

Built Environment and Walking in Adults from Curitiba, Brazil: Does Walkability Matter?

ACTIVE LIVING RESEARCH – ANNUAL CONFERENCE 2013

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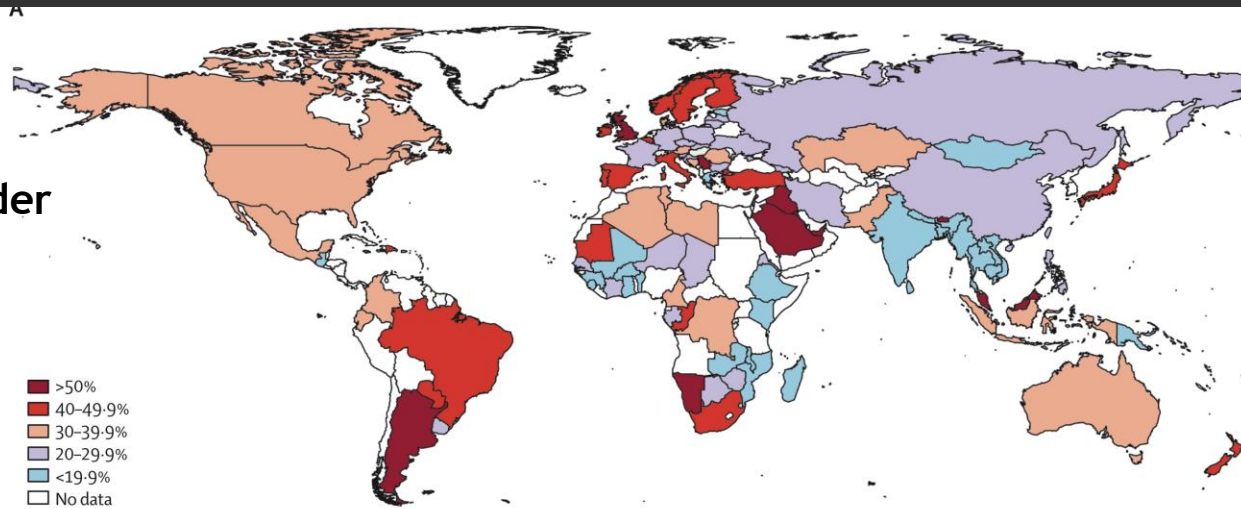
[3] Universidade Estadual de Ponta Grossa, Ponta Grossa, Brazil;

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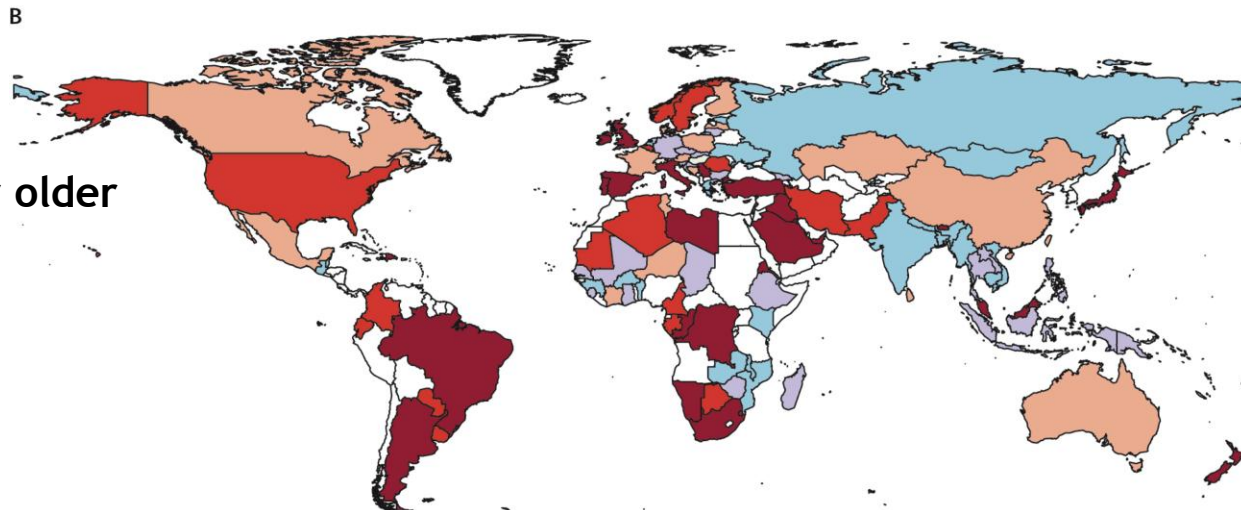
[5] Federal University of Pelotas, Department of Physical Education, Pelotas, Brazil;

