

# COVID-19 pandemic impact on paediatric dentistry treatments in the Brazilian Public Health System

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Brazil has the largest National Public Health System (SUS) in the world. The system includes free dental care, covering different specialties, including paediatric dentistry. SUS covers almost 75% of the Brazilian population throughout the country and is the only available option for the more vulnerable.<sup>1</sup> Brazil is currently at the epicentre of COVID-19 pandemic, with more than 2 million infected and more than 120 000 deaths to date.<sup>2</sup> Due to the pandemic, since dentists are professionals at higher risk of contamination and spreading the disease, following World Health Organization (WHO) recommendations, most of the dental clinics significantly reduced their activities, elective dental treatments were postponed with mainly emergency and urgent care remaining.<sup>3</sup> This study aimed to describe the impact of COVID-19 pandemic on the paediatric dentistry treatments offered by the Public National Systems in Brazil.

A retrospective longitudinal (from January 2019 to May 2020) ecological study was carried out using secondary data from the sources: the SUS Computer Department information systems (DATA-SUS) and the Brazilian Institute of Geography and Statistics (IBGE). The dependent variable was monthly calculated (from March of 2019 to May of 2020) as the absolute number of paediatric procedures (restoration, tooth extraction, and endodontic in the primary teeth)

carried out by 10 000 inhabitants-month in the Brazilian Public Health Services (SIA-SUS). The exposure variable was the impact of the COVID-19 pandemic evaluated in different ways. Two time points were used: (a) the period of the first case described in Brazil (February 2020) and (b) the period of exponential growth (April). Also, months within the exponential growth (April and May) were compared with the respective months in 2019. The results of exponential growth were stratified by Brazilian Regions are as follow: South, Southeast, Central-west, North, and Northeast. Due to data overdispersion, a multilevel mixed-effects negative binomial regression was used to analyse the longitudinal associations between the impact of the COVID-19 pandemic and the number of dental procedures. Analyses were performed using the STATA 16.0 software (<https://www.stata.com>).

The sample corresponded to almost all Brazilian municipalities (5564 of 5570) with dental records on DATA-SUS. A reduction of 66% (IRR = 0.34, 95%CI 0.32-0.35) was observed on paediatric treatments performed on SUS when considering the first COVID-19 case. Similar results were observed in restorative (IRR = 0.32, 95%CI 0.31-0.33), tooth extraction (IRR = 0.36, 95%CI 0.35-0.37), and endodontics (IRR = 0.45, 95%CI 0.41-0.48). Considering the period of exponential contagion (April), a drastic reduction of 89%

in the total paediatric dentistry procedures was observed (IRR = 0.11, 95%CI 0.10-0.12). When the analysis was performed comparing April and May from the current year to the respective months in 2019, paediatric procedures performed in public service were near to a complete shutdown (IRR = 0.04, 95%CI 0.03-0.05 in April; and IRR = 0.04, 95%CI 0.03-0.05 in May). Similar results were observed for all procedures (Table 1). Considering Brazilian Regions, the reduction was more evident in the Southeast (Figure 1).

The overall result from this study is that COVID-19 pandemic has strongly and negatively impacted on the paediatric treatments carried out in the Brazilian Public Health System, especially when the Pandemic started its exponential growing. This reduction was similarly observed in all procedures, and these results are consequence of social isolation, quarantine, and health and sanitary recommendations to reduce the activities in dental care, in order to avoid the disease contamination.<sup>3</sup> Even though children have low risk of death due to COVID-19, considering the unspecific and milder symptoms in children, and considering the wide period of incubation (from 2 to 14 days), child patients and parents should be considered as possible SARS-CoV-2 carriers.<sup>4</sup> Although the decrease was significant considering the beginning of pandemic, when the pandemic started to grow exponentially the treatments reduction was dramatic. When comparing the months of April and May, when the pandemic was spreading out of control, to the same months of last year, the observed

### Why this paper is important to paediatric dentists

- The COVID-19 pandemic affected the number of paediatric dental procedures carried out in Primary Health Care in Brazil.
- Children attending in the public health system are left almost without dental care during the Pandemic in Brazil.
- The COVID-19 pandemic strongly and negatively impacted on the paediatric treatments carried out in the Brazilian Public Health System.

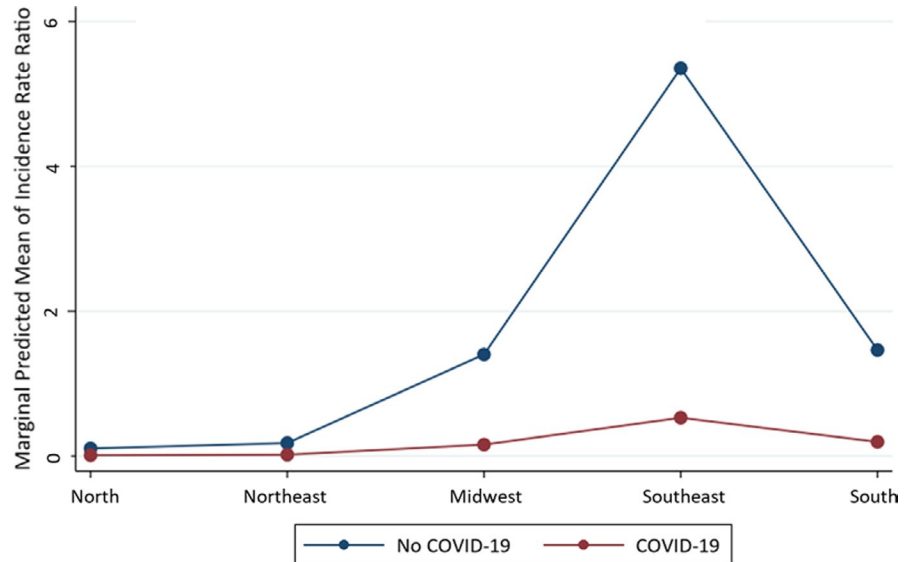
decrease in paediatric procedures was even more remarkable. Also, the decrease in paediatric treatments was different among Brazilian regions, with a higher reduction in the Southeast Region, which is the country's richer region, with more working dentists and one of the region's most affected by the COVID-19 pandemic.

