

Economic Commission for Latin America and the Caribbean

ECLAC SUBREGIONAL HEADQUARTERS FOR THE CARIBBEAN



Evaluation report of the regional workshop on the creation of maps to display census and small area statistics using REDATAM and QGIS



UNITED NATIONS

ECLAC



Economic Commission for Latin America and the Caribbean
Subregional Headquarters for the Caribbean

Regional workshop on the creation of maps
to display census and small area statistics
using REDATAM and QGIS

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EVALUATION REPORT OF THE REGIONAL WORKSHOP ON THE CREATION OF MAPS TO DISPLAY CENSUS AND SMALL AREA STATISTICS USING REDATAM AND QGIS

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A. INTRODUCTION

1. Population and housing censuses are the main source of official statistics for small areas, which are used for planning and resource allocation. Administrative sources can also provide geographically disaggregated information (although capacity constraints mean that administrative data is relatively underutilized in Caribbean statistical systems). With geography being such an important dimension, maps have an important role to play in analysis and reporting of census and administrative statistics.
2. The REDATAM software, which is used by many Caribbean statistical offices for the online dissemination of census data, has some basic mapping functionality (for example for creating choropleth maps) but the QGIS software provides a comprehensive Geographic Information Systems (GIS) capability for statistical mapping in the form of free open-source software. For this reason, ECLAC are promoting the use of QGIS for spatial analysis and mapping alongside REDATAM.
3. This workshop was organized to provide training in the use of the REDATAM and QGIS software for the preparation of maps to display geographically disaggregated data. It was hosted by the Economic Commission for Latin America and the Caribbean (ECLAC) subregional headquarters for the Caribbean in collaboration with the Latin American and Caribbean Demographic Centre (CELADE), the Population Division of ECLAC. The participants learned how to use REDATAM to process census data which was then imported into QGIS so it could be displayed using maps. They learned how to create several different kinds of maps, such as choropleth maps, proportional circle maps, maps with pie or bar charts and dot density maps, and they evaluated the strengths and weaknesses of these different approaches. It is anticipated that this workshop will enable census statisticians and GIS specialists to make greater use of maps in the analysis and reporting of data collected during the 2020 round of population and housing censuses which was launched in the Caribbean earlier this year.
4. REDATAM is a software programme developed and supported by ECLAC for the processing, analysis and dissemination of data from censuses and household surveys. The REDATAM software makes it possible to provide public access, via the Internet, to census and survey data sets in a way which permits much wider public access to data but still protects the confidentiality of individual statistical records. It has been used primarily to disseminate population and housing censuses but can also be used to provide online access to living conditions, demographic and health, and other household surveys.
5. QGIS is GIS software which allows users to analyze and edit spatial information, to carry out spatial analysis and create maps. Statistical maps are created by combining spatial data (for example polygons defining the boundaries of census enumeration districts) with geocoded statistical data where each data item is linked to a specific location or area. QGIS describes itself as a user-friendly, open-source Geographic Information Systems licensed under the GNU General Public License and is a volunteer driven project.

B. ATTENDANCE AND ORGANIZATION OF WORK

1. Place and date of the workshop

6. The regional workshop on the creation of maps to display census and small area statistics using REDATAM and QGIS was held virtually from 8 November to 15 November 2021.

2. Attendance¹

7. The workshop was attended by technical staff of Caribbean statistical offices who process, analyse and report on census data or who work with Geographic Information Systems. Statisticians and technical staff from the following member States and associate members participated in the workshop: Bahamas, Barbados, Belize, Cayman Islands, Dominica, Grenada, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and Grenadines, Suriname, and Turks and Caicos Islands.

3. Organization of work

8. The workshop was organized using Microsoft Teams. Before the formal start of the workshop, there was a drop-in session to enable participants to test the platform and to facilitate the download and installation of software. The workshop then consisted of six consecutive days of morning classes with an exercise set for each afternoon. Guidance was available from the workshop facilitators through an optional afternoon drop-in session. On the fifth day, instead of an exercise, the participants were set a project which they worked on in small teams and then presented on the sixth and final morning of the workshop. The participant's successful completion of the workshop was assessed based on these daily exercises and the final project.

