EPH148

Medical Costs of Adults With COVID-19 in Guatemala 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 Guatemala (GT) there have been approximately 1,250,392 cases and 20,203 deaths.**[1]
- COVID-19 is now endemic in Latin America and the Caribbean (LAC) and continues to circulate,[2] but the region faced a major public health and economic burden during the pandemic,[2-4] accounting for 25% of global cases and over 43% of deaths worldwide.[5]
- Socioeconomic disparities and health inequities significantly impacted the burden of COVID-19 in GT. Unequal distribution of healthcare resources and infrastructure posed challenges to the National Healthcare System (NHS), particularly for marginalized populations, resulting in limited access to quality care.[6,7]
- COVID-19 continues to be a challenge to GT, with **22,740 cumulative cases and 47 deaths as of November 3rd, 2024, mostly affecting those aged 20-59.**[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 GT during the endemic period.

OBJECTIVE

- Estimate the direct medical costs per patient related to the acute for acute COVID-19 treatment in the adult population within GT´s 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 GT, 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 GT 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 data from the Guatemalan Social Security,[9] Ministry of Public Finance,[10,11] and other public sources.[12,13] Costs in local currency were expressed in 2023 USD.

RESULTS

- For vaccination status, we presumed that **10%** of the adult population in GT had received at least one dose of a COVID-19 vaccine (i.e., “ever vaccinated”).[8,14] Additionally, according to literature and clinical experts, about **75%** of the adult population in GT has at least one comorbidity, such as obesity, which is used as a risk factor of developing severe COVID-19/complications.[14,15]
- Across all age groups, outpatient care costs averaged **US$486.6** (unvaccinated, low-risk) to **US$500.8** (unvaccinated, high-risk) and **USD$510.2** (vaccinated, regardless of risk). Overall, **50%** of high-risk symptomatic patients needed outpatient care, comparted to **92.5%** of low-risk symptomatic patients. (See **Table 1., and Figures 1 and 2.).** Clinical experts suggested that, despite receiving identical medical care, vaccinated patients likely had higher educational levels, resulting in more frequent medical consultations comparted to unvaccinated patients.[14]
- For high-risk groups, regardless of vaccination status, the length of stay (LOS) was 3 days in general ward (GW) for ages 18-29, 5 days for ages 30-74, and 7 days for ages 75 and above. In intensive care, the LOS ranged from 5 to 12 days.

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. Costs in GW (all age groups) displayed minimal variation, averaging around **US$8,738.8** to **US$8,765.1** in high-risk and **US$8,740.3** to **US$8,745** in low-risk patients (vaccinated vs unvaccinated, respectively). ICU care costs were significantly higher, ranging from **US$19,353.5** and **US$16,809.8** for high-risk (unvaccinated and vaccinated, respectively); while low risk was **US$19,317.6** and **US$16,369.5** (unvaccinated and vaccinated, respectively). **The cost of care was highest for unvaccinated ICU patients ≥75 years old (high-risk: US$26,145.52; low-risk: US$26,100.92) (Table 1.).** This was particularly due to inpatient-stay costs (across all age groups, it represents on average a 74% of the total medical costs per patient).
- In the ICU context, older adults (≥65 years) exhibited greater HCRU, and associated costs compared to younger individuals. However, vaccinated patients aged ≥65 years incurred in lower expenses than their unvaccinated counterparts. Use of mechanical ventilation (MV) in the ICU increases costs by **US$13,897.7** across all age groups and extends the LOS by 5 days.

