Salut als Carrers

METHODOLOGICAL GUIDE

Salut als Carrers (Health in the streets)

Ajuntament de Barcelona

CSB Consorci Sanitari de Barcelona

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CHAPTER I

What is the Salut als Carrers (Health in the Streets) project?

The city of Barcelona faces a number of social, environmental and health challenges, such as high levels of air and noise pollution, lack of green spaces and stay and injuries caused by traffic. In recent years, the Barcelona City Council began the implementation of the Superblocks model in different neighborhoods of the city, as put forth in the government measure “Omplim de vida els carrers”. The aim of this program is to improve the livability of public space, advance sustainable mobility, increase and improve urban green space and environmental diversity, and promote citizen participation and co-responsibility [1].

In order to evaluate the effects on health of this program, a project has been carried out, led by the Barcelona Public Health Agency (ASPB), with both quantitative and qualitative methods and with the participation of a professional working group. Entitled Salut als Carrers (Health in the Streets), the project objective was to evaluate the environmental and health effects of the Superblocks model with an equity perspective.

The evaluation was planned in the neighborhoods of Poblenou, Sant Antoni and Horta, taking into account different moments of implementation of the Superblocks. The interventions that were evaluated are explained below.

“In recent years, the Barcelona City Council began the implementation of the Superblocks model in different neighborhoods of the city,...”

POBLENOU SUPERBLOCK

Opened in September 2016 with the objective of calming motorized traffic and prioritizing pedestrians and bicycles, in an area of 3 x 3 blocks. The superblock includes the creation of public spaces in sections of the area previously reserved for street space, and now freed from traffic; with picnic tables, literary tours, spaces for occasional markets and sports and play areas.

SANT ANTONI SUPERBLOCK

The first phase was inaugurated in May 2018, as a redevelopment of the public space around the new Sant Antoni market. Specifically, the pacification of the Comte Borrell streets between Floridablanca and Manso and Tamarit between Viladomat and Comte Urgell. This represents the creation of a large public square at the crossroads of the streets, as well as the creation of new spaces and more presence of green in the pacified streets.

HORTA SUPERBLOCK

Implementation began in October 2018, after a two-year participatory process to develop an action plan for improved mobility and quality of life in Horta. Redevelopment interventions were focused on the entrance to the neighborhood: Fulton and part of Horta street (single platform and speed limit of 10 km/h). Also included are Feliu Codina and part of Chapí streets, home to many public and private facilities and known for very narrow sidewalks (single platform and reduction of parking) and Eduard Todà street (reduction of parking and creation of stay areas), as well as the redevelopment of two corners. The first phase of the work was completed in March 2020.

In a first phase of the SAC project, a specific conceptual framework for the Superblock evaluation was developed (Figure 1). This model shows how urban governance, through the Superblocks intervention, aims to impact public space, different types of mobility, green spaces and community participation. This intervention is expected to have effects at the neighborhood level (such as a decrease in air and noise pollution, increased road safety or improved walkability) and at the individual level (such as an increase in active transportation and social support), but could also lead to an increase in the cost of living in the neighborhood and cause the eventual displacement of neighbors. All this will have effects on health and, if the effects vary according to the different axes of inequality, on social inequalities in health.

Source: Mehdipanah et al., 2018 [2]

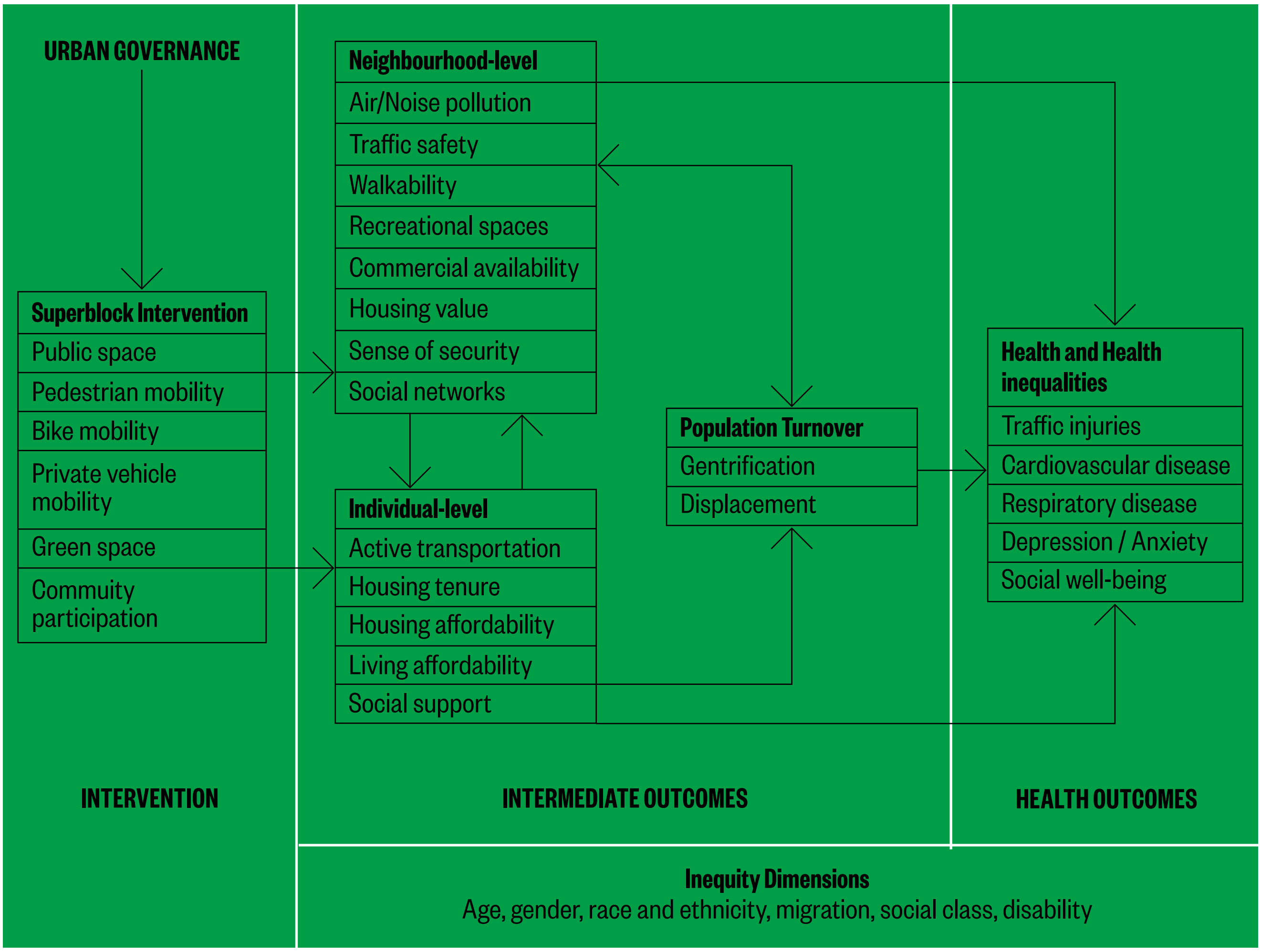

Figure 1. Conceptual model for the evaluation of the effects of Superblocks on health

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- For more details on the project Salut Als Carrers: Palència L, León-Gómez BB, Bartoll X, et al. Study Protocol for the Evaluation of the Health Effects of Superblocks in Barcelona: The Salut als Carrers project. Int J Environ Res Public Health. 2020;17(8):2956. Published April 24, 2020. doi:10.3390/ijerph17082956