Physical Inactivity: a global issue

Men 15yrs or older

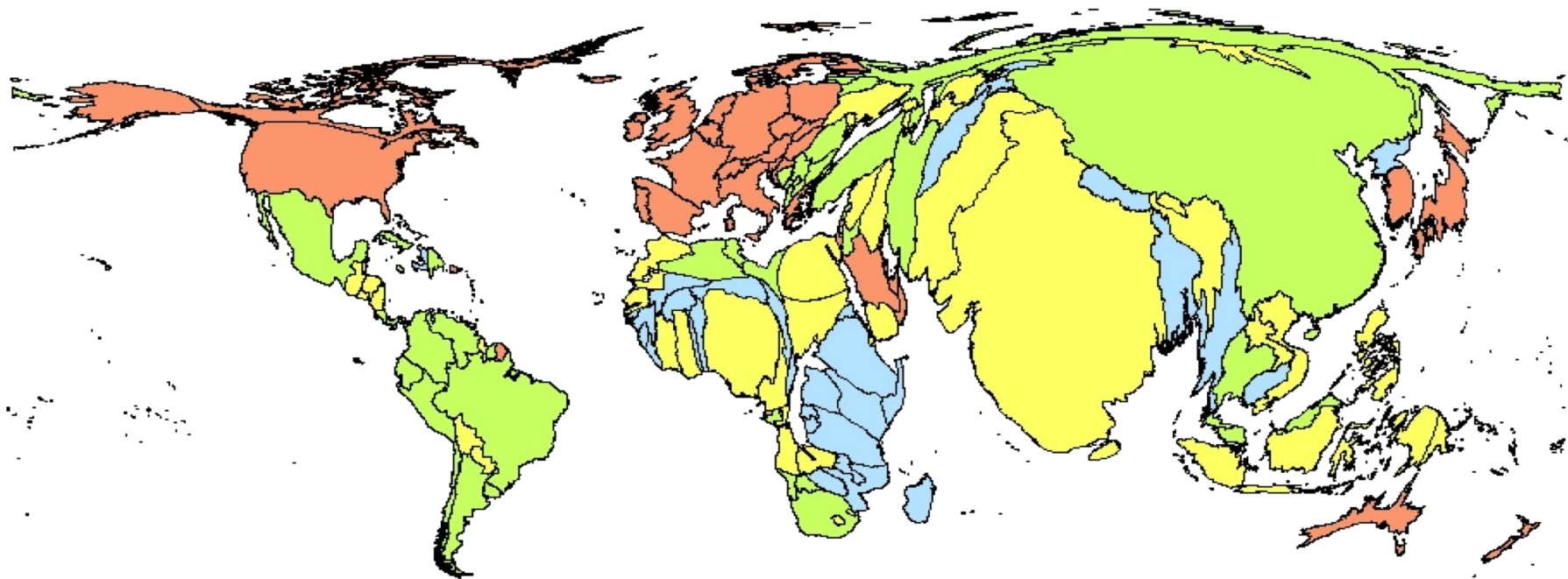


Women 15yrs or older



Hallal PC, Andersen LB, Bull FC, Guthold R, Haskell W, Ekelund U. Global physical activity levels: surveillance progress, pitfalls, and prospects. *Lancet* 2012;380(9838):247-57

Population in the world: Where people are?

