Sumplemary materials

Supplementary Table 1. Main characteristics of the monitored routes

Route/Location	Quality air condition IBOCA*	Mean Distance traveled	Bicycle infrastructure Cycle route	Characteristics of the route
Southern Highway	Low	6.8 kilometers	On the sidewalk	Main route with very high traffic flow
Cali Avenue	Regular and low	7.5 kilometers	On the sidewalk	Main route with very high traffic flow
Quinto Centenario AVE	Regular	8.7 kilometers	Next to the vehicular lane	Main route with moderate traffic flow
116th Street	Medium and good	6.1 kilometers	On the sidewalk and in the middle of the road.	Main route with high traffic flow

*Bogota Air Quality Index for its initials in Spanish (IBOCA).

Supplementary Table 2. MET's by transport mode

Mode	Mean	Median	SD	p
Minivan	1.463	1.455	0.025	0.9
Bike	1.668	1.598	0.270	0.008
Bus	1.506	1.487	0.058	0.17

Supplementary Table 3. Mean concentrations of $PM_{2.5}$ in by route and source compared with mean $PM_{2.5}$ concentrations from RCMB

Source	116th Street	Cali Avenue	Quinto Centenario	Southern Highway
ITHACA	15.66 ugm^{-3}	54.65 ugm^{-3}	36.24 ugm^{-3}	54.64 ugm^{-3}
RCMB	13.25 ugm^{-3}	23.23 ugm^{-3}	14.81 ugm^{-3}	25.65 ugm^{-3}
Proportion	1.18	2.35	2.45	2.13

Supplementary Table 4. Inhaled dose by the mode of transportation used by the participants.

Mode	Mean (μg)	Median (μg)	SD (μg)	Proportion of the daily dose inhaled during the trip
Minivan	6.76	5.93	5.21	0.02
Bike	16.41	10.58	18.7	0.08
Bus	12.17	7.98	13.18	0.05

Supplementary Table 5. Emergent categories and definitions.

Category	Subcategory	Definition
Knowledge of air quality and its relationship with health	**Pollution levels**	Qualitative individual assessment that defines the characteristics of air quality, the elements that are considered as generators of pollution, the substances that are identified in the environment and that are related to unwanted effects or that have a negative effect.
	Health effects	Changes in health resulting from exposure to sources of pollution or in polluted environments.
	Effects on quality of life	Changes in conditions that contribute to personal and social well-being.
Attitudes towards exposure	**Attitudes towards the Exposition**	Orientation and/or posture (positive or negative) when exposed to air pollutants or in polluted environments.
Practices towards exposure	**Protection against exposure**	Activities or behaviors of care and prevention in the face of exposure to contaminants or in contaminated environments.
	Reduction actions	Activities to minimize pollution and improve air quality.
	Actions as a collective subject	Behaviors that express the recognition of the environmental conditions of the environment and the historical, political, social, economic, and cultural dimensions and conditions, and from there the proposal of a change or a transformation based on the protection and/or defense of individual and collective interests

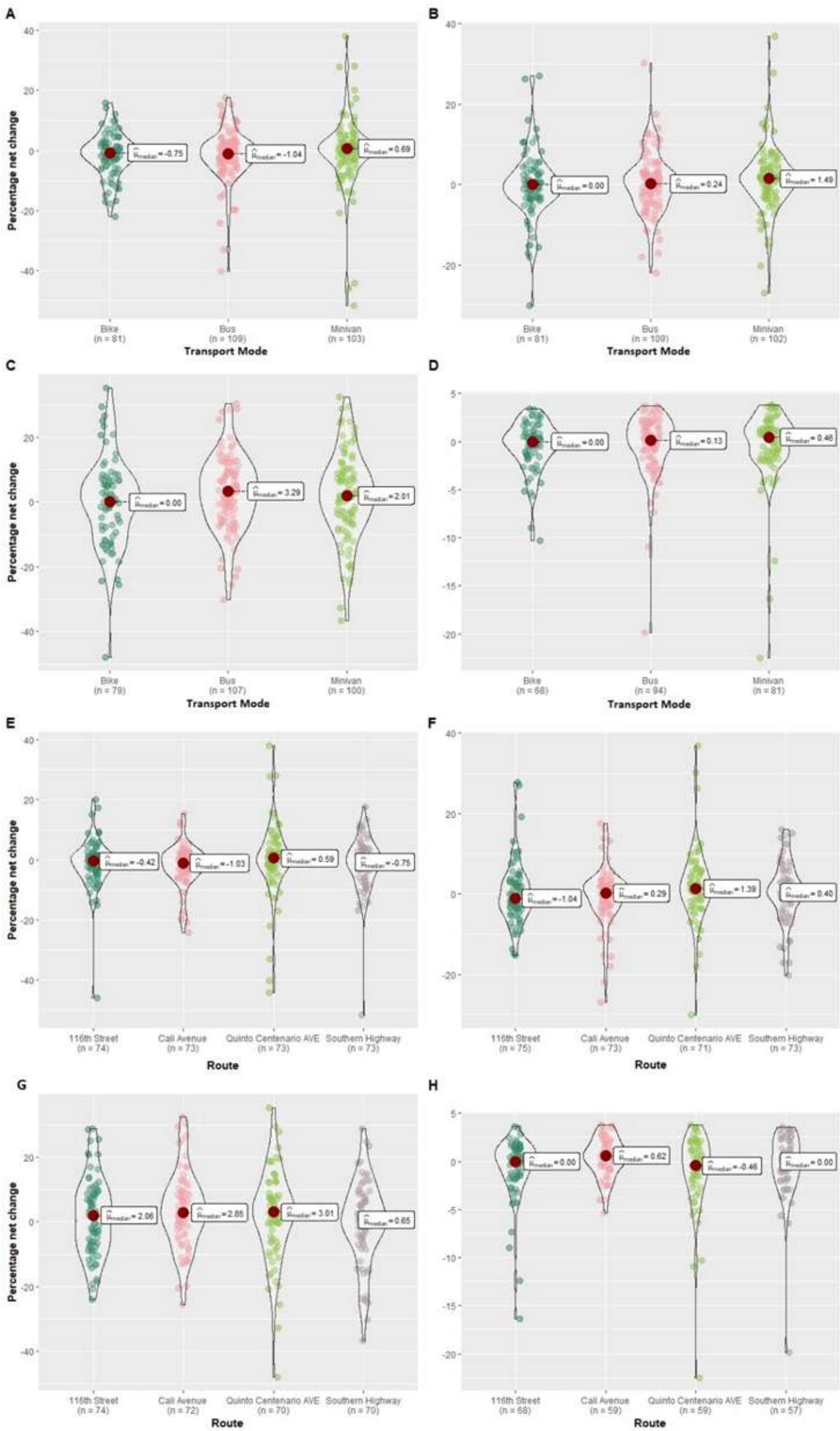
Table 6. Joint result of air pollution, respiratory effects, and perception among volunteers of the study

Aim of the study	Quatitative mode	Qualitative moment		Relationship	Summary of the triangulation
	Summary of results	Synthesis of Social Representations			
Describe the perception of the participants about air pollution in Bogotá.	*Quality of the air: regular (47%); bad (24%), and very bad (12%), with a link between air quality and health (72%).* *Human systems most frequently affected by air pollution: respiratory (94%), visual (72%), skin (67%), cardiovascular (41%), and gastrointestinal (17%).* *Elements to protect against air pollution (62%). Surgical/cloth mask (40%). Closing windows (16%); open the windows (7%), and hold the breath (10%).*	*Knowledge about air quality and its relationship with health.*	*The perception of air quality was mediated by the sensory experience (visual and olfactory), context: sensation occurred. Recognizing, an environment with high levels of contamination, public transport, cargo, and industries as the largest sources of contamination.Relationship between air pollution and health, which is expressed, on the one hand, in the appearance of respiratory diseases, eye irritation and skin discomfort, and on the other hand, the alteration of the mental health expressed in changes in moods and stressful situations*	*Complementarity relationship between the quantitative-qualitative results.*	*For most of the participants, the air quality in the city is not good.* *The sensory experience reported in the qualitative component in the different contexts is decisive in the perception of air quality. In addition, the quantitative and qualitative data agree that there is a direct relationship between health and air quality. Air pollution was associated with the presence mainly of respiratory and visual discomfort. Finally, qualitative results revealed a relationship between mental health and poor air quality.* *The analysis of the relationship between the quantitative and qualitative results allows us to conclude that protection practices have an individual predominance. The main action appears to be the use of some type of element to protect oneself from air pollution. In addition, the qualitative data refer to other practices to reduce exposure to air pollution, such as changing the mode of transport and the routes used to travel.* *Finally, the qualitative data allow us to identify a subject that carries out individual practices, but also a collective subject that seeks political action, with a low capacity for incidence. A subject with whom to work actions for the promotion of health,*
		Attitudes towards exposure	*Two types of attitudes were identified, 1) associated with knowledge, mostly attitudes of protection, and change in the face of possibilities of using different means of transport or modifying the routes traveled to reduce exposure. 2) attitudes of resignation, habits, naturalization where being exposed is an inevitable condition, being aware that the situation cannot be changed, and therefore, an absence in actions as a political subject is denoted.*		
		Practices against exposure	*Individual protection practices, mainly using face masks (mandatory health measure to avoid contagion by Covid-19), became an element that establishes protection against contamination and reduction practices based on the use of alternative means of transport to reduce emissions. A collective subject of rights is identified that even having the power to demand, does not make a full exercise of citizenship from its participation. His practice is part of a questioning of the absence of the State in the effective regulation of the sources of exposure.*		

