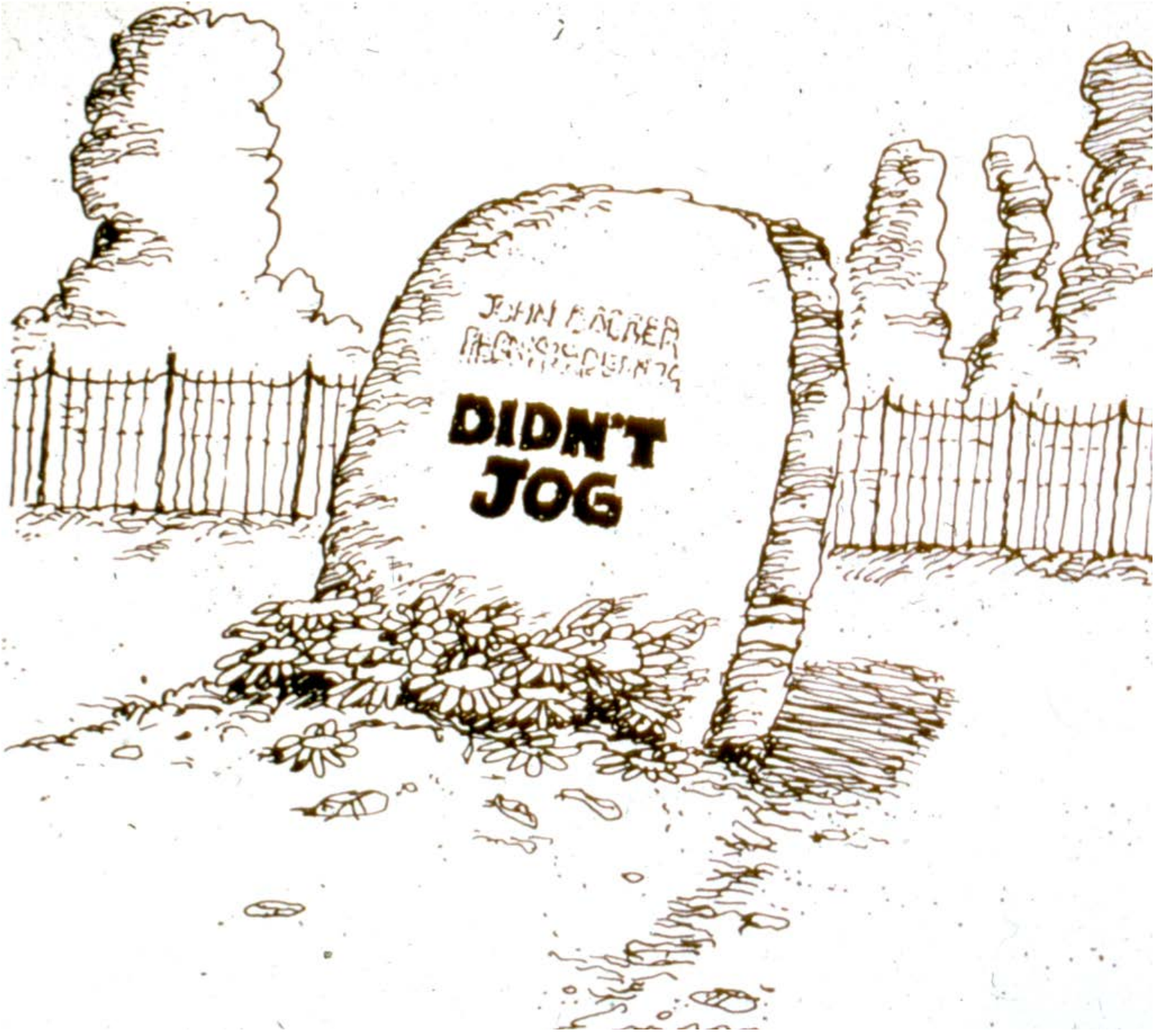
# Active Living: Using Research to Inform Policy and Practice

James Sallis
UCSD, Active Living Research
http://sallis.ucsd.edu

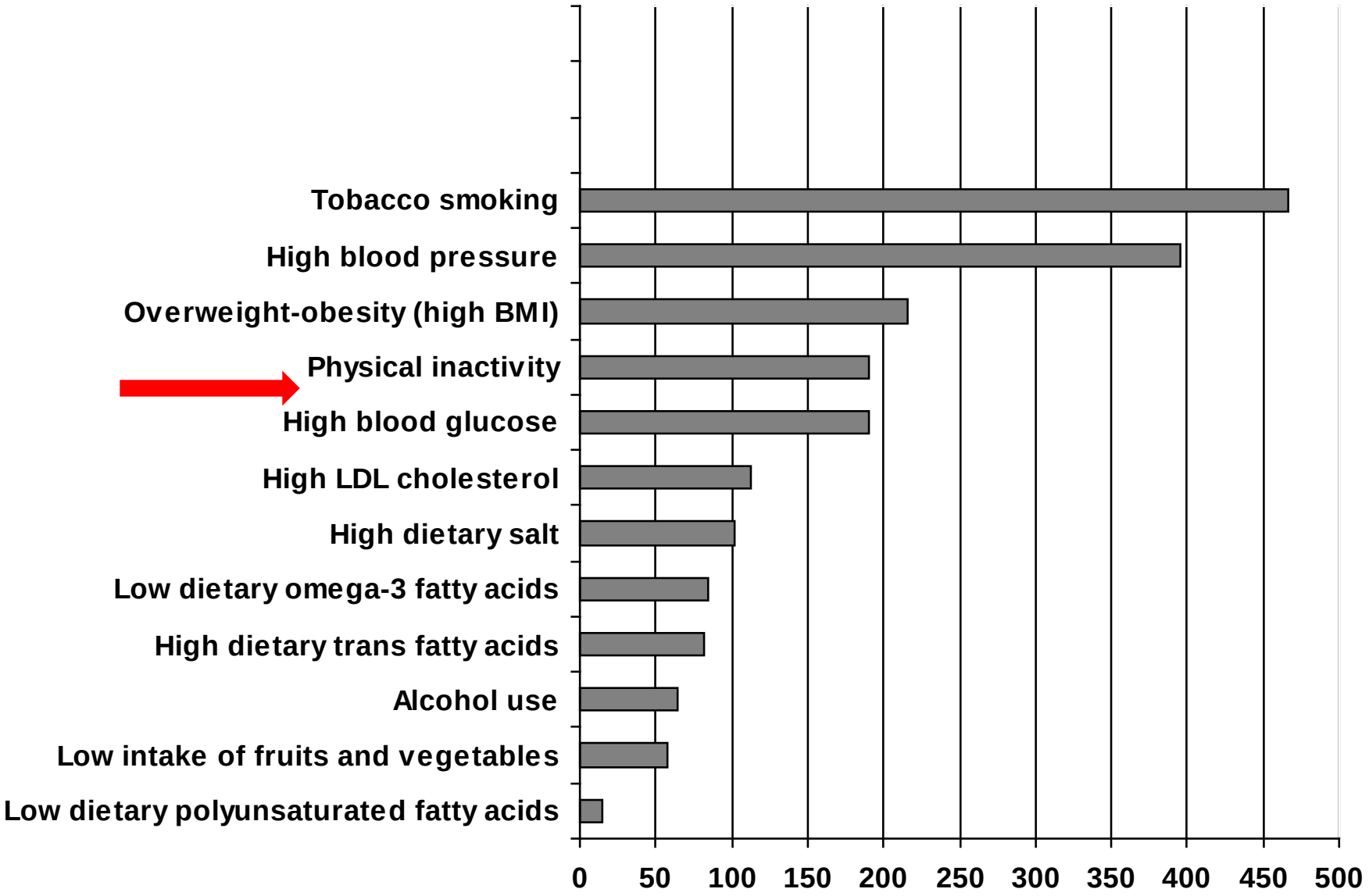
Society for Nutrition Education and Behavior. July 30, 2016

# Outline

- Why physical activity?
- What is evidence about the role of environments and policies in active living?
- Examples of effective PSE strategies
- How to improve our translation of research to policy and practice


