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COVID-19: DEATH PROFILE IN PATIENTS IN SOUTHWEST PARANÁ

Covid-19: perfil do óbito em pacientes do sudoeste do Paraná

Covid-19: perfil de muerte en pacientes del sudoeste de Paraná

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RESUMO

Objetivo: descrever o perfil de pessoas que morreram de covid-19 em um município do Paraná. **Métodos:** trata-se de um estudo descritivo, exploratório, transversal e documental, de caráter quantitativo, que estudou 214 óbitos. **Resultados:** o perfil se caracterizou por homens (57%) entre 71 e 80 anos (26%), brancos (18%), hipertensos (46%) e diabéticos (24%), com sintomas como tosse (73%), dispneia (59%) e baixa saturação (52%). Quanto ao local de internamento, a maioria em leitos do Sistema Único de Saúde (70%) e em enfermarias (43%). No que tange à testagem para identificação do vírus, foi utilizado o RT-PCR (94%), e quanto às notificações, a maioria se deu pela vigilância em saúde (47%). **Conclusões:** sugere-se implementação de políticas públicas, capacitação às equipes de saúde e encorajamento para a adoção de hábitos saudáveis e vacinação.

DESCRITORES: Saúde global; Epidemiologia; Pandemia; Covid-19.

ABSTRACT

Objective: to describe the profile of people who died from Covid-19 in a municipality in Paraná. **Methods:** this is a descriptive, exploratory, cross-sectional and documentary study, of a quantitative nature, which recorded 214 deaths. **Results:** the profile

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was characterized by men (57%) between 71 and 80 years old (26%), white (18%), hypertensive (46%) and diabetic (24%), with symptoms such as cough (73%), dyspnea (59%) and low saturation (52%). As for the place of hospitalization, the majority were in beds in the Unified Health System (70%) and in wards (43%). Regarding testing to identify the virus, RT-PCR was used (94%), and regarding notifications, the majority were through health surveillance (47%). **Conclusions:** it is suggested to implement public policies, train health teams and encourage the adoption of health and vaccination habits.

DESCRIPTORS: Global health; Epidemiology; Pandemic; Covid-19.

RESUMEN

Objetivo describir el perfil de las personas fallecidas por Covid-19 en un municipio de Paraná. **Métodos**: se trata de un estudio descriptivo, exploratorio, transversal y documental, de carácter cuantitativo, que registró 214 defunciones. **Resultados:** el perfil se caracterizó por hombres (57%) entre 71 y 80 años (26%), blancos (18%), hipertensos (46%) y diabéticos (24%), con síntomas como tos (73%), disnea (59%) y baja saturación (52%). En cuanto al lugar de internación, la mayoría fue en camas del Sistema Único de Salud (70%) y en salas (43%). En cuanto a las pruebas para identificar el virus, se utilizó RT-PCR (94%), y en cuanto a las notificaciones, la mayoría fueron a través de vigilancia sanitaria (47%). **Conclusiones:** se sugiere implementar políticas públicas, capacitar a los equipos de salud e incentivar la adopción de hábitos de salud y vacunación.

DESCRIPTORS: Salud global; Epidemiología; Pandemia; COVID-19.

INTRODUCTION

At the end of 2019, an infectious disease with respiratory characteristics and a high degree of dissemination was discovered in China. The outbreak began at a seafood market in the city of Wuhan, the capital of Hubei. Five months after the first cases were reported, the disease had already spread to several continents around the world.[1]

It was first described in the mid-2000s, when it caused Severe Acute Respiratory Syndrome (SARS) in humans and was quickly controlled, affecting only China and Canada. Almost two decades later, the virus returned, this time without the ability to control it, spreading worldwide as SARS-CoV-2 or COVID-19.[2] Due to the increase in the number of cases and deaths worldwide, the World Health Organization declared a Public Health Emergency in January 2020, and in March of the same year declared a pandemic situation, since the disease was affecting more than 143 countries.[3]

Contamination occurs through droplets, through contact with secretions, mucus, sneezing, coughing or contact with a contaminated surface and then contact with the eye, nose or mouth. The incubation period can vary from two to fourteen days. It's worth noting that infected patients can be asymptomatic, but when they develop symptoms they mainly report: fever, cough, myalgia and fatigue, symptoms characteristic of infection, often accompanied by odynophagia, headache, anosmia and diarrhea, which can evolve with clinical worsening, the need for hospitalization, intubation and death.[4] Wearing a mask, social distancing and hand hygiene with soap and water or 70% alcohol gel are the most recommended and effective measures to combat the disease.[5]

