



CHILDHOOD CANCER SURVIVAL GAP BY HEALTH INSURANCE TYPE IN COLOMBIA

A REPORT FROM VIGICANCER SURVEILLANCE SYSTEM

Oscar Ramirez, MD,^{1,2} Paula Aristizabal, MD, MAS³, Vivian Piedrahita, RN¹, Francois Desbrandes⁴, Luis E. Bravo, MD⁵.

On behalf of Vigicancer Working Group

1. Fundación POHEMA, Cali, Colombia
2. Clínica Imbanaco de Cali, Colombia
3. University of California San Diego, Department of Pediatrics & Moores Cancer Center, Population Sciences, Disparities & Community Engagement, USA
4. Sanofi Espoir Foundation; “My Child Matters” program, France
5. Cali’s Population-based Cancer Registry, Universidad del Valle, Cali, Colombia



I HAVE NOTHING TO DISCLOSE





COLOMBIAN INDICATORS

Childhood cancer incident rate in Colombia:
149.6 per million person-years



		Study period	
		2013	2019
Colombia			
Population	(per million)	46.5	50.3
Population ages 0-14	(per million)	<u>11.4</u>	<u>11.9</u>
GDP per capita	(current US\$)	8218	6424
GINI index (income inequality index)		<u>0.526</u>	<u>0.513</u>
Poverty	(%)	<u>38.3</u>	<u>35.7</u>
*CHE as % of GDP	(%)	7.0	7.6
Neonatal mortality rate	(x1000 live births)	<u>9.1</u>	<u>7.5</u>
Infant mortality rate	(x1000 live births)	<u>14.3</u>	<u>11.8</u>
Under-five mortality rate	(x1000 live births)	<u>16.7</u>	<u>13.8</u>
Mortality rate 5-14yrs	(x1000 children 5-14 yrs)	<u>2.6</u>	<u>2.5</u>
Fertility rate	(births/woman)	1.9	1.8

*CHE, Current health expenditure

The global health observatory; WHO web page. & the World Bank.

WHO. IICC-3, International Incidence of Childhood Cancer, Volumen 3, Results. Vol. 3, Lyon, France: IARC



UNIVERSAL HEALTH COVERAGE IN COLOMBIA & DISPARITIES IN SURVIVAL IN CALI

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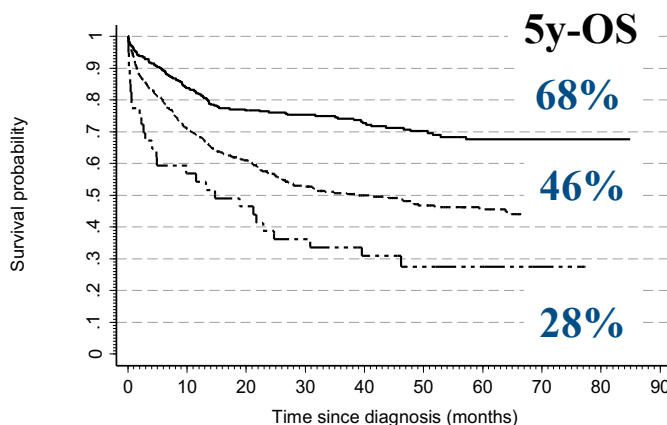


Childhood cancer survival disparities in a universalized health system in Cali, Colombia[☆]

Oscar Ramirez^{a, b, c, *}, Paula Aristizabal^e, Alia Zaidi^f, Anne Gagnepain-Lacheteau^g, Raul C. Ribeiro^f, Luis E. Bravo^{a, d}, On behalf of VIGANCER working group

