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INTRODUCTION

The burden of disease and injury can be expressed in terms of mortality, incidence, prevalence, years of life lost (YLLs), years lived with disability (YLDs), disability-adjusted life years (DALYs) and economic burden [1].

In the era of the health care cost crisis, economic burden is essential for prioritizing health interventions and policies [2].

Economic evaluation includes direct costs, both medical and non-medical, as well as indirect costs [1].

Direct medical costs incurred during ICU hospitalization are particularly relevant due to their high cost to the healthcare system [3].

OBJECTIVES

The objective of this study was to assess the economic burden of diseases and injuries occurring during ICU admissions in a lower-middle-income country (Brazil) during the pandemic (2020 and 2021).

METHODS

Epidemiologic data and patient-level costs were collected from 10 ICUs in Brazil between January 2020 and December 2021. A convenience sample, consisting of 2 ICUs selected in each geographic region of Brazil, with no guarantee of representativeness.

Data were extracted from Impacto-MR, a collaborative research platform coordinated by six Brazilian hospitals, including Hospital Israelita Albert Einstein, in partnership with the Ministry of Health and the National Health Surveillance Agency (ANVISA).

Clinical conditions were classified according to **Global Burden of Diseases (GBD)** standards [4].

From the hospital's perspective, a standard absorption methodology was developed to measure the cost of ICU admissions. Cost components measured included: ICU staff, depreciation, electricity, water, telephone, internet, medical gases, overhead, drugs, office and medical supplies, hemodialysis, blood transfusions, and laboratory and imaging tests.

Economic burden of ICU diseases and injuries in Brazil during the COVID-19 pandemic

RESULTS

Level 1: non-communicable diseases (such as cardiovascular diseases, chronic respiratory diseases, cancer, etc.) were the main cause (58.4% of the total economic burden of US\$ 81 million), followed by communicable, maternal, neonatal and nutritional diseases (28.2%) and other diseases, injuries and disabilities (13.4%).

Level 2: Respiratory infections and tuberculosis had the highest costs for both men and women, accounting for **22.0% of the total economic** burden and a median cost of US\$ 7,146/patient, mostly associated with COVID-19. Cardiovascular diseases (16.9%) and digestive diseases (12.1%) were the next highest costs.

For all diseases and injuries, ICU staff costs were the highest, followed by overheads and drugs.

Figure 1 - Economic Burden of Diseases and Injuries in Brazilian ICUs 2020 t

Non-communicable diseases Communicable, maternal, neonatal, and nutritional diseases Injuries Others

		Diabetes and kidney diseases, 6,0%	Total cancers, 4,3%		
Cardiovascular	Digestive diseases, 12,1%	Other non- communicable		Respiratory infections and tuberculosis.	Others, 7,5% Epilepsy, 0,9%
		Chronic respiratory	Musculoskeldisorders, 2,9%Skin andSubst use disor0.6%	22,0% HIV/ AIDS and M	Transport and unintentional
liseases, 16,9%	Neurological disorders, 7,7%	diseases, 3,3%	subcu	Other infectious diseases, 5,7% N.E.	.injuries, 4,4%

Note: Graphs based on visualization by the Institute for Health Metrics and Evaluation, GBD, University of Washington (https://vizhub.healthdata.org/gbd-compare/) Reference: GBD 2021 Diseases and Injuries Collaborators (2024). Global incidence, prevalence, years lived with disability (YLDs), disability-adjusted life-years (DALYs), and healthy life expectancy (HALE) for 371 diseases and injuries in 204 countries and territories and 811 subnational locations, 1990-2021: a systematic analysis for the Global Burden of Disease Study 2021. Lancet (London, England), \$0140-6736(24)00757-8. Advance online publication. https://doi.org/10.1016/S0140-6736(24)00757-8





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Figure 2 - Economic Burden Rank of Diseases and Injuries in Brazilian ICUs 2020 to 2021



Non-communicable diseases

2020 Rank

9 Transport & unintentional injuries

Brazilian ICUs 2020 to 2021

10 Other non-communicable

1 Respiratory infections & TB

2 Cardiovascular diseases

5 Neurological disorders

3 Digestive diseases

6 Other infectious

7 Diabetes & CKD

4 Others

8 Cancer

Communicable, maternal neonatal, and nutritional diseases



Figure 3 - Cost Components of Diseases and Injuries in

ICU staff Overhead

- Direct drugs
- Lab and imaging tests Hemodialysis and blood transfusion
- Indirect supplies Indirect drugs
- Direct supplies
- Medical Gases Depreciation
- Office supplies and others









2021 Rank					
1 Respiratory infections & TB					
2 Cardiovascular diseases					
3 Digestive diseases					
4 Neurological disorders					
5 Diabetes & CKD					
6 Others					
7 Transport & unintentional injuries					
8 Other non-communicable					
9 Cancer					
10 Other infectious					

Electricity, water, telephone and internet

CONCLUSION

More than half of the economic burden of ICUs is associated with **non-communicable** diseases.

However, respiratory infections and tuberculosis were the causes that absorbed the most resources in 2020 and 2021.

The burden of disease and injury is dynamic, and regular monitoring could help prioritize interventions and improve the allocation of limited resources.

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