

L1: A dynamic, interactive platform for assessing urban health services accessibility and equity

Luis Gabriel Cuervo, representing the AMORE Project
Doctoral Candidate, Universitat Autònoma de Barcelona

12:30-13:00 May 16, 2023

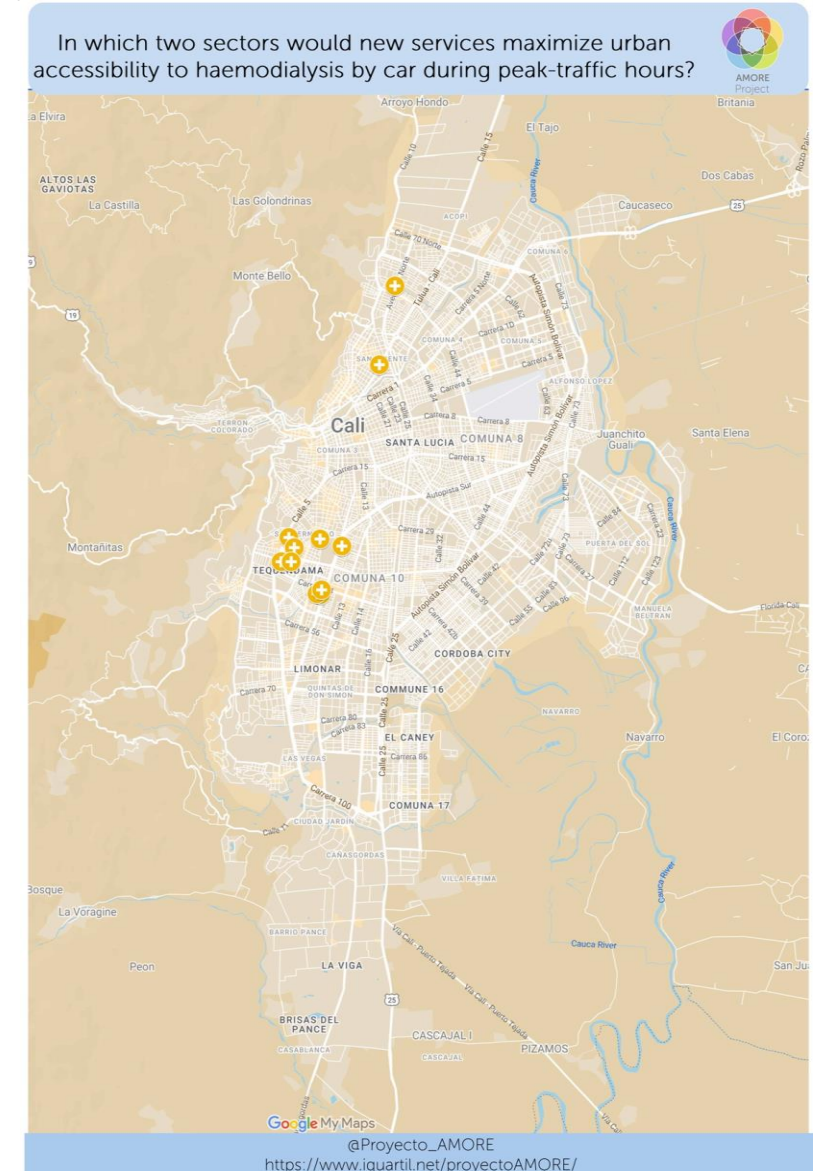
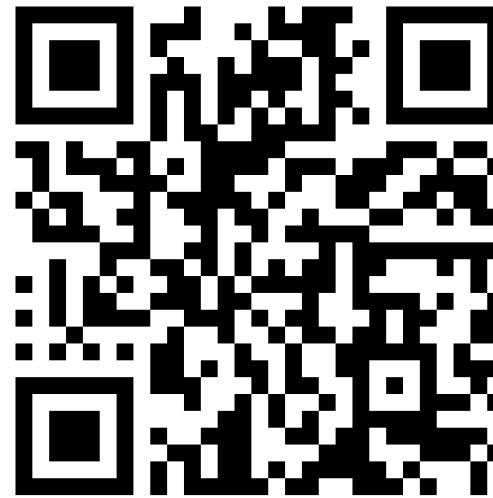
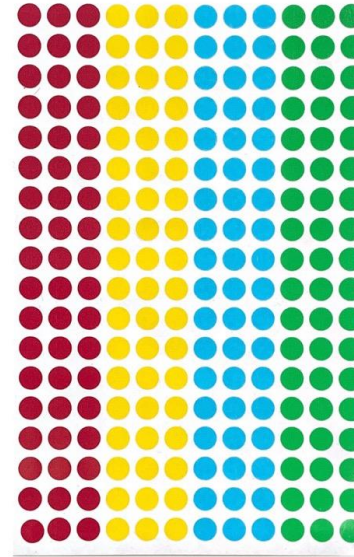
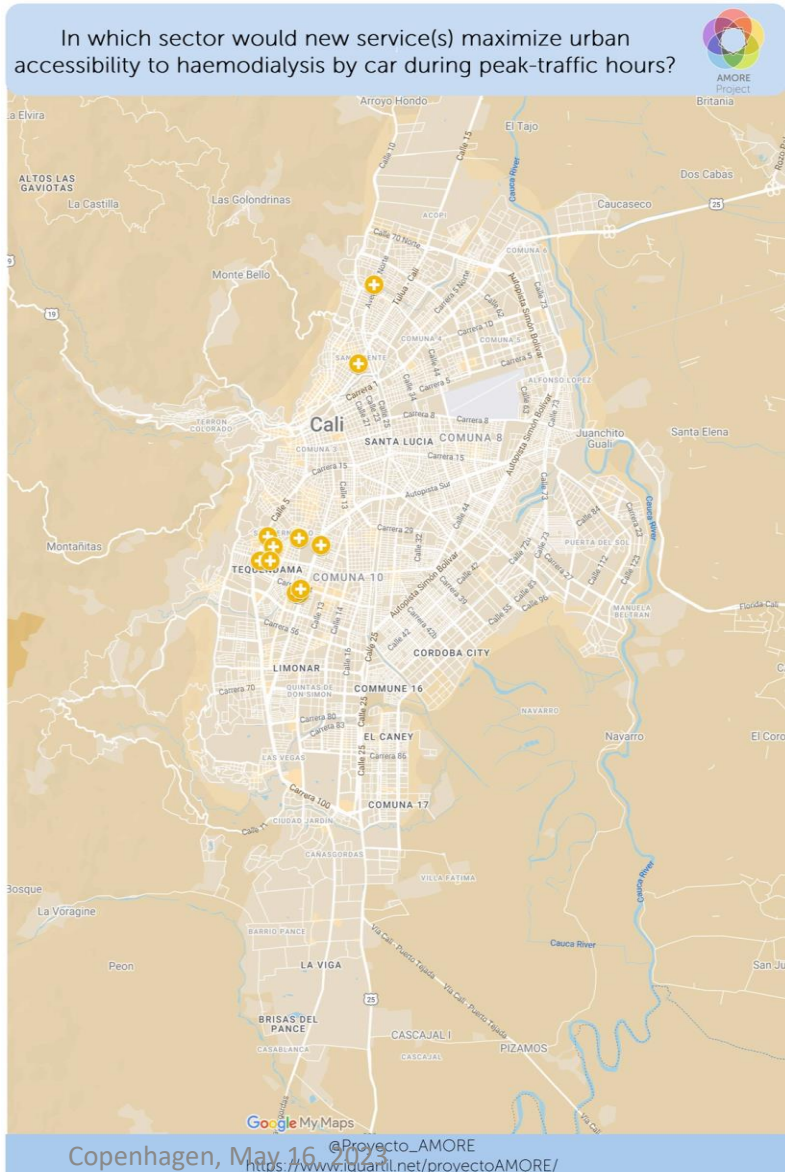


@Proyecto_AMORE



www.iquartil.net/proyecto-amore/

These posters show haemodialysis services in Cali.
Please mark your answers on the posters using three of the stickers provided



Disclosures / declarations of interest

- No external funding has been received for the project or platform, or attendance to this event.
- Contributions to this project are done in my personal capacity as a part-time doctoral student. My contributions do not necessarily reflect the policies or decisions of my employer, the Pan American Health Organization (PAHO/WHO).
- PAHO/WHO do not endorse any related product or service.
- I have not been paid to give talks
- I have not been paid to give advice
- I am not paid for conferences
- IQartil SAS, where Daniel Cuervo is a partner, was commissioned to develop the backend and front end of the AMORE Platform and to host the platform.
- Publication discounts/waivers were received as per publisher's policies (BMJ, F1000Research)



AMORE Project

@Proyecto_AMORE

Project Leader: Dr. Luis Gabriel Cuervo MD MSc

Universitat Autònoma de Barcelona
www.linkedin.com/in/lgcuervo

Researchers: **Ciro Jaramillo Molina**, Daniel **Cuervo**, Eliana **Martínez-Herrera**, Lyda **Osorio**, María O. **Bula**, Janet **Hatcher-Roberts**, María B. **Ospina**, Luis Fernando **Pinilla**, Felipe **Piquero**, Carmen Juliana **Villamizar**,
and the
AMORE Project Collaborative Group

Analytics support: **Daniel Cuervo** ^{MBA, CDS} iQuartil S.A.S.

May 16, 2023

Cali themed painting ©Adriana Cabal Aulestia





Oscar Rojas Rentería



Doctor en Letras Modernas (Literatura Española). Docente de asignaturas de Lengua, former president of Universidad del Valle. Social leader, public speaking, communication.

[LinkedIn](#)
[ORCID](#)
[ResearchGate](#)

María Fernanda Tobías-Barralón



Investigadora asociada, docente, diseñadora de cursos, egresada de la maestría en comunicación y ciencias de la salud.

[LinkedIn](#)
[ORCID](#)
[ResearchGate](#)

Sara M. Valencia Cadavid



Investigadora asociada. Tercer idioma: inglés y conocimiento en estadística, experiencia en gestión pública y en desarrollo management y comunicación.