DIDN'T
JOG

## Deaths (thousands) attributable to individual risk factors in both sexes

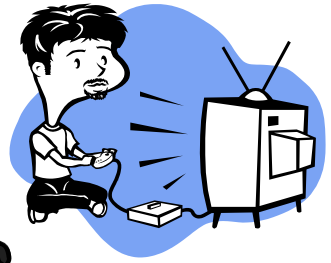


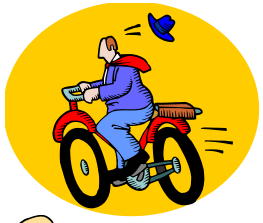

Danaei G et al, PLoS Medicine, 2009

# How Did We Become Inactive?

- Sleep
- Leisure
- Occupation
- Transportation
- Household



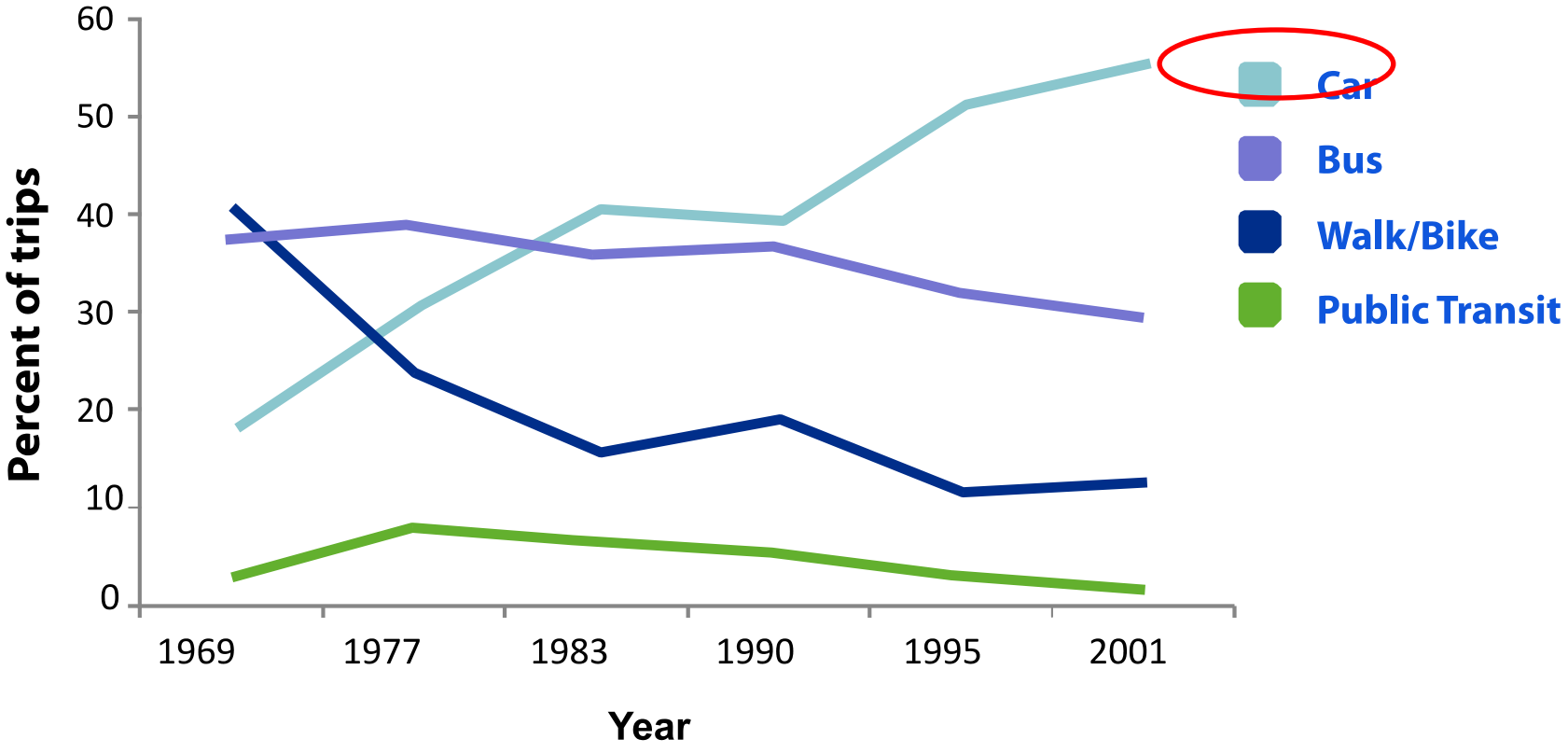



ACTIVE LIVING RESEARCH

# We have invested $Billions to make active transport difficult or impossible

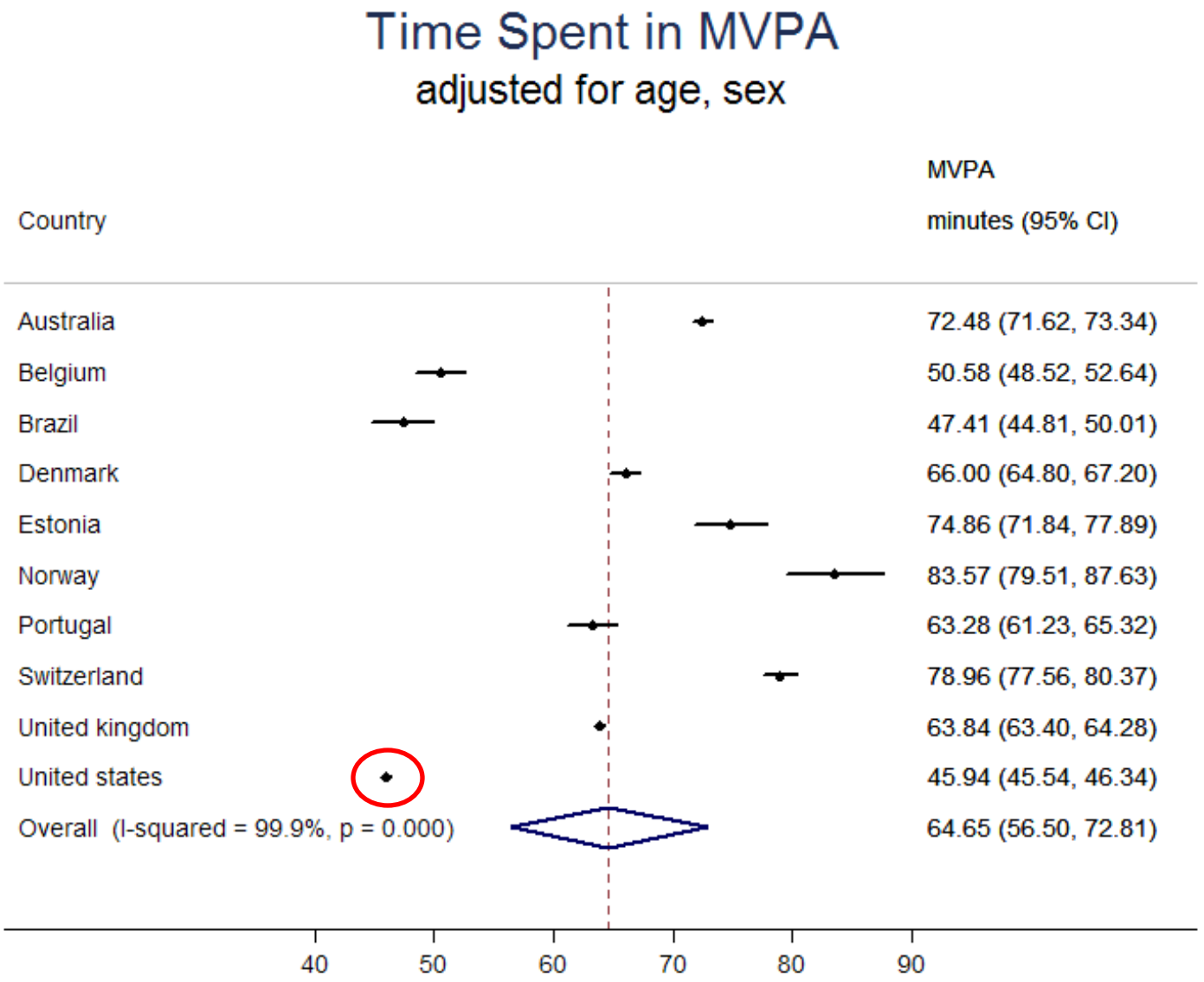

# Active Transportation by Youth has Decreased

## *Mode for Trips to School – National Personal Transportation Survey*

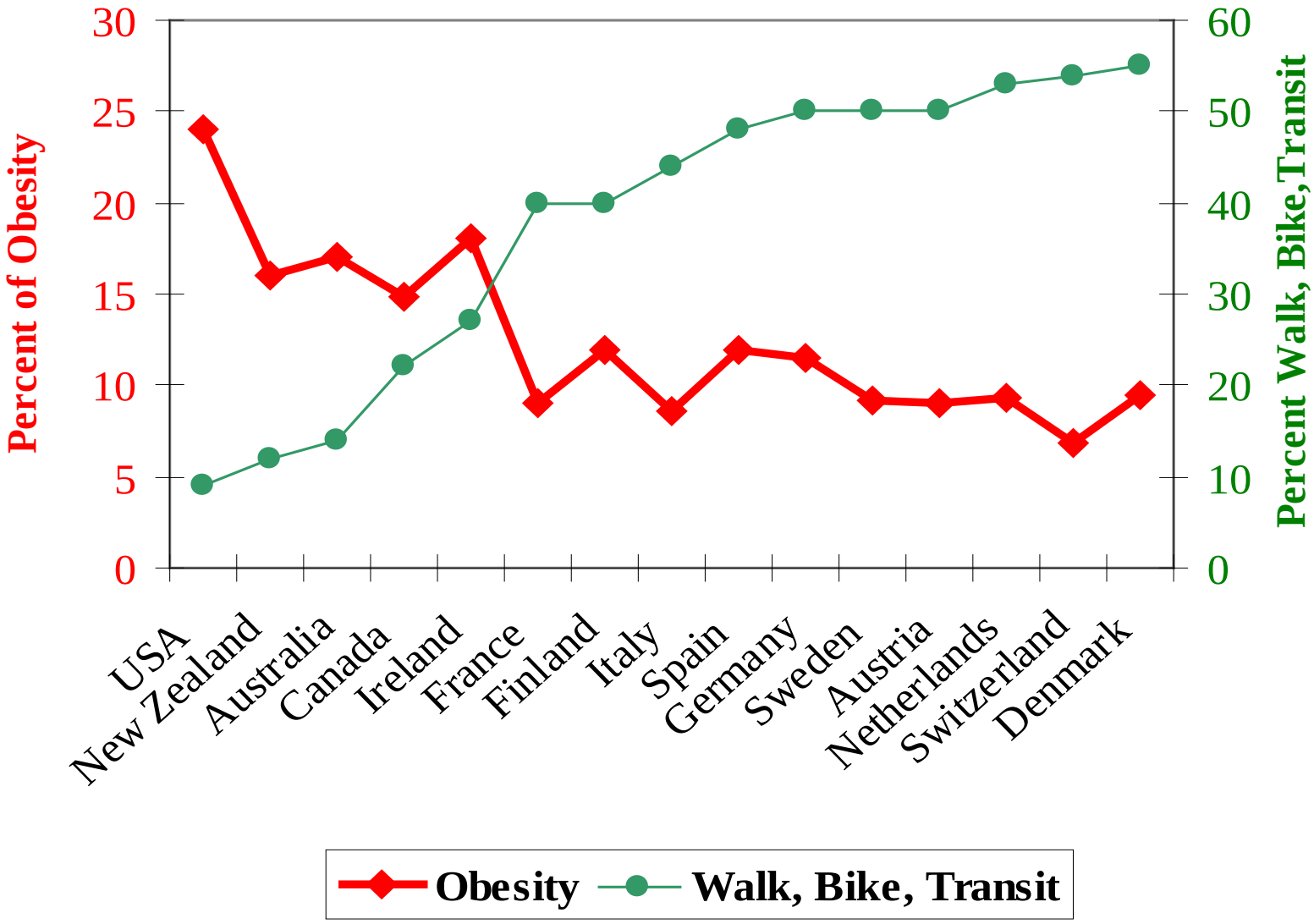



McDonald NC. Am J Prev Med 2007;32:509.

# Accelerometer-based MVPA for Adolescents. From Hallal, Lancet, 2012



# Obesity is strongly related to walking, cycling, and transit use!




Credit: John Pucher

# Elements of An Active Living Community

**Community Design**
**Destinations**

**Transportation System**

**Home**

**School & Worksite**

**Park & Rec**

# Public Health Needs to Partner

## Setting for PA

- Neighborhood
- Transportation facilities (sidewalks)
- Recreation facilities
- Schools & workplaces

## Expertise for Policy, Practice

- Planners
- Transport engineers & planners
- Park & rec, landscape architects
- Educators, architects


# The Neighborhood Quality of Life (NQLS) Study: The Link Between Neighborhood Design and Physical Activity 2001-2005

James Sallis, Ph.D.

Brian Saelens, Ph.D.

Lawrence Frank, Ph.D.

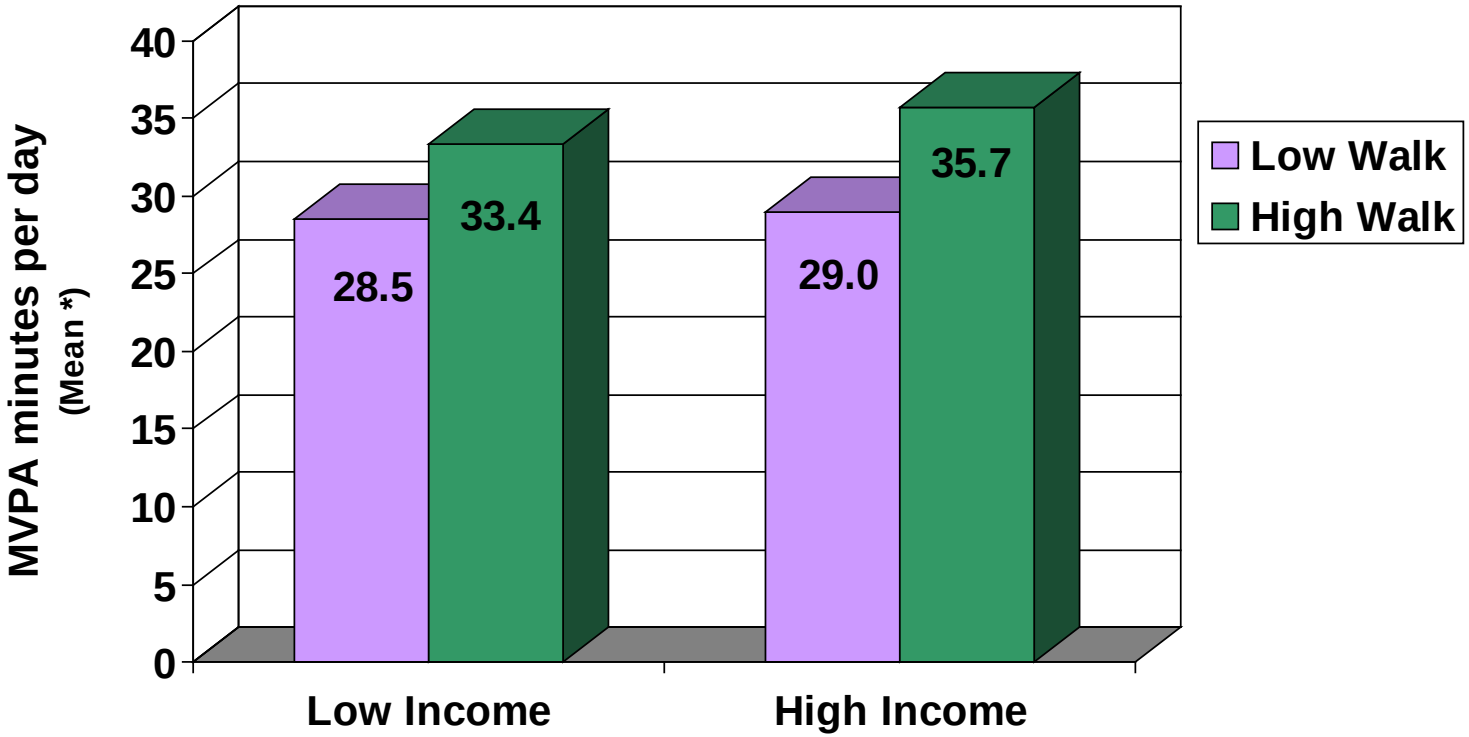
And team

# Accelerometer-based MVPA Min/day in Walkability-by-Income Quadrants

**Walkability: *p* =.0002**

**Income: *p* =.36**

**Walkability X Income: *p* =.57**




* Adjusted for neighborhood clustering, gender, age, education, ethnicity, # motor vehicles/adult in household, site, marital status, number of people in household, and length of time at current address.

# Estimated Public Health Impact of Walkability

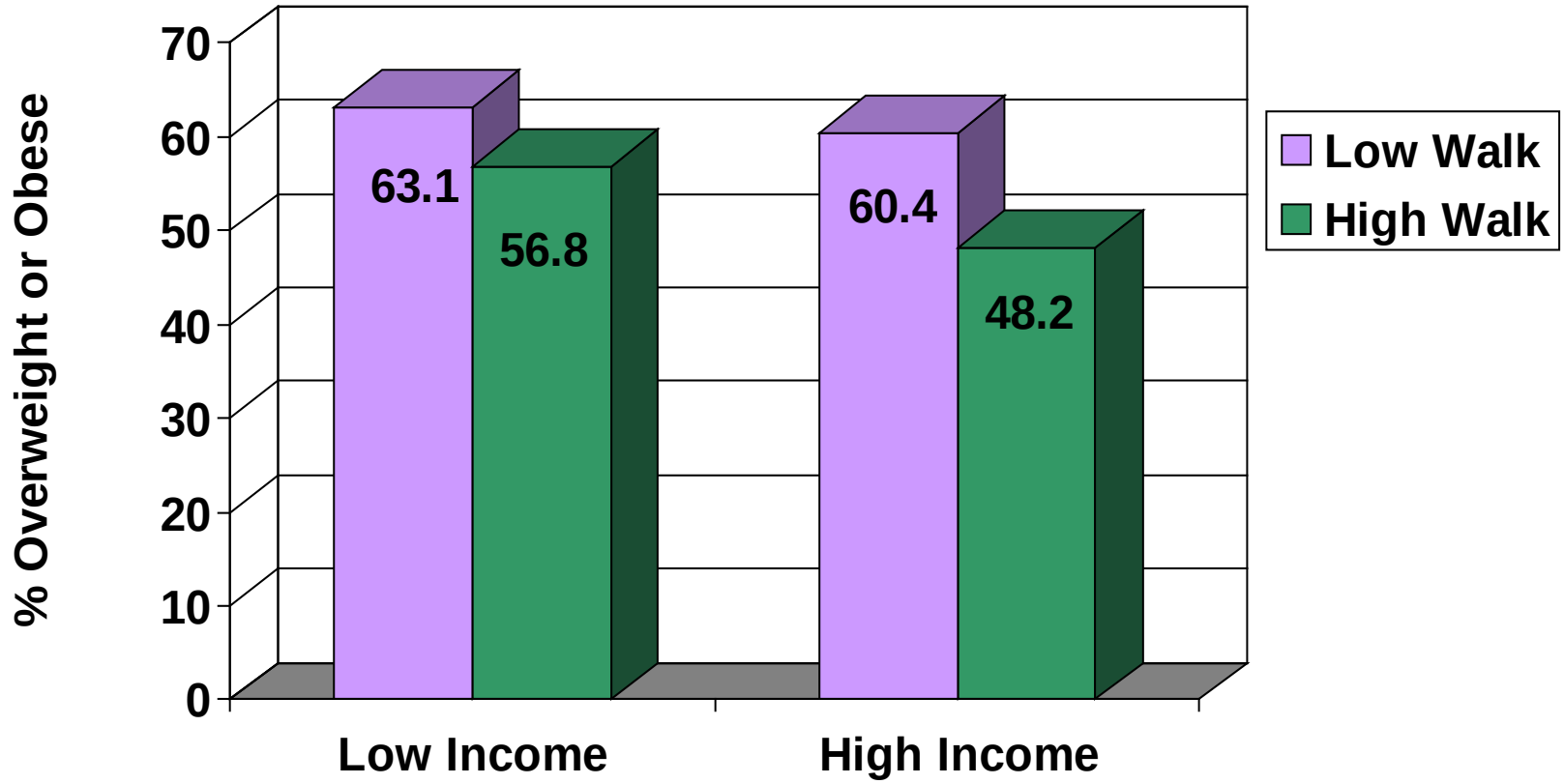
- 50 minutes per week = 2+ miles per week
- 2 miles per week = 100 miles per year
- 100 miles per year = 10,000 kcal per year
- 10,000 kcal per year = 2.9 pounds/1.3 kg
- More than the average adult weight gain per year in the U.S.

