Coping strategies for COVID-19 primary care: a mixed method study

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Abstract *This article aims to analyse the CO-VID-19 coping strategies adopted by municipal health managers in two regions. A mixed method study of the sequential explanatory type was carried out with municipal health managers and primary care coordinators. The quantitative stage was developed with the application of an instrument to 42 managers to identify coping actions and associations with demographic and epidemiological data of COVID-19 in the municipalities. The results aimed at the definition of 15 participants and the collection of data in the qualitative stage, enabling approximation of the meta inferences of the study. Of the actions implemented, there were immediate actions to monitor cases, organize new care flows and encourage the population to adopt nonpharmacological measures. Regional articulation was the device that allowed for expansion and municipal autonomy for testing, reducing contamination and deaths among citizens. Municipal coping strategies that focused on the surveillance of cases and expansion of testing showed positive outcomes in terms of the number of infections and deaths from CO-VID-19.*

Key words *COVID-19, Regional health planning, Primary health care, Health manager*

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Introduction

After two years of fighting the coronavirus disease 2019 (COVID-19) pandemic, a disaster in the number of cases and deaths was observed in some countries of the world, such as Brazil, due to the lack of treatment in the first year and to inequalities in access to immunobiologicals in the second year[1]. A study published by the Pan American Health Organization found an excess of deaths directly and indirectly associated with COVID-19 (approximately 14.9 million) in 2020 and 2021[2].

The underfunding of the Unified Health System (SUS) was exacerbated in 2016 by the Constitutional Amendment No. 95, which reduced the amount of health expenditures[3]. As a result of the pandemic, costs in this department were not adjusted and resources remained scarce, resulting in insufficient supplies[4].

The federal government's lack of coordination in the management of the pandemic delegated to states and municipalities the responsibility of ensuring coordinated and more effective actions[5]. However, the possibilities for success in this scenario rise when health systems are prepared, governed and financed at all levels in an integrated manner[6,7].

Given the absence of national mandates and coordination to combat the pandemic, experiences of consortia at the state level and between states in the northeast region of the country have been reported[5]. In the pandemic context, PHC faced difficulties, such as changes in the work model and the digital health revolution, and had to plan actions for different times, according to the epidemiological scenario[8]. In addition, it reduced the activities inherent to the processes for the containment of COVID-19 and showed the need for public health systems to be rethought and the importance of PHC with actions related to health surveillance[9,10].

Based on the foregoing, this study aims to analyse the COVID-19 coping strategies adopted by municipal health managers in two regions.

Methods

Study design

This is a mixed method study of the sequential explanatory type in which quantitative elements are implemented and, based on the analysis and results obtained, the qualitative stage is guided[11]. Data integration is presented at three levels[12]: in the study design, as a visual model; in the collection and analysis of data, through the connection; and at the level of data interpretation, performed through narrative and visual display, and joint display.

Figure 1 shows the visual model[13] that details the integration of data in the study design, with the following global guiding question: what were the strategies for coping with COVID-19 adopted by the municipal health managers?

Following the precepts of the mixed method[11], through a connection, the data and the results of the quantitative phase were used to implement criteria for inclusion of the participants and construction of the guiding questions of the qualitative phase.

Scenario

The study was conducted in the municipalities that make up health regions 15 and 20, located in the northern macroregion of the state of Rio Grande do Sul (RS). Both regions are composed of 26 municipalities, for a total of 52. The municipalities have populations ranging from 1,886 to 34,328 inhabitants, with indigenous populations in 12 of them (23.07%). In addition, 50 municipalities (96.15%) had full coverage with family health teams.

Population

Municipal health managers or PHC managers of the 52 municipalities of the two health regions participated in the study. The main researcher chose these municipalities because of her relationship with management in these regional decision-making arenas.

Selection criteria

The inclusion criteria were as follows: occupying the position of municipal health manager or PHC manager for more than one year. Thus, the participants would have spent the initial period of the COVID-19 pandemic facing the challenges it posed to their communities, which would contribute to the objectives of this study.