In Brazil, the first case of COVID-19 was confirmed at the end of February 2020 and the first death in mid-March.[6] Despite this, the Ministry of Health stated that the virus was already circulating in the country in January. According to data from the Coronavirus Brazil platform, one year later, on March 17, 2021, 11,603,535 cases of infection by the virus and 282,127 deaths were considered at the national level.[7]

At the time, it was found that the highest death rate from the infection in the southern region was in the state of Paraná, and that both the death rate and the hospitalization rate were more prevalent in males, corroborating the profile identified in Santa Catarina and Rio Grande do Sul.[8]

In Paraná[9], the majority of deaths were among the elderly and men. It was also possible to identify that 75% of the cases had some associated clinical condition, especially Systemic Arterial Hypertension and Diabetes Mellitus, followed by heart disease, kidney disease and obesity.

Given this scenario, this study aims to describe the profile of people who died from COVID-19, in a municipality in the southwest of Paraná, answering the following question: what is the profile of COVID-19 deaths in this region between 2020 and 2022?

METHOD

This is a descriptive, exploratory, cross-sectional and documentary quantitative study carried out in the municipality of Francisco Beltrão, located in the southwest of Paraná, with the aim of assessing the mortality profile by covid-19 between 2020 and 2022.

According to the Brazilian Institute of Geography and Statistics, the municipality studied has a territorial area of 735.11 km^2 with an estimated population of 96,666 people in 2024.[10] The research site was the City Hall, in the Health Surveillance department, in the Epidemiological Surveillance sector.

For data collection, an instrument was used with questions pertinent to the objectives of the study, including sociodemographic data (gender, age, race, neighborhood of residence and notification period), associated comorbidities (cardiovascular disease, systemic arterial hypertension, diabetes mellitus, obesity, smoking, kidney and neurological diseases), main clinical symptoms (cough, dyspnea, low O2 saturation, fever, myalgia, sore throat, headache, diarrhea, fatigue, adynamia, runny nose, nausea/vomiting, chills, loss of smell/feeling, arthralgia, cyanosis, sputum, nasal congestion, abdominal pain, episodes of irritability/confusion and general malaise) and hospitalization characteristics (use of antivirals, place of hospitalization, type of bed used, whether Intensive Care Unit or ward, whether public bed, linked to the Unified Health System (SUS) or private, the method used for diagnosis and X-ray and place of notification). Individual notification forms for hospitalized patients were also used, as well as spreadsheets available from the health surveillance department and patients' death certificates.

The sample consisted of all notifications of deaths due to COVID-19 from the municipality under study in 2020, 2021 and the first half of 2022, totaling 214 records, and data collection took place during the months of June and July 2022.

The data was tabulated using Microsoft Excel software (2013) and then analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0. Descriptive statistics were used to characterize the sample and distribute the frequencies of the different variables analyzed, and all the data is presented in tabular form.

This study was submitted to the Ethics Committee for Research Involving Human Beings for analysis.

Research Involving Human Beings (CEPEH), under opinion 3.363.857 and Certificate of Presentation (CAAE) 133330159.5.0000. 0109.

RESULTS

Analysis of the data showed that 214 people died as a result of COVID-19, with the highest rate recorded in 2021 (62.1%). Of this total, 57.5% were men and with regard to age, the most affected age group was between 71 and 80 years old (26%), and with regard to race, the most frequent race was white (18.2%), with emphasis on the ignored variable (79%). The neighborhoods with the most death records were Padre Ulrico (6.5%), the inner city of Francisco Beltrão (6.5%) and the São Miguel neighborhood (5.6%).

Table 1 - Profile of patients who died from Covid between 2020 and 2022 in a municipality in southwestern Paraná

Variable	N	%
Year of occurrence	-	-
2020	65	30,3
2021	133	62,1
2022	16	7,4
Gender	-	-
Female	91	42,5
Male	123	57,5
Age	-	-
Under 40	11	5,3

Variable	N	%
41 to 50	20	9,3
51 to 60	46	21,4
61 to 70	44	20,6
71 to 80	56	26
81 to 90	24	11,2
91 to 99	13	6,1
Race	-	-
White	39	18,2
Brown	6	2,8
Not informed	169	79,0
Neighborhood of residence	-	-
Padre Ulrico	14	6,5
Interior	14	6,5
São Miguel	12	5,6
Cango	11	5,1
Centro	8	3,7
Pinheirinho	8	3,7
Vila Nova	6	2,8
Presidente Kennedy	6	2,8
Sadia	5	2,3
Jardim Floresta	5	2,3
Cristo Rei	5	2,3
Others	48	21,6
São Francisco	3	1,4
Not informed	65	30,4

Others: Sum of 18 neighborhoods
(Data collection, 2022).