C. SUMMARY OF PROCEEDINGS

1. Opening of the workshop

9. In his opening remarks, the Population Affairs Officer of ECLAC subregional headquarters for the Caribbean explained that the main objective of the workshop was to train participants in the use of REDATAM and QGIS for the creation of maps to display census and other small area statistics. Maps are a powerful means of communicating census findings (or other statistical information) and he argued that more effective use of maps could help to widen utilization of statistics for planning and informed decision-making at all levels.

2. Use of REDATAM for data preparation

10. Before a map can be produced, the data has to be prepared in geographically disaggregated form. With this in mind, the first two days of the workshop focused on the use of REDATAM for the processing of census data. This involved calculating geographically disaggregated indicators, including Sustainable Development Goal (SDG) indicators, for example the proportion of people using the Internet or the proportion of youth not in education, employment or training.

3. Use of QGIS for creation of maps

11. On day three, the QGIS software was introduced and participants were taught how to import data from REDATAM into QGIS. Over the course of days three to five, participants were introduced to a range of different kinds of maps. These included choropleth maps, proportional symbol maps, maps with bar charts and pie charts, and dot density maps.

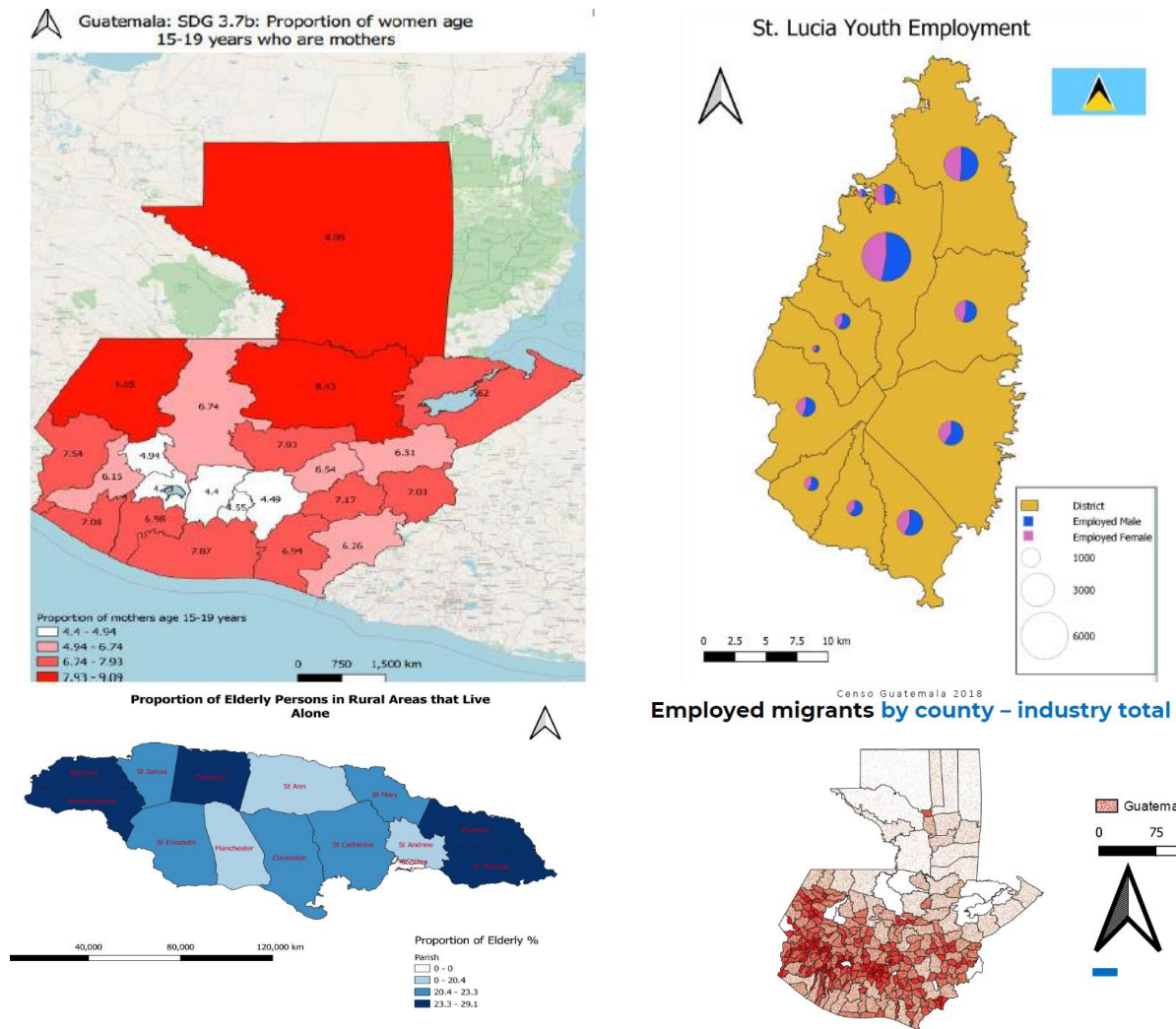
4. Participant's presentation of final projects

