



Cycling: The Public Health perspective

Nick Cavill PhD

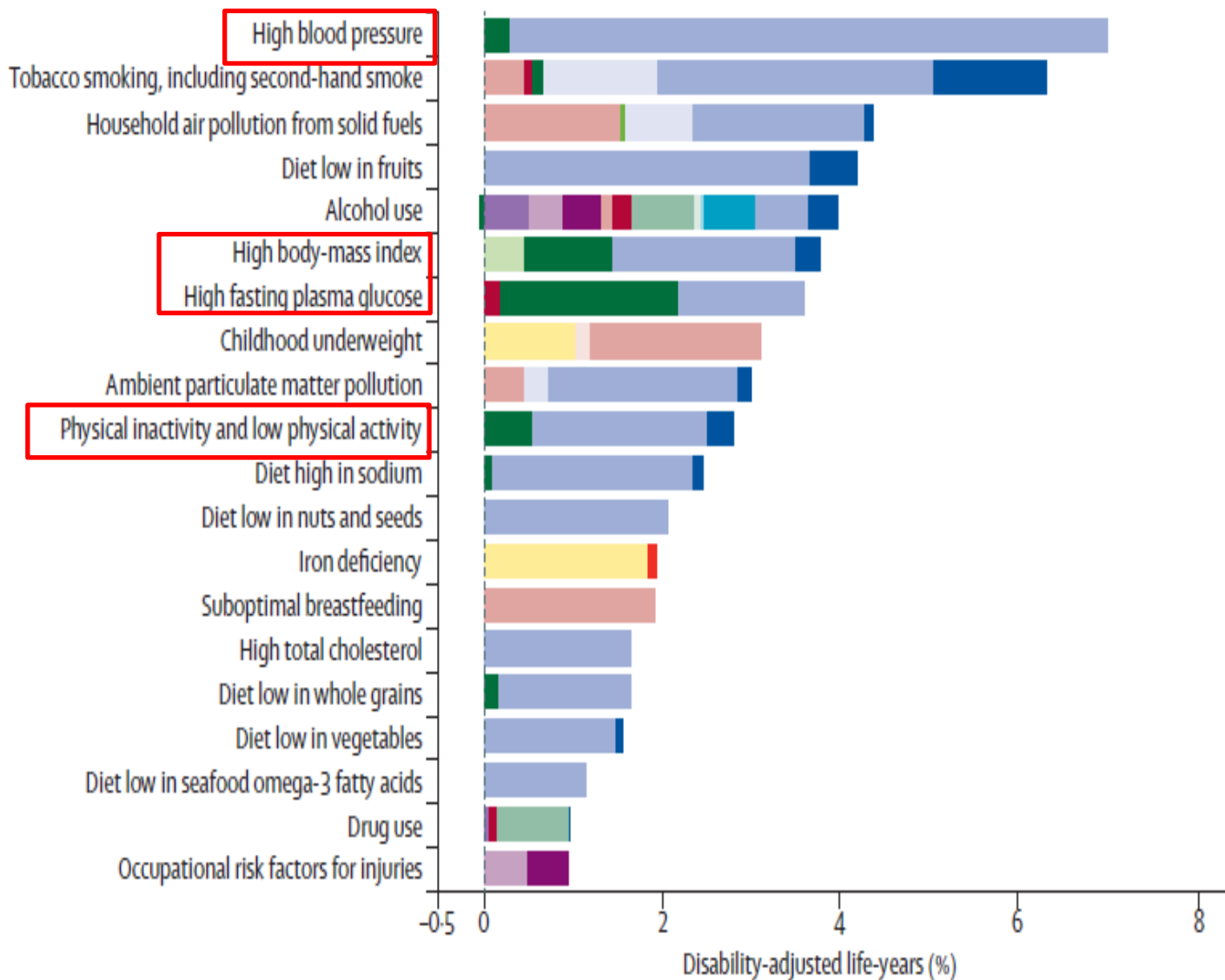
(Selected pictures by Mikael Colville Andersen with permission)