Sample definition

In the quantitative phase, convenience sampling was used, in which one representative from each of the 52 municipalities that met the inclu-
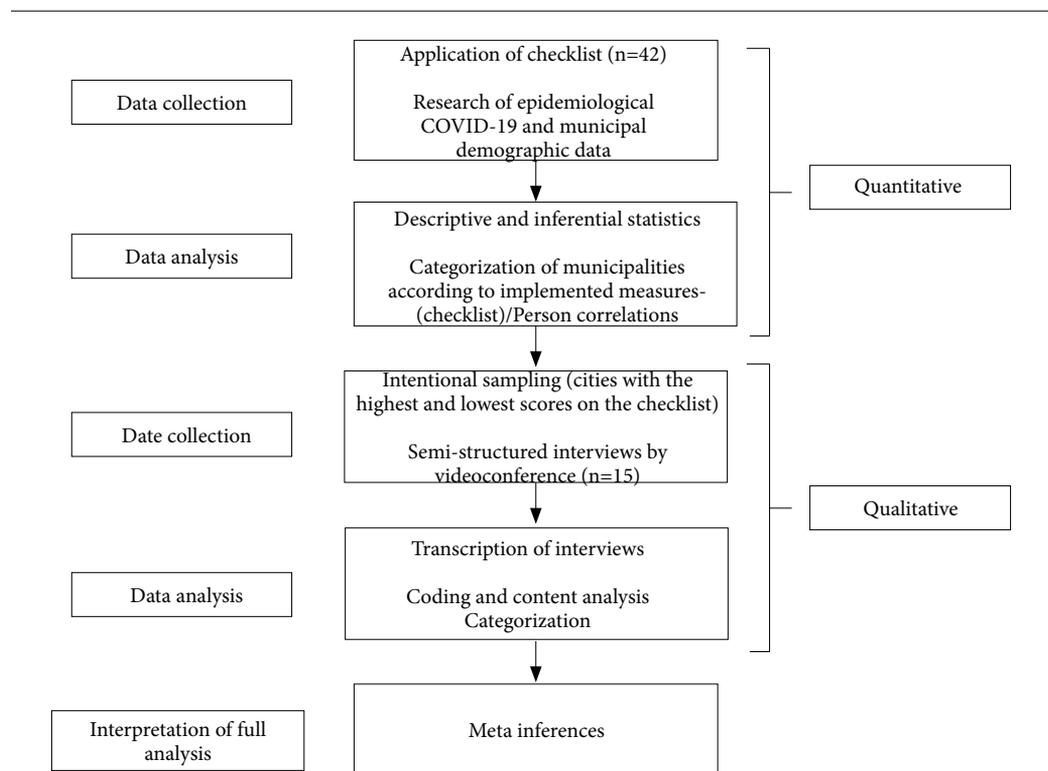
Figure 1. Visual model of integration at the design level of the sequential explanatory study (adapted) [13].

sion criteria was invited. Of these, 42 agreed to participate and compose the sample. In the qualitative phase, the sample was intentional[14], with PHC managers or managers from 15 municipalities who presented high and low performances in the quantitative phase and agreed to participate in the second phase.

Instruments used to collect information

In the quantitative phase, the following instruments were used: sociodemographic form for characterization of the population of the municipality, form for epidemiological data on COVID-19 and a checklist prepared for the collection of data on the actions municipal health managers took to combat COVID-19.

The checklist was related to the mitigation measures of COVID-19 with proposals guided by the World Health Organization (WHO)[15], Pan American Health Organization (PAHO)[16] and Brazilian researchers[17]. It consisted of 20 variables with a nominal dichotomous categorical scale of

"yes" or "no" responses to identify the level of implementation of the measures in the sample.

In the qualitative phase, interviews were conducted by videoconferencing to ensure the measures of isolation and social distancing and were recorded with the permission of the participant. The semistructured questions were prepared from the quantitative results, with the purpose of illustrating the situations and deepening gaps arising from the first stage of the mixed survey.

Data collection

The collection of quantitative data took place between July and August 2020, with application of the checklist by telephone, and in March 2021, by means of a search of epidemiological data on official websites of the Municipal Health Department and the State Department, in addition to sociodemographic data on the Brazilian Institute of Geography and Statistics (IBGE) website.

The qualitative data collection took place in June and July 2021 by videoconferences previ-

ously scheduled with the participants. The duration of the interviews ranged from 30 to 90 minutes. The data collection of the two phases of the study was performed by the main researcher.

