COULD THE COVID19 CRISIS BE THE OPPORTUNITY TO MAKE CITIES CARBON NEUTRAL, LIVEABLE AND HEALTHY

Mark J Nieuwenhuijsen

ISGlobal Barcelona Institute for Global Health

Institució CERCA Centres de Recerca de Catalunya

A partnership of:

"la Caixa" Foundation

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The New Coronavirus: Some Answers and Man Questions

s - ISG....html

TRANSMISSION REDUCTION MEASURES

Hygiene/hand washing

Physical distancing (1.5 meters)

Self isolation when ill

Light to severe lockdown measures

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IMPACTS

	Barcelona/Catalonia
Reduced physical activity	-40%
Increase in poor mental health	+20%
Domestic violence	+20%
Reduced traffic	70-80%
Reduced air pollution (NO2)	70-90%
Reduced noise	-9Db(a)
Green space visits	-90%

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PREREQUISITES FOR CHANGE

- Crisis
- Knowledge
- Technology
- Partnership
- Vision
- Leadership

Adapted from Lucia Reisch

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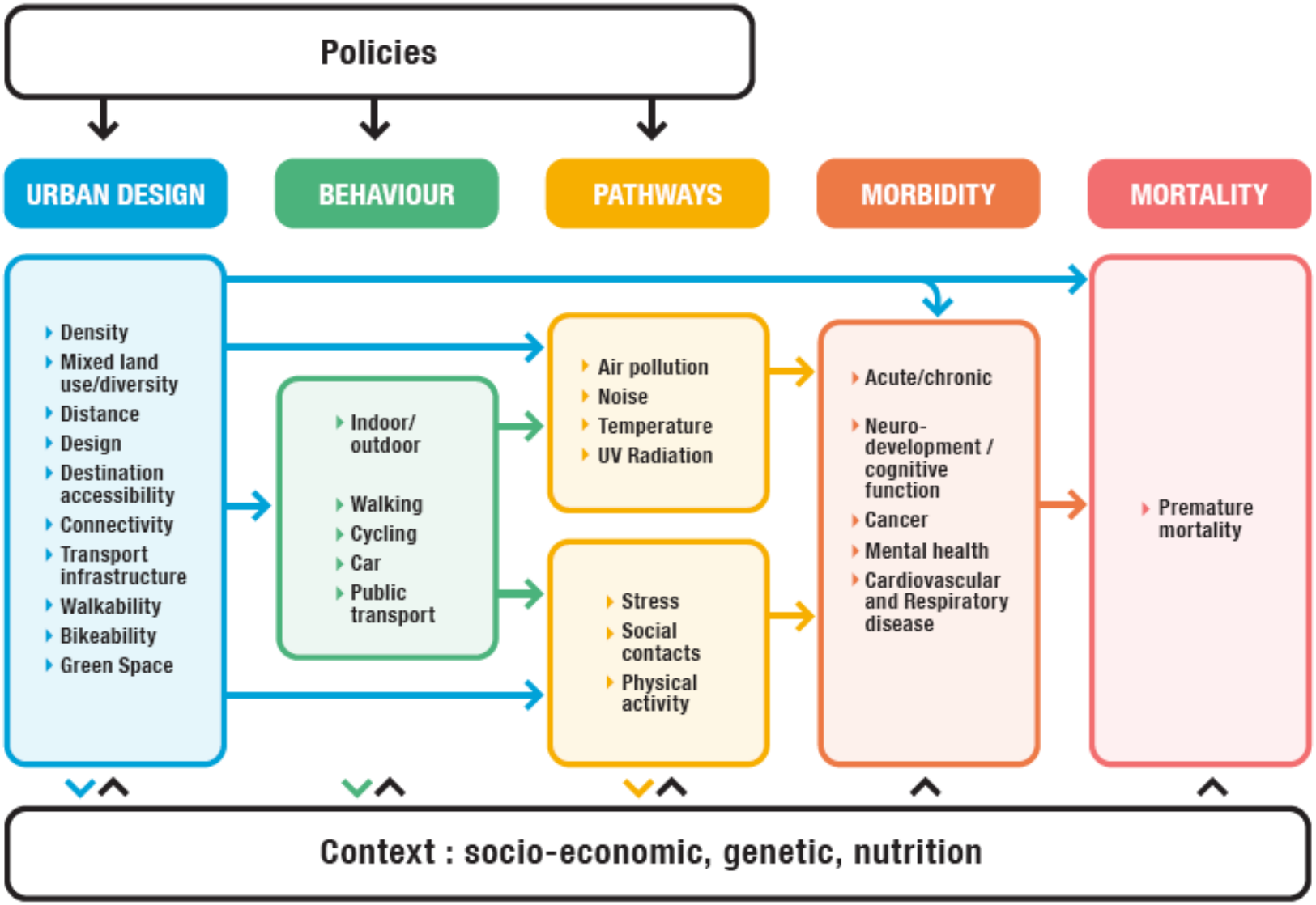

