AMORE Project

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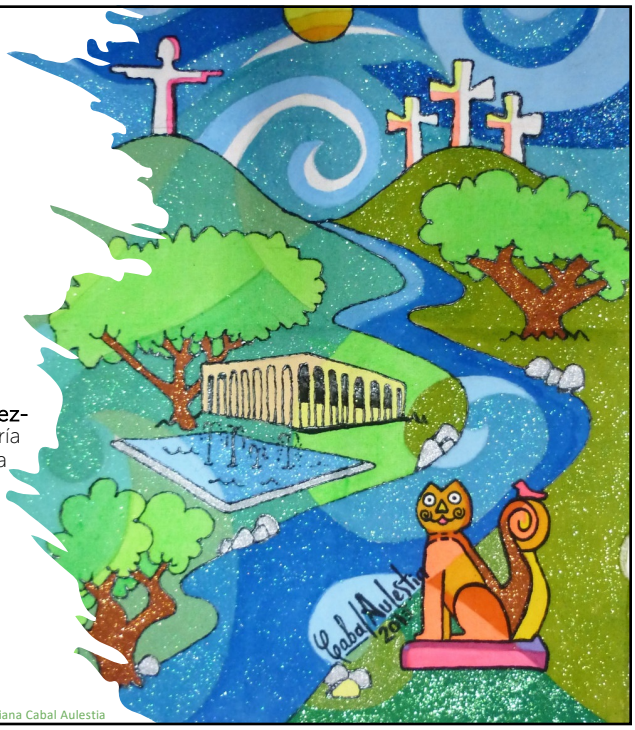
Universitat Autònoma de Barcelona
www.linkedin.com/in/lgcuervo

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**, on behalf of the

AMORE Project Collaborative Group

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

November 3, 2022



Cali themed painting ©Adriana Cabal Aulestia

1

AMORE Project

@Proyecto_AMORE

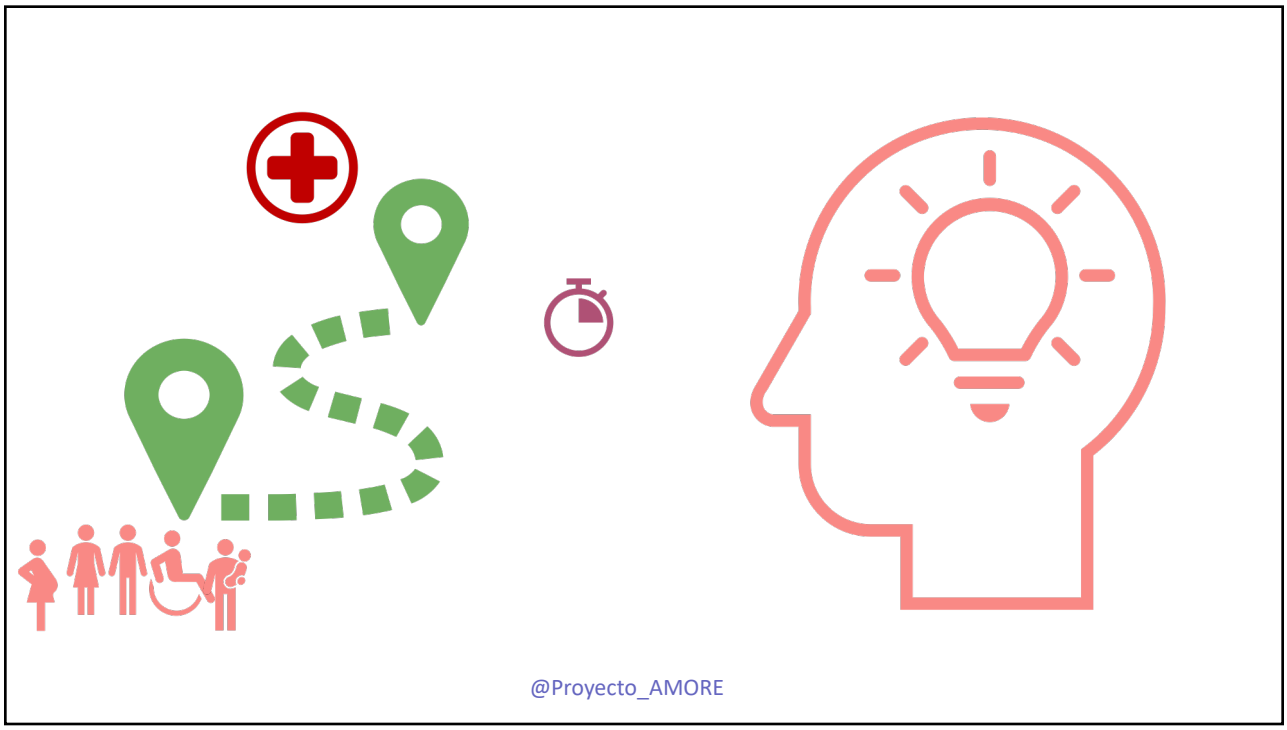
SCAN ME

Dynamic Geographical Accessibility Assessments to Improve Health Equity and enable multistakeholder collaboration

