

# Public oral health services: impacts caused by the COVID-19 pandemic

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**Abstract:** The aim of this study was to describe the oral health services offered by the Unified Health System in the northern macro-region of Minas Gerais, Brazil, during the COVID-19 pandemic. This was an observational, cross-sectional and descriptive study. Data collection took place between August and September 2020 through the completion of online questionnaires by oral health managers in the northern municipalities of Minas Gerais and by consultation of information available in the Special Epidemiological Bulletin Coronavirus North Macro-region nº 14. After collection, data were transferred to SPSS® (Statistical Package for the Social Sciences for Windows, version 24.0). Analyses were performed using frequency, mean, standard deviation and percentages. It was found that all included municipalities suspended elective treatments and maintained emergency dental care at all levels of care. In 62.5% of municipalities there were oral health professionals contaminated by COVID-19. Oral health teams implemented specific interventions to address the pandemic, with the most frequent being tele-orientation (74.7%), use of sanitary barriers (72%), and telemonitoring (68%). At the beginning of the pandemic, 62.5% of municipalities lacked personal protective equipment. Considering these results, it was found that the COVID-19 pandemic impacted the supply of dental services in northern Minas Gerais due to the suspension of elective care, contamination of professionals, lack of personal protective equipment, and development of new interventions. Thus, oral health teams had to adapt to new contexts of health interventions to face COVID-19 and maintain dental care services.

**Keywords:** Coronaviridae; Covid-19; Oral Health; Public Health.

## Introduction

On March 11, 2020, the World Health Organization (WHO) declared the infection by the new coronavirus (COVID-19) a pandemic.<sup>1</sup> Brazil recorded its first official case of the disease in a 61-year-old man from São Paulo who had returned from a trip to Italy. By May 21, 2020, Brazil already had more than 20,000 deaths from COVID-19. Approximately 40 days later, the country already had 30,000 deaths and 500,000 infected with SARS-CoV-2.<sup>2</sup>

The virus is transmitted mainly by direct or indirect personal contact via droplets in the breath exhaled by an infected person.<sup>3</sup> Due



to close and continuous contact with saliva, blood, and other oral fluids, dental treatment poses a significant risk of contamination and spread of the virus.<sup>4</sup> Therefore, dental procedures that generate aerosols became a risk during the pandemic.<sup>5</sup> For infection control reasons, the WHO recommended postponing elective procedures in all countries with COVID-19 until the end of the acute phase of the pandemic. However, some dental conditions require urgent treatment.<sup>4</sup>

In Brazil, the Ministry of Health published a technical note in March 2020 recommending that oral health services prioritize measures to prevent the spread of the virus and advising that all elective dental treatments be suspended, and only emergency dental treatments be maintained.<sup>6</sup> For the accomplishment of ineligible dental procedures, the Brazilian Federal Council of Dentistry has established norms and guidelines in order to minimize the spread of the virus in dental practice, including the use of individual protective equipment that increases biosafety, such as the use of facial shields, surgical or N95 or FFP2 masks and waterproof aprons or cloaks.<sup>7</sup>

In order to enable the adaptation of dental practice in face of COVID-19, teledentistry, a form of application of telemedicine in the dental field, was regulated in Brazil in June 2020 as a strategy for health promotion and prevention of diseases and oral health problems in the population through telemonitoring and teleorientation in public oral health services.<sup>7,8</sup>

Teledentistry expands oral healthcare options by providing various services remotely, such as: tracking, active searching, monitoring of priority users, at-risk and individuals with individuals with systemic problems, suspected COVID-19 and contacts, through telemonitoring and initial hearings and individual or group educational activities through teleorientation. Although telemedicine or similar programs cannot solve all health problems, they are adequate for the COVID-19 pandemic scenario.<sup>9</sup>

In Brazil, health is guaranteed in the Constitution as a right for all. Under this proposal, the Unified Health System (SUS) and its principles are based on comprehensive care, equity, universality and social control of health interventions. Oral health care is

integrated in the SUS in a care network that provides low, medium and high complexity care.<sup>10</sup>

In January 2021, there were 579,469 COVID-19 cases and 12,469 COVID-19-related deaths in Minas Gerais. In the northern macroregion of Minas Gerais, the first case of infection by SARS-CoV-2 was registered in April 2020, and by January 2021, 31,996 cases and 546 deaths from the disease had been confirmed in the macroregion.<sup>11</sup> Considering the implications of federal and state recommendations for dental care in public oral health services, this study aimed to describe the oral health services provided by SUS in the northern macroregion of Minas Gerais during the COVID-19 pandemic.