Nieuwenhuijsen 2016 and 2018

2904 premature deaths (20%) annually in Barcelona due to suboptimal urban and transport planning

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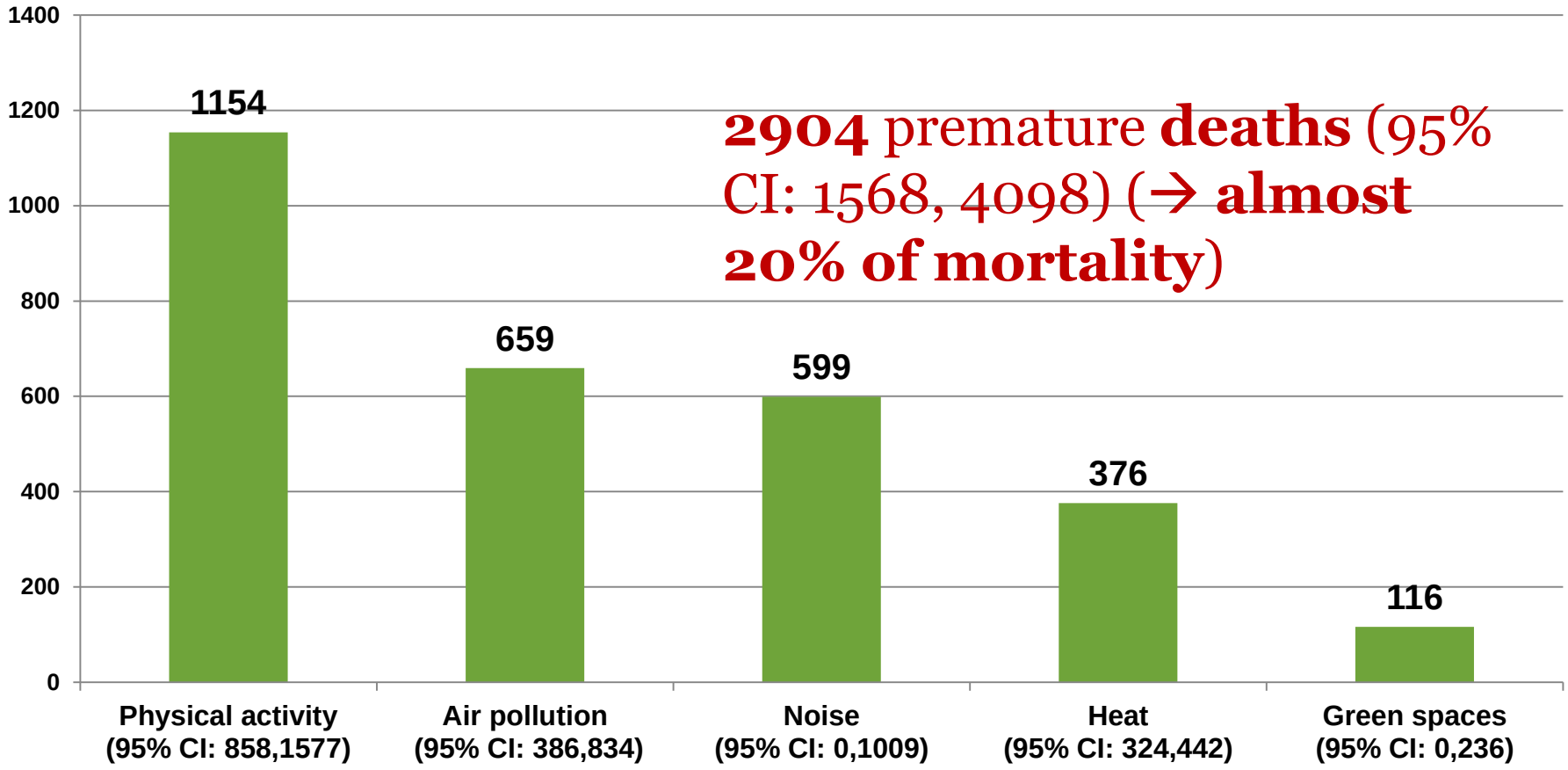
Mueller et al EHP 2017; 125: 89-96

DEATHS DUE TO POOR URBAN AND TRANSPORT PLANNING BARCELONA



2904 premature **deaths** (95% CI: 1568, 4098) (→ **almost 20% of mortality**)

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Traffic injury deaths 30

Mueller et al EHP 2017; 125: 89-96

TRANSPORT SOLUTIONS

1.5 meters distance society

Impact on transport and use of public space

	CR	Public space	health benefits	Environ. impacts
Car	L	H	L	H
Public transport	H	M	M	M
Walking	L	L	H	L
Cycling	L	L	H	L
Others	?	?	?	?