[LinkedIn](#)
[ORCID](#)
[ResearchGate](#)

Project Portfolio / Portafolio del Proyecto



https://pdfcrowd.com/Proyecto_A43DR_ProyectoInvesta/

[Link to Portfolio](#)

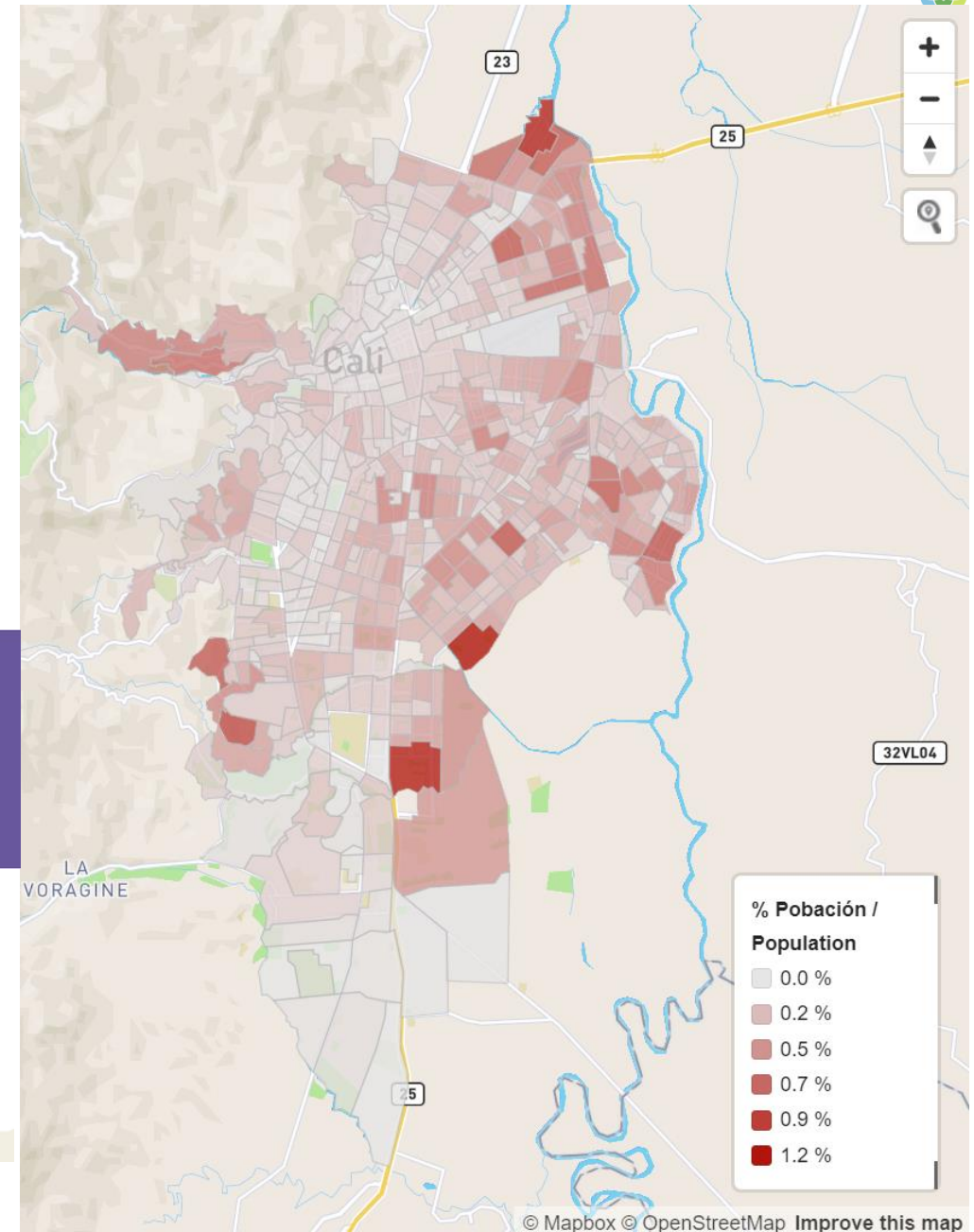
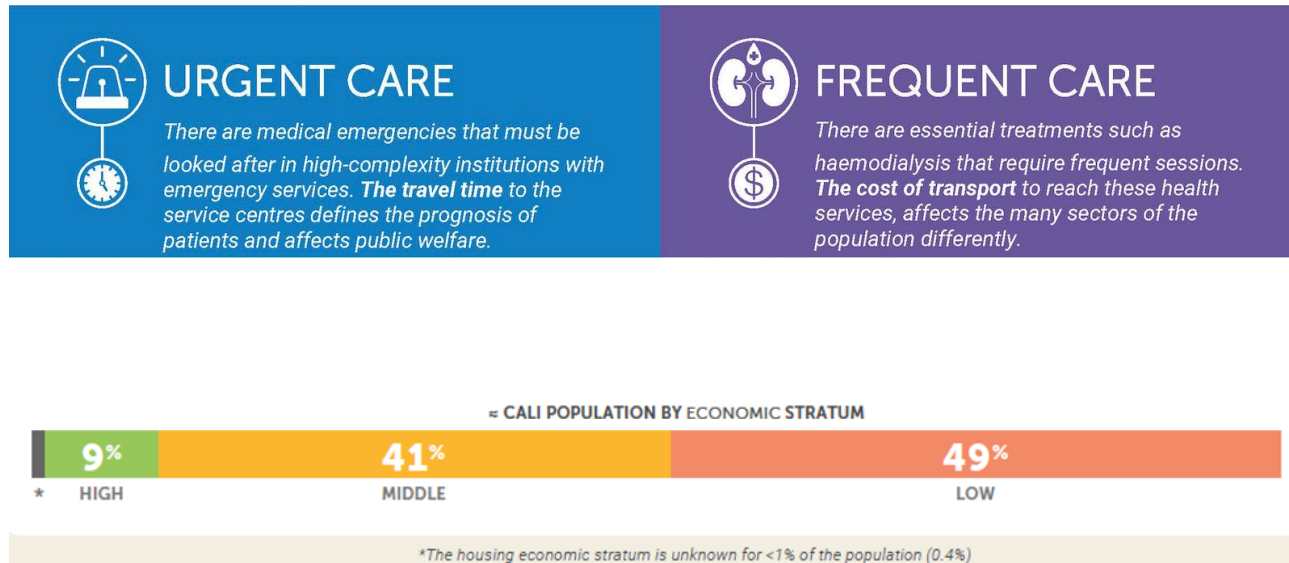
Health services planning



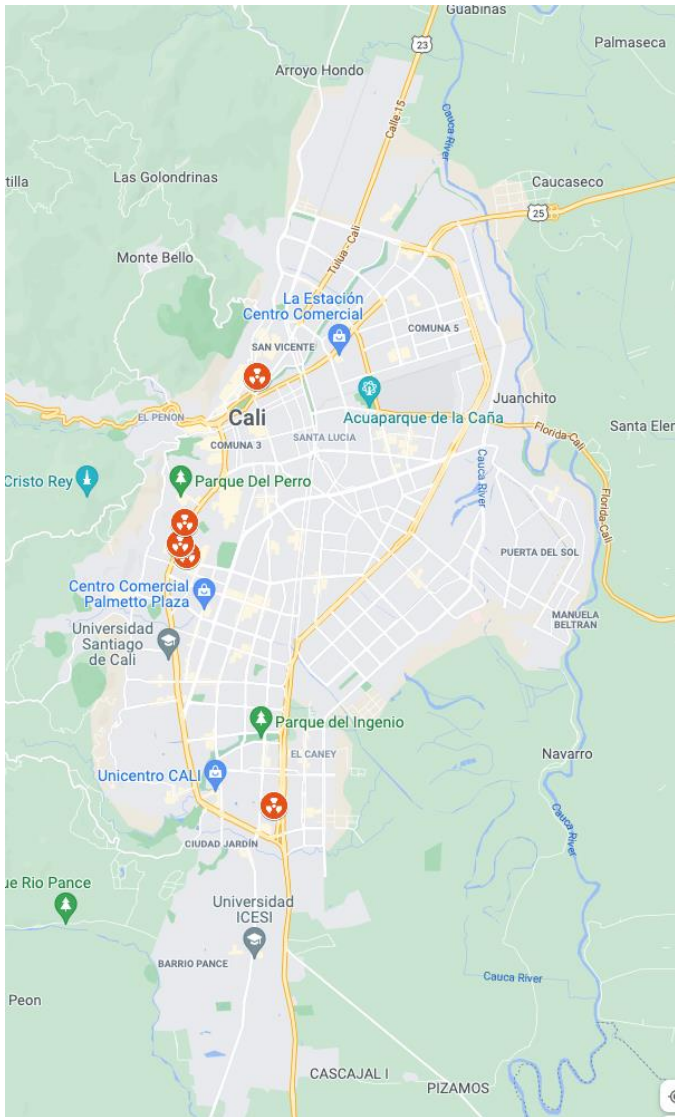
@Proyecto_AMORE

Test case in urban Cali, Colombia (2.258 million inhabitants in 2020)