Table 2 shows the symptoms presented by the patients, the vast majority of whom were symptomatic (90.6%). Of the symptoms described as common in the face of the coronavirus, the most frequent were: cough (73.8%), dyspnea (59.3%), low O2 saturation (52.8%), fever (45.3%), and myalgia (32.7%).

Table 2 - Prevalent symptoms of patients who died from Covid between 2020 and 2022 in a municipality in southwestern Paraná

Variable	N	%
Asymptomatic	-	-
Yes	6	2,8
No	194	90,6
Not informed	14	6,5
Fever	-	-
Yes	97	45,3
No	18	8,4
Not informed	99	46,3
Coughing	-	-
Yes	158	73,8
No	10	4,7
Not informed	46	21,5
Sore throat	-	-
Yes	54	25,3
No	32	15,0
Not informed	128	59,8
Myalgia	-	-
Yes	70	32,7
No	23	10,7
Not informed	121	56,5
Arthralgia	-	-
Yes	10	4,7
No	33	15,4
Not informed	171	79,9
Diarrhea	-	-
Yes	36	16,8
No	35	16,4
Not informed	143	66,8
Nausea/vomiting	-	-
Yes	23	10,7
No	34	15,9
Not informed	157	73,4
Headache	-	-
Yes	54	25,2
No	27	12,6
Not informed	133	62,1

Variable	N	%
Runny nose	-	-
Yes	25	11,7
No	27	12,6
Not informed	162	75,7
	-	-
Yes	6	2,8
No	35	16,4
Not informed	173	80,8
Adynamia	-	-
Yes	32	15,0
No	26	12,1
Ignored	156	72,9
Sputum	-	-
Yes	9	4,2
No	32	15,0
Not informed	173	80,8
Chills	-	-
Yes	23	10,7
No	31	14,5
Not informed	160	74,8
Nasal congestion	-	-
Yes	8	3,7
No	35	16,4
Not informed	171	79,9
O2 saturation	-	-
Yes	113	52,8
No	16	7,5
Not informed	85	39,7
Dyspnea	-	-
Yes	127	59,3
No	14	6,5
Not informed	73	34,1
Loss of smell/feel	-	-
Yes	15	7,0
No	29	13,6
Not informed	170	79,4
Fatigue	-	-

Variable	N	%
Yes	36	16,8
No	0	0
Not informed	178	83,2
Abdominal pain	-	-
Yes	8	3,7
No	0	0
Not informed	206	96,3
General malaise	-	-
Yes	6	2,8
No	0	0
Not informed	208	97,2
Cyanosis	-	-
Yes	10	4,7
No	29	13,6
Not informed	175	81,8

(Data collection, 2022).

Table 3 shows the morbidities of the patients who died as a result of COVID-19. 46.7% of the sample had hypertension, while 41.6% of the sample did not know this information. 59.3% of the sample had diabetes and 59.8% had cardiovascular disease.

Table 3 - Prevalent comorbidities of patients who died from Covid between 2020 and 2022 in a municipality in southwestern Paraná

Comorbidities	N	%
Cardiovascular Disease	-	-
Yes	52	24,3
No	34	15,9
Not informed	128	59,8
Systemic Arterial Hypertension	-	-
Yes	100	46,7
No	25	11,6
Not informed	82	41,6
Chronic Kidney Disease	-	-
Yes	13	6,1
No	49	22,9

Comorbidities	N	%
Not informed	152	71,0
Obesity	-	-
Yes	28	13,1
No	45	21,0
Not informed	141	65,9
Diabetes Mellitus	-	-
Yes	53	24,8
No	34	15,9
Not informed	127	59,3
Neurological Disease	-	-
Yes	12	5,6
No	46	21,5
Not informed	156	72,9
Smoker/ex-smoker	-	-
Yes	9	4,2
No	48	22,4
Not informed	157	73,4

(Data collection, 2022).