					which becomes a transformer of its reality.
To evaluate the levels of physical activity during the trip in the study participants	*Mean METs were highest in bicycle users, followed by bus participants.* *According to the 2011 Ainsworth manual, cycling commutes were classified as "light activity", while car and bus commuting were classified as "sedentary activity". MET's were significantly higher among bicycle users (Chi2 = 106; p = 0.008).*	*knowledge*	*Bicycle users who practice physical activity more frequently, refer that paradoxically they are the ones who generate the least emissions. However, they are the users most exposed to air pollutants, because in practice the consumption of oxygen increases, generating an inhalation of greater amounts of pollutants.*	*Relationship of complementarity between the qualitative results with the qualitative ones*	*Bicycle users had the highest METs, followed by bus users. This result is complemented with the social representations of bicycle users. Particularly, bicycle users relate the increase in oxygen consumption due to activity, with the inhalation of pollutants. In addition, bicycle users have as a typical social representation that their mode of transport is a protective behavior in terms of physical activity, and they associate it with the reduction of the risk of disease appearance and with conditions of general well-being. In addition, it is recognized that beyond physical activity and well-being, they are generating changes in the city, reducing emissions, and improving mobility in the city.*
		Attitudes	*The performance of physical activity is assumed as an attitude of health protection since it is associated with the reduction of the risk of appearance of diseases and well-being.*		
		Practices	*The individual practice of pollution reduction, the adoption of healthy lifestyles, such as changing modes of transportation using bicycles or walking, was recognized.*		
To estimate changes in lung volumes and respiratory symptoms in users according to the means of transport evaluated.	*No differences were observed between pre and post spirometry within the FVC and FEV1 parameters. In some cases, the FEF25-75% was reduced in the participants of the southern highway route. However, this does not constitute a physiological alteration.*	*Knowledge of air quality and its relationship with health*	*They relate pollution levels to health effects. Especially, effects on the respiratory system from the appearance of immediate symptoms such as fatigue, shortness of breath, cough, allergic reactions, sore throat, and nasal congestion. They referred to a lesser extent long-term consequence such as the appearance of chronic respiratory diseases and even lung cancer.*	*Neutrality relationship since qualitative information does not provide results against spirometry alterations.*	*Social representations do not recognize spirometry alterations as a factor associated with contamination. However, a representation is constructed that relates pollution levels with health effects, especially with effects on the respiratory system.*
		Attitudes towards exposure	*The health-disease relationship given by the exposure was assumed as an individual responsibility that depends on the level of protection and care that the person assumes for himself. The pandemic reinforced this idea. The risk transferred to the person was maximized with the use of personal protection elements.*		
		Exposure Practices	*The influence of the cognitive and affective was recognized as a determinant of environmental behavior and its relationship with*		

			health care. This behavior included individual actions to protect and implement healthy lifestyles, as well as reduction actions focused on caring for the environment.		
To determine the concentration of P.M 2.5 and black carbon in the microenvironments evaluated.	PM2.5 in buses was the highest (median 50.67 ugm-3; RI: 306.7), followed by minivans (38.49; RI: 182.3). CN in buses were the highest (29.94 ug m-3; RI: 116.3), they differed significantly from the concentrations in bicycles (7.83 ugm-3; RI: 26.6). and car (18.54 ugm-3; IR: 68.6)	Knowledge of air quality and its relationship with health	Visual and olfactory perception were the two main references for changes in environmental conditions in different contexts, which generally allow air quality to be assessed as poor. Thus, the smell of smoke and the visibility of smog are significant sensory evidence. Bicycle users are the ones who recognize these changes and these sensory and bodily experiences generated by exposure with greater intensity.	Relation of complementarity, while the qualitative component allows expanding from the representations of the participants, the individual perception of the levels of contamination, a situation that appears in the construction of a representation associated with the sensory experience that defines contaminated social spaces.	The inhaled dose of PM2.5 and carbon black were significantly higher among men than women. There was no association between inhaled PM2.5 dose and subsequent carbon with route or mode of transport. There was also no correlation between spirometry parameters, age, body mass index and inhaled dose of PM2.5 and carbon black. From a qualitative perspective, social representations allow to complement the construction of the polluted microspace, beyond an objective measurement of pollutants. In this way, it expands the characterization of microenvironments with the description of the sensory experience that makes it possible to differentiate contaminated spaces.
	PM2.5 was significantly lower ($p<0.00001$) in Calle 116 (median 15.66 ugm-3; IR: 59) compared to South way (median 60.18 ugm-3; IR: 202.7), and Avenida Cali (median 54.64 pgm-3; RI: 304.4). BC concentrations were higher in Carretera Sur (median 23.58 ugm-3; IR:113.8), and Avenida Cali (median 22.21 ugm-3; IR: 102.8) compared to Calle 116 (median 6.37 pgm-3; IR: 30.9).	Attitudes towards exposure	The use of protection elements is claimed, especially against direct and sudden exposure. Although some attitudes suggest a generalized awareness of the presence of air pollution, they also reflect a considerable level of apparent ambivalence, a naturalization that locates and signifies a distancing from the problem and a lack of social participation.		
	The mean inhaled dose of PM2.5 and BC were 11.50 µg ± 13.68 and 17.95 µg ± 23.36, respectively. There was no association between inhaled PM2.5 dose, BC, route, or mode of transport ($p>0.05$). Spirometry parameters, age, body mass index, and inhaled dose of PM2.5 and BC had not correlation ($p>0.05$). A positive correlation was observed between travel time and inhaled	Practices towards exposure	They claim the use of the bicycle as the ideal means of transport, not only to reduce emissions, but also to improve and maintain optimal health conditions. They also suggest the adaptation of infrastructure and security conditions that allow this practice.		

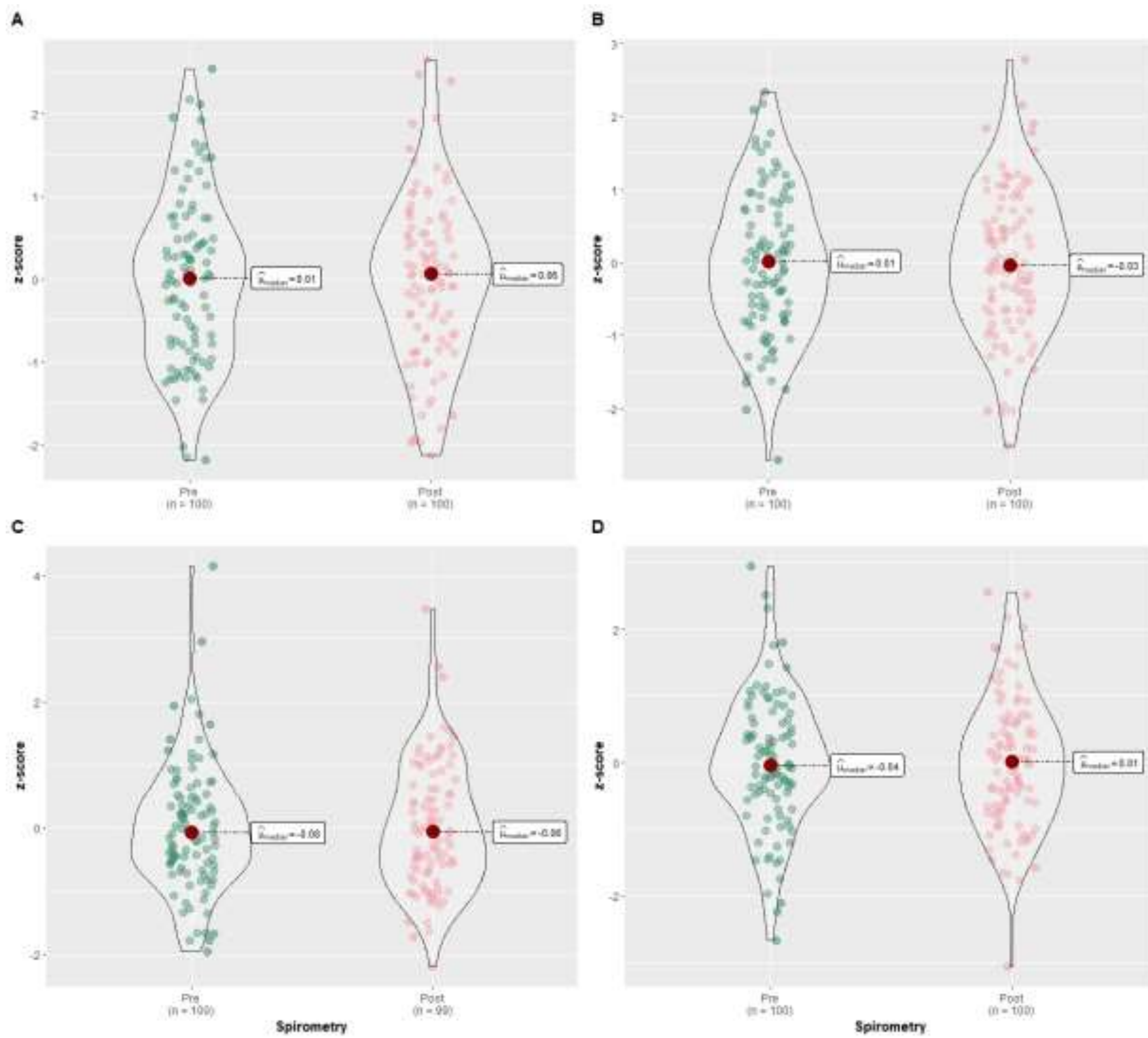
	dose of PM2.5 (Spearman 0.53; p= 3.6504E-21) and posterior carbon (Spearman 0.46; p= 1.3962E-16).				



