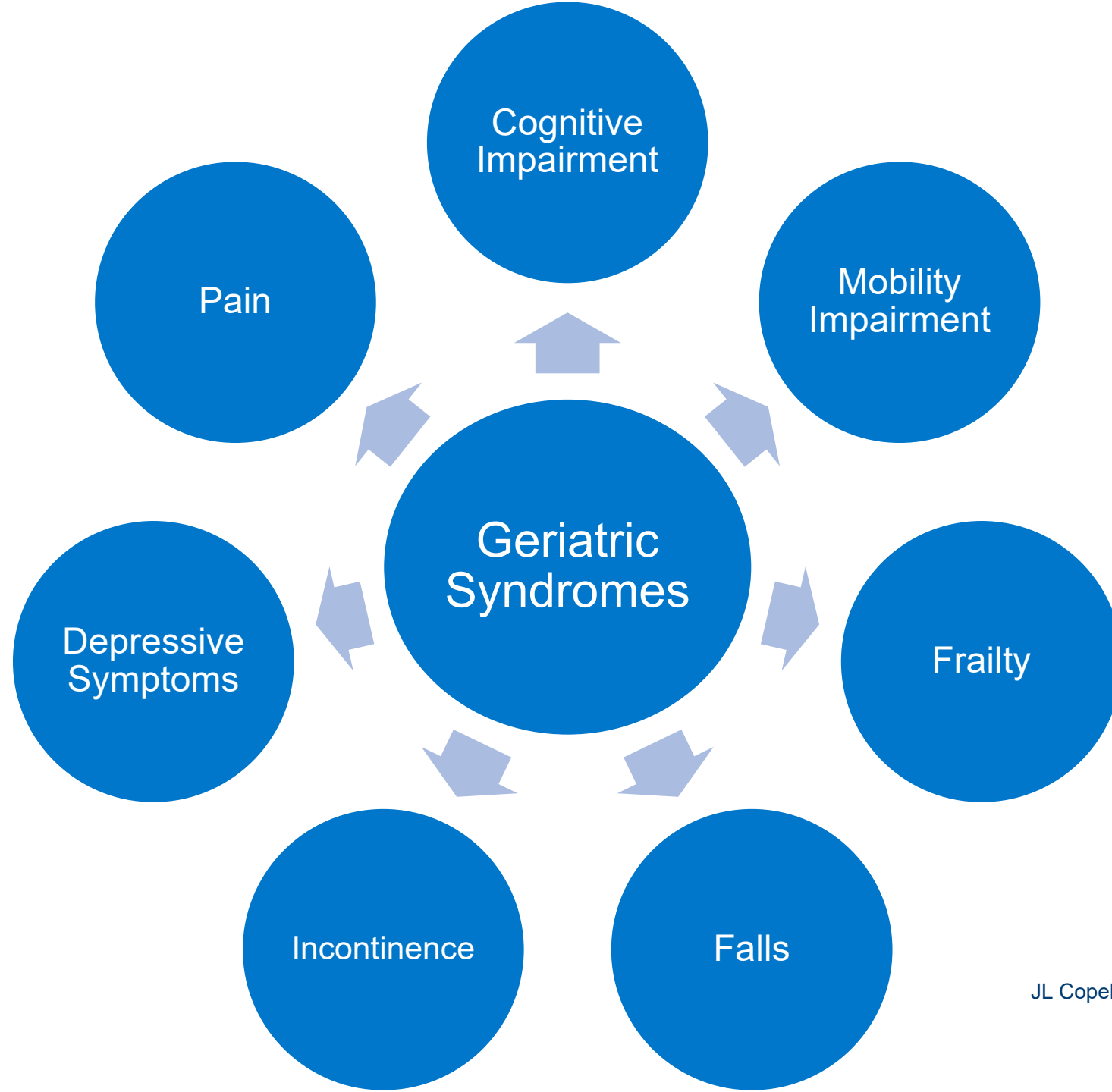


Figure adapted from
JL Copeland, ISBNPA Webinar
April 2020

Leisure sedentary time and physical activity are higher in neighbourhoods with denser greenness and better built environments: an analysis of the Canadian Longitudinal Study on Aging

Irmina Klicnik, John David Cullen, Dany Doiron, Caroline Barakat, Chris I. Ardern, David Rudoler, and Shilpa Dogra

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The **PURPOSE** of this study was to examine movement behavior (e.g. physical activity/sedentary time) across different neighborhood environments.