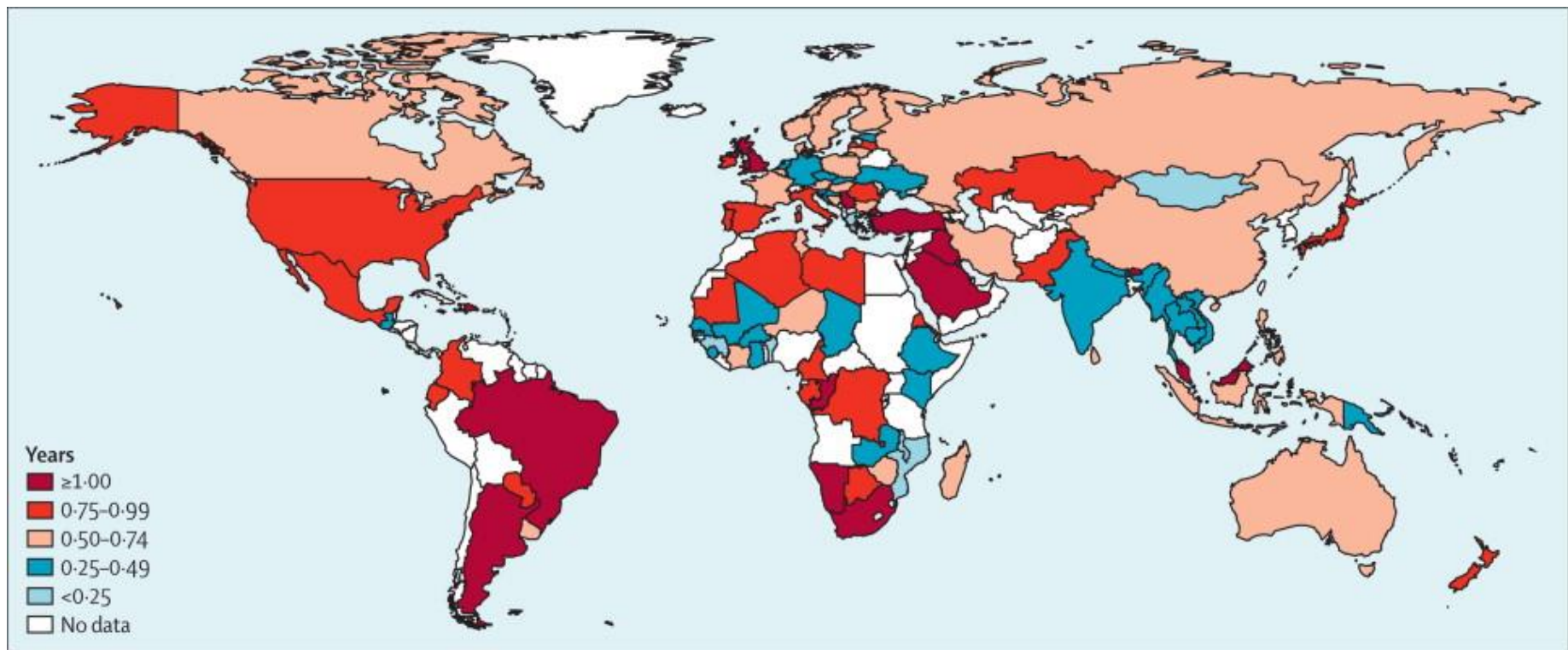
cavill ASSOCIATES

public health consultancy

Disease burden attributable to physical inactivity in comparison with other risk factors in 2010

(Lim et al, *Lancet*, 2012; 380: 2224-60,)





Estimated gains in life expectancy worldwide with elimination of physical inactivity

I-Min Lee, Eric J Shiroma, Felipe Lobelo, Pekka Puska, Steven N Blair, Peter T Katzmarzyk. **Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy.** *Lancet*. Volume 380, Issue 9838, 2012, 219–229