https://www.iquartil.net/proyectoamore/

LinkedIn: The AMORE Project Collaborative Group

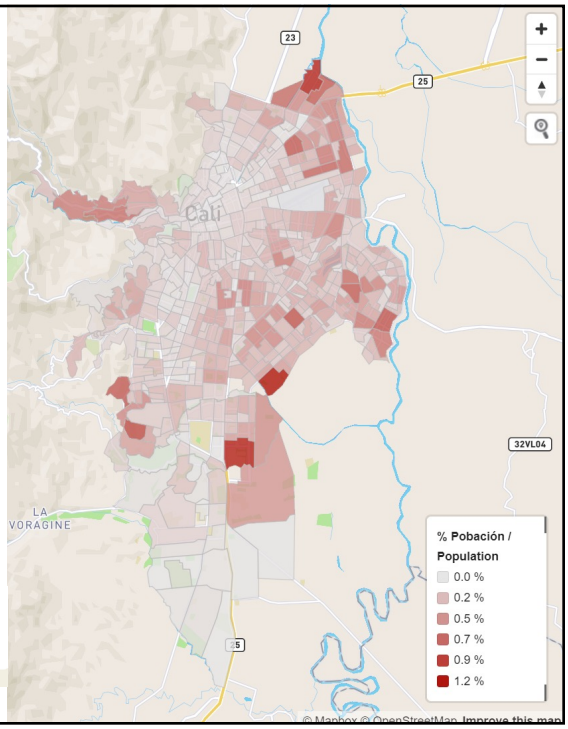
2



3

Measuring dynamic geographical accessibility

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



4

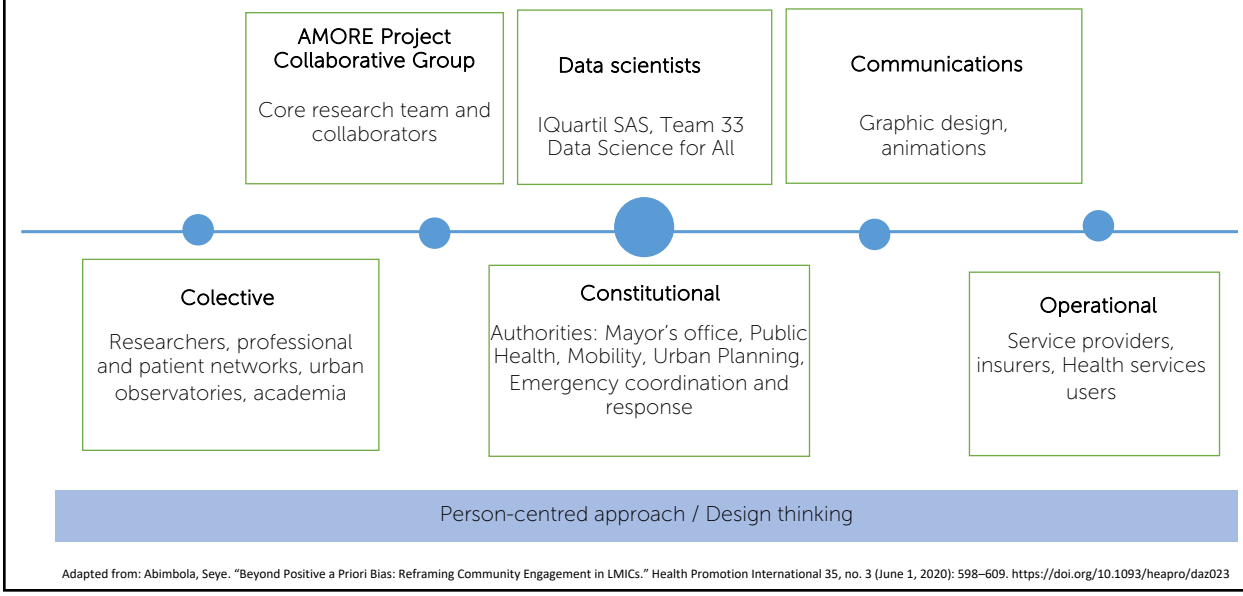
2021 INRIX Global Traffic Scorecard – South America

https://inrix.com/scorecard/

Urban Area	Impact Rank (2020 Rank)	Hours Lost in Congestion (2021 Rank)	Change from Pre-COVID	Last Mile Speed (mph)
Bogota	8 (1)	94 (12)	-51%	11
Quito	39 (8)	63 (51)	-56%	11
Belo Horizonte	57 (27)	58 (68)	-64%	13
Medellin	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

5

Stakeholders and governance levels



Adapted from: Abimbola, Seye. "Beyond Positive a Priori Bias: Reframing Community Engagement in LMICs." Health Promotion International 35, no. 3 (June 1, 2020): 598–609. https://doi.org/10.1093/heapro/daz023

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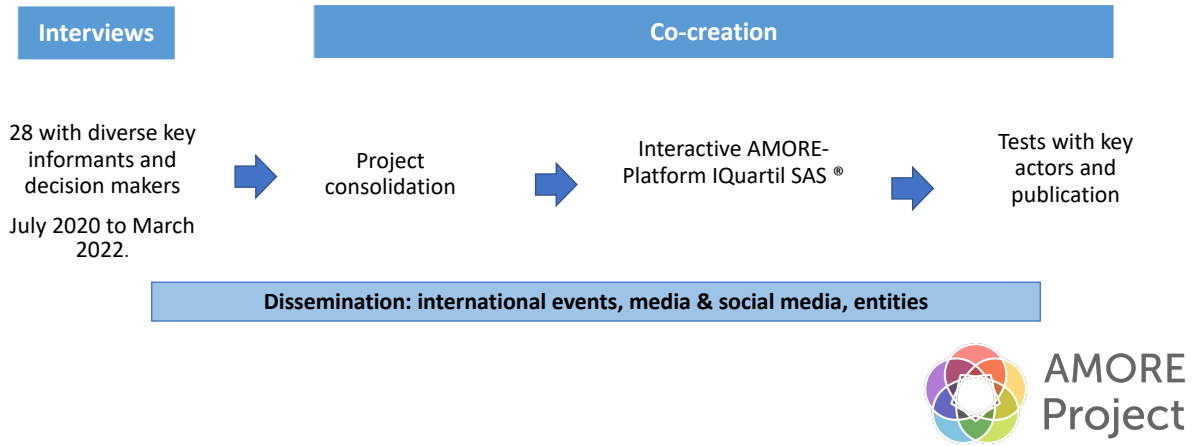
AMORE Platform development