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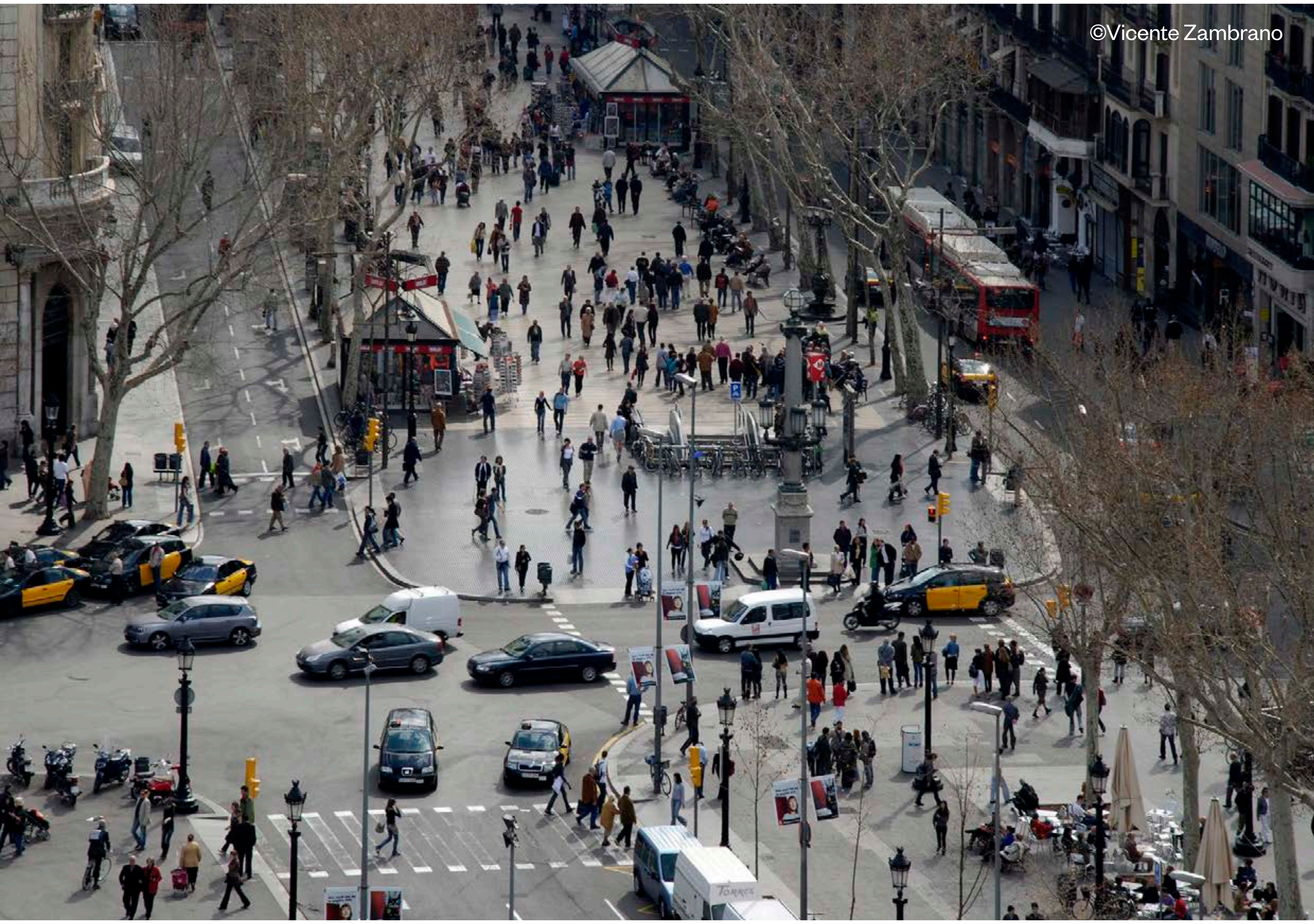
CHAPTER II

Why do we need the Salut als Carrers Methodological Manual?

INTRODUCTION

More and more of the world's population lives in cities. Recent estimates indicate that more than half of the world's population already lives in urban areas. Moreover, according to the World Health Organization, there is potential for urban growth in more than 500 cities of 1-10 million people. In this context of urban concentration, humanity is experiencing new challenges to the wellbeing and health of urban populations. These challenges at the global level have altered the dynamics of cities—the COVID-19 pandemic serves as a prime example. This is underway in all cities, regardless of geographic location, latitude, language, history, or culture.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According to the World Health Organization, changes associated with the effects of climate change on population health fall into two categories [2]: direct and indirect. Direct effects include consequences of exposure to extreme weather events. Examples include droughts, floods, heat waves, storms, and fires. Indirect effects include consequences of exposure to changes in ecological and environmental channels that have an impact on health, such as air quality, quality of drinking water, and vector-borne diseases. Indirect effects also include those mediated by human systems, such as population migration, malnutrition, or lack of access to universal health systems. Climate change has the capacity to influence the main social and environmental determinants of health, i.e. clean air, safe water and food, and a safe and sufficiently comfortable habitat.

These direct and indirect effects will have different consequences for cities around the world in the coming years. According to the studies conducted [3-5], the main effects of climate change on public health in the city of Barcelona are the following: heat waves, effects on the availability and quality of drinking water, air quality, communicable diseases (e.g., COVID-19, dengue or chikunguya), and energy poverty.

On the other hand, the increase in socio-economic inequalities in cities has also been highlighted in recent years. It is now known that intensive urban growth can lead to increased poverty, given that local governments are unable to provide services for all residents. Inequalities and inequalities in health tend to be more marked in urban areas inhabited by the most disadvantaged and impoverished populations [1].

JUSTIFICATION

21st Century urbanization demands that we transform cities to increase people's well-being. Many of the interventions in our toolbox have historical roots. A clear example comes from Barcelona, where Ildefons Cerdà developed one of the great signs of identity of the city: the interiors of "blocks", spaces of leisure and rest. An example of complex projects in other contexts is the "Complete Streets" program in the United States [6-9]—streets designed to allow safe use and to support the mobility of all people. This means that each project will make the street network better and safer for drivers, traffic users, pedestrians and bicyclists, making your city a better place to live. Another complex project that has been implemented is the "Healthy Streets" project [10,11] in London. The Healthy Streets approach takes into account the elements necessary for public spaces to improve people's health and make urban places socially and economically vibrant and environmentally sustainable.

By prioritizing the needs of pedestrians over motorized vehicles as a paradigm shift, Barcelona's Superblocks program aims to tackle the challenge of climate change and other urban challenges. It is a complex intervention that, through modifications in mobility and urban improvements, allows to decrease the use of cars and reduce noise and air pollution. The Superblocks also confront mobility challenges associated with the improvement of the quality of life in cities, by promoting physical activity through urban improvements that stimulate active mobility.

On the other hand, climate change and the devastation of natural resources seem to be related to emerging health crises, and there is no guarantee that the current crisis generated by a pandemic (COVID-19) will not be repeated. During this crisis, person-to-person transmission transformed the pandemic into a social phenomenon and then a social emergency. Public space (e.g., parks or pedestrian areas) and outdoor mobility (e.g., via bicycle or skateboard) play a critical role in an indoor aerosol transmission context. Because of the systematic increase in the cost of housing in recent years and the consequent gentrification, especially in large cities, the pandemic has forced people to spend months of confinement in small spaces as part of voluntary and forced isolation. As a result, multiple studies have raised how the mental health of the population in large cities during and after the pandemic seems to be a greater challenge than previously imagined. COVID-19 has further exacerbated the need for more open public spaces and options for active mobility—as well as the reduction of barriers to access and use of these spaces. Doing so will generate new habits of coexistence within cities, both in the present and future.

Nevertheless, the study of the effects of the urban environment on health is relatively recent. It is having a remarkable resurgence in the current context of climate change and of forecasts of a greater share of the world's population living in urban environments. There is increasing evidence of how the elements of the urban environment and its configuration have a significant impact on health: traffic density, lack of green spaces, and industrial and traffic emissions are important determinants of health and their approach has a great impact on social inequalities in health.

The evaluation of the Superblocks program will provide pieces of information on what impact its implementation will have had on air quality, perception of health and quality of life, social support, physical activity, and traffic injuries, with a gender and inequality perspective. This guide aims to describe the Methodology for this.

CONTENT

This guide describes the methodology used in the different sub-studies developed to evaluate the health and environmental effects of the implementation of the Superblocks in Barcelona. It includes qualitative and quantitative methodologies depending on the moment of development of the Superblocks.

In the areas where Superblocks had already been implemented (San Antoni and Poblenou), qualitative studies were carried out to find out the changes in the perception of the use of space and observational measures of physical activity and sedentarism for one year.

Where Superblocks had not yet been implanted (Horta), a pre-post evaluation study with a specific health survey and environmental measures was proposed. It also includes a brief qualitative study to help interpret the changes, since a comparison group was not included due to the high cost of a survey. In addition, measures have been taken to produce a walking index before and after the intervention.

With all the Superblocks in place, the impact on reducing road traffic injuries will be assessed and what impact it would have if the number of Superblocks were expanded.

Air quality measures have been taken in all Superblocks.

This guide includes a description of each of the methodologies used.

RECOMMENDED READINGS

- For more details on methodological manuals (classic): Handbook of Urban Health: Populations, Methods, and Practice Edited by Sandro Galea and David VlahovNew York: Springer, 2005. 599 pp. ISBN-0-387-23994-4

- For more details on current evaluations and methodologies: WHO European Healthy Cities Network http://www.euro.who.int/en/health-topics/environment-and-health/urban-health/who-european-healthy-cities-network

- For more information on the links between transport and health: https://www.sciencedirect.com/book/9780128191361/advances-in-transportation-and-health

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CHAPTER III

Salut als Carrers Health Survey, Horta

INTRODUCTION

In the case of the Horta neighborhood, a pre-post intervention evaluation study using a population health survey has been proposed. In this way, not only will the changes in the residents' health perceptions of the neighborhood will be measured, but also the changes in the health determinants associated with the intervention, such as sedentary behavior, physical activity, mobility, social support, and perception of the physical environment.