CR=contagion risk

L=low, M=medium, H=high

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The Guardian view on Covid-19 and transport: walk to the future

Editorial

The need for physical distancing means that space in our towns and cities must be shared in new ways

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The Rue de Rivoli, a central route in Paris, will be devoted mostly to bike and pedestrian traffic after lockdown is lifted. // Cyril Marcilhacy/Bloomberg

Paris Has a Plan to Keep Cars Out After Lockdown

FEARGUS O'SULLIVAN APRIL 29, 2020

Guardian

Milan announces ambitious scheme to reduce car use after lockdown

SOLUTIONS

- **Land use changes**
- **Reduce car dependency**
- **Move towards public and active transportation**
- **Greening cities**

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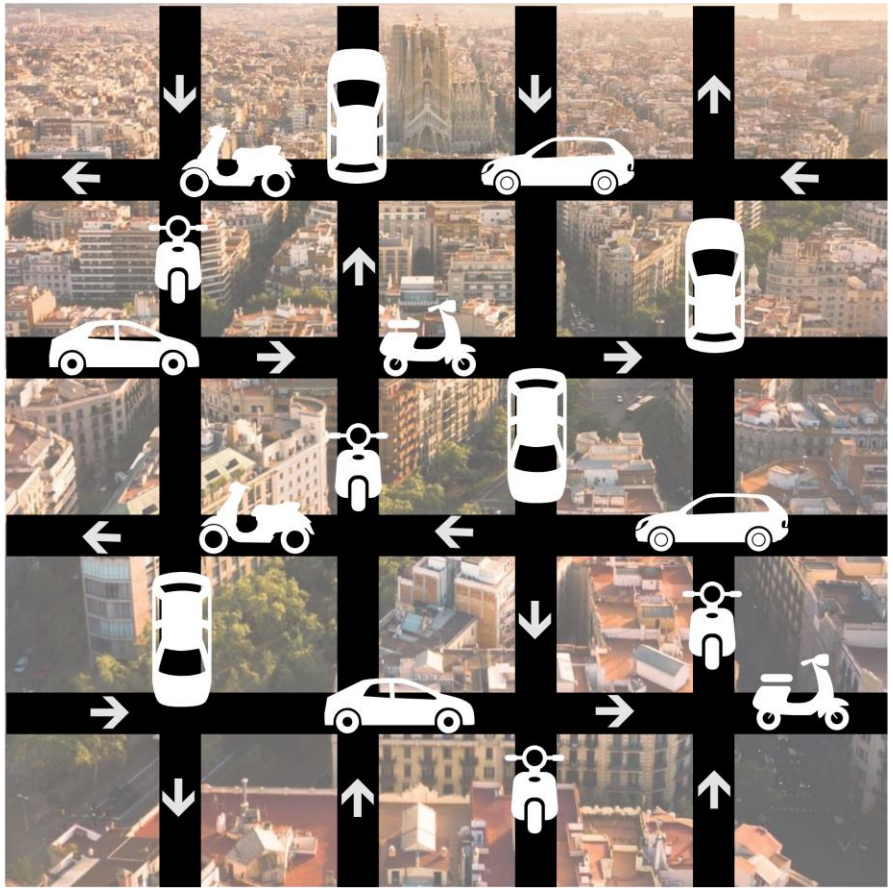
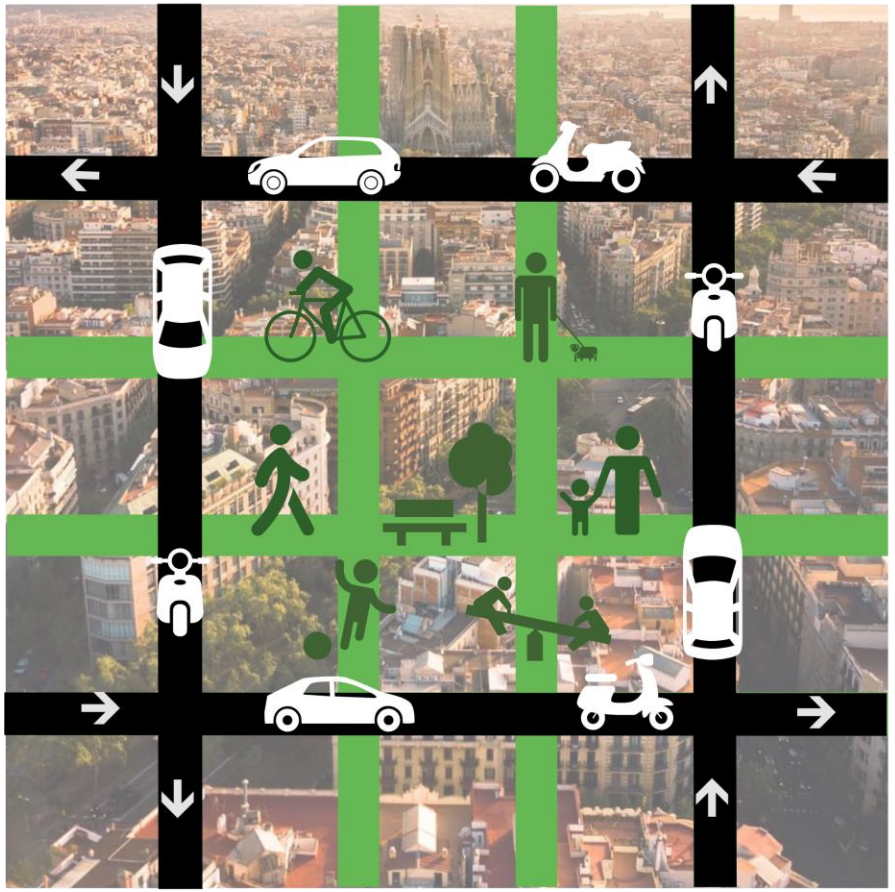
Carrer d'Aribau
Carrer de Còrsega
Carrer del Rosselló
Carrer d'Enric Granados
Carrer de Còrsega
Carrer del Rosselló
Carrer d'Aribau
Carrer del Rosselló
Carrer de Provença
Carrer de Muntaner
Carrer de Provença
Carrer d'Aribau
Carrer de Mallorca