Data processing and analysis

The data obtained in the quantitative phase were tabulated in an Excel spreadsheet, and the derived variables were calculated, such as proportion, sum and rates, for later exportation to the Statistical Package for the Social Sciences (SPSS, version 18.0). The normality of continuous variables was assessed using the Shapiro-Wilk test. Correlations were calculated using Pearson's correlation coefficient, and all analyses with $p < 0.05$ were considered significant.

The data resulting from the qualitative phase were initially transcribed in full. Subsequently, adopting the technique of content analysis [14], the three recommended steps were performed: preanalysis, exploration of the material and treatment of the results, with their interpretation. In the preanalysis stage, the transcribed and treated speeches were exhaustively analysed to elaborate the categorization by units of context with which they were similar. In the second phase – exploration of the material – the nuclei of meaning within the categories were sought. Finally, in the third stage, the results were interpreted.

Ethical aspects

The study followed the guidelines of Resolution No. 466/12 of the National Health Council regarding submission and approval by the Research Ethics Committee under No. CAE 31545920.2.0000.5327. To guarantee the anonymity of the participants, the statements were coded with the letter E (respondent) and numbered according to the chronological order of the interviews.

Results

The results are presented sequentially, with the integration of the quantitative and qualitative phases through a visual joint display with the meta inferences obtained, following the recommendations and rigor of mixed methods studies[13-18].

Quantitative phase

In the municipalities under study, the population density is 30.65/km², and on average, 55.6% of the population resides in rural areas. Regarding the characteristics of the managers, there was parity with 50% of both sexes, and 38% (n = 16) had been in the position for less than two years. Regarding education, 62% (n = 26) had higher education; of these, 50% (n = 13) had training in the field of health.

The results of the first phase, derived from the application of the checklist, revealed that all municipalities implemented the following mitigation measures: (1) support from multidisciplinary teams in monitoring cases and the flow of care for urgent/emergency cases or telecare; (2) home monitoring of cases of flu syndromes; (3) the role of community health workers in the prevention of COVID-19; and (4) induction of nonpharmacological intervention actions for the population. In turn, the strategies implemented in 90% of the municipalities were (1) coordination with other agencies and creation of the Crisis Committee to address the fight against the pandemic; (2) actions to avoid the shortage of personal protective equipment (PPE); (3) creation of new care flows in PHC for usual demands and flu syndromes; and (4) dental care strategy. Those implemented in less than 50% of the municipalities were the delivery of medicines to homes and the teams' home office work. In the evaluation of the 20 mitigation strategies suggested in the checklist, one municipality implemented only 11, while the four municipalities that implemented the most listed 19 strategies. The mean was 17 strategies in the sampling of municipalities.

Chart 1 presents the results of Pearson's correlation analysis, as well as the gaps that guided the elaboration of the guiding questions for the qualitative phase.

Qualitative phase

In the sample, of the 15 municipal health managers or professionals who worked on the front line of municipal management, ten were women; 11 had higher education, specifically in health; and six participants were from the nursing field.

Based on the thematic analysis of the testimonies, three categories emerged: organization of

the service network at the municipal level; challenges of municipal management in coping with the pandemic; and regional coordination and expansion of COVID-19 testing. The results of each category are presented in Chart 2, together with the meta inferences.

Discussion

According to the data found, new flows were necessary and implemented according to the reality of each municipality. Therefore, it was essential to create and organize specific places to care for people with flu symptoms, called COVID centres. Using federal funding, it was possible for the inherent demands of PHC to continue, albeit timidly, according to the "natural" course of the pandemic. This strategy of COVID-19 care centres (implemented by 22 municipalities in the quantitative phase of the study that met the criteria established in the Portaria do Ministério da Saúde, No. 1.445, may 2020) demonstrates the importance it had, based on the experiences of countries such as Portugal and China[19].

It is relevant to remember that in 2020, strategic measures for the organization of health in the country were recommended, such as the creation of crisis committees, composed of qualified representatives and capable of identifying the critical aspects and pointing out strategies to guide actions; the interaction and articulation between the spheres of the care network; and the elaboration of structured contingency plans to guide assertive decision-making aimed at obtaining a structured care model, starting with PHC and

specialized care[20]. Two managers reported that such initiatives were taken.