Table 1. Heat map displaying the 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 $)	ICU without MV (US $)
		Low Risk – Unvaccinated patients	Low Risk – Unvaccinated patients	
Age Group (years)	18 – 29	$ 296.28	$ 5,898.96	$12,019.16
	30-49	$ 334.20	$ 8,354.90	$ 15,877.94
	50-64	$ 339.28	$8,968.74	$ 16,492.64
	65-74	$731.52	$8,974.96	$ 26,097.72
	> 75	$731.52	$11,527.65	$ 26,100.92
		Low Risk – Ever vaccinated patients	Low Risk – Ever vaccinated patients	
Age Group (years)	18 – 29	$ 310.17	$ 5,898.96	$ 11,974.55
	30-49	$ 358.49	$ 8,423.79	$ 11,991.55
	50-64	$363.56	$8,902.49	$ 12,470.24
	65-74	$ 759.31	$8,961.16	$ 22,704.03
	> 75	$ 759.31	$11,515.45	$ 22,707.23
		High Risk – Unvaccinated patients	High Risk – Unvaccinated patients	
Age Group (years)	18 – 29	$ 310.17	$ 5,898.96	$ 12,019.16
	30-49	$ 358.49	$ 8,423.79	$ 15,922.55
	50-64	$363.56	$8,902.49	$ 16,538.00
	65-74	$ 759.31	$8,961.16	$ 26,142.33
	> 75	$ 759.31	$11,515.45	$ 26,145.53
		High Risk – Ever vaccinated patients	High Risk – Ever vaccinated patients	
Age Group (years)	18 – 29	$ 310.17	$5,837.09	$ 12,019.16
	30-49	$ 358.49	$ 8,396.76	$ 12,036.16
	50-64	$363.56	$8,956.54	$ 14,493.46
	65-74	$ 759.31	$8,961.16	$ 22,748.64
	> 75	$ 759.31	$11,542.48	$ 22,751.84

MV= mechanical ventilation; US$= United States dollar

Heat Map Color Key: $200- $500 | $700 - $1,000 | $2000 - $6,000 | $8,000- <$15,000 | ≥$15,000- $25,000 | >$26,000

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

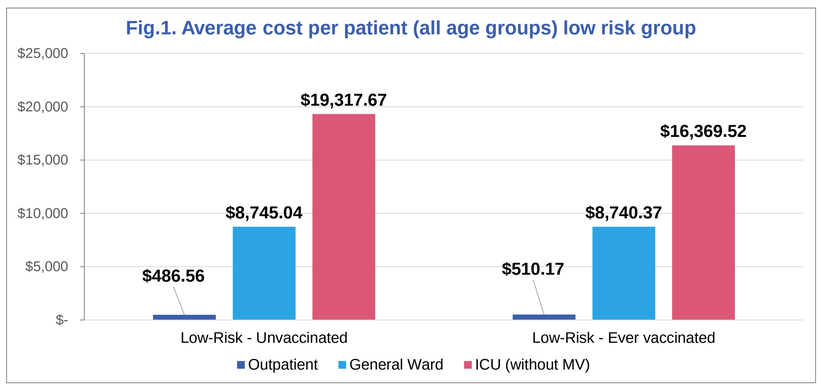
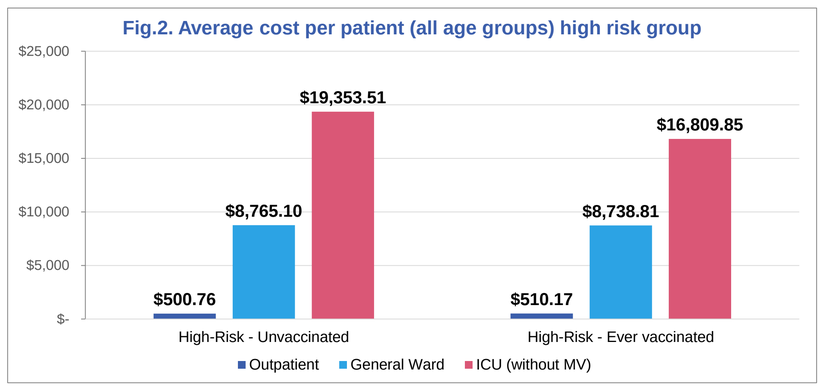


Fig.2. Average cost per patient (all age groups) high risk group



CONCLUSIONS

- **In the ICU setting, older adults (≥65 years) had higher HCRU/costs compared to younger patients; nonetheless, vaccinated patients ≥65 years accrued lower costs than the unvaccinated.**
- **Socioeconomic disparities, vaccine hesitancy, and limited access to healthcare significantly impacted the COVID-19 pandemic in GT. [6,16] Additionally, vaccine hesitancy, fueled by misinformation, cultural beliefs, and mistrust in healthcare systems, hindered vaccination efforts, potentially leaving vulnerable groups at increased risk.[6,16]**
- **This study suggests that COVID-19 continues to impose a significant economic burden for GT´s NHS, particularly affecting older unvaccinated individuals and severe cases. This highlights the importance for ongoing preventive strategies, including vaccination and targeted educational initiatives to address vaccine hesitancy, to reduce the burden and prevent future infections and hospital admissions.**

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