# Percent Overweight or Obese (BMI≥25) in Walkability-by-Income Quadrants

**Walkability: *p* =.007**

**Income: *p* =.081**

**Walkability X Income: *p* =.26**



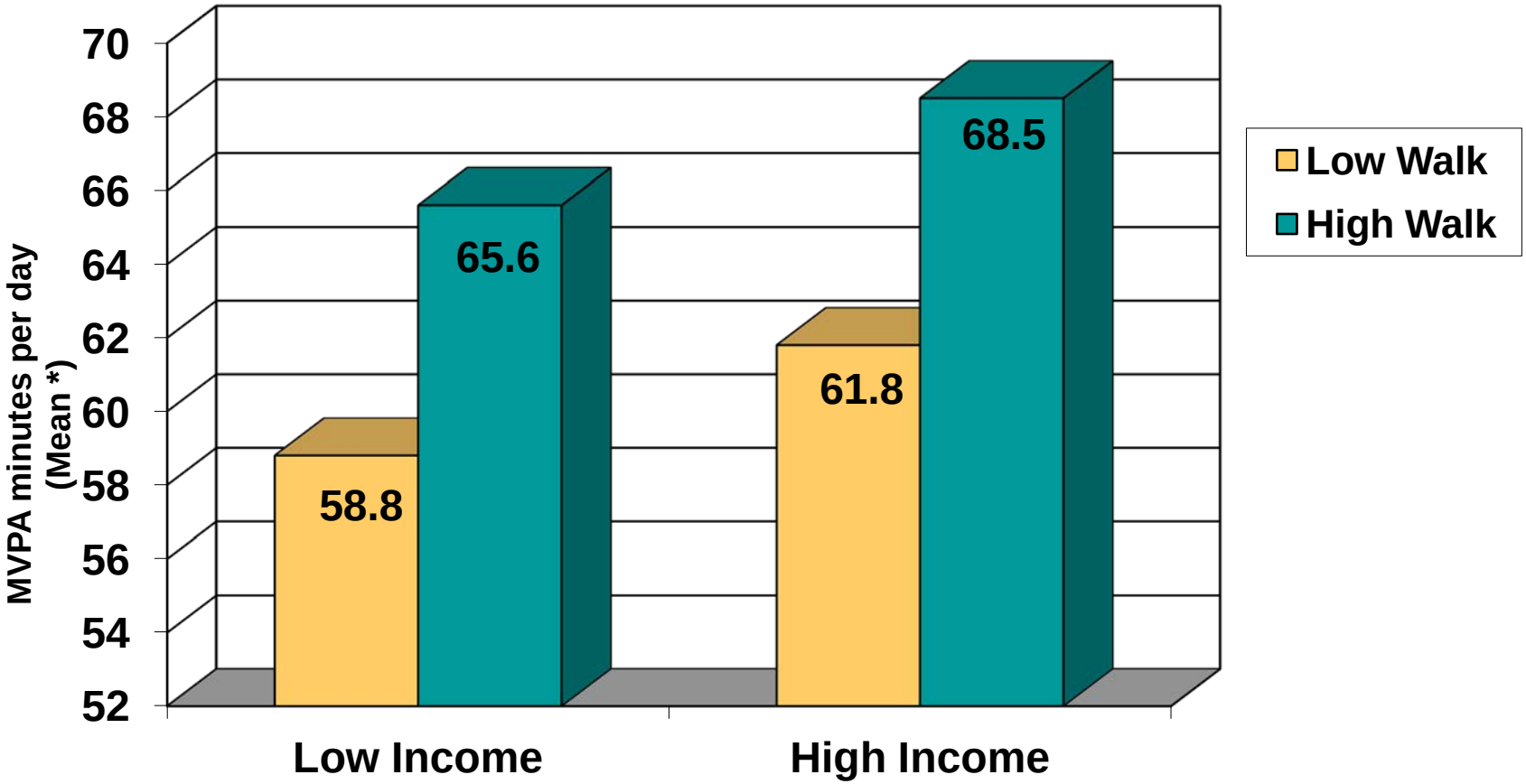

* Adjusted for neighborhood clustering, gender, age, education, ethnicity, # motor vehicles/adult in household, site, marital status, number of people in household, and length of time at current address.

# Accelerometer-based MVPA Min/day in Walkability-by-Income Quadrants

**Walkability: F=13.74; *p* =.000**

**Income: F=2.59; *p* =.108**

**Walkability X Income: F=.001; *p* =.981**

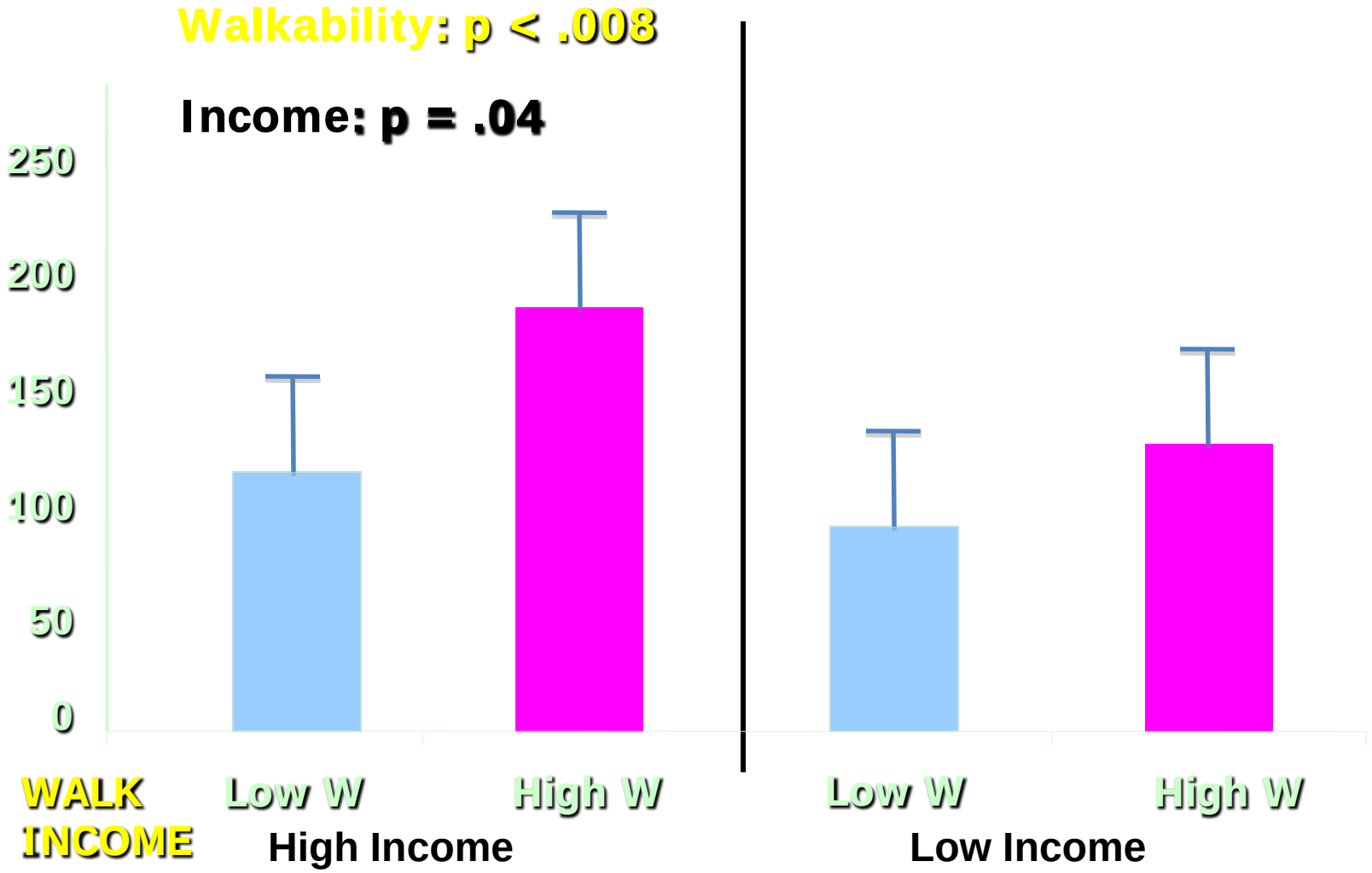



* Adjusted for gender and age

SNQLS

# Outside Activities (except gardening) (min/wk)

(Adjusted for Time, Region, Demographics)



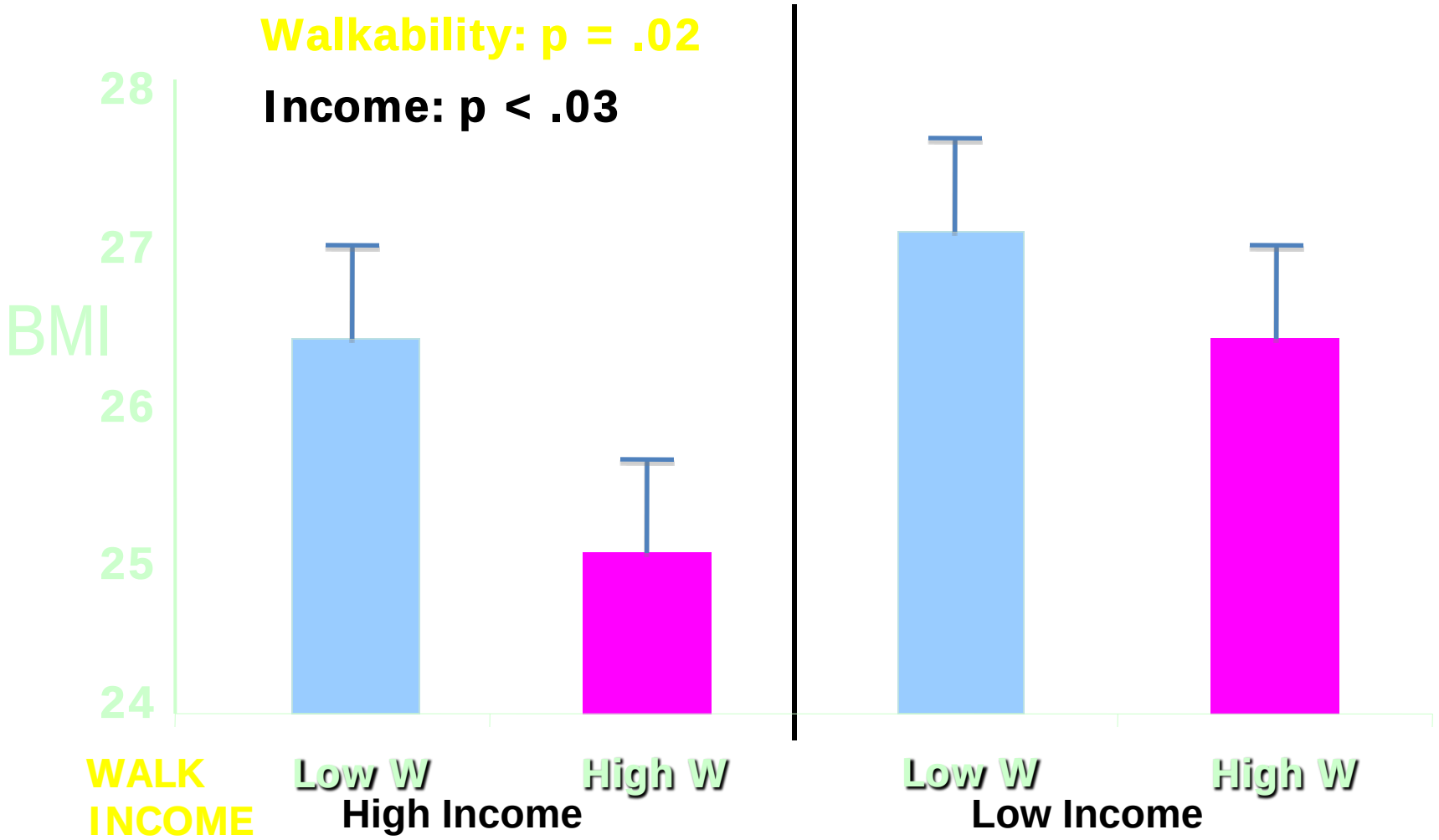

King, Sallis, Frank, Saelens et al., 2011, *Soc Sci Med, 73, 1525-1533*



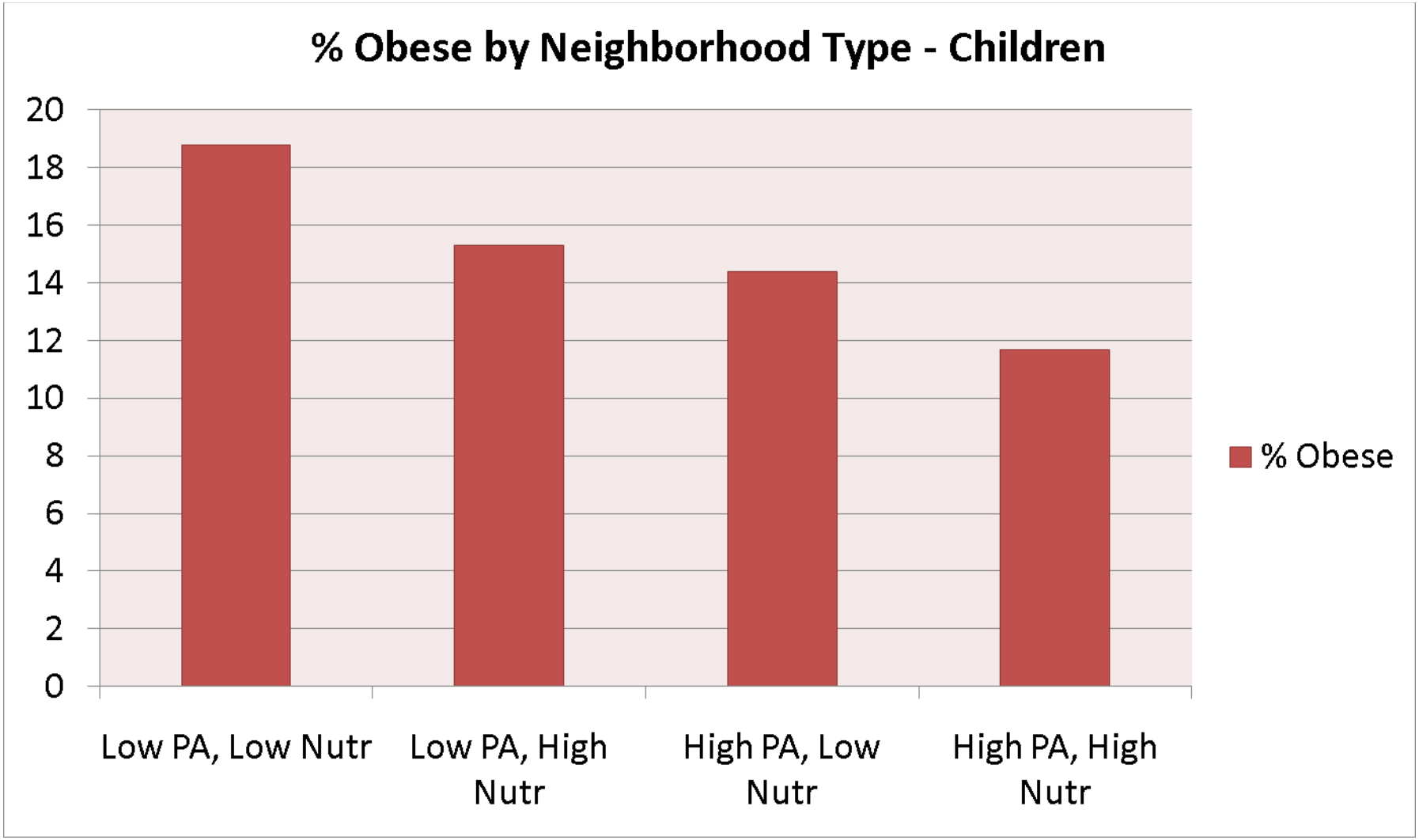
ACTIVE LIVING RESEARCH

# Body Mass Index (BMI)

(Adjusted for Time, Region, Demographics)