STUDY 2

[Prev Med Rep.](#) 2022 Dec; 30: 102018.

PMCID: PMC9563631

Published online 2022 Oct 11. doi: [10.1016/j.pmedr.2022.102018](https://doi.org/10.1016/j.pmedr.2022.102018)

PMID: [36245807](https://pubmed.ncbi.nlm.nih.gov/36245807/)

Neighborhood greenness, but not walkability, is associated with self-rated measures of health in older adults: An analysis of the Canadian Longitudinal Study on Aging

[Irmina Klicnik](#),^a [Andrew Putman](#),^a [Dany Doiron](#),^b [Caroline Barakat](#),^a [Chris I. Arden](#),^c [David Rudoler](#),^a and [Shilpa Dogra](#)^{a,*}

The PURPOSE of this study was to examine the associations between neighborhood factors (e.g. greenness and walkability), and chronic condition count, and self-rated measures of health (e.g. general health, mental health, and healthy aging).

STUDY 3



The **PURPOSE** of this study was to assess for a moderating effect in the relationship between (1) physical activity (2) neighborhood factors and geriatric relevant health outcomes (e.g., physical impairment, pain, medication use, and depression)

SAMPLE CHARACTERISTICS	Females (n = 7689)	Males (n = 7650)	Total (n = 15339)
Age (mean (SD))	72.9 (5.7)	72.9 (5.6)	72.9 (5.6)
Total Physical Activity Hours (all intensities) per week, mean (SD)*	6.8 (6.8)	8.4 (8.1)	7.6 (7.5)
<i>*indicates a significant difference between sexes</i>			

- Study 1: entire sample (n ~ 36500)
- Study 2+3: 65+ years of age at baseline (n ~ 15300-16500)
- All environmental exposures were from baseline, outcomes were from follow-up
- Total PA ranged from 5-8hours per week

OUTCOME VARIABLES

(all at follow-up)

STUDY 1

TOTAL PHYSICAL ACTIVITY

Physical Activity Scale for the elderly (PASE)

SEDENTARY TIME

Continuous, hours per week

STUDY 2

CHRONIC CONDITIONS

“Have you been diagnosed with ____ in the past 12 months” YES/NO

SELF RATED HEALTH

- GENERAL
- MENTAL
- HEALTHY AGING

In general, would you say your mental health is excellent, very good, good, fair, or poor?

Categorical

STUDY 3

GERIATRIC RELEVANT HEALTH

- PHYSICAL IMPAIRMENT
- PAIN
- MEDICATION USE
- DEPRESSION

Older Americans' Resources and Services

Pain severity rating (General Symptoms and Signs)

1/2/3+ Rx medications

CES-D 0-30 depression scale

Exposure Variables

At baseline*

Exposure Variables

Can-ALE

Active Living Environments
(z- score)

Dwelling Density
Intersection Density
Points of Interest

Exposure Variables

Greenness

Normalized Difference
Vegetation Index (NDVI)

