

Social inclusion and physical activity in Ciclovía

Recreativa programs in Latin America

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DREXEL UNIVERSITY
**Urban Health
Collaborative**
Dornsife School of Public Health

LAC-URBAN HEALTH
Urban Health Network for Latin America and the Caribbean





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Ciclovía Recreativa program



Week day traffic
Bogotá, Colombia



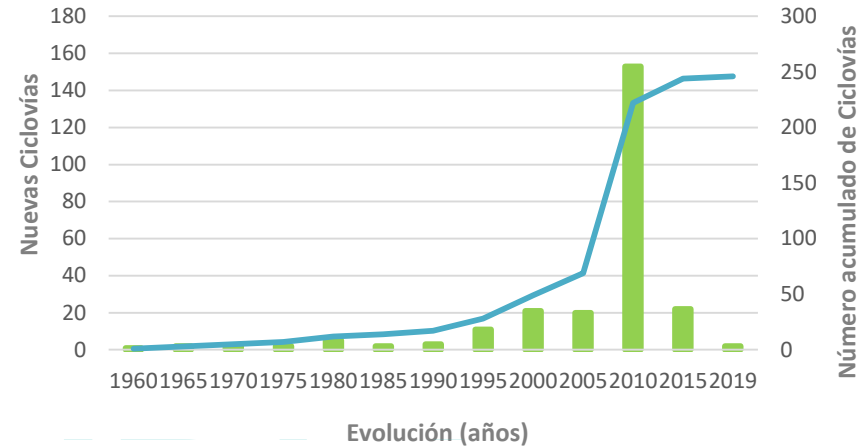
**A day in the Ciclovía
Recreativa**
Bogotá, Colombia



Ciclovia programs in the world: A healthy epidemic 497 programs in 27 Countries globally



Expansion of the Ciclovías en Latin America in the last 59 years



Olga L. Sarmiento et al. Reclaiming the Streets for People: Insights from Ciclovias Recreativas in Latin America. 2016. Preventive Medicine S0091-7435(16)30205-5



Large areas of London to be made car-free as lockdown eased

World cities turn their streets over to walkers and cyclists

RODRIGO DÍAZ Subsecretario de Movilidad

Apostará la Semovi a ciclovia temporal

Buscan mantener baja aforo en MB-1 y MB-2 con 2 rutas ciclistas paralelas para viajes de media distancia

Una vez que se retomen actividades, el principal reto para la movilidad en la CD-MX será mantener la capacidad habitual... y las ciclovías temporales son una opción.

Son en los satélites, pero a parte de la apertura habrán incrementos de la demanda. "El reto es que estamos planteando ciclovías temporales, sobre todo para viajes de media distancia".

En 2019, la Línea 2 tuvo un promedio mensual de 15 millones DTM en capacidad al día, y la Línea 3 transportó una media de 11 millones DTM.

¡Atención! Alcaldía habilita ciclovia permanente por coronavirus

Leaders from SF, Philly, Duluth and Bogotá discuss open streets as a public health strategy

By Courtney Cobbs | Apr 7, 2020 | 11 COMMENTS

medida busca que dejen de usar el transporte público para evitar más gios

bilímetro Colombia
miércoles 15 de marzo de 2020, a las 20:28

PRESENTS

Webinar on

THE CICLOVIA MOVEMENT: FROM ANDES TO HIMMALAYAS

A FORTUITY IN POST PANDEMIC SCENARIO



SEGREGATION IN LATIN AMERICA

- **Segregation:** social differentiation of the urban space or spatial concentration of a social group.
- The pattern of **spatial segregation** in Latin American cities has some distinguishable features (Sabatini;2003):
 - Lower-income groups occupy peripheral, homogenous and poorly-serviced areas
 - High-income groups are clustered in one area of the city, frequently linked to the city's downtown.

In this study, urban segregation is the degree to which people from two or more SES live separately from one another, at the different spatial units of the city.



AIMS

- To compare participant's spatial trajectories in four Ciclovía Recreativa programs in Latin America (Bogotá, Mexico City, Santiago de Cali, and Santiago de Chile) according to socioeconomic characteristics and urban segregation of these cities
- To assess the relationship between Ciclovía Recreativa participants' PA levels and sociodemographic characteristics.