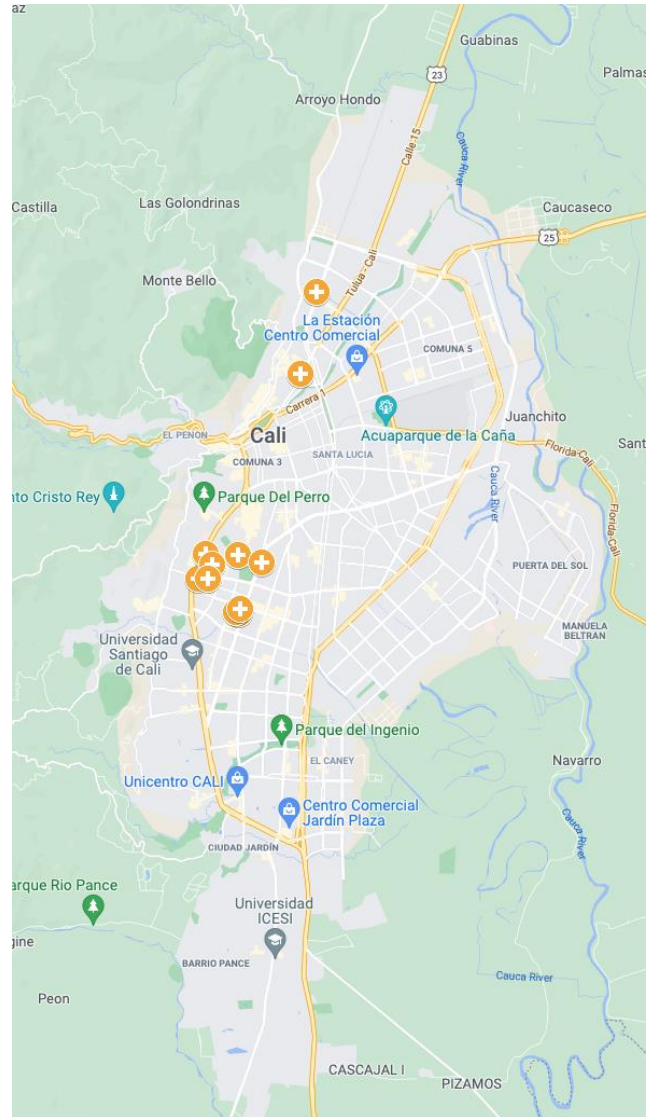
- Urgent care, when every minute counts:
Tertiary care emergency care
- Frequent care, that can lead to catastrophic health expenditures:
Haemodialysis, Radiation therapy



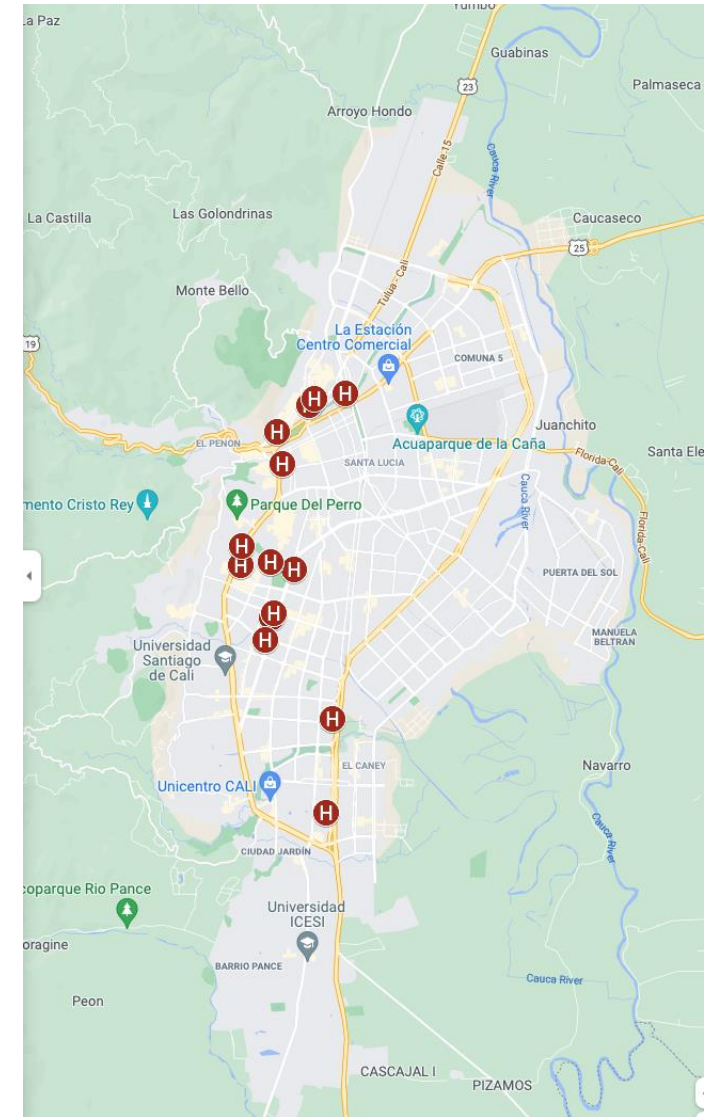
Services assessed



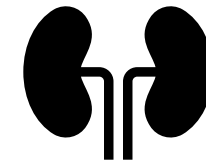
Copenhagen, May 16, 2023
5 radiation therapy services