12. On day five participants were set a project, the intention being for them to put into practice what they had learned during the workshop. Working in small teams, participants were asked to select a particular census or research topic and to use REDATAM and QGIS to prepare at least three maps presenting census

¹ See annex I for a full list of participants.

data on that topic, utilizing some of the different techniques that had been taught during the workshop. The projects were presented in the form of PowerPoint presentations on the final morning of the workshop. Figure 1 illustrates some examples of maps displaying census data which were produced by participants as part of their projects.

Figure 1: Some examples of maps produced by participants during the workshop



5. Closing remarks

13. In the closing session of the workshop, some general principles and lessons concerning preparation of maps were reinforced:

- Maps should convey a clear message (or messages) and users should be able to identify these key messages relatively easily.
- If a map does not quickly and easily convey a message about the data, it's probably not a very useful map.
- Choropleth maps are the most commonly used approach to mapping census data and are good for mapping a single indicator. They are often the best way to map data but they do have some weaknesses and, in some circumstances, alternatives can be more appropriate.

- Maps with pie charts or bar charts are good for analysing the spatial distribution of multiple categories of a single variable (for example ethnicities, religions or languages).
- Dot density maps are very effective for illustrating extreme differences between areas of high and low population density and can be used to map totals or different categories of a single variable (ethnicities...)
- Creating effective maps involves trial and error. It's common that when you produce a map, it doesn't show exactly what you expected it to show (and it might show something very different).
- There are often different ways of mapping the same data so it's a good idea to try different approaches and discuss with your colleagues what they think works well.

D. RESULTS OF THE POST-WORKSHOP EVALUATION

1. Summary

14. Following the workshop, participants completed an evaluation questionnaire. Twenty-six participants completed the workshop (including submission of the exercises and final project) and, of those, twenty submitted the evaluation questionnaire. The evaluation confirmed a generally high level of satisfaction with the workshop.

2. Results of evaluation

Q1. Rate these elements of the workshop: duration of the workshop?

	Very Good	Good	Poor	Very poor	Not sure/ no response	Total
N	7	11	1	0	1	20
%	35	55	5	0	5	100

Q2. Virtual Platform: how do you evaluate the experience using Teams as a virtual platform?

	Very Good	Good	Poor	Very poor	Not sure/ no response	Total
N	10	10	0	0	0	20
%	50	50	0	0	0	100

Q3. How do you consider the combination of classes in the morning and individual exercises in the afternoons?

	Very Good	Good	Poor	Very poor	Not sure/ no response	Total
N	10	7	0	0	3	20
%	50	35	0	0	15	100

Q4. Quality of the class material delivered (databases, exercises, support material)

	Very Good	Good	Poor	Very poor	Not sure/ no response	Total
N	12	8	0	0	0	20
%	60	40	0	0	0	100

Q5. Teacher's experience

	Very Good	Good	Poor	Very poor	Not sure/ no response	Total
N	15	5	0	0	0	20
%	75	25	0	0	0	100

Q6. Teacher's support in class and in the afternoon sessions

	Very Good	Good	Poor	Very poor	Not sure/ no response	Total
N	14	3	0	0	3	20
%	70	15	0	0	15	100

Q7. Were your expectations about the workshop met?

	Very Good	Good	Poor	Very poor	Not sure/ no response	Total
N	6	10	0	0	4	20
%	30	50	0	0	20	100

Q8. Is this workshop useful for your work?