Table 4 shows the clinical characteristics of the individuals, where it can be seen that 92.5% were hospitalized. As for the place of hospitalization, the Hospital Regional do Sudoeste Walter Alberto Pecoits had the highest prevalence (39.3%). As for the type of bed used by the user, 70.6% of the patients were treated in the SUS network, a small proportion in the private network (18.2%) and 11.2% of the data for this information was unknown. As for hospitalizations, a large proportion of cases were treated in wards (43.9%), while 39.7% were treated in the Intensive Care Unit. With regard to the method used to identify the virus, RT-PCR was the most commonly used (94.9%) and as for the place where the disease was reported, a large proportion was carried out by health surveillance (47.7%), followed by the 24-hour UPA (35%). With regard to X-rays, the vast majority of patients (98.1%) had lung consolidation, while a small proportion had interstitial infiltrates (1.4%) and used antivirals (2.3%).

Table 4 - Characteristics and outcome of hospitalizations of patients who died from Covid between 2020 and 2022 in a municipality in southwestern Paraná

Variable	N	%
Was the patient hospitalized?	-	-
Yes	198	92,5
No	5	2,3
Not informed	11	5,1

Variable	N	%
Hospital Institution	-	-
HRSWAP	84	39,3
PSVP	38	17,8
Hospital São Francisco	25	11,7
UPA 24 horas	18	8,4
Instituto São Rafael	9	4,2
Other institutions	6	2,9
Not informed	34	15,9
SUS hospitalization	-	-
Yes	151	70,6
No	39	18,2
Not informed	24	11,2
Hospitalization sector	-	-
Infirmary	94	43,9
ICU	85	39,7
Not informed	35	16,4
Diagnostic method	-	-
Immunofluorescence	2	0,9
RT-PCR	203	94,9
Quick test	8	3,7
Not done	1	0,5
Notifying unit	-	-
Health Surveillance	102	47,7
UPA 24 horas	75	35,0
Hospital São Francisco	5	2,3
São João Farmácias	5	2,3
Other institutions	13	6,4
Not informed	14	6,5
Chest X-ray result	-	-
Consolidated	210	98,1
Interstitial infiltrate	3	1,4
Not done	1	0,5
Antiviral use	-	-
Yes	5	2,3
No	35	16,4
Not informed	174	81,3

(Data collection, 2022).

DISCUSSION

The coronavirus subtypes mainly infect birds and mammals. Among humans, they especially affect the upper respiratory tract and cause cold-like symptoms and severe acute respiratory syndrome when they reach the lower respiratory tract.[4,10]

Considering the passage of a global pandemic and the high death rate due to covid-19, there was a need to trace the epidemiological profile of people who died, in order to create health strategies aimed at the population at risk. In view of this, this study presents variables that allow analysis and comparison with other Brazilian regions. Therefore, this research found that, in 2021, there was the highest mortality rate, corresponding to 133 (62.1%) deaths, justified by the peak of the pandemic.

With regard to gender, in this study, the majority were men (57.5%), which is in line with a study[11] carried out in Pará, where 60.9% of the dead were male. According to data from the Brazilian Institute of Geography and Statistics, published in 2019, life expectancy in Brazil is 80.1 years for women and 73.1 years for men. In addition, it is worth noting that women seek health services more often, which contributes to the possible identification of health problems.

As for the age most affected, there was a prevalence of 56 patients aged between 71 and 80 years (26%), data similar to that found in a study[12] that sought to analyze the epidemiological profile of COVID-19 deaths in Mato Grosso, from April to June 2020, where 24.7% of the sample was aged between 61 and 70 years. In line with this variable, it is known that aging and illness are naturally linked to a higher probability of death, contributing to the explanation of this profile.

In terms of mortality, this study showed that white people were the most affected, with 39 patients (18.2%). However, when compared to a study[13] carried out in Dougherty County, a city in Georgia, 81% of deaths were black. This data can be explained by the fact that the predominant population in this study is of European descent, while in Georgia the black race is the most prevalent.

In this study, the neighborhoods with the highest number of deaths were Padre Ulrico, which accounted for 14 (6.5%) individuals, while in the study[14] carried out in Acre, the Rio Branco neighborhood stood out (38.5%). It should be noted that in both studies, the neighborhoods with the highest incidence of deaths were associated with a lack of resources, adequate infrastructure and difficulty in accessing healthcare.