Methods

- Harmonization data from 4 longitudinal surveys of Ciclovía participants
 - Bogotá: 1,001 adults (18-64 years); 2015
 - Mexico City: 721 adults (18-64 years); 2017-2018
 - Santiago de Cali: 1,159 adults (18-64 years); 2019
 - Santiago de Chile: 401 adults (18-64 years); 2016
 - Total of **3,282** adult participants
 - Variables: sociodemographic, health, and PA information, PA Behaviors and program usage
- Geocoding and trajectories → Information on participants' trajectories within the program
 - Origin:
 - Bogotá: participant's home address or nearest intersection to home address
 - Santiago de Cali, Santiago de Chile: the nearest intersection to participant's home addresses
 - México city: the nearest intersection to the location where participants were interviewed.
 - Destination:
 - Bogotá: address of the location where participants were interviewed in the Ciclovía.
 - Santiago de Chile: the nearest intersection to the location where participants were interviewed
 - Mexico city, Santiago de Cali: the farthest point participants intended to reach during their journey.
 - Trajectories: the shortest path distance through the street network (ArcGIS®).



Methods- Urban Segregation

Urban segregation index (Theil index or Entropy index range 0-1):

- It allowed to characterize the extent to which populations of different SES (i.e. low, middle and high level) are evenly distributed throughout geographic units (i.e. neighborhoods, localities, census zones).
 - Bogotá and Santiago de Cali: neighborhoods; the classification institutionalized by the DANE
 - Mexico city: localities; Marginalization index (CONAPO)
 - Santiago de Chile: census areas; socio-material territorial indicator
- **Average SES per traveled kilometer**
 - Within the trajectory, we the average SES per traveled kilometer of all participants' trajectories.
 - To quantify the changes in the socioeconomic characteristics of urban environments during participants' trajectories





RESULTS



City characteristics

Characteristic	Bogotá	Mexico City	Santiago de Cali	Santiago de Chile
Total population	7,878,783	8,918,653	2,470,852	7,112,808
Population density (people/Ha)	21,916	11,247	17,691	9,632
GINI coefficient	0.50	0.53	0.46	0.49
Homicide rate (per 100,000 people)	14.30	16.00	51.30	4.90
Green area per capita (m ² /inhabitant)	3.90	5.40	5.93	4.83
Motorization rate (per 1,000 inhabitants)	247.00	544.05	251.28	254.67
Urban travel delay index	0.82	0.57	0.57	0.34



Ciclovía Recreativa program characteristics

Characteristic	Bogotá	Mexico City	Santiago de Cali	Santiago de Chile
Name	Ciclovía de Bogotá	Muévete En Bici	Ciclovida de Cali	CicloRecreoVía
Year of inauguration	1974	2007	1996	2006
Participants per event	600,000-1,750,000	21,000	30,000	40,000
Events per year	72	37	93	51
Length (Km)	127	55	60	38
Source of funding	Public and Private	Public	Public	Public and Private
Program average cost/year (USD millions)	2.4	1.0	1.65	1.06



Participant's sociodemographic characteristics

	Bogotá		Mexico City		Santiago de Cali		Santiago de Chile		Overall	
	n	%	n	%	n	%	n	%	n	%
Sex										
Men	619	61.84%	370	51.32%	583	50.48%	142	35.41%	1714	52.29%
Women	382	38.16%	351	48.68%	572	49.52%	259	64.59%	1564	47.71%
Age group (years)										
18 - 29	367	36.74%	255	35.61%	306	26.40%	115	30.42%	1043	32.07%
30 - 49	451	45.15%	334	46.65%	522	45.04%	181	47.88%	1488	45.76%
≥ 50	181	18.12%	127	17.74%	331	28.56%	82	21.69%	721	22.17%
Socio-economic level (SES)										
Low	207	20.68%	4	0.61%	335	28.90%	37	9.25%	578	18.31%
Middle	655	65.43%	52	7.90%	751	64.80%	314	78.32%	1722	54.55%
High	139	13.89%	602	91.49%	73	6.30%	50	12.43%	857	27.15%



Participant's health characteristics

	Bogotá		Mexico City		Santiago de Cali		Santiago de Chile		Overall	
	n	%	n	%	n	%	n	%	n	%
Body Mass Index										
Underweight	20	2.00%	4	0.55%	11	0.95%	--	--	35	1.21%
Normal weight	644	64.34%	352	48.82%	511	44.09%	--	--	1507	52.31%
Overweight	297	29.67%	270	37.45%	469	40.47%	--	--	1036	35.96%
Obese	40	4.00%	95	13.18%	168	14.50%	--	--	303	10.52%
Meeting PA recommendations during the Ciclovía										
Yes	453	45.25%	629	87.24%	487	42.02%	109	27.18%	1678	51.13%
No	548	54.75%	92	12.76%	672	57.98%	292	72.82%	1604	48.87%