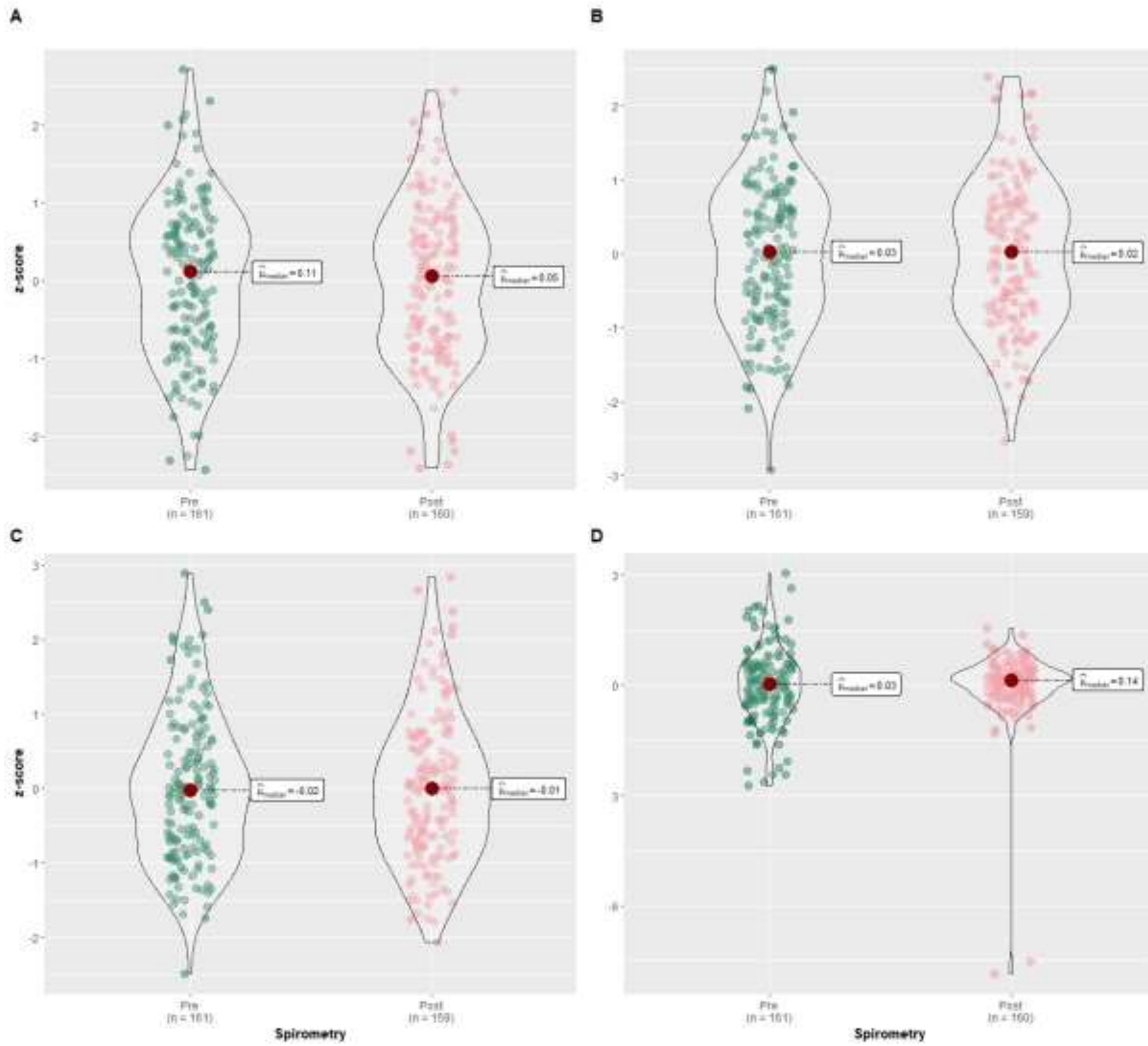
A
Percentage net change
μ̂median = -0.75
μ̂median = -1.04
μ̂median = 0.69
Bike (n = 81)
Bus (n = 109)
Minivan (n = 103)
Transport Mode
B
μ̂median = 0.00
μ̂median = 0.24
μ̂median = 1.49
Bike (n = 81)
Bus (n = 109)
Minivan (n = 102)
Transport Mode
C
Percentage net change
μ̂median = 0.00
μ̂median = 3.29
μ̂median = 2.01
Bike (n = 79)
Bus (n = 107)
Minivan (n = 100)
Transport Mode
D
μ̂median = 0.00
μ̂median = 0.13
μ̂median = 0.46
Bike (n = 68)
Bus (n = 94)
Minivan (n = 81)
Transport Mode
E
Percentage net change
μ̂median = -0.42
μ̂median = -1.03
μ̂median = 0.59
μ̂median = -0.75
116th Street (n = 74)
Cali Avenue (n = 73)
Quinto Centenario AVE (n = 73)
Southern Highway (n = 73)
Route
F
μ̂median = -1.04
μ̂median = 0.29
μ̂median = 1.39
μ̂median = 0.40
116th Street (n = 75)
Cali Avenue (n = 73)
Quinto Centenario AVE (n = 71)
Southern Highway (n = 73)
Route
G
Percentage net change
μ̂median = 2.06
μ̂median = 2.85
μ̂median = 3.01
μ̂median = 0.65
116th Street (n = 74)
Cali Avenue (n = 72)
Quinto Centenario AVE (n = 70)
Southern Highway (n = 70)
Route
H
μ̂median = 0.00
μ̂median = 0.62
μ̂median = -0.46
μ̂median = 0.00
116th Street (n = 68)
Cali Avenue (n = 59)
Quinto Centenario AVE (n = 59)
Southern Highway (n = 57)
Route

Supplementary Figure 1. Changes in spirometry patterns by transport mode and route

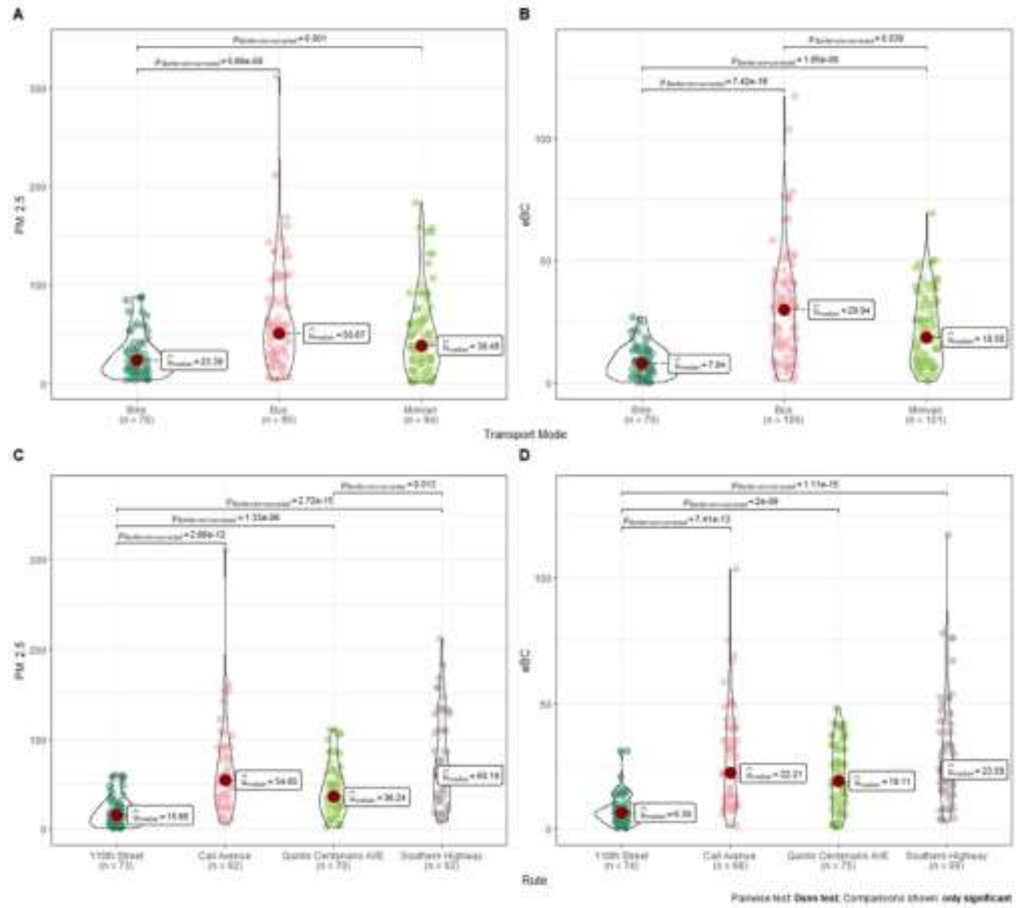
It is estimated that the value of the PRE spirometry is 100%, it is calculated how much the POS net value of the spirometry represents in percentage compared to the PRE, the percentage delta between the POS and the PRE is obtained. The figure shows on the X axis the mode or route and on the Y axis the percentage delta stratified by: A y E = Forced vital capacity, B Y F = Forced expiratory volume in 1 second, C y G= Forced expiratory flow at 25 and 75% of the pulmonary volume, D y H = FEV1/FCV ratio



Supplementary Figure 2. Changes in the spirometry parameters (male): We have considered the spirometry variables (pre and post) for male and we estimate the z-score ($z = (x - \mu)/\sigma$) for each variable (a. Forced vital capacity, b.Forced expiratory volume in the first second, c. Forced expiratory flow at 25 and 75% of the pulmonary volume, d. FEV_1/FCV ratio).