0.001–0.338

0.339–0.415

0.416–0.494

0.495–0.743

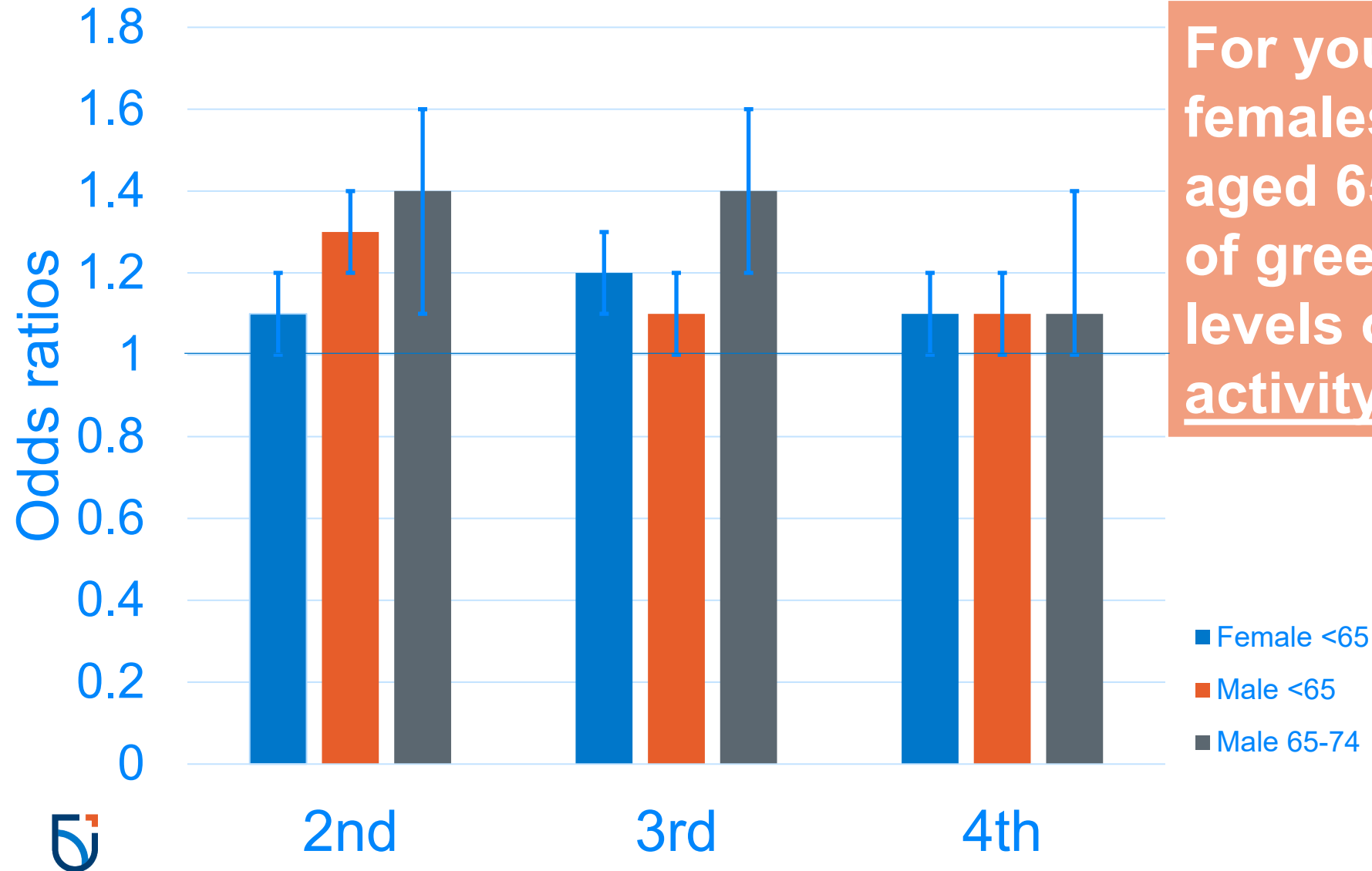
Can-ALE

Active Living Environments
(z- score)