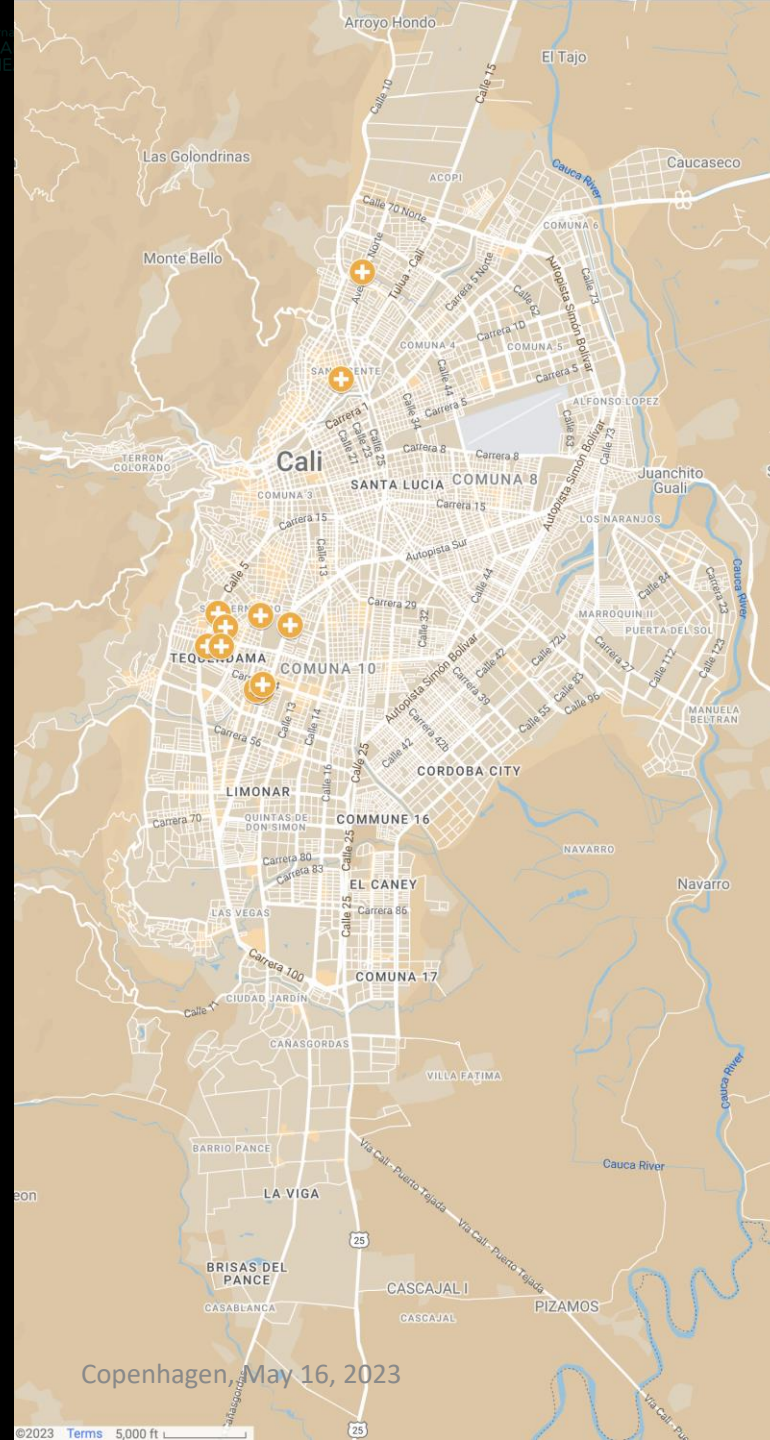
370 hemodialysis chairs in 11 services



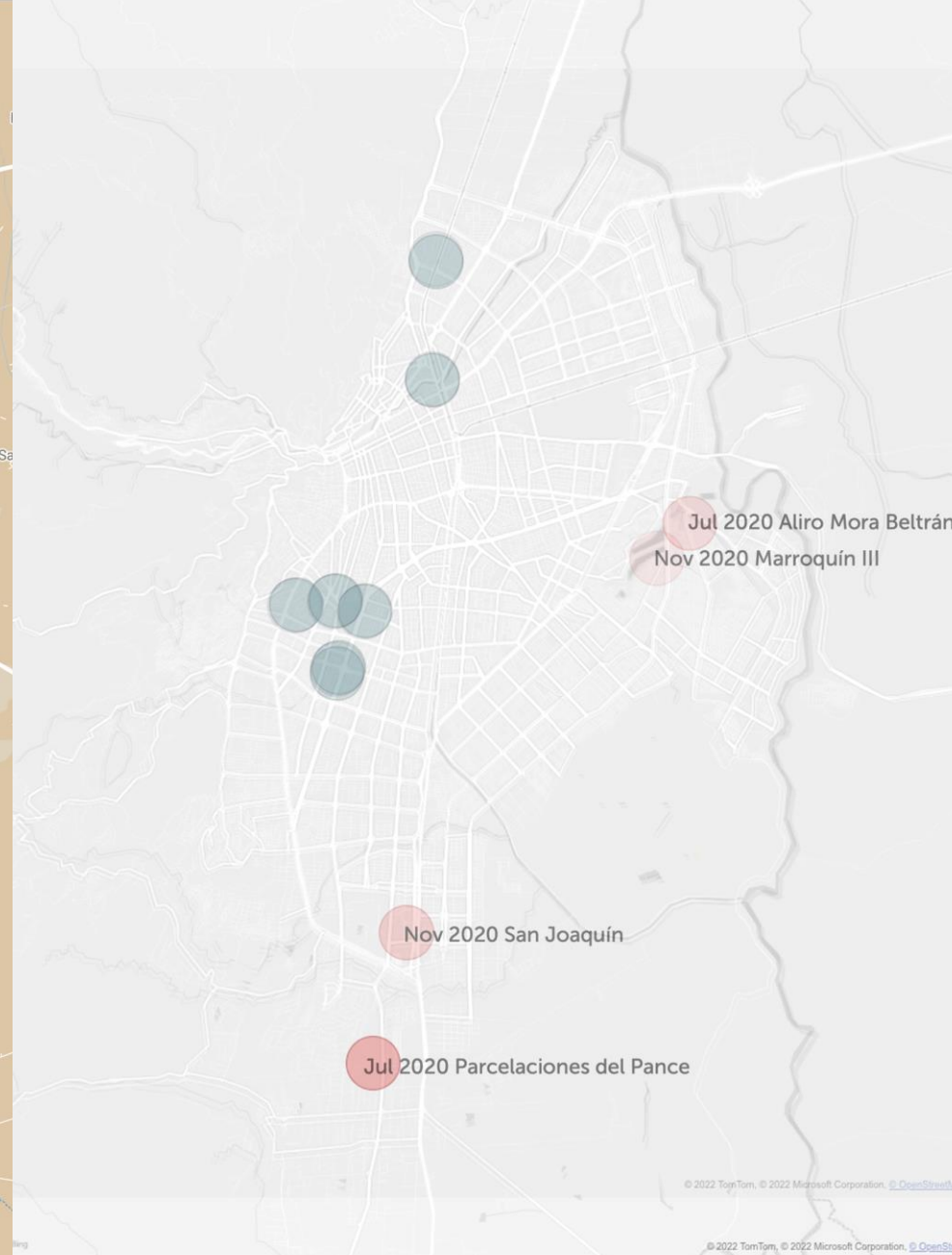
14 tertiary care emergency services



End Stage Renal Disease in Cali
128 per 100,000 / hab
= 2900 patients

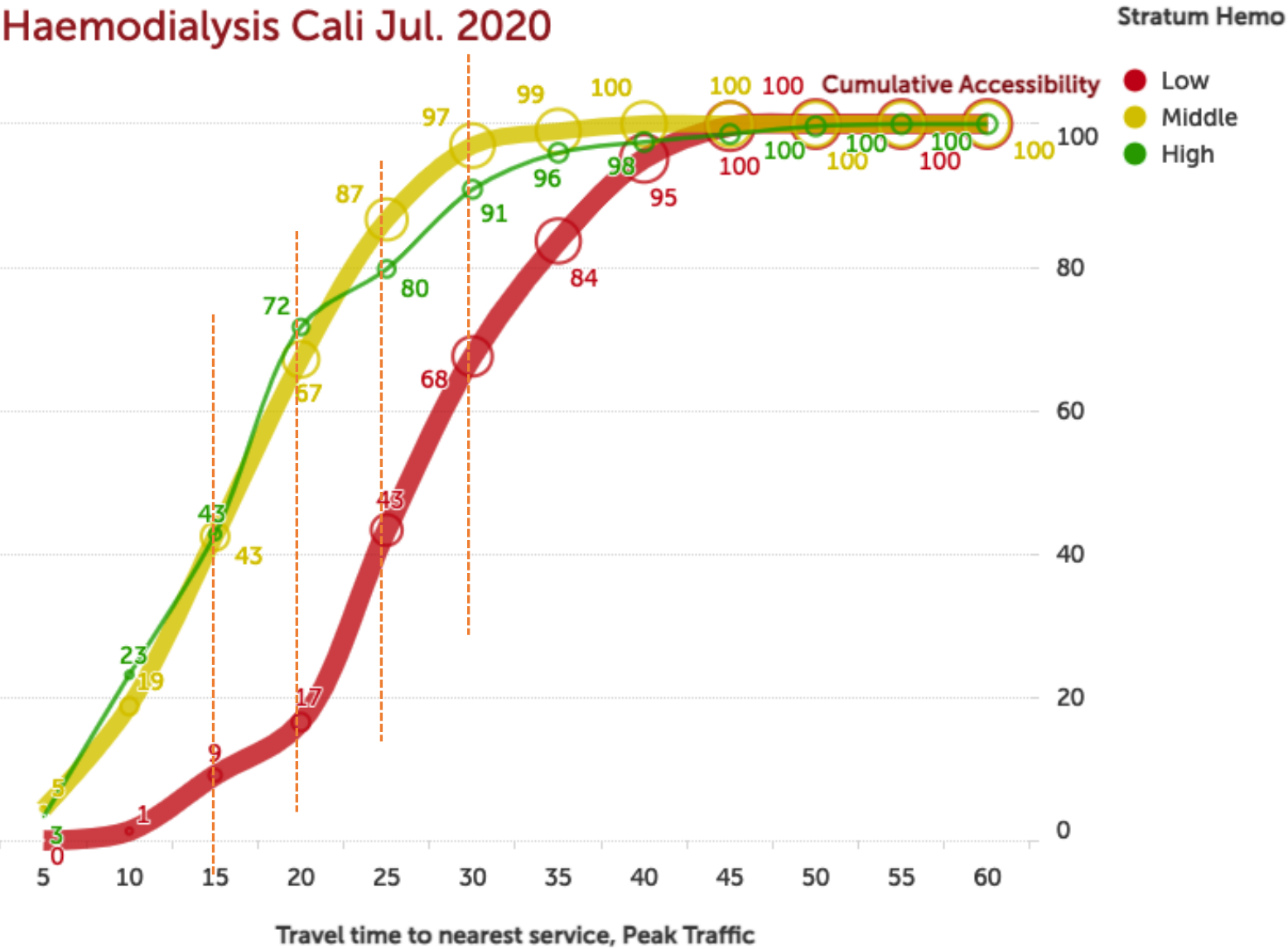


Copenhagen, May 16, 2023



Variations in optimized location for a two haemodialysis in Cali
July and November 2020

Haemodialysis Cali Jul. 2020



https://padlet.com/Proyecto_AMORE_Project/products

AMORE Project portfolio
Publications, events, and resources developed by the AMORE Project Collaboration. We are a participatory intersectoral research project aiming to advance the Sustainable Development Goals by addressing equity in accessibility to essential health services. We provide an approach and the evidence to inform public policy, as well as urban and health services planning. We seek social appropriation of knowledge, dialogue, and engagement with stakeholders. *Publicaciones, eventos y recursos desarrollados por la Colaboración del Proyecto AMORE. Somos un proyecto de investigación intersectorial participativo que tiene como objetivo avanzar en los Objetivos de Desarrollo Sostenible al abordar la equidad en la accesibilidad a los servicios de salud esenciales. Brindamos un enfoque y la evidencia para informar la política pública, así como la planificación urbana y de servicios de salud. Buscamos la apropiación social del conocimiento, el diálogo y la vinculación con los grupos de interés.*

Media - Medios

The AMORE Project in 4 minutes

YouTube

AMORE Project - to improve health equity by reducing the travel time to essential health services

Get acquainted with the AMORE Project in 4 minutes

★★★★★ (1)

Add comment

Website - portales

Tutorial to access and use the AMORE Platform

YouTube

Demo AMORE Platform

This is how to access and use the AMORE Platform to test assumptions and reach conclusions, regarding measurements of published results.

★ Rate

Add comment

Publications - publicaciones

Situational Analysis of Accessibility to Emergency Services in Cali, Colombia, 2020.

BMJ Open: Dynamic accessibility by car to tertiary care emergency services in Cali, Colombia, in 2020: cross-sectional equity analyses using travel time big data from a Google API

https://doi.org/10.1136/bmjopen-2022-062178

★ Rate

Add comment

News - Noticias

Seminario de la Escuela de Gobierno y Transformación Pública - Tecnológico de Monterrey

Midiendo la accesibilidad urbana a los servicios de salud con perspectiva de equidad

Martes 7 de febrero 17:00 hrs

Virtual

Regístrate aquí

#PolíticaPublica #SomosEGobiernoTP #FormamosElFuturo #ODS #TecdeMonterrey

Iniciativa de Política Pública y Salud @Tec

January 26, 2023

Registro https://t.co/skAZNFawC 7 de febrero de 2023 a las 7 PM México, 8 PM COTEST

★ Rate

Add comment

Preprints - preimpresos

Dynamic Geographical Accessibility Assessments to Improve Health Equity: Protocol for a Test Case in Cali, Colombia

Cuervo, LG, Jaramillo C, Cuervo D, Martínez-Herrera E, Hatcher-Roberts J, Pinilla LF, Bula MO, Osorio L, Zapata P, Piquero Villegas F, Ospina MB, and Villamizar CJ. "Dynamic Geographical Accessibility Assessments to Improve Health Equity: Protocol for a Test Case in Cali, Colombia." F1000Research, November 28, 2022. https://doi.org/10.12688/f1000research.127294.1

★ Rate

Add comment

Events - eventos

PBR -Webinar: Big data analysis on a Shoestring. Using publicly available data for population and global health research. March 13, 2023.

us06web.zoom.us

Welcome! You are invited to join a meeting: PBR Webinar - Big Data Analysis on a Shoestring: Using Publicly Available Data for Population and Global Health Research. After registering, you will receive a confirmation email about joining the meeting.

Register here: https://us06web.zoom.us/join/register/tZElcu2urTtGdfkZawGrUDzVj0EohDhCMt

Big data is increasingly utilized in demography and global health research to gain new insights and fill information gaps. Yet, cost and technical expertise challenges have hindered its widespread adoption. Join us for a webinar with Dr. Luis Gabriel Cuervo from the Autonomous University of Barcelona, Dr. Joshua Wilde from Max Planck Institute for Demographic Research (MPIDR) and Portland State University, and Dr. Diego Albrez-Gutierrez from MPIDR, who will discuss their experience using Google's big data to tackle important research questions.