**I don't ride a bike to
add days to my life.
I ride a bike to
add life to my days!**

Cycling: systematic review

Scand J Med Sci Sports 2011
doi: 10.1111/j.1600-0838.2011.01299.x

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SCANDINAVIAN JOURNAL OF
MEDICINE & SCIENCE
IN SPORTS

Review

Health benefits of cycling: a systematic review

P. Oja¹, S. Titze², A. Bauman³, B. de Geus⁴, P. Krenn², B. Reger-Nash⁵, T. Kohlberger²

These studies suggest that there is a clear positive dose–response relationship between the amount of cycling and health outcomes: fitness improvement increases and the risk of all-cause mortality, CVD and colon cancer morbidity, and incidence of overweight and obesity decrease with increasing amount of daily cycling.

CAFE BAR

Opportunità
Salsiccia Cinghiale
Salsiccia Tacchino 14,00
Pancetta Prosciutto 14,00
Pasta Tortiglioni 14,00
Pasta di Penne 14,00
Pasta di Farfalle 14,00
Pasta di Conchiglie 14,00
Pasta di Farfalle 14,00

Stacco Salsiccia
P.F. 14,00
L'Ortolano Cinghiale 14,00
Salsiccia di Penne 14,00
Salsiccia di Conchiglie 14,00
Pasta di Farfalle 14,00
Pasta di Conchiglie 14,00
Pasta di Farfalle 14,00

A Goutte d'Or
Café
G



NON COMMUNICABLE DISEASE PREVENTION: Investments that Work for Physical Activity

A complementary document to
The Toronto Charter for Physical Activity: A Global Call to Action

Physical inactivity is the fourth leading cause of deaths due to non-communicable diseases (NCDs) worldwide - heart disease, stroke, diabetes and cancers - and each year contributes to over three million preventable deaths.¹ Physical inactivity is related (directly and indirectly) to the other leading risk factors for NCDs such as high blood pressure, high cholesterol and high glucose levels; and, to the recent striking increases in childhood and adult obesity, not only in developed countries but also in many developing countries. Substantial scientific evidence supports the importance of physical inactivity as a risk factor for NCD independent of poor diet, smoking and alcohol misuse.

Physical activity has comprehensive health benefits across the lifespan: It promotes healthy growth and development in children and young people, helps to prevent unhealthy mid-life weight gain, and is important for healthy ageing, improving and maintaining quality of life and independence in older adults.

The most recent global estimates indicate that 60% of the world population are exposed to health risks due to inactivity.² Increasing population-wide participation in physical activity is a major health priority in most high and middle income countries and is a rapidly-emerging priority in lower income countries experiencing rapid social and economic transitions.

The *Toronto Charter for Physical Activity* (May 2010) outlines the direct health benefits and co-benefits of investing in policies and programs to increase levels of physical activity.³ Already translated into 11 languages, the Toronto Charter makes a strong case for increased action and greater investment on physical activity as part of a comprehensive approach to NCD prevention. The Charter was developed with extensive world-wide

stakeholder consultation and calls for action in four key areas consistent with the WHO Global Strategy for Diet and Physical Activity: 1) national policy; 2) policies and regulations; 3) programs and environments; and 4) partnerships.

There is strong evidence to guide the implementation of effective approaches to increase physical activity.^{4,5,6} Reversing downward trends in physical activity will require countries to commit to a combination of strategies aimed at the individual, social-cultural, environmental and policy determinants of inactivity. Physical activity is influenced by policies and practices in education, transportation, parks and recreation, media, and business, so multiple sectors of society need to be involved in the solutions. There is the clear need to inform, motivate and support individuals and communities to be active in ways that are safe, accessible and enjoyable. **There is no one single solution to increasing physical activity, an effective comprehensive approach will require multiple concurrent strategies to be implemented.** To support countries ready to respond, there are seven "best investments" for physical activity, which are supported by good evidence of effectiveness and that will have worldwide applicability.