A study[19] analysing PHC in seven Latin American countries, including Brazil, identified a policy that prioritized hospital care to the detriment of surveillance and isolation of cases, underestimating the capacity of territorial PHC. However, PHC initiatives that focused on the territory were identified, although they required community engagement, social movements and civil society actions to face health emergencies, mitigate inequities and protect the most vulnerable, given the absence of national health leadership[21]. In the study scenario, all municipalities had PHC management, and for eight of them, this was the only health resource. Therefore, the actions of confrontation were primarily from and for the territory.

When analysing the health promotion strategies used in PHC, integrated practices with case surveillance, an orderly approach in the care of patients with COVID-19, support for vulnerable and at-risk groups, and strategies to enable the continuity of activities inherent to primary care were important[22]. In this study, some reports highlighted the dedication of the team to the work performed by daily monitoring of the cases at home, preventing worsening or hospitalization. Thus, the actions implemented by the municipalities, aimed at tracking, monitoring and surveillance of cases, enabled a greater evaluation of the scenario[23].

During the pandemic, the state of Rio Grande do Sul directed coping actions instituted through the Crisis Office to regulate contingency measures and analyse the regional capacities[24]. Even

Chart 1. Results of the quantitative phase and integration with the qualitative phase, through the delimitation of the guiding question in the interview.

Quantitative results	Interview questions	Justification of the question
Significant correlation between the mitigation strategies and the percentage of confirmed tests for COVID-19 ($p = 0.029$; $r = 0.34$)	What determined the adoption of mitigating measures and how were they implemented?	To analyse the organizational dynamics of municipal management and health teams in the implementation of mitigating strategies
Significant correlation between the confirmed case rate and the death rate ($p = 0.002$; $r = 0.47$)	What facilitated and what hindered the adoption of mitigating measures? How did the municipal managers handle the scenario in the face of the challenges?	To understand how the pandemic scenario was managed in the municipality and influenced COVID-19 deaths
Inverse and significant correlation between the testing rate and mortality ($p = 0.038$; $r = -0.32$)	How was COVID-19 testing implemented in the municipality?	Understand the impact of testing in reducing the mortality of COVID-19

Source: Authors.

Chart 2. Meta inferences, based on the integration of the results of the quantitative and qualitative phases.

Quantitative results	Qualitative results	Meta inferences
Significant correlation between the mitigation strategies and the percentage of confirmed tests for COVID-19 (p = 0.029; r = 0.34)	**Organization of the network of services at the municipal level** In the beginning, each municipality acted individually. One made a decree, the other did it differently. Therefore, after the State protocol was established, everyone followed the same pattern more or less [...] (E6). Following the municipal law for hiring professionals [...], our staff has increased a lot [...]. The structure created for the COVID outpatient clinic was one of the best things (E3, E7, E8, E12, E14, E15). [...] in the construction of the contingency plan, our committee involved various segments of the municipality, from the Civil Police to the Public Ministry (E5, E14). [...] strategy of going to the patient's home for testing, monitoring, including indigenous areas (E3, E5, E7, E13, E14).	The municipalities adapted their physical and organizational structures. There was a national and regional misalignment. The regional level was considered after the state assumed the role of guiding coping guidelines. In the municipalities, there was an expansion of teams, the creation of new patient care flows and protocols
Significant correlation between the rate of confirmed cases and deaths (p = 0.002; r = 0.47)	**Challenges of municipal management in coping with the pandemic** We were not able to hold people back during the election period (E1, E5, E8). The government was under a lot of pressure from businesses, bars and restaurants and this entire group of businessmen were against closures (E3, E4, E6, E8, E9, E14). As Secretary of Health, I had the full support of the mayor to make decisions. However, he, like me, as political managers, we were concerned about not massacring our trade, but it was very difficult to consider the economy and health in the pandemic (E4). In the region, our municipality was the one where most died due to COVID [...]. The lockdown was instituted [...]. We also had difficulties here with religious services, the churches did not want to cease their activities [...], or saying that the deaths generated financial resources, which did not exist [...]. We had a large reduction in cases and deaths in the end. After we hired specific professionals for COVID care, we reduced the cases by almost 100% (E8). We had some problems with the refrigerator [...]. The PHC physician would leave, and the occupational physician there would ask him or her to return. Until, on a certain day, we had a meeting and, there, they started to respect what the primary care physician said (E3). The CRP tests were sent to LACEN at the time. We even had exams that took 27 days to get the results (E9)	The municipalities faced political and economic pressures, difficulties in complying with sanitary and epidemiological protocols, in addition to the shortage of tests. In addition, there were flows with low effectiveness in the response time of the results. Such obstacles may have contributed to the negative outcomes of high hospitalization and death rates
Inverse and significant correlation between the testing rate and mortality (p = 0.038; r = -0.32)	**Regional coordination and expansion of COVID-19 testing** The advent of the university laboratory had a great impact on our region. From there, for us, it was a leap, not only because of the quality of the test but also the logistics. With a lab very close by, we were able to administer the tests and receive the results quickly (E3, E6, E9, E14). We appreciated the university laboratory. It was there that things started to gear up regarding the tests and the quick results… and there were changes in the protocols[....] Asymptomatic respiratory patients, those in contact with positive or suspected individuals, were tested (E2, E3). We knew that it was necessary to identify all contacts of people with COVID-19, or as many people as we could, who had contact with positive people, and test and isolate those who were positive (E3)	Regarding regional coordination, the main coping measure, testing, was expanded. Thus, with the autonomy to test and obtain the results in a timely manner, the municipalities that appropriated this tool were able to break the chain of transmissibility of the virus to comfortable levels