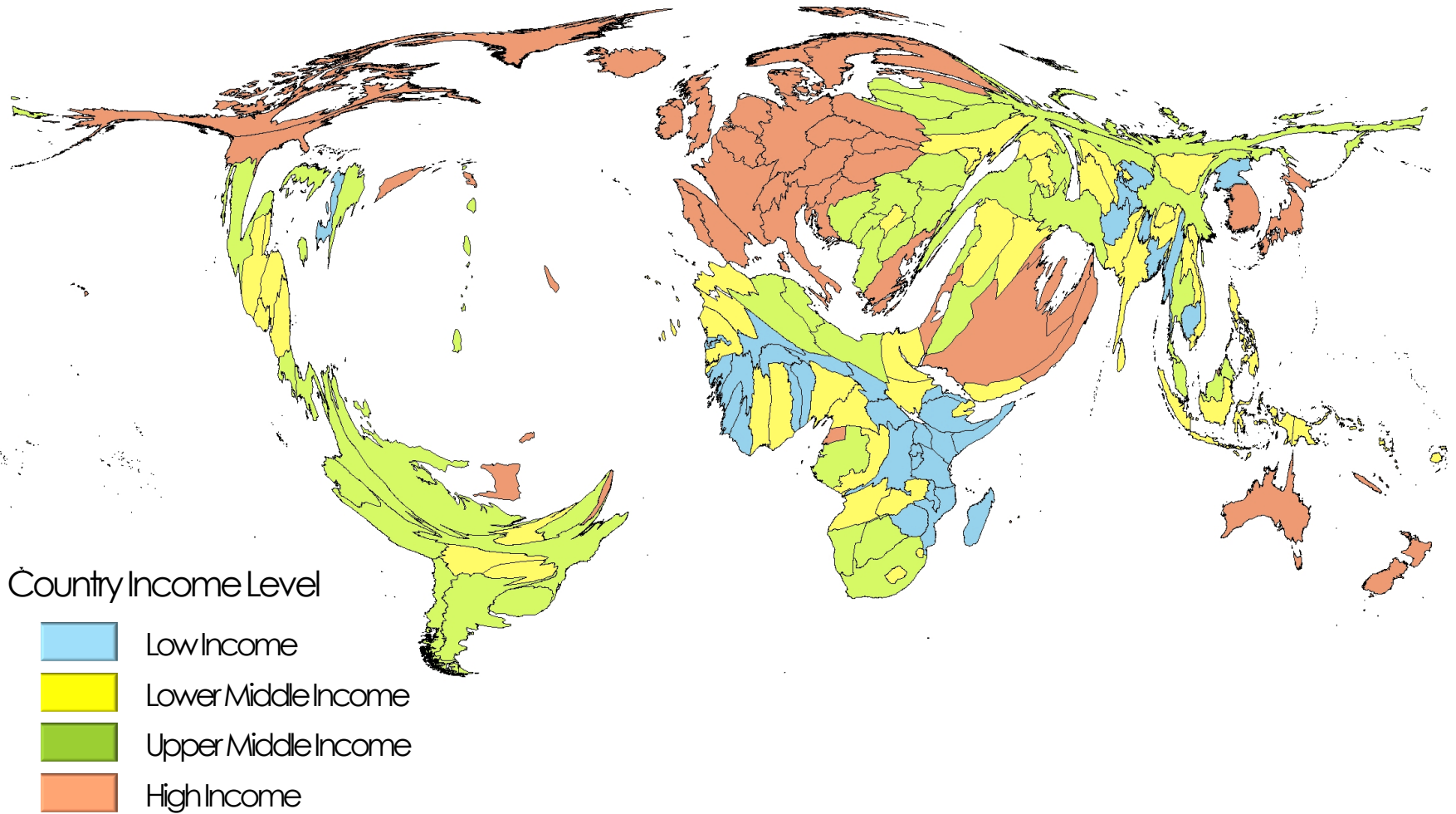


Country Income Level



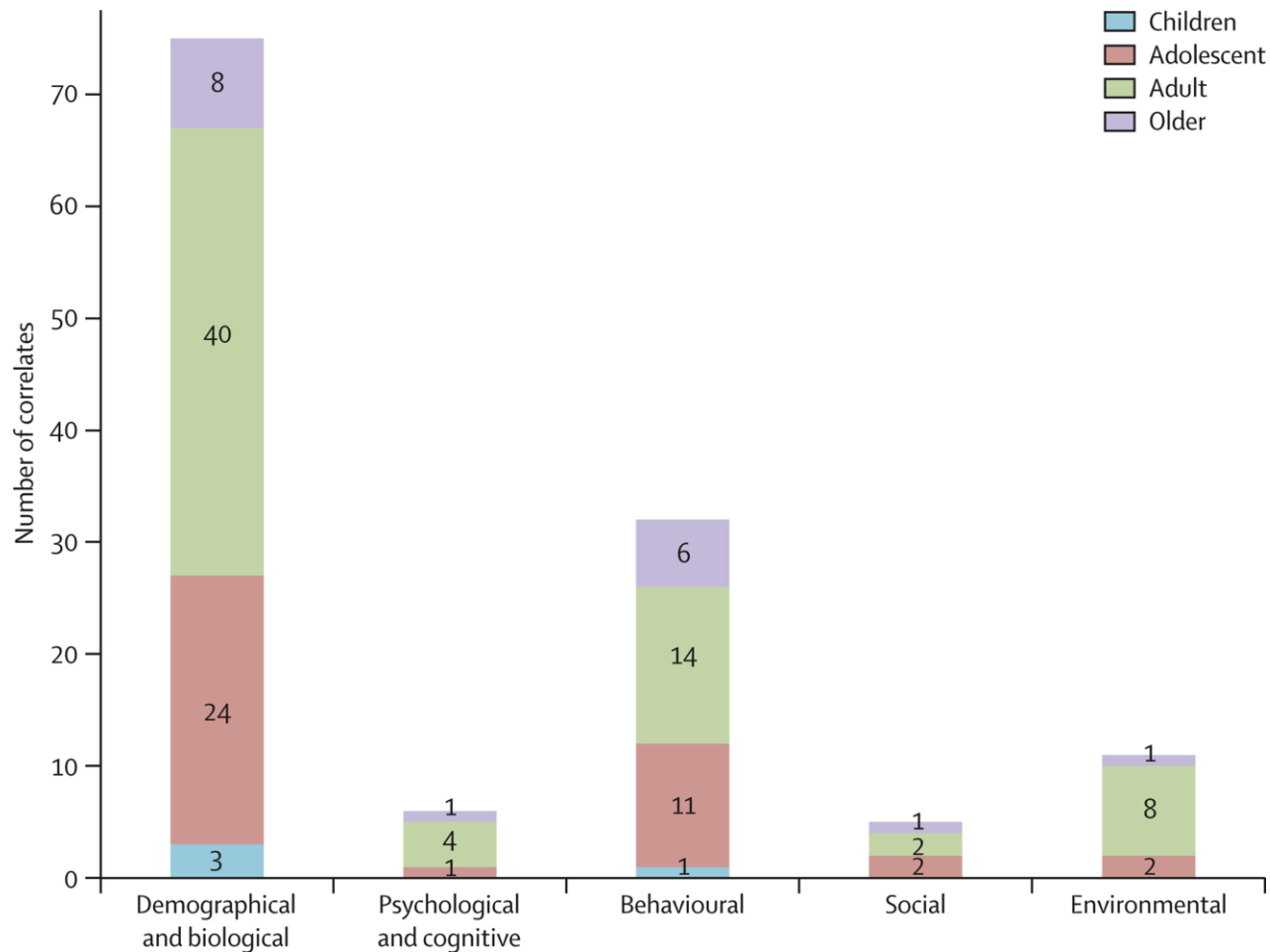
United Nations, Department of Economic and Social Affairs, Population Division (2012). World Urbanization Prospects: The 2011 Revision, CD-ROM Edition.