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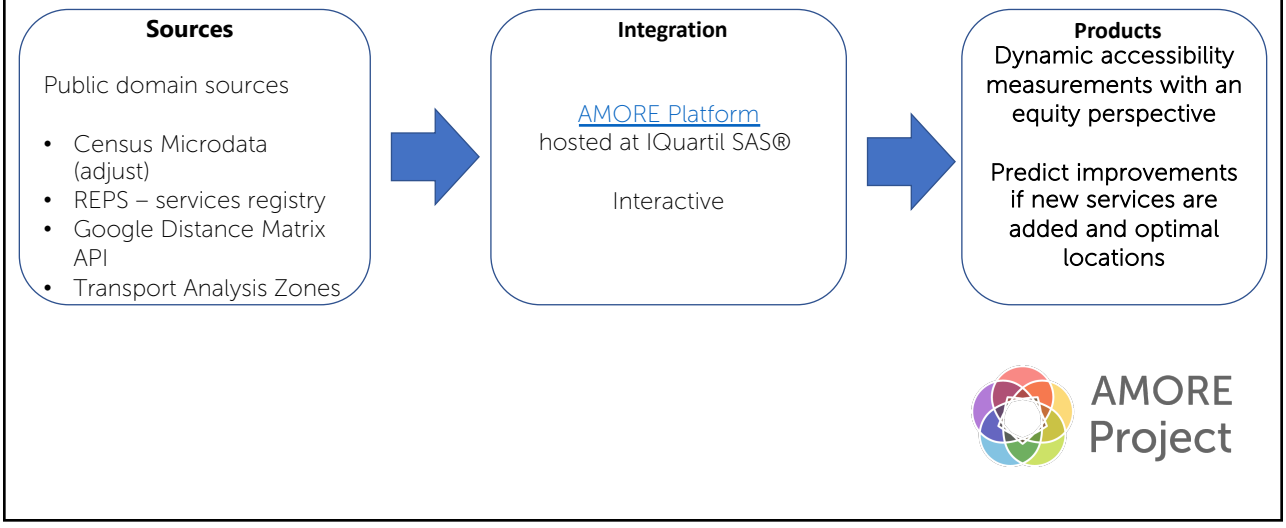
Situational Analysis



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Services studied

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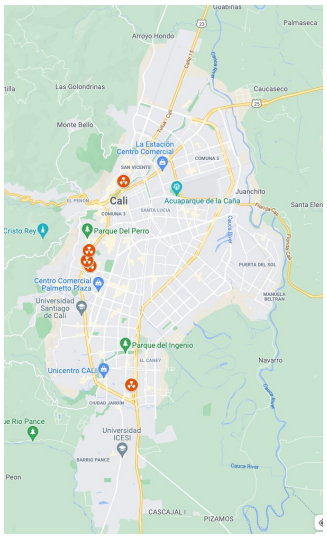
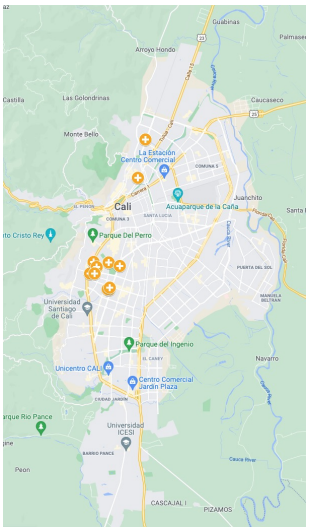
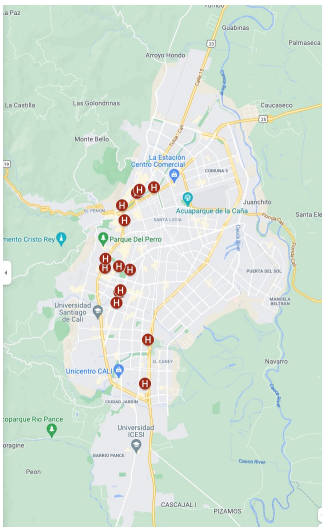


5 radiation therapy services

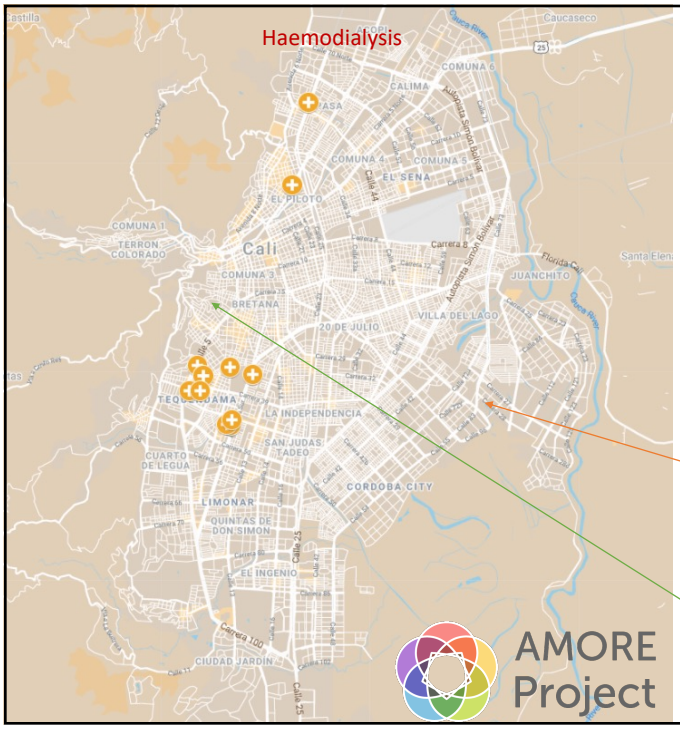


11 haemodialysis services with 370 chairs



14 tertiary care emergency services

9



Haemodialysis 3 /week (min) Taxi costs

- Minimum monthly income COP $1 million
- Round trip Commune 19: COP 10,000
- Round trip Commune 21 COP 70,000

- 3 weekly sessions x 52/12 = monthly cost
- Commune 19 = 130,000 monthly (13%) $High income
- Commune 21 = 910,000 monthly (91%) $Low Income

