Active travel: why and how

Dr Jenna Panter
School of Clinical Medicine, University of Cambridge
Learning from experience
Evaluating infrastructure
Building the health case
Building the health case

Evaluating infrastructure

Learning from experience
Inactivity 'kills more than obesity'

By James Gallagher
Health editor, BBC News website
Inactivity 'kills more than obesity'

By James Gallagher

A lack of exercise could be killing twice as many people as obesity in Europe, a 12-year study of more than 300,000 people suggests.

University of Cambridge researchers said about 676,000 deaths each year were down to inactivity, compared with 337,000 from carrying too much weight.

They concluded that getting everyone to do at least 20 minutes of brisk walking a day would have substantial benefits.
Cycling to work

Adapted from Hallal et al., *Lancet* 2012b
Active travel and physical activity
Active travel and physical activity

Adjusted linear regression coefficients. N=1628

Sahlqvist et al., IJBNPA 2013
Commuting and body mass index
Commuting and body mass index

![Graph showing change in BMI (95% CI) for those who switched from car to another mode of transport. N = 3269. Adjusted linear regression coefficients.](image)

Martin et al., *J Epidemiol Community Health* 2015
Commuting and body mass index

Change in BMI (95% CI)

Switched from car
N=3269

Switched to car
N=787

Adjusted linear regression coefficients

Martin et al., J Epidemiol Community Health 2015
Physical activity on the multimodal commute
Physical activity on the multimodal commute

On average:

20% of the duration of each trip

Over half the weekly target

Costa et al., *Prev Med* 2015
Commuting and wellbeing
## Commuting and wellbeing

<table>
<thead>
<tr>
<th>Maintained cycling</th>
<th>Sickness absence</th>
<th>Mental wellbeing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.46 (0.14, 0.80)</td>
<td>1.50 (0.1, 2.10)</td>
</tr>
</tbody>
</table>

Odds ratios adjusting for sociodemographic variables, physical activity and physical limitation

“For physical activity, a strong case can be made that the science of how to understand individual behaviour change has overshadowed the efforts to understand true population-level change”

Kohl et al., Lancet 2012
Physical activity in the workplace

Public health guideline
Published: 28 May 2008
nice.org.uk/guidance/ph13
Physical activity and the environment

Public health guideline
Published: 23 January 2008
nice.org.uk/guidance/ph8
Health impacts of the Cambridgeshire Guided Busway: the Commuting and Health in Cambridge study

Ogilvie et al., BMC Public Health 2010
Panter et al., IJBNPA 2011
Jones & Ogilvie, IJBNPA 2012
Panter et al., PLoS ONE 2012
Yang et al., Prev Med 2012
Yang et al., BMC Public Health 2012
Carse et al., J Transport Geogr 2013
Panter et al., Prev Med 2013a
Guell et al., BMC Public Health 2013

Dalton et al., PLoS ONE 2013
Humphreys et al., Prev Med 2013
Jones et al., PLoS ONE 2013
Panter et al., Prev Med 2013b
Guell & Ogilvie, Qual Res 2013
Kesten et al., BMC Public Health 2014
Tully et al., PLoS ONE 2014
Panter et al., Prev Med 2014
Panter et al., IJBNPA 2014
Dalton et al., J Transport Health in press
Heinen et al., J Transport Health in press
"I hurt myself quite badly and now my wife won’t let me cycle in town, she says it’s too dangerous."

[Cycling] is probably the most dangerous thing I do but well I read the statistics and it’s more dangerous not to cycle from the health point of view!
Trends in active commuting

Median duration (min·wk$^{-1}$)

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>120</td>
</tr>
<tr>
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<td>100</td>
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## Trends in active commuting

<table>
<thead>
<tr>
<th>Activity</th>
<th>Median duration (min·wk(^{-1}))</th>
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<tbody>
<tr>
<td>Active commuting</td>
<td>120     \quad 100</td>
</tr>
<tr>
<td>Cycling</td>
<td>70      \quad 40</td>
</tr>
</tbody>
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<table>
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<th>Year</th>
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Effects on commute mode share
Effects on commute mode share

Car only  Any active
Effects on commute mode share

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<th>Car only</th>
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<tr>
<td>Large decrease</td>
<td>2.09 (1.35, 3.21)</td>
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Adjusted relative risk ratios (95% confidence intervals) for >30% increase in proportion of commute trips per unit of proximity (square root of distance) to busway. N=469

Heinen et al., IJBNPA 2015
## Effects on commute mode share

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Adjusted relative risk ratios (95% confidence intervals) for >30% increase in proportion of commute trips per unit of proximity (square root of distance) to busway. N=469

Heinen et al., IJBNPA 2015
4 km  80% more likely  1 km
80% more likely

4 km vs. 1 km

9 km vs. 4 km
Effects on cycling and walking time
## Effects on cycling and walking time

<table>
<thead>
<tr>
<th></th>
<th>Cycling</th>
<th>Walking</th>
</tr>
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<tbody>
<tr>
<td>Commuting</td>
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Adjusted relative risk ratios (95% confidence intervals) for an increase in weekly duration of the given behaviour per unit of proximity (square root of distance) to busway. N=469  