The sudden and continuous interruption of dental care, however, may increase the already overloaded demand and overburden the services in the future.<sup>5</sup> Brazil has observed an improvement in the oral health indicators, especially among children and adolescents.<sup>6</sup> One of the reasons contributing

**TABLE 1** Incidence rate ratio (IRR) and 95% confidence interval (95%CI) for restorative, tooth extraction, endodontic and total procedures in models of multilevel mixed-effects negative binomial regression for Brazilian municipalities (N = 5564). January 2019 to May 2020

Group of procedures	Impact of COVID-19							
	Complete longitudinal analysis from 2019 January to 2020 May				Compared to the respective months in 2019			
	From 1st COVID-19 case in Brazil (February 2020)		From the start of exponential contagion (April 2020)		April		May	
	IRR (95%CI)	P-value	IRR (95%CI)	P-value	IRR (95%CI)	P-value	IRR (95%CI)	P-value
Restorative								
Before pandemic	1	<.001	1	<.001	1	<.001	1	<.001
Pandemic	0.32 (0.31-0.33)		0.09 (0.08-0.09)		0.03 (0.02-0.04)		0.03 (0.02-0.03)	
Tooth extraction								
Before pandemic	1	<.001	1	<.001	1	<.001	1	<.001
Pandemic	0.36 (0.35-0.37)		0.16 (0.16-0.17)		0.07 (0.06-0.08)		0.07 (0.06-0.08)	
Endodontic								
Before pandemic	1	<.001	1	<.001	1	<.001	1	<.001
Pandemic	0.45 (0.41-0.48)		0.22 (0.19-0.25)		0.09 (0.06-0.15)		0.07 (0.05-0.11)	
Total of procedures								
Before pandemic	1	<.001	1	<.001	1	<.001	1	<.001
Pandemic	0.34 (0.32-0.35)		0.11 (0.10-0.12)		0.04 (0.03-0.05)		0.04 (0.03-0.05)	

**FIGURE 1** Marginal predictive mean of incidence rate ratio on of total paediatric procedures performed in the Brazilian National Public Health System according to the COVID-19 pandemic and Brazilian regions. Brazil (n = 5564) [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]



to better oral health in Brazil was the inclusion of dentistry in the Public National System and the dental care coverage being expanded to the entire country.<sup>1</sup> Indeed, the negative impact of the pandemic could compromise the maintenance of the good results observed over the past decade.<sup>7</sup> Therefore, efforts to reduce the pandemic's negative impact in child oral health should be emphasized, such as the tele-dentistry for primary health care,<sup>8</sup> which could be adapted for preventive approaches. A recent National online survey demonstrated that dentists in the whole country have significantly reduced their time in clinical practices, reducing the number of patients cared in daily basis and mostly relying in urgency and emergency care. The reduction was significantly higher for dentists working in public dental services than in private dental clinics.<sup>3</sup>

Yet, dental urgencies still require clinical care and, for that, considering the high risk incurred by the dental office, dentists should adopt rigid infection control procedures and favour the use of minimally invasive approaches, specially avoiding the use of equipment that generates aerosol, which increases the potential for contamination.<sup>9-11</sup> A survey carried out with Brazilian dentists showed that they are incorporating new protective equipment in their routines and relying on health organizations and professional associations on how to effectively prevent the contamination.<sup>3</sup> Despite precautions must be taken during the pandemic, the maintenance of children oral care is essential, especially considering the occurrence of dental pain and it's negative impact in the children oral health-related quality of life.<sup>12</sup> Public policymakers should strongly consider to coordinate children oral care within the Public Health Systems, with the adequate and needed protection, at least for urgency and emergency care, as children on SUS are those with the higher burden of dental diseases<sup>13,14</sup> and also more vulnerable to the effects of pandemics. This situation is alarming

once the Pandemic in Brazil has already claimed more than 120 000 lives, with the country experiencing more than 1000 deaths/daily in the past 2 months<sup>2</sup> and there is no signal of relief in the near future.

Therefore, the COVID-19 pandemic has affected the number of paediatric dental procedures carried out in Primary Health Care in Brazil. This reduction is of concern since children more vulnerable and with the higher burden of oral disease are left without dental care due to the pandemic, which could worsen oral health conditions and increase disparities.

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#### CONFLICT OF INTEREST

None.

#### AUTHOR CONTRIBUTIONS

LAC and FSC conceived the ideas, analysed the data, collected the data and wrote the paper. ERS and GTD collected the data and wrote the paper. FFD conceived the idea, supervised the data analysis, wrote the manuscript and prepared the final version for submission.

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