Family MMI's	Com. 19	Com 21
1	13%	91%
2	7%	46%
3	4%	30%
4	3%	23%

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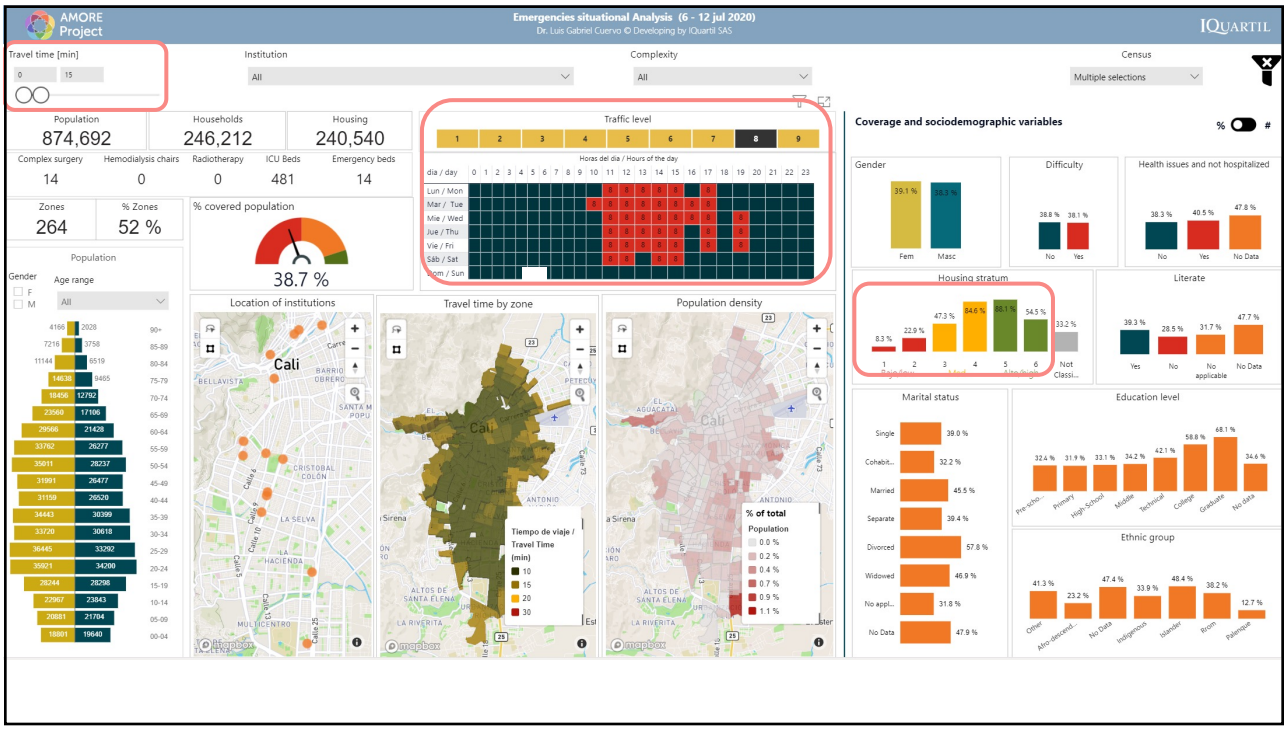

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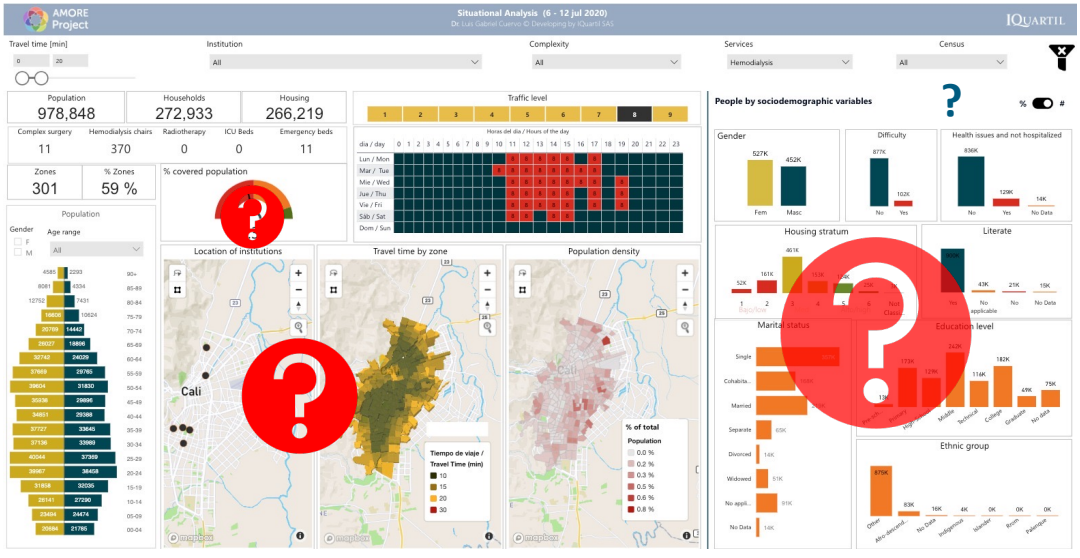
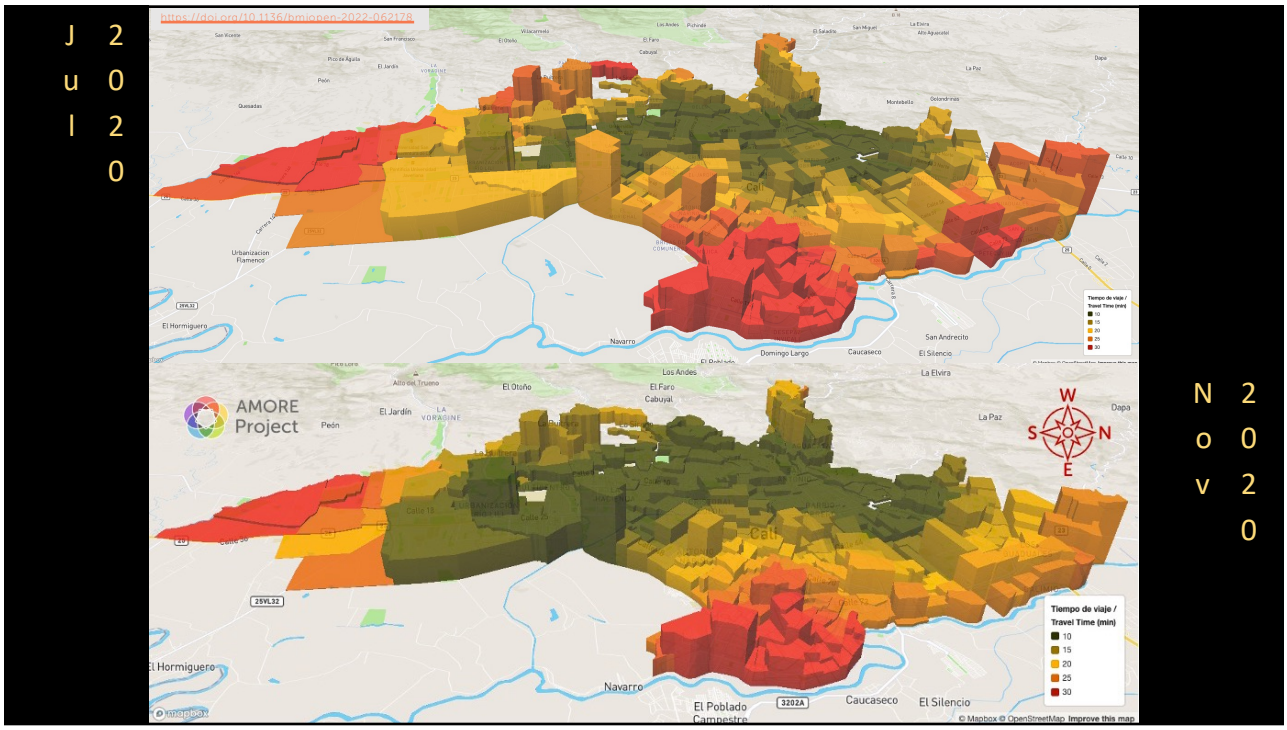
Service optimisation

