EPH27

Medical Costs of Adults With COVID-19 in Dominican Republic During the Endemic Phase: A Micro-Costing Study

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INTRODUCTION

- As of October 20th, 2024, the WHO has reported around 776.7 million global cases of COVID-19 linked to SARS-CoV-2.[1] **In Dominican Republic (DR) there have been approximately 661,103 cases and 4,384 deaths.** [1]
- While COVID-19 is now considered endemic in Latin America and the Caribbean (LAC),[2] both the region and DR experienced significant public health and economic burden from the COVID-19 pandemic,[2-4] **accounting for 25% of global cases and over 43% of deaths worldwide.**[5] Despite substantial efforts to mitigate the pandemic´s impact in DR,[4,6] from March 2020 to February 2022, adults aged 20-64 were primarily affected.[7] However, individuals >50 years old faced the highest risk of fatal outcomes, with lethality rates increasing with age.[7]
- COVID-19 remains a challenge to DR´s Healthcare System **(6,913 cases reported in epidemiological weeks 1-42 during 2024)**.[8] However, the economic burden of this disease in adults remains poorly understood in the current context. To our knowledge, this is the first attempt to assess the economic impact of acute COVID-19 in DR during the endemic period.

OBJECTIVE

- Estimate the direct medical costs per patient related to the acute management of adult patients with COVID-19, from the perspective of DR´s National Healthcare System (NHS).

METHODS

- A mixed structured approach was employed to identify, measure, and value resource use in estimating the cost of care for patients experiencing acute COVID-19 episodes. This encompassed a literature review, consultation and validation with clinical experts, as well as and resource evaluation using a bottom-up micro-costing technique.
- A literature review was conducted to identify local clinical practice guidelines for adult patients (>18 years) in DR, as well as pertinent literature on the clinical management of the disease. This aimed to establish the use of required resources and identify cost-generating elements associated with the diagnosis, treatment, and management of COVID-19 across different settings: outpatient care, general ward hospitalization, and intensive care unit (ICU).
- A standardized questionnaire was administered to DR clinical experts to estimate the healthcare resource utilization (HCRU) for adult patients with COVID-19. The questionnaire also considered and validated factors like age group, vaccination status, and risk of severe outcomes (e.g., progression to severe COVID-19).
- A case-type methodology determined resource requirements for outpatient, general ward, and ICU settings which served to establish the base case. Unit costs were allocated to these resources using the National Health Service,[9] Health and Labor Risks Superintendence,[10] public tariffs for health services,[11-13] and the program of essential medicines.[14] Costs in local currency were expressed in 2023 USD.

RESULTS

- For vaccination status, we presumed that **70%** of the adult population in DR had received at least one dose of a COVID-19 vaccine (i.e., “ever vaccinated”).[15,16] Additionally, according to literature and clinical experts, about **60%** of the adult population in DR has at least one comorbidity, such as hypertension, which is used as a risk factor of developing severe COVID-19/complications.[16,17]
- The average cost of outpatient care (across all age groups) was **US$1,644.2** and **US$1571.2** in high-risk patients (10% of high-risk symptomatic patients required outpatient care), and **US$1,525.7** and **US$1477.5** in low–risk patients (95% of low-risk symptomatic patients required outpatient care), for unvaccinated and vaccinated patients, respectively (See **Table 1., and Figures 1 and 2.)**
- In high-risk groups, regardless of vaccination status, the length of stay (LOS) for adult symptomatic patients needing hospitalization was 5 days in general ward (GW) for patients under 49 years old and extended to 10 days for patients aged 65 and older. In the intensive care unit, the LOS was 10-15 days for all age groups.

RESULTS (continued)

- In addition to outpatient costs, **Table 1., and Figures 1 and 2** present the hospitalization costs (per-patient) both in the GW and UCI setting. In the GW the average cost (all age groups) in the high-risk patients was **US$2,450.2** for the unvaccinated and **US$2,425.9** for vaccinated patients (with higher costs for those over 50 years old), in contrast with In with **US$1938.4** (unvaccinated) and **US$1937.0** (vaccinated) in the low-risk group. In the ICU, the costs increased drastically, being on average **US$14,406.5** and **US$14,366.3** for high-risk; while low risk was **US$14,137.7** regardless of the vaccination status **(Table 1.).**
- The main cost drivers that influenced the total cost of ICU and GW were medications, laboratory tests and doctor/HCP visits (except for high-risk patients >50 years in GW, where the hospitalization costs were twice than those of doctor/HCP visits). For instance, among high-risk groups (all ages), the average medication expenses in GW accounted for **55% (US$1,338.54)** and **48% (US$922.79)** of the total average cost per patient for unvaccinated and vaccinated individuals, respectively.
- Use of mechanical ventilation (MV) in the ICU increases costs by **US$14,846.8** for any age group and extends the LOS by 7-10 days.

Table 1. Overview of individual costs associated with the acute treatment of adults with COVID-19, categorized by treatment setting, age group, risk, and vaccination status.