	Very Good	Good	Poor	Very poor	Not sure/ no response	Total
N	10	10	0	0	0	20
%	50	50	0	0	0	100

Q9. How do you rate the workshop overall?

	Very Good	Good	Poor	Very poor	Not sure/ no response	Total
N	12	8	0	0	0	20
%	60	40	0	0	0	100

Q10. What do you suggest for improving the virtual teaching for future workshops?

- For future workshops, I think it would be better if the workshop was given in a program that the participants are using. I have never worked with REDATAM nor QGIS. At the General Bureau of Statistics we are using ArcGis/ArcMap so everything was new to me.
- Sometimes the teachers were too fast so it was a little bit difficult to keep up, especially when using the software for the first time.
- Manuals with a little more instruction for first-timers.
- I'm not a fan of virtual workshops because one-to-one communication with the presenters is very important. Maybe the workshop could be spread out over a longer duration with some days off in between.
- Extend the time of the workshop to at least 2 weeks, decrease the number of exercises and allow more time for the final project.
- An extra day could be very useful especially for writing the syntax. Training in creating a database in REDATAM would be useful.
- The training was difficult for me to keep up with as my area of expertise is map based and not census data processing. My suggestion is to have persons work in groups where persons who are unfamiliar with this type of processing work together.
- The workshop was great. My only issue is the fact that it was online and so it can't be as interactive. Other than that it was great and the facilitators were very accommodating.
- I would recommend only morning sessions with a few tutorials that allowed time to interactively read through and complete the exercises. Explanations could be given as to why a particular set of codes and method was used and possibly alternative methods. Rather than all day, a few days could involve training followed by optional homework for additional practice. We would have wanted a training showing the creation of the data in the REDATAM format.
- The workshop came at a time that was very busy for my office (we are in the middle of conducting a census).

Q11. How do you plan to apply what you learned during this workshop?

- I will be using what I learned for the upcoming census if there is time to do so. We have not heard yet if there is funding for our census.
- Very useful for Census 2022.
- I will use what I learned in our upcoming census.
- I'm planning to use what I've learned in the dissemination phase of our planned 2022 census.
- I will use the census data to create maps in QGIS.
- Develop tables and maps from census data for an SDG report.
- This REDATAM training will better equip me to run codes to obtain specified fields from a plethora of census data and to create tables. QGIS software allows for the creation of maps to represent the data using appropriate symbols such as pie charts, bar charts, dot maps and choropleth maps. This training will be used in my organization to display census data.
- The Saint Kitts and Nevis Census is going to begin shortly and hopefully thereafter we can load the database on our website.
- The QGIS sessions were useful and I am looking to see how best we can use it after our next census.
- Making thematic maps is interesting, but it all starts with setting up the database which was not addressed in this workshop.
- The material will be applied to create more visually appealing maps (and the knowledge will be transferred to other officers within the mapping unit). If REDATAM is used during the upcoming census, then the unit will be well placed to use the database to create visually appealing spatial data.
- I intend to read through the documents and watch some videos to further grasp the concepts taught.
- We are in the process of updating the data visualization on our office's website. This workshop has brought new ideas that we cannot wait to implement.
- We plan on using it to disseminate census maps and data.

Annex I**LIST OF PARTICIPANTS****A. Member States****BARBADOS**

- Trudi Alleyne, GIS Technician (a.i.), Barbados Statistical Service, email: talleyne@barstats.gov.bb
- Nadia Skeete, Statistician I, Barbados, Statistical Service, email: nskeete@barstats.gov.bb
- Toria Small, Census Statistician, Barbados, Statistical Service, email: tsmall@barstats.gov.bb
- Dondre Trotman, Information Technology Officer, Barbados Statistical Service, email: dtrotman@barstats.gov.bb

BAHAMAS

- Angelique Davis, Senior Data Entry Operator, Bahamas National Statistical Institute, email: angeliquedavis@bahamas.gov.bs
- Insa Frith, GIS Unit Supervisor, Bahamas National Statistical Institute, email: insafrith@bahamas.gov.bs
- Tia Rolle, GIS Technician, Bahamas National Statistical Institute, email: thinsey@bahamas.gov.bs

BELIZE

- Javier Romero, Assistant Statistician I, Statistical Institute of Belize, email: jromero@mail.sib.org.bz