Dwelling Density
Intersection Density
Points of Interest

STUDY 1

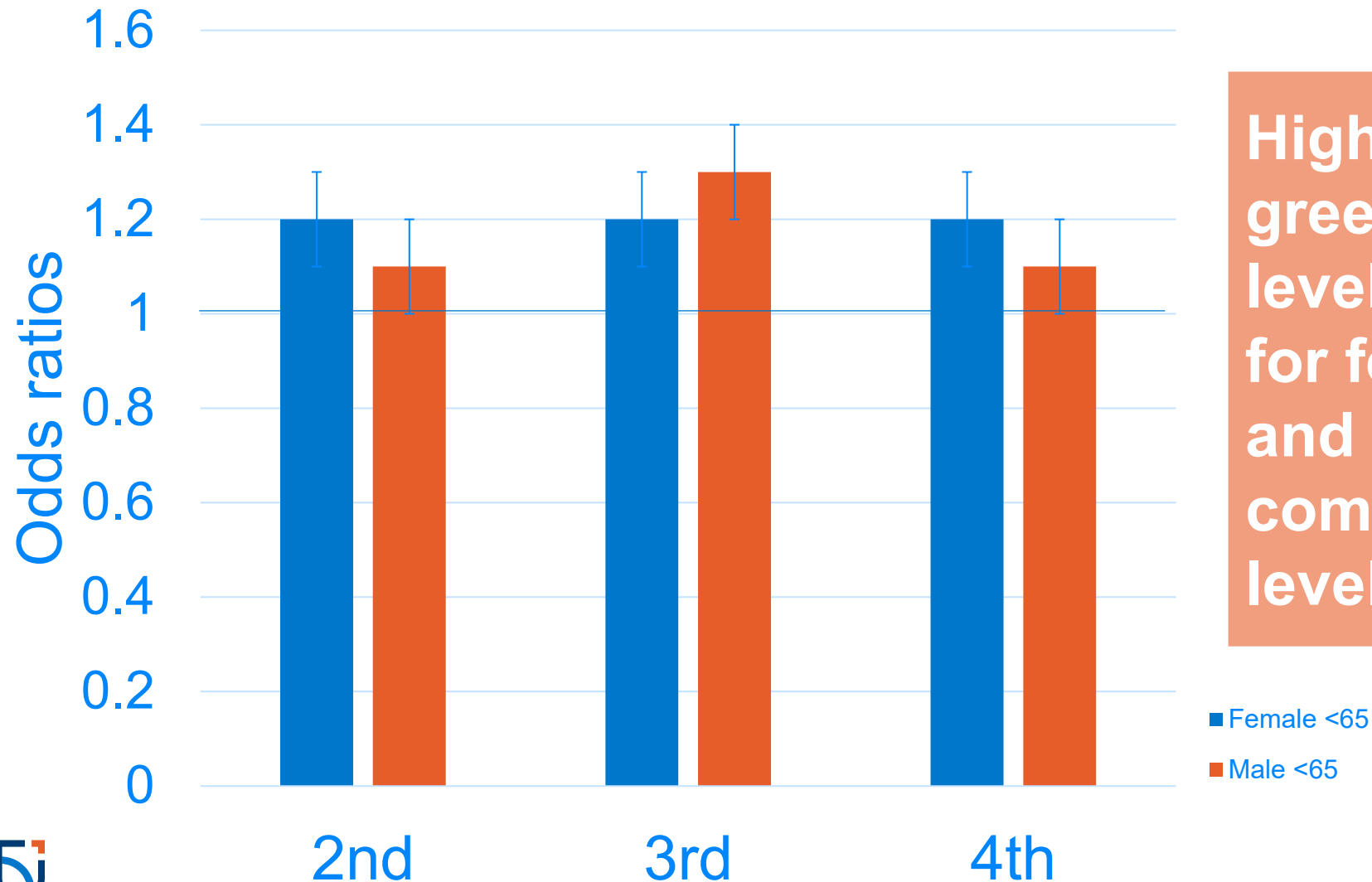
Results – Total PA



For younger males and females (<65), and males aged 65-74, higher levels of greenness had higher levels of physical activity