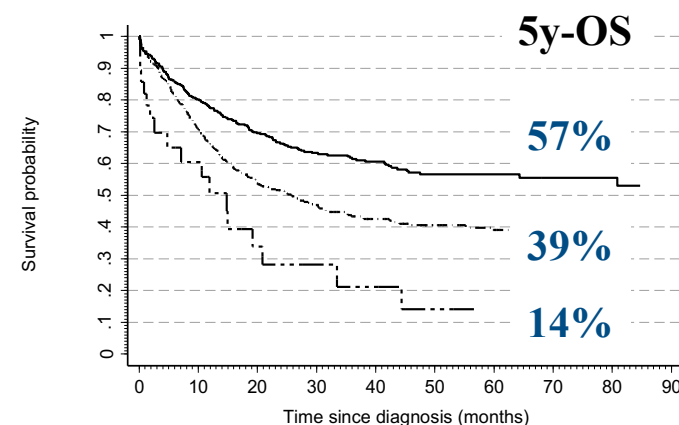
- Since 1993 Colombia started the implementation of universal health coverage
- Current health coverage for children with a new diagnosis of cancer >95%
- Disparities in childhood cancer survival in Cali, the third largest city of Colombia are evident.
- Five-year overall survival (5y-OS) difference of 40% between highest and lowest survival values.

Hematological malignancies



Number at risk	0	10	20	30	40	50	60	70	80	90
Private	382	297	238	197	153	123	88	62	51	23
Public	479	313	238	167	128	92	63	48	27	18
Uninsured	40	22	18	14	12	8	8	7	4	2

Solid tumors

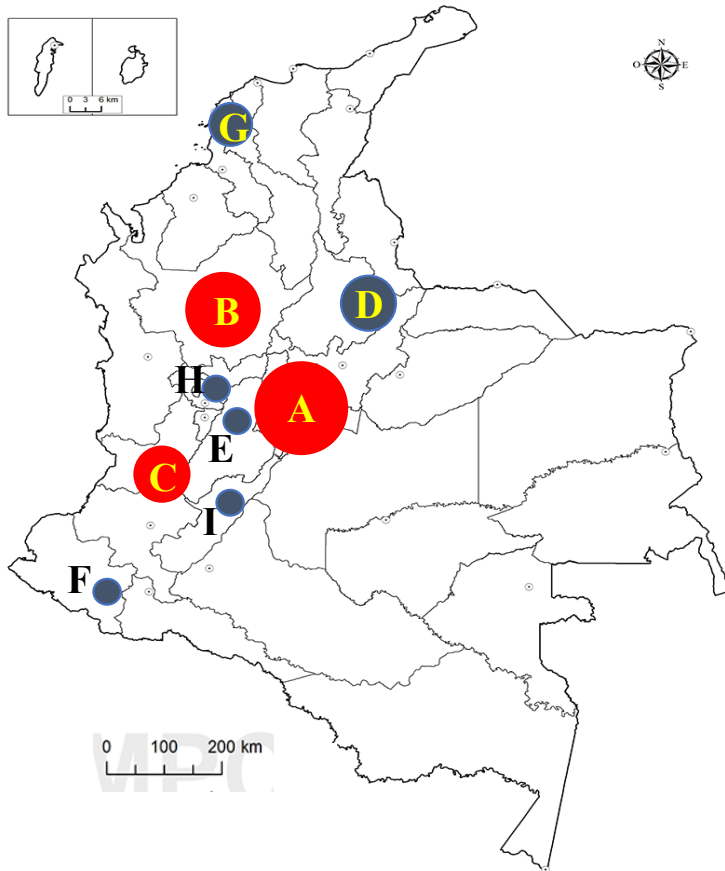


Number at risk	0	10	20	30	40	50	60	70	80	90
Private	408	295	226	179	134	99	67	42	24	10
Public	471	274	183	130	91	67	47	27	11	1
Uninsured	28	13	6	4	3	2	1	1	1	1

