



Rheumatoid Arthritis in Colombia

by

Juan Carlos Méndez

jc.mendez (at) uniandes.edu.co

for

Hospital Militar

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Universidad de los Andes

Url: <http://jcmendez.gkudos.com/ar/>

What is Rheumatoid Arthritis (RA)?

Rheumatoid arthritis (RA) is an autoimmune disease that can cause joint pain and damage throughout your body. There's no cure for RA. In addition to physical and emotional pain. It is considered as a high-cost disease.



As someone once said,

For any country, health problems are really money problems



For a country like Colombia, where health resources are scarce, it is really important trying to understand how \$\$ is spent.





Physicians and Health professional interested in RA usually would like to know...

Costs of procedures per Persons are the same across the country? Do they differ by sex, age or regime?

Does the available data has a “good enough” quality?

Which procedures are the most expensive or most used?

Which administrators and providers have the most expensive costs per person?

... but it isn't a secret that in Colombia Health information technology its too limited in comparison to other countries



Wouldn't be great to have a visual and interactive tool that could help Health professionals to use the available data and **Discover** the **distribution of Costs per Person (CP)** of RA procedures in Colombia by attributes like state, year, regime, sisben, sex, age group, administrator or provider?



Let me introduce you the Interactive Dashboard to analyze Rheumatoid Arthritis in Colombia using data of Costs of procedures per Person...

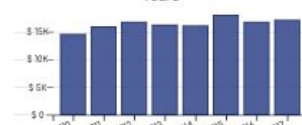




Costs per Person

 Clear FiltersCosts per
Person (C/P)
\$16K COPPeople
Served
41461Total Costs
\$663.2M COP

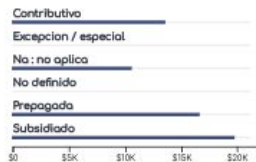
Years



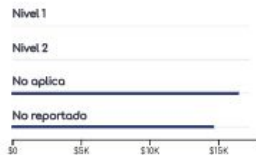
States

1- na
Amazonas
Antioquia
Arauca
Atlántico
Bogotá, d.c.
Bolívar
Boyacá
Caldas
Caquetá
Casanare
Cauca
Cesar
Chocó
Cundinamarca
Córdoba
Guainía
Guaviare
Hulla
La guajira
Magdalena
Meta
Nariño
Norte de santander
Putumayo
Quindío
Risaralda
San andrés, providencia y santa catalin
Santander
Sucre
Tolima
Valle del cauca
Vaupés
Vichada

Regime



Sisben



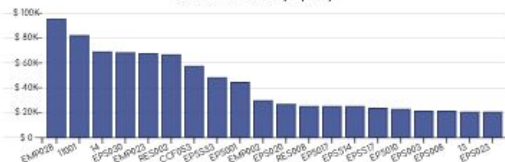
Sex



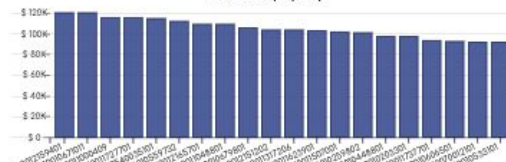
Age Group



Administrators (Top 20)



Providers (Top 20)



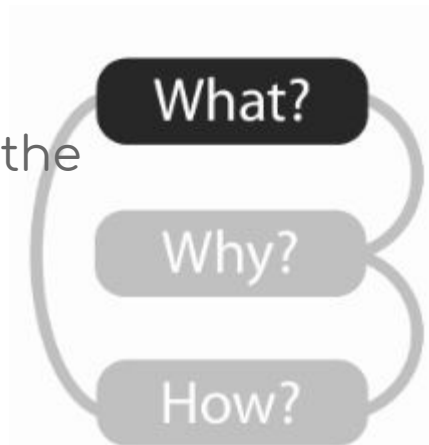
Procedures

CUPS	Name	Cost per Person	People Served	Total Costs
920701	Gamografía hepatoesplénica	111505	1	111505
901407	Prueba intradérmica de alergias con escarificación o puntura (aeroalérgenos, alimentos, venenos de insecto...	110930	2	221860
999100	Acupuntura y terapia neural sod +	110000	1	110000
873305	Radiografía panorámica de miembros inferiores (goniometría u ortograma), en formato 14 x 36 (adultos) +	109031	1	109031
920901	Gamografía ósea (corporal total o segmentaria) +	106836.2	5	534181
901003	Antibiograma (mic) método manual	106680	1	106680
541302	Drenaje de colección intraperitoneal (epiploico, omental, periesplénica, perigástrica, subhepática, subfrenica...	105734	1	105734
893871	Prueba de broncomatridad con electros monitorio +	102577.33333333333	1	102577.33333333333

Total Items: 694

Main Dataset : SISPRO

- Administrative Database with Medical services given to patients in Colombian health system, filtered by Diagnostic codes for Rheumatoid Arthritis.
- Dataset Type: Table, Temporal
- Attributes
- States : Categorical. States of Colombia
- Year: Categorical, orderered, sequential. Year of the procedure.
- Regime : Categorical. Type of health regime to which the patient belongs