STUDY 1

Results – Sedentary Time

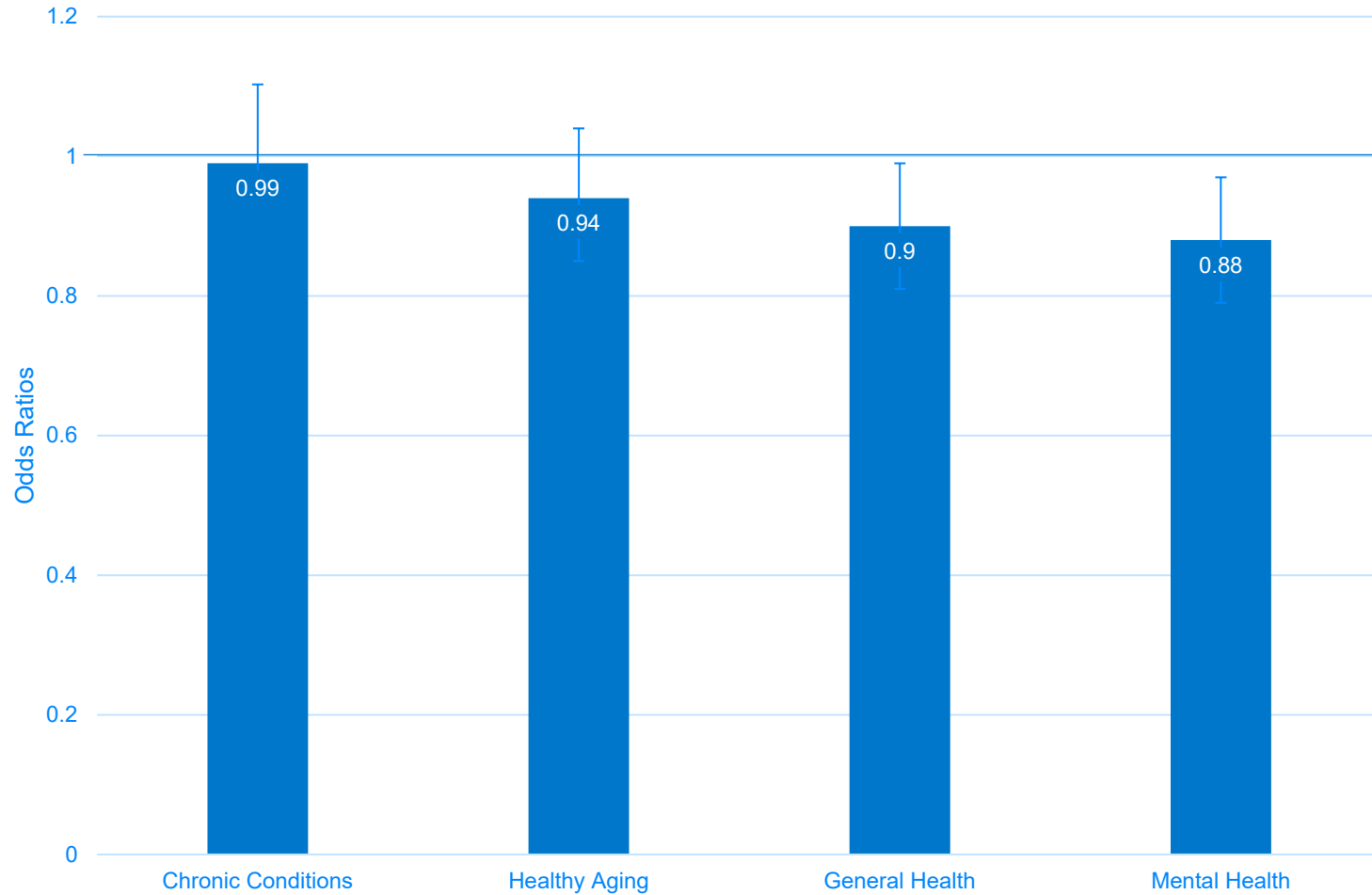


Higher levels of greenness had higher levels of sedentary time for females <65, 65-74, and for males <65, 75+ compared with lower levels