Urbanization in world: Where people live?



United Nations, Department of Economic and Social Affairs, Population Division (2012). World Urbanization Prospects: The 2011 Revision, CD-ROM Edition.

Environment PA correlates in LMICs: Where is the evidence?



Bauman AE, Reis RS, Sallis JF, Wells JC, Loos RJ, Martin BW. Correlates of physical activity: why are some people physically active and others not? Lancet 2012.

IPEN Studies: International Physical Activity & Environment Network

- Started at ICBM in Mainz Germany in 2004 by: Sallis & Kerr (US) Owen (Australia) DeBourdeaudhuij (Belgium)
- IPEN study funded by NCI 2009—2013: 12 countries
 - Support countries to collect or enhance data according to common protocol
 - Study co-ordination, quality control, & pooled analyses
 - Support the network more widely
 - Advance science through pooled analyses
 - Use results to inform policy internationally

Aims

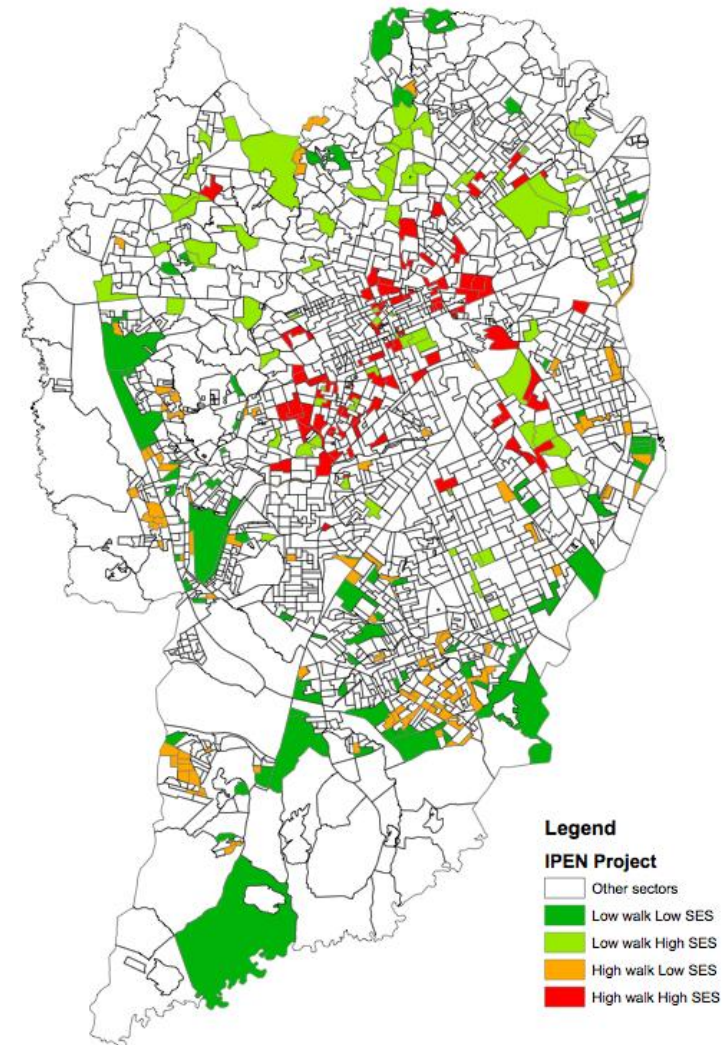
- Examine the association between walkability and walking for commuting and leisure in adults from Curitiba, Brazil.
- Assess the interactions between income and walkability