BARCELONA SUPERBLOCK MODEL



Baseline situation



Superblocks model

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Mueller et al 2019, Env Int

Barcelona Superblock San Antoni

Before

After

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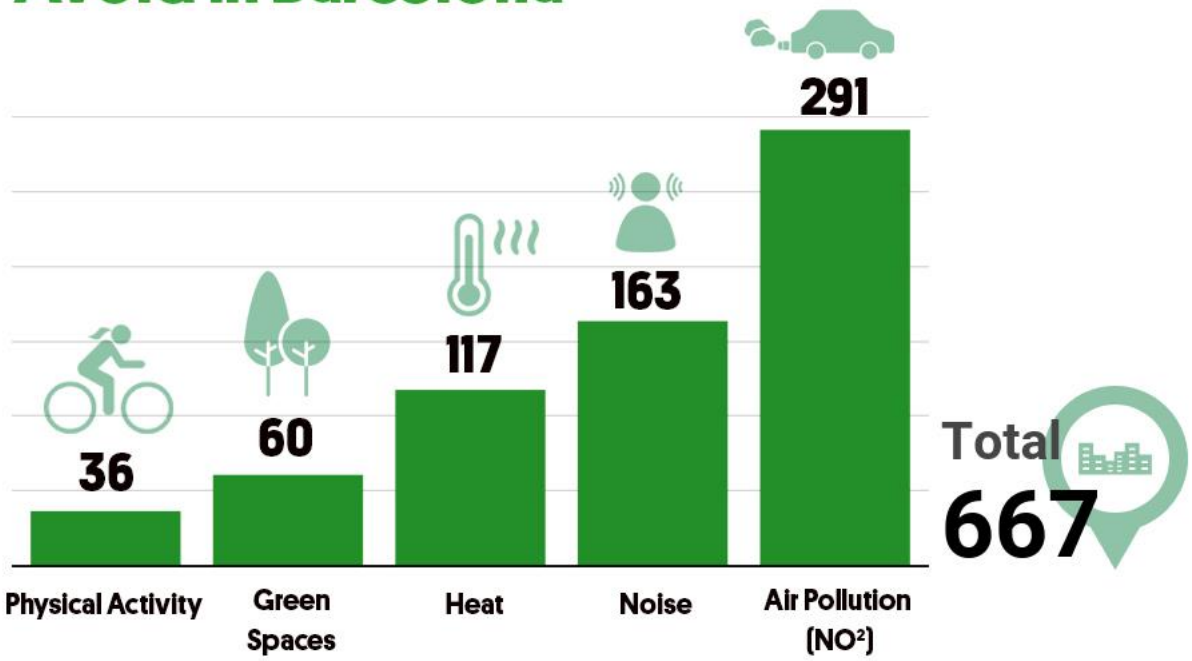
Annual Premature Deaths that the "Superblocks" Model Could Avoid in Barcelona