———— Private - - - - - Public - · - · - Uninsured



AIM: TO DESCRIBE PEDIATRIC CANCER SURVIVAL GAPS BY HEALTH INSURANCE TYPE IN NINE COLOMBIAN CITIES



City (cases per year)	City population (per million)	% population with unmet basic needs (2018)	
		City	Region
>100	A 7.7	3.5	4.7
75%	B 4.1	6.7	10.7
	C 2.5	5.3	6.3
<100	D 1.3	6.4	9.6
●	E 0.5	7.7	12.2
	F 0.5	16.4	22.0
	G 1.0	21.8	26.7
	H 0.4	7.0	9.0
	I 0.4	9.4	12.9
Total for Colombia		9.5	14.3



METHODS

JCO® Global Oncology
An American Society of Clinical Oncology Journal

original report
Implementing a Childhood Cancer Outcomes Surveillance System Within a Population-Based Cancer Registry

DOI: <https://doi.org/10.1200/JGO.17.00193>
Published online on jgo.org on March 7, 2018.

VIGICANCER

- - Childhood Cancer Outcomes Surveillance System - was established in 2009
- Operating in 10 cities, including 27 pediatric oncology units, in collaboration with 52 pediatric oncologists.
- 65-70% of all new cases of cancer in children in the country have been registered

Selection criteria

- A child with a new diagnosis of invasive neoplasms with malignant behavior, except in the CNS were neoplasms with uncertain or benign behavior are also included.
- Craniopharyngiomas are excluded.
- Treatment in a pediatric oncology facility in the cities participating of the system



METHODS

• Outcomes

- Cancer relapse
- Death
- Treatment abandonment
- Secondary tumors

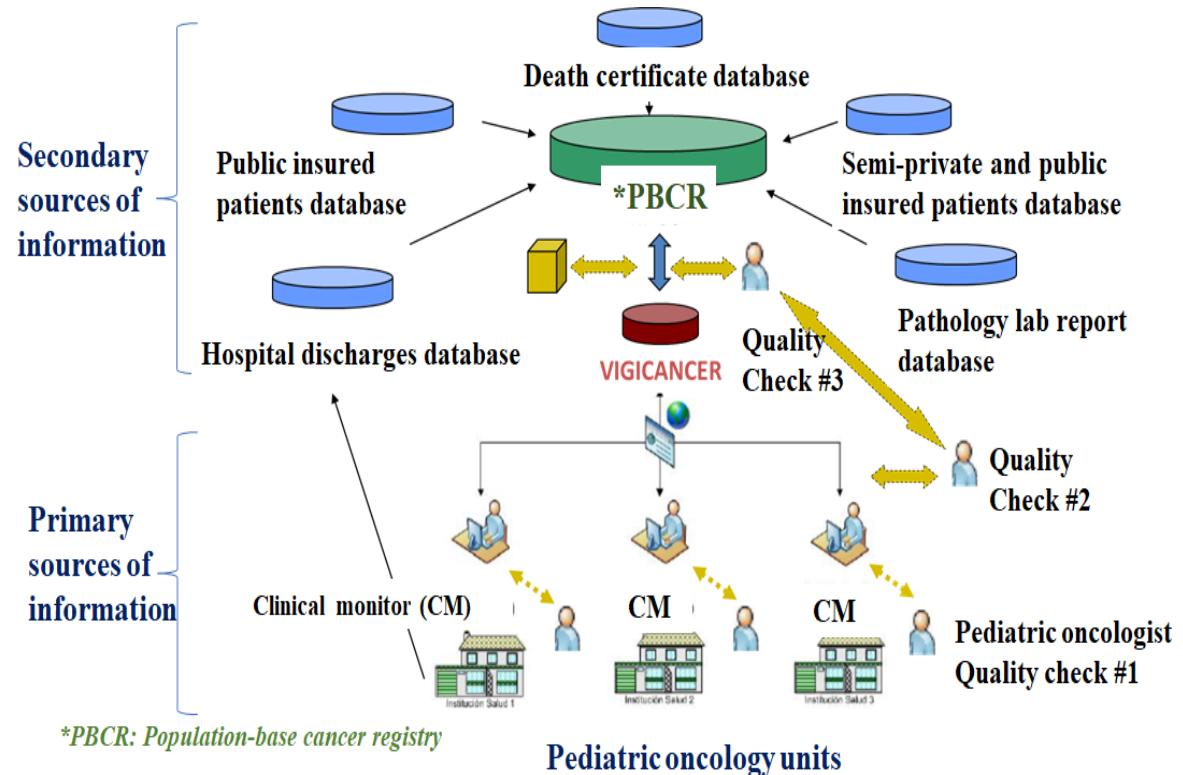
• Events were registered in “real-time”