METHODS

- The Spaces for Physical Activity in Adults Study (ESPACOS)
- Cross-sectional study
- Curitiba, Brazil (1,746,896 inhabitants (52% women); 8th largest city in the country)
- August and December 2010
- Walkability (residential density, intersection density, and land use mix), obtained through data layers exported into a Geographic Information System.

Methods

- Selected census tracts drawn from 2,125 (~225 households/census tract)
- Average annual income within census tract (national census)
- Walkability index (Residential density, Connectivity, Land use mix (entropy obtained though five land use categories))
- Census tracts ranked according deciles of walkability & income
- 2nd & 3rd deciles: low walkability & low income"
- 8th & 9th deciles: high walkability & high income"
- Eight selected census tracts (total of 32)



METHODS

- 10,063 eligible households (~320 houses/census tract)
 - 22 households systematically sampled
- One adult randomly sampled (N=704; 50% Women)
 - lived in the neighborhood > 1 year
 - Between 18 and 65 years.
- Leisure (walking, moderate and vigorous PA) and transportation (walking)
 - International PA Questionnaire (IPAQ)
- Outcomes: ≥ 150 min/week versus < 149 min/week. Leisure Walking (≥ 150 min/week versus < 149 min/week)

METHODS

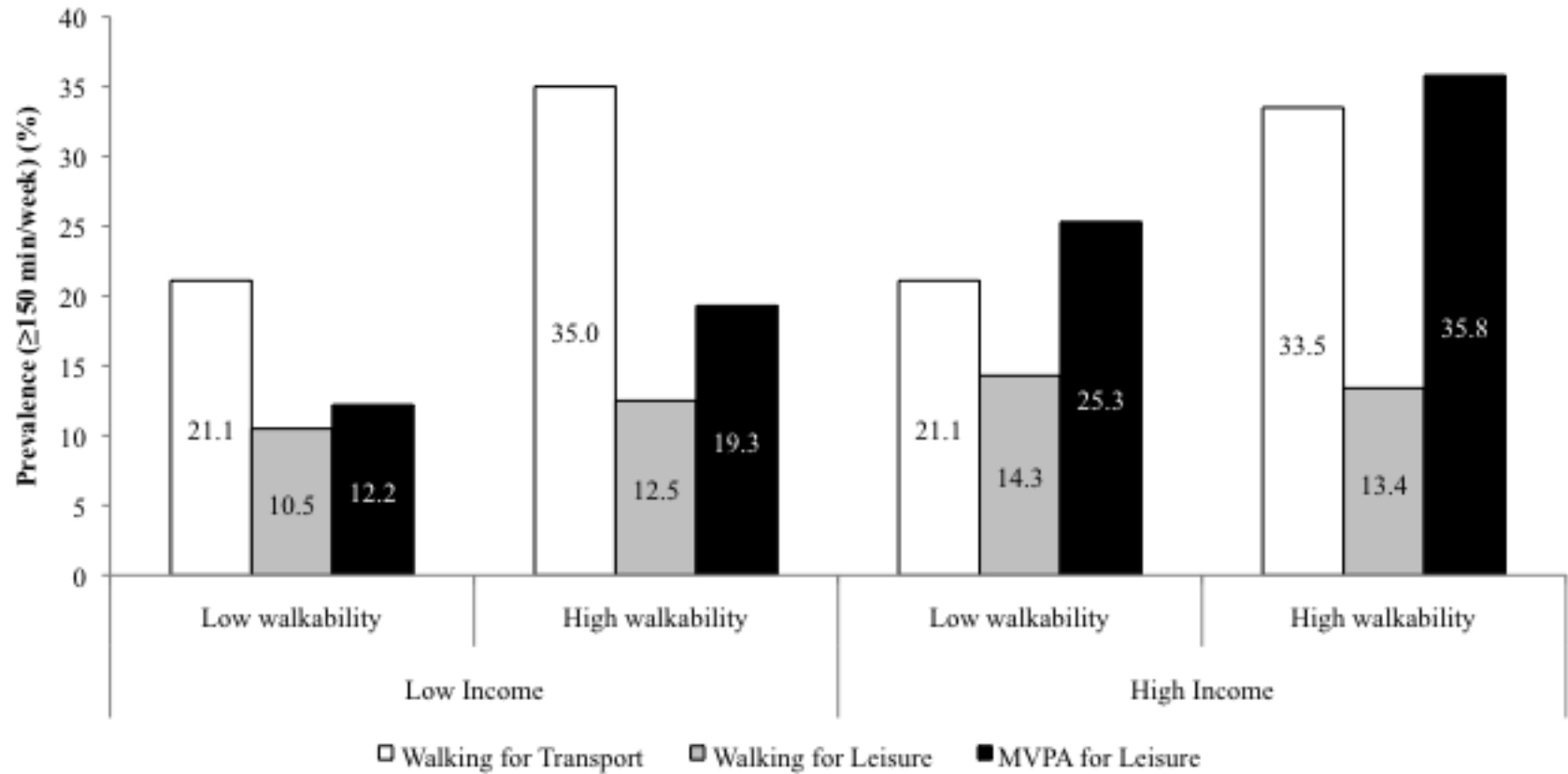
- Main effects of walkability and income and their interaction were the main focus of these analyses.
- Logistic regressions
 - Crude model included walkability (low and high)
 - Neighborhood income included as an independent variable
 - All individual variables were included in the next model.
- Interaction terms between walkability and income (moderating effect of quadrants of income on the walkability PA association)
- Analyses adjusted for the clustering effect of census tract.