Source: Authors.

fragmented regionalization, due to the proactivity of some regional actors and the apathy of others, was powerful in inducing the supply of services to overcome inequalities[25].

In this scenario, it is relevant to note that in 2020, municipal elections took place, which weakened the management processes, given that some health managers were licenced for the election. This affected the continuity of actions, corroborating previous analyses that found a counterproductive impact of changes in managers on the quality of health services[26]. In addition to these considerations, it is noteworthy that the election also weakened the induction and maintenance of distancing actions, considering the dynamics of the electoral process, which subsequently culminated in an increase in cases in the state and in the country.

The difficulties in maintaining the rules for closing trade and enforcing social distancing measures in the municipalities, as reported by nine managers, were exacerbated by the President of the Republic's speeches that minimized the effects and consequences of the pandemic. However, through the regional and state political alignment obtained by state decrees[27] and the model of controlled social distancing, municipal managers mobilized in their territories to maintain the recommended measures, even when faced with clashes between these two entities (state and municipal) due to the dilemma of health versus economic impact[21]. Likewise, other countries were not immune to criticism and controversial political decisions regarding sanitary restrictions[28].

In the two health regions of this study, there are meatpacking plants that had outbreaks of COVID-19, especially due to flaws in worker safety measures and the fragility of practices inherent to the work process and transportation to the company[29]. As the first cases of the disease appeared among workers, the municipality became more concerned with stopping the chain of contagion, and there was a need to strengthen ties in such places and to keep positive cases in isolation, thus preventing the increase in outbreaks. However, economic issues created obstacles in the maintenance of distancing measures, requiring the action of responsible bodies, such as the Public Ministry of Labour.

The term *necropolitics*, or politics of death, was used to exemplify the discourse and denial of the pandemic scenario, in which health and the economy were placed as opposing entities[21]. The latter should be prioritized to the detriment of loss of life, especially of a portion of the population that is little valued by society, such as poor, elderly, black, indigenous and/or female people[30]. In turn, the phenomenon known as *infodemic*, resulting from the propagation of false news and strategically created by groups with ideologies that deny scientific information, aggravated tensions in the public health system[31] and became another challenge to teams and health managers.

The dissemination of *fake news* and the lack of transparency regarding the numbers of deaths in a certain period of the pandemic also fueled distorted information about the resources and death rates in the municipalities[32]. In the Americas, the heterogeneity of actions and the characteristics inherent to their health systems led to diversified outcomes and inequities in infections and deaths[33].

However, through presentations from the National Council of Municipal Health Departments (CONASEMS) and the Council of Municipal Health Departments (CONASS), the organization of service networks to combat fake news[5] were directed to the municipalities. They, in turn, mitigate denialist information through the dispersion of documents, such as epidemiological guidelines produced by Brazilian scientists.

