

**Deaths by COVID-19 in a municipality in the northwest of the state of Paraná, 2020 and 2021***Muertes por COVID-19 en un municipio del noroeste del estado de Paraná, 2020 y 2021**Óbitos por COVID-19 em um município no noroeste do estado do Paraná, 2020 e 2021***Thárcis Rocha de Oliveira<sup>1</sup>**

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Armada de Oliveira**Submission:** 09-25-2021**Approval:** 10-30-2021**Abstract**

The aim of this study was to describe the sociodemographic profile of confirmed deaths from COVID-19 that occurred in the municipality of Maringá, from March 2020 (month of the first death) to June 2021, according to sociodemographic variables and presence of pre-existing diseases. Retrospective, quantitative descriptive study, carried out at the Strategic Information Center for Health Surveillance (CIEVS) located in the Health Department of the city of Maringá. A total of 1157 files were analyzed, of which 59.29% (689) were male. There was a predominance of patients aged >60 years old 69.3% (802). Related to race/color, white patients stood out 75.02% (868). Regarding the education of the sample components, it was identified that most of the forms 29.13% (337) had this variable as ignored. It was also observed that 75.5% (874) of the patients who died had some pre-existing pathology. In view of the data presented, it was evident that death from COVID-19 affects more male patients, as well as the prevalence in white patients and older individuals, so that it has followed the same proportions reported since the beginning of the pandemic.

**Descriptors:** Epidemiology; Severe Acute Respiratory Syndrome; COVID-19; Disease Notification; Public Health.**Resumen**

El objetivo de este estudio fue describir el perfil sociodemográfico de las muertes confirmadas por COVID-19 ocurridas en el municipio de Maringá, desde marzo de 2020 (mes de la primera muerte) hasta junio de 2021, según variables sociodemográficas y presencia de preexistentes enfermedades. Estudio retrospectivo, descriptivo cuantitativo, realizado en el Centro de Información Estratégica para la Vigilancia en Salud (CIEVS) ubicado en el Departamento de Salud de la ciudad de Maringá. Se analizaron un total de 1.157 expedientes, de los cuales el 59,29% (689) eran del sexo masculino. Hubo un predominio de pacientes > 60 años 69,3% (802). En relación con la raza / color, los pacientes blancos se destacaron 75,02% (868). Con respecto a la educación de los componentes de la muestra, se identificó que la mayoría de los formularios 29,13% (337) tenían esta variable como ignorada. También se observó que el 75,5% (874) de los pacientes que fallecieron tenían alguna patología preexistente. A la vista de los datos presentados, se evidenció que la muerte por COVID-19 afecta a más pacientes del sexo masculino, así como la prevalencia en pacientes de raza blanca y personas mayores, por lo que ha seguido las mismas proporciones reportadas desde el inicio de la pandemia.

**Descritores:** Epidemiología; Síndrome Respiratorio Agudo Grave; COVID-19; Notificación de Enfermedades; Salud Pública.**Resumo**

Objetivou-se por meio deste estudo, descrever o perfil sociodemográfico dos óbitos confirmados de COVID-19 ocorridos no município de Maringá, desde março de 2020 (mês do primeiro óbito) até o mês de junho de 2021, segundo as variáveis sociodemográficas e presença de doenças pré-existentes. Estudo retrospectivo, quantitativo descritivo, realizado no Centro de Informações Estratégicas de Vigilância em Saúde (CIEVS) situado na Secretaria de Saúde do município de Maringá. Foram analisadas 1157 fichas, destas 59,29% (689) eram indivíduos de sexo masculino. Houve predominância em pacientes na faixa etária de >60 anos 69,3% (802). Relacionado a raça/cor, destacou-se pacientes da cor branca 75,02% (868). No que diz respeito a escolaridade dos componentes da amostra, foi identificado que a maior parte das fichas 29,13% (337) apresentavam esta variável como ignorado. Observou-se ainda que 75,5% (874) dos pacientes que evoluíram a óbito, eram portadores de alguma patologia pré-existente. Diante o dado apresentado, evidenciou-se que o óbito por COVID-19 acomete mais pacientes masculinos bem como a prevalência em pacientes de cor branca e indivíduos com maior idade, de modo que vem seguindo as mesmas proporções reportadas desde o início da pandemia.