• Follow-up every 3 months

• Analyses

- Survival using Kaplan-Meier.
- Estimates adjusted using Cox’s regression
- Period analyzed: 2013-2019; *follow-up until June 30th, 2021.

Sources of information



***Data updated since the abstract submission**



VIGICANCER 2009-2021 (<19y) = 6995

2013-19 = 4618

One city started surveillance in 2019 = 64

Missing data about diagnosis = 78

Adolescents = 719 (16%)

Children = 3757 (81%)

Other health insurance = 156

Without health insurance = 113

Missing data about insurance = 28

Health insurance plan

Private 1570 (42%) Public 1890 (50%)

City (cases/year)	Private		Public	
	<100	>100	<100	>100
Total	500	1070	981	909
Contribution to follow-up	496	1049	966	881
Events	179	353	428	392
Deaths	152	288	387	341

RESULTS
STROBE DIAGRAM



CHARACTERISTICS BY HEALTH INSURANCE

Characteristics	Health Insurance				Total	*P-value	
	Private		Public				
	n	(%)	n	(%)			
Age (years; n=3460)						0.04	
<1	118	(8)	100	(5)	218	(6)	
1-4	518	(33)	612	(32)	1130	(33)	
5-9	444	(28)	576	(30)	1020	(29)	
10-14	490	(31)	602	(32)	1092	(32)	
Male sex (n=3460)	865	(55)	1023	(54)	1888	(55)	0.47
Afrodescendent (n=3417)	106	(7)	226	(12)	332	(10)	<0.01

*Log-likelihood ratio chi²



GENERAL CHARACTERISTICS BY HEALTH INSURANCE

Characteristics	Health Insurance				Total n (%)	P- value*
	Private		Public			
	n	(%)	n	(%)		
Place of residence (n=3439)						<0.01
Province's capital city with POU**	768	(49)	491	(26)	1259 (37)	
Province's towns without POU	474	(30)	755	(40)	1229 (36)	
Other Provinces	297	(19)	630	(33)	927 (27)	
Other country	17	(1)	7	(0)	24 (1)	
Cities (cases/year; n=3460)						
>100	1070	(68)	909	(48)	1979 (57)	<0.01
<100	500	(32)	981	(52)	1481 (43)	

*Log-likelihood ratio chi²; ** POU, Pediatric Oncology Unit.