What if one or two new services were added?

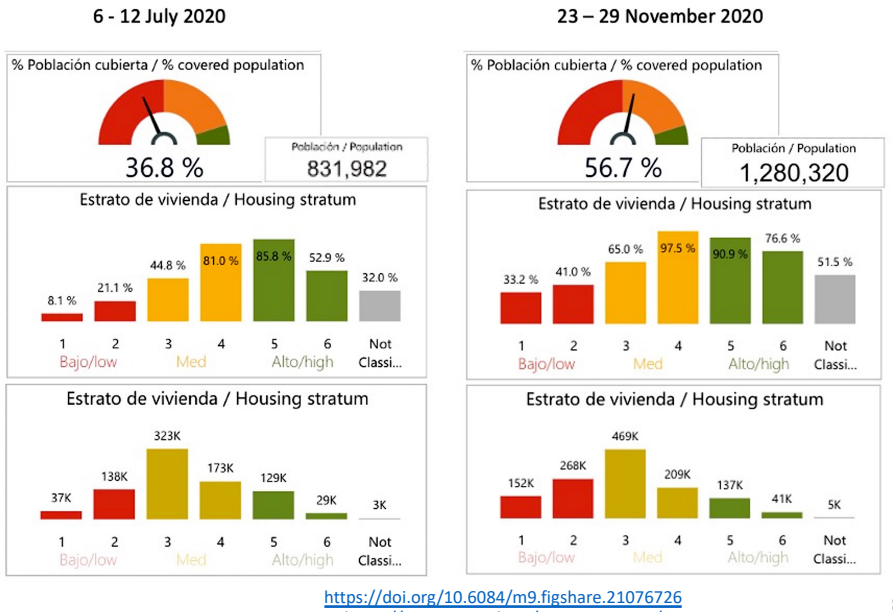


12



13

Accessibility to tertiary care emergency services with peak-traffic



https://doi.org/10.6084/m9.figshare.21076726
https://www.iquartil.net/proyectoamore/