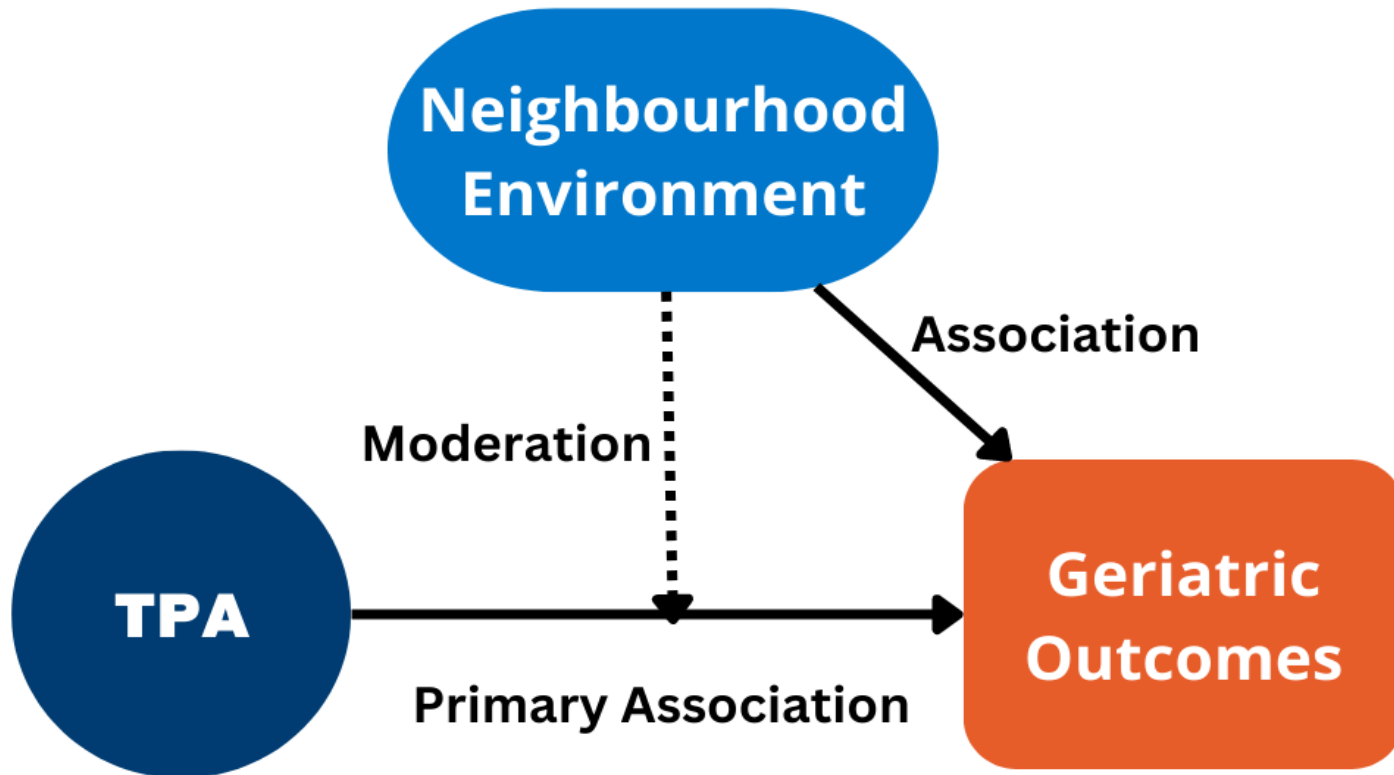
STUDY 2

Results

Greenness and 4 Health Outcomes



**3rd Q of Greenness –
10% higher odds of
higher self rated
general health and
12% higher odds of
better self rated
mental health**



There is an additional effect on top of the known associations between TPA/GHO and G/GHO.