King, Sallis, Frank, Saelens et al., 2011, *Soc Sci Med, 73, 1525-1533*

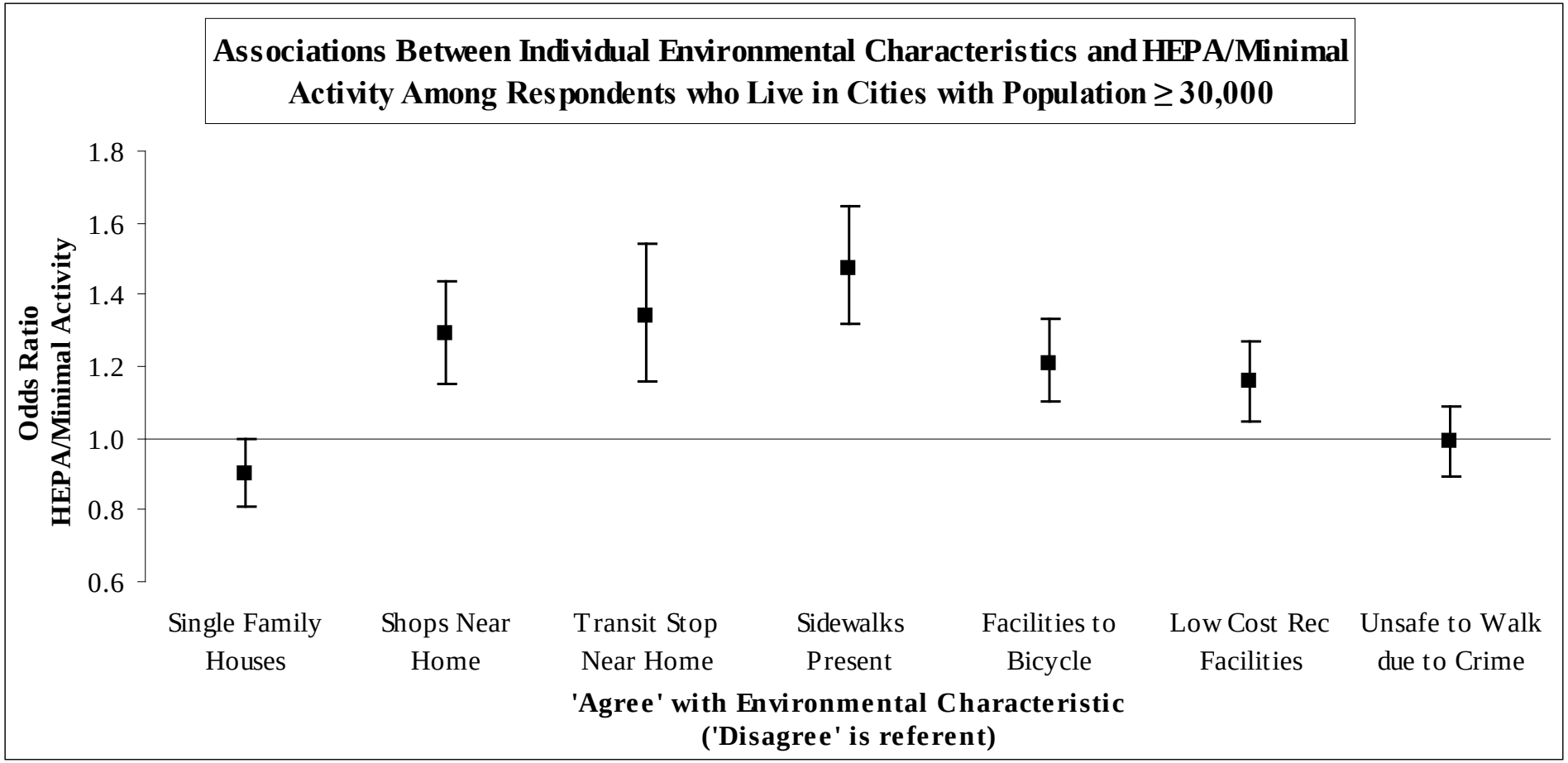



| | Low PA, Low N | Low PA, High N | High PA, Low N | High PA, High N |
|---|---|---|---|---|
| BMI in 85$^{th}$ percentile | 34.4% | 31.6% | 28.7% | 27.3% |
| BMI in 95$^{th}$ percentile | **18.8%** | 15.3% | 14.4% | **11.7%** |

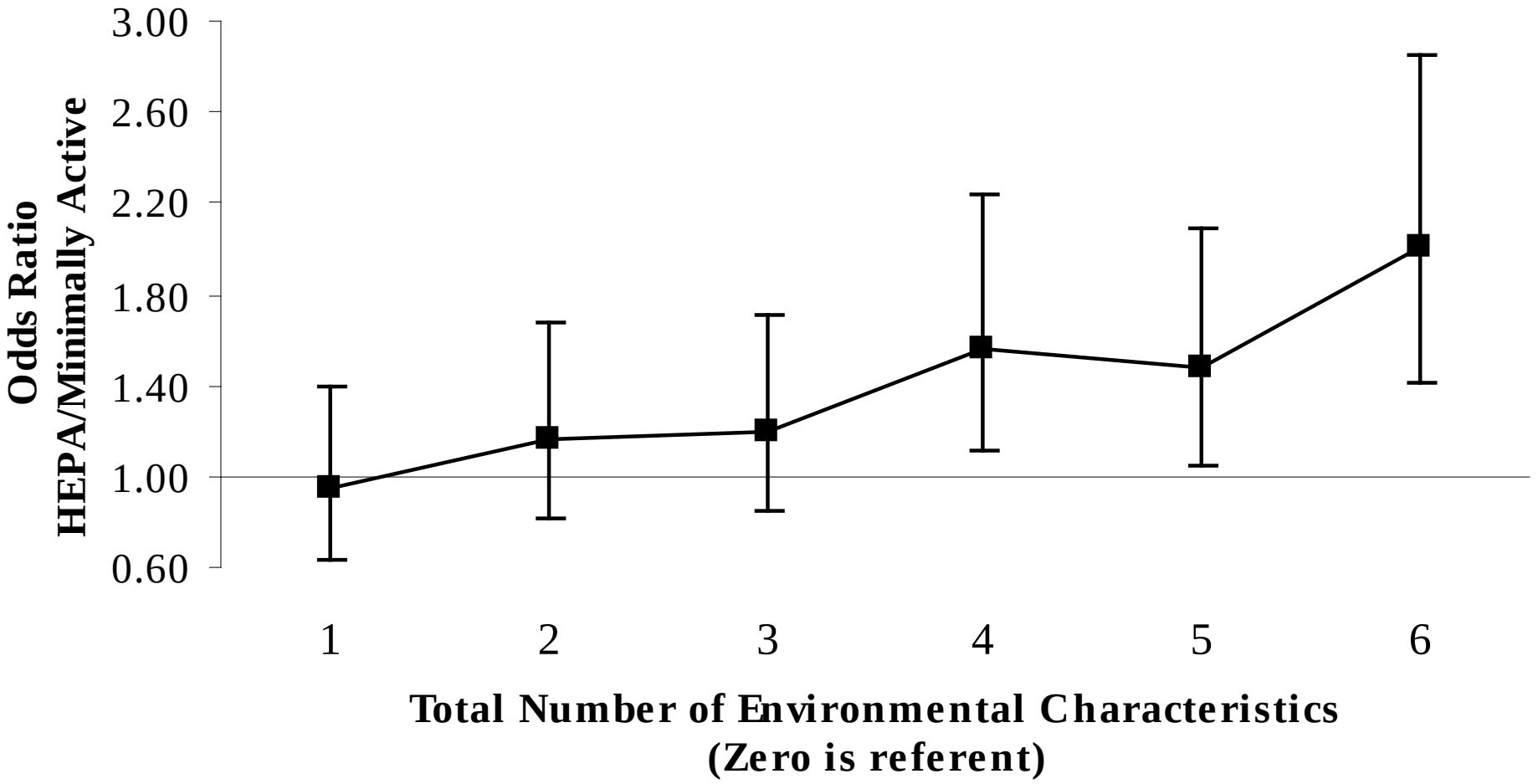
Atlanta, USA

Ghent, Belgium


We can learn from international studies


Associations Between Individual Environmental Characteristics and HEPA/Minimal Activity Among Respondents who Live in Cities with Population ≥ 30,000
Odds Ratio HEPA/Minimal Activity
1.8
1.6
1.4
1.2
1.0
0.8
0.6
Single Family Houses
Shops Near Home
Transit Stop Near Home
Sidewalks Present
Facilities to Bicycle
Low Cost Rec Facilities
Unsafe to Walk due to Crime
'Agree' with Environmental Characteristic ('Disagree' is referent)

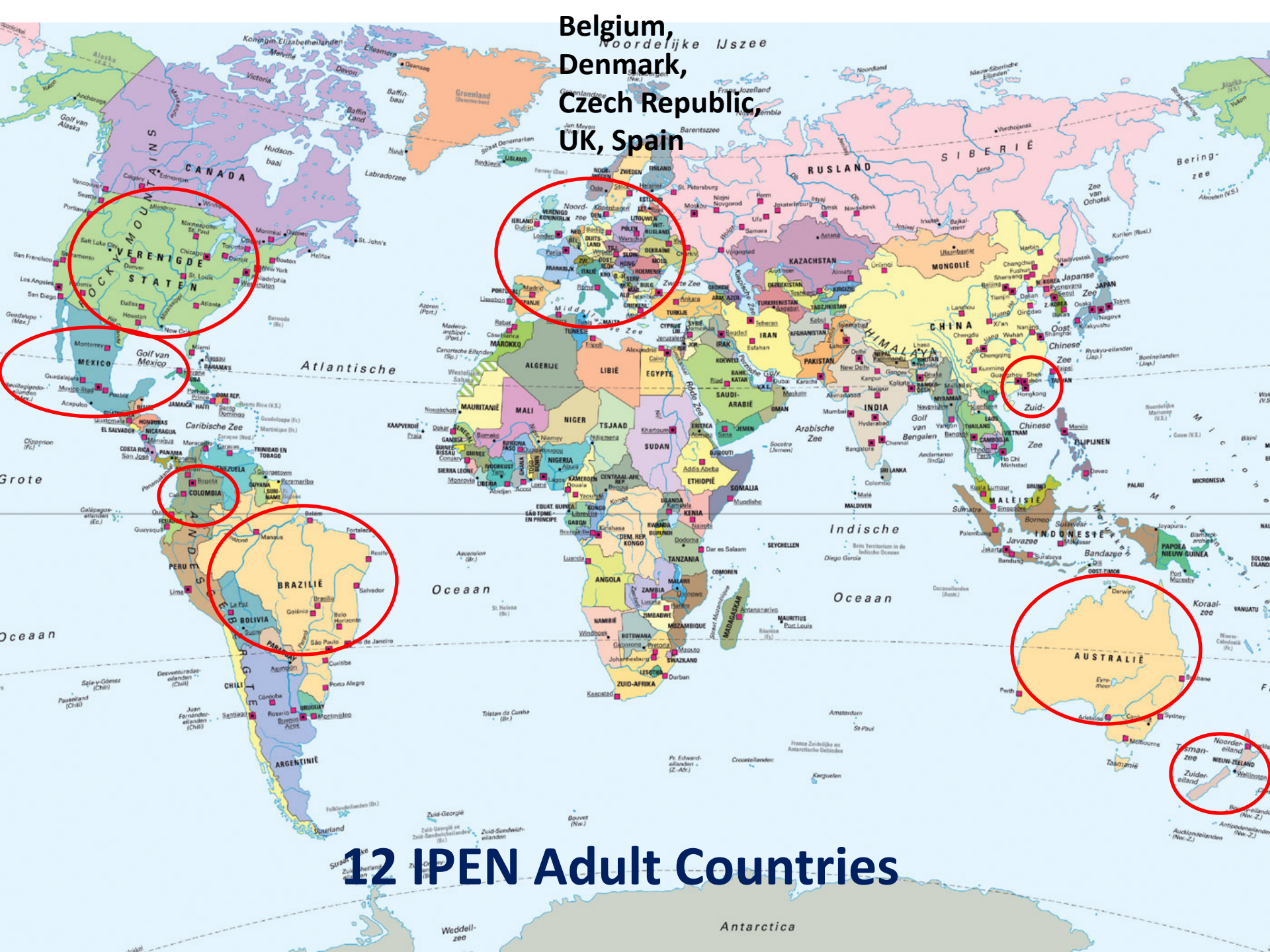
# Dose Response between Number of Environmental Characteristics and HEPA/Minimal Activity (Pooled City Sample)