AMORE Project

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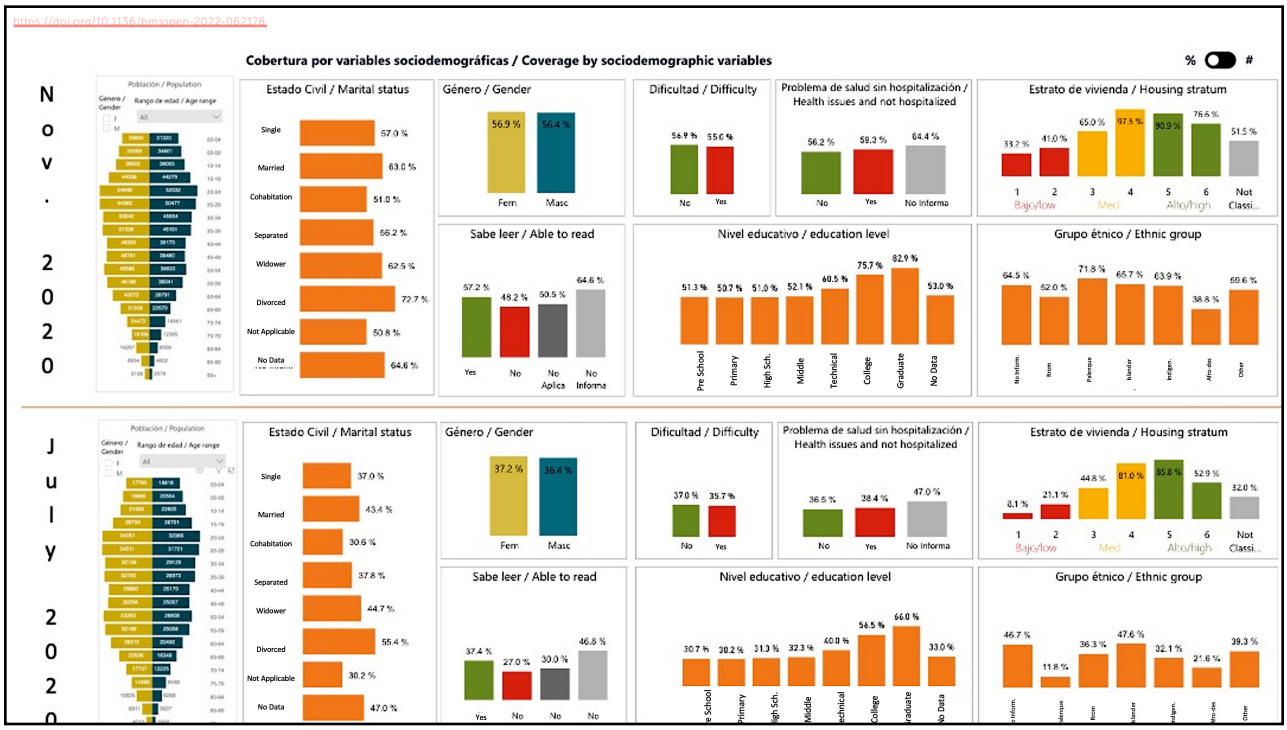
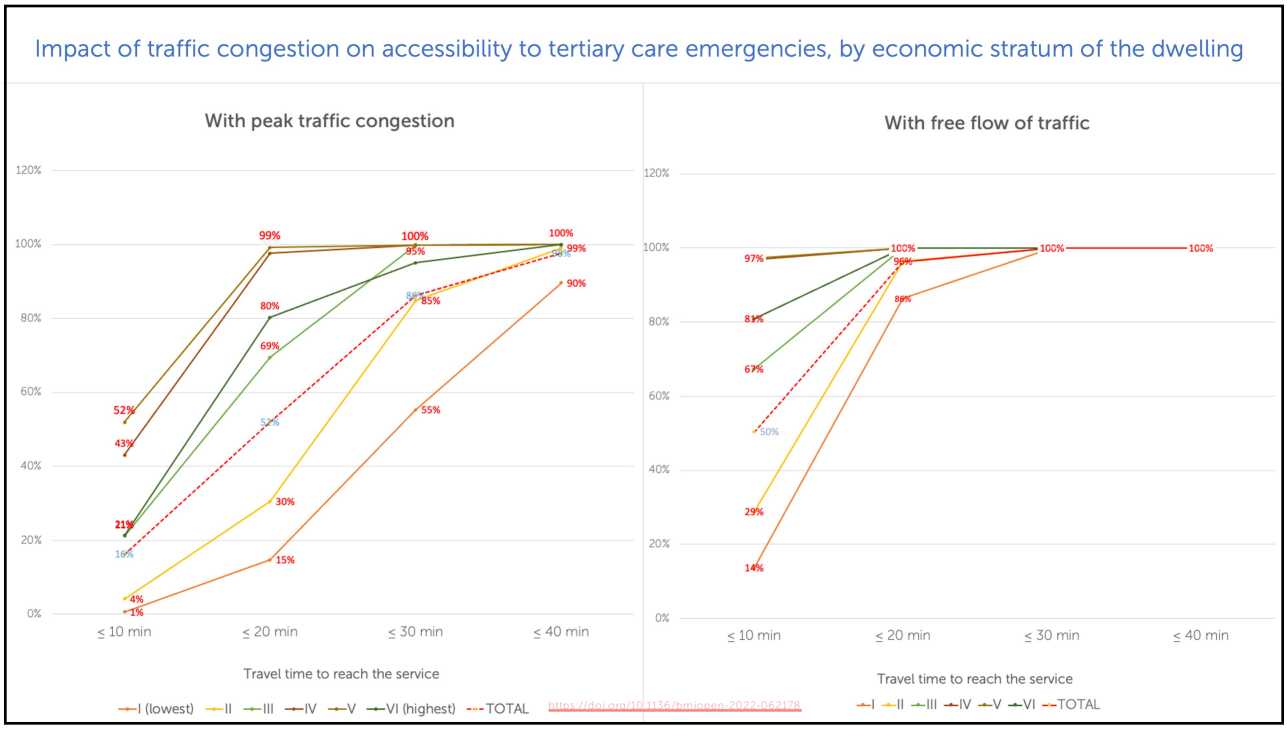

https://doi.org/10.1136/bmjopen-2022-062178
Cobertura por variables sociodemográficas / Coverage by sociodemographic variables
%
#
Nov. 2020
July 2020
Población / Population
Estado Civil / Marital status
Single
Married
Cohabitation
Separated
Widower
Divorced
Not Applicable
No Data
Género / Gender
Fem
Masc
Dificultad / Difficulty
No
Yes
Problema de salud sin hospitalización / Health issues and not hospitalized
No
Yes
No informa
Estrato de vivienda / Housing stratum
Bajo/low
Med
Alto/high
Not Classi...
Sabe leer / Able to read
Yes
No
No Aplica
No Informa
Nivel educativo / education level
Pre School
Primary
High Sch.
Middle
Technical
College
Graduate
No Data
Grupo étnico / Ethnic group
Other

15


Impact of traffic congestion on accessibility to tertiary care emergencies, by economic stratum of the dwelling
With peak traffic congestion
With free flow of traffic
120%
100%
80%
60%
40%
20%
0%
≤ 10 min
≤ 20 min
≤ 30 min
≤ 40 min
Travel time to reach the service
I (lowest)
II
III
IV
V
VI (highest)
TOTAL
https://doi.org/10.1136/bmjopen-2022-062178