★ Rate

Add comment

Contributors

Collaborators - Colaboradores

Open the link or scan the QR Code - Pinche el enlace o escanee el código

List of contributors, authors, and project coordinators

★ Rate

Add comment

El Proyecto AMORE en 4 minutos

YouTube

Proyecto AMORE - para mejorar la equidad en salud reduciendo los tiempos de viaje a los servicios

Familiarícese con el Proyecto AMORE en cuatro minutos

★ Rate

Add comment

Website (English / Español) Proyecto AMORE Project

iquartil.net

Proyecto AMORE - Nuestra página, hospedada por IQuartil SAS, permite acceder los resultados publicados en la Plataforma AMORE

Our website is hosted by IQuartil SAS and offers access to our published results through the interactive AMORE Platform.

★ Rate

Add comment

Impact of traffic build-up on accessibility to tertiary care emergency services in Cali, Colombia, 6 - 12 July 2020

15-min accessibility to tertiary care emergencies - Cali

Accesibilidad a emergencias de alta complejidad en 15 min

★ Rate

Add comment

Linked In

https://www.linkedin.com/company/the-amore-project-collaborative

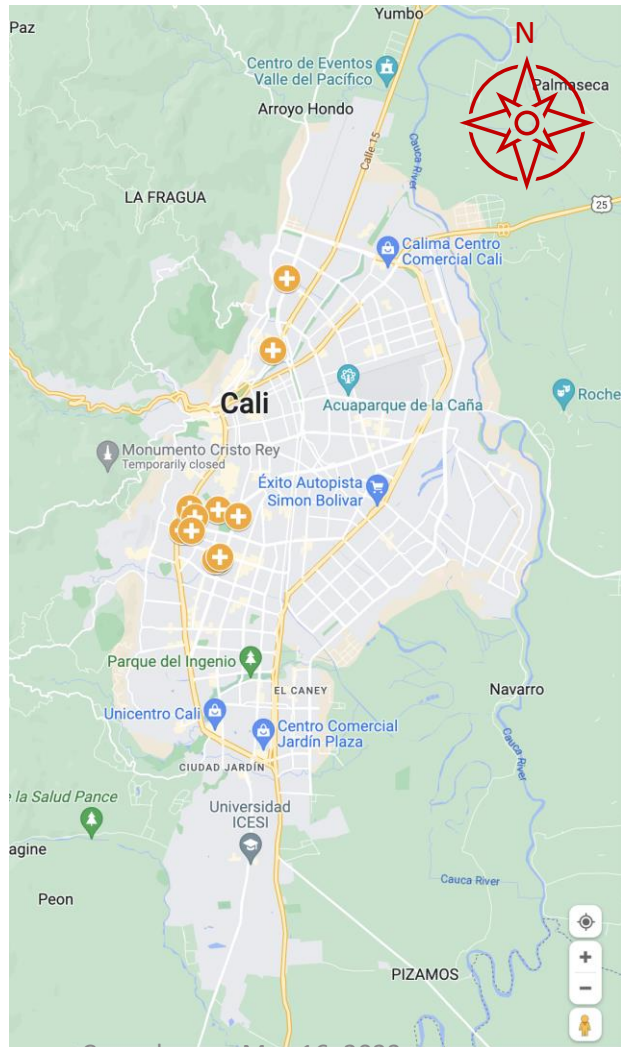
★ Rate

Add comment

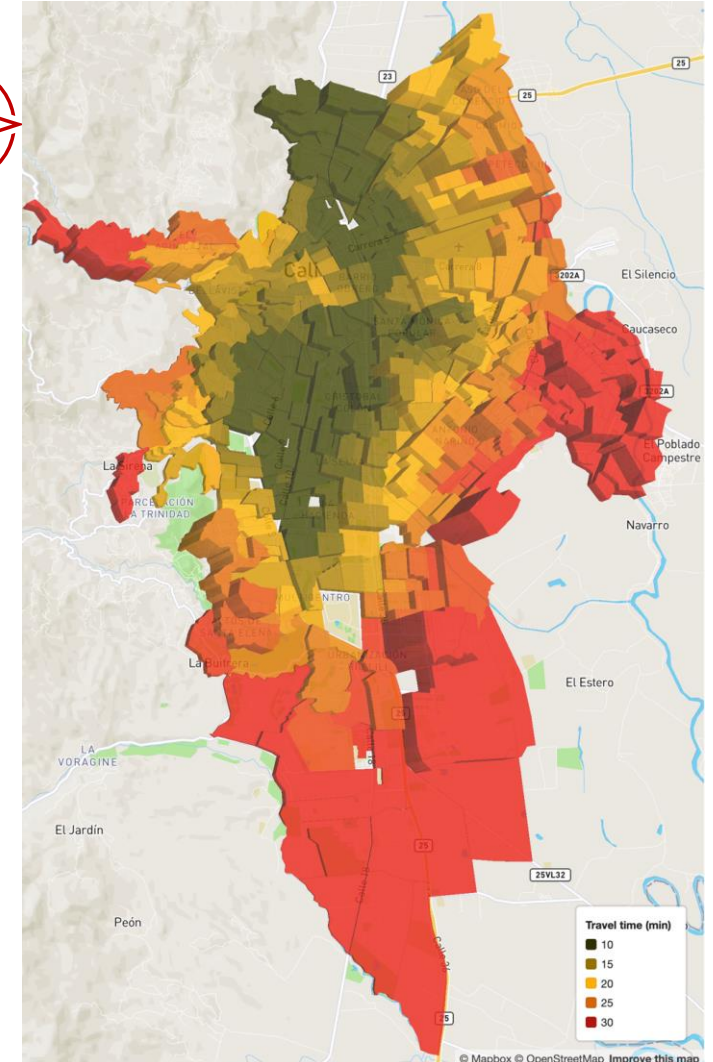
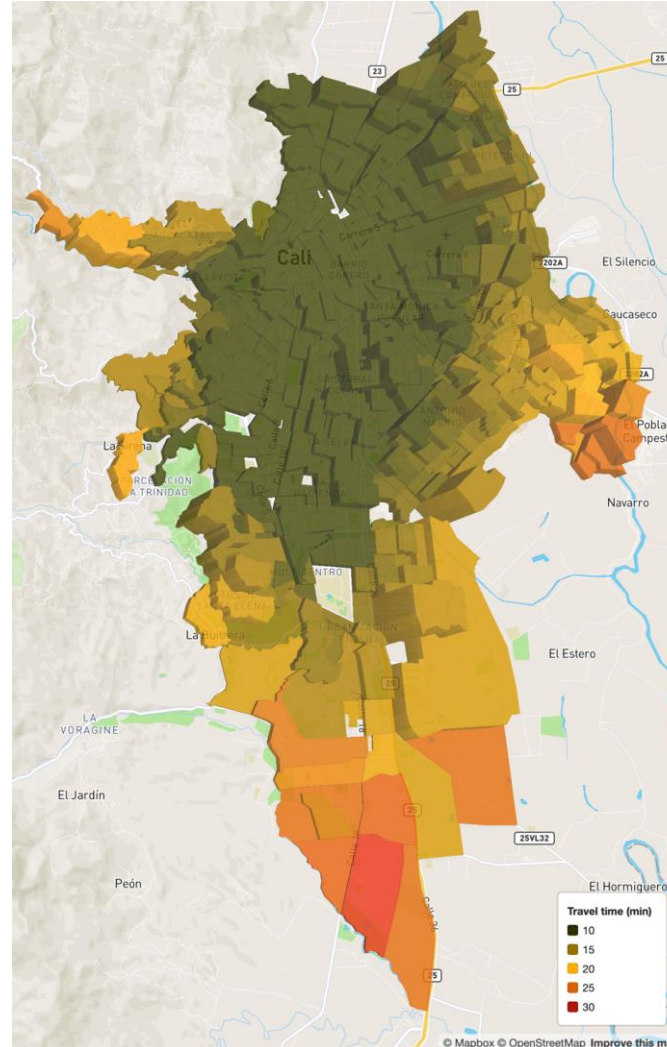
Copenhagen, May 16, 2023



