Barcelona Rethinking models of mobility and public space

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**Barcelona In Summary**

| Population       | N=1.6 million  
|                  | (≥20 years N=1.3 million) |
| Area             | 100 km²  
|                  | (high population density = 16,000 p/ km²) |
| Climate          | 18 ºC mean temperature, hot summers, mild winters, low precipitation |
| Vehicle fleet    | 500,000 cars and 300,000 motorcycles + large daily suburban commuter fleet  
|                  | (highest traffic density in Europe) |
| Urban design     | Narrow street canyons  
|                  | Dense construction of semi-tall buildings  
|                  | (5-6 stories) |
| Mobility         | 6.8 million trips per day. 7 out of 10 within the city. |
| Green spaces     | 7 m² per resident |
Challenges

- Urban green space deficit: 1,85 m² per inhabitant (Eixample District).
- High levels of pollution: 3,500 premature deaths per year in the Metropolitan Area of Barcelona.
- High road accident: more than 11,000 injured in traffic accidents (2015).
- Sedentary lifestyle: 1 in 5 children between 0 and 18 years presents overweight.
- Noise pollution: 57.5% of the population is exposed to levels above 65 dBA noise during the day.
Metro area transport modes

Llaurado et al 2015
Pedestrians.
CURRENT SITUATION

Karl Jilg, for the Swedish Road Administration
Urban Heart Analysis Barcelona 2015

Health Outcomes By Neighborhood

- Red: Poor
- Yellow: Average
- Green: Good

Source: Barcelona Public Health Agency
What is Barcelona doing?

• Estimating health burdens (e.g. air pollution)
• Using health impact assessment to quantify health impacts of interventions
• Developing health indicators to monitor impacts of interventions
~20% premature deaths in Barcelona avoided by compliance with recommendations

- Physical activity (95% CI: 858,1577)
- Air pollution (95% CI: 386,834)
- Noise (95% CI: 0,1009)
- Heat (95% CI: 324,442)
- Green spaces (95% CI: 0,236)

Mueller EHP 2017
Morbidity attributable to non-compliance with recommendations

CVD = cardiovascular disease; hosp.adm = hospital admissions
Noise-related annoyance and sleep disturbance (i.e. 171,773 persons and 99,633 persons, respectively) are not considered.

Mueller 2017
Objective:

To compare changes in health among a sample of families living in substandard dwellings or with housing affordability problems assisted by Caritas Diocesana de Barcelona, according to the improvement of their socioeconomic and housing situation during the study period.

Methods:

A quasi-experimental study was performed, including 232 families assisted by Caritas who were interviewed in 2012 and one year later.

Participants could have received a set of interventions, including relocation and different types of economic subsidies.

Main results:

Mental health improved among participants with a reduction in the perceived risk of losing their house.

The study shows that health gains can derive from improvements in housing conditions, especially those related to housing affordability.
Practica el bicing
Conclusions Public bicycle sharing initiatives such as Bicing in Barcelona have greater benefits than risks to health and reduce carbon dioxide emissions.

Rojas et al, BMJ 2011

<table>
<thead>
<tr>
<th>Variables</th>
<th>Relative risk*</th>
<th>AF&lt;sub&gt;mo&lt;/sub&gt; †</th>
<th>Deaths/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road traffic injury</td>
<td>1.0007</td>
<td>0.0007</td>
<td>0.03</td>
</tr>
<tr>
<td>Air pollution (particulate matter &lt;2.5 μm)</td>
<td>1.002</td>
<td>0.002</td>
<td>0.13</td>
</tr>
<tr>
<td>Physical activity</td>
<td>0.80</td>
<td>-0.23</td>
<td>-12.46</td>
</tr>
<tr>
<td>Carbon dioxide emissions saved (kg/year)‡</td>
<td>—</td>
<td>—</td>
<td>9,062,344</td>
</tr>
</tbody>
</table>