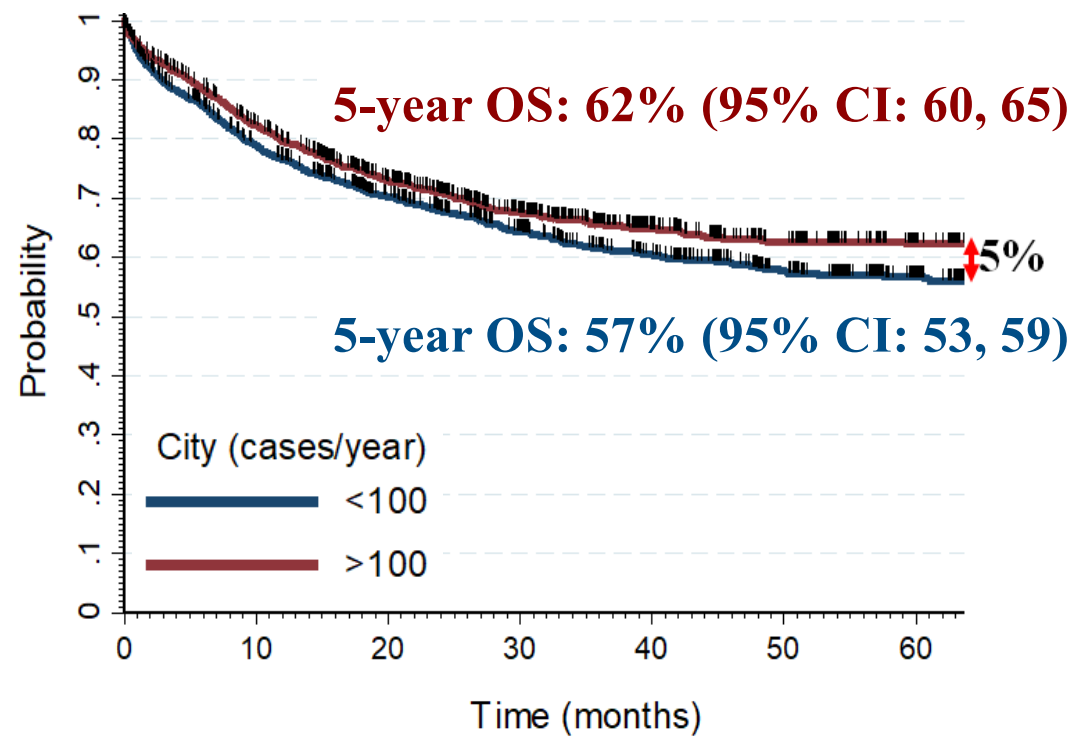
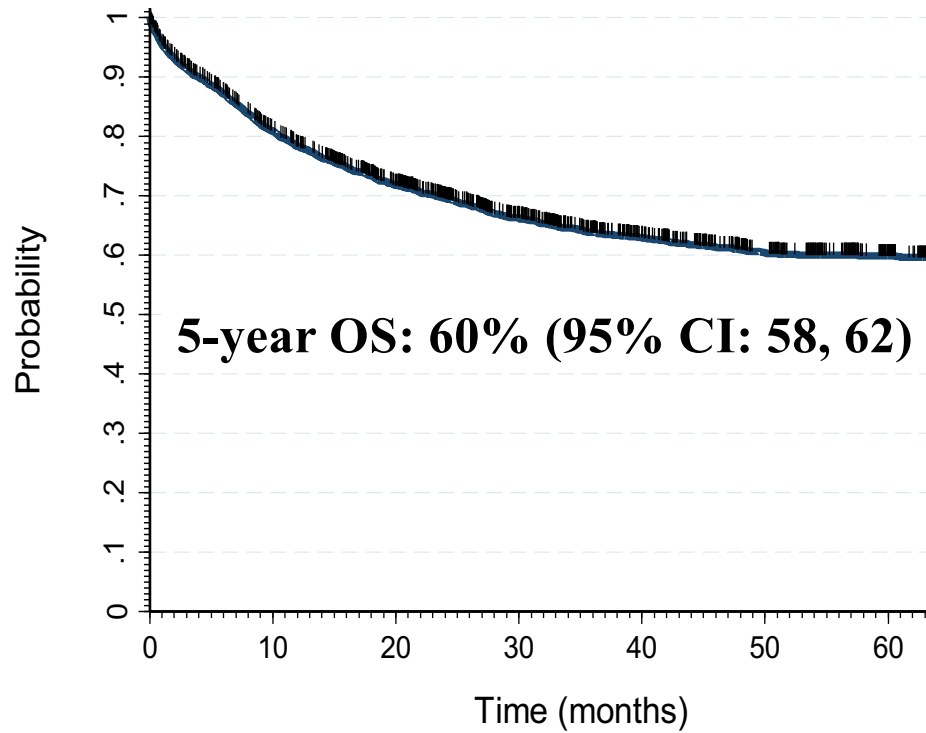
TUMOR TYPE REPRESENTATION BY INSURANCE