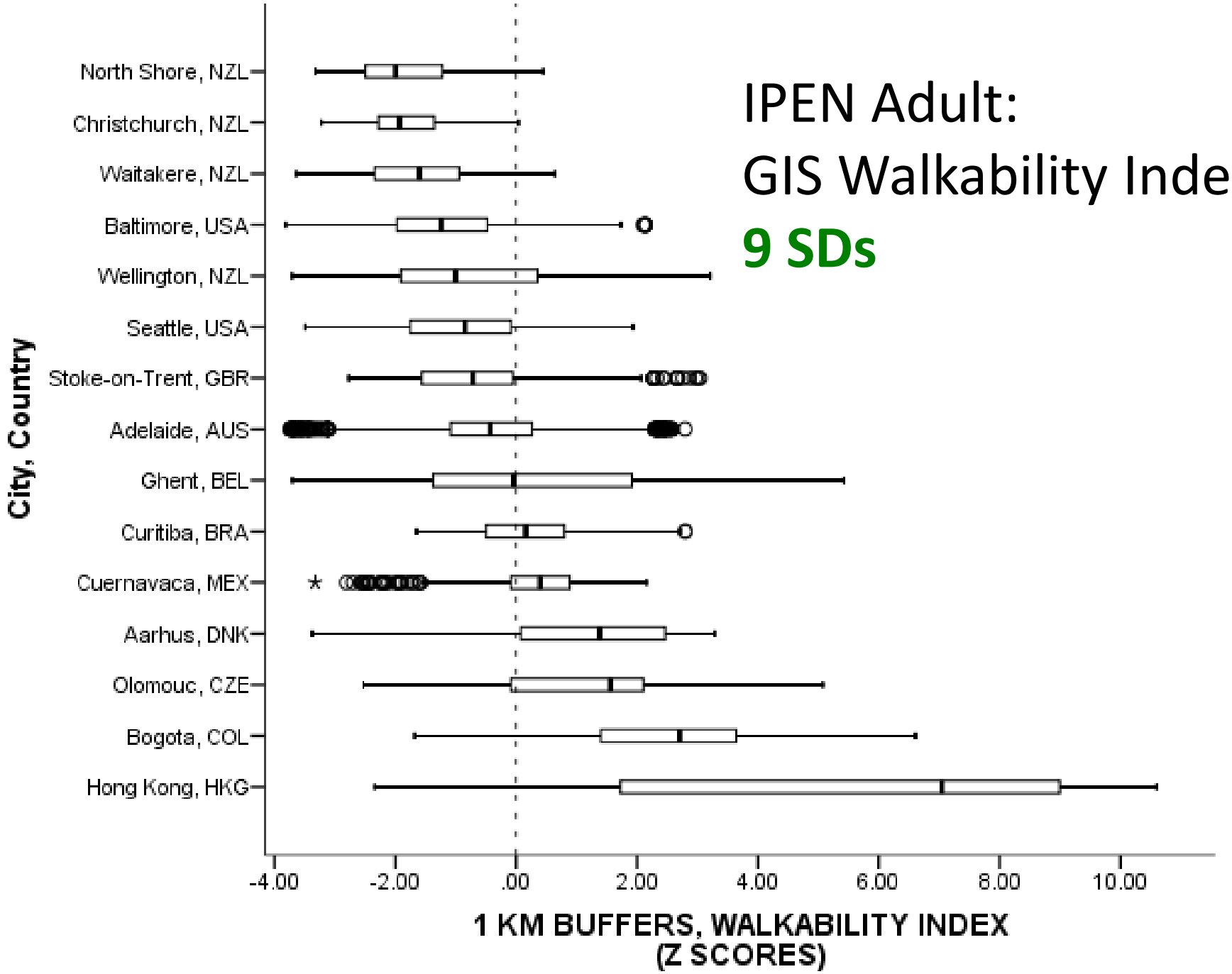



Sallis. Am J Prev Med. 06/09


# www.ipenproject.org

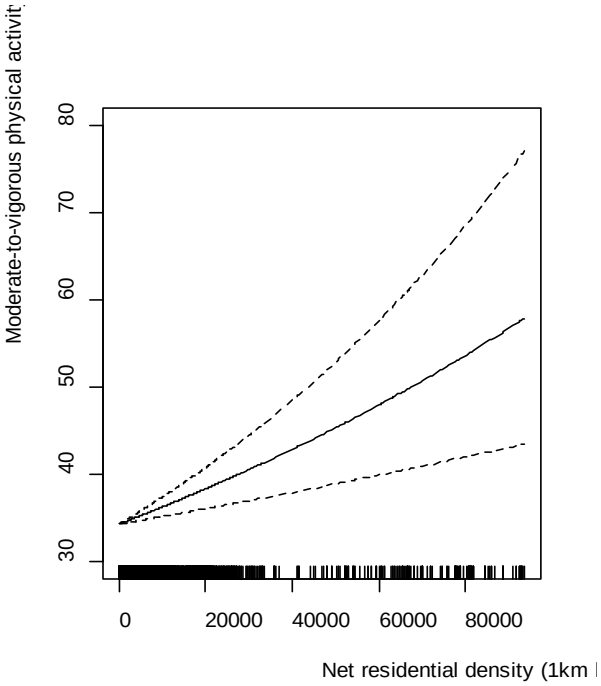
- Encourage environment and policy research on physical activity worldwide
- Develop & encourage use of common measures and methods
- Support investigators to obtain internal funding
- Coordinate international studies
  - IPEN Adult, funded by NCI
  - IPEN Adolescent, funded by NHLBI
- Communicate findings to decision makers

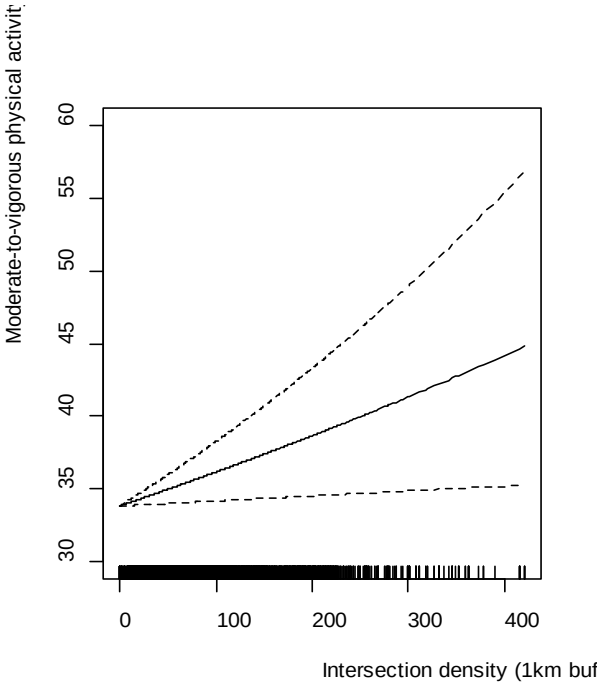

Belgium,
Denmark,
Czech Republic,
UK, Spain
12 IPEN Adult Countries

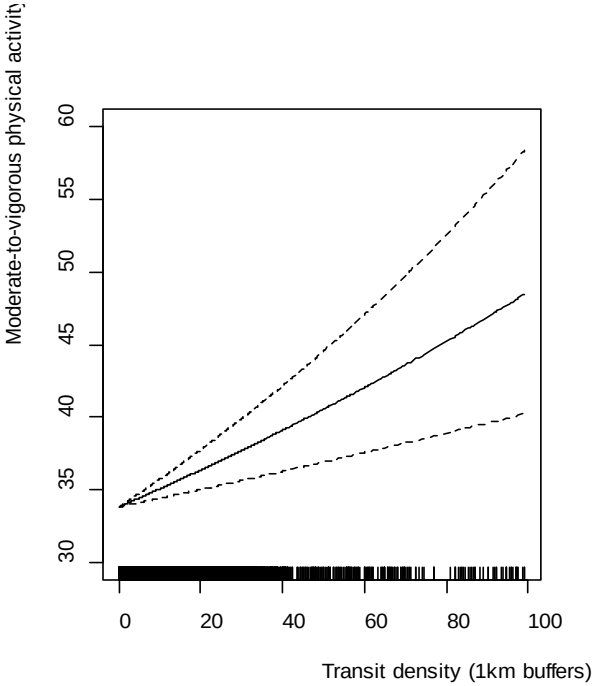

IPEN Adult:
GIS Walkability Index
9 SDs
City, Country
North Shore, NZL
Christchurch, NZL
Waitakere, NZL
Baltimore, USA
Wellington, NZL
Seattle, USA
Stoke-on-Trent, GBR
Adelaide, AUS
Ghent, BEL
Curitiba, BRA
Cuernavaca, MEX
Aarhus, DNK
Olomouc, CZE
Bogota, COL
Hong Kong, HKG
-4.00
-2.00
.00
2.00
4.00
6.00
8.00
10.00
1 KM BUFFERS, WALKABILITY INDEX
(Z SCORES)

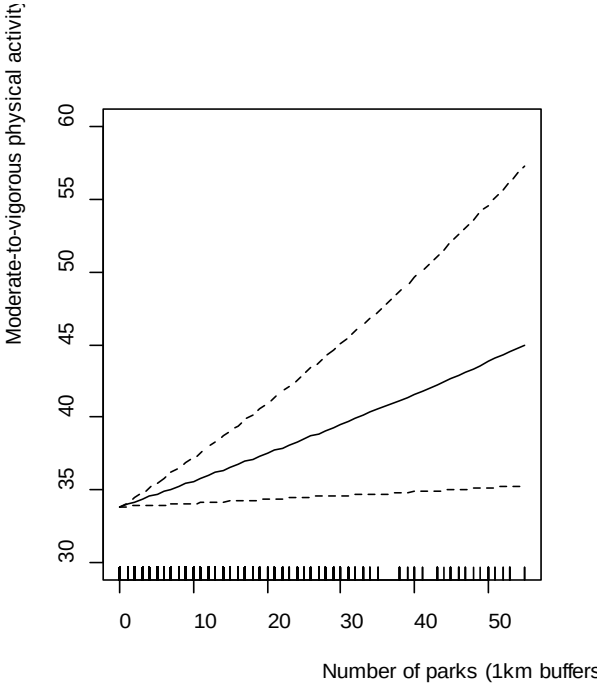
# Results: Environmental Attributes + MVPA Min/Week

| GIS-based Environmental Variable | Single variable model | Final adjusted model |
|---|---|---|
| Net residential density 1km | *** | *** |
| Intersection density 1km | * | NS |
| Mixed land use 1km (retail & civic) | NS | NS |
| Public transit density 1km | ** | * |
| Number of parks 0.5km | ** | * |




Associations of environmental variables based on 1 km buffers with accelerometry-based estimates of daily minutes of moderate-to-vigorous physical activity

# Comparing MVPA by Lowest & Highest Cities on Environmental Variables

- Adults living in the most activity-friendly cities did 68-89 more minutes of MVPA per week compared to those in the least activity-friendly cities
- Living in the most activity-friendly environments could help the average resident achieve 32-59% of the 150 minute/week physical activity guidelines

# Design of streetscapes matters

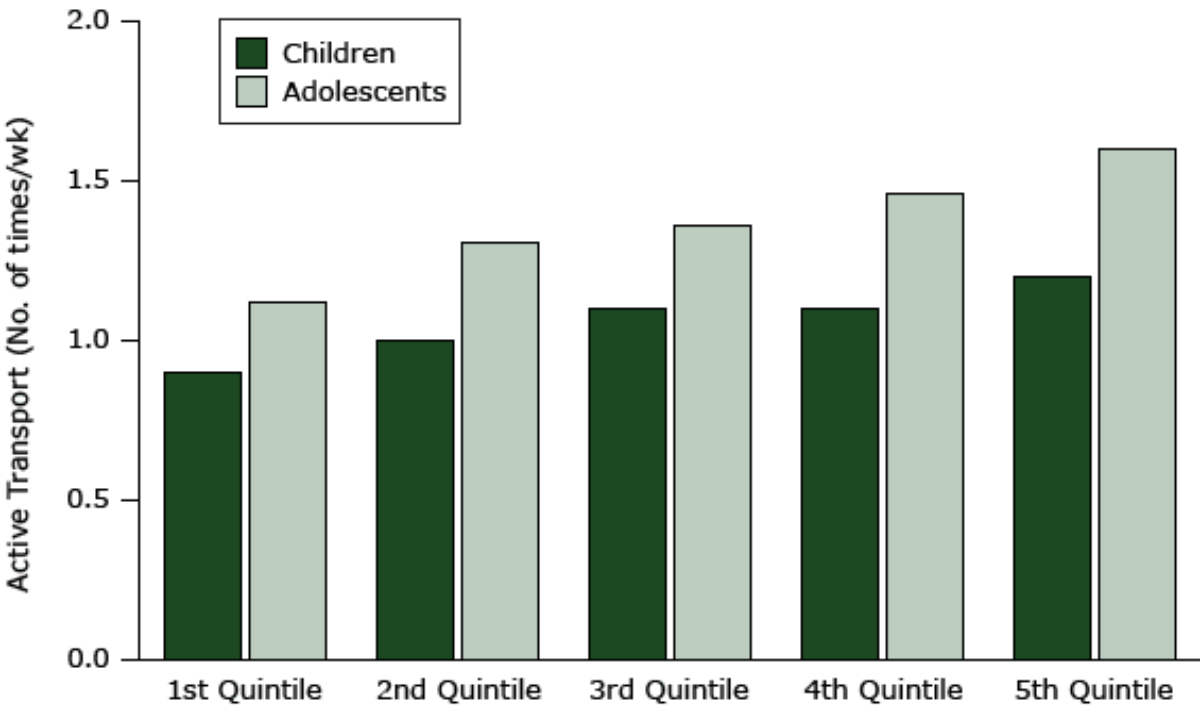
# What is the role of streetscape design? MAPS Mini