Whole-of-community approaches where people live, work and recreate have the opportunity to mobilize large numbers of people.

1 'Whole-of-school' programs

2 Transport policies and systems that prioritise walking, cycling and public transport

3 Urban design regulations and infrastructure that provide for equitable and safe access for recreational physical activity, and recreational and transport-related walking and cycling across the life course

4 Physical activity and NCD prevention integrated into primary health care systems

5 Public education, including mass media to raise awareness and change social norms on physical activity

6 Community-wide programs involving multiple settings and sectors and that mobilize and integrate community engagement and resources

7 Sports systems and programs that promote 'sport for all' and encourage participation across the life span.



PRINT

VIDEO

Mulder

ZONE
30

Contrasts in active transport behaviour across four countries: how do they translate into public health benefits?

Götschi T¹, Tainio M², Maizlish N³, Schwanen T⁴, Goodman A⁵, Woodcock J⁶.

Substantial population health benefits would accrue if people in England and Wales gained as much transport related physical activity as people in Switzerland or the Netherlands, whilst smaller but still considerable harms would occur if active travel fell to the level seen in California. The benefits from achieving the travel patterns of the high cycling Netherlands or high walking Switzerland were similar











Benefits and risks: modelling

EPIDEMIOLOGY

De Hartog et al, 2011

Epidemiology:

January 2011 - Volume 22 - Issue 1 - pp S76-S77

doi: 10.1097/01.ede.0000391897.18320.1d

Abstracts: ISEE 22nd Annual Conference, Seoul, Korea, 28 August-1 September 2010: Travel-time Air Pollution Exposure, Energy Expenditure, and Health Outcomes: Use of New Technologies and Results

Conclusion:

The health benefits of cycling are 11 times larger than the risks relative to car driving for the individual subjects shifting mode of transport. Societal benefits are even larger due to a modest reduction in air pollution emissions and traffic accidents.

Benefits and risks: modelling

Transport Policy 19 (2012) 121–131



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journal homepage: www.elsevier.com/locate/tranpol



Benefits of shift from car to active transport

Ari Rabl^{a,*}, Audrey de Nazelle^b

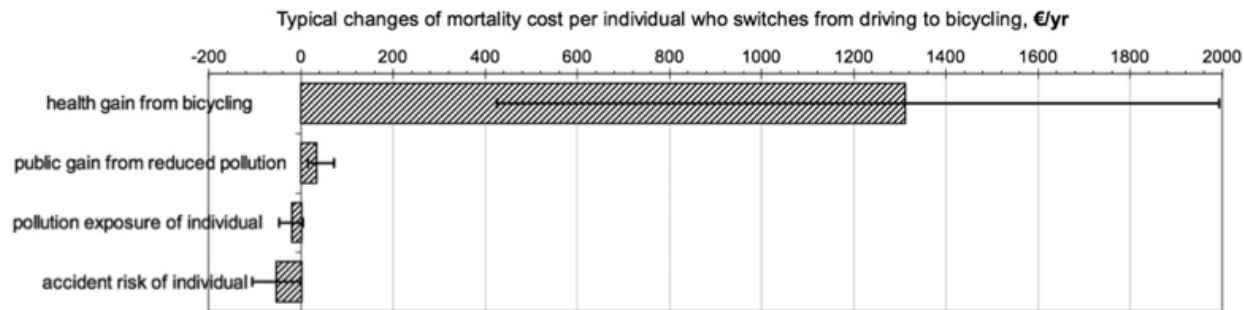


Fig. 2. Results for mortality costs and benefits per individual who switches from car to bicycle for commuting to work (2*5 km roundtrip, 5*46 weeks/yr) in large cities of EU. Error bars indicate confidence intervals.