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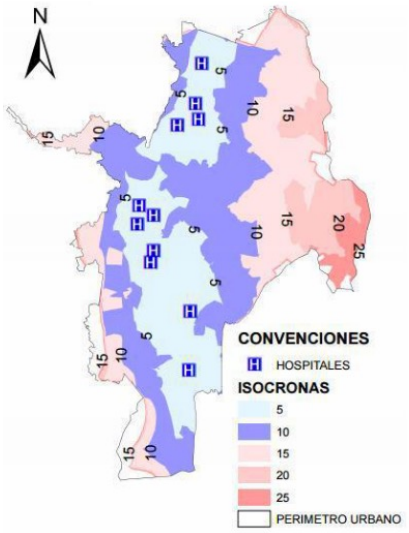
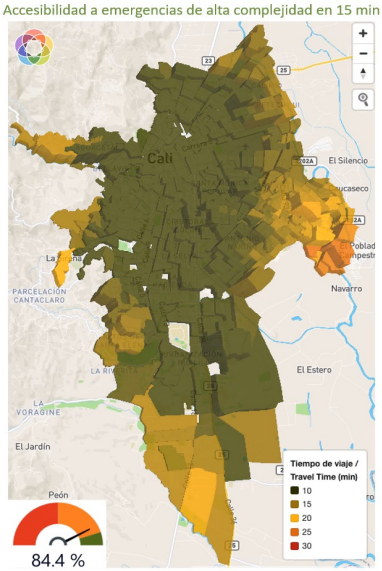
Static vs. dynamic



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

15-min accessibility to tertiary care emergencies -Cali

Accesibilidad a emergencias de alta complejidad en 15 min



6-12 Jul 2020

Free Flow / Flujo Libre

https://doi.org/10.6084/m9.figshare.21076726
https://www.iquartil.net/proyectoamore/

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Broad summary of experience and skills brought by the Collaborative Group - Emergencies Situational Analyses

Surname	Given name	Experience as public servant	Service organization / emergency response	Patient or advocate	Policy maker experience	Public Health Background	Mobility, geography, urban planning	Service provider or funder	Data analytics and programming	Approved final version
Avila Rodriguez	German	●	●	*	●	●	●			●
Bula	María Olga	●		*	●	●	●			●
Concha-Eastman	Alberto			*	●		●			●
Cuervo	Daniel	●		*	●	●	●			●
Cuervo	Luis Gabriel			*					●	●
Franco	Oscar	●		*	●	●				●
Garcia	Crhistian			*	●	●			●	●
Guerrero	Rodrigo	●	●	*						●
Hatcher-Roberts	Janet	●	●	*	●	●	●	●		●
Jaramillo	Ciro	●		*	●	●	●			●
Martínez Arámbula	Fernando Rafael			*	●					●
Martínez Herrera	Eliana	●		*	●		●			●
Merino Juarez	Maria Fernanda			*	●	●	●			●
Osorio	Lyda	●		*	●	●				●
Ospina	Maria B	●	●	*	●	●	●	●		●
Paredes	Gabriel			*		●				●
Paredes-Zapata	David	●	●	●	●	●		●		●
Pinilla	Luis Fernando			●		●		●		●
Piquero	Felipe			*					●	●
Rojas	Oscar			●				●		●
Rosero Hernández	Myriam	●		*	●		●	●		●
Tobar-Blandón	Maria Fernanda			*						●
Villamizar Jaimes	Carmen Juliana			*		●				
Zapata Murillo	Pablo			*	●			●		●

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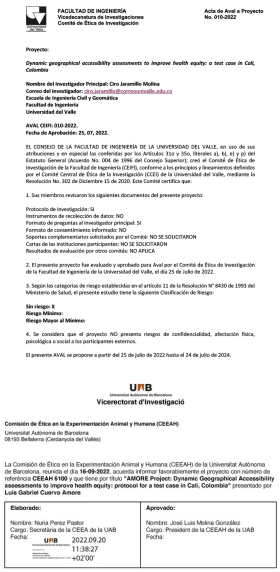
Ethics approvals and publications to date



FACULTAD DE INGENIERÍA
Vicedecanatura de Investigaciones
Comité de Ética de Investigación

Acta de Aval a Proyecto
No. 010-2022

Proyecto:

Dynamic geographical accessibility assessments to improve health equity: a test case in Cali, Colombia

Nombre del Investigador Principal: Ciro Jaramillo Molina
Correo del investigador: ciro.jaramillo@correounivalle.edu.co
Escuela de Ingeniería Civil y Geomática
Facultad de Ingeniería
Universidad del Valle

AVAL CEIFI: 010-2022.
Fecha de Aprobación: 25, 07, 2022.

EL CONSEJO DE LA FACULTAD DE INGENIERÍA DE LA UNIVERSIDAD DEL VALLE, en uso de sus atribuciones y en especial las conferidas por los Artículo 31o y 35o, literales a), b), e) y p) del Estatuto General (Acuerdo No. 004 de 1996 del Consejo Superior); creó el Comité de Ética de Investigación de la Facultad de Ingeniería (CEIFI), conforme a los principios y lineamientos definidos por el Comité Central de Ética de la Investigación (CCEI) de la Universidad del Valle, mediante la Resolución No. 302 de Diciembre 15 de 2020. Este Comité certifica que:

1. Sus miembros revisaron los siguientes documentos del presente proyecto:

Protocolo de Investigación: SI
Instrumentos de recolección de datos: NO
Formato de preguntas al investigador principal: SI
Formato de consentimiento informado: NO
Soportes complementarios solicitados por el Comité: NO SE SOLICITARON
Cartas de las Instituciones participantes: NO SE SOLICITARON
Resultados de evaluación por otros comités: NO APLICA

2. El presente proyecto fue evaluado y aprobado para Aval por el Comité de Ética de Investigación de la Facultad de Ingeniería de la Universidad del Valle, el día 25 de Julio de 2022.

3. Según las categorías de riesgo establecidas en el artículo 11 de la Resolución N° 8430 de 1993 del Ministerio de Salud, el presente estudio tiene la siguiente Clasificación de Riesgo:

Sin riesgo: X
Riesgo Mínimo:
Riesgo Mayor al Mínimo:

4. Se considera que el proyecto NO presenta riesgos de confidencialidad, afectación física, psicológica o social a los participantes externos.

El presente AVAL se propone a partir del 25 de julio de 2022 hasta el 24 de julio de 2024.