Main Dataset : SISPRO

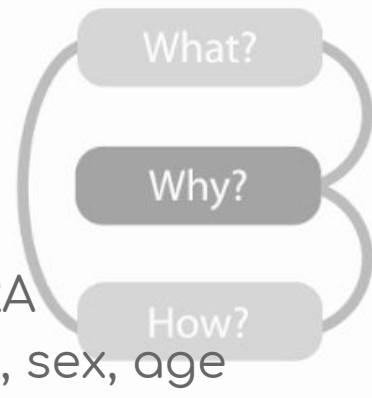
- Sisben : Categorical. Subtype of Subsidized regime.
- Sex : Categorical.
- Age Group: Categorical, ordered. Age Groups classified by human cycle.
- Administrator: Categorical. Administrators of the Social Security System
- Provider: Categorical. Company that provides a medical service.
- Procedure: Categorical. Procedures and medical services performed in Colombia
- Procedure Cost: Quantitative, ordered, sequential. Cost of a procedure applied to a patient.
- People Served : Quantitative, ordered, sequential. Number of people



Tasks

Main Task:

- Discover the **distribution** of Costs per Person (CP) of RA procedures in Colombia by state, year, regime, sisben, sex, age group, administrator and provider.



Secondary Tasks:

- Derive attributes from raw data as **features** to be used in the final visualization.
- Identify Outliers in costs.
- Identify the **Features** of a specific procedure in the dataset.
- Summarize the **distribution** of Costs per Person, people served and total costs of RA procedures in Colombia.

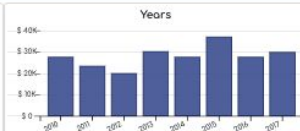


What?

Why?

How?

<https://www.youtube.com/watch?v=fCqVDYocl3Q>

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1- na
Amazonas
Antioquillo
Arouca
Atlántico
Bogotá, d.c.
Bolíver
Boyacá
Caldas
Caquetá
Casanare
Cauca
Cesar
Chocó
Cundinamarca
Córdoba

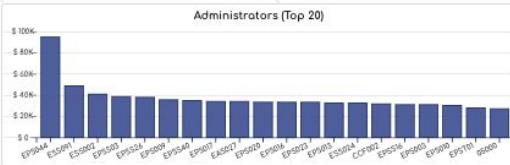
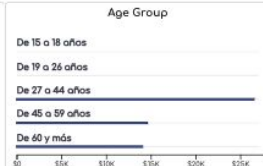
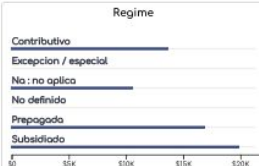
Guainía
Guaviare
Huila
La Guajira
Magdalena
Meta
Nariño
Norste de santander
Putumayo
Quindío
Risaralda
San andrés, providencia y santa catalina
Santander
Sucre
Tolima
Valle del cauca
Vaupés
Vichada



Costs per
Person (C/P)
\$26.6K COP

People
Served
2057

Total Costs
\$54.7M COP



Procedures				
Proteína c reactiva, cuantitativo de alta precisión +				
CUPS	Name	Cost per Person	People Served	Total Costs
906913	Proteína c reactiva, cuantitativo de alta precisión +	26601.624015556635	2057	54719952
903866	Transaminasa glutámico-pirúvica o alanina amino transferasa [tgp-alt] +	11433.05746560142	4506	51517402
903867	Transaminasa glutámico oxalacética o aspartato amino transferasa [tgo-ast] +	11478.511286681716	4430	50849805
904902	Hormona estimulante del tiroides [tsh]	34793.68782673637	1339	46588748
906910	Factor reumatoide [ra] cuantitativo por nefelometría +	2047722440746344	1983	40606336
907106	Uroanálisis con sedimento y densidad urinaria +	8664.443099273607	4543	39362565
903825	Creatinina en suero, orina u otros	5214.58264783486	6443	33597556
903908	Hemograma III (hemoglobina, hematocrito, recuento de eritrocitos, índices eritrocitarios, leucograma, re...	30343.198328343804	3871	38348473

Total Items: 828 (Selected Items: 1)

<http://jcmendez.gkudos.com/ar/>

How?

Insights

- There are data quality problems like these:
 - Some states do not have data for one or more years (e.g Amazonas, Arauca, Casanare, Guainía, Guaviare)
 - There are "Not Reported - NR" and "Not Available - NA", values in some of the attributes. Such kind of "*data loss*" problem should be mitigated by data publishers in order to improve the general data quality of the dataset.
 - The expert found different NIT providers with the same name.
- The overall Costs per Person (C/P) for procedures is higher for younger people.



Insights

- The overall C/P is higher for [well known](#) isolated states like Chocó, Guainía, La Guajira , Putumayo , Arauca, Vaupés and Vichada.
- For every year of the dataset Córdoba is the State with the highest C/P.
- There are anomalies in procedure costs that reflect problems during data collection (e.g. procedures with cost of \$1 COP)
- According to the expert, the costs of some procedures in the database differ a *lot* from the official rates established for the country. ([SOAT DECRETO 2423 DE 1996](#)] and its yearly updates)
- There is a huge number of persons (65k) with RA that belong to the subsidized (*subsidiado*) regime. According to the expert, usually that group of people doesn't have access to the most advanced or modern procedures due to the high costs of them.
- There are more women affected with the decease, but costs for men are higher





Thanks