- Physical activity ‘by far’ the most important
- “Concern about pollution exposure...is unfounded when compared to the benefits of the cycling activity”
- Only includes mortality so total benefits likely to be much higher

Benefits and risks: HIA

BMJ

BMJ 2011;343:d4521 doi: 10.1136/bmj.d4521

The health risks and benefits of cycling in urban environments compared with car use: health impact assessment study

David Rojas-Rueda *predoctoral researcher*¹, Audrey de Nazelle *researcher*¹, Marko Tainio *researcher*², Mark J Nieuwenhuijsen *research professor*¹

Table 2| Main results from health impact assessment of Bicing initiative in Barcelona

Variables	Relative risk*	AF _{exp} †	Deaths/year
Road traffic injury	1.0007	0.0007	0.03
Air pollution (particulate matter <2.5 µm)	1.002	0.002	0.13
Physical activity	0.80	-0.23	-12.46
Carbon dioxide emissions saved (kg/year)‡	—	—	9 062 344

*Relative risk of death during cycling compared with travel by car.

†Attributable fraction of mortality among exposed (Bicing users).

‡Calculated for Barcelona vehicle fleet, reported in 2008 by Spanish traffic department.

Table 2. Benefits and Costs of Cycling Demonstration Towns

Impact	Estimate of benefits and costs over 10 year period (£m, 2007 prices and values)
Reduced mortality	Benefit of £45 million
Decongestion	Benefit of £7 million
Reduced absenteeism	Benefit of £1-3 million
Amenity	Benefit of £9 million
Accidents	Disbenefit of £0-£15 million
TOTAL BENEFITS	£47-64 million
Costs	£18 million
Benefit-Cost Ratio	2.6 – 3.5