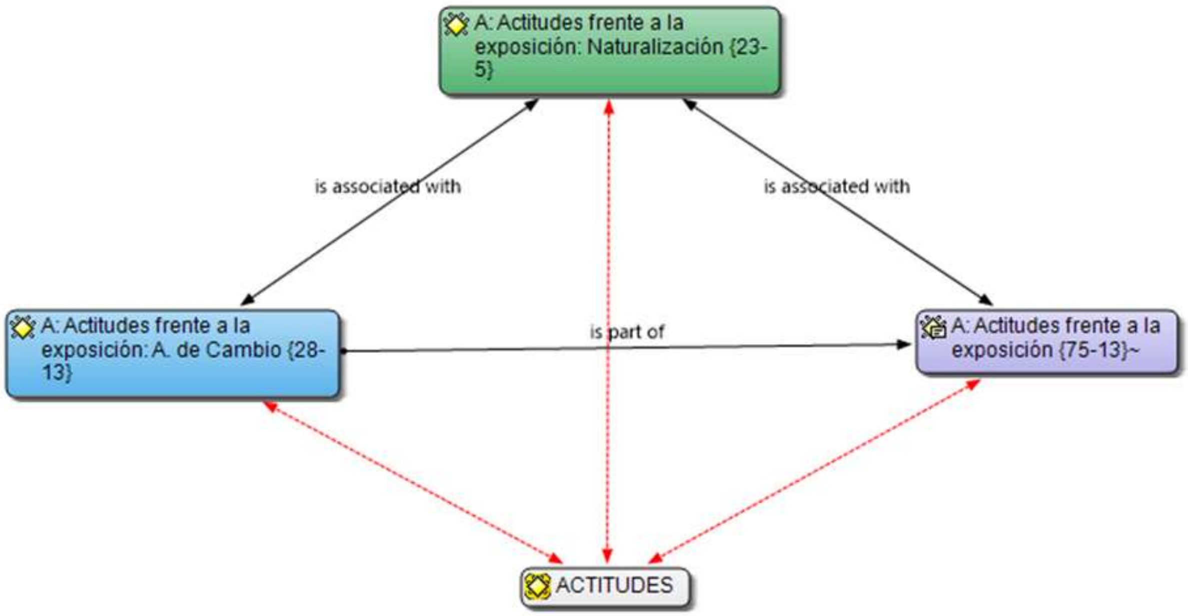


Supplementary Figure 3. Changes in the spirometry parameters (female). We have considered the spirometry variables (pre and post) for females and we estimate the z-score ($z = (x - \mu)/\sigma$) for each variable (a. Forced vital capacity, b.Forced expiratory volume in the first second, c. Forced expiratory flow at 25 and 75% of the pulmonary volume, d. FEV_1/FCV ratio.)

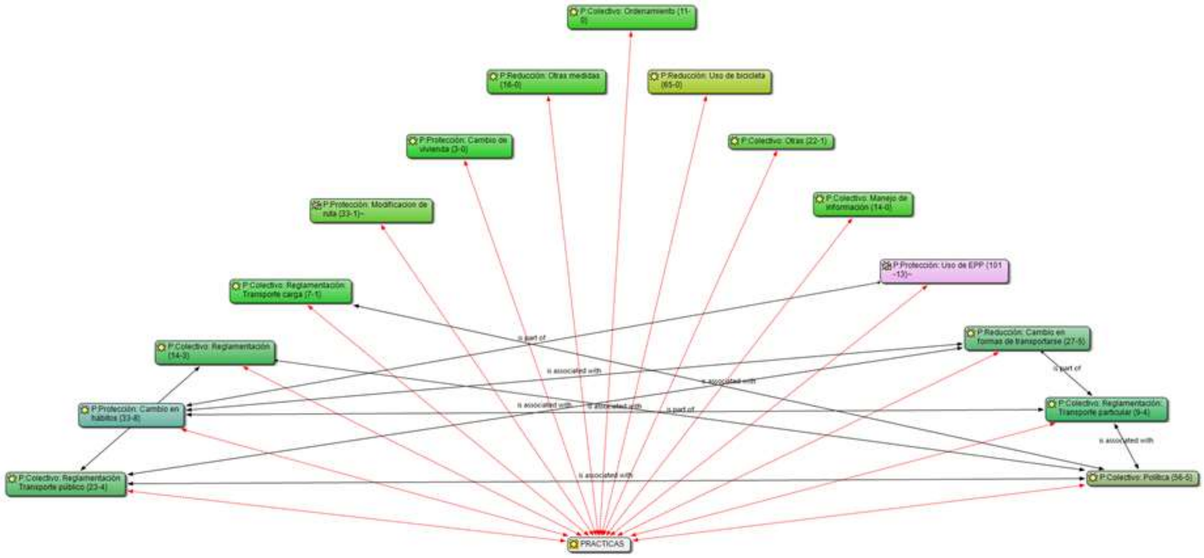


Supplementary Figure 4. Concentrations of $PM_{2.5}$ and eBC pollutants in the microenvironments. The red dots indicate the median value of the concentration of pollutants by transport mode and route. The Y axis shows the values of pollutant concentrations in ugm^{-3}. A) $PM_{2.5}$ concentration ug m^{-3} by transport mode. B) Black carbon concentration ugm^{-3} by transport mode. C) $PM_{2.5}$ Concentration ug m^{-3} by route. D) Black carbon concentration ugm^{-3} by route.

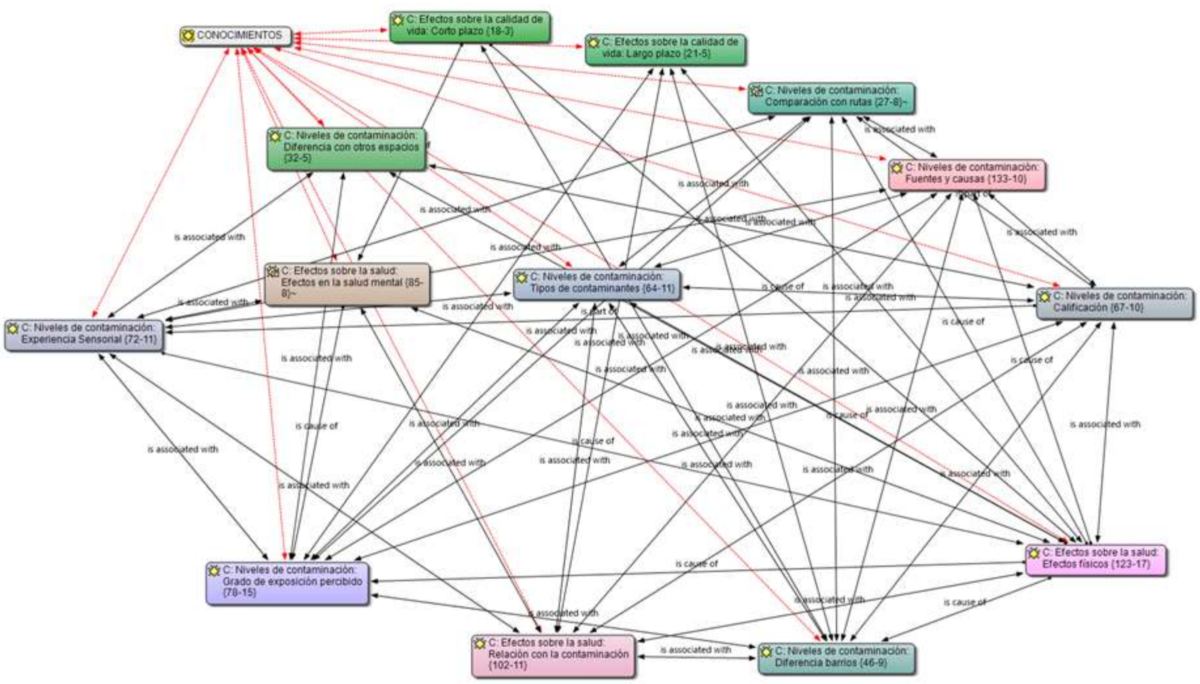
A.