International Classification of Childhood Cancer (ICCC-v3)	Health Insurance		Total
	Private	Public	
	n (%)	n (%)	n (%)
I. Leukemias, myeloproliferative diseases, and myelodysplastic diseases	657 (42)	911 (48)	1568 (45)
II. Lymphomas and reticuloendothelial neoplasms	174 (11)	219 (12)	393 (11)
III. CNS and miscellaneous intracranial and intraspinal neoplasms	272 (17)	254 (13)	526 (15)
IV. Neuroblastoma and other peripheral nervous cell tumors	56 (4)	44 (2)	100 (3)
V. Retinoblastoma	58 (4)	55 (3)	113 (3)
VI. Renal tumors	81 (5)	94 (5)	175 (5)
VII. Hepatic tumors	31 (2)	35 (2)	66 (2)
VIII. Malignant bone tumors	86 (5)	112 (6)	198 (6)
IX. Soft tissue and other extraosseous sarcomas	66 (4)	69 (4)	135 (4)
X. Germ cell tumors, trophoblastic tumors, and neoplasms of gonads	56 (4)	64 (3)	120 (3)
XI. Other malignant epithelial neoplasms and malignant melanomas	32 (2)	24 (1)	56 (2)
XII. Other and unspecified malignant neoplasms	1 (0)	9 (0)	10 (0)
Total	1570 (45)	1890 (55)	3460 (100)



OVERALL SURVIVAL BY CITY SIZE



Number at risk

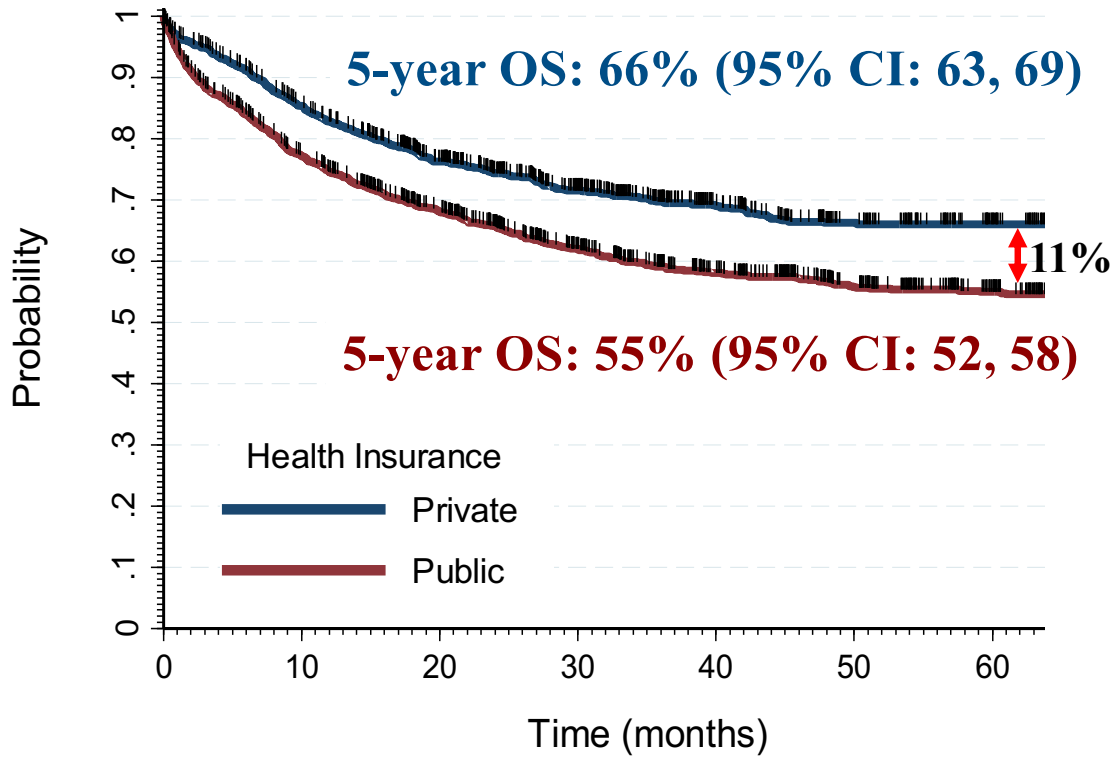
3392	2871	2513	2181	1777	1421	1127	930	764	627	506
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Number at risk