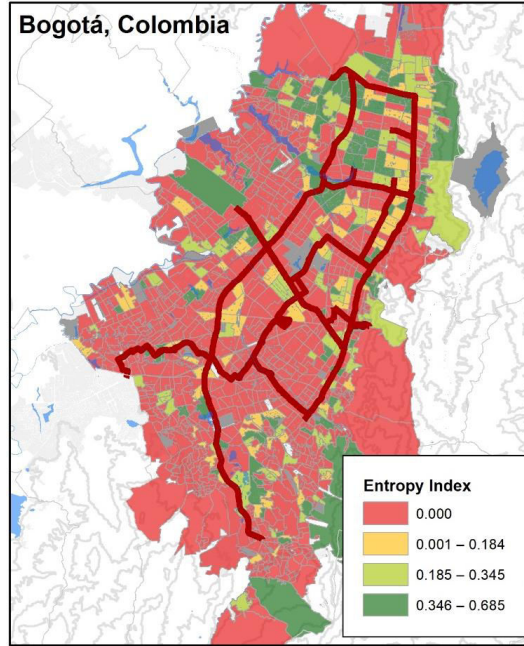


NEIGHBORHOOD URBAN SEGREGATION AND SES ACROSS CICLOVIA'S TRAJECTORIES

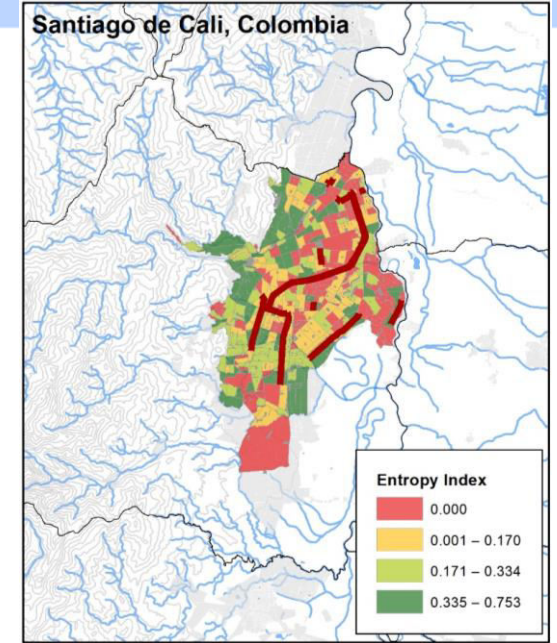


Entropy Index

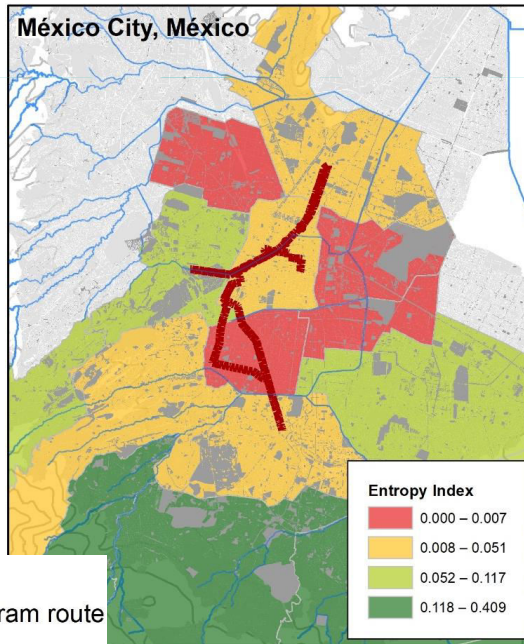
LAC-URBAN HEALTH



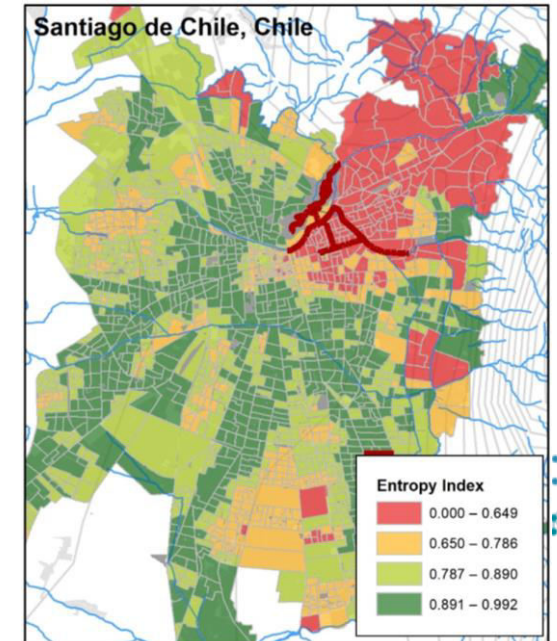
Mean: 0.06
SD: ± 0.13