A: Actitudes frente a la exposición: Naturalización {23-5}
is associated with
is associated with
A: Actitudes frente a la exposición: A. de Cambio {28-13}
is part of
A: Actitudes frente a la exposición {75-13}~
ACTITUDES

B.



C.



Supplementary Figure 5. Code tree. A. Qualitative analysis of Knowledge, B. Qualitative analysis of Attitudes. C. Qualitative analysis of Practices.

The code tree is built from the coding process where the text is divided into units of meaning in social contexts that express a collective representation. These units materialize in codes that constitute the axis of analysis and from which association or contradiction relationships are established that can be identified in the graph through the links or arrows between codes. Thus, the red arrows indicate the codes associated with the category, and the black arrows the association between codes. On the other hand, the network that is generated is determined by the rationale, that is, the number of citations associated with each code, and by the density, which refers to the number of relationships that one code has with others. Thus, in the graphs, the color of the nodes is determined by the foundation and by the density that can be identified in the numbers that are in parentheses. For example, the code Health Effects: Physical Effects (123-17) has 123 associated citations (rationale) and is related to 17 codes (density). Finally, the networks are in the original language of the research so as not to alter their meaning of interpretation

INITIALIZATION MANUAL, DOWNLOAD AND TRANSFORMATION OF ACCELEROMETER DATA

This manual serves to guide the initialization of GT3X and GT3X + accelerometers with the ActiLife program, the downloading of their information and the transformation of this information into databases using R software.

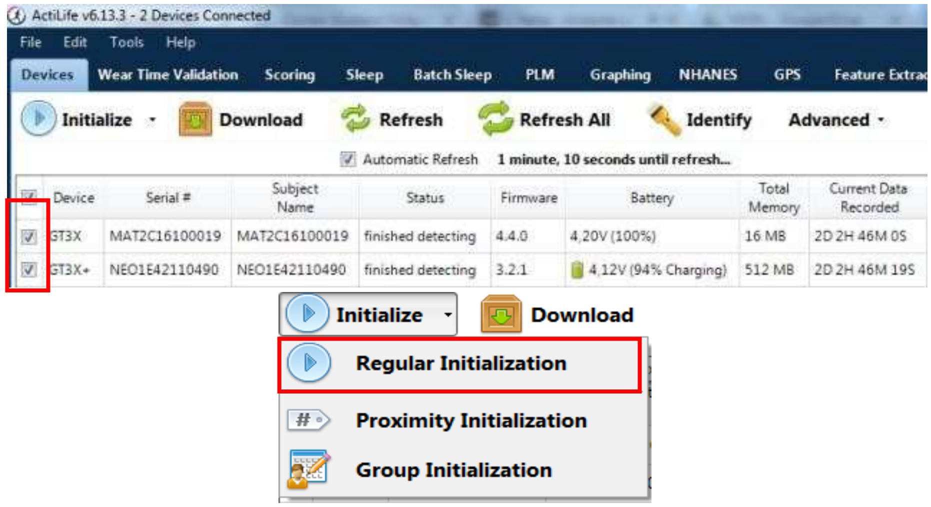
1. Initialization of accelerometers

To use an accelerometer, it must be in perfect condition and fully charged. To check the status of the accelerometer, connect it to the computer and open the ActiLife program. The program will recognize the accelerometer and indicate its status.

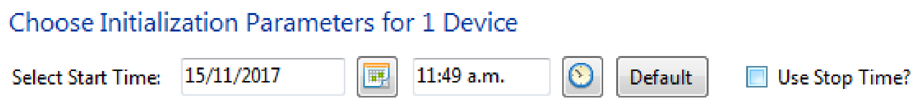
To charge the accelerometer, it must be connected to the power source through the USB cable. The LED light on the accelerometer will blink while charging and will glow steadily when the accelerometer is fully charged.

After the status of the accelerometer is verified and the accelerometer is fully charging it, it must be initialized for data collection. To do this, the following steps are necessary:

1. Launch the ActiLife software and open the initialization window:

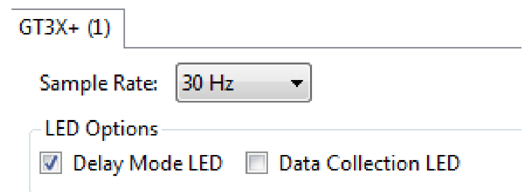


2. Establish the date and time at which information collection will begin:

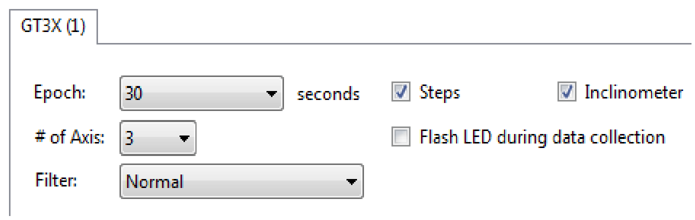


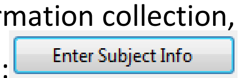
Remember that the time will be adjusted to the time on the computer.

3. For the GT3X + accelerometers, the 30 Hz option should be chosen for collecting data from adults.

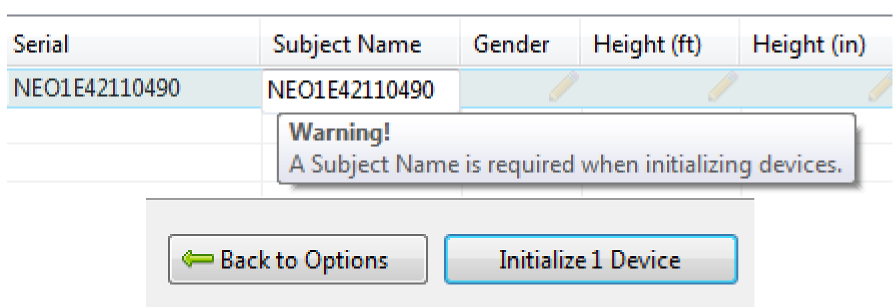


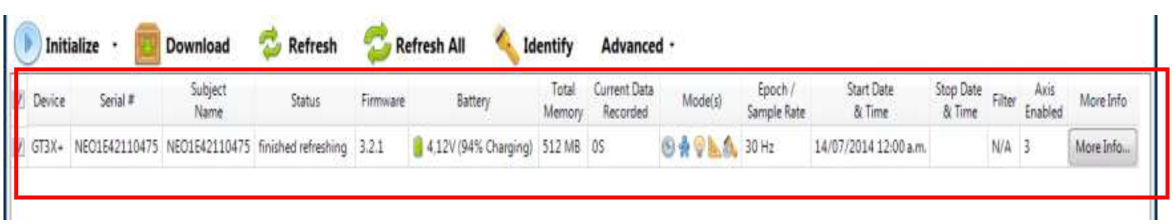
For the GT3X accelerometers, "60 epochs" should be chosen.



4. After selecting the type of information collection, you should click the "Enter Subject Info" button: 

5. Use the serial number as the subject name and select "Initialize 1 Device".

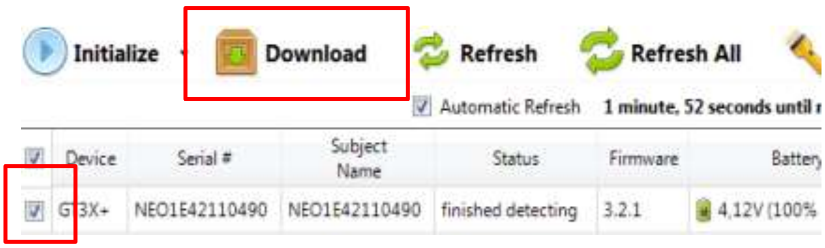


6. 

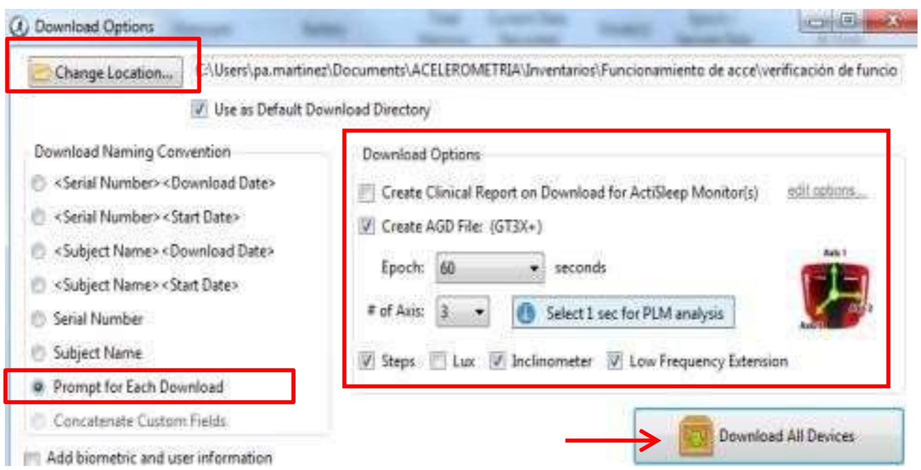
2. Downloading information

After using the accelerometer for data collection, the collected information must be downloaded for analysis. Each accelerometer should be verified and downloaded separately to avoid confusion during data collection. The following steps should be followed:

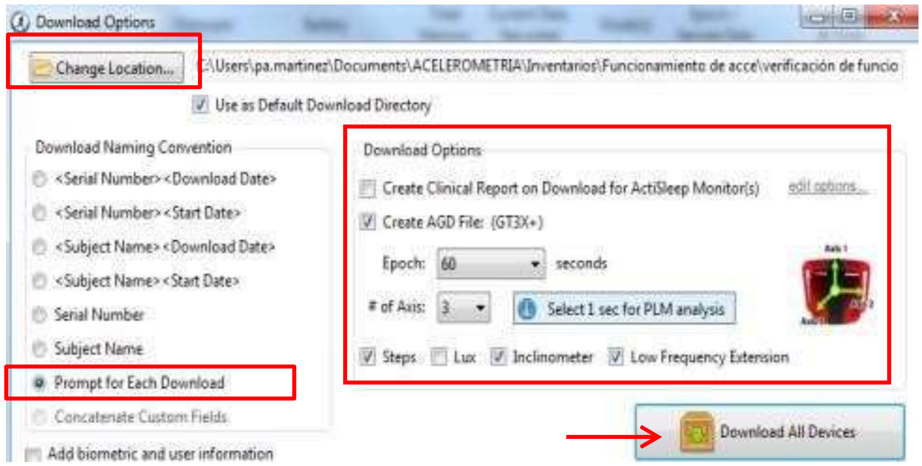
1. Select the accelerometer and the “Download” button:



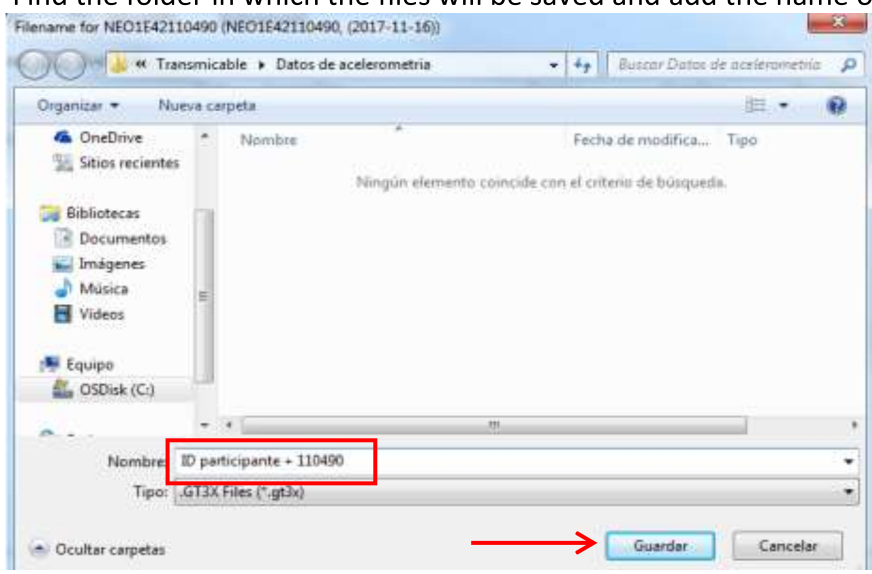
2. Select the path of the folder in which the files will be saved, and click the “Prompt for each Download” button to save the download path:



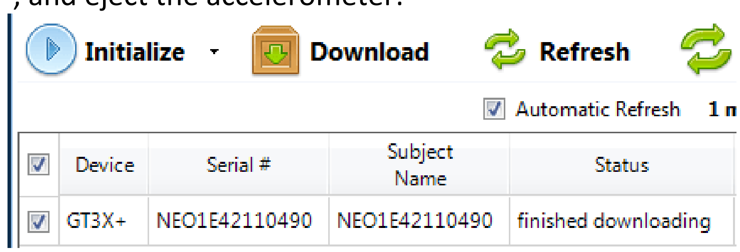
3. Select “Create AGD File”, the characteristics required for the study and “Download All Devices”:



4. Find the folder in which the files will be saved and add the name of the file:



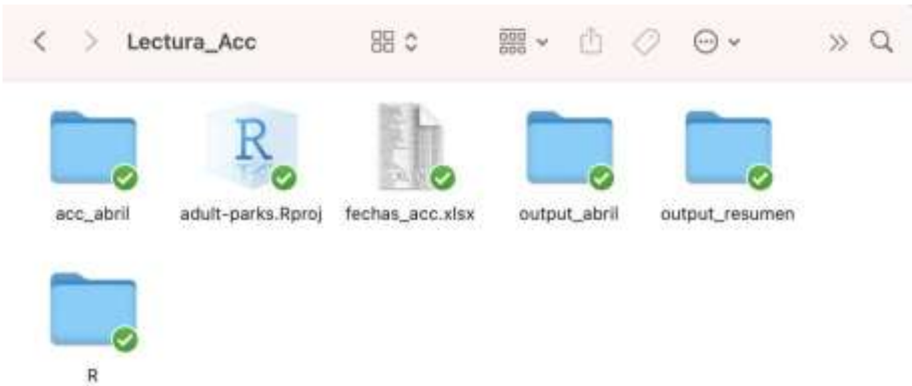
5. Check that the status of the accelerometer reads “finished downloading”, and eject the accelerometer:



3. Information transformation

After downloading all the AGD files into a single folder with a unique name, the information must be transformed for further analysis. For this, R software and the Excel template in the folder will be used.

For the transformation, the following folder will be used:



The folder contains four folders, a project and an Excel template. The files fulfill the following functions:

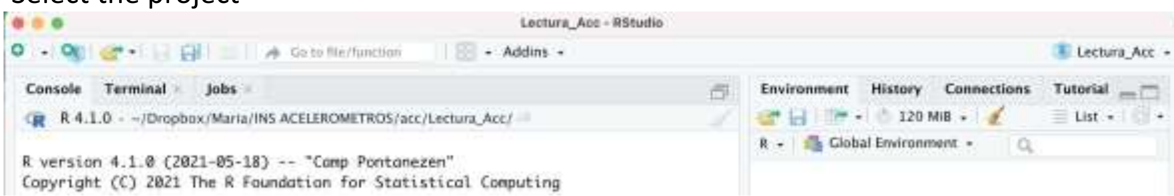
- acc: the folder where all AGD files should be saved
- adult-parks.Rproj: the R project where the data will be transformed
- dates_acc: the Excel template where the names of the accelerometers and the dates and times to be analyzed must be recorded
- output: the folder where the transformed information will be stored
- output_resumen: the folder where the summary file for the accelerometers will be saved
- R: the folder where the R scripts necessary to transform the information are stored

To begin the transformation of the data, the information must be recorded in the Excel file. In this file, there are four columns. In the first one, the name of the AGD file to be read must be entered. In the second column, the date of data collection must be entered. In the third and fourth columns, the start and end times of the data collection should be entered.

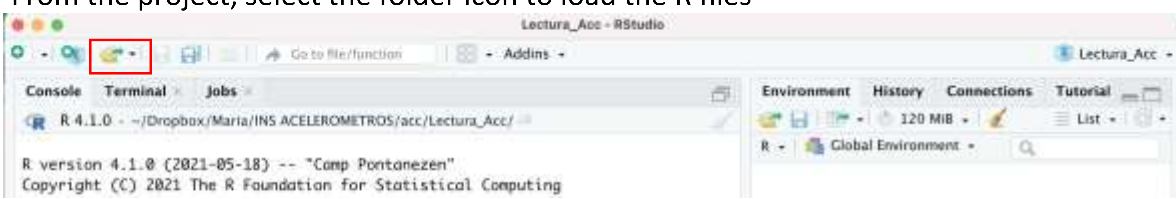
Nombre	Fecha	HoraInicio	HoraFin
2_Andrea Rico Hernandez	23/02/21	9:48:00 a. m.	10:52:00 a. m.
2_Angela Magaly Baracaldo	25/02/21	9:40:00 a. m.	10:52:00 a. m.
2_Catalina Geraldine Medina	23/02/21	9:48:00 a. m.	10:37:00 a. m.
2_Cindy Lorena Nieto Estupinan	23/02/21	9:48:00 a. m.	10:52:00 a. m.
2_Claudia Portilla	25/02/21	9:40:00 a. m.	10:52:00 a. m.
2_Edwin Melo Gonzalez	24/02/21	9:06:00 a. m.	9:55:00 a. m.
2_Jennsy Daniela Catama Gonzalez	23/02/21	9:48:00 a. m.	10:37:00 a. m.
2_Jorge Mario Garcia Santa	24/02/21	9:06:00 a. m.	9:48:00 a. m.
2_Lady Parra	25/02/21	9:40:00 a. m.	10:39:00 a. m.
2_Maura Alejandra Varela	25/02/21	9:40:00 a. m.	10:52:00 a. m.