DOMINICA

- Dwayne Dick, Statistician, Central Statistics Office, email: dickd@dominica.gov.dm
- Abigail Durand, GIS Officer, Central Statistics Office, email: durandab@dominica.gov.dm
- Arnelle Isaac, GIS (Mapping) Officer, Central Statistics Office, email: isaacar@dominica.gov.dm
- Shania Scotland, GIS Mapping Officer/Area Supervisor, Central Statistics Office, email: scotlandsh@dominica.gov.dm

GRENADA

- Kishi Logie, Systems Administrator, Central Statistical Office, Ministry of Finance, Economic Development, Physical Development and Energy, email: kishilogie@cso.gov.gd
- Shimron Millette, Data Technician, Central Statistical Office, Ministry of Finance, Economic Development, Physical Development and Energy, email: shimron.millette@cso.gov.gd
- Joshua Williams, Data Processing Clerk, Central Statistical Office, Ministry of Finance, Economic Development, Physical Development and Energy, email: joshua.williams@cso.gov.gd

JAMAICA

- Arlando Lennon, Geographer, Statistical Institute of Jamaica, email: alennon@statinja.gov.jm
- Hope Perkins, Senior Statistician, Statistical Institute of Jamaica, email: hperkins@statinja.gov.jm
- Sherril Shepherd, GIS Technician, Statistical Institute of Jamaica, email: sshepherd@statinja.gov.jm
- Michelle Thomas-Fagan, GIS Specialist, Statistical Institute of Jamaica, email: mthomas@statinja.gov.jm

SAINT KITTS AND NEVIS

- Keown Hughes, Statistics Department, Ministry of Sustainable Development, Saint Kitts and Nevis, email: keownhughes01@gmail.com
- Karen McDonald, Statistician, Statistics Department, Nevis Island Administration, email: karen.mcdonald@niagov.com
- Lisa Pestano-Browne, GIS Officer, Department of Statistics, Nevis Island Administration, email: lisa.browne@hotmail.com

- Corneil Williams, Statistician, Statistics Department, Ministry of Sustainable Development, Saint Kitts and Nevis, email: williamscor@gmail.com

SAINT LUCIA

- Patrick Dujon, Statistical Assistant, Central Statistical Office, email: Patrick.dujon@govt.lc
- Sherma Small, Mapping Supervisor, Central Statistical Office, email: sherma.lawrence@govt.lc

SAINT VINCENT AND THE GRENADINES

- Andy Baptiste, Statistical Officer, GIS Technician, Economic Planning Division, Ministry of Finance, Economic Planning and Information Technology, email: abaptiste@svgcpd.com
- Darren Solomon, Statistical Assistant, Statistical Office of Saint Vincent and the Grenadines, email: dsolomon@gov.vc

SURINAME

- Mirelva Alexander, Head of Labor Statistics, General Bureau of Statistics, email: shanida.alexander@gmail.com
- Naomi Caupain, Manager Census Office (Ag.), General Bureau of Statistics, email: n_caupain@hotmail.com
- Miriam Ramdhari, Head of Electronic Data Processing (Ag.), General Bureau of Statistics, email: miriam.ramdhari@gmail.com
- Paul Samiran, Cartography, General Bureau of Statistics, email: samipaulran@hotmail.com

B. Associate Members

CAYMAN ISLANDS

- Travis Walters, Statistician I, Economics and Statistics Office, email: travis.walters@gov.ky

MONTSERRAT

- Jason Ryan, IT Technician, Statistics Department, Ministry of Finance and Economic Management, email: ryanj@gov.ms
- Dmitri Tuitt, Computer Systems Officer, Statistics Department, Ministry of Finance and Economic Management, email: tuittd@gov.ms

TURKS AND CAICOS ISLANDS

- Cierra Garland, Statistician, Department of Statistics, Turks and Caicos Islands Government, email: cagarland@gov.tc
- Roshard Talbot, Statistical Technician, Department of Statistics, Turks and Caicos Islands Government, email: rtalbot@gov.tc

C. Secretariat

Economic Commission for Latin America and the Caribbean (ECLAC)

- Alejandra Silva, REDATAM Development Team, Latin American and Caribbean Demographic Centre (CELADE), email: alejandra.silva@cepal.org

