

Laparoscopic Bariatric Surgery Implementation

Empirical Evaluation of over 100,000 Laparoscopic Procedures in
Brazilian Public Health System

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Brazilian Background

Population

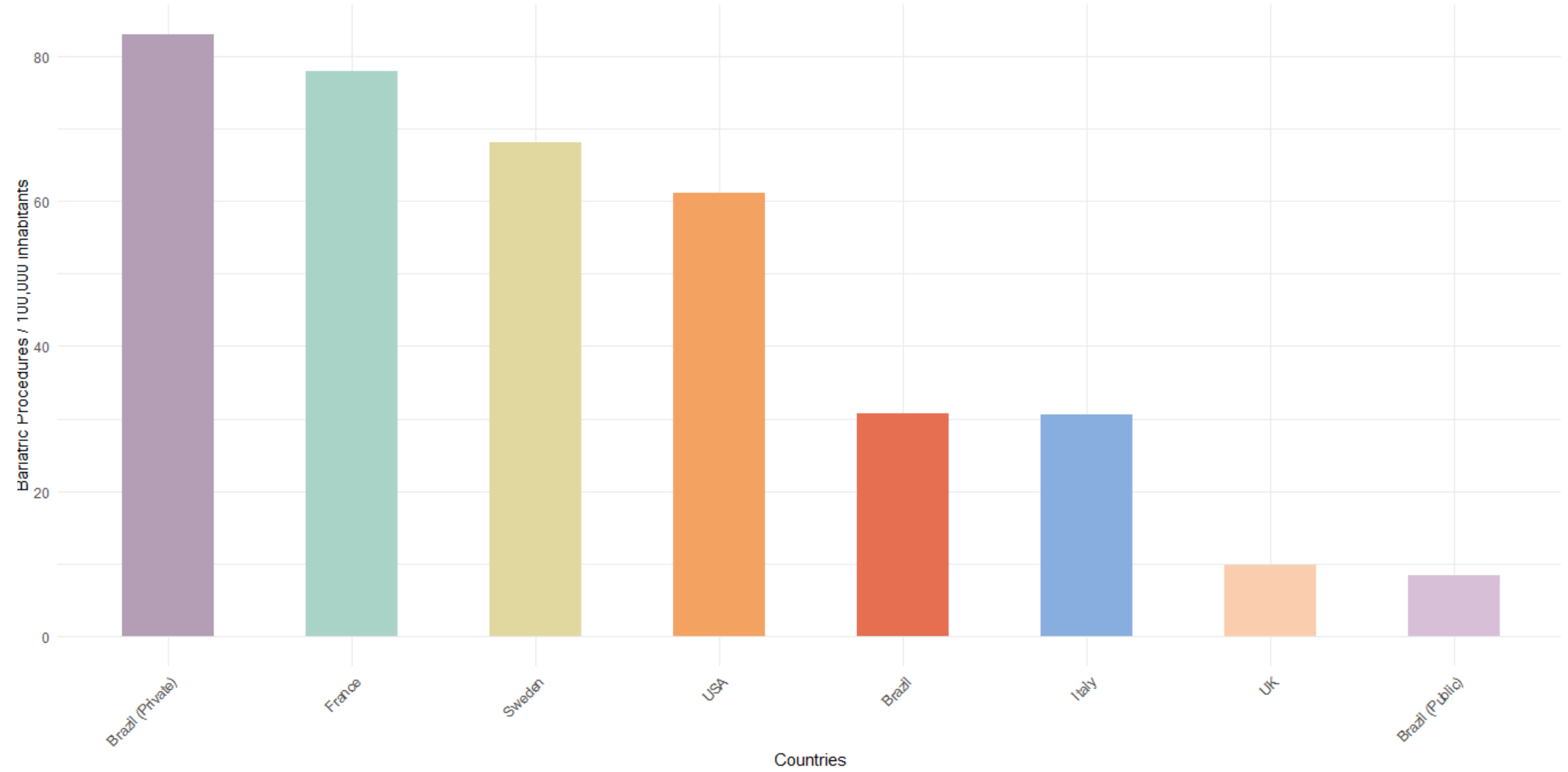
- Over 211 Million Inhabitants
- ~ 63 Million - Private Healthcare System (30%)
- ~ 148 Million - Public Healthcare System (70%)