Once the information is registered in the Excel file, adult-parks.Rproj must be opened, and the necessary R files must be loaded according to the following steps:

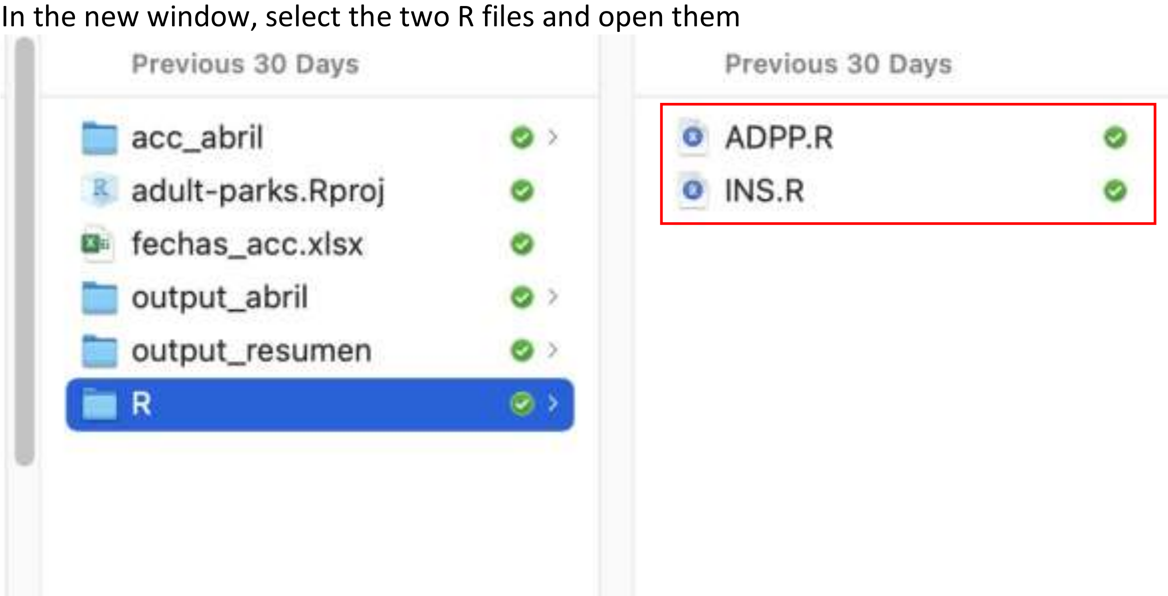
1. Select the project



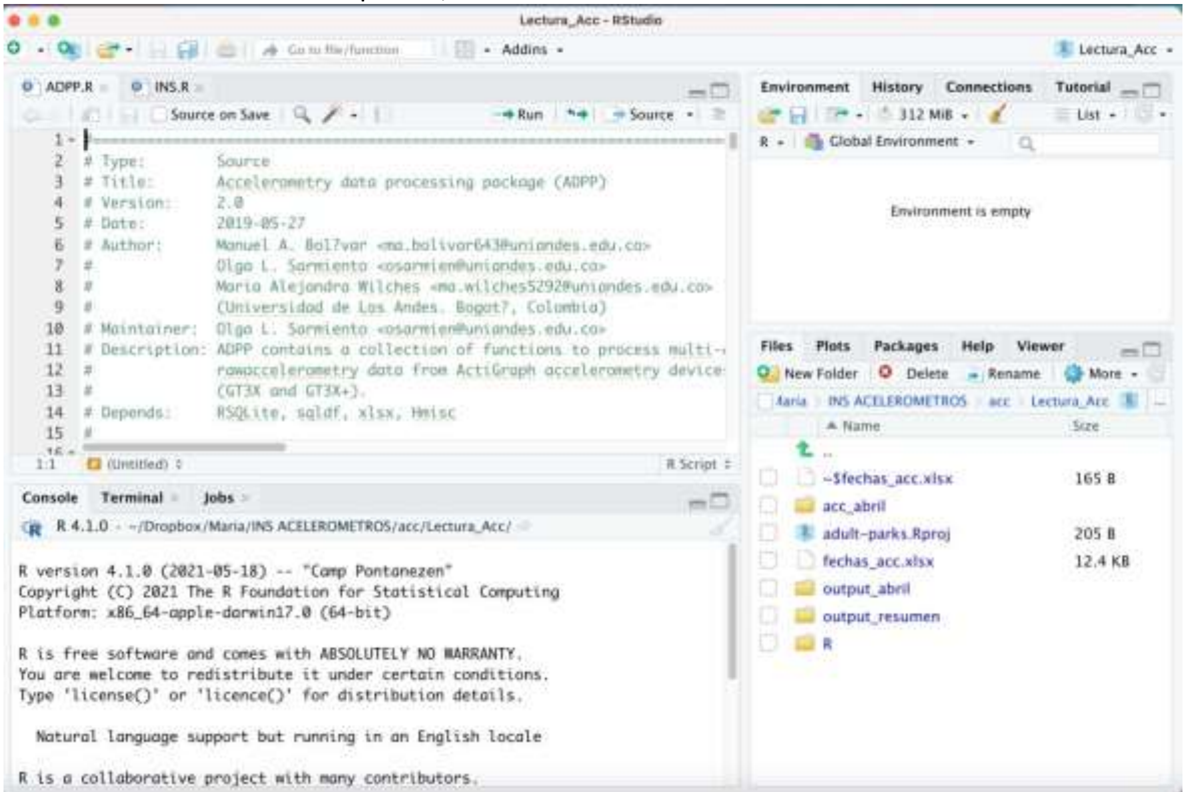
2. From the project, select the folder icon to load the R files



3. In the new window, select the two R files and open them



4. Once the files are opened, the R window will look like this:



After uploading the files, select the tab called INS in R.

Finally, select the entire file and run it using the "Run" button.

The transformed files will be csv files.

UPLOAD, DOWNLOAD AND SYNC AETHALOMETER AND SIDEPACK DATA

Cleaning procedure for the environmental pollutant measurement equipment

Once the monitoring is finished, the equipment is unloaded and maintenance is performed in an area authorized for this purpose—in this case, the air quality laboratory of the University of Los Andes.

The actions that must be taken in an orderly manner are as follows:

- Cleaning of the surface of all air quality exposure measurement equipment (DustTrak 8520/30 (DT), MicroAeth AE51 (MAE), GPS, CPC 3007 and BioHarness 3.0 physical activity bands). The equipment should be cleaned with 70% alcohol and absorbent paper towels and then dried with a cloth. Since the bands are in contact with the skin, once the monitor is removed from the bands, they should be washed and left to dry for later use.
- The processes described below begin with the downloading of data and the appropriate maintenance:

DustTrak 8520, DustTrak 8530 (DT):

a) The equipment is gathered, and the available data are reviewed.
b) The device is connected to the computer with all the raw data.
c) Using the equipment software, the data are downloaded in the required text format.
d) The equipment should be stored as established in the protocol. At this stage, depending on the configuration, there may be variations. If the software does not recognize the equipment, it is necessary to manually connect it by selecting the appropriate software options, looking for the model of the equipment and then performing a communication test. If that the equipment is recognized without the need to take these steps, proceed to the next step.
e) Once the data download is finished, the date and time are synchronized with those of the base computer to ensure that the time lag between the devices is minimal.
f) The equipment is disconnected.
g) Using an SKC Brand calibration pump, the flow of the equipment is calibrated. For this, the flow is first measured continuously with 10 pumps, without modification; with this information, we can determine the postmonitoring flow. Next, another 10 pumps are delivered, and the flow is modified to ensure that it remains at 3,000 L/min. Once the 10 pumps are finished, the premonitoring flow is recorded.
h) The device is disconnected from the pump.
i) Downloaded data is eliminated from the equipment.
j) The equipment is loaded for subsequent monitoring.

MicroAeth AE51 (MAE):

a) The equipment is connected to the computer.
b) The equipment is turned on in the same way as at the beginning of monitoring, by

holding the on/off button and waiting for the signal that the equipment is collecting data. Until the equipment beeps a second time, it will not be read by the computer.

c) The equipment software is opened, and communication with the equipment is established.
d) Once communication is established, the data are downloaded. Unlike other devices, this one always downloads a data folder containing all the data stored on the device.
e) Once the equipment signals that the data have been downloaded, the date and time are synchronized as described above.
f) The equipment will warn that unless it is restarted, it will not take new data into account using the new configuration. Thus, the equipment should be turned off and restarted.
g) The data from the equipment are then deleted from the software. After this, the equipment can be turned off and disconnected from the computer.
h) The folder with the downloaded data should be reviewed, the names of the files should be changed, and the files should be stored as established in the protocol.
i) If necessary, equipment connected to the wall must be charged. However, it should be noted that this equipment has a more durable battery than the other types. Therefore, it is not necessary to do this every time data are downloaded or monitoring is finished.

a.

Data processing procedure:

Data processing is performed to unify and preliminarily clear the raw files that each device removes. It is noteworthy that during this process, the person in charge of data processing is the one who reviews formats, performs raw data analysis and elaborate the specific formats for data consignation and processing.

is the key person who reviews formats, provides a superficial review of data and determines formats. These steps guarantee that all the requirements of the automatic processing program are met. If the formats are incorrect and are not changed, the program will not work.

The program used was developed by Professor Ricardo Morales Betancourt with the help of assistants and students in charge of this type of data. The program is run in the software Wolfram Mathematica 11.3, licensed by the Universidad de los Andes. In addition, it receives several files as input, including the following:

a. The folders from each of the monitoring sessions are segregated by the equipments from the University of Los Andes (1) and the National Institute of Health (2). These folders have the format of DATE-1 or 2. In each of these folders, the raw data are the equipment's measurement output.
b. A file with the initial attenuations of the filter without impact that is used at the beginning of each monitoring in the MAE; this file contains the verification codes for each of the MAE devices, as established in protocols.
c. "Landmark" files, or specific sites that allow the code to recognize and name the route for each monitoring session and to find reference places

through which the monitor always passes.

d. Logs that note each event that occurred during a monitoring session for a given transport mode .