METHODOLOGY

Two surveys have been carried out on a representative sample of the population, before and after the Superblocks intervention: pre-intervention (May-September 2018) and post-intervention (May-September 2020). The second survey was conducted with the same people who responded to the first survey. The sample unit for the survey is individuals (not households or families). A sample size (1200 persons) sufficient to detect a 3% change in self-reported ill health and mental ill health was calculated —Goldberg scale—with a statistical power of 80% and an error of 5% at α. Also, the sample size is sufficient to make the survey representative for the Horta neighborhood (area of Superblock intervention).

> "A sample size (1200 persons) sufficient to detect a 3% change in self-reported ill health and mental ill health was calculated..."


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The selection of the people to be interviewed was made through a simple random extraction process from the Barcelona Population Register (Padrón de habitantes). A pure randomness control system was applied by establishing quotas by sex and age based on the actual population structure of the neighborhood. In anticipation that some of the people selected would not or could not participate in the survey, five substitutes were selected for each of the 1200 selected as incumbents with the same sex and age characteristics. All the people selected for the sample and the replacement had to have been residents of the neighborhood for more than 6 months. It was important to measure the perception of health and its determinants in residents who knew the neighborhood and their perception after the intervention.

The survey was conducted with previously selected people, contacted at home by professional surveyors. The survey was carried out through a CAPI system (computer assisted survey). About ten days before the visit of the interviewers, an information letter was sent to the sample group. This letter, signed by the manager of the Barcelona Public Health Agency and the Health Council, presented the objectives of the survey, a summary of the project and announced the next visit of an interviewer to their home while encouraging participation in the survey.

To evaluate if there were significant changes between the different health outcomes before and after the intervention, McNemar tests were carried out for the categorical variables and paired sample T test for the continuous. If changes were confirmed, subsequent analyses assessed whether such effects differed according to socioeconomic characteristics such as age, sex, social class, or immigrant status. Poisson regression models with robust variance were used to estimate the prevalence ratio of the dependent variable in the health outcome and the independent variables the socioeconomic characteristics (2).

METHODOLOGICAL INSTRUMENT

The survey was developed from a set of scales validated for both Catalan and Spanish, as well as questions obtained from the Barcelona Health Survey (BHS) which is conducted every 5 years in the city of Barcelona to a sample of 4000 people. The particularity of having questions that are present both in the Barcelona Health Survey and in the Salut als Carrers survey, allows to compare the health of the neighborhood with the city.

There are two versions of the questionnaire, in Catalan and Spanish. The questionnaire is administered to the population over 17 years old and some questions differ depending on the age (more or less than 65 years old), the work situation and the composition of the household. The administration of the questionnaire takes between 20-25 minutes.

Below is a list of the sections and scales in which the Salut als Carrers survey is configured:

THEMATIC AREAS	QUESTIONS	REFERENCE SCALES
Socio-demographic data	1-12	Barcelona Health Survey Questionnaire [3] IDESCAT [4]
Health status and quality of life	13-17	WHO (5) Pittsburgh sleep quality index (6-8) EQ5-D (9)
Welfare	19	DUKE-8 (10)
Mental Health	20	Goldberg (11)
Mobility	35-40	EMEF (12) ESB(3)
Lifestyles: physical activity	21-34	Marshall (13) IPAQ (14) LONG YALE (15)
Environmental context	41-42	Community Life survey (16) ESB(3) Neigbourhood(17)
Coexistence and characteristics of the housing	45 50-51	EU-SILC 2012 (18) ESB](3)
Informed consent	52	In compliance with Regulation (EU) 2016/679 of the European Parliament and of the Council [19]
Observation sheet	D-F	

Table 1. Questions of the basic questionnaire by thematic sections

METHODOLOGICAL CHALLENGES

▪ Sample collection: difficulty in ensuring participation in home interviews. For this purpose, we disseminated information on the survey through social networks and sent informational letters to members of the sample group. The interviewers were properly identified.

▪ Quality of the survey: ensure that the interviewers are conducting the surveys with the necessary quality to allow the validity of the results. For this purpose, it is recommended to carry out a quality control of the survey.

RECOMMENDATIONS

A number of recommendations emerged:

▪ Inform the territorial authorities before the implementation of the survey.

▪ Talk to people in the neighborhood and present the project to them before implementing the survey. Also inform the main social centers/civic centers or key sites where information is concentrated in the neighborhood.

▪ If there is pushback on the project, the evaluation of the project itself may be confused with the implementation of interventions. For this reason, it is considered convenient to carry out a strategy of dissemination of information about the project evaluation and, in this case, about the elaboration of the survey so that there is no confusion between the intervention and the evaluation. If there is resistance in the neighborhood to the intervention, it is possible that only the people in favor or who have benefited will answer the survey, and a participation bias will be produced.

▪ Need for coordination with the team that is implementing the urban project, resulting in shared information about implementation measures and the time frame, so that it does not affect the field work.

RECOMMENDED READING

- For more details on survey methodology: Rutstein SO, Rojas G. Demographic and Health Surveys Methodology. 2006.

- For details on more methodologies that could be implemented at the time of the field work: Seskin S, Kite H, Searfoss L. Evaluation Complete Streets Projects: A guide for practitioners. Victoria, BC: AARP: Governmen Affairs; p. 49.

- For more examples of survey implementation: B.B. Brown, K. Smith, D. Tharp et. al. A Complete Street Intervention for Walking to Transit, Nontransit Walking, and Bicycling: A Quasi-Experimental Demonstration of Increased Use. J Phys Act Health. 2016 Nov;13(11):1210-9.

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CHAPTER IV

Use of the SOPARC tool to evaluate physical activity in the Barcelona Superblocks model

INTRODUCTION

The System for Observation of Play and Recreation in Communities (SOPARC) is a valid and reliable method for understanding how people engage in physical activity in environments that are permanent (e.g., parks or superblocks) or temporary (e.g., public access spaces) (1, 2). The data provided by the SOPARC method help to determine the changes that need to be made in neighborhoods to create more conducive environments for physical activity (3). In the Superblock model, the SOPARC methodology can help with long-term planning. The distribution of characteristics of users and their activities can enable urban designers to develop relevant characteristics to increase physical activity in these settings.

Briefly, SOPARC records the physical activity of people standing or moving in the selected space, by direct on-site observation (3). The area of the superblock is mapped to identify the target areas and is subdivided into observation spaces (3). Observation scans of the target areas (a visual sweep from left to right across the area) are performed to obtain information about the number of people in the selected area, their gender, age group, race/ethnicity, and physical activity (2). Observations are made weekly, either during one or several seasons (3). Days of observation include at least one weekday and one day of the weekend, observing at least 4 bands per day, in the morning, afternoon and evening (3). Using SOPARC, we identified the pattern of physical activity use and sedentary behaviors in users of the Sant Antoni Superblock over a period of one year (May 2018 to May 2019).


JUST DO

METHODOLOGY

Three observers received 8 hours of training on SOPARC, including theoretical classes and field practice (3 and 5 hours respectively). Concordance among observers—the degree of agreement among observer assessments—was measured by the proportion of times all observers gave the same score (4). After five hours of field training, agreement values among observers reached more than 70 percent of the total number of observations, age, sex, physical activity, and sedentary behavior, which is generally considered high (4).

Following the SOPARC protocol (5), the members of the research team identified two target areas for observation in the recently developed space of the Superblock in the Sant Antoni Market Square, in the Eixample district. Target zone 1: Market Square plus Compte Borrell Street (northbound); Target zone 2: Tamarit Street (westbound from Market Square). One observer for each target zone (n=2) scanned the area for the following observed variables: sex (male; female), age groups (children 0-12 years; adolescents 13-20 years; adults 21-59 years; adults 60 years and older), physical activity (walking; vigorous activities), and sedentary behaviors (sitting; standing without moving). The observation of race/ethnicity was not relevant to the objective of the study and may reduce the reliability of the scores during data collection (2, 4). To better understand the use of Superblocks for physical activity and sedentary behavior, the SOPARC instrument was slightly modified from its original format (3) to distinguish between types of walking (dog walking; pushing baby carriages; pushing shopping carts; pushing wheelchairs; walking only); vigorous activities (cycling, running, skating); and electric scooters.