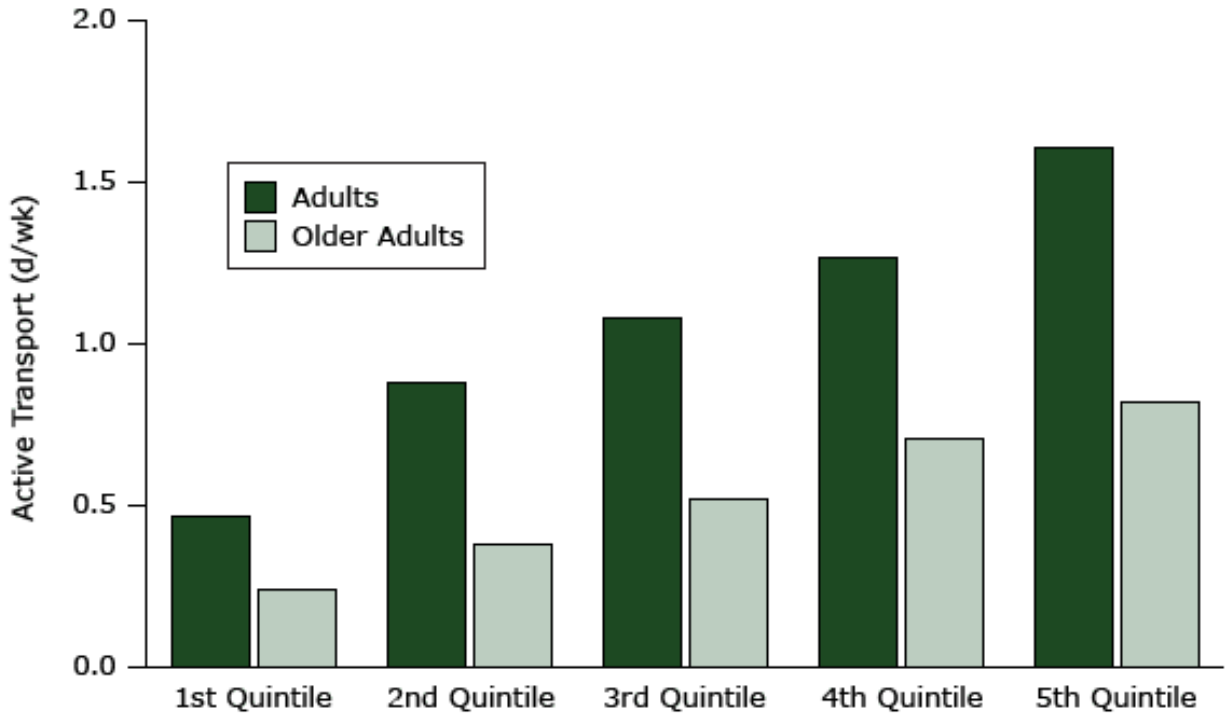
- **15-item MAPS-Mini was designed for practitioners and advocates**
  - Reduced from 120 items
- Items were selected based on
  - Correlations with physical activity
  - Guidelines and recommendations
  - Modifiability
- Evaluated for validity in 3677 children, teens, adults, older adults
  - 3 regions

# How do MAPS-Mini scores relate to active transportation? ADJUSTED

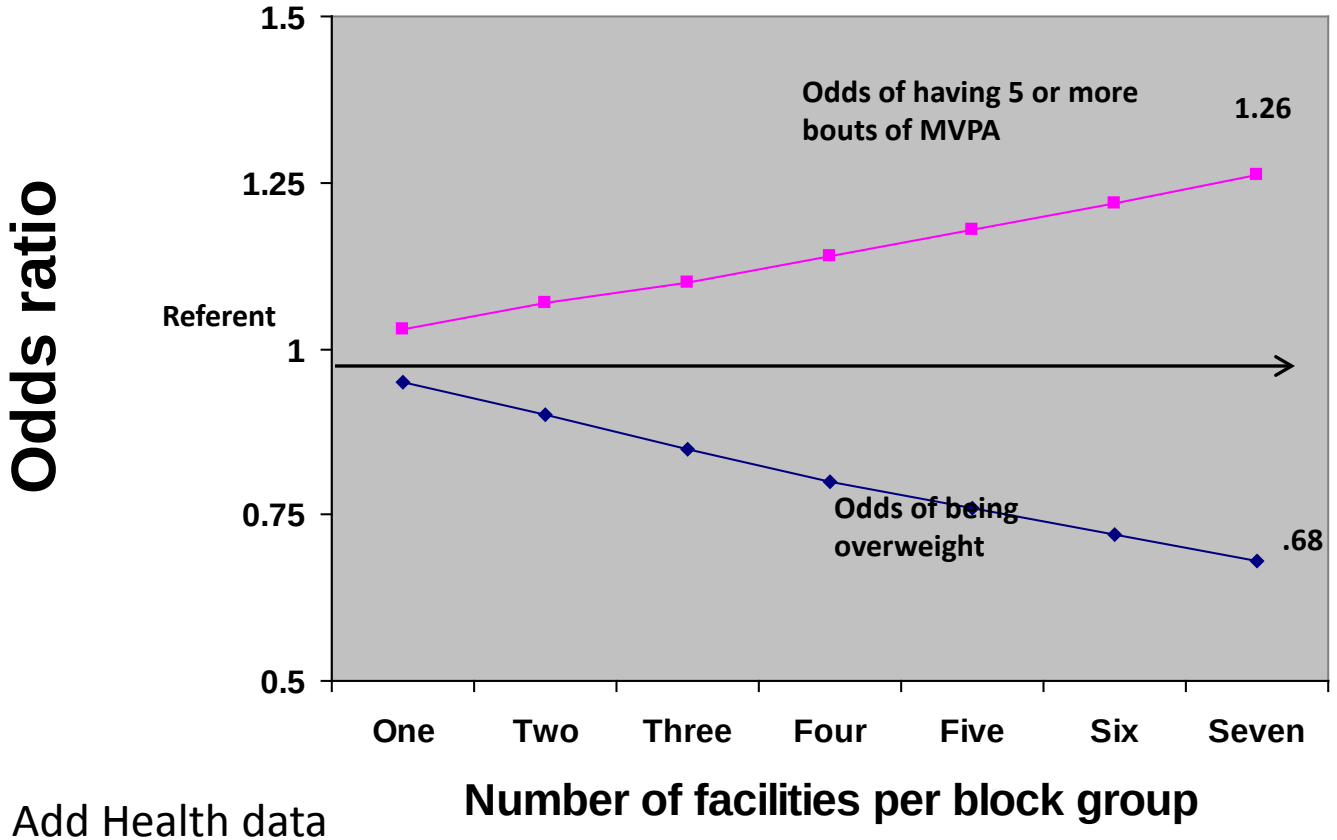
| MAPS Mini Score | Children | Adolescents | Adults | Seniors |
|---|---|---|---|---|
| Commercial Segments | | | | N/A |
| Public Parks | | | | |
| Transit Stops | | | | |
| Street Lights | | | | |
| Benches | | | | |
| Building Maintenance | | | | |
| Absence of Graffiti | | | | |
| Sidewalk | | | | |
| Buffer | | | | |
| Tree, Awning Coverage | | | | |
| Absence of Trip Hazards | | | | |
| Marked Crosswalk | | | | |
| Curb Cuts | | | | |
| Crossing Signal | | | | |
| GRAND SCORE | | | | |
| GRAND SCORE (for Active Transport) | | | | |

# Dose-response of MAPS-Mini total scores and active transport Frequency for 4 age groups



# A national study of US adolescents (N=20,745)* found a greater number of physical activity facilities is directly related to physical activity and inversely related to risk of overweight

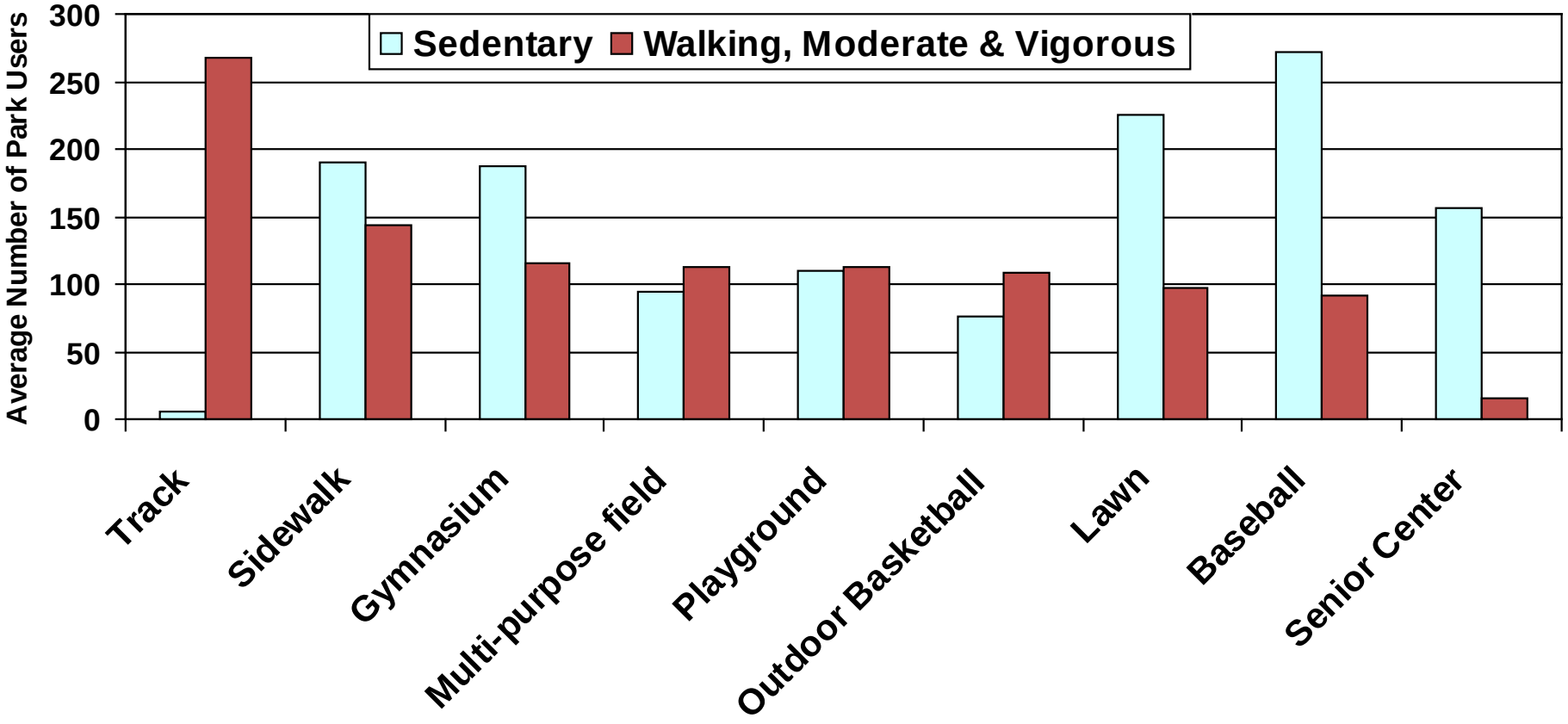



*using Add Health data

Gordon-Larsen et al, Pediatrics, 2006

http://www.pediatrics.org/cgi/content/full/117/2/417

# People are Most Active on Tracks and Walking Paths




Cohen. RAND

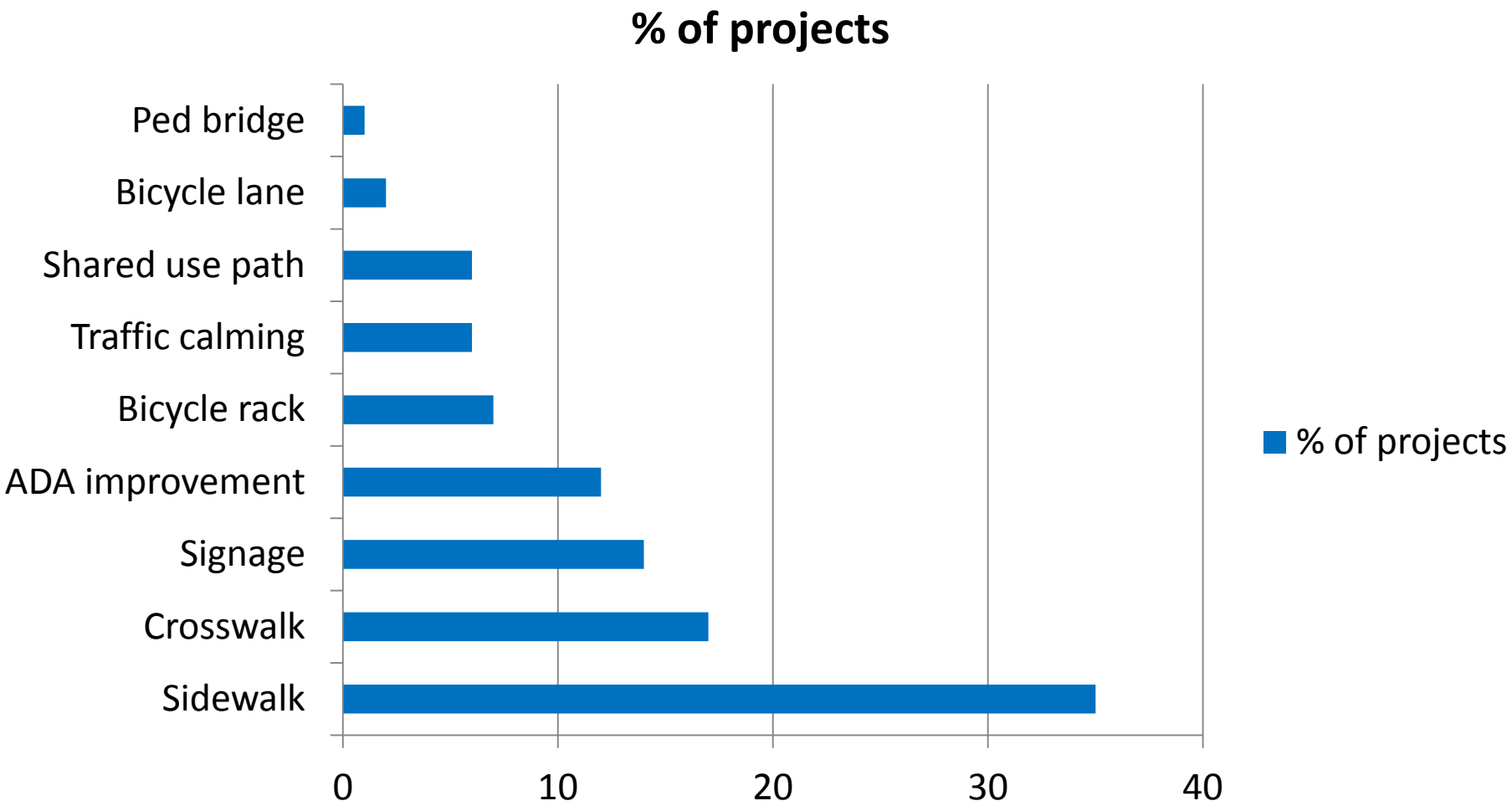
# Multistate Evaluation of Safe Routes to School Programs