Regarding the effectiveness of social distancing, more comprehensive testing was a strategy to prevent the spread of the virus[34,35]. However, in Brazil, due to delays in the delivery of tests, a testing policy with functional barriers and slow data management systems, it has not yet been possible to achieve satisfactory results to prevent contagion and deaths[36].

Another concern to be mentioned is the notification data that showed underreporting of COVID-19 cases. Conducted in 2020, a study considered the increase in cases of severe acute respiratory syndrome and the number of unreported deaths[37].

It is pertinent to recognize that, in the face of the pandemic, actions such as testing, tracking of contacts, isolation (or quarantine) and monitoring of cases are essential to interrupt the chain of contagion. It is imperative to build a coordinated and articulated network involving public health actors and service providers to meet the demand[6]. Realizing this gap, some actors involved in the decision-making arenas of the health region under study started a movement that attracted other actors intertwined in SUS management, as well as in the provision of services. Thus, a network was started, which was expanded to meet the demand for testing.

Decentralization of testing has taken place in several countries with the aim of achieving more active testing, given the importance of this strategy to reduce the chain of virus transmission[6]. Testing in some countries, such as Brazil and others with low socioeconomic conditions, was selective and insufficient from the beginning, resulting in the inability to control the pandemic[38].

When comparing the most populous countries on each continent, in March 2021, Brazil was identified as having more deaths and fewer tests per million inhabitants. In the same study, the state of RS, compared to the other states in the south of the country, was the state that performed the most tests for COVID and had greater adherence to isolation; however, it had a higher fatality rate[39].

With regard to the contributions of this study, through mixed methods, we sought to bring an original and creative analysis, especially because it focuses on an emerging topic in the regional perspective. Thus, the findings of this study may contribute to the accumulation and advancement of scientific knowledge, especially by corroborating other studies in health regions. The studied regions bear similarities with other national territories and allow managers and professionals to have evidence for reflection and decision-making. The findings also reinforce the adoption of precautionary principles in a little-known scenario, such as the beginning of the COVID-19 pandemic, through the adoption of strategies recommended by competent bodies, such as the WHO and PAHO.

Finally, this article sought to analyse the complexity of the challenges for COVID-19 control based on the experience of professionals and managers. This is the main limitation of the article because the subject is complex and requires other complementary views and permanent evaluations to monitor the advances and setbacks inherent to public policies, especially in the face of a pandemic. In addition, intentional sampling, restricted to two health regions, may not reflect the reality of other locations. Other limitations that can be pointed out refer to the study period, i.e., during a pandemic, with health professionals and managers having to deal with the unknown, in addition to the scarcity of literature regarding the context in PHC. However, the study has theoretical and methodological consistency that supports the transferability of results[40].

Conclusion

In this study, it was observed that the strategies adopted by all the municipal health managers interviewed in the fight against COVID-19 referred to the monitoring of cases, the flow of care by the multiprofessional team and the performance of two community health agents in prevention activities with the population. It is noteworthy that the tests, which were initially scarce, were predominant in people with acute respiratory symptoms and in an advanced stage of contamination. Subsequently, with the regional organization and the partnership with the university, it was possible to provide more tests in people with symptoms and in contacts and receive the results quickly, which led to a reduction in the chain of transmission and deaths.

The most often reported difficulties were the maintenance of social isolation with the closure of businesses, religious services and movement during the electoral period. In addition to these obstacles, the lack of national coordination, economic pressures and the dissemination of integrationist and false news were difficulties reported by the management of the municipalities. Note that the municipalities in this study created mechanisms according to their organizational infrastructure and human resources. In addition, mutual aid mechanisms were appropriated to overcome difficulties and care gaps, such as the partnership between municipalities that, through the intermunicipal consortium and the university of the region, made it possible to expand testing.

Collaborations

J Barbieri, DL Riquinho, AR Ramos and AS Recalcati: has substantially contributed to the creation, planning, analysis and data interpretation; in drafting and reviewing the subject; participation in the approval for the final version of the manuscript. AM Santos and AMM Magalhães: has helped in reviewing the subject.

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