We integrated population, services, and travel times



Copenhagen, May 16, 2023



Cali



dreamstime.com ID 132357913 © Mathes



Download from
Dreamstime.com



Copenhagen May 16, 2023



© Terra Colombia



© Miss Tourist





© El Tiempo

© Alcaldía de Cali

© Q'huboCali.com

© PopuLab

© Diario El País

© ACODAL Occidente




© PopuLab

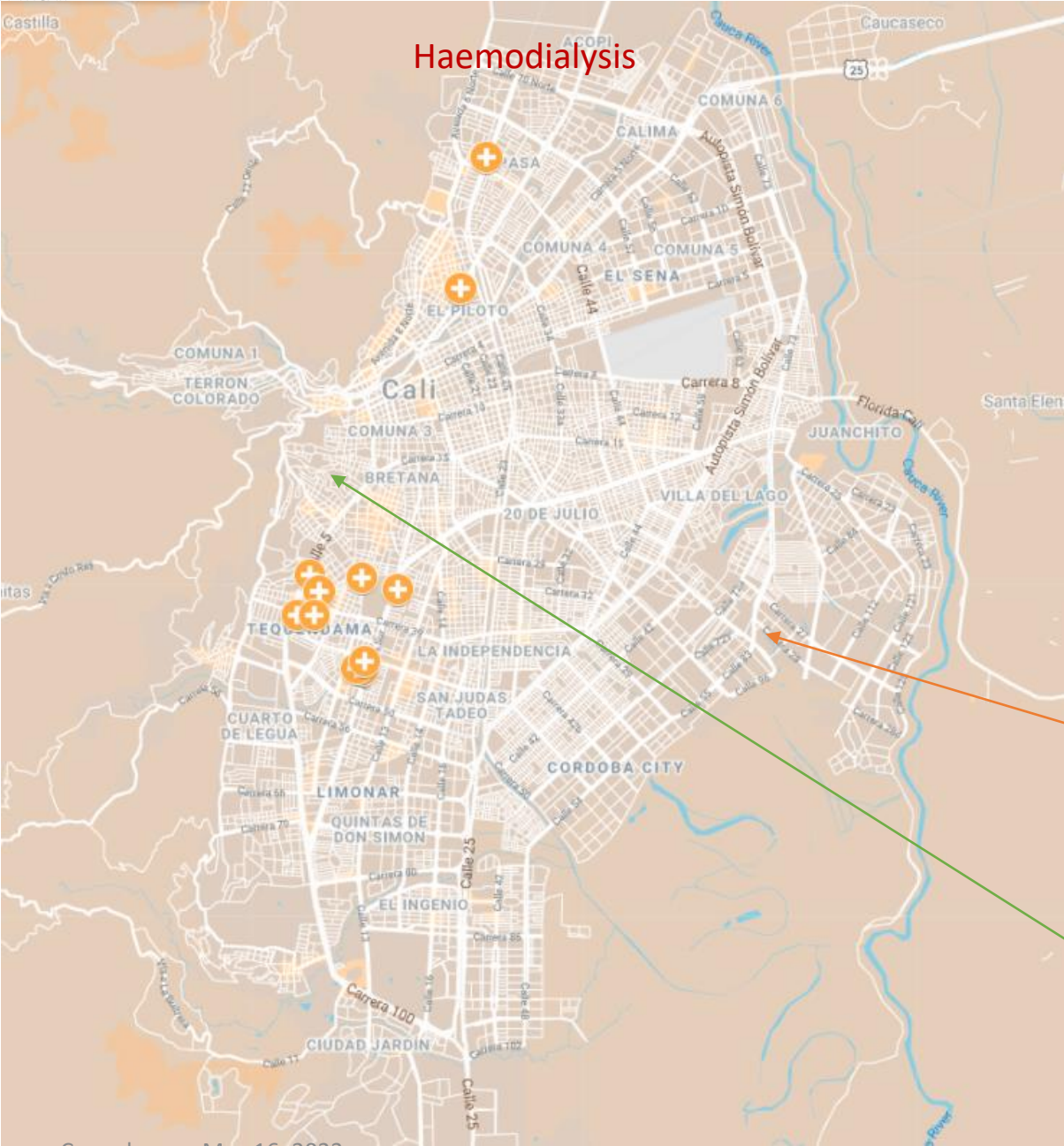
© Cheapbooks



© Openbar Región 16, 2023

2021 INRIX Global Traffic Scorecard – South America

Urban Area	Impact Rank (2020 Rank)	Hours Lost in Congestion (2021 Rank)	Change from Pre-COVID	Last Mile Speed (mph)
 Bogotá	8 (1)	94 (12)	-51%	11
 Quito	39 (8)	63 (51)	-56%	11
 Belo Horizonte	57 (27)	58 (68)	-64%	13
 Medellín	68 (22)	53 (94)	-24%	13
 Cali	76 (10)	51 (109)	-45%	12
 São Paulo	78 (24)	45 (155)	-70%	15
 Guayaquil	89 (31)	47 (139)	-64%	19
 Porto Alegre	397 (158)	24 (473)	-52%	20



Haemodialysis

Haemodialysis 3 /week. (min) Taxi transportation

Minimum Monthly wage MMW COL \$1 m

- Round trip commune 19 (west): \$10,000
- Round trip commune 21 (east) \$ 70,000

3 weekly round trips x 52/12 wks./month

- Commune 19 = 130,000 m (13%) \$\$\$\$\$
- Commune 21 = 910,000 m (91%) \$

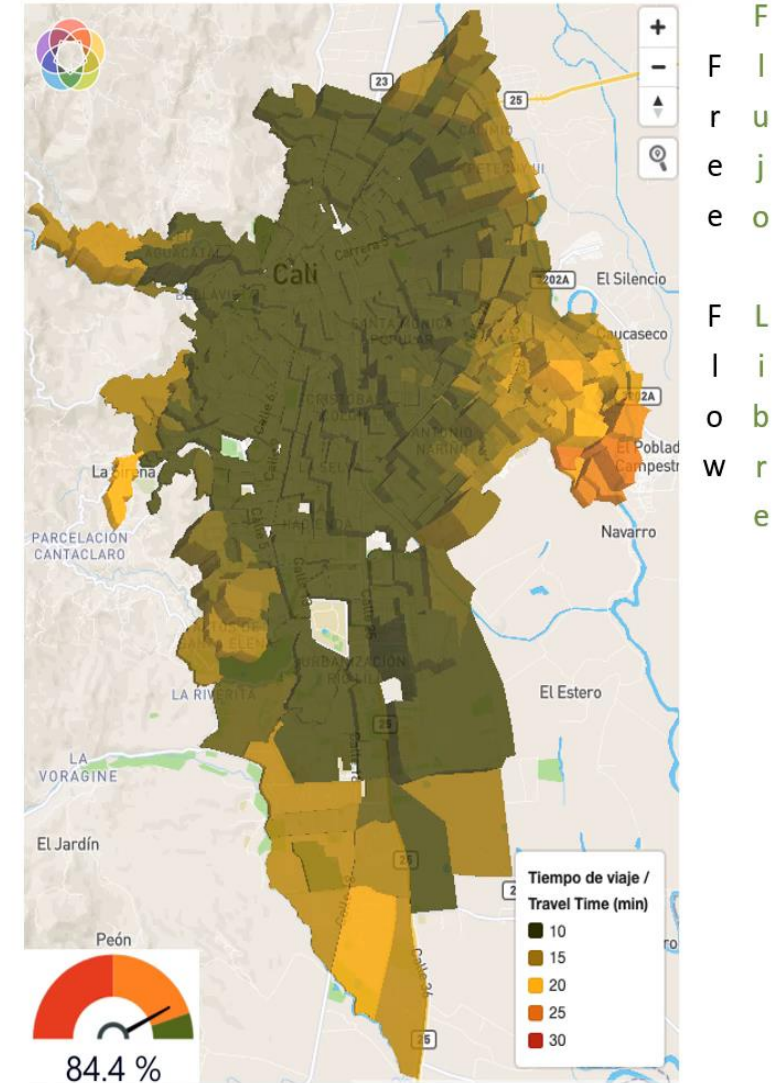
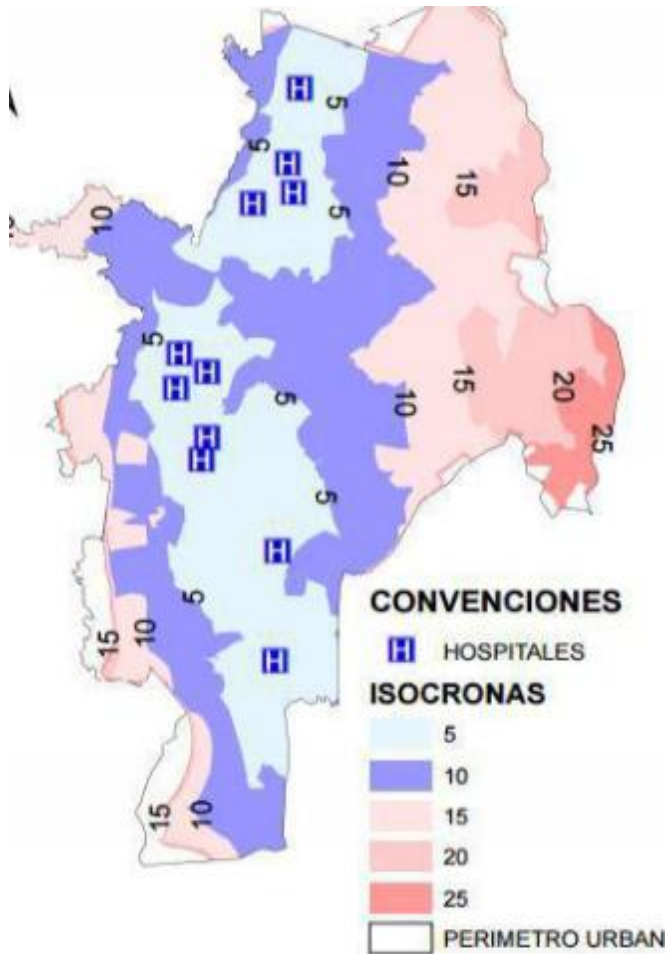
Family MMWs	Commune 19	Commune 21
1	13%	91%
2	7%	46%
3	4%	30%
4	3%	23%