INSTRUMENTS METODOLÒGICS

The SOPARC instrument and protocol can be found on the website of the Center for Active Life Research (https://activelivingresearch.org/). This center is administered by the University of California-San Diego School of Medicine (USA) and offers a wide range of instruments to assess the extent to which neighborhood environments support physical activity. Information on how to use the SOPARC instrument can be found at https://activelivingresearch.org/soparc-system-observing-play-and-recreation-communities.

A free 27-minute training on SOPARC Introduction, Practice, and Assessment is also available from the Center for Active Living Research and can be downloaded at https://hwb.cnr.ncsu.edu/resources/. A SOPARC application is available as a free download from Apple's App Store. We did not use the application for the Superblocks because it did not distinguish between types of walking, types of vigorous activity, standing, or electric skating.

METHODOLOGICAL CHALLENGES

- The observation of age, sex, physical activity and sedentary behavior as a whole is a complex cognitive task that can be difficult to measure in highly dynamic areas such as Superblocks. This could reduce reliability values among observers (4).

- The superblock model includes different designs of the built environment adapted to the characteristics of the district. This could influence the use of Superblocks by citizens for physical activity. The administration of SOPARC should be considered through a wider range of Superblocks with different built environment designs.

RECOMMENDATIONS

- Natural experiments are a valuable alternative for acquiring evidence for public health interventions when randomized controlled trials are often impractical (6). To assess the impact of Superblocks on physical activity and sedentary behavior, SOPARC should be administered at Superblock sites before and after the application of the Superblock program, as well as at non-Superblock sites. However, this may not always be possible due to the challenges of the experiments.

- In addition to proper training of observers at SOPARC, reliability of observers in crowded environments can be improved:

Go to the areas with the highest attendance and where the most activities take place, instead of the entire area of the superblock (4).

Exclude the observation of race/ethnicity, as this is one of the most difficult variables to observe (4).

Use repeated measurements observed (five weeks) of the same variables over a year.

Have observers with specific training in physical activity who are familiar with different intensities of physical activity.

Modify the SOPARC observation sheet to numerically code the different physical activity variables and the types of walking and vigorous activities (see methodological annexes).

RECOMMENDED READING

- The SOPARC protocol can be found at: https://activelivingresearch.org/sites/activelivingresearch.org/files/SOPARC_Protocols.pdf

- The SOPARC data path coding forms can be found at: https://activelivingresearch.org/sites/activelivingresearch.org/files/SOPARC_DataPathCodingForms.pdf

- SOPARC's mapping strategies can be found at: https://activelivingresearch.org/sites/activelivingresearch.org/files/SOPARC-SOPLAY_MappingStrategies.pdf

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6. https://mrc.ukri.org/documents/pdf/natural-experiments-to-evaluate-population-health-interventions/

CHAPTER V

Salut als Carrers, ethnographic approach in Sant Antoni

INTRODUCTION

In the case of Sant Antoni, a qualitative study was proposed with a spontaneous ethnographic approach (ethnographic guerrilla) that combines ethnographic observation with semi-structured interviews. The main objectives were:

- To obtain a general assessment of the Superblock.
- To evaluate the positive aspects associated with the daily life and quality of life of the neighborhood.
- To evaluate the negative aspects, disadvantages and aspects that can be improved by the implementation of the Superblock.
- Evaluate changes in the use of public space.
- To evaluate changes in the well-being or health of the neighbors.
- Identify changes according to different user profiles (according to age, type of family, functional diversity, country of origin, gender, etc.).

The spontaneous ethnographic, or ethnographic guerrilla, approach allows observation through immersion within a group in its natural environment in order to collect information. In addition, through the semi-structured short interviews, interesting information is obtained from the participants. The physical context is especially relevant and becomes one more investigated space. Thus, the ethnographic guerrilla is a very appropriate method to capture the behavior in the superblock of Sant Antoni and also to collect information on the perception of neighbors of the changes that have occurred. The ease of implementation and the speed in obtaining results make it an ideal method to complement other quantitative studies implemented in the area.

METHODOLOGY

The spontaneous ethnographic approach was carried out by pairs of researchers with experience in ethnographic analysis and qualitative research. In this case, 3 sessions of 5 hours each were carried out at different times of the day and week: one weekday from 9:00 am to 2:00 pm, one Friday from 4:00 pm to 9:00 pm and one Sunday from 9:00 am to 2:00 pm. The guerrillas were made in an itinerant way, covering especially the streets of the superblock, but also the adjacent streets and other parts of the neighborhood.

As mentioned above, in the guerrillas, observation is combined with individual or group interviews of short duration (in our case from 3 to 15 minutes to about 10 individuals or groups of people). The participants are not captured beforehand, but are approached spontaneously, informing them of the objective and characteristics of the study. Data collection is done in a multimedia way through audio, video, and photographic recordings, which are then analyzed and form part of the report. Different profiles of people were interviewed: neighbors who use the supermarket, floating population who use the supermarket, shopkeepers, neighbors of streets adjacent to the supermarket. In addition, an attempt was made to have the maximum possible representation of different socio-demographic variables such as age, gender, social class, or country of origin.

> “The participants are not captured beforehand, but are approached spontaneously, informing them of the objective and characteristics of the study.”

METHODOLOGICAL INSTRUMENT

For the semi-structured survey, a script was written beforehand on topics to be covered. The script had the following items:

1. Resides in the neighborhood and since when. Inside or outside of the superblock.

2 .What activity are you doing right now? How long are you going to be there?

3. What do you think of the current state of this area? Do you name it in any way (knowledge of the superblock concept)?

4. How has the change affected you? (first in spontaneous but ask)

- Tours
- Activities
- Time of use
- Mobility
- Interactions/Socialization
- Sales (business)
- Your productive, reproductive, community, personal life
- It has affected you differently according to different times of the day/ week (also day/night, especially for women)

5. To what extent do you feel the change has affected your health? (spontaneous first but ask)

- Physical health
- Mental/emotional/well-being

6. What do you like most and least about the superblock?

7. How would you rate the Superblock from 1 to 10?

METHODOLOGICAL CHALLENGES

▪ The interviews were of short duration, in comparison to long interviews in which interviewees receive compensation, due to the situation on the street and the little time available to the people interviewed. This makes the interviews impossible to reflect in depth on the different aspects.
▪ On the other hand, people who are not in the public space are excluded from the study.
▪ Although we tried to have a diversity of days and schedules, the observation was limited to the schedules of the interviewers.

RECOMMENDATIONS

▪ It is highly recommended to combine the studies generated in the same area and to coordinate the different methodologies and sources of information.
▪ Experience and training in ethnography and qualitative research are key to directing the research.

CHAPTER VI

The impact of the Superblocks program on walkability in Horta (MAPS tool)

INTRODUCTION

Creating active and supportive built environments can reduce the burden of chronic disease (1). Specifically, the integration of activity-friendly contextual characteristics into neighborhoods has been associated with increased physical activity in citizenship (2). These environmental characteristics fall into two categories:

A. Macro scale, which encompasses structural characteristics and design elements (e.g., interconnectivity, land use, and residential density).
B. Micro scale, which includes details about streets, sidewalks, intersections, design features, and the social environment that affect activity in a location, such as features of road crossings, presence of trees, and graffiti (3).

The micro-scale characteristics of the pedestrian environment are related to physical activity throughout life, especially with transportation, walking or cycling, and physical activity in leisure neighborhoods (4). Micro-scale factors can be modified at lower cost and in a shorter time, which may be more cost-effective than reconfiguring macro-scale design (4). In addition, identification of micro-scale factors allows for the detailed examination of environmental characteristics that influence physical activity, which can be effective in allocating infrastructure resources to ensure opportunities and access to enabling environments (5).

In the Superblocks model, we evaluated the micro-scale characteristics of the urban landscape of a the Horta neighborhood in Barcelona before and after the implementation of the Superblocks program, using a local environmental audit of the urban landscape, the Micro-Audit of Urban Pedestrian Landscapes (MAPS) (6). This allowed for the identification of the impact of the Superblocks program on the characteristics of the micro-scale urban landscape that affect the physical activity of pedestrians.

METHODOLOGY

The Micro-Audit of Pedestrian Landscapes (MAPS), collected data from the audit on the characteristics of the pedestrian environment in the neighborhood of Horta. Before the implementation of the superblock (in June 2018), two independent auditors (1 man, 1 woman) completed the MAPS audit along 4 routes of Horta's street network: Chapí Street, Fulton and Horta Street, Feliu Codina Street and Eduard Toda Street. Previously, the auditors had gone through a two-day training process that required them to complete the audit of two routes in the city of Vic (Barcelona). The agreement between both auditors reached 95% in all the environmental characteristics observed. The post-intervention audit took place in the same locations.

For each street, three sections were audited (6): general route (assessed the characteristics of the entire route), street segments (assessed the route segments between crossings) and crossings (assessed each street that crosses along the route).