UAB
Universitat Autònoma de Barcelona
Vicerectorat d'Investigació

Comisión de Ética en la Experimentación Animal y Humana (CEEAH)
Universitat Autònoma de Barcelona
08193 Bellaterra (Cerdanyola del Vallès)

La Comisión de Ética en la Experimentación Animal y Humana (CEEAH) de la Universitat Autònoma de Barcelona, reunida el día **16-09-2022**, acuerda informar favorablemente el proyecto con número de referencia **CEEAH 4100** y que tiene por título **"AMORE Project: Dynamic Geographical Accessibility assessments to improve health equity: protocol for a test case in Cali, Colombia"** presentado por **Luis Gabriel Cuervo Amore**

Elaborado:	Aprovado:
Nombre: Nuria Perez Pastor Cargo: Secretaria de la CEEA de la UAB Fecha: 2022.09.20 11:38:27 +02'00'	Nombre: José Luis Molina González Cargo: President de la CEEAH de la UAB Fecha:

Original Research

Cuervo LG, Martínez-Herrera E, Osorio L, Hatcher-Roberts J, Cuervo D, Bula MO, Pinilla LF, Piquero F, and Jaramillo C. "**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.**" BMJ Open 12, no. 9 (September 1, 2022): e062178. https://doi.org/10.1136/bmjopen-2022-062178.

Editorials

Cuervo LG, Martínez-Herrera E, Cuervo D, Jaramillo C. "**Improving Equity Using Dynamic Geographic Accessibility Data for Urban Health Services Planning**". Gaceta Sanitaria (E-Publication ahead of print) 11 Jun 2022. http://dx.doi.org/10.1016/j.gaceta.2022.05.001

Preprints

Cuervo LG, Jaramillo C, Cuervo D, Martínez Herrera E, Hatcher-Roberts J, Pinilla LF, Bula MO, Osorio L, Zapata P, Piquero F, Ospina MB, Villamizar CJ. "**Dynamic Geographical Accessibility Assessments to Improve Health Equity: Protocol for a Test Case in Cali, Colombia.**" SSRN Scholarly Paper. Rochester, NY, July 28, 2022. https://ssrn.com/abstract=4175407. http://dx.doi.org/10.2139/ssrn.4175407.

Cuervo LG, Cuervo D, Hatcher-Roberts J, Martínez Herrera E, Pinilla LF, Piquero F, Ospina M, and Jaramillo Molina C. "**AMORE Project: Integrated Knowledge Translation and Geospatial Analysis to Improve Travel Times to Health Services (Accessibility) and Health Equity in Cali, Colombia: A Proof of Concept Using Mixed-Methods Research.**" Preprint. Thesis Commons, November 19, 2021. https://doi.org/10.31237/osf.io/4atqc.

Cuervo LG, Martínez-Herrera E, Osorio L, Hatcher-Roberts J, Cuervo D, Bula MO, Pinilla LF, Piquero F, Jaramillo C. **Cross-sectional equity analysis of accessibility by automobile to tertiary care emergency services in Cali, Colombia in 2020.** medRxiv 2022.02.03.22269929; doi: https://doi.org/10.1101/2022.02.03.22269929

Proyecto AMORE

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Way forward

AMORE Project

1. Implementation of new indicators
2. Assess use
3. Integration within planning, monitoring and evaluation, and processes
4. Identify refinements and development: add data layers and applications (e.g., finding the nearest available haemodialysis chair; adjusting subsidies)
5. Replication, adaptation, growth
   - New locations, services, sectors

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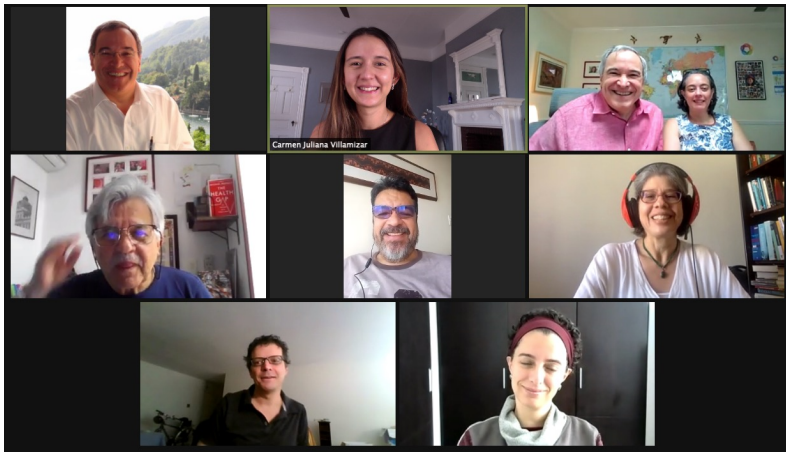

@Proyecto_AMORE
https://www.iquartil.net/proyectoAMORE/
LuisGabriel.Cuervo@autonoma.cat

Proyecto AMORE

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Questions and comments, please

Cali themed paintings ©Adriana Cabal Aulestia

@Proyecto_AMORE

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CPC 2: Assuring access to health care for all

Oral session

11:00 AM - 12:30 PM | November 2, 2022

Level 3 - Room N

Comprehensive primary care in promoting sustainability | Hybrid

Moderator: Harry Coleman, KIT Royal Tropical Institute, Netherlands

Assessing service delivery readiness to operationalize a reform towards improving Primary Healthcare services in Kaduna state, Nigeria
Sani Abubakar, Clinton Health Access Initiative, Nigeria

A new approach to assess equity in accessibility to health services: dynamic assessments of travel times to health services in Cali, Colombia

Luis Gabriel, Cuervo Universitat Autònoma de Barcelona, Spain

An approach to integrating and scaling up mental health services as part of comprehensive primary health care in Liberia: Lessons and challenges in pandemic times
Adeel Ishtiaq, Results for Development, United States of America

Barriers and facilitators to accessible and coordinated care during the First 1,000 Days in rural Colombia: A qualitative study
Sonya Panjwani, Texas A&M University; Community Health Center, Inc., United States of America

Health system recovery from the Covid pandemic: Experience from Advancing Universal Health Coverage (AUHC) project in Bangladesh
Mahfuza Rifat, USAID Advancing Universal Health Coverage (AUHC), ThinkWell, Bangladesh

Tracking health system performance in times of crisis using routine health information systems: lessons learned from a multi-country consortium
Anne-Marie Turcotte-Tremblay, Harvard University, United States of America