Source: Mueller et all. Changing the urban design of cities for health: the Superblock model. *Enviroment International.* 2019

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Mueller et al 2019, Env Int

ELECTRIC CARS

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7 WAYS THAT BICYCLES CAN MAKE CITIES *Healthier*

1 LESS RISK OF PREMATURE MORTALITY

REGULAR CYCLING IMPROVES CARDIOVASCULAR HEALTH AND DECREASES THE RISK FOR PREMATURE MORTALITY BY 10%

1. SOURCE: KELLY ET AL. 2014. INT J BEHAV NUTR PHYS ACT .11:1

2 CYCLING COMBINES TRANSPORT WITH THE GYM

ON AVERAGE CYCLISTS WEIGH **2 KG LESS** THAN CAR DRIVERS

2. SOURCE: PASTA PROJECT

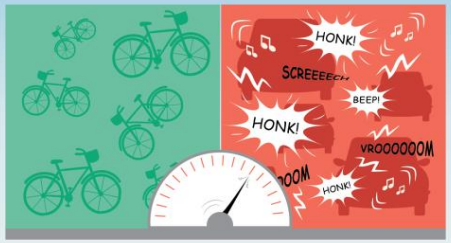
3 LESS AIR POLLUTION

A 40% SHIFT FROM CAR TRIPS TO CYCLING IN BARCELONA'S METROPOLITAN AREA

COULD AVOID AT LEAST 28 PREMATURE DEATHS A YEAR DUE TO REDUCED AIR POLLUTION

3. SOURCE: ROJAS-RUEDA ET AL. 2012. ENVIRON. INT. 49:100-109

4 LESS NOISE POLLUTION



ON CAR FREE DAYS NOISE LEVELS CAN BE REDUCED BY UP TO 10 DECIBELS

4. SOURCE: NIEUWENHUISEN & KHREIS 2016

5 ZERO EMISSIONS TRANSPORT MODE

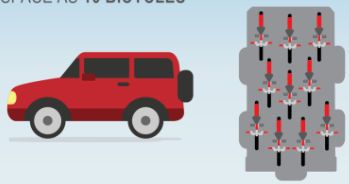
CYCLING DOES NOT DEPEND ON FOSSIL FUELS AND CAN HELP STOP GLOBAL WARMING

A 40% SHIFT FROM CAR TRIPS TO CYCLING CAN REDUCE 200,000 TONS OF CO_2 EMISSIONS ANNUALLY IN BARCELONA'S METROPOLITAN AREA

5. SOURCE: ROJAS-RUEDA ET AL. 2012. ENVIRON. INT. 49:100-109

6 MORE PUBLIC SPACE

ONE CAR OCCUPIES THE SAME PARKING SPACE AS **10 BICYCLES**



BICYCLES ARE A DOOR-TO- DOOR TRANSPORT THAT CAN HELP AVOID TRAFFIC JAMS AND CONGESTION IN CITIES

7 MORE HAPPINESS!!

ACTIVE TRANSPORT IS ASSOCIATED WITH BETTER MENTAL AND PHYSICAL WELL-BEING, LESS STRESS AND MORE HAPPINESS!

Be healthy, be happy, cycle!!!

FOR MORE INFORMATION, VISIT
WWW.ISGLOBAL.ORG/EN/URBAN-PLANNING

GRAPHIC DESIGN: RACHEL JILL PAPERNICK

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Benefits of physical activity well outweight the risks of air pollution and accidents for cyclists