The general route section evaluated elements such as destinations and land use (mix of residence, stores, restaurant-entertainment, institutional services, government services, public recreation, parking and transit stops) and the landscape characteristics of the streets, aesthetics and social characteristics. The crossing section evaluated elements such as crosswalk amenities, curb quality, intersection control, roadway width, and roadway impediments. The street sections evaluated the relationship between building height and road width, cushioning, bicycle infrastructure and trees, building aesthetics and design, sidewalks, sidewalk obstructions and hazards, one-way street design, and grade. A more detailed explanation of the characteristics of the elements and subscales can be found in tables 1, 2 and 3 of the methodological annexes (6).

Following the MAPS scoring protocol (https://drjimsallis.org/measure_maps.html), most of the MAPS elements were coded dichotomously (no/yes), while the frequency elements (0, 1, and 2+) were scored as zero, 1, or 2 respectively. Continuous and descriptive items were then dichotomized or tricotomized. All sections had positive and negative valence scores based on the expected effect on physical activity (i.e., steps to cross the street were positive while impediments to crossing were negative). Higher negative value scores indicated more negative attributes toward physical activity. Higher positive value scores indicated more positive attributes toward physical activity. The negative valence scores were subtracted from the positive scores to create an overall section score. For example, if a route's negative valence score was 6 and the positive valence score was 10, the overall route score would be scored +4, indicating a greater presence of microscopic attributes that positively influence pedestrian physical activity. On the other hand, a negative score (e.g.,−4) would indicate a greater presence of microscale attributes that negatively influence pedestrian physical activity. The higher the total score, the greater the positive effect related to the physical activity of pedestrians.

METHODOLOGICAL INSTRUMENT

The MAPS tool is described on the website of the Center for Active Life Research (https://activelivingresearch.org/). There are four versions of the MAPS tool: MAPS-Full (120-item audit survey), MAPS-Abbreviated (60-item audit survey), MAPS-Mini (15-item audit survey), and MAPS-Global which was developed for international use in February 2018. For the Horta Superblock, we used the MAPS-Full version instead of MAPS-Global, as auditors had already completed their training with MAPS-Full before MAPS-Global was released.

Information on how to use MAPS-FULL can be found on the website of Dr. James F. Sallis' research group at the Department of Family and Preventive Medicine, University of California, USA. The survey syntax, aggregation, and creation of MAPS FULL for recoding and scoring subscale elements can be found at https://drjimsallis.org/measure_maps.html.

METHODOLOGICAL CHALLENGES

- Subtracting the negative results from the positive ones in MAPS-Full can be confusing in some subscales. It is important to build an expert consensus between the two independent auditors during the training period.

- MAPS can be used to evaluate different built environments. Some terms used in the MAPS can be modified, if necessary, to make the audit clearer and more tailored to the specific environment.

RECOMMENDATIONS

▪ Auditors should familiarize themselves with the routes or area to be audited before using MAPS-Full. It is recommended that a two-day training process be conducted in the same area of the district where the audit will take place.

▪ The interrelationship between the auditors is crucial. The two-day training should include an in-depth discussion of all sections audited.

▪ The MAPS-Full is designed to audit the characteristics of the urban landscape at the micro scale in American based cities. The use of the MAPS Global audit tool (6), which was designed for international use, would be recommended to further assess other areas of the Superblocks in the future.

RECOMMENDED READING

- The complete MAPS manual can be found at https://drjimsallis.org/Documents/Measures_documents/MAPS%20Manual_v1_010713.pdf

- Cain KL et al. Development and reliability of a streetscape observation instrument for international use: MAPS-Global. International Journal of Behavioral Nutrition and Physical Activity. 2018; 15:19. Open access. https://ijbnpa.biomedcentral.com/articles/10.1186/s12966-018-0650-z

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3. Microscale Audit of Pedestrian Streetscapes (MAPS) Active Living Research https://activelivingresearch.org/microscale-audit-pedestrian-streetscapes Accessed: 2020-11-093. Cain et al. Contribution of streetscape audits to explanation of physical activity in four age groups based on the Microscale Audit of Pedestrian Streetscapes (MAPS). *Social Science & Medicine. 2014*; 116 (2014): 82e92

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CHAPTER VII

Qualitative focus groups, Poblenou

INTRODUCTION

In the case of the Poblenou Superblock, a qualitative evaluation was proposed, with the objective of understanding residents' perceptions of the urbanistic changes and of mobility derived from the superblock, as well as of the effects that these could have had. Specifically, the effects of the superblock were evaluated in the following areas: public space, mobility, well-being and health, and the effects on other areas such as the neighborhood and the community.

The qualitative analysis allows us to approach the structures of meaning and the symbolic components of the discourses. Specifically, the qualitative technique applied was that of discussion groups. The main characteristic of these groups consists in their procedure for collecting information, since "the focal groups incorporate the interaction of the participants among themselves and with the moderator, and the obtaining of this type of interactive information is what distinguishes the focal group from the interview" (1).

METHODOLOGY

Six focal groups were convened for the qualitative evaluation, between the months of February and May 2019. The six focal groups were determined in two successive phases. First, the construction of the focus groups required knowledge of the objectives, methodology and characteristics of the program Salut Als Carrers, evaluation of Superblocks areas. Secondly, the feasibility of the possible groups that had emerged as hypotheses throughout the launch meeting was contrasted. During this phase, contact with the people responsible at the Agència de Salut Pública de Barcelona (ASPB) made it possible to draw up and validate with the ASPB the proposal for the composition of the 6 focus groups.

The construction of the 6 focus groups was based on the research priorities. In the first place, it depended on the need to evaluate the experience and assessment of the Poblenou Superblock and to know its effects. Consequently, qualitative fieldwork required the inclusion of people who live in or have made use of the Superblock. Secondly, the focus groups had to maximize the extraction of information that would make it possible to describe the experience and assessment of the Poblenou Superblock and the effects of the Ward on public space, mobility, health or coexistence and the neighborhood, and, as far as possible, explain the reasons for this. To this end, an effort was made to maximize the internal homogeneity of the groups, so that it was possible to associate certain differential evaluations collected with the specific characteristics of each group and make them comparable with each other.

Thirdly, the construction of the focus groups responded to the need to maximize the validity of the descriptions and explanations that were extracted. Consequently, efforts were made to diversify the representativeness of the groups. Aspects such as gender and age were considered and three differentiated groups were generated: a group of only young people, a group of only older people and a group of only women. Consideration was also given to whether or not there were children to take care of, to create two differentiated groups, one of adults with children and one of adults without children. Finally, the application of the criterion of internal homogeneity implied separating those groups mentioned that lived in the Superblock from those that only used, without living in it, in different groups, and from here arose the need to create a group of workers and students.

The duration of each group discussion was approximately one and a half hours. Two people were required to conduct each group discussion: a moderator and an observer. The moderator has to have skills for leading groups, making the discussion among participants more dynamic and stimulating. The observer has to intervene as little as possible, observing the group dynamics and taking notes.

The qualitative evaluation was carried out based on the analysis of the literal transcripts of the 6 focus groups. The analysis process was mainly focused on the understanding of what the subjects expressed from the content analysis. The basic stages were:

- First reading with semantic markers (initial and emerging).
- Identification of the context in which they appear.
- Identification of the link with other markers and from the same family.
- The analysis of the text was carried out with the support of the specialized program Atlas.ti.

METHODOLOGICAL INSTRUMENT

The script used for the Focus Groups consisted of different sections, among which were the presentation of the participants, the effects of the superblock (which included effects on mobility, health and other effects), recommendations, and closing.

METHODOLOGICAL CHALLENGES

- It was difficult to find opponents the Superblock to participate. Even though we directly contacted entities that were opposed to the project, we did not find a favorable response to participating in the discussion groups.
- The group of young people and the group of older people had a notable bias in terms of the proportion of men and women participants. The young people's group had only one female and the older people's group had only one male.
- Although attention was paid to incorporating groups with similar distribution in relation to sex and age, it was not possible to do the same in relation to socioeconomic position. Thus, it can be said that the study has a low level of intersectionality. In general, there was little presence of people with a disadvantaged socioeconomic level in the groups.

RECOMMENDATIONS

- Adapt the recruitment to the profile of people (for example, avoid social networks in the recruitment of older people).
- It is very important to coordinate with entities in the neighborhood that help to recruit people.
- Facilitate the space and schedule compatible with the type of target population of each group.

RECOMMENDED READING

- Wilkinson, S. Focus group methodology: a review. *International journal of social research methodolog*. *1998*; 1(3): 181-203.