The Padre Ulrico neighborhood, together with the Terra Nossa settlement, are described as places of frequent invasions and struggles for public land. This profile concentrates underprivileged populations, with no fixed source of income and great marginalization. In addition, there are inefficient basic sanitation, housing and security structures, contributing to a higher rate of communicable diseases, such as COVID-19.[15]

There are data confirming this, since developing countries are the most affected by the disease, due to economic inequalities. A study carried out in Brazil shows that people living in more vulnerable neighborhoods are 10 times more likely to develop the infection, and that at least 62% of the black population is more likely to be victims of the disease.[16]

In this study, 90.6% of the sample had some symptom associated with the clinical picture, explained by Covid-19 infection prior to the use of vaccines. This high rate was also observed in the study[14], where 41.2% of patients had 1 to 2 symptoms, while 44.1% of participants had 3 to 4 associated symptoms.

The most prevalent symptom in this study was cough, reported by 158 patients (73.8%), followed by 127 who claimed to have dyspnea (59.3%). These data are at odds with a study[17] of workers at an outpatient clinic in Porto Alegre, which found symptoms such as myalgia (33.3%) and headache (25%), due to the stage at which the disease manifests itself in the individual. It should be noted that, despite the similar clinical pictures in both studies, there is a variation in symptoms according to the stage of the disease.

Still on the subject of the most prevalent symptoms, a study[18] found that only 5% of people had episodes of diarrhea, while in the present study 16.8% had this symptom. In Paraíba[19], only 8.2% of the population had a loss of smell or taste, which is similar to the data found in this study (7.5%). For both variables, the significant number of ignored answers should be highlighted: loss of smell and taste (79.4%) and gastroenteritis. (66,8%).

Neurological alterations can occur from the 14th day after the onset of respiratory symptoms, with a propensity of 3% to 35% of cases when the most common symptom is headache. Given this assumption, the present study indicated a prevalence of 5.6% of the sample.[20] However, there are still high rates of ignored answers (72.9%), justified by the difficult diagnosis.

International studies show that some factors have influenced the risk of Covid-19 contamination and its progression to more serious stages. These include advanced age, chronic obstructive pulmonary disease and immunocompromised patients, as well as hypertensive, diabetic and obese patients.[21]

With regard to tobacco use, this study found that patients who use tobacco tend to stay in hospital for longer because of the up-regulation of the expression of converting enzymes, such as

angiotensin 2, which makes links with SARS-CoV-2, worsening the clinical picture. A study[22] carried out in São Paulo showed that 57% of its sample had worsened their condition because they were smokers, while in the Francisco Beltrão study only 9 (4.2%) were smokers. Despite the divergent data, 157 notification forms had this variable ignored (73.4%). However, evaluating the clinical outcome of the cases, it is assumed that a higher percentage were tobacco users, as the patients were hospitalized for a longer period and their outcome was death.

In addition, with regard to comorbidities associated with death, systemic arterial hypertension stood out, presented by 100 patients (46.7%), followed by 53 who had diabetes mellitus (24.8%) and cardiovascular disease (24.3%). In a study[23] carried out in Espírito Santo, the most prevalent diseases were heart disease (44.8%), followed by diabetes mellitus (31.8%), lung disease (12.1%) and smoking (12.1%). In this sense, it is suggested that the studies show similar results, since hypertension is also a heart disease.

A study[24] carried out in Austria found that only 12.2% of hospitalized patients had diabetes, while in the present study, 24.8% had this comorbidity. Thus, it is suggested that genetic and cultural issues of the different nationalities, Brazilian and Austrian, may affect the data of diabetic patients, since eating habits are different, and when linked to high rates of decompensation, can lead to negative outcomes and greater propensity to death.

With regard to the rate of obese patients, this study found that 28 individuals (13.1%) were obese. This condition suggests a four times greater chance of mortality when compared to patients with an adequate body mass index, indicating that chronic diseases and coronavirus infection lead to a greater likelihood of hospitalization in Intensive Care Units.[25] In addition, the heterogeneity in the degree of association between diabetes and the severity of covid-19 suggests that age, smoking and obesity are linked to more severe cases.