**Descritores:** Epidemiologia; Síndrome Respiratória Aguda Grave; COVID-19; Notificação de Doenças; Saúde Pública.

## Introduction

In December 2019, a new Coronavirus (SARS-COV-2) was identified. In a short period of time this virus has spread to numerous countries and on March 11, 2020, the World Health Organization (WHO) characterized the situation as a pandemic. According to WHO data published in the March 2021 bulletin, the global situation was with 114,428,211 confirmed cases and more than 2,543,755 deaths. In Brazil, the first case of virus contamination was registered on February 26, 2020, in the city of São Paulo and the first death in the following month.<sup>1,2</sup>

In the state of Paraná, data published by the Ministry of Health in March 2021 indicated a total of 661,109 confirmed cases and 11,982 deaths, ranking eighth in the ranking of accumulated deaths by COVID-19 in Brazilian states. In the 14th epidemiological week of 2020 (week of publication of the 1st bulletin), the municipality of Maringá recorded 912 notifications, 25 positive cases, 4 admissions for Severe Acute Respiratory Syndrome (SRAG) and 2 deaths, however, the situation worsened and in March 2021 the city registered 32,666 positive cases accumulated and more than 460 deaths from the virus.<sup>3,4</sup>

Based on this, it is essential to monitor both suspected and positive cases, and even more so to identify the profile of deaths, in order to favor greater control and the possibility of containing the proliferation of the virus, which has a high power of transmissibility and virulence, causing a great impact on the morbidity and mortality profile of the population. Thus, health surveillance actions, through epidemiological surveillance, are essential for local management to organize and structure the health system to favor safe care for all, based on the doctrinal principle of equity, in which access to services health care should be offered to those who need it most at this time.<sup>4</sup>

The present study is justified based on the current world scenario, in which mortality from COVID-19 is alarming as it grows rapidly. Thus, the purpose of this research was to perform a description of the sociodemographic characteristics of deaths positive for COVID-19 in the city to understand the behavior of the virus in society as well as to serve as a subsidy for the formulation of prevention and intervention strategies for the disease. For the development of the research, it was used as a guiding question what is the profile of the population that evolved to death in a medium-sized city in Paraná, which managed to organize the local health system prior to the epicenter of cases of COVID-19?

Thus, the objective of this study was to identify the profile of confirmed deaths from COVID-19 that occurred in a municipality in the Northwest of Paraná, from March 2020 (month of the first death) to the month of June 2021, according to the sociodemographic variables and presence of pre-existing diseases.

## Methodology

This is a retrospective, quantitative, transversal, and descriptive study, carried out at the Center for Strategic Information on Health Surveillance (CIEVS) located at the

The city underwent a process of reorganization of the health system, in which the municipal management structured some of the 34 Basic Health Units (UBS) for emergency care and the Emergency Care Units (UPA) for reception and treatment of people with flu-like symptoms and confirmed cases of COVID-19. In this way, the population always had a reference for directing the demand to solve their weaknesses. As the months went by and the increase in cases concomitantly with the increase in deaths, the city reorganized itself to meet the population demand.

The study population consisted of patients who died, notified, and confirmed to COVID-19, whose place of residence belonged to the city of Maringá-PR, from March 2020 to June 2021.

Data collection took place through the release of a database extracted from the Influenza Surveillance Information System (SIVEP-Influenza) and provided by the Municipal Health Department of Maringá from a pre-elaborated questionnaire. The data provided were organized with the help of Microsoft Excel<sup>®</sup> software. The following variables were considered: age, sex, race/color, education, and Pre-existing Diseases (PED). The inclusion factor was positive death for COVID-19. Exclusion factor: living in a municipality other than Maringá.

The results were presented in absolute and relative frequencies (expressed as percentages) or age group (for the age variable). As this is a study with data made available by the Municipal Health Department of Maringá, there was a need for approval by the Permanent Training and Training Center for Health Workers of Maringá (CECAPS), which is under the official letter of No. 569 /2021 and the Ethics Committee under opinion No. 4,678,701, and CAAE number 45730621.6.0000.5539, according to Resolution No. 466/2012 of the National Health Council.

## Results

Table 1 presents the results obtained through the information contained in the collected forms. A total of 1,157 files were analyzed, of which 40.71% (471) were female patients and 59.29% (689) were male. There was a predominance of patients aged > 60 years (69.3%). Regarding race and color, white patients stood out 75.02% (868). Regarding the education of the sample members, it was identified that most of the forms 29.13% (337) had this variable as ignored, however, from the forms that contained the information, patients with education stood out. average with 21.35% (247). It was also observed that 75.5% (874) of the patients who progressed to death had some pre-existing pathology.

