### **RWD91**

# Healthcare resource utilization and costs associated with **COVID -19 in Colombia: a retrospective database study.**

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### BACKGROUND

The COVID-19 pandemic has set an extraordinary demand on healthcare services and has had a profound impact on economies around the globe. For the formulation of effective preventative and therapeutic measures, it is essential to compile data regarding patient demographics, healthcare resource usage, and associated costs, both for inpatient and outpatient care. While such data is ample in wealthier nations<sup>1–6</sup> and certain middle-income countries like Brazil, Turkey, Iran, and China<sup>7-11</sup>, it is notably scarce in Latin American nations<sup>12-14</sup>, particularly in Colombia<sup>15–17</sup>.

### OBJECTIVE

• To describe the Healthcare resource utilization (HCRU) and costs related to the management of COVID-19 in one of the largest Health Maintenance Organization (HMO) in Colombia.

### METHODS

- This is a retrospective observational study in patients diagnosed with COVID-19 who received medical care at the HMO -Sura- in Colombia between March 2020, and January 2023.
- A micro costing method was used based on available data on hospital stay (general ward and Intensive Care Unit [ICU]), outpatient, emergency visits, drugs, medical supplies laboratories, diagnostic imaging, and most frequent procedures. And costs estimations were obtained from the technical note of the sufficiency study and SISMED database. All costs were adjusted to 2023 and converted to US dollars (1 USD = 3982.5 COP).
- The diagnosis of COVID-19 was defined as documented records of COVID-19 related ICD codes (U07.1 or U07.2) and confirmation of COVID-19 infection with PCR. Disease severity was categorized based on the utilization of outpatient and inpatient services. Outpatient cases were considered mild if managed at home via telemedicine or phone consultations without the need for oxygen therapy, and moderate if treated at home or on an outpatient basis with oxygen therapy. Inpatient cases were considered severe if treated in a hospital setting without requiring ICU admission, and critical if the patient was treated in the ICU at any point during the observation period.
- The data analysis in this study was targeted on generating descriptive statistics, which included the calculation of frequencies, percentages (for qualitative variables), and measures of central tendency (like the median) and variability (Interquartile Range, IQR) (for quantitative variables). The statistical analysis was conducted using the R statistical language (v.4.3.1)<sup>20</sup>.

### RESULTS

 1,030,037 cases of positive COVID-19 were observed during the study period. Overall, the study population consisted of adults aged 18 years old and above (~92.6%), female (55.4%), urban residents (99.4%), with incomes below two minimum wages (61.5%), with a low number of comorbidities (median 0, IQR: 2) and unvaccinated (94.9%). Most cases (80%) were mild (n-=815,936, 79.2%) or moderate (n=7,804, 0.8%), followed by severe (n= 197,348, 19.2%) and critical cases (n= 8,949, 0.9%).

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## **RESULTS** (cont)

 
 Table 1. Clinical and demographical characteristics of COVID-19 cases during
March 2020, and January 2023

	Total	1,030,037
Demographic data		
Age, median years (IQR)	38	(22)
Age groups, n (%)		
5 years or under	19,148	(1.9)
>5 to 10 years	20,780	(2)
>10 to under 18 years	36,448	(3.5)
18 to 49 years	678,559	(65.9)
50 to 65 years	196,367	(19.1)
Over 65 years	78,735	(7.6)
Female, n (%)	570,911	(55.4)
Urban residents, n (%)	1,024,009	(99.4)
Contributor income*, n (%)		
Less than 2 legal minimum wages	633,184	(61.5)
Between 2 and 5 legal minimum wages	237,223	(23)
More than 5 legal minimum wages	97,181	(9.4)
Missing	62,449	(6.1)
Clinical data		
Weight, median kg (IQR)	69	(22)
Height, median cm (IQR)	162	(15)
Pregnant, n (%)	5,248	(0.5)
Number of comorbidities, median (IQR)	0	(2)
Comorbidities, n (%)		
Immunocompromised state	234,700	(22.8)
Hypertension	182,288	(17.7)
Mental Health Conditions	157,773	(15.3)
Cancer	108,976	(10.6)
Obesity	107,378	(10.4)
Chronic lung disease	81,350	(7.9)
Diabetes	59,978	(5.8)
Cardiac Conditions	22,017	(2.1)
Chronic Kidney Disease	21,067	(2)
Peripheral vascular disease	17,991	(1.7)
Chronic Liver Disease	13,370	(1.3)
Cerebrovascular accident	8,233	(0.8)
Drug use disorder	7,249	(0.7)
HIV/AIDS	6,733	(0.7)
Dementia–Neurological Conditions	6,284	(0.6)
Tuberculosis	3,318	(0.3)
Transient ischemic attack	2,765	(0.3)
Organ Transplantation	1,995	(0.2)

Sickle c Down **Risk Facto** COVID-19,

Reinfecte Vaccinat

Unvacc Partial

Fully vac Fully va Severity,

Mild

Modera Severe Critical

Johnson vaccine.



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## **RESULTS** (cont)

	Total	1,030,037
ell disease	554	(0.1)
yndrome	308	(0)
ors for Severe , n (%)	86,990	(8.4)
d, n (%)	56,489	(5.5)
on status <sup>‡</sup> , n (%)		
inated	977,472	(94.9)
	18,338	(1.8)
ccinated	33,309	(3.2)
ccinated + any booster	918	(0.1)
n (%)		
	815,936	(79.2)
ite	7,804	(0.8)
	197,348	(19.2)
	8,949	(0.9)

\*For 2022 a minimum legal wage was 235 USD.

<sup>+</sup> Partial vaccination: a single dose of mRNA or adenovirus-vectored vaccines. Fully vaccination: the primary series of two doses of mRNA or adenovirus-vectored vaccines or a single dose of Johnson &

• For hospitalized cases, the median length of stay (LoS) was 5 days (IQR 5) for hospitalization in general ward and 13 days (IQR 10) for ICU. The median cost for mild to moderate cases treated on an outpatient setting ranged between 64.0 USD (IQR 20.3) to 113.3 USD (IQR 34). For severe (hospitalized patients on general ward) and critical cases (ICU patients), the median cost was 4,187.2 USD (IQR 1,693.8) and 29,596.5 USD (IQR 21,939) respectively.

• For mild and moderate cases, the main driver was the laboratory costs, 54.5 USD (IQR 9.4) and 57.5 USD (IQR 20.3) respectively, however, it is worth highlighting that for moderate cases another key cost was the ER utilization, where for 74.4% of those cases it had median cost of 49.3 USD. On the other hand, severe and critical cases, consistent with the above, the main cost was due to hospitalization, although with important differences in the scale, for severe cases the median hospitalization cost was 4,132.8 USD (IQR 1,653.1) while for critical cases the median was 28,824.4 USD (IQR 21,195.2).

Most COVID patients were treated only in an outpatient setting mirroring low-cost expenses. However, for severe and critical COVID cases the total healthcare costs were substantially higher due to the LoS in general ward and ICU. Overall, costs associated with severe and critical cases were 60 to 400-fold higher compared with mild and moderate cases.

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## CONCLUSION

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