## Methodology

An observational, cross-sectional and descriptive study was conducted in the municipalities of the North Health macroregion, one of the 13 health macroregions established in the Regionalization Master Plan of the Minas Gerais State Health Department. The North macroregion, whose pole municipality is Montes Claros, is made up of 86 municipalities divided into nine health microregions.

The North macroregion is a geographic region characterized by limited social indicators, marked social inequality, wide territorial extension, a predominantly rural population, low population density, and long distances between municipalities.<sup>12</sup> It has the municipality with the lowest Municipal Human Development Index in the state.<sup>13</sup>

Initially, data were collected through the completion of online questionnaires by the oral health managers of the municipalities in the north of Minas Gerais after they signed the free and informed consent form, which was made available through a link. The questionnaires were developed by the researchers themselves and contained questions about changes and adaptations in oral health services during the pandemic. As a pilot study had been conducted previously, there was no need to adapt the data collection instrument. The questionnaires were applied between August and September 2020.

The spatial dimension of the study included all oral health teams, mobile dental units, dental specialty

centers, regional dental prosthesis laboratories and hospital dental care services present in the 86 municipalities of the northern macroregion of Minas Gerais.

To contextualize the COVID-19 pandemic in the northern macroregion of Minas Gerais, data on the number of confirmed cases of COVID-19 and the number of inhabitants for each municipality participating in this study were collected to establish the prevalence of COVID-19 for each municipality. This information was obtained respectively from the Epidemiological Bulletin of COVID-19 Norte de Minas Gerais n° 14 and from the Brazilian Institute of Geography and Statistics database.<sup>11,13</sup>

Once the information and data were collected, they were exported to SPSS® (Statistical Package for the Social Sciences for Windows, version 24.0). Analyses were performed using frequencies and percentages. A calculation of the weighted mean and standard deviation was performed to obtain the prevalence of COVID-19 for the municipalities that participated in this study, taking into account their population size. The calculation was obtained for every 1000 inhabitants. The study was approved by the institutional Ethics Committee (#4.185.913).

## Results

Of the 86 municipalities in the northern Minas Gerais macroregion, 64 (74.4%) participated in this study, represented by oral health managers.

The calculation of the weighted average prevalence of COVID-19 was carried out among the municipalities that participated in this study (mean = 0.0058; SD: 0.0049). The majority (61.9%) were below average.

In the online questionnaire, managers answered questions about changes and adaptations in oral health services during the pandemic. Most managers were dentists (71.9%), and 75% were female. Regarding the recommendation to suspend elective care and maintain emergency dental care, all municipalities accepted the suspension in primary, secondary, and tertiary care.

Oral health professionals were contaminated by COVID-19 in 62.5% of the municipalities. Managers emphasized that oral health teams implemented

**Table.** Frequency of municipalities in the North of Minas Gerais North macro-region that carried out actions interventions by oral health teams to combat COVID-19.

Actions to confront COVID-19	Municipalities
	n (%)
Tele-orientation of patients	
Yes	46 (71.9)
No	18 (28.1)
Use of sanitary barriers to control the transmission of COVID-19 in the municipality	
Yes	43 (67.2)
No	21 (32.8)
Telemonitoring of patients	
Yes	42 (65.6)
No	22 (34.4)
Preparation and/or delivery of oral health informational materials to the public by digital means	
Yes	36 (56.3)
No	28 (43.7)
Participation in in-person team meetings	
Yes	31 (48.4)
No	33 (51.6)
Participation in continuing education actions as a listener/student	
Yes	30(46.9)
No	34(53.1)
Participation in meetings with the health team through video-conference	
Yes	20(31.3)
No	44(68.7)
Providing podcasts with oral health guidelines to the public	
Yes	14(21.9)
No	50(79.1)
Periodic visits to users according to the demand of the team and population	
Yes	12(18.8)
No	52(81.2)
Video conferencing with the population providing distance collective action for oral health guidance.	
Yes	5(7.8)
No	59(92.2)

special actions to manage COVID-19 (Table) during the pandemic. Among these actions, the most frequent were teleorientation (74.7%), use of sanitary barriers (72%), and telemonitoring (68%).