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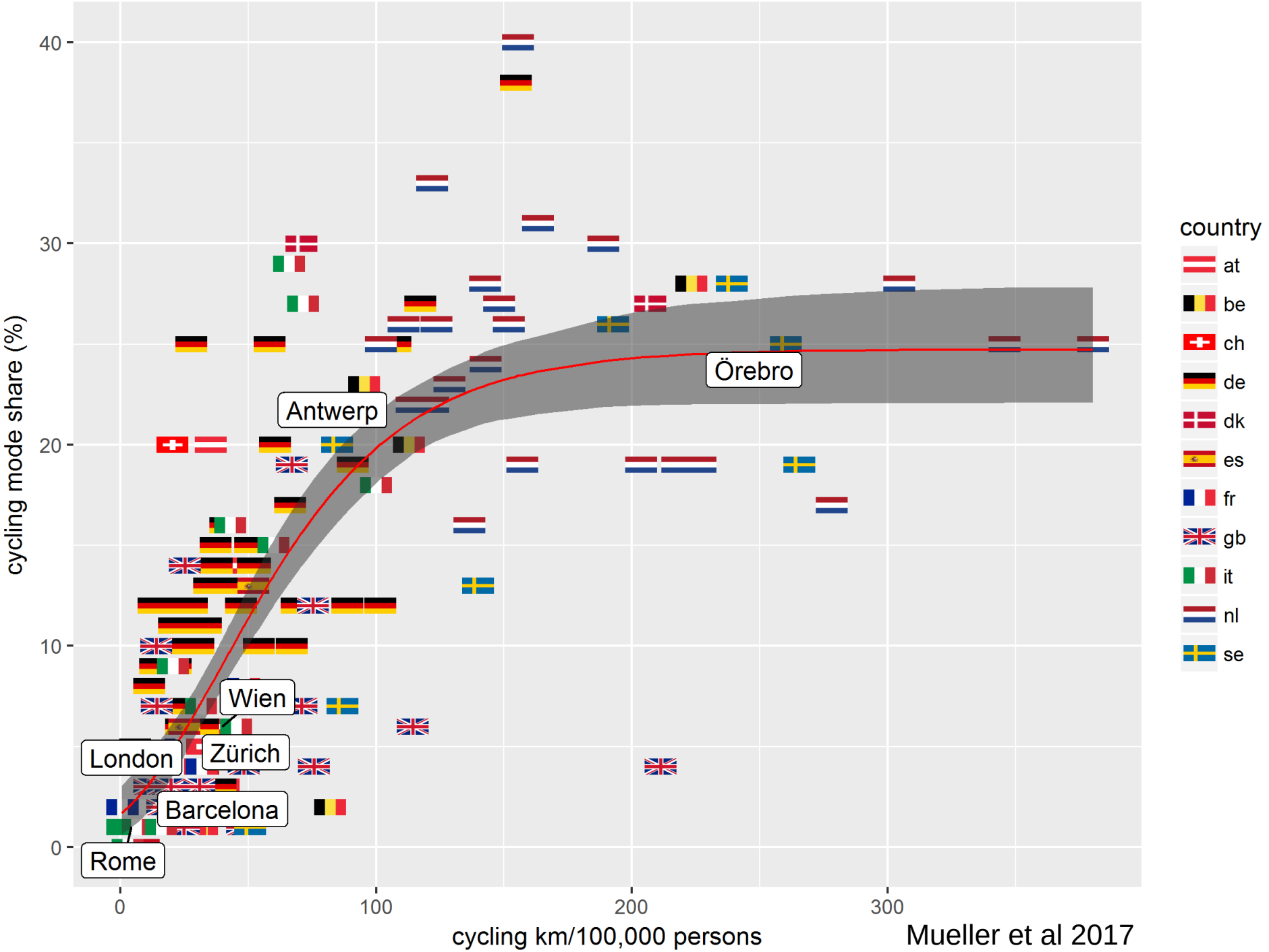
cycling mode share (%)
40
30
20
10
0
0
100
200
300
cycling km/100,000 persons
Mueller et al 2017
Rome
Barcelona
London
Zürich
Wien
Antwerp
Örebro
country
at
be
ch
de
dk
es
fr
gb
it
nl
se

PREMATURE DEATHS PREVENTED

- **10,091 premature deaths prevented annually in 167 European cities (75M people) if the mode share of cycling went up to 24.7%**

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Mueller et al 2018, Prev Med

GREEN AND LIVEABLE

- Greening cities has many health benefits including longer life expectancy, fewer mental health problems, better cognitive function, better mood and healthier babies
- It mitigates air pollution, heat and noise levels.
- CO2 sequestration
- Replacing roads and parking with green environments can be one way forward to change an environment from detrimental to beneficial.

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Nieuwenhuijsen et al 2017, Epidemiology

DEATHS PREVENTED IN PHILADEPHIA BY INCREASING TREE COVER

	Preventable premature adult deaths		Value (millions, US$ 2015 [95% interval])*
	n (95% interval)	% (95% interval)	
Ambitious increase scenario§			
City-wide	403 (298–618)	2·9% (2·1–4·5)	3865 (2865–5933)
Lower socioeconomic status census tracts	244 (180–373)	3·6% (2·6–5·5)	2339 (1735–3586)
Higher socioeconomic status census tracts	159 (11–244)	2·4% (1·7–3·6)	1526 (1130–2346)
Tree canopy cover (%)			
Quantile 1 (<10%)	196 (144–301)	5·9% (4·3–9·1)	1877 (1389–2890)
Quantile 2 (12–15%)	129 (95–197)	4·0% (2·9–6·1)	1235 (916–1891)
Quantile 3 (16–26%)	75 (55–113)	1·9% (1·4–2·9)	716 (532–1092)
Quantile 4 (>27%)	3 (2–4)	0·1% (0·0–0·1)	28 (2–43)

*Based on value of a statistical life year for 2015 generated by the US Department of Transportation; values are per million (2015 $US). †Five percentage point increase in tree canopy coverage. ‡Ten percentage point increase in tree canopy coverage. §30% total tree canopy cover.