<100	1462	1192	1041	907	753	603	512	430	345	273	195
>100	1930	1679	1472	1274	1024	818	615	500	419	354	311



OVERALL SURVIVAL BY INSURANCE



Multivariate cox regression*

Variable	HR [¥]	(95% CI)
Health insurance		
Public vs Private	1.4	(1.2, 1.6)
City size (cases/year)		
<100 vs >100	1.2	(1.1, 1.4)
Place of residence		
Other Provinces vs Others**	1.2	(1.1, 1.4)

*Stratified for ICC3-3 group

**Others: Province's capital city with POU; Province's towns without POU; Other country

¥ HR: Hazard ratio (adjusted by covariates)

Number at risk

Private	1545	1370	1210	1052	836	656	497	391	325	272	223
Public	1847	1501	1303	1129	941	765	630	539	439	355	283



CONCLUSIONS

- We show that the pediatric cancer overall survival gap by health insurance type in Colombia is a widespread phenomenon despite city size and region.
- Determinants of pediatric cancer survival are complex and insurance coverage plays a pivotal role.
- Achieving universal health coverage is an immense public health advancement, but it seems that is not sufficient to improve outcomes in childhood cancer.
- Additional measures must be taken to address the childhood cancer survival gaps.



VIGICANCER's Working group

Pediatric oncologists (52)

Viviana Lotero
 Ximena Castro
 Margarita Quintero
 Diego Medina
 Carlos A Portilla
 Luz A Urcuqui
 Maria Alvarez
 Jesus Ardila
 Nelson Ramirez
 Patricia Montenegro
 Diego Estupiñan
 Pilar Obregon
 Ernesto Rueda
 Amaranto Suarez
 Jhon Lopera
 Marta Piña
 Mauricio Mesa
 Jorge Hernández
 Ingrid Aristizabal
 Adriana Linares
 Maurice Chaparro
 Edgar Cabrera
 Carlos Pardo
 Marcela Estupiñan
 Jimmy Lagos
 César Montaña

Gissela Barros
 Agustín Contreras
 Ana M. Infante
 Carolina Casas
 Sandra P. Garcés
 Lida Rengifo
 Oscar Gonzalez
 Isabel C. Sarmiento
 Leila Martinez
 Angélica Castillo
 Jaime Pérez
 Natalia González
 Iliana de los Reyes
 Gloria Suarez
 Ángela Trujillo
 Javier Fox
 Rosmira Pérez
 Carlos E. Restrepo
 Natalia Valencia
 Lina M. Quiróz
 Hernán D. Vasquez
 Diana Valencia
 Fabio Molina
 Daniel Ozaeta
 Bibiana Villa
 Oscar Ramirez

Clinical Monitors Cali's Cancer Registry

Mónica Lotero (Lead)
Vivian Piedrahita (Lead)
 Dilia Escobar
 Liliana Ruiz
 Lorena López
 José Alferez
 Diana Cárdenas
 Luis Perlaza
 Laura V. Gualteros
 Jamile Zapata
 Lady T. Abril
 Olga I. Henao
 Jorleth Agudelo
 Johana Nuñez
 Delcy Goenaga
 Yesenia Franco

Luis E. Bravo
 Roberto Jaramillo
 Luz S. García
 Paola Collazos
 Mariela Palacios
 Juan C. Hernández
 Julio C. Guarnizo

POHEMA Foundation

Marta Paz (manager)



Mentor MCM

M. Paula Aristizabal
MAS (2009 – present)



Advisor (2009)

Eva Steliarova-Foucher

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