Managers were also asked about the availability of personal protective equipment (PPE). At the beginning of the pandemic, there was a shortage of PPE in 62.5% of the municipalities. It was noted that 7.8% of the municipalities were still suffering from a lack of PPE.

## Discussion

Most municipalities (61.9%) in the northern macroregion of Minas Gerais had a low prevalence of COVID-19, which was 58 cases per 1000 inhabitants. At the time of the survey, the region was ranked sixth place in terms of number of notifications throughout the entire state of Minas Gerais and stability.<sup>14</sup> Data from Bulletin n° 27 of the Secretariat of the State of Minas Gerais confirm this finding, evaluating that when the cumulative case data are broken down by municipality size, it is found that the larger the municipality, the higher the score.<sup>14</sup>

This study has shown that the state recommendation to suspend elective care and maintain emergency care was followed at the three levels of care in the oral health care network. These data show that the public system actively confronted the pandemic and supported the spontaneous demand for dental urgency. In 1989, Brazil publicly and universally established the SUS which, in this pandemic scenario, allowed for a coordinated response among the various states of the Federation and presented public policies and government strategies to prevent the rapid spread of the disease in the absence of effective treatment.<sup>2</sup> This result endorses the importance of the community-based approach of the SUS, which is organized in a network based on comprehensive primary health care (PHC). Despite structural and financial obstacles, Brazilian PHC has achieved positive results that have made it internationally renowned.<sup>10</sup>

Thus, PHC should be considered an important pillar in emergencies, such as dengue, Zika, yellow fever, chikungunya and now COVID-19 epidemics. Relying on what is the essence of PHC, such as area knowledge, access, linkage between user and health team, comprehensive care, surveillance of vulnerable families, and monitoring of suspicious and mild cases, is a fundamental strategy to both

contain the pandemic and prevent exacerbation of COVID-19 patients.<sup>15</sup>

The COVID-19 pandemic has profound implications for health systems around the world, as health care will continue to be limited from the beginning of 2020.<sup>16</sup> In contrast, the suspension of elective care decreases the early detection of lesions or oral diseases that could be detected in routine consultations and treated and/or biopsied in a timely manner.<sup>17</sup> In a recent study, an alarming decrease in the rate of oral biopsies in 2020 was observed in all Brazilian regions, considering the average of March, April, and May compared to previous years. This alarming situation was accompanied by a general decrease in elective dental consultations in Brazil.<sup>6</sup>

This study found that a significant percentage (62.5%) of municipalities had oral health professionals that were contaminated by COVID-19. Therefore, testing for COVID-19 in should be given with the same priority in dental as in hospital health professionals. The risk of a dentist testing positive for COVID-19 being potentially infectious when treating patients in emergency dental services should not be underestimated.<sup>18</sup> In Italy, 4824 health professionals had been infected with COVID-19 by March 22, and 24 physicians had died, which led the Italian Federation of Health Professionals to consider that a hospital-centered model is inadequate for the control of the coronavirus. Epidemics should be neutralized by well-planned surveillance at the local level by identifying and isolating suspicious and/or symptomatic cases.<sup>19</sup>

With the paucity of vaccines and proven effective treatments, social distancing strategies have been identified as the most important interventions for the control of COVID-19. However, for healthcare teams, especially professionals directly caring for patients with a suspected or confirmed diagnosis of COVID-19 in primary care services, emergency departments and hospitals, the recommendation to stay at home does not apply.<sup>20</sup>

Early treatment of emergencies in acute dentistry is important to avoid complications and hospitalizations. One concern is that by suspending elective dental care, more patients will develop acute dental infections that threaten the airway and require intensive care.