Physical activity accounted for >70% of benefits

Benefits estimated using WHO HEAT tool



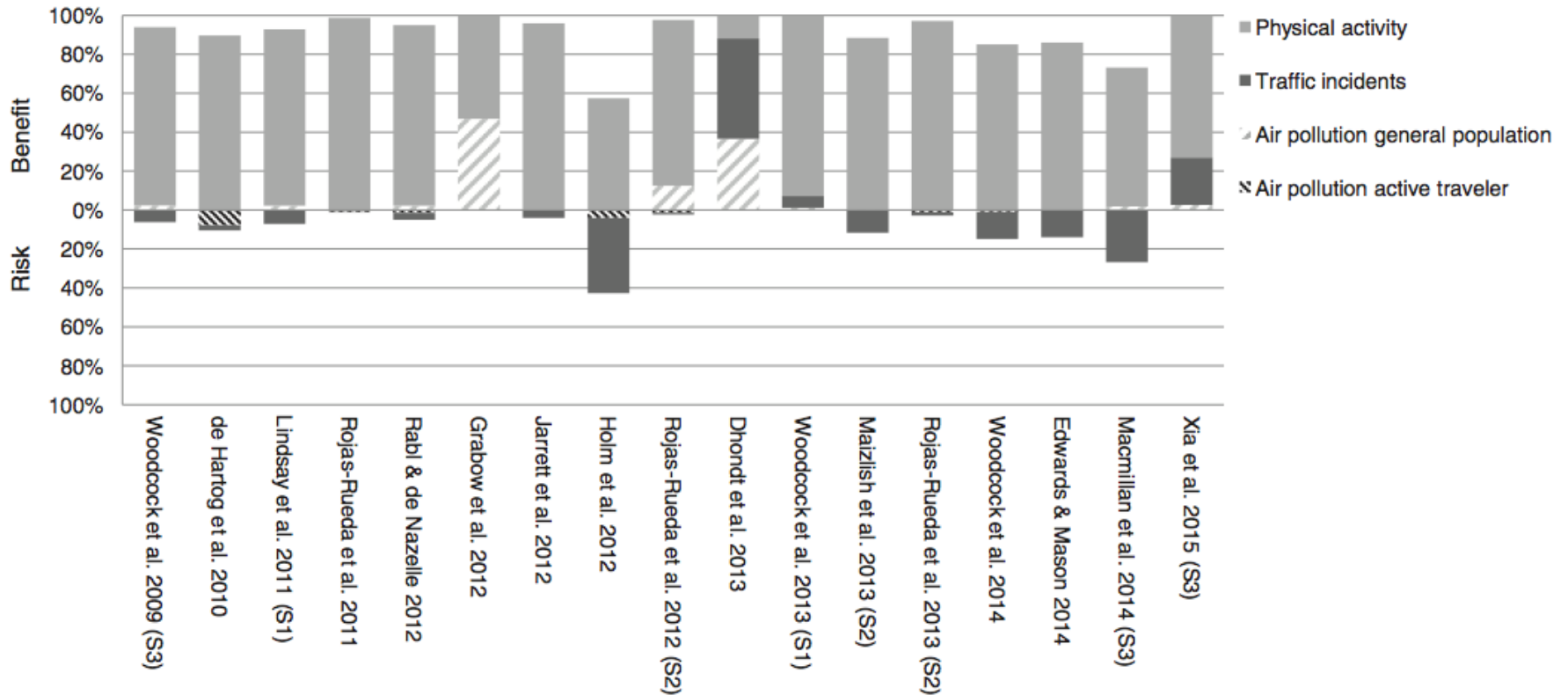
Review

Health impact assessment of active transportation: A systematic review



Natalie Mueller^{a,b,c,*}, David Rojas-Rueda^{a,b,c}, Tom Cole-Hunter^{a,b,c}, Audrey de Nazelle^d, Evi Dons^{e,f},
Regine Gerike^g, Thomas Götschi^h, Luc Int Panis^{e,i}, Sonja Kahlmeier^h, Mark Nieuwenhuijsen^{a,b,c}

N. Mueller et al. / Preventive Medicine 76 (2015) 103–114





Review

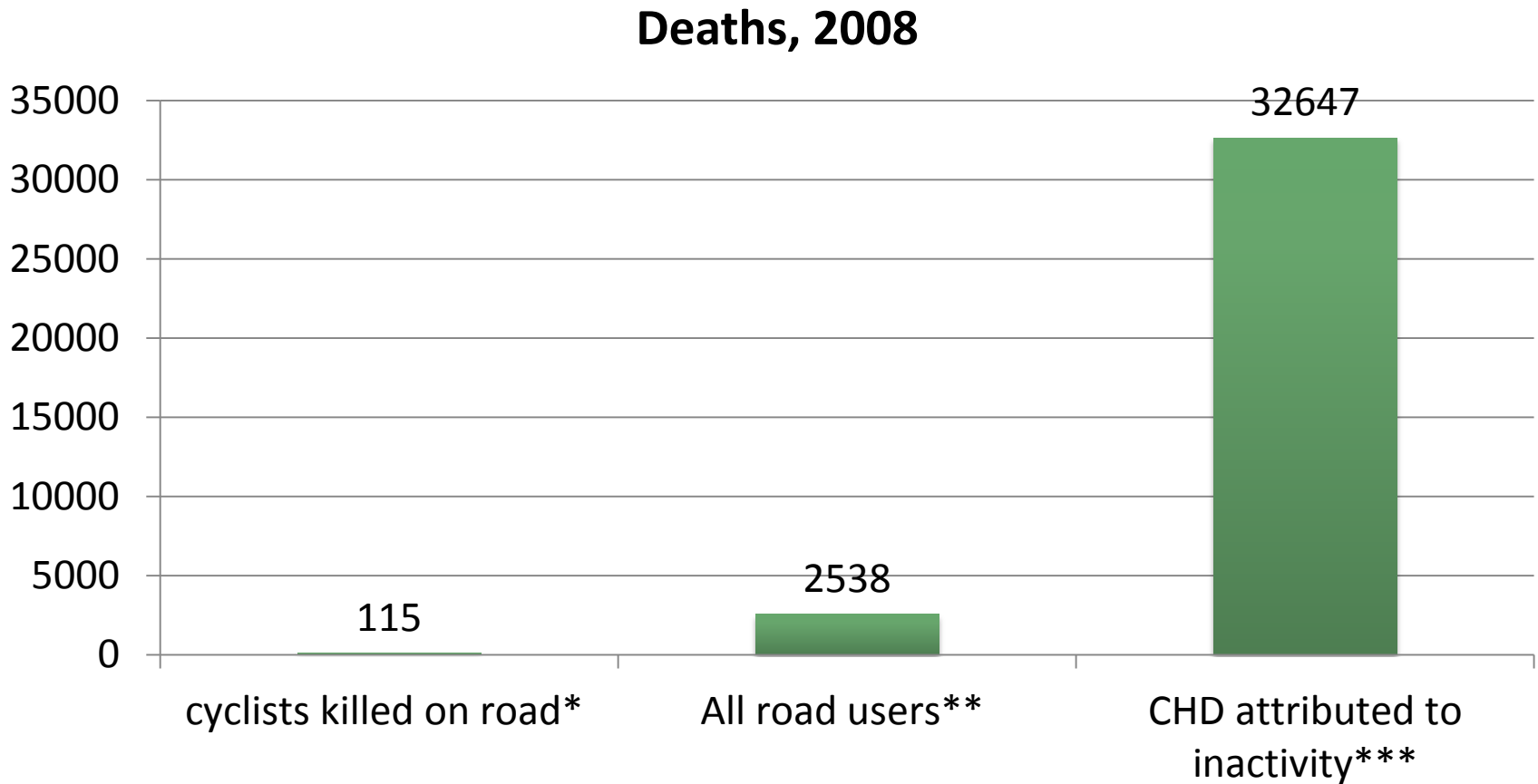
Health impact assessment of active transportation: A systematic review