RESULTS

Demographics	Total		Low Income				High Income			
			Low W		High W		Low W		High W	
	n	%	n	%	n	%	n	%	n	%
Sex										
Female	369	52.9	93	54.1	92	52.0	94	53.7	90	52.0
Male	328	47.1	79	45.9	85	48.0	81	46.3	83	48.0
Age group										
18-29	169	24.3	38	22.1	31	17.5	43	24.6	57	33.0
30-39	161	23.1	36	20.9	45	25.4	40	22.9	40	23.1
40-49	159	22.8	49	28.5	40	22.6	38	21.7	32	18.5
50-65	208	29.8	49	28.5	61	34.5	54	30.9	44	25.4
Education[§]										
0-8	203	29.1	87	50.6	79	44.6	27	15.4	10	5.8
9-11	229	32.9	68	39.5	69	39.0	55	31.4	37	21.4
Participation rate[§]		66.4		62.3		70.9		62.6		71.2

[§]p<0.05; Chi-square Test

RESULTS



Results

	Walking for Transport		Walking for Leisure		Leisure MVPA	
	OR	CI95%	OR	CI95%	OR	CI95%
Low walk (ref.) vs. High walk	2.12 [§]	(1.31-3.37)	1.01	(0.63-1.62)	1.57 [§]	(1.06-2.32)
Low income (ref.) vs. High income	1.25	(0.73-2.15)	1.02	(0.58-1.80)	1.72 [§]	(1.06-2.74)
Walkability vs. Income (Interaction)	0.91	(0.36 -2.32)	0.86	(0.34-2.19)	0.9	(0.41-1.95)

[§]p<0.05; Chi-square Test

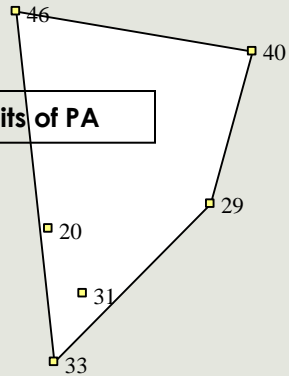
Odds ratio adjusted for area income. sex. age. education. marital status. number the children at living at home. car ownership and time living in the neighborhood

Translating the results to practice and policy: a remaining challenge

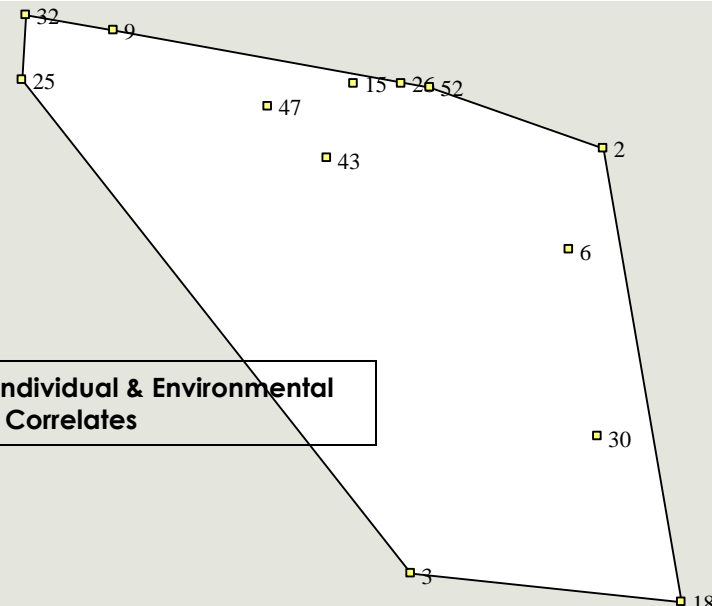
- Concept Mapping approach
- *Understand the gaps between 'researchers' and practitioners' research priorities*
- *Identify useful tools, methods, collaborative strategies and action steps to move the research agenda forward.*
- Focus Prompt: "In your opinion, which RESEARCH topic could contribute to help the design of public policies and the planning of environment intervention to physical activity promotion?"

