IMPACTS OF COVID19 TRANSPORT AND HEALTH

Mark J Nieuwenhuijsen
The New Coronavirus: Some Answers and Many Questions
CONTEXT

Each year world wide there are:

• 4.2 million deaths due to ambient air pollution
• 3.2 million deaths due to lack of physical activity
• 1.2 million deaths due to traffic fatalities

• Climate crisis
• Population growth and ageing
• Urbanization (70% live in cities soon)

WHO, GBD
Policies

- Urban Design
  - Density
  - Mixed land use/diversity
  - Distance
  - Design
  - Destination accessibility
  - Connectivity
  - Transport infrastructure
  - Walkability
  - Bikeability
  - Green Space

- Behaviour
  - Indoor/outdoor
  - Walking
  - Cycling
  - Car
  - Public transport

- Pathways
  - Air pollution
    - Noise
    - Temperature
    - UV Radiation

- Morbidity
  - Acute/chronic
    - Neurodevelopment/cognitive function
    - Cancer
    - Mental health
    - Cardiovascular and Respiratory disease

- Mortality
  - Premature mortality

Context: socio-economic, genetic, nutrition

Nieuwenhuijsen 2016 and 2018
2904 premature deaths (20%) annually in Barcelona due to suboptimal urban and transport planning

Mueller et al EHP 2017; 125: 89-96
TRANSMISSION REDUCTION MEASURES

Hygiene/hand washing
Physical distancing (1.5 meters)

Self isolation when ill

Light to severe lockdown measures
<table>
<thead>
<tr>
<th>Impact</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced physical activity</td>
<td>-40%</td>
</tr>
<tr>
<td>Increase in poor mental health</td>
<td>+20%</td>
</tr>
<tr>
<td>Domestic violence</td>
<td>+20%</td>
</tr>
<tr>
<td>Reduced traffic</td>
<td>70-80%</td>
</tr>
<tr>
<td>Reduced air pollution (NO2)</td>
<td>70-90%</td>
</tr>
<tr>
<td>Reduced noise</td>
<td>-9Db(a)</td>
</tr>
<tr>
<td>Green space visits</td>
<td>-90%</td>
</tr>
</tbody>
</table>
**TRANSPORT SOLUTIONS**

1.5 meters distance society

Impact on transport and use of public space

<table>
<thead>
<tr>
<th>Mode</th>
<th>CR</th>
<th>Public space</th>
<th>Health benefits</th>
<th>Environ. impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>L</td>
<td>H</td>
<td>L</td>
<td>H</td>
</tr>
<tr>
<td>Public transport</td>
<td>H</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Walking</td>
<td>L</td>
<td>L</td>
<td>H</td>
<td>L</td>
</tr>
<tr>
<td>Cycling</td>
<td>L</td>
<td>L</td>
<td>H</td>
<td>L</td>
</tr>
<tr>
<td>Others</td>
<td>?</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>

CR=contagion risk

L=low, M=medium, H=high
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

- Coronavirus - latest updates
- See all our coronavirus coverage
Paris Has a Plan to Keep Cars Out After Lockdown

FEARGUS O’SULLIVAN  APRIL 29, 2020
London / Large areas of city to be made car-free as lockdown eased

Live
UK coronavirus: Welsh schools will not open until September; 'stay home' advice remains

London
TfL faces £3bn funding gap despite £1.6bn bailout

Education
Prolonged school closures risk damaging children's education, No 10 warns
Milan announces ambitious scheme to reduce car use after lockdown
1. Monitoring mobility

**Important changes**

- Severe activity reduction since 13/03/2020
- COVID scenario is an abnormal scenario

**Demand reduction**

- 80% traffic reductions
- 90% falls in public transport demand
- 85% falls in bicycle lanes demand

**SUMP Objective**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Before Lockdown</th>
<th>After Lockdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>26%</td>
<td>34.4%</td>
</tr>
<tr>
<td>Bus</td>
<td>37.3%</td>
<td>19.5%</td>
</tr>
</tbody>
</table>

- Accident reduction in the same proportion as traffic falls
- Increase of speeding offenses
SOLUTIONS

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

Mueller et al 2019, Env Int
Annual Premature Deaths that the "Superblocks" Model Could Avoid in Barcelona

- Physical Activity: 36
- Green Spaces: 60
- Heat: 117
- Noise: 163
- Air Pollution (NO₂): 291

Total: 667


Mueller et al 2019, Env Int
Benefits of physical activity well outweigh the risks of air pollution and accidents for cyclists.
Multisectorial approach

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

Making cities healthier worldwide

Courtesy of Jo Ivey Boufford
Seoul
Hamburg Plans to Become Car-Free By 2034
But should there really be zero cars?

By Rachel Nuwer
SMITHSONIANMAG.COM
FEBRUARY 17, 2014

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

Mark J. Nieuwenhuijsen*

ISGlobal, Barcelona, Spain
Universitat Pompeu Fabra (UPF), Barcelona, Spain
CIBER Epidemiología y Salud Pública (CIBERESP), Madrid, Spain
Mary MacKillop Institute for Health Research, Melbourne, Australia

EMAIL: mark.nieuwenhuijsen@isglobal.org
Green cities, healthy people

Active cities, healthy people,

Clean cities, healthy people

Social cities, healthy people

mark.nieuwenhuijsen@isglobal.org