Mean: 0.11
SD: ± 0.13



Mean: 0.16
SD: ± 0.13



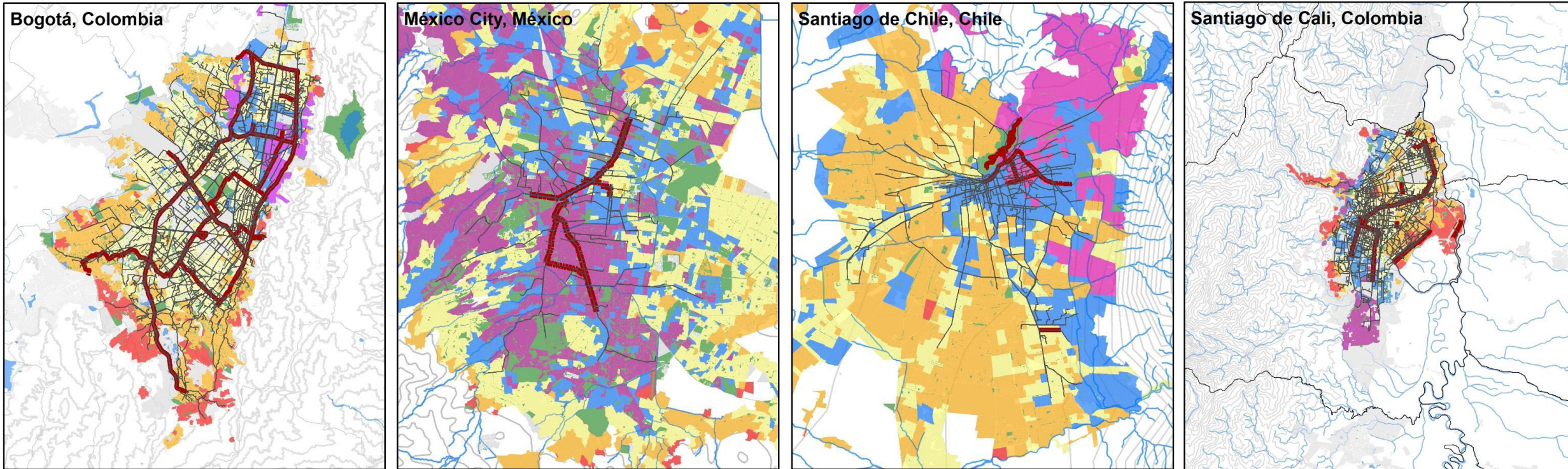
Mean: 0.82
SD: ± 0.17

Entropy Index

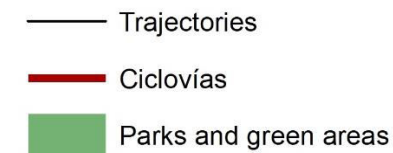
- Highly Segregated
- Segregated
- Integrated
- Highly Integrated
- Green areas
- Ciclovía Recreativa program route