*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.
Super Block
Barcelona wants to establish a new way to organize the city to reverse the current distribution of public space between vehicles and people, giving priority to the citizen in order to improve environmental conditions and quality of life.
Pedestrians

CURRENT SITUATION

PHASE 1. FUNCTIONAL SUPERBLOCKS

PHASE 2. URBAN SUPERBLOCKS

- Pedestrian space
  - Sidewalks, pedestrian priority streets, boulevards, promenades
- Accessible citizen space
- Services area
  - Mixed area for parking, loading and unloading and pedestrian traffic

40 % 53 % 94 %
Urban green space

CURRENT SITUATION

PHASE 1. FUNCTIONAL SUPERBLOCKS

PHASE 2. URBAN SUPERBLOCKS

Street trees
Green space potential (permeable)
Urban garden
Green roof
Green wall

ISGlobal Barcelona Institute for Global Health
One Activity: Mobility

5 Rights in urban context: Multiple activities

- Expression and Participation
- Exchange
- Recreation, Leisure
- Mobility
- Culture and Knowledge
Rethinking urban public space: moving from linear and uni-purpose to dynamic spaces with diverse uses
Impacts and Benefits

Air Quality  (population exposed to acceptable levels)
Current situation: 56.2%
Future scenario with new Superblock: 93.9%

Acoustic comfort  (population exposed to acceptable levels)
Current situation: 57.5%
Future scenario with new Superblock: 73.5%

Pedestrian road space  (vs. motorized)
Current situation: 45.2%
Future scenario with new Superblock: 70%

Staying space  (m²/inhabitant)
Current situation: 8.6 m²/inhabitant
Future scenario with new Superblock: 12.5 m²/inhabitant
The health risks and benefits of cycling in urban environments compared with car use: health impact assessment study

David Rojas-Rueda (predictor researcher), Audrey de Nazelle (researcher), Marko Tainio (researcher), Mark J. Nieuwenhuijzen (principal research professor)

Abstract

Objective To estimate the risks and benefits in terms of traffic by bicycling, using a bicycle sharing scheme, compared with travel by car in an urban environment.

Design Health impact assessment study.

Setting Public bicycle sharing initiative, Bicing, in Barcelona, Spain.

Background

Cycling is widely recognized as a means of reducing traffic accidents and pollution, and improving health and well-being (1,2). Despite this, few studies have estimated the health and economic effects of cycling in urban environments (3,4).

Methods

We present findings from a Health Impact Assessment (HIA) of the Bicing initiative in Barcelona, Spain. Our analysis takes into account the different age and health characteristics of cyclists and drivers, as well as exposure to emissions and traffic noise. We used a multi-criteria approach in which the main criteria for evaluating the health impacts of cycling were its benefits (e.g. health and environmental improvements) and its costs (e.g. economic costs).

Results

Our analysis suggests that cycling is a healthier and more environmentally friendly mode of transport than driving. However, cycling is not without its risks, particularly for older people and those with pre-existing health conditions. The HIA identified several key areas for improvement, including better infrastructure for cyclists and improved public education to encourage safe cycling.

Conclusion

Cycling is a valuable mode of transport that can improve health and reduce pollution. However, it is important to ensure that cycling is accessible and safe for all users. Further research is needed to better understand the health and social benefits of cycling in urban environments.

References


The guardian
Next Steps for research....

• Spatially-resolved data for cities including health, behaviours, environment, socioeconomics
• City-level burden of disease estimates
• Consideration of distributional aspects
• Coordination across local authorities with metro and regional
• Practical tools to support evidence-based decision making, generate public support, political will
Understanding Governance & Political Cycles

The role of citizen science

Flexibility of Academic Structures

Academic vs political timelines

Breaking down silos & creating common agendas

Climate Change and natural disasters

Mass Tourism

Electric & Autonomous Vehicles

Safety

Big data & privacy
THANK YOU
Health Impact Assessment

- Context
  - Politics

- Policy

- Evidence

- Stakeholders

- Communication
  - Influence & Legitimacy

- Research & Credibility

HIA