Natalie Mueller^{a,b,c,*}, David Rojas-Rueda^{a,b,c}, Tom Cole-Hunter^{a,b,c}, Audrey de Nazelle^d, Evi Dons^{e,f},
Regine Gerike^g, Thomas Götschi^h, Luc Int Panis^{e,i}, Sonja Kahlmeier^h, Mark Nieuwenhuijsen^{a,b,c}

We conclude that net health benefits of AT are substantial, irrespective of geographical context. Projected health gains by increases in PA levels exceed detrimental effects of traffic incidents and air pollution exposure. Thus, we encourage the promotion of AT, as associated health risks are minor.

Selected causes of death: 2008



Source: * **DfT Road Traffic Casualties 2009 *** BHF statistics 2010 edition; McPherson et al 2002.

CAFE BAR

Oniglo Usine
Sablons Compote
Sablons Tarte 1,50
Fraisier Patis 1,50
Tarte Tatin Patis 1,50
Patis de Patis Patis
Patis de Patis Patis
Patis de Patis Patis
Patis de Patis Patis
Patis de Patis Patis

Sablons Sans Patis
Patis 1,50
L'Oniglo Compote 1,50
(sans sucre, sans alcool)
Sablons de Patis 1,50
Sablons de Patis 1,50
Patis de Patis Patis
Patis de Patis Patis
Patis de Patis Patis



A Goutte d'Amour



Menu items listed on a chalkboard in the upper left corner of the cafe window.

Omelette Volaille
Salade Composit
Steack Frites 11,50
Pommes Frites 11,50
Fouet Frit 11,50
Poulet Frites 11,50
Crisp de Canard 11,50
Crisp de Pigeon 11,50

Steack Sauc Pointe
P.Frites 11,50
L'Omelette Composit 11,50
Crisp de Canard 11,50
Salade de Poulet 11,50
Salade Quaillette 11,50
Poulet Frites 11,50
Crisp
Prix nets

BOULE HENRI
Menu items listed on a chalkboard in the middle left section of the cafe window.





EUROPEAN CYCLISTS' FEDERATION



TURN UP THE HEAT

*Recommendations to increase the use of the
World Health Organization's Health Economic
Assessment Tool for Cycling across Europe*

*Summary Report for the European Cyclists'
Federation*

FAST
LANE

FAST LANE

W55GKA