Regarding risk factors, it was possible to identify the presence of comorbidities associated with deaths, such as pre-existing pathologies related to the cardiovascular system such as hypertension, endocrine system such as diabetes both type I and type II, and some pathologies to a lesser extent number related to the respiratory system.



**Table 1.** Sociodemographic characterization of deaths from COVID-19. Maringá, PR, Brazil, 2020-2021

Variable	N (1157)	%
<b>Sex</b>		
Feminine	471	40,7
Masculine	686	59,3
<b>Race/color</b>		
White	868	75,02
Black	36	3,11
Yellow	33	2,85
Brown	147	12,71
Ignored	73	6,31
<b>Education</b>		
Illiterate	56	4,84
Up to 9 years	394	34,05
> 9 years	370	31,98
Ignored	337	29,13
<b>Age group</b>		
Up to 18 years	1	1
Between 19 and 59 years	354	30,6
> Over 60 years	802	69,3
<b>Risk factors</b>		
Yes	874	75,5
No	283	24,5

## Discussion

Through the results presented in this study, deaths from COVID-19 are shown in greater proportion in the male population, this corroborates a research<sup>5</sup> carried out in the state of Maranhão, which aimed to analyze the epidemiological profile of notifications of cases of the new Coronavirus in the state, from March to April 2020. This study revealed a higher incidence of death in male patients, totaling 62 % of the sample used in the study and is also in line with other studies<sup>6-8</sup> that reported the same trend in males in the first cases of death reported in China.

Regarding the race/color of the individuals characterized in our research, the results diverge from other studies<sup>9,10</sup>, as our results show a greater predominance of white color in patients who died in the city, while in a research<sup>10</sup> developed in the city. West Bahia has a greater number of browns; however, another study points out that these differences seen between surveys may vary due to the difference in ethnicity between countries and between Brazilian regions.

Even though the installation of the disease in the world is still very recent, it is already possible to notice the deficiency of some specific subjects in the scientific literature. In our study, findings in terms of education indicate that patients with a lower level of education were the group that most stood out in deaths by COVID-19. However, no study was found that allowed a comparative analysis, therefore, this event reinforces the idea that there is a need for new studies mainly aimed at a more complete sociodemographic characterization, contemplating key information, such as the education of the population sample.

When analyzing the age group of individuals included in our study, there was a greater emphasis on deaths in patients aged over 60 years. Likewise, this age group is seen in most studies<sup>5,11,12</sup> that address the issue of deaths from the new coronavirus. This finding is extremely relevant for the epidemiological area, considering that it already points to a specific characteristic of the disease, the involvement of older people. Considering the demographic transition and population aging, this finding should serve as a warning for the development of measures and strategies to block or reduce contamination in this population<sup>12</sup>.

Thus, the population over 60 years of age deserves special attention from health services, as they are more vulnerable, including the development of comorbidities that may be associated with impairment or worsening of cases, causing an unfavorable prognosis and progression to death in impressive numbers at this age<sup>11,12</sup>.

Another very relevant feature presented by the results, and which has also been reported in other surveys<sup>2,11,13</sup> is the predominance of patients who already have some comorbidity prior to Coronavirus infection. Research carried out in Western Bahia shows that in addition to deaths from COVID-19 being seen more often in elderly individuals, they are also accompanied by at least one pre-existing pathological condition. Most of these comorbidities refer to cardiovascular diseases and diabetes, and these characteristics are in general, as the research that evidenced this finding was carried out in three countries: Brazil, USA and India, in which the three presented the same proportions<sup>5,9</sup>.



Undoubtedly, the presence of comorbidities increases the risk by 9.44 times more for the patient to evolve to death, when compared to patients who did not have any associated comorbidity<sup>14</sup>. Even though it has a lower lethality rate than other pandemics caused by the coronavirus, such as severe respiratory syndrome (SARS), it is notorious when it disrupted health services, impacting the increase in the number of deaths, especially in people with a pre-existing disease that had greater difficulties in overcoming the complications caused by the infectious process caused by the virus, and many of these unfortunately failed to have a good prognosis<sup>15</sup>.

## Conclusion

Despite the compromising universality of the virus, it is important to establish the local profile of the population in relation to the disease. In view of this, the findings in the present study showed that deaths from COVID-19 in the city of Maringá (PR) mostly affected male patients, as well as the prevalence in white patients and older individuals with at least one pre-existing disease. It was also identified that there are still difficulties in the process of filling out the notification form, as most of them did not contain the patient's education information, as well as the lack of studies that encompass this variable in their methodology and consequently in their analysis.

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