## Effects on cycling and walking time

<table>
<thead>
<tr>
<th>Commuting</th>
<th>Cycling</th>
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<tr>
<td></td>
<td>1.34</td>
<td>0.90</td>
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<td></td>
<td>(1.03, 1.76)</td>
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Adjusted relative risk ratios (95% confidence intervals) for an increase in weekly duration of the given behaviour per unit of proximity (square root of distance) to busway. N=469

34% more likely
### Effects on cycling and walking time

<table>
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<tr>
<th>Activity</th>
<th>RRR (95% CI)</th>
<th>Mean increase</th>
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<tr>
<td>Cycling</td>
<td>1.34 (1.03, 1.76)</td>
<td>+86 min·wk⁻¹</td>
</tr>
<tr>
<td>Walking</td>
<td>0.90 (0.69, 1.18)</td>
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Adjusted for age, sex, education, car ownership, home ownership, children, health condition, body mass index, urban-rural classification, distance to work, car parking provision at work, baseline level of active commuting and home or work relocation.

## Effects on cycling and walking time

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<tr>
<td>Commuting plus recreation</td>
<td>1.32 (1.04, 1.68)</td>
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Adjusted for age, sex, education, car ownership, home ownership, children, health condition, body mass index, urban-rural classification, distance to work, car parking provision at work, baseline level of active commuting and home or work relocation.

Impact of CONstructing Non-motorised Networks and Evaluating Changes in Travel

Ogilvie et al., *Am J Public Health* 2011
Sahlqvist et al., *BMC Med Res Methodol* 2011
Powell et al., *Built Environ* 2011
Ogilvie et al., *BMJ Open* 2012
Sahlqvist et al., *Prev Med* 2012
Goodman et al., *Environ Health* 2012
Brand et al., *Appl Energy* in press
Bird et al., *Health Psychol* in press
Connect2 case study sites

Ogilvie et al., BMJ Open 2012
Effects of Connect2
Effects of Connect2

Change (min·wk⁻¹, 95% CI)

Walking and cycling
Overall PA

One year
N=1796

4.6
4.3

Adjusted linear regression coefficients per kilometre of proximity
Goodman et al., *Am J Public Health* 2014
Adjusted linear regression coefficients per kilometre of proximity

Effects of Connect2

Walking and cycling
Overall PA
Walking and cycling
Overall PA

One year
Two years

Change (min·wk$^{-1}$, 95% CI)

N=1796
N=1465

4.6
4.3
15.3
12.5

Goodman et al., *Am J Public Health* 2014
Building the health case
Evaluating infrastructure
Learning from experience
Trends in active commuting

Panter et al., under review

Median duration (min·wk$^{-1}$)

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He said ‘I wanted to hate it’ because of all the bad publicity... But then when he tried it he really liked it... He wouldn’t use other public transport – it’s unreliable. He’s told his friends how good it is.

For people like me, who used to have a good bus service, it’s frustrating that now it’s slower and you can’t always get a seat.

Jones et al., PLoS ONE 2013
I could almost be in the Netherlands... lovely wide cycle path alongside the Cambridgeshire guided busway.

Cyclists have been injured in accidents caused by a lack of lighting on the track next to the guided busway, it is claimed.  

Kesten et al., BMC Public Health 2014
Effects of Connect2

Increase in perceived supportiveness of environment → Use of C2 → Increase in time spent walking and cycling

Proximity to C2
Effects of Connect2

Increase in perceived supportiveness of environment → Use of C2

Proximity to C2 → Increase in time spent walking and cycling

Panter et al., BMJ Open 2015
Use of Connect2

- Walking: 85%
- Cycling: 32%
- Transport: 18%

Percentage of users who reported each type of use at two-year follow-up

Goodman et al., *Prev Med*
Effects of Connect2

Percent using Connect2 (95% CI)

Walking and cycling at baseline (min·wk⁻¹)
Effects of Connect2

Change (min·wk⁻¹, 95% CI)

Proximity (km)

Car
No car

p < 0.007 for interaction
## Effects of the busway

<table>
<thead>
<tr>
<th>Active commuting</th>
<th>Least active</th>
<th>Most active</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>1.76 (1.16, 2.67)</td>
<td>2.18 (0.69, 7.02)</td>
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Adjusted linear regression coefficients per kilometre of proximity

Uptake of walking

Odds ratio (95% CI)

More than 2km from Connect2

Up to 2km from Connect2

Adjusted odds ratio

Panter and Ogilvie, ICPAPH 20
Connect2 case study sites

Sahlqvist et al., IJBNA 2015
“For physical activity, a strong case can be made that the science of how to understand individual behaviour change has overshadowed the efforts to understand true population-level change”

Kohl et al., Lancet 2012
“... The job for government and its partners at a national and local level is to transform the environment so that it is less inhibiting of healthy lifestyles.”

*Healthy lives, healthy people: a call to action on obesity in England. Department of Health, 2011*
The Physical Activity and Public Health research programme is supported by the Medical Research Council, and the research described in this talk was carried out as part of the Centre for Diet and Activity Research (CEDAR), a UKCRC Public Health Research Centre of Excellence funded by the British Heart Foundation, Economic and Social Research Council, Medical Research Council, National Institute for Health Research (NIHR) and Wellcome Trust under the auspices of the UK Clinical Research Collaboration.

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The views expressed are those of the author and not necessarily those of the NHS, the NIHR or the Department of Health.

For further information please visit:

www.cambridgecommutingstudy.org.uk
www.iconnect.ac.uk
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