Static vs. dynamic

15-min accessibility to tertiary care emergencies -Cali

Accesibilidad a emergencias de alta complejidad en 15 min



F
L
i
o
b
w
r
e

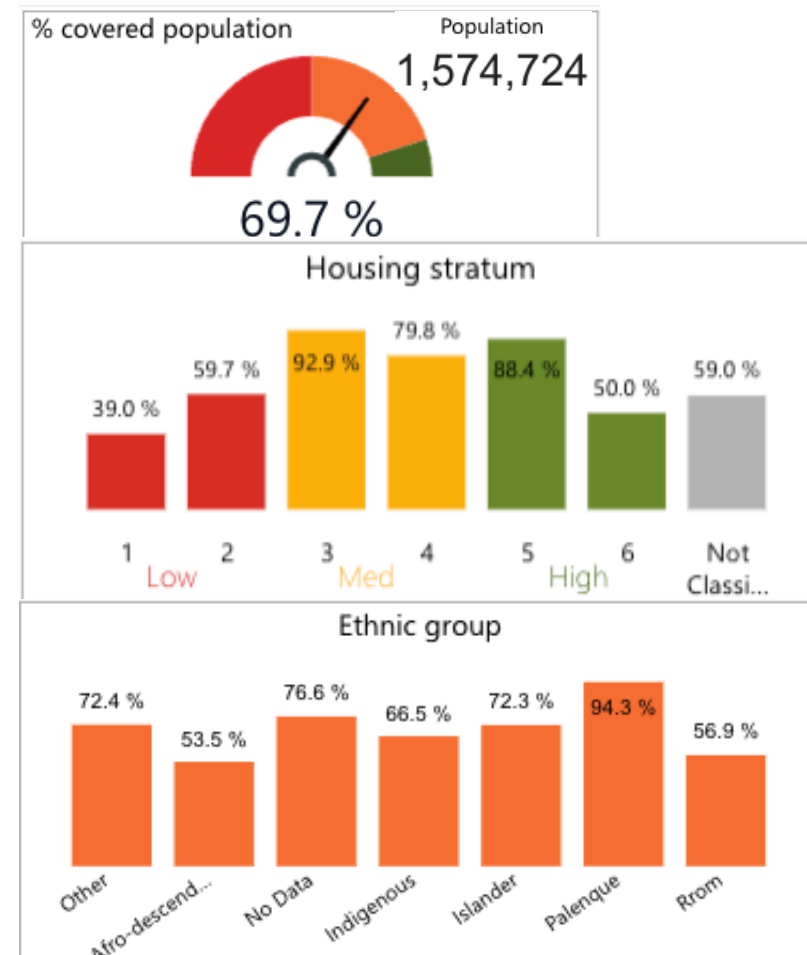
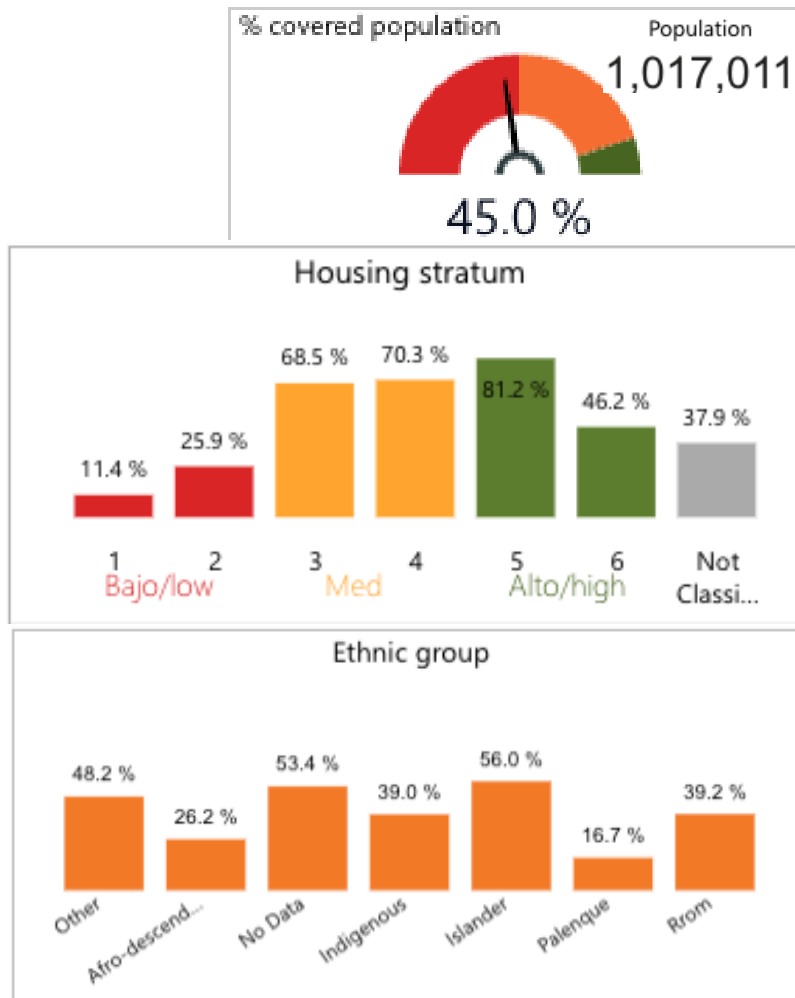
6-12 Jul 2020
<https://doi.org/10.6084/m9.figshare.21076726>
<https://www.iquartil.net/proyectoamore/>

Reina Duque JC, Rojas Monsalve C. (2017)

<https://bibliotecadigital.univalle.edu.co/handle/10893/10481>

Copenhagen, May 16, 2023

Peak traffic accessibility to haemodialysis 6-12 July vs. 23-29 November 2020





Accessibility per socioeco. stratum	Geographical Accessibility	Plus services in Alirio Mora	Covered population	Additional covered pop.
Urban population	45%	70%	1,017,011	568,426
Low-income	20%	62%	221,296	471,239
Middle-income	69%	79%	645,076	93,891
High-income	72%	72%	147,229	485

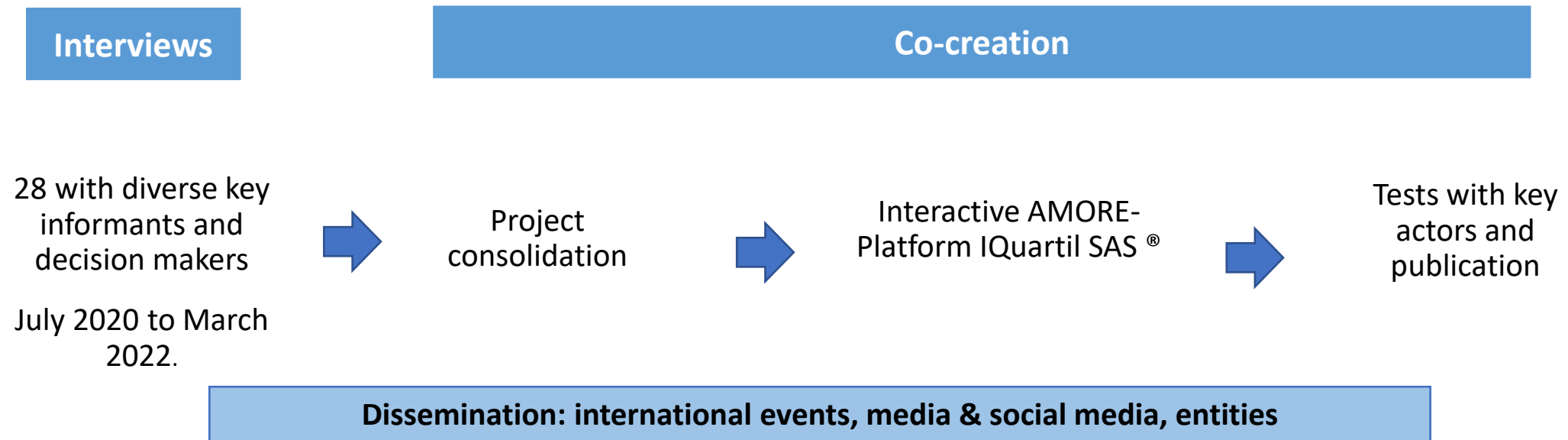
Copenhagen, May 16, 2023

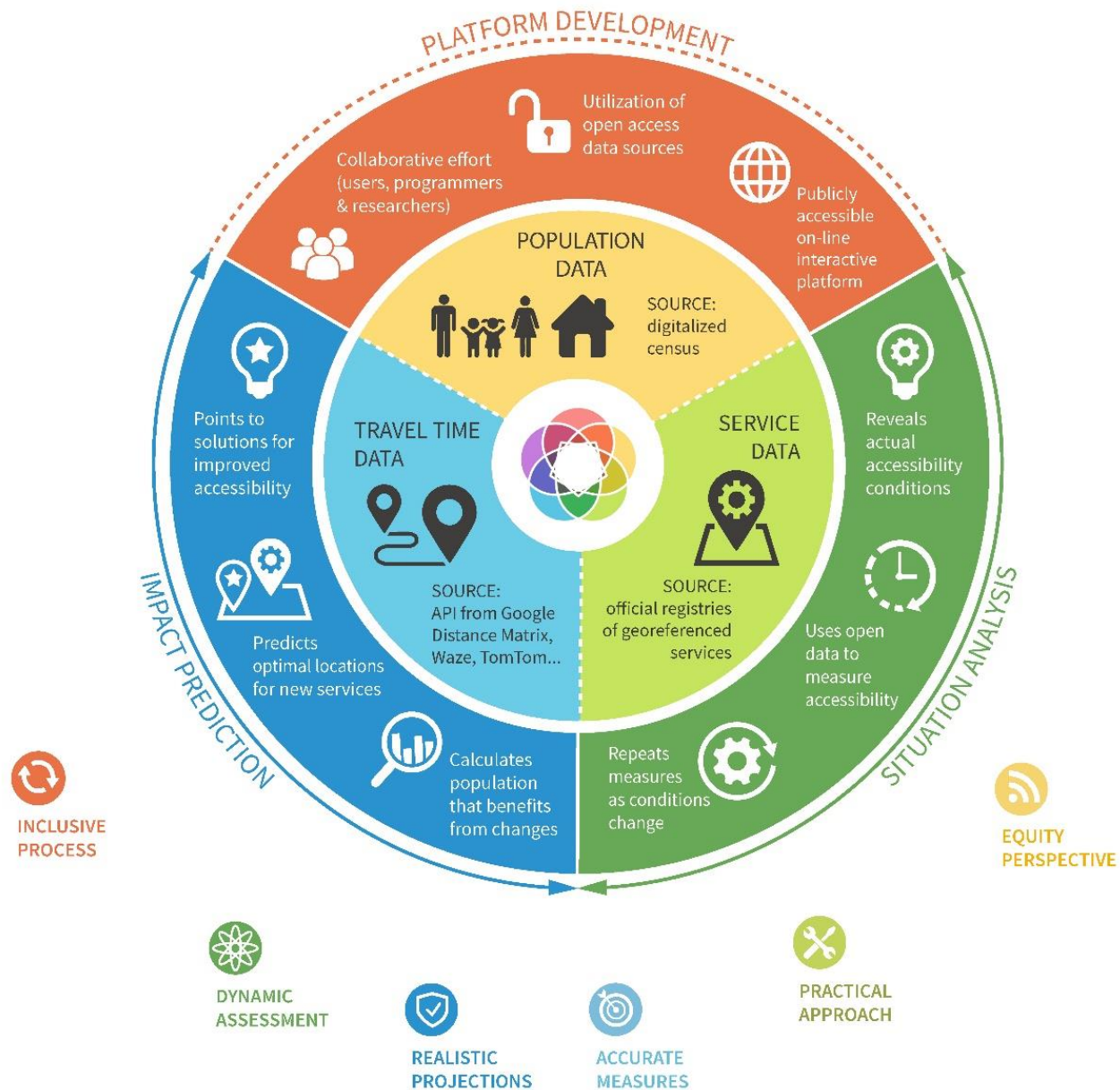


Source: doi 10.2139/ssrn.4299562

	Geographical Accessibility	Plus services in AMB	Plus services in AMB & PP	Covered AMB+PP	Additional Pop. Covered AMB	Parcel. Pance added pop.
Urban population	45%	70%	75%	1,017,011	568,426	131,018
Low-income	20%	62%	64%	221,296	471,239	42,662
Middle-income	69%	79%	84%	645,076	93,891	51,349
High-income	72%	72%	95%	147,229	485	36,563