*Orion Stewart, MUP; Anne Vernez Moudon, Dr Es Sc; Charlotte Claybrooke, MS*

American Journal of Health Promotion

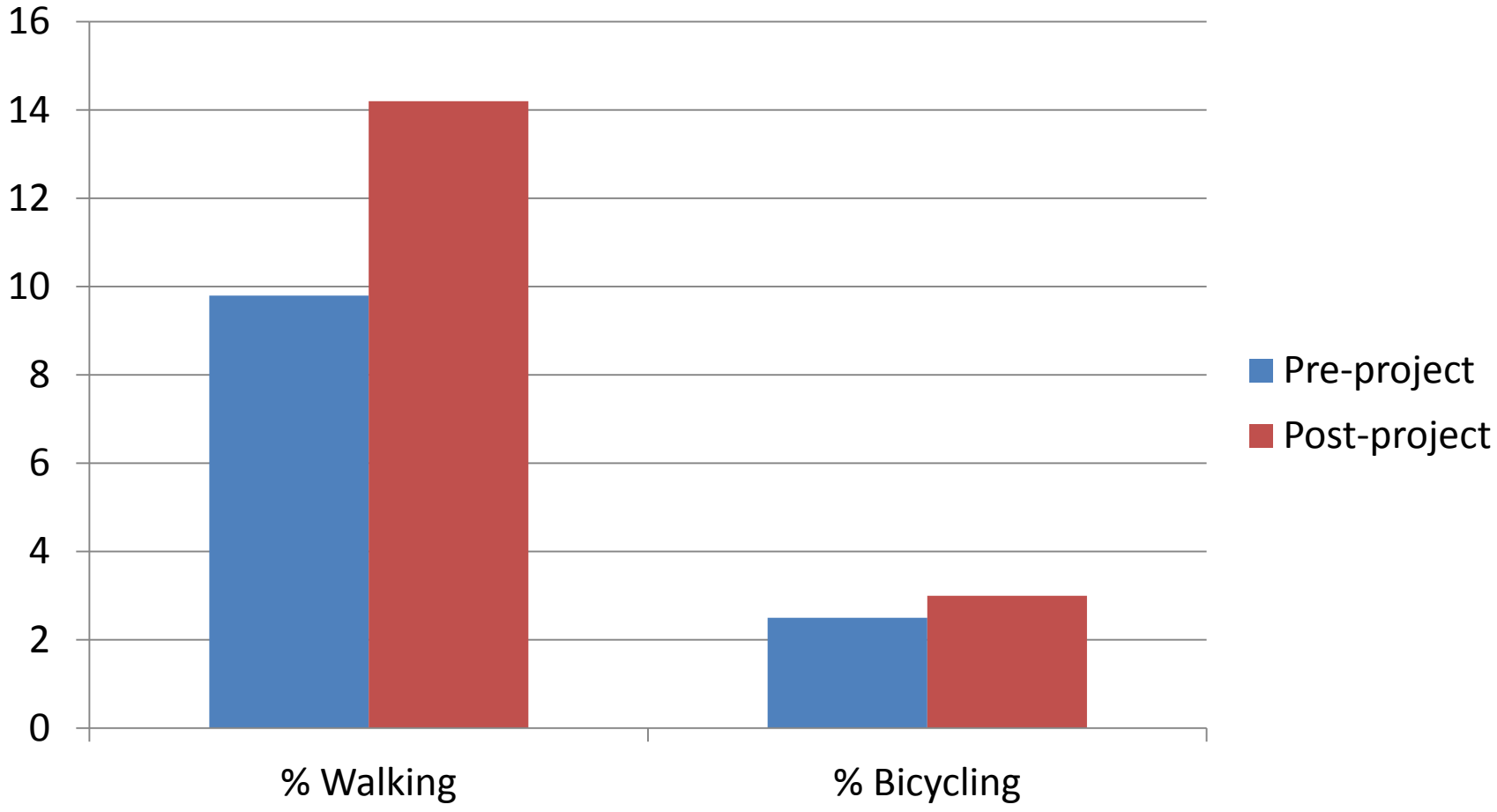
January/February 2014, Vol. 28, No. 3 Supplement S89

# % of SRTS Projects, By Type




Moving Forward: WASH DOT.
http://www.wsdot.wa.gov/research/reports/fullreports/743.3.pdf

# Walking & Cycling to School Pre & Post SRTS Projects in 5 States




Moving Forward: WASH DOT.

http://www.wsdot.wa.gov/research/reports/fullreports/743.3.pdf

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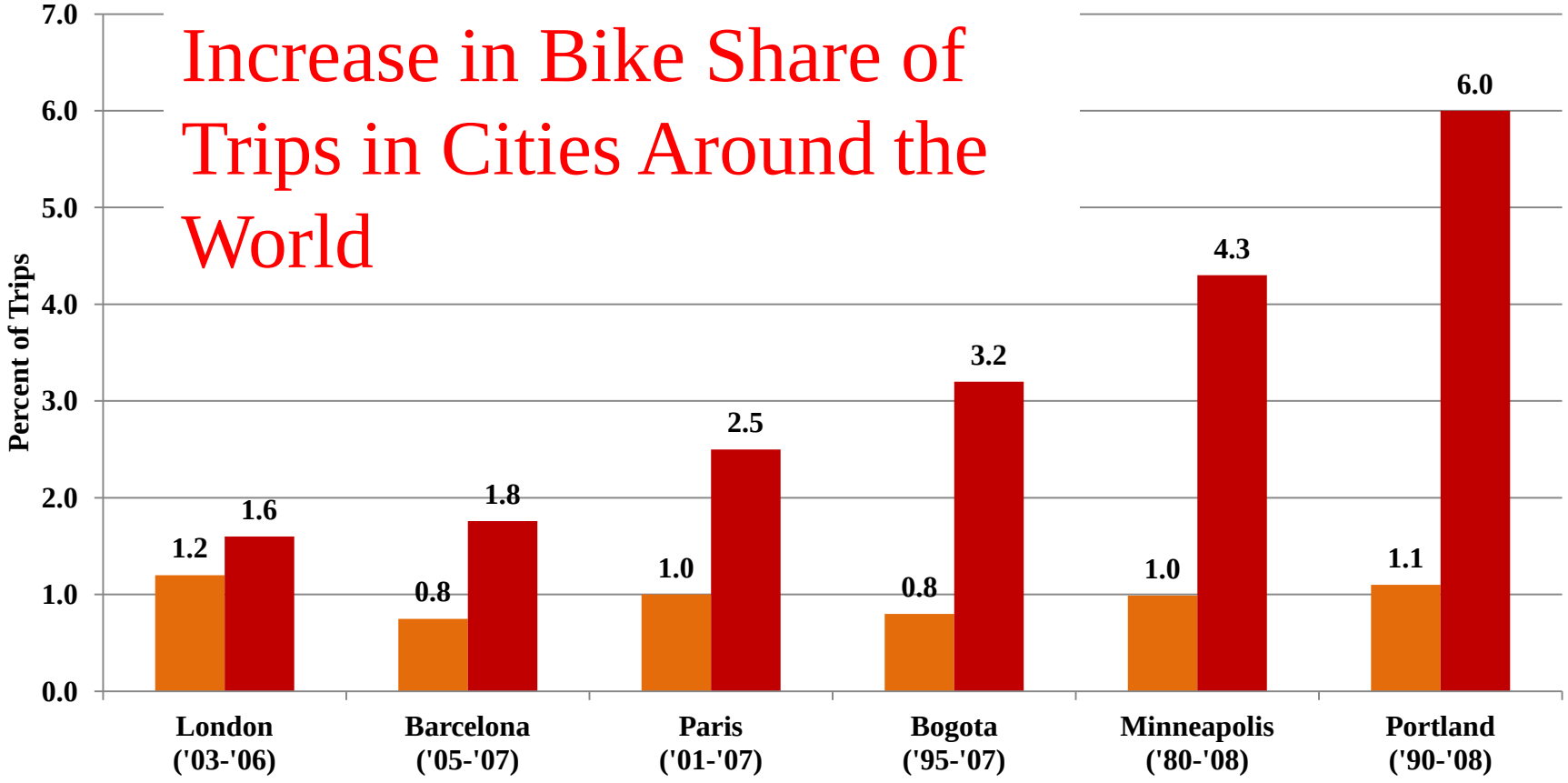
# Can we increase bicycling? According to controlled studies, single cycling interventions don't work

BMJ

## Interventions to promote cycling: systematic review

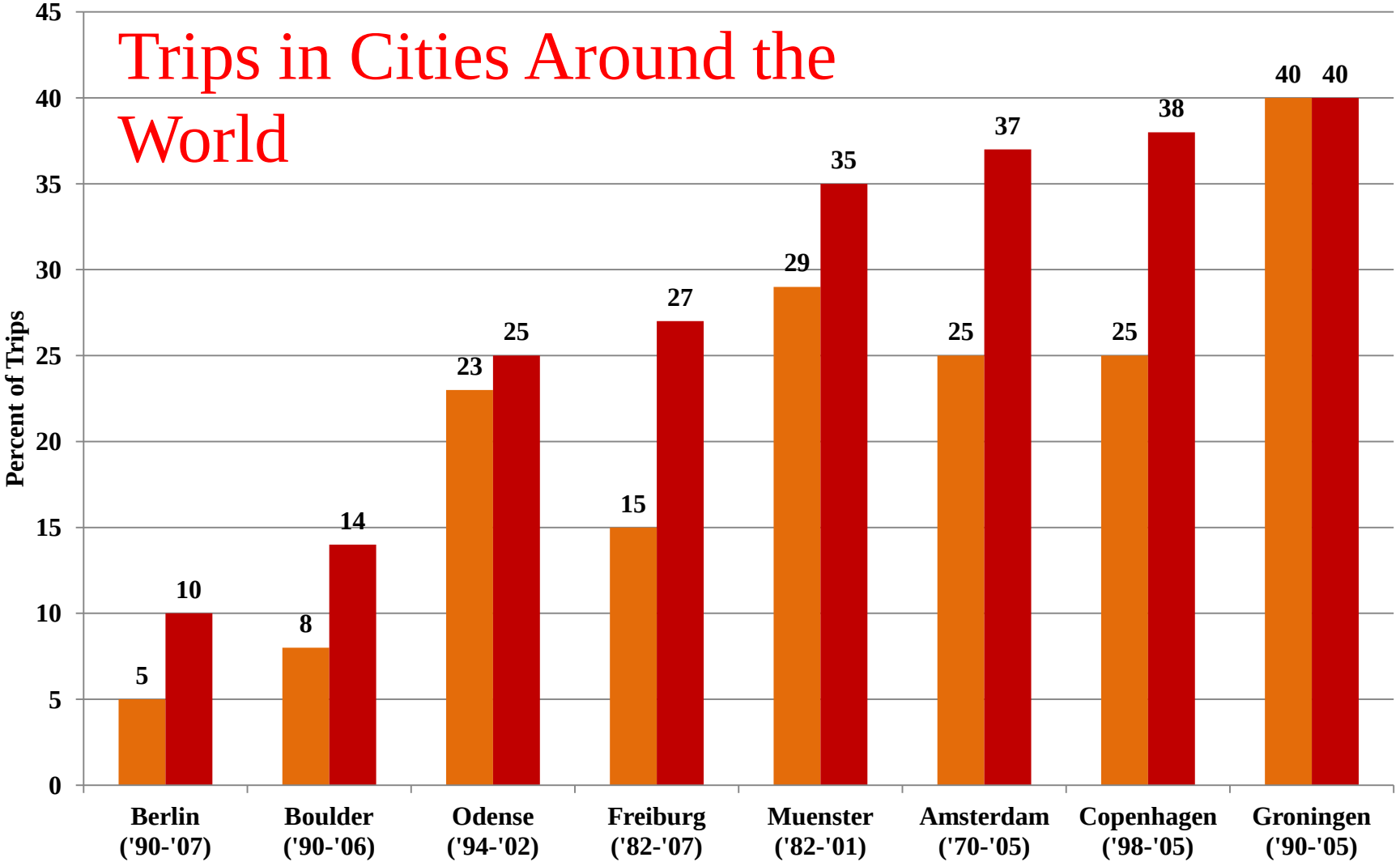
Lin Yang, PhD student Shannon Sahlqvist, career development fellow Alison McMinn, career development fellow Simon J Griffin, assistant director David Ogilvie, clinical investigator scientist

# Case studies of multi-level, multi-component, multi-year interventions suggest a different conclusion




**Source: Pucher, Dill, and Handy, "Infrastructure, Programs, and Policies to Increase Bicycling," *Preventive Medicine*, Jan 2010, Vol. 50, S.1, pp. S106-S125.**

# Increase in Bike Share of Trips in Cities Around the World




**Source: Pucher, Dill, and Handy, "Infrastructure, Programs, and Policies to Increase Bicycling," *Preventive Medicine*, Jan 2010, Vol. 50, S.1, pp. S106-S125.**