Reis RS, Kelly CM, Parra DC, Barros M, Gomes G, Malta D, et al. Developing a research agenda for promoting physical activity in Brazil through environmental and policy change. *Rev Panam Salud Publica*. 2012;32(2):93-100.

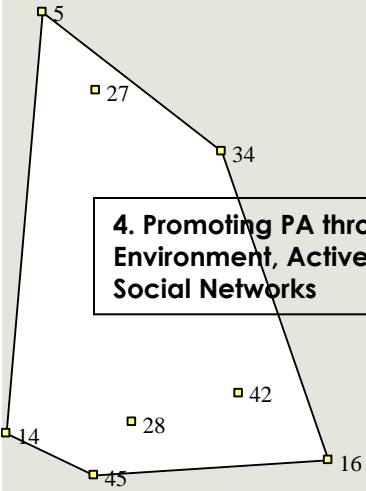
5. Health & Economic Benefits of PA



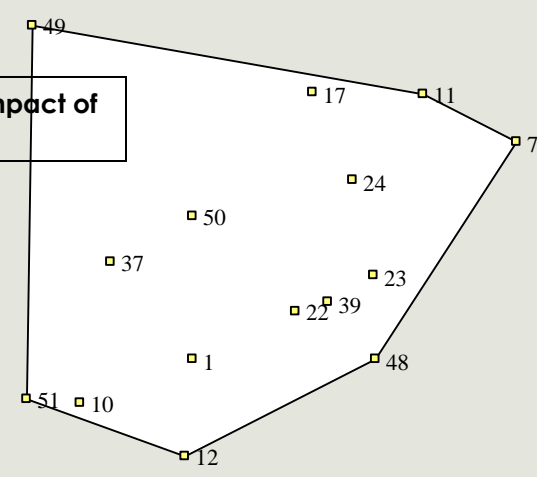
2. Individual & Environmental PA Correlates



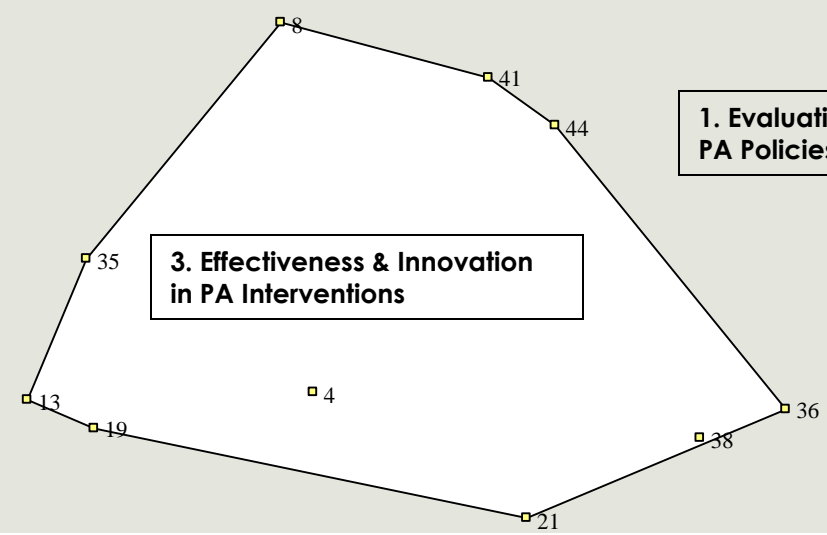
4. Promoting PA through Urban Environment, Active Commuting and Social Networks



1. Evaluation & Impact of PA Policies



3. Effectiveness & Innovation in PA Interventions



Practitioners: Importance (n=18)

Researchers: Feasibility (n=18)

8.96

7.7

Evaluation & Impact of PA policies

Promoting PA through Urban Environment, Active Commuting & Social Networks

Health & Economic Benefits of PA

Individual & Environmental Correlates of PA

Effectiveness & Innovation in PA Interventions

Evaluation & impact of PA policies

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Effectiveness & Innovation in PA Interventions