- Berenguera A, Fernández de Sanmamed MJ, Pons M, Pujol E, Rodríguez D, Saura S. Escuchar, observar y comprender. Recuperando la narrativa en las Ciencias de la Salud. Aportaciones de la investigación cualitativa. Barcelona: Institut Universitari d'Investigació en Atenció Primària Jordi Gol (IDIAP J. Gol), 2014.

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CHAPTER VIII

Environmental measures in Sant Antoni

INTRODUCTION

The evaluation of the impact on environmental levels, especially the levels of air pollution, derived from the implementation of the Superblocks model is based on a pre-post evaluation of environmental measures in representative points of the urban network where the mobility restructurings have been carried out.

In this evaluation, it was taken into account the sections of street where the traffic calming measures were carried out, where a future improvement of the pollution levels was expected, as well as points that would channel the traffic both within the area of the Superblock and around its perimeter and, therefore, could potentially see the environmental quality in this environment diminished. In this way, the impact evaluation allowed for environmental information of the previous situation and of the different post-intervention scenarios.

The levels of air pollution were measured with automatic analyzers and manual sensors according to the European directive on air quality, and therefore provided a quality equivalent to the data measured with fixed measurement stations in the city. At the same time, indicative measurements were made with passive diffusers to obtain information about the whole area of execution of the Superblock.

METHODOLOGY

Measurements of critical air quality pollutants (NO_2 and particles) were performed with the Mobile Air Monitoring Unit equipped with automatic analyzers and manual sensors based on the reference methods of Directive 2008/50/EC on ambient air quality and cleaner air for Europe.

For each Superblock, two points were selected depending on its future design. These points were representative of the urban fabric, one in the area of intervention to reduce traffic mobility, and the second in an area where no action was taken on private vehicle mobility, and which was therefore a stretch of traffic channeling. This second point was within the interior of the Superblock or in one of the perimeter streets (see Figure 1).

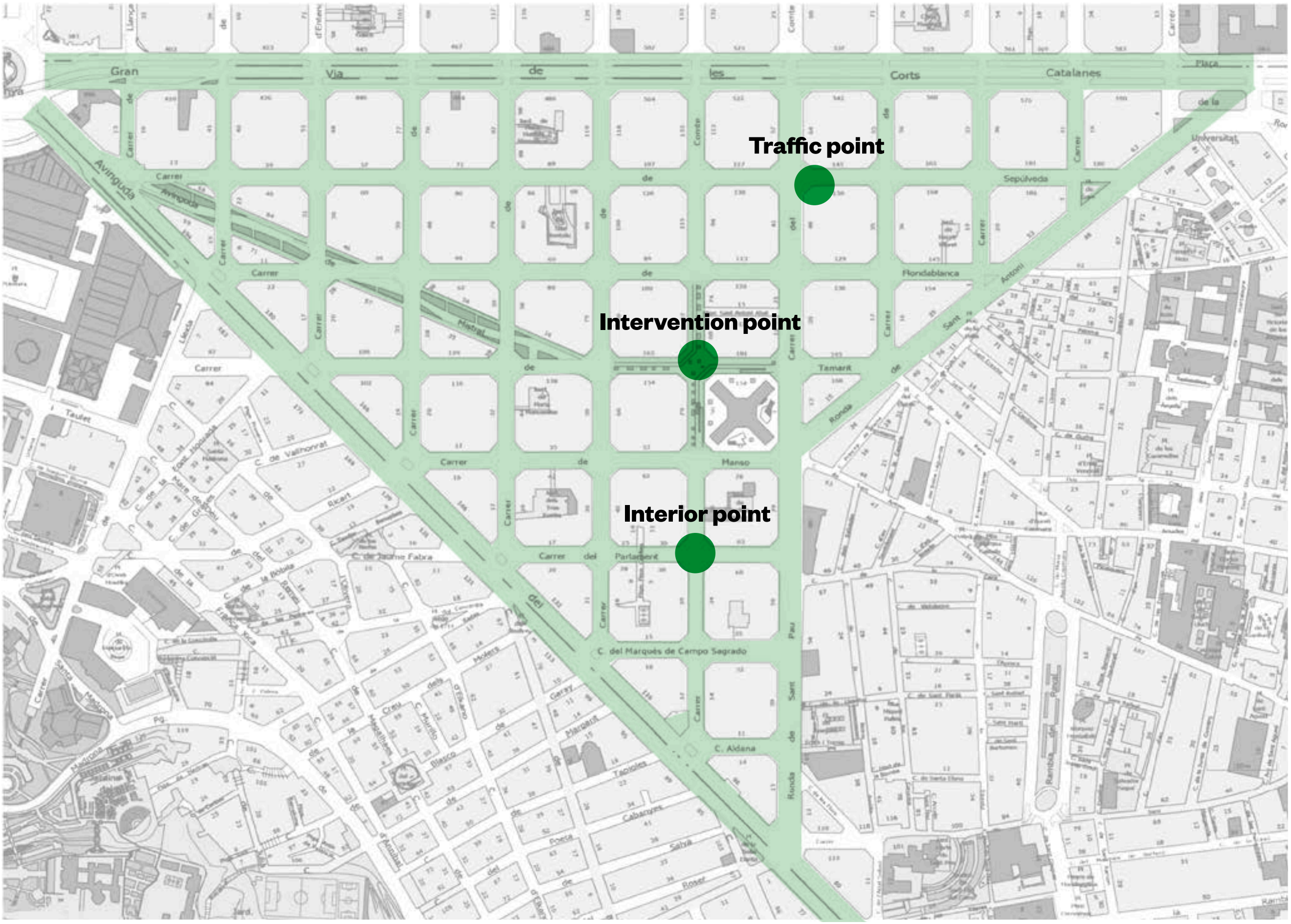

Figure 1. Sant Antoni area and environmental sampling points.

Previous assessments allowed for the establishment of contamination profiles at these two representative points in the area of study. These contamination profiles (hourly, daily, average of the period) were compared with the rest of the stations in the city and with the purpose of contextualizing the contamination levels of the area of study.

The post-intervention environmental measures allowed for evaluating the improvement or worsening of the pollution levels in the representative points studied, always taking into account the necessary corrections to de-seasonalize the air quality measures, subject to variables such as meteorological conditions.