With regard to patients infected with the coronavirus and their greater vulnerability to developing acute renal failure (ARF), a study[26] that investigated 572 patients in Colombia identified an incidence of 33% for ARF, in addition to 26% of participants already suffering from chronic renal failure (CRF), totaling 59% of the sample. However, this study found that only 13 individuals (6.1%) had kidney disease related to the initial infection, suggesting that this data may be linked to the large number of notification forms in which this variable was ignored, corresponding to 152 (71%).

A study[27] in the state of Amazonas found that 80.2% of the sample used some form of antiviral, while in this study only 2.3% did so. The divergent data is justified by the fact that the Ministry of Health approved and encouraged the use of antivirals in patients with symptoms suggestive of or positive for Covid, indicating the use of Oseltamivir. With regard to the patients in this study, it is not possible to confirm whether antivirals were clearly used, since the vast majority of the data, 174, were ignored (81.3%).

With regard to hospitalizations, 198 (92.5%) people were referred to some unit. Bearing in mind that Brazil is the only country to have a Unified Health System, it was observed that the majority, corresponding to 151 individuals (70.6%) had been hospitalized in the public network, data that is in line with the study[28] in Bahia, in which 75% of the population depended exclusively on the SUS.

With regard to dealing with the pandemic, the country has had several provisional measures such as 1015/2020, which refers to the R$20 billion credit allocated to the Ministry of Health for the purchase of vaccines, equipment, medication and tests.[29] In addition, in 2021 the National Health Council approved R$168.7 billion reais for public health, for the purchase of masks, alcohol gel, monitoring of diagnostic tests, medication, and the cost of ward and ICU beds.[30]

Given this scenario, we sought to highlight the sectors with the most hospitalizations during the pandemic, with the ward (43.9%) standing out, followed by the Intensive Care Unit (39.7%). Research[31] with similar results carried out in Montes Claros indicated that the hospitalization rate was 47% for the ICU and 42% for clinical beds. The similar figures for the different types of hospital accommodation suggest overcrowding of beds during the period of highest pandemic incidence, when the unavailability of beds in intensive care units kept patients who met ICU criteria in wards.

With regard to the form of diagnosis, this study found that the vast majority of tests for Covid-19, totaling 203 (94.9%), were carried out using RT-PCR, while a study[32] carried out in Goiânia found that the majority were carried out using a rapid antibody test (52.5%). In this sense, it is worth highlighting the fact that RT-PCR is considered the gold standard for investigating covid-19, as it tests for traces of RNA, while the rapid test seeks to identify viral nucleocapsids.

With regard to chest X-rays, this study found that 210 patients (98.1%) had lung consolidation, resulting from the accumulation of exudate, fat and neoplastic cells throughout their lives, as the main alteration. These figures are higher than those of a study[33] carried out in Pernambuco, where it was observed that the majority of patients had bilateral interstitial infiltrates (54.5%). This condition, in turn, is characterized by the Brazilian Society of Pneumology as inflammation surrounding the alveoli, interfering with lung

function and consequently reducing blood oxygenation levels. This difference can be explained by the age of the individuals analyzed, since in this study most of the deaths were over 71 years old, while in the Pernambuco study the sample was no older than 13.

In addition, after a year of the pandemic, vaccination campaigns against COVID-19 were launched and deaths fell sharply. As observed in 2022, the state of Alagoas identified a drop of 77.7% due to the fact that the vaccines were effective against coronavirus-related mortality.[34]

A study carried out in Paraná with around 16.2% of the population already vaccinated, in which social isolation was still a great ally for the prevention of Covid-19, found that the mortality rate decreased, thus showing the effectiveness of vaccination35, thus allowing the resumption of daily activities in general, in addition to the reduction in morbidity and mortality rates associated with Covid-19.

The main limitation of this study is the high rate of variables given as ignored, suggesting greater difficulty in identifying the epidemiological profile of this population.

CONCLUSION

The epidemiological profile was characterized by men aged between 71 and 80, white and living in the Padre Ulrico neighbourhood. The most frequent symptoms were cough, dyspnea, low saturation and fever. This population already had underlying diseases such as systemic arterial hypertension and diabetes mellitus. As for the place of hospitalization, most of them were in the Southwest Regional Hospital, i.e. in SUS beds and in wards notified by the health surveillance sector. As for testing to identify the virus, RT-PCR was used, as it is considered the gold standard, and as for X-rays, lung consolidation was the most prevalent.

It's worth noting that vaccination has made a very positive contribution to controlling this disease and improving living standards and, why not say it, the quality of life of the general population, especially the most vulnerable.

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