STUDY 1

Movement behavior
(e.g. physical activity
/sedentary time) is
different across different
neighborhood
environments.



STUDY 1

Movement behavior
(e.g. physical activity
/sedentary time) is
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STUDY 2

Neighborhood factors (e.g.
greenness and
walkability), are
associated with general
health, and mental health.



STUDY 1

Movement behavior
(e.g. physical activity
/sedentary time) is
different across different
neighborhood
environments.



STUDY 2

Neighborhood factors (e.g.
greenness and
walkability), are
associated with general
health, and mental health.



STUDY 3

There is a moderating
effect in the relationship
between (1) physical
activity (2) neighborhood
factors and geriatric
relevant health outcomes



Overall Conclusions

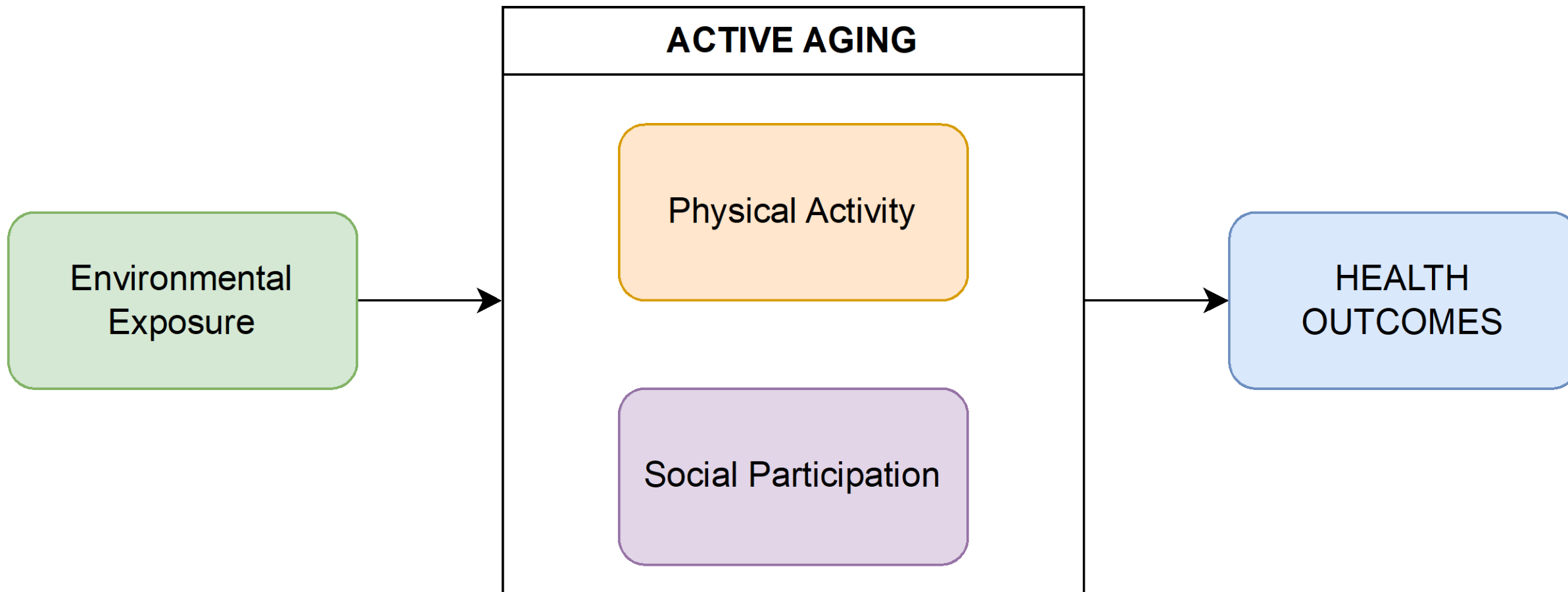
Neighborhood greenness may be an important factor to consider when promoting healthy aging in older adults.



Future Research

- Other mechanisms – social





Thank you!

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