Once these files are ready, the code is run in parts. This takes place to verify each stage and ensure that the code is performing well. This program has a main interface that can call other code files, which decentralizes the task.

The script has certain parameters that are defined through the calibrations of the equipment. These calibrations allow us to eliminate inaccuracies in the data and correct them according to the literature, the equipment manual and comparisons between both sets of equipment. From here, we can apply the k factor for the correction of black carbon measured by the MAE and compare the results from all of the equipment being used; we can also apply a correction factor for the DT, again based on comparisons made during calibrations. Other parameters are established for the general operation of the code, but these are not mentioned because they are not directly linked to the operation of the equipment.

In the first instance, the program reads the folders and joins the MAE and DT files. This is done by pasting the files by hour, but later, they are joined using cross-correlation functions and by finding the best coefficient of representation of this correlation. This correlation is measured by lagging the time series of each device with increasing lag slots and calculating the cross correlation coefficient between the two device's time series.
Once the best cross correlation coefficient value is found, that lag is chosen, and the pasted data for both types of equipment are modified based on the MAE time.

Once this is done, the program reads the data from the CPC and exports them to a readable and useful format for the subsequent union of the data.

Subsequently, these CPC files are coordinated with the MAE and DT files, and the same process is performed, again based on the MAE time. In addition, the concentrations are corrected for humidity when a device that allows the measurement of relative humidity is used. This, as in previous steps, results in several output files, one for each monitoring session; for example, if 2 monitoring sessions were performed in one day, one file is produced for each session.

Later, after the previous step is verified, the logs and the measured geospatial data are read. The reading of the GPS data starts with the reading of established reference points. Once these reference points are read, they are put together. At this point, the hours become a determining factor. In principle, the GPS sets the standard and is the best way to coordinate with the hours recorded in the log. This process can have errors. Therefore, the logged data from the GPS must always be reviewed, in order to ensure that the synchronization process is accurate.

Finally, the final result is a file for each monitoring session. This file includes the date and the code (1 or 2) as well as the final level, which is used to track each stage of the program. Once the file is generated (always in .xls), the data analyst and the researchers can validate each file to ensure that the database meets the pre-established criteria to perform the statistical analysis.

SEMI-STRUCTURED INTERVIEW GUIDE

Good morning/afternoon. My name is ………… and we are conducting a study on the relationship between exposure to environmental pollutants and respiratory health in people who travel by public transport, motorcycle or bicycle in Bogotá. The idea of this component is to learn about your perception of air pollution in Bogotá. In this sense, feel free to share your ideas in this space. There are no correct or incorrect answers; what matters is your honest opinion.

It should be noted that the information is only for our work; your responses will be anonymously linked to other opinions, and at no time will any participant be linked to what he or she said. To speed up the collection of information, it is very useful to record the conversation.

Do you authorize us to record the conversation? The use of the recording is for analysis purposes only. Thank you very much for your time!

Could you tell me your full name and what you do?

- Before starting, please tell me if the purpose of this interview has been explained to you and if you agree to participate (wait for the answer)

- Additionally, please indicate if you authorize the interview to be recorded to guarantee the collection of the information in a complete way (wait for the response)

Knowledge

1. I would like to ask you, what is your perception of the air quality in Bogotá?

2. What elements in the environment allow you to recognize that there is air pollution?

3. Do you know which pollutants affect air quality?

4. What do you consider to be the main sources that impact air quality?

5. What do you consider the mode of transport with the greatest exposure to pollutants?

6. Do you know if air quality has health effects? What do you consider to be the effects of air pollution on people's physical, mental and emotional health, and how are these effects evidenced?

7. Did you always perceive the air quality to be the same? Yes/No. Could you describe it?
Attitudes:

8. Does pollution in the city alter your quality of life?

9. What do you do when you are exposed to a direct source of pollution?

10. Do you think you have become ill from exposure to air pollutants? What made you sick? has your attitude changed at all since that episode?

11. Do you feel that you take care of yourself and protect yourself from exposure to air pollutants? How?

12. Do you know of activities that take place within your environment to protect people's health against exposure to air pollutants? Which ones?

13. Do you participate in any of the activities that you mentioned?

14. Does your perception of air quality interfere with your decisions to travel or use any means of transportation?

15. How do you think the air quality in the city could

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract Pg 1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found Pg1
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported Pg 2
Objectives	3	State specific objectives, including any prespecified hypotheses Pg 2
Methods		
Study design	4	Present key elements of study design early in the paper Pg 2- 3
Setting	5	Describe the setting, locations, and relevant dates, including-g periods of recruitment, exposure, follow-up, and data collection Pg 3-4
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants Pg 5-6
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable Pg 5-6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group Pg 4-6
Bias	9	Describe any efforts to address potential sources of bias Pg 3-8
Study size	10	Explain how the study size was arrived at Pg 3-8
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why Pg 3-8

Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding Pg 7-8
		(*b*) Describe any methods used to examine subgroups and interactions Pg 7-8
		(*c*) Explain how missing data were addressed
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy Pg 7-8
		(*e*) Describe any sensitivity analyses

Continued on next page

Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed Pg12-13
		(b) Give reasons for non-participation at each stage Figure 1
		(c) Consider use of a flow diagram Figure 1
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders Table 2
		(b) Indicate number of participants with missing data for each variable of interest Figure 1
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time
		Case-control study—Report numbers in each exposure category, or summary measures of exposure
		Cross-sectional study—Report numbers of outcome events or summary measures Pg 13
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included Pg 13-14
		(*b*) Report category boundaries when continuous variables were categorized Pg 13-15
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period Pg16
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses Pg 17
Discussion		
Key results	18	Summarise key results with reference to study objectives Pg 23
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias Pg26

Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence Pg26
Generalisability	21	Discuss the generalisability (external validity) of the study results Pg26
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based Pg 27

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Table 1

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

No	Item	Guide questions/description
Domain 1: Research team and reflexivity		
Personal Characteristics		
1.	Interviewer/facilitator	Which author/s conducted the interview or focus group? Mónica Quintana, John Benavides
2.	Credentials	What were the researcher's credentials? *E.g. PhD, MD* PhD and MD
3.	Occupation	What was their occupation at the time of the study? Researchers
4.	Gender	Was the researcher male or female? Was a multidisciplinary team
5.	Experience and training	What experience or training did the researcher have? John Benavides and Jeadran Malagón did a PhD on Public Health, with emphasis in mixed methdos studies
Relationship with participants		
6.	Relationship established	Was a relationship established prior to study commencement? None
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? e*.g. personal goals, reasons for doing the research* None

8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. *Bias, assumptions, reasons and interests in the research topic* The interviews were designed and validated in an expert panel. Also, it was performed a polito to evaluate the performance of the questions.
Domain 2: study design		
Theoretical framework		
9.	Methodological orientation and Theory	What methodological orientation was stated to underpin the study? *e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis* Grounded theory, social representations
Participant selection		
10.	Sampling	How were participants selected? *e.g. purposive, convenience, consecutive, snowball* Consecutive
11.	Method of approach	How were participants approached? e.*g. face-to-face, telephone, mail, email* Face-to-face and teleconference
12.	Sample size	How many participants were in the study? 44
13.	Non-participation	How many people refused to participate or dropped out? Reasons? None refused to participate
Setting		
14.	Setting of data collection	Where was the data collected? e.*g. home, clinic, workplace* Was collected on the day were the measurements were carried out
15.	Presence of non-participants	Was anyone else present besides the participants and researchers? No

16.	Description of sample	What are the important characteristics of the sample? *e.g. demographic data, date* Sociodemographic characteristics are described in Supplementary tables
Data collection		
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested? Yes,the questions were builit based on preestablisjhed categories, then was validated and piloted
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many? No, they were not
19.	Audio/visual recording	Did the research use audio or visual recording to collect the data? Yes, we have 44 records of the inverviews
20.	Field notes	Were field notes made during and/or after the interview or focus group? Yes, researchers take notes during the interviews
21.	Duration	What was the duration of the interviews or focus group? 30 min per participant
22.	Data saturation	Was data saturation discussed? Yes, pg 8
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction? Yes, pg 11
Domain 3: analysis and findingsz		
Data analysis		
24.	Number of data coders	How many data coders coded the data? 2
25.	Description of the coding tree	Did authors provide a description of the coding tree? Yes, please see suplementary section
26.	Derivation of themes	Were themes identified in advance or derived from the data?

Both, we prestabisled categories and according to deh

27.	Software	What software, if applicable, was used to manage the data? Atlas T.I. V 8.0
28.	Participant checking	Did participants provide feedback on the findings? Yes, Pg 6
Reporting		
29.	Quotations presented	Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? e.*g. participant number* Yes, pg 20-23
30.	Data and findings consistent	Was there consistency between the data presented and the findings? Yes, pg 23 -25
31.	Clarity of major themes	Were major themes clearly presented in the findings? Yes, see emergent categories table and joint result table
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes? Pg 23-24