Patients with severe swelling may develop life-threatening emergencies, which may increase risks in the event of limited healthcare availability.<sup>21</sup>

The COVID-19 pandemic has exacerbated socioeconomic and ethnic inequalities,<sup>22</sup> and has undoubtedly restricted access to oral healthcare services. Dental services need to be more responsive to the needs of their registered populations and prioritize care for groups with high care needs, such as those on low income, and marginalized and vulnerable groups, including those with multiple morbidities. Currently, restrictions of aerosol-generating procedures provide an opportunity to redirect dental care towards less invasive and more preventive approaches.<sup>23</sup>

In this context, this investigation has shown that oral health services had to adapt its practices by implementing specific measures to cope with COVID-19. These measures mainly included teleorientation, implementation of sanitary barriers, and telemonitoring. Other studies conducted in Brazil also indicated the involvement of dental professionals in these actions to fight COVID-19.<sup>24,25</sup>

Telemonitoring and teleorientation are covered by teledentistry regulated in Brazil by the Federal Council of Dentistry in June 2020. Telemonitoring consists of the remote monitoring of patients undergoing treatment and may include the collection of clinical data, transmission, processing, and management by a health professional using an electronic system. In the context of COVID-19, this measure is also intended to monitor contacted, suspected and/or diagnosed patients with this disease. Teleorientation, on the other hand, is used solely to determine the best time to perform face-to-face care using a pre-clinical questionnaire.<sup>8</sup>

The suitable adoption of these technologies increases responsiveness of the health system, facilitates people's access to qualified guidance, helps reduce congestion in PHC and other levels of care, and assists ordering the flow of people within the system. In addition, given the potential absence of many health professionals during the epidemic, teledentistry provides an opportunity for these workers to work remotely.<sup>15</sup>

Soon, these technologies should not operate only as an additional service of the care network or

only in this time of confrontation with COVID-19. The benefits of telehealth to the system indicate the importance of its wider adoption in SUS and especially its integration with PHC. Such a measure, if properly implemented at this level of care, can lead to positive outcomes in terms of access, resolvability, comprehensiveness of care, convenience for people, and monitoring of patients with chronic diseases being cared for by healthcare units.<sup>15</sup>

However, there are few teledentistry projects in developing countries, due to the conservatism of those in charge and the lack of resources, infrastructure, and support equipment. Another problem is that dental care services is still based on emergencies and curative treatments, while not enough importance is given to preventive care. With the COVID-19 crisis, the need has arisen to incorporate teledentistry into the routine of dental care, especially in the Unified Health System.<sup>8</sup>

Another intervention carried out by municipalities in the northern macroregion of Minas Gerais through oral health teams was participation in sanitary barriers. This was also found in other studies.<sup>24,25</sup> After the dissemination of municipal decrees throughout the country, it was decided to install sanitary barriers at the entrances and exits of cities as measures to prevent the virus from circulating between municipalities. Therefore, oral health professionals can collaborate with epidemiological surveillance, reinforcing prevention measures against coronavirus.<sup>25,26</sup>

The oral health team also participated in preparing and/or delivering oral health information materials to the public through digital means, in-person team meetings, and continuing education actions as a listener/student. Given the new reality of dealing with COVID-19, it was necessary for oral health professionals to develop new skills as a member of the multidisciplinary team that makes up strategic family health. This result is consistent with other studies showing that the performance of the oral health team is not limited to interventions in the oral cavity, but can also collaborate effectively in the prevention of health problems.<sup>24,25</sup>

The managers of the municipalities involved in this study reported the lack of PPE at the beginning of the

pandemic, and in a small proportion of municipalities the problem persisted up to the time of the present investigation. In the early stages of a pandemic, when vaccine is not yet available, PPE plays an important role in disease control.<sup>27</sup> Other authors corroborate this finding. Meng (2020) suggested that, given the suspension of elective care, appropriate PPE must be available to treat dental emergencies. However, the distribution of PPE was a major challenge at the beginning of the pandemic as these materials were not available or were in short supply.<sup>28</sup>

The present study used a brief data collection instrument, which is a limitation justified by the pandemic, the constant changes in the scenario, and the overload of the work processes of the oral health teams. More meaningful studies are needed to better understand the impact of the COVID-19 pandemic on the public oral health service.

## Conclusion

The COVID-19 pandemic affected the supply of dental services in the northern macroregion of Minas Gerais as elective treatments were suspended, personal protective equipment was lacking/scarcely, and new interventions had to be developed, either remote or on-site. It was noted that, despite the restriction to emergency care in most municipalities, managers reported that there were oral health professionals infected with the new coronavirus. In order to contain the spread of the virus in the dental environment and enable safe practices for both professionals and patients Proactive, preventive and educational measures need to be established in the form of protocols. In this sense, oral health teams have had to adapt to new contexts of health interventions to cope with COVID-19.

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