Table 3: Annual preventable premature adult deaths (2014–2025) and economic effects

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Kondo et al 2020

Multisectorial approach

Multi sectorial and systemic approaches are needed to address current problems and find solutions

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SYSTEMIC APPROACHES

- It is important that we have a more systemic approach to our cities,

Tackling

- COVID19
- Air pollution
- Noise
- Heat islands
- Lack of green space
- Lack of physical activity

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HOLISTIC APPROACHES

- It is important that we have a more holistic to our cities,

Addressing

- Health
- Livability
- Sustainability
- Climate change
- Equity

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FINANCING

- a large financial stimulus package

- The money can only be spent once, and we therefore might as well do it in the way that will save more lives in the long term, and create also a more just, sustainable and liveable society

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Seoul

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ALDERHEY HOSPITAL LIVERPOOL BEFORE AND AFTER

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Hamburg Plans to Become Ca
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(Photo: Marcia Taylor)

Hamburg Plans to Become Car-Free By 2034

But should there really be zero cars?

By Rachel Nuwer
SMITHSONIANMAG.COM
FEBRUARY 17, 2014

26 28 0 1 2 0 718

Hamburg, Germany, recently announced plans to convert 40 percent of the city into car-free pedestrian zones within the next two decades. According to Inhabitat, existing green spaces

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Urban and transport planning pathways to carbon neutral, liveable and healthy cities; A review of the current evidence

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Mark Nieuwenhuijsen · Haneen Khreis *Editors*

Integrating Human Health into Urban and Transport Planning

A Framework

This volume brings together the world's leading experts on urban and transport planning, environmental exposures, physical activity, health and health impact assessment to discuss challenges and solutions in cities. The book provides a conceptual framework and work program for actions and outlines future research needs. It presents the current evidence-base, the benefits of and numerous case studies on integrating health and the environment into urban development and transport planning.

Within cities there is a considerable variation in the levels of environmental exposures such as ambient air pollution, noise, and temperature, green space availability and physical activity. Many of these exposures, and their adverse health impacts, are related to and are being exacerbated by urban and transport planning and policy. Emerging research suggests that urban and transport planning indicators such as road network, distance to major roads, traffic density, household density, industry, and natural and green space can explain a large proportion of the variability in environmental exposures and therefore represent important and highly modifiable factors.

The urban environment is a complex interlinked system. Decision-makers need not only better data on the complexity of factors in environmental and developmental processes affecting human health, but also an enhanced understanding of the linkages between these factors and health effects to determine at which level to target their actions most effectively. In recent years, there also has been a shift from trying to change at the national level to more comprehensive and ambitious actions being developed and implemented at the regional and local levels. Cities have come to the forefront of providing solutions for environmental issues such as climate change, which has co-benefits for health, but yet need better knowledge for wider health-centric action. This book provides the latest and most up-to-date information and studies for academics and practitioners alike.

Environment

ISBN 978-3-319-74982-2

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Integrating Human Health into Urban and Transport Planning

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Springer

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Green cities, healthy people

Active cities, healthy people,

Clean cities, healthy people

Social cities, healthy people

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TRANSPORT SOLUTIONS

1.5 meters distance society

Impact on transport and use of public space

	CR	Public space	health benefits	Environ. impacts
Car	L	H	L	H
Public transport	H	M	M	M
Walking	L	L	H	L
Cycling	L	L	H	L
Others	?	?	?	?