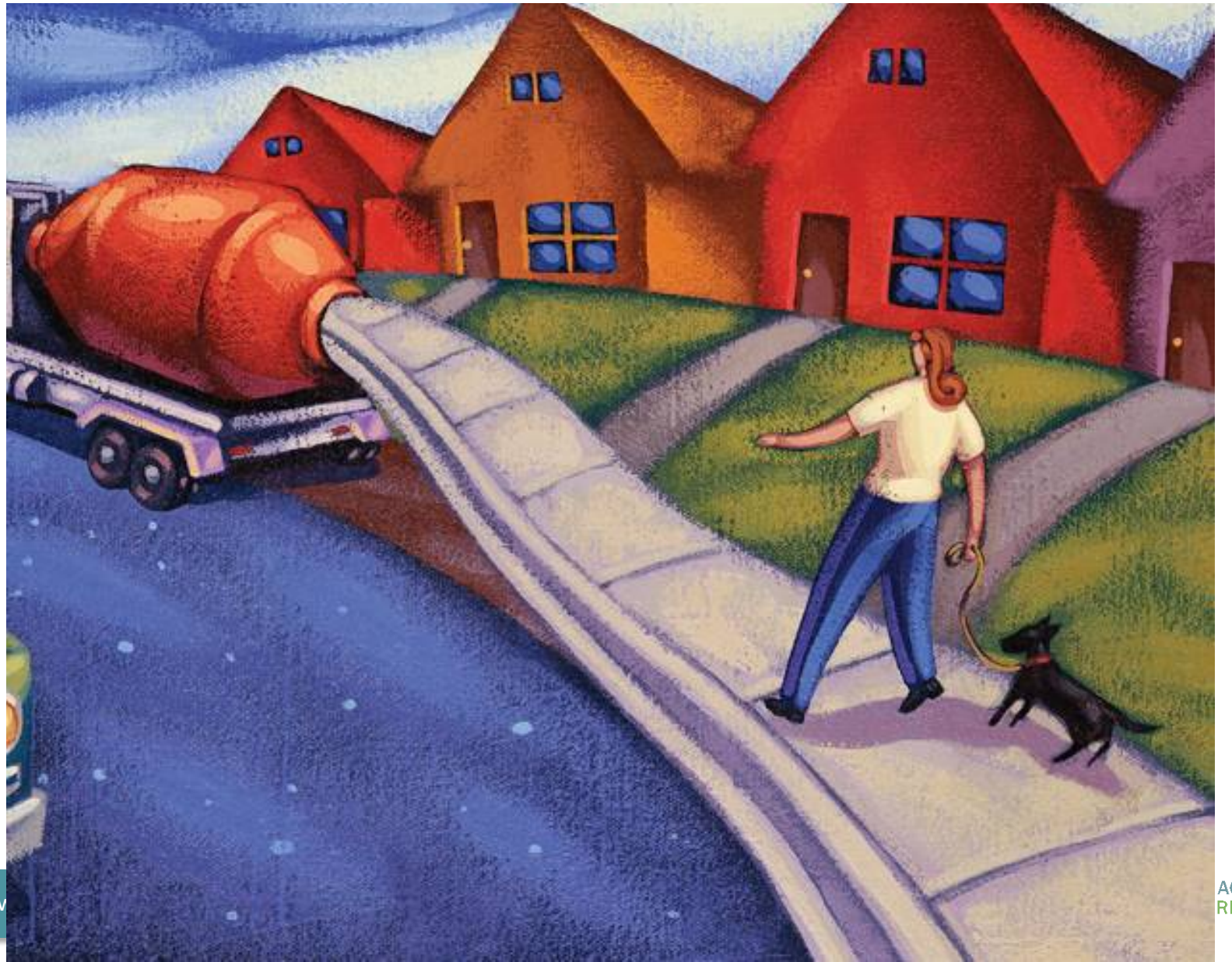
# Policy Recommendations

- Zoning/planning laws that require or favor mixed-use, high density development
- Change transportation goals
  - High quality pedestrian and bicycle facilities
- Count pedestrians and bicyclists
- More investment in active transport
- Parks in every neighborhood
- Parks designed to promote activity in all ages
- Invest first in lower-income neighborhoods

# Conclusions

- Active cities are designed with walkable neighborhoods, inviting streetscapes, proximal and well-designed parks, safe places to bicycle, and good access to public transit
- The more activity-friendly the city, the more physical activity
- The more activity-friendly the city, the more co-benefits, including economic
- Please advocate for a more active America, but how?

# Research is not easy to put into practice



# What info do policy makers & advocates need?

- Evidence relevant to CURRENT policy debates
- Evidence of what works
- Evidence relevant to local communities & populations at highest risk
- Evidence communicated in accessible ways
- Follow the money: how much does it cost & what is ROI?

# Co-Benefits of Designing Activity-Friendly Environments

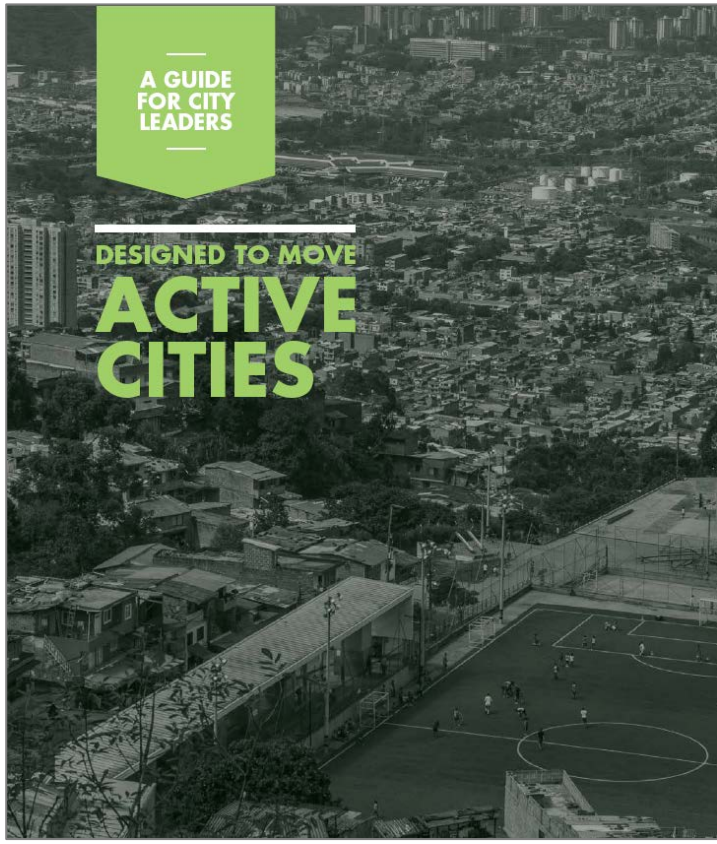
| | Physical Health | Mental Health | Social Benefits | Environmental Sustainability | Safety / Injury Prevention | Economic Benefits |
|---|---|---|---|---|---|---|
| **Open spaces / Parks / Trails** | 57.5+<br>3.5(0) | 93+ | 42.5+<br>4(0) | 20+<br>4(0) | 23+ | 19+<br>4(0) |
| **Urban Design** | 105+<br>54(0)<br>19- | 31+<br>4- | 80.5+<br>29(0) | 265.5+<br>45.5(0)<br>3.5- | 13.5(0)<br>18.5- | 69+<br>10.5(0)<br>4- |
| **Transport Systems** | 7+<br>3.5- | 3+<br>3.5(0) | 23+ | 70+<br>21(0)<br>3- | 67+<br>14(0)<br>4- | 56+<br>3.5(0)<br>4- |
| **Schools** | 19.5+<br>3.5(0) | 21+ | 11+ | 21.5+ | 4+<br>3- | 15+ |
| **Workplaces / Buildings** | 55+<br>3.5(0) | 18.5+<br>4- | | 20.5+ | | 48+<br>3.5(0) |

Sallis, J.F., et al. (2015). Co-benefits of designing communities for active living: An exploration of literature. **International Journal of Behavioral Nutrition and Physical Activity, 12:** 30.

# Designed to Move: Active Cities

**Blueprint for city leaders to create an active city**

- Comprehensive summary of the evidence base on co-benefits
- Proven interventions
- Recommendations, checklists, practical steps/ideas, sample metrics
- Talking points for city leaders
- Case studies of ‘bright spots’

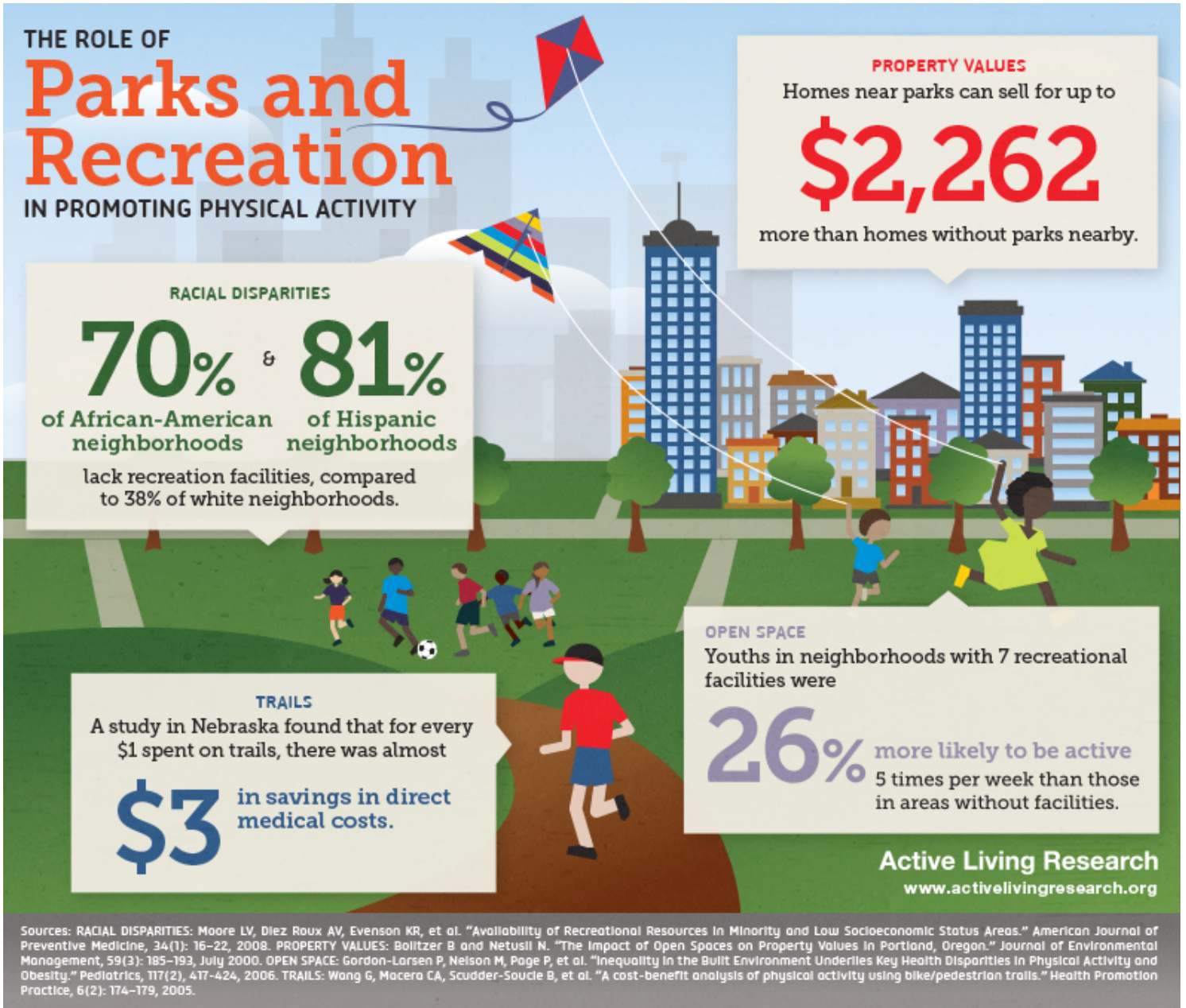



- www.designedtomove.org/resources

# ALR: Communicating Results to Non-Researchers

- Website: about 12,000 visits per month
  - Research briefs are widely downloaded
  - MOVE blog
- Webinar series: www.dialogue4health.org
- ALR electronic Newsletter to list of 5000+
- Facebook, Twitter, Youtube
- Partnerships, presentations

# Good feedback from infographics



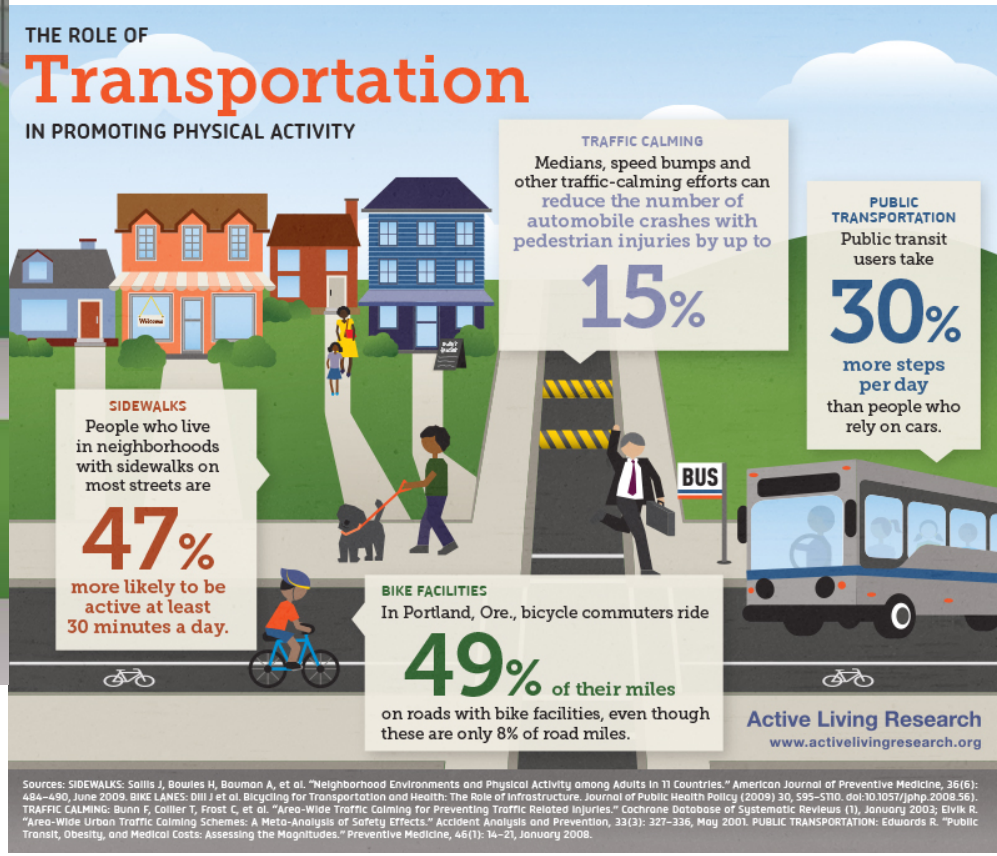
# Research Translation Grant: Active Transport to School: Keshia Pollack

- Audiences
  - School principals
  - City elected officials
  - City agency directors
  - School and City police
  - Community members
- Messages
  - Routes to school have physical hazards and violence
  - Feasible solutions are Walking School Buses, streetscape improvements
- Tactics
  - Package findings for key audiences.
  - Briefing with City Council.
  - Meeting with Schools and City Police.
  - Write Op Ed

# Lessons We Are Learning

- It is difficult to communicate research. Simplify results. Collaborate with communication professional/journalist
- Select researchers with interest & skill in communication. We consulted quarterly to provide frequent input.
- Some investigators are uncomfortable in translation role
- Create permanent products in multiple media
- Promote via traditional & new media
- Partnerships with key organizations, not just promotion
- Difficult to evaluate

# Resources at www.activelivingresearch.org

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