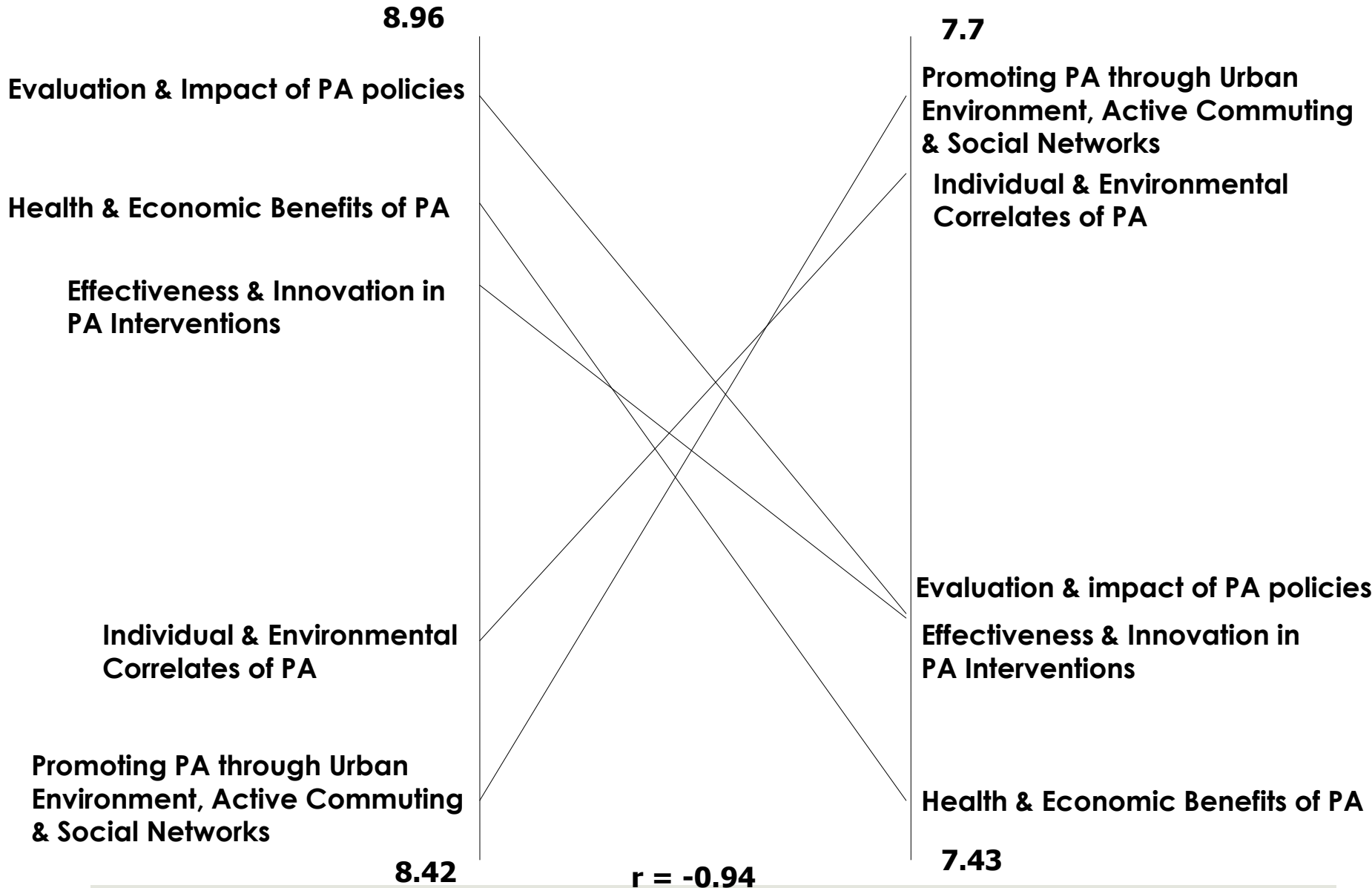
Promoting PA through Urban Environment, Active Commuting & Social Networks

Health & Economic Benefits of PA

8.42

r = -0.94

7.43



Strengths & Limitations

- The first study to examine walkability and income and its association with PA outcomes in a developing country.
- Walkability was assessed through objective GIS-based measures & followed a standardized approach.
- Recruitment and participation rates did not vary significantly across the census tracts.
- Cross-sectional design prevents the determination of causality.
- Walkability index included only a few aspects of the built environment.
- The study was conducted in one single city in Brazil.

Conclusions & Challenges

- ❑ Walkability was associated with transport and leisure PA in the Brazilian context.
- ❑ Adding the concept of walkability into the urban planning process could help to prevent the increase of physical inactivity in LMICs
- ❑ The gap between research and practice needs to be decreased to promote active behavior through policy and built environment changes
- ❑ it is crucial to provide evidence that is relevant to the region and to developing countries.