Parameters		Outpatient Care (US $)	Hospital Care: GW (US $)	Hospital Care: ICU without MV (US $)
		Low Risk – Unvaccinated patients	**Low Risk – Unvaccinated patients**	
Age Group (years)	18 – 29	$ 1,495.91	$ 1,936.27	$14,111.38
	30-49	$ 1,499.88	$1,937.44	$14,142.54
	50-64	$ 1,553.49	$ 1,938.61	$14,144.88
	65-74	$ 1,575.91	$ 1,939.77	$14,144.88
	> 75	$ 1,553.49	$ 1,939.77	$14,144.88
		Low Risk – Ever vaccinated patients	**Low Risk – Ever vaccinated patients**	
Age Group (years)	18 – 29	$ 1,438.66	$ 1,934.86	$14,141.37
	30-49	$ 1,441.46	$1,936.03	$14,142.54
	50-64	$1,495.08	$1,937.20	$ 14,144.88
	65-74	$ 1,517.49	$ 1,938.36	$14,144.88
	> 75	$ 1,495.08	$ 1,938.36	$ 14,144.88
		High Risk – Unvaccinated patients	**High Risk – Unvaccinated patients**	
Age Group (years)	18 – 29	$ 1,642.13	$ 1,956.43	**$14,565.00**
	30-49	$ 1,643.30	$ 1,957.60	**$14,365.16**
	50-64	$ 1,644.47	$ 2,778.23	**$14,367.49**
	65-74	$ 1,645.64	$ 2,779.40	**$14,367.49**
	> 75	$ 1,645.64	$ 2,779.40	**$14,367.49**
		High Risk – Ever vaccinated patients	**High Risk – Ever vaccinated patients**	
Age Group (years)	18 – 29	$ 1,569.12	$ 1,932.02	$14,363.99
	30-49	$ 1,570.28	$ 1,933.19	$14,365.16
	50-64	$ 1,571.45	$ 2,753.82	$ 14,367.49
	65-74	$ 1,572.62	$ 2,754.99	$14,367.49
	> 75	$ 1,572.62	$ 2,754.99	$ 14,367.49

MV= mechanical ventilation; US$= United States dollar

Color Key: $1000- <$1,500 | ≥$1,500- $1,800 | $1,900 - $2,500 | $2,600- $3,000 | ≥$14,000

Fig.1. Average cost per patient (all age groups) low risk group

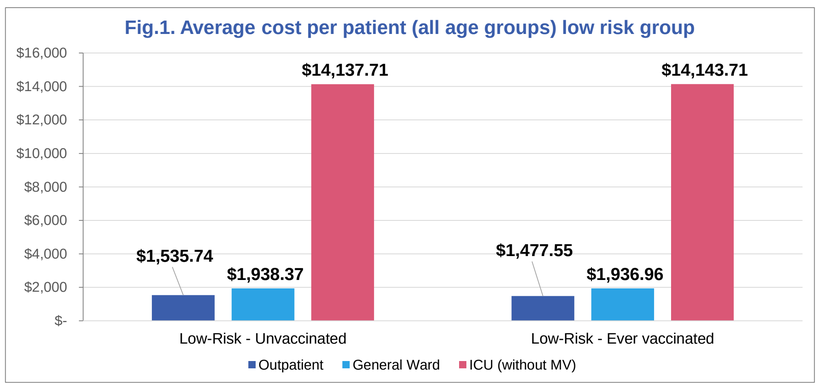
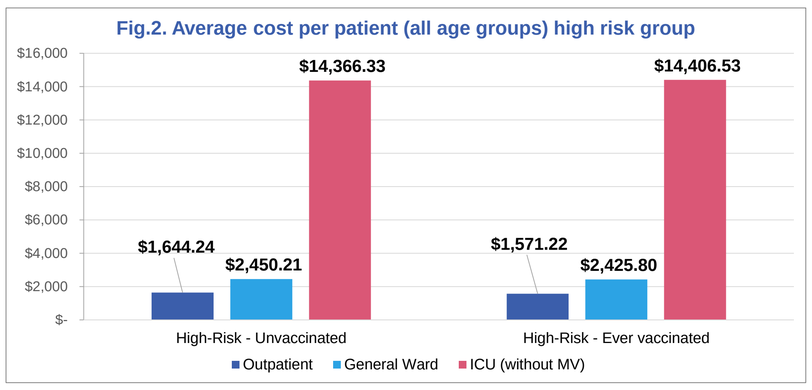


Fig.2. Average cost per patient (all age groups) high risk group



CONCLUSIONS

- **Higher costs were observed in patients over 50 years of age in GW (i.e., an age group more likely to die from COVID-19 than younger adults and children),[18] compared to younger patients.**
- **Compared to vaccinated patients, unvaccinated high-risk patients used more health resources and incurred in higher expenses. Additionally, high-risk patients across all age groups had higher HCRU than low-risk patients.**
- **The LAC region faced a substantial COVID-19 impact during the pandemic (especially in its initial phases), and despite COVID-19 has become endemic, it continues to circulate in LAC.[2] This study suggests that COVID-19 among adults still imposes considerable economic costs on DR´s NHS. This underscores the importance of continuous preventive measures, such as vaccination, to mitigate the burden (particularly severe disease) and avert future infections and hospitalizations.**

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