Participant's trajectories

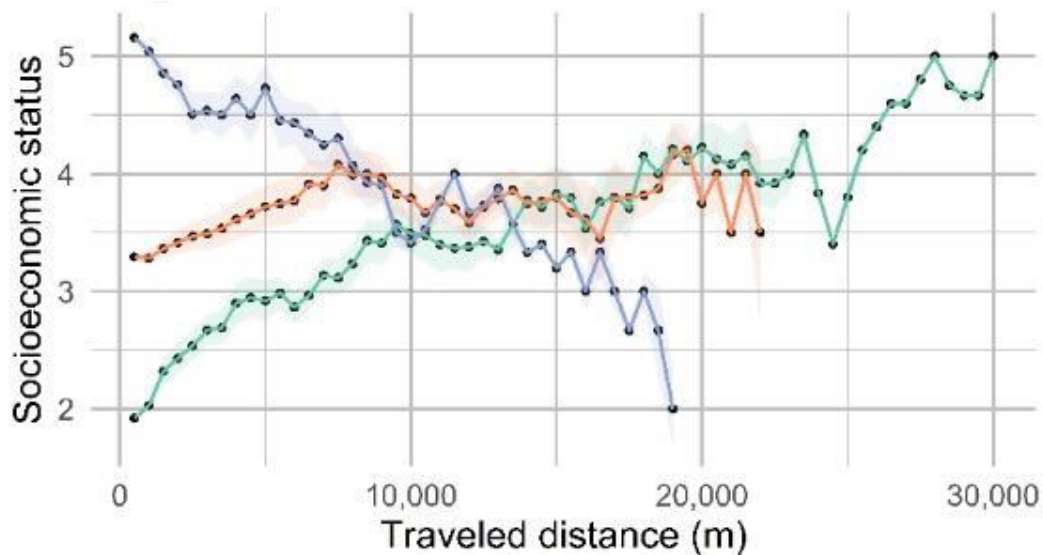


Socioeconomic Status

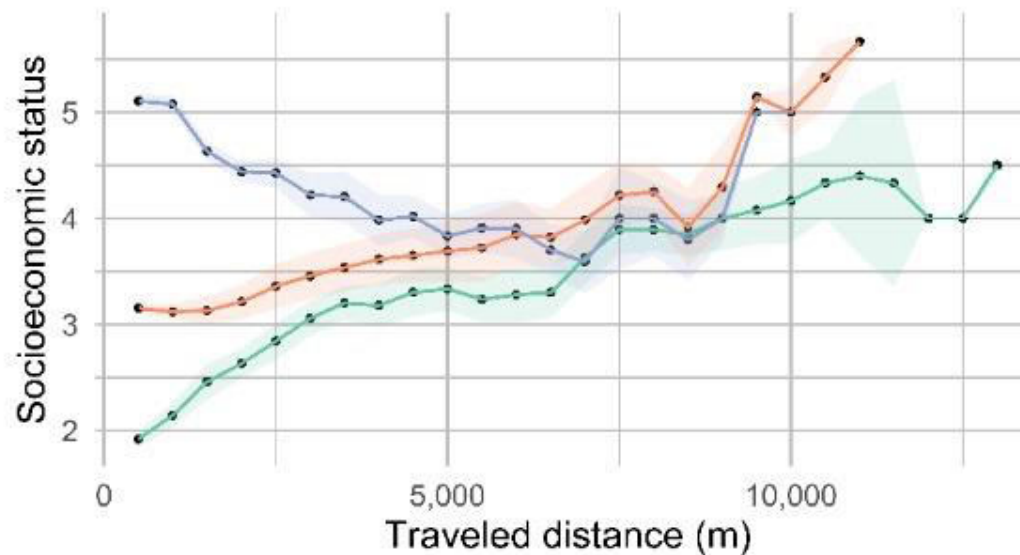


Average SES per traveled kilometer

Bogota, Colombia

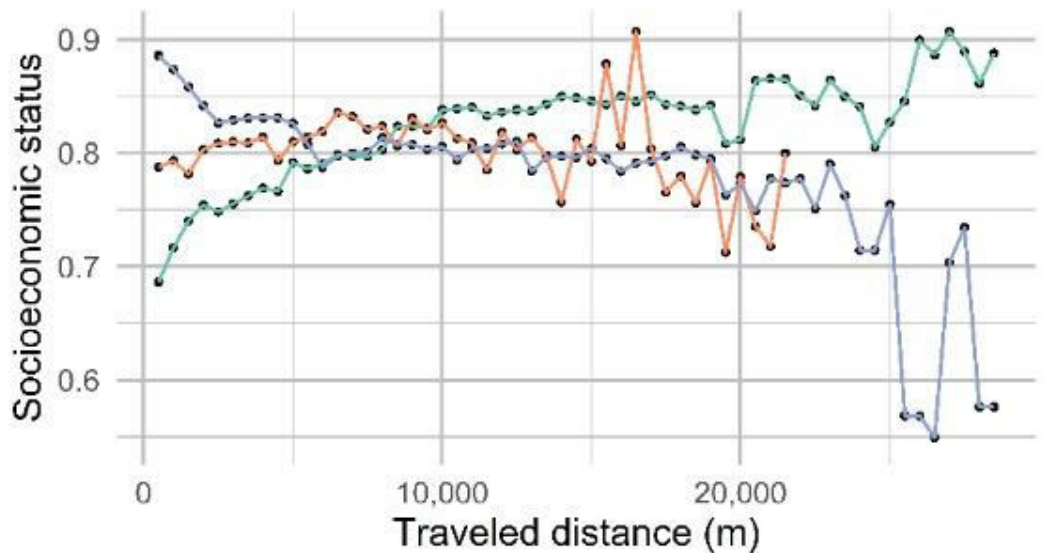


Cali, Colombia

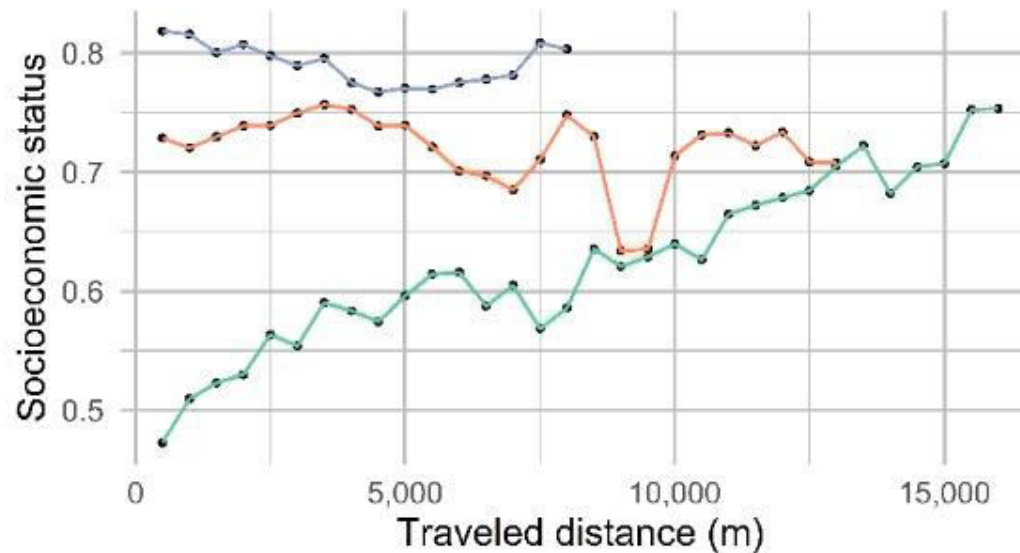


SES-of-origin
 — Low
 — Middle
 — High

Mexico City, Mexico



Santiago de Chile, Chile



IC(95%) of SES-of-origin
 Low
 Middle
 High

Average SES per traveled kilometer

	Bogotá		Mexico City		Santiago de Cali		Santiago de Chile		Overall
Average percentage of the participants' trajectories in									
Low SES	15.13		0.24		16.20		10.23		<0.001
Middle SES	66.24	<0.001	13.88	<0.001	68.55	<0.001	77.46	<0.001	<0.001
High SES	18.63		85.89		15.26		12.31		<0.001
Maximum SES percentile difference (neighborhood of origin and the neighborhoods visited)									
Low SES	33.58		13.84		30.38		15.06		<0.001
Middle SES	8.94	<0.001	1.55	<0.001	16.22	<0.001	-0.91	<0.001	<0.001
High SES	-25.60		-11.06		-17.25		-2.76		<0.001
Average distance traveled (km) by SES origin									
Low SES	14.75		14.00		6.25		7.75		<0.001
Middle SES	10.75	0.004	10.50	0.060	5.25	0.377	6.25	0.013	<0.001
High SES	9.25		14.00		4.75		3.75		<0.001



Conclusions

- The Ciclovía Recreativa program can be a socially inclusive program in highly unequal and segregated urban environments.
- In addition to providing a space for PA, the Ciclovía program works as a venue that facilitates physical proximity, exposure to new communities, and interactions between different socioeconomic groups.
- SES integration through city trajectories differed by city. Bogotá and Santiago de Cali programs exhibit larger integration compared to the Mexico city and Santiago de Chile program.
- This study illustrates the importance of implementing public space usage policies, as well as built environment changes in urban settings, to have a population-based impact in relevant aspects of public health.



THANK YOU!

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