AMORE Platform development







INCLUSIVE PROCESS

- ▶ This new concept and platform are the result of a cocreation involving stakeholders and data scientist.
- ▶ Stakeholders included health services users, providers, government officials, communities, and academia.
- ▶ The concept and platform seek the social appropriation of knowledge.
- ▶ Data is displayed in maps and descriptive statistics for non-specialized stakeholders to interpret and communicate.
- ▶ The approach was tested in a collaborative research project.



DYNAMIC ASSESSMENT

- ▶ The platform delivers dynamic spatial-temporal measurements of accessibility, indicating travel-times to the service and the shortest journey for the traffic congestion levels.
- ▶ Shows the populations and sectors within a travel time threshold.
- ▶ Predicts accessibility changes for adding services in one or two optimal sectors.



REALISTIC PROJECTIONS

- ▶ The platform identifies locations for new services to optimize accessibility.
- ▶ The concept was tested in Cali, Colombia (2.25m) using three life-saving health services: haemodialysis, radiotherapy, and tertiary-care emergencies.



ACCURATE MEASURES

- ▶ The platform samples millions of travel time measurements between residential zones and those of health services.
- ▶ Uses anonymized and georeferenced population and housing data from the census with granularity that allows for accurate assessments.



PRACTICAL APPROACH

- ▶ The platform leverages readily available open data (census, service location) and big data (travel times).
- ▶ Can be updated as conditions change (e.g., demographics, infrastructure, traffic).
- ▶ Supports continuous planning and monitoring of accessibility.
- ▶ It can be used to inform accessibility analyses, prioritization, follow-up, and impact assessments.



EQUITY PERSPECTIVE

- ▶ The concept addresses evidence gaps and reveals inequities hidden in plain sight.
- ▶ Data and analyses are disaggregated by sociodemographic characteristics, providing an equity perspective. For example, showing differences by age, place of residence, sexual identification, ethnicity, highest level of education attained, marital status, or economic stratum of the housing unit.
- ▶ Reveals the extent by which traffic congestion reduces accessibility.



EXPANSIVE CAPACITY

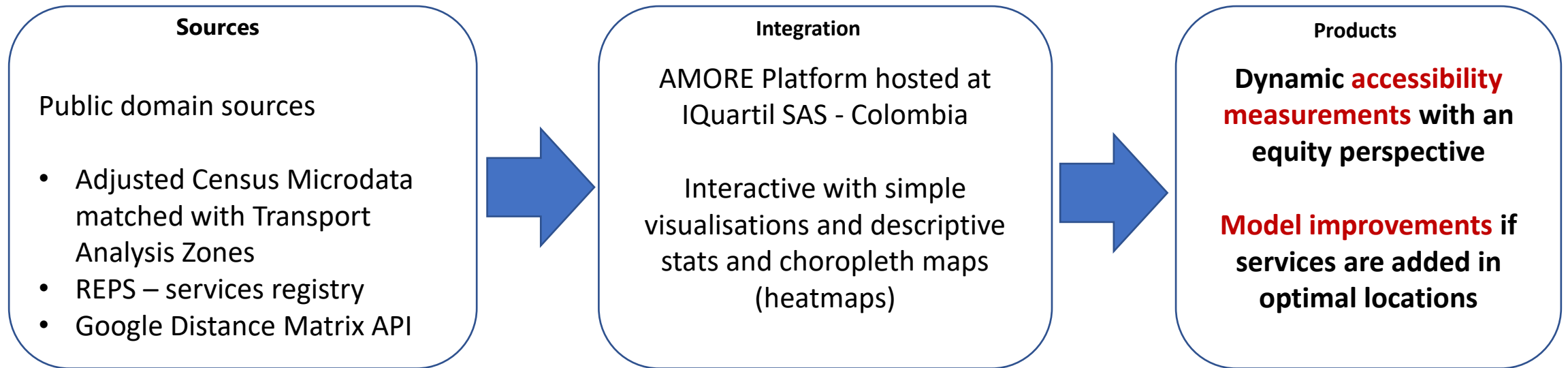
- ▶ The participatory process and the platform can be adapted and tested for other services, sectors, and stakeholders.
- ▶ Potential for integration of additional data layers (e.g., insurance provider, availability of services).
- ▶ The project developed an emerging concept using a participatory approach.
- ▶ Points at specific solutions predicting their impact and offering means for accountability.

Copenhagen, May 16, 2023

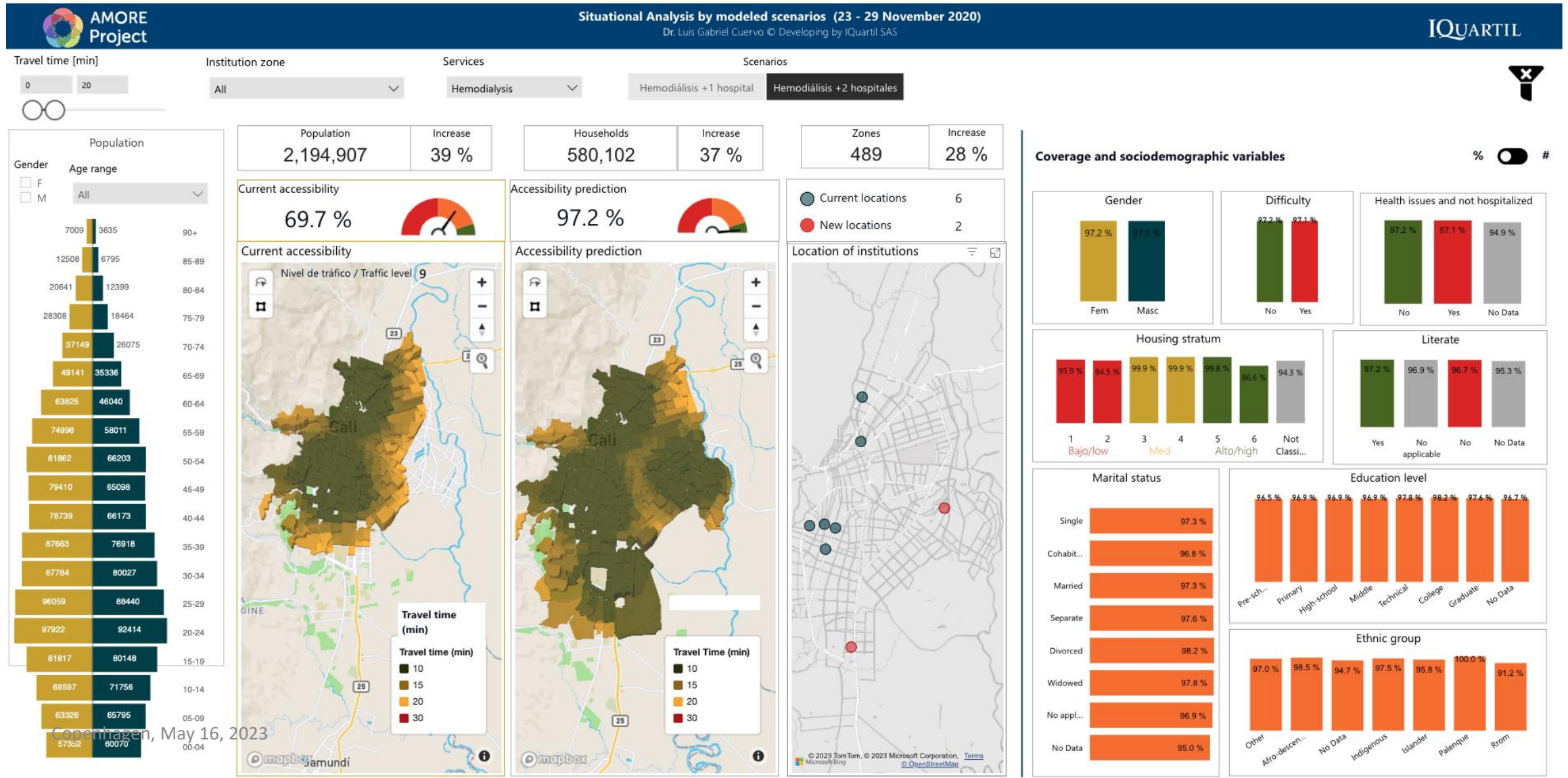
AMORE Project



Situational Analyses and modelling



Poor accessibility and inequities addressed by strategically locating services



“The way to right wrongs is to turn the light
of truth upon them.”

Ida B. Wells (1862-1931)
American investigative journalist

Summary points

- Dynamic accessibility can be measured and predicted by combining open data and big data.
- This approach is suitable to prioritize and monitor accessibility with an equity perspective.
- This approach provides evidence for data-driven urban and health services planning.

Questions and comments, please



Cali themed paintings ©Adriana Cabal Aulestia

@Proyecto_AMORE