ECLAC subregional headquarters for the Caribbean

- Francis Jones, Population Affairs Officer, Statistics and Social Development Unit, email: francis.jones@eclac.org
- Iskuhi Mkrtchyan, Statistics Assistant, Statistics and Social Development Unit, email: iskuhi.mkrtchyan@eclac.org
- Colleen Skeete, Programme Management Assistant, Statistics and Social Development Unit, email: colleen.skeete@eclac.org

Annex II**PROGRAMME**

Day 1: Monday 8 November		
09.30 – 09.40	Opening remarks	Francis/ Alejandra
09.40 – 11.00	Processing and tabulation of census data using REDATAM Introduction to the REDATAM Process module Examining a census database, basic REDATAM programming REDATAM commands: DEFINE, COUNT, FOR, TABLE, AREALIST SDG Indicator 5.b.1 Proportion of people who use/own mobile phones	Francis
11.00 – 11.15	<i>Break</i>	
11.15 – 12.30	SDG Indicator 17.8.1 Proportion of people using the Internet SDG Indicator 6.1.1 Proportion of population using safely managed drinking water services.	Iskuhi
12.30 – 13.30	<i>Lunch</i>	
13.30 – 15.30	Individual daily exercise SDG Indicator 6.2.1 Proportion of population using safely managed sanitation services	Francis/ Alejandra/ Iskuhi (all)
Day 2: Tuesday 9 November		
09.30 – 11.00	Calculation of indicators (including SDG indicators) Using intermediate variables for the creation of indicators Further REDATAM commands: RECODE SDG Indicators 11.6.1 Proportion of municipal solid waste collected and managed in controlled facilities and 7.1.2 Proportion of population with primary reliance on clean fuels and technology.	Iskuhi
11.00 – 11.15	<i>Break</i>	
11.15 – 12.30	Further REDATAM commands: SWITCH SDG indicators 8.6.1 Proportion of youth (aged 15-24 years) not in education, employment or training and 11.1.1 Proportion of urban population living in slums, informal settlements or inadequate housing	Iskuhi
12.30 – 13.30	<i>Lunch</i>	
13.30 – 15.30	Individual daily exercise SDG indicator 3.7.2 Adolescent birth rate (aged 10-14 years; aged 15-19 years) per 1,000 women in that age group	All
Day 3: Wednesday 10 November		
09.30 – 11.00	Creating maps to display census data in QGIS Transfer of data from REDATAM to QGIS Choropleth maps and rule-based application of styles Standardization of data, labelling	Alejandra
11.00 – 11.15	<i>Break</i>	

11.15 – 12.30	Preparing maps for publication Preparing map layouts for printing, colour ramps, titles, legends Examples of map creation using indicators generated in REDATAM	Alejandra
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12.30 – 13.30	<i>Lunch</i>	
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13.30 – 15.30	Individual daily exercise	All
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Day 4: Thursday 11 November

09.30 – 11.00	Alternatives to choropleth maps Strengths and weaknesses of choropleth maps Proportional circle maps, maps with pie charts	Francis
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11.00 – 11.15	<i>Break</i>	
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11.15 – 12.20	More alternatives to choropleth maps Maps with bar charts Further examples of maps, for example displaying industry of employment by region/parish; first language by region/parish	Francis
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12.20 – 12.30	Discussion of individual projects (to be presented on Monday)	
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12.30 – 13.30	<i>Lunch</i>	
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13.30 – 15.30	Individual daily exercise	All
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Day 5: Friday 12 November

09.30 – 11.00	Dot density maps Dot density maps for population distribution Dot density maps for multiple categories of one variable	Alejandra
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11.00 – 11.15	<i>Break</i>	
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11.15 – 12.20	Examples of dot density maps For example, population by ethnic group by region/parish	Alejandra
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12.20 – 12.30	Discussion of individual projects (to be presented on Monday)	
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12.30 – 13.30	<i>Lunch</i>	
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13.30 – 15.30	Work on individual projects	All
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Day 6: Monday 15 November

09.30 – 11.00	Presentations by participants	All
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11.00 – 11.15	<i>Break</i>	
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11.15 – 12.30	Presentations by participants	All
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