Number of Procedures

- 65,267 Bariatric Procedures (2018)
- 52,699 Procedures - Private Healthcare (~80%)
- 12,568 Procedures - Public Healthcare (~20%)

Private and Public Healthcare Systems are substitutes, not complements in Brazil

Public vs. Private Bariatric Procedures Worldwide (2018)



Brazilian Public System's Strategy

Authorized the Implementation of Laparoscopic Bariatric Procedures in 2017



Length of Stay

Reduction of length of stay when compared to open technique

Number of Surgeries

Increase of the number of procedures performed

Costs

Scale benefits and lower costs due to reduced length of stay

Surgical Complications

Minimally invasive technique could lead to lower levels of complications

Our work aims to assess the efficacy of this implementation



Data

Brazilian Hospital Admissions System

- Registries of admissions - Patients undergoing bariatric surgeries
- Patients' characteristics
- Hospitals' characteristics

National Health Survey

- Percentage of obese population per municipality

Municipal Basic Information Survey

- Population per municipality
- Municipal characteristics

~ 110 thousand Surgeries | 2004 - 2022 | ~ 100 Hospitals

Method

Units Comparison

- Treatment Group: Hospitals that performed Laparoscopic Bariatric Surgeries after the Law
- Control Group: Hospitals that performed only Open Bariatric Surgeries

Staggered Difference-in-Differences

- Multiple treatment points (units start performing Laparoscopic Bariatric Surgeries in different periods)
- ATT (Average Treatment Effect on the Treated) estimation

Mechanisms / Robustness

- Do the effects change for hospitals that perform more laparoscopic procedures?
- Are there any differences between public and private providers?

Results

Table A1 – Effects of Laparoscopic Bariatric Surgery Implementation – Multiple Treatment Groups

	(1)	(2)	(3)	(4)	(5)	(6)
	Treatment Group					
	Baseline Mean	General	General		Type of Hospital	
			Above median	Below median	Private	Public
Outcomes						
Total Length of Stay (days)	4.368	-0.114 (0.398)	0.288 (0.503)	-0.056 (0.410)	0.016 (0.441)	-0.263 (0.358)
Length of Stay in ICU (days)	0.239	<u>0.189**</u> (0.082)	0.280*** (0.077)	0.169* (0.102)	0.220*** (0.079)	0.089 (0.129)
Costs (US\$)	1678.650	<u>85.439***</u> (32.988)	114.939*** (33.567)	75.360 (73.248)	110.816*** (42.019)	22.400 (22.048)
Number of Procedures Performed	6.340	8.488 (10.154)	9.411 (9.838)	6.592 (0.475)	7.668 (9.594)	10.030 (9.876)
Observations		11,068	7,955	7,800	9,385	6,248

Notes: *p<0.10, **p<0.05, and ***p<0.01. This table explores the effect of the introduction of Laparoscopic Bariatric Surgery on Brazilian Unified Health System hospitals. Coefficients in columns 2 to 6 refer to the Average Treatment Effect on the Treated units (ATT).

**Average Treatment Effect
(changes due to the treatment)**

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Average Treatment Effect

(percentage of laparoscopic procedures above and below median - 52,26%)

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**Average Treatment Effect
(private vs. public providers)**



Discussion

- Private Health Providers serving individuals from the Public Health System might have financial incentives to extend the length of stay of patients
 - Our results suggest that, despite the expectations, the implementation of Laparoscopic Bariatric Surgeries has not brought the benefits proposed so far
 - The effects observed (increase in ICU length of stay and costs) occur in hospitals that perform a high percentage of laparoscopic procedures, suggesting that the effects are not due to a lack of experience / technical knowledge
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Conclusion

- Laws are not enough to ensure the desired outcomes of Laparoscopic Bariatric Surgeries
- Brazilian Health authorities should implement more strict protocols and monitoring tools to guarantee the efficacy of these procedures

Thank You

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