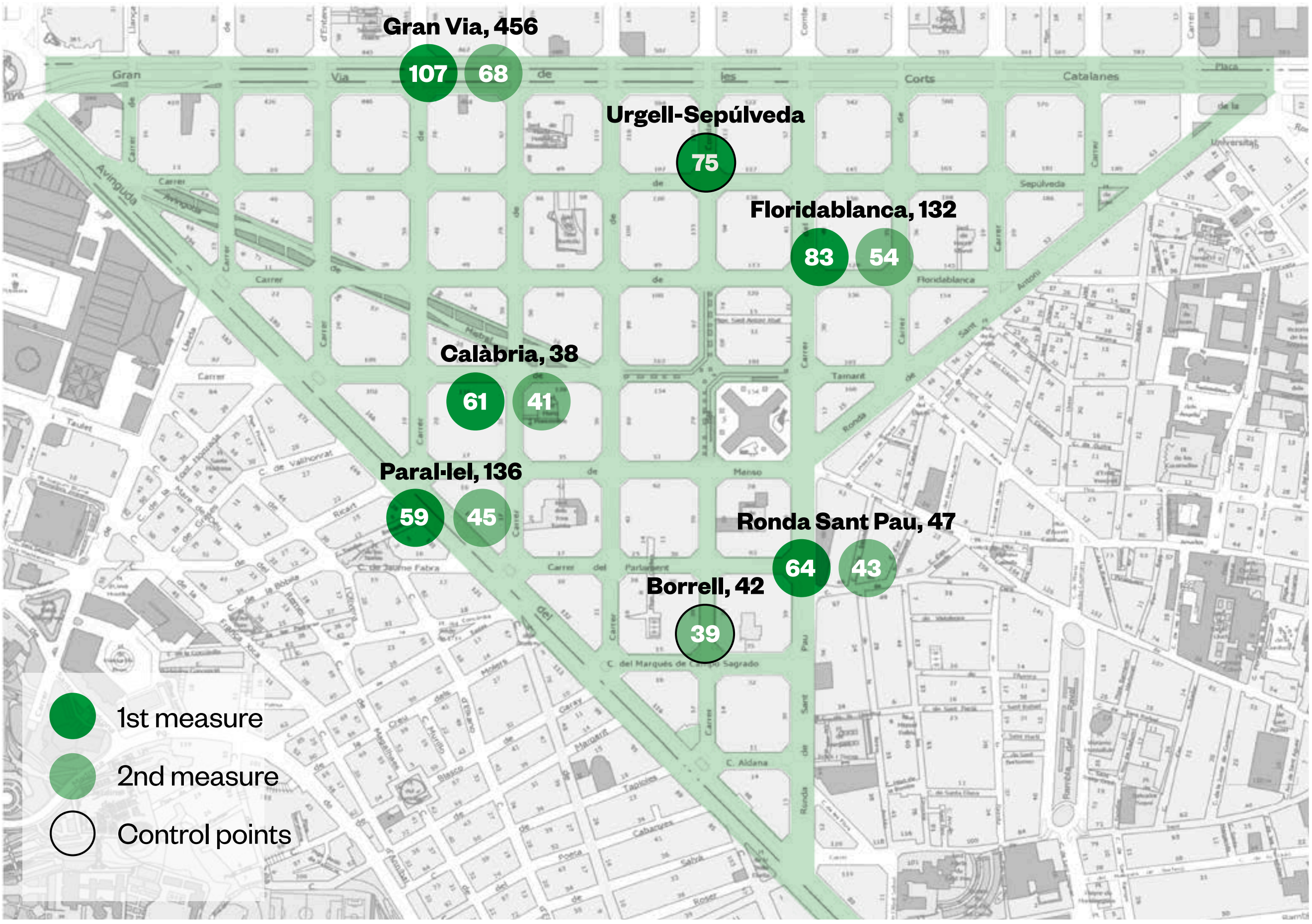

Figure 2. Measurement points and means of NO_2 (in mg / m^3) in the area of Sant Antoni superblock

Another objective of the environmental measures was to have information from the rest of the area. To this end, two indicative methods were used. In each of the measurement campaigns with the Mobile Atmospheric Control Unit, measurements were carried out in approximately 10 additional points in the area of superblock with passive NO_2 diffusers. This allowed to have the average concentration for this pollutant (see Figure 2). On the other hand, we used the high-resolution map of air pollution in the city of Barcelona, based on an immissions model of the Barcelona City Council and corrected from the environmental measurements made during the current year by the Public Health Agency of Barcelona (see Figure 3). With this map, it was possible to have information especially in the area of study and establish the population exposed to different levels of pollution by place of residence.

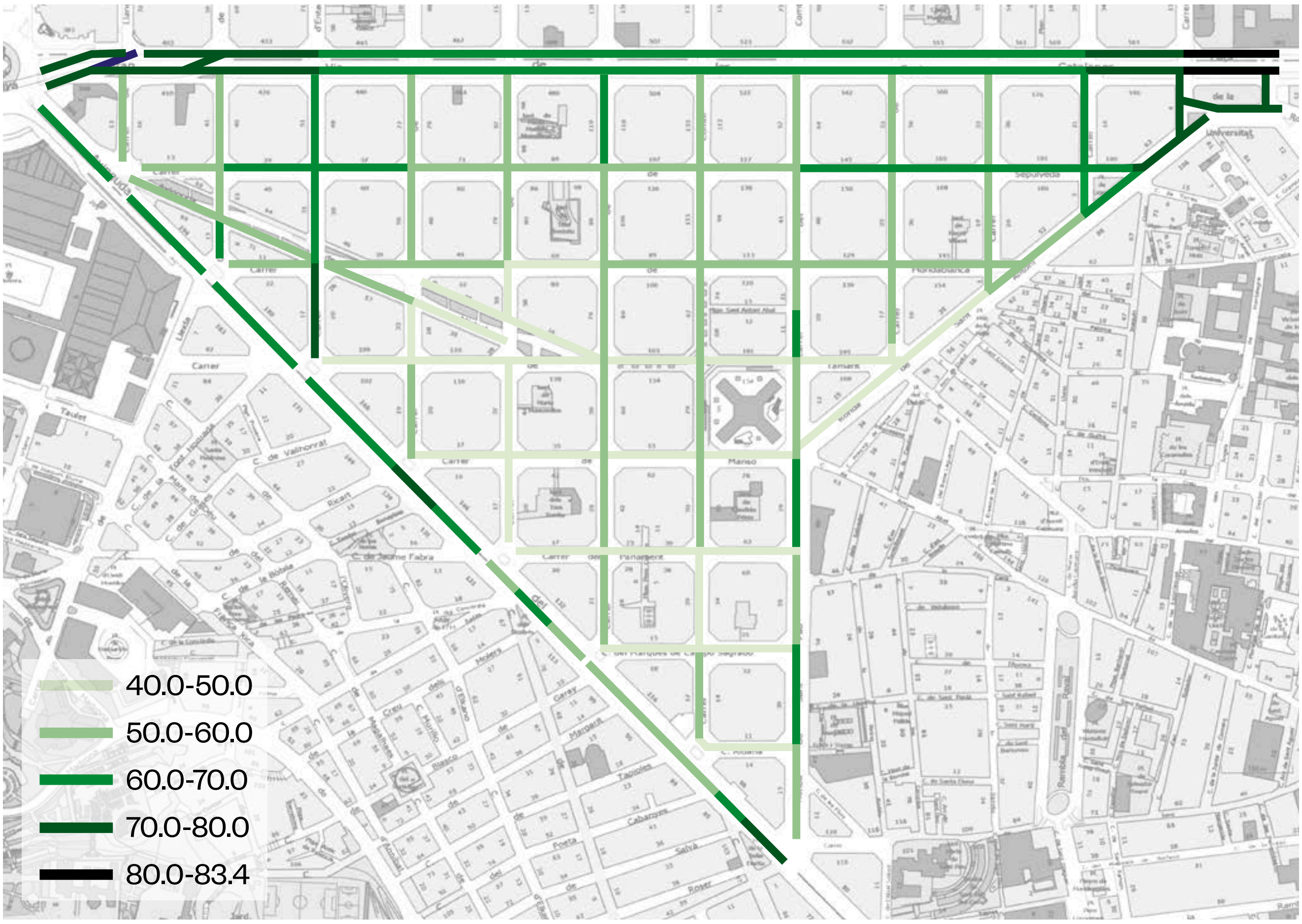

Figure 3. Annual average map of NO_2 by street sections in the area of the Sant Antoni superblock.

METHODOLOGICAL INSTRUMENT

The measurements were made with the following instruments:

- Mobile atmospheric control unit. Vehicle adapted to an air pollution control station and equipped with automatic analyzers, monitors and manual sensors to measure the concentration of the main air pollutants in ambient air.

- Passive diffusers. Tubes with specific adsorbents that are placed in the public road to measure by diffusion the average concentration of a pollutant during a certain sampling period.

- Model of immissions. Model based on the city's emissions inventory, the urban fabric and the meteorological variables, corrected from the environmental measurements made during the current year, and that allows calculating the annual average concentration for some pollutants in all the city's street sections.

RECOMMENDATIONS

- The installation of the Mobile Atmospheric Control Unit requires the authorization of municipal permits and the contracting of electrical connections for its operation.

- The measurement equipment must be subject to a maintenance and calibration plan that ensures the quality of the data.

METHODOLOGICAL CHALLENGES

The biggest challenge is to establish representative sampling points with the Mobile Atmospheric Control Unit, to characterize the pollution profiles and the impact on post-intervention levels. To do this, it is necessary to have the information and planning of urban actions planned for the implementation of the superblock.

RECOMMENDED READING

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CHAPTER IX

Environmental measurements of black carbon and nitrogen dioxide in Horta

INTRODUCTION

The Horta Superblock project offered the opportunity to evaluate pollution levels before and after the intervention; eliminating or greatly reducing traffic implies, a priori, a decrease in pollution in the intervened areas, and a possible variation in the adjacent areas due to changes in the dynamics of vehicle traffic. The assessment of pollution in Horta was conducted in May 2018 prior to the implementation of the intervention, which took place throughout 2019. In September 2020, the subsequent assessment was conducted to see the changes in pollution after the planned intervention.

To evaluate the pollution, black carbon measures were taken on streets affected and not affected by the implementation. A total of 21 points were chosen, classified in three types (table 1): 6 points in streets in the intervention area, 8 points in areas close to the intervention, and 7 points as a control, in an area sufficiently distant from the intervention and which, a priori, would not be affected by the change in traffic dynamics resulting from the intervention. This made it possible to see how the changes in the concentration of black carbon pollution would affect not only the streets that had been intervened, but also the surrounding streets. The measures in control zones, in the same neighborhood, but far from the intervened area, allowed for measurement of more general changes if any.

> "To evaluate the pollution, black carbon measures were taken on streets affected and not affected by the implementation."