CR=contagion risk

L=low, M=medium, H=high

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BACKGROUND

- More than 2.4 million infected
- Almost 200K deaths
- Large impact on the economy
- Lock down measures

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BARCELONA SUPER BLOCKS

- 19.2% car reduction
- 11.5 ug/m3 (24.3%) NO2 reduction
- 2.9 dB noise reduction
- 3 fold increase green space (6.5% to 19.6%)
- 20% Surface temperature reduction

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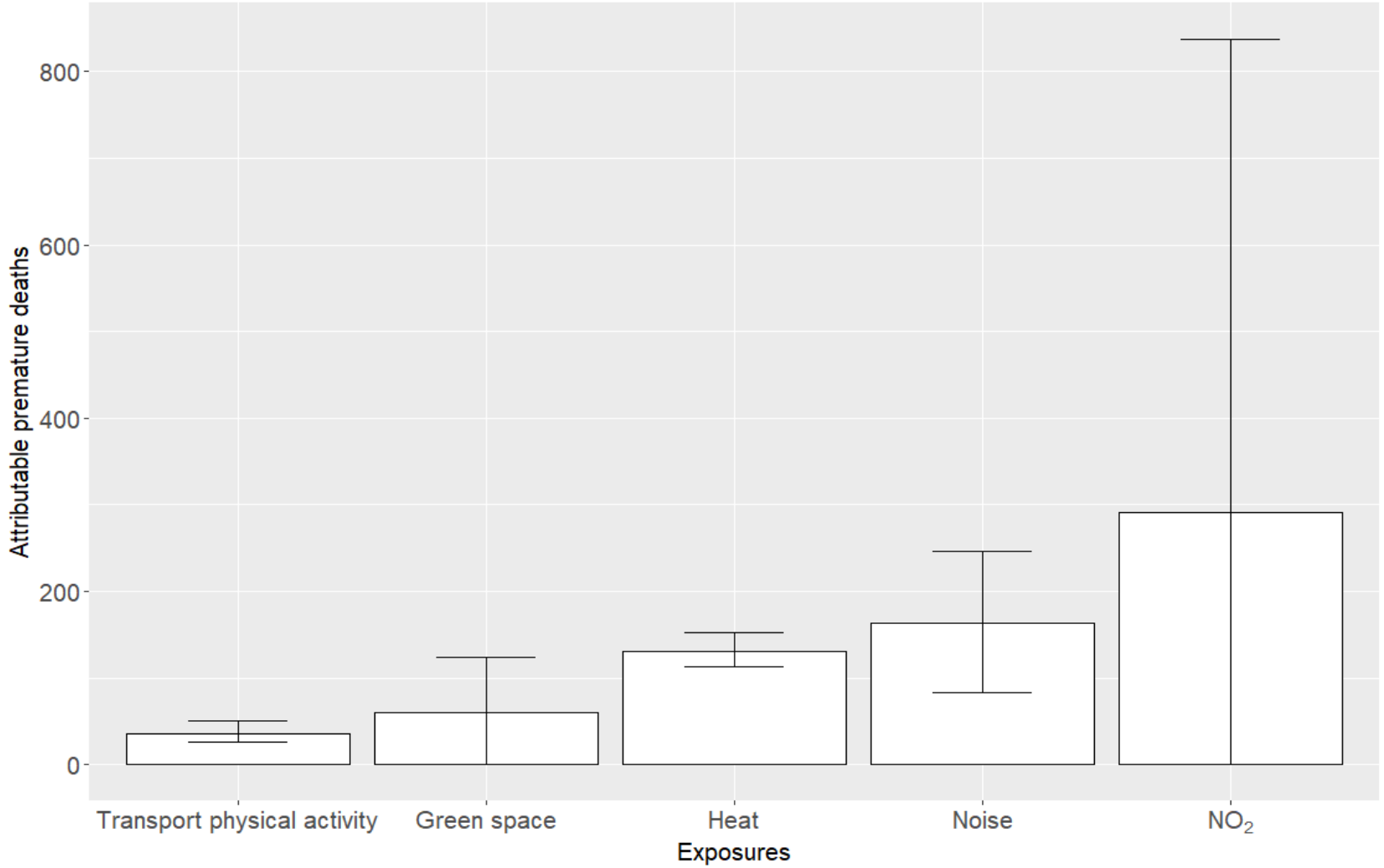
IMPACTS ON MORTALITY

681 premature deaths preventable (95% CI: 245-1,113)

36 deaths	61 deaths	131 deaths	163 deaths	291 deaths
95% CI: 26-50	95% CI: 0-123	95% CI: 114-153	95% CI: 83-246	95% CI: 0-838



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URBAN TRANSITIONS 2020

Integrating Urban and Transport Planning,
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10–12 November 2020
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Figure 1. Visualisations for a typical urban terraced street. The four figures are taken from the visualisations used in the Visions 2030 Walking and Cycling Project http://www.visions2030.org.uk/. Each vision represents four different possibilities for urban transport in 2030 in the UK. These visualisations are of a 'typical' Victorian terraced street. Visualisations created by the School of Computing at the University of East Anglia.
doi:10.1371/journal.pone.0051462.g001

Woodcock et al 2013