CONTROL POINTS	
2	59 Rivero Street
3	30 Coïmbra Street
15	Torrent Can Carreres Street with Letamendi Street
16	94-98 Congrés Street
17	118-124 Hedilla Street
18	73 Canigó Street
19	31-37 Hedilla Street
CONTROL AFFECTED POINTS	
1	31C De la Plana Street
4	3 l'Església Street
5	45 Clara Campoamor Street
7	12 Rectoria Street
8	8 Lisboa Street
9	10-12 Pere Pau Street
11	21 Tajo Street
20	Carrer Feliu i Codina, 36 Street
INTERVENTION POINTS	
6	21-31 Eduard Toda Street
10	13 Fulton Street
12	55 Horta Street
13	39-41 Chapí Street
14	76 Carrer Chapí Street
21	24 Feliu i Codina Street

Table 1. Sampling points distributed in control, affected control and intervention.

METHODOLOGY

La Measurements were taken during 10 working days (two Mondays, two Tuesdays, etc), organized in three measurement teams that worked in parallel to cover the 21 measurement points (figure 1). The 21 points were distributed in 3 routes of 7 points each. Route A included points 1 to 7, route B points 8 to 14, and route C points 15 to 21. The 7 sampling points of each route were sampled following the same order each sampling day. The selection of points was made a priori, on a map, taking into account the planned intervention. Subsequently, the suitability of the location was checked by visiting the area, in order to finish defining the exact location of the points, taking into account that they should be far from smoke exits, parking lots, and bus stops, and avoiding locations with physical barriers that would make it difficult to disperse the air around them.

The measurements at each point were made over 30 minutes for each day of sampling. Peak hours were excluded, so the measurements were made from 9:30 a.m. until the completion of the 7 points for each route, thus ending around 2 p.m. The measurements were made at 1.5m above ground level, on the sidewalk; at 60cm from the road when the instrument was placed on poles or street lights; or in the water downspouts of the facade when the sidewalk was narrow or there were no poles to place them. This allowed us to capture the exposure levels of the population at street level.

In parallel to the black carbon measurement, we counted the vehicles that passed by each point for 15 minutes. Specifically, cars, motorcycles, light trucks, heavy trucks, buses, and also bicycles were counted. In turn, points were detected near sampling points with high vehicle traffic; we call these points of influence, and are points that can contribute substantial amounts of pollution to a sampling point because of their proximity. These points must be at a maximum distance of 50m to the sampling point to be considered as such.

Other variables such as NO_2, temperature, humidity, and wind speed and direction were also measured. The NO_2 was measured with passive diffusion tubes (NO_2 passive diffusion tubes, Gradko) in duplicate (two tubes per point), exposed continuously for 4 complete weeks, at 3m height at each of the sampling points, also placed in supports on poles or street lights. In cases of narrow sidewalks or without poles, the tubes were placed in the water drains located on the facades. The NO_2 concentration at the sampling points is therefore an average for each point. Temperature, relative humidity, and wind speed and direction were measured with a portable weather station each day on a different sampling route, in order to have a general idea of the weather conditions on each sampling day. The weather station was placed at 1.5 m above ground level.

The measurement campaign was complemented with a continuous measurement of black carbon during the whole sampling period at the station of the Xarxa de Vigilància i Previsió de la Contaminació Atmosfèrica de la Vall d'Hebron, as well as the measurement of NO_2 in triplicate using passive diffusion tubes. This station is considered as a background station, and as it is near the Horta district, it is used to control the temporal variability, to make the measurements comparable among them and, at the same time, to be able to compare them with the measurements after the intervention.

METHODOLOGICAL INSTRUMENT

Black carbon is the black sooty material resulting from the burning of fossil fuels, and is an important part of the suspended particles present in the air. Black carbon concentrations were measured with the microAeth AE51 instrument (microAeth, Model AE51 Magee Scientific, Berkeley, California, USA) at a recording frequency of 60 seconds and a flow rate of 150 mL/min. This instrument analyzes in real time the rate of change in the absorption of the transmitted light due to the continuous collection of aerosol deposits in the filter housed inside. The measurement at 880nm is interpreted as black carbon concentration.

The microAeth instrument, small and portable, allows to take continuous measurements at different points without having to perform a major installation or needing a power supply, since the battery has enough autonomy to perform each of the sampling routes.

From the measurements of black carbon concentrations, averages and medians per point and day were obtained, previously adjusted temporarily by means of the values of the same hour obtained in the Vall d'Hebron background station. These measures can be compared with the measures that will be taken in the post-intervention campaign in 2020.

METHODOLOGICAL CHALLENGES

To obtain a good measure of exposure to a contaminant, the optimal thing to do would be to sample continuously for as long as possible. This means either having a wide time window to sample and rotate the instruments between different points, or having many instruments to perform the study at all points simultaneously and in parallel.

The choice of the sampling point for the subsequent placement of the instruments, both the microAeth instrument for the measurement of black carbon and the placement of the NO_2 tubes, was not an easy task; the placement criteria were not always met or there was no adequate and safe physical support (a pole, street light or water drain) on which to place the instruments. Perhaps the placement at some points could have been done in such a way that the instruments would have been farther away from the roadway to avoid occasional fluctuations due to vehicles parking nearby.

RECOMMENDATIONS

A number of recommendations emerged:

▪ Know the intervention that will be carried out and know when it will be implemented, in order to be able to plan the evaluation campaign sufficiently in advance and to be able to carry out sufficient measurements at each point.
▪ Conduct longer measurements at the sampling points, even if this means an increase in the resources allocated to both materials and personnel to carry out the study.
▪ Plan a spatial coverage of sampling according to the intervention area. Intervention areas larger than Horta will need more measurement points and therefore more material and/or personnel resources.
▪ If possible, place the instruments in areas farther away from traffic as long as the logistics and viability of the study allow it.

RECOMMENDED READING

- To design a sampling campaign for subsequent LUR modeling: Provat K Saha, Hugh Z. Li, Joshua Schulz Apte, Allen L. Robinson, and Albert A Presto. Urban Ultrafine Particle Exposure Assessment with Land-Use Regression: Influence of Sampling Strategy. Environ. Sci. Technol., 31 May 2019.

- For more information on black carbon and its effects on health: Nicole AH Janssen, Miriam E Gerlofs-Nijland, Timo Lanki, Raimo O Salonen, Flemming Cassee, Gerard Hoek, Paul Fischer, Bert Brunekreef, Michal Krzyzanowski. Health effects of black carbón. WHO, 2012 http://www.euro.who.int/_data/assets/pdf_file/0004/162535/e96541.pdf

CHAPTER X

Final thoughts for future complex evaluations such as the Superblocks

The Salut Als Carrers methodological guide is a tool for public health evaluations of complex urban interventions. This set of methodologies shows a comprehensive approach to health assessments of complex interventions, such as Superblocks. In order to evaluate the health effects of these interventions, health must be considered, as well as its determinants. In this sense, a broad conception of health should be taken, as the complete state of physical, mental and social well-being, and not only as the absence of disease. In addition, it is important to reflect on health as a component of the population event and not at an individual level. These assessments require an understanding of urban health as a collective and social event.

The multi-method strategy, with qualitative and quantitative approaches, provides information from different perspectives and allows for taking into account different moments of development of the interventions (for example, in our project we used qualitative when it was not possible to take action prior to the intervention). In addition, the different strategies complement each other giving different visions of the same phenomenon, also allowing for a validation of results.

A relevant lesson in all methodologies and in the overall project was the importance of coordination between the group in charge of the urban intervention (Superblocks in this case) and the health evaluation team. Coordination is fundamental to, among other things, know in detail the actions planned in each territory and to coordinate the times of the interventions with the pre- and post-intervention measures.

Adaptability is also important. In our case, our post study has had the challenge of the social and health crisis produced by the COVID-19 for which we have had to move dates and times, and integrate the situation into the analysis. In this way, for example, the guerrillas and the survey of the neighborhood of Horta integrated questions regarding this situation.

In all the studies, it was also essential to coordinate with the entities and the community at the neighborhood level to explain the evaluation project and be on the same page. Most studies depend on the participation and collective involvement of the population, but this was of particular importance in the evaluation of the Superblocks because the neighborhood population are the potential beneficiaries. Furthermore, at the level of citizen science and information transfer, their participation is important.

Finally, the causes of health outcomes, that is, the social determinants of health should be taken into account—integrating these reflections in the understanding of the results is fundamental for a complete analysis. Likewise, we highlight the importance of the historical, social, and temporal context in which the evaluation is carried out. For example, other mobility interventions that occurred in the city in the temporal period and the confinement by COVID-19 have been key events in the context of our evaluation that cannot be ignored at the time of analysis.

The Partnership for Healthy Cities is a prestigious global network of 70 cities committed to saving lives by preventing noncommunicable diseases (NCDs) and injuries. Supported by Bloomberg Philanthropies in partnership with the World Health Organization (WHO) and Vital Strategies, this initiative enables cities around the world to deliver a high-impact policy or programmatic intervention to reduce NCDs and injuries in their communities.

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