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Epidemiological profile of confirmed cases of COVID-19 infection in the state of Minas Gerais

covid-19 infection

Epidemiological profile of confirmed cases of covid-19 infection in the state of Minas Gerais

RESUMO | Objetivo: identificar o perfil epidemiológico dos casos confirmados de infecção por COVID-19 no Estado de Minas Gerais. Método: trata-se de um estudo descritivo, exploratório, retrospectivo, com abordagem quantitativa, realizada em um banco de dados público da Secretaria Estadual de Saúde de Minas Gerais. A amostra foi composta por 275 pacientes notificados durante o 1º trimestre de 2020, os quais foram confirmados com COVID-19 em Minas Gerais. Resultados: observou-se prevalência de infecção na cidade de Belo Horizonte (59,3%), seguido das cidades de Juiz de Fora (8,4%) e Nova Lima (7,3%). Com relação ao sexo e idade, foram acometidos em sua maioria adultos jovens com prevalência do sexo masculino (59,6%) e idade entre 20 e 59 anos (80,7%). Conclusão: o coronavírus apresentou alta transmissibilidade, bem como alta difusibilidade, em um curto espaço de tempo no território mineiro, sendo os adultos jovens os principais veículos carreadores para os idosos.
Palavras-Chave: AInfecções por coronavírus; Epidemias; Prevenção de doenças; Controle de doenças transmissíveis; Saúde pública.

ABSTRACT | Objective: to identify the epidemiological profile of confirmed cases of COVID-19 infection in the state of Minas Gerais. Method: this is a descriptive, exploratory, retrospective study, with a quantitative approach, carried out in a public database of the Minas Gerais State Department of Health. The sample was composed of 275 patients notified during the 1st quarter of 2020, who were confirmed with COVID-19 in Minas Gerais. Results: prevalence of infection was observed in the city of Belo Horizonte (59.3%), followed by the cities of Juiz de Fora (8.4%) and Nova Lima (7.3%). Regarding sex and age, most young adults were affected, with a prevalence of males (59.6%) and ages between 20 and 59 years (80.7%). Conclusion: the coronavirus showed high transmissibility, as well as high diffusibility, in a short period of time in the territory of Minas Gerais, young adults being the main carriers for the elderly.
Keywords: Coronavírus infections; Epidemics; Disease prevention; Communicable disease control; Public health.

RESUMEN | Objetivo: identificar el perfil epidemiológico de casos confirmados de infección por COVID-19 en Minas Gerais. Método: se trata de un estudio descriptivo, exploratorio, retrospectivo, cuantitativo, realizado en una base de datos pública de la Secretaría de Salud del Estado de Minas Gerais. La muestra se compone de 275 pacientes notificados durante el primer trimestre de 2020, que fueron confirmados con COVID-19 en Minas Gerais. Resultados: la prevalencia de infección se observó en la ciudad de Belo Horizonte (59,3%), seguida de Juiz de Fora (8,4%) y Nova Lima (7,3%). En cuanto al género y la edad, la mayoría de los adultos jóvenes estaban afectados, con una prevalencia de varones (59,6%) y con edades comprendidas entre los 20 y los 59 años (80,7%). Conclusión: el coronavirus presentó una alta transmisibilidad y difusibilidad, en un corto espacio de tiempo en el territorio minero, siendo los adultos jóvenes los principales vehículos para los ancianos.
Palabras claves: Infecciones por coronavirus, epidemias, prevención de enfermedades, control de enfermedades transmisibles, salud pública.

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INTRODUCTION

COVID-19, whose etiologic agent is the coronavirus, is a highly transmissible infectious disease caused by a new virus that had never been identified in humans. The new etiological agent, in Brazil, was discovered in 2019 after cases registered in China. The first viral strains in humans were isolated for the first time in 1937. However, it was in 1965 that the virus was described as a coronavirus due to its microscopic morphology being associated with a crown. [1] Most people have contact with the most common viral strains throughout their lives, with young children more likely to become infected with the most common type. The most common viral species infecting humans are α-coronavirus 229E, α-coronavirus NL63, β-coronavirus OC43 and β-coronavirus HKU1. [2]

The viral symptoms of COVID-19 are due to a flu-like respiratory illness with clinical manifestations such as cough, fever and, in more severe cases, pneumonia. You can protect yourself by washing your hands frequently and avoiding touching your face. The main form of contamination by COVID-19 is through contact with an affected person, in order to transmit the virus through coughing, sneezing, saliva droplets or a runny nose. [3]

Prophylactic measures against the acquisition of COVID-19 include: frequent hand washing with soap and water for at least 20 seconds or alcoholic hand sanitizer in the absence of soap and water; avoid touching eyes, nose and mouth with unwashed hands; avoid direct contact with sick people; cover mouth and nose when coughing or sneezing with a tissue and throwing it in the trash; and clean and disinfect frequently touched objects and surfaces. In case of suspicion of the disease, rest and frequent oral hydration are indicated, in addition to measures for symptomatic relief, such as the use of analgesics and antipyretics. [4]

In more serious situations, where more severe symptoms occur, such as a high and persistent fever, as well as respiratory distress (dyspnea), it is important to search for the Basic Health Unit (UBS) with a view to reporting the suspected case and monitoring of the disease in order to aim its confirmation by COVID-19 or its full diagnostic discard. [5] In a suspicious case, the health service must provide the patient with a surgical mask and take him to an isolated room. Health professionals must use personal protective equipment (PPE), which, with the exception of eye protection, must be discarded after use. [6]

According to the Ministry of Health (MH), to date, 6.836 confirmed cases of infection by COVID-19 and 241 deaths have been reported in Brazil, with a mortality rate of 3,5%. [7] Among more than 200 deaths analyzed, 89% were of people over 60 and 84% of people with at least one comorbidity, which is a pre-existing disease. Seven of the 212 deaths analyzed occurred in people under 60 years of age and without comorbidities. [8] The travel history of patients to areas with COVID-19 transmission, contacts with people with suspected or confirmed cases of the disease, are factors that health professionals should take into account when notifying the Municipal Health Departments, which, in turn, will trigger the Minas Gerais State Health Department (SESMG - Secretaria de Estado de Saúde de Minas Gerais) and the MH. [6]

In order to prevent the spread of the new COVID-19, the Center for Epidemiological, Environmental and Occupational Health Surveillance of the Regional Health of Montes Claros alerted health professionals to the importance of strengthening surveillance and health care actions, collection of samples for laboratory tests and implementation of communication actions, in order to clarify the population about the preventive measures that must be adopted to avoid infection by the virus. [6]

Thus, the objective was to identify the epidemiological profile of confirmed cases of infection by COVID-19 in the State of Minas Gerais, Brazil.

METHOD

This is a study with a descriptive, exploratory, retrospective design, with a quantitative approach, carried out in the public database of SESMG. The distribution of suspected cases by municipality, as well as discarded and notified cases, is updated daily, and can be publicly viewed and downloaded through the website http://www.saude.mg.gov.br/coronavirus, under the link " Distribution of COVID-19 cases in Minas Gerais". So far, there are a total of 34,224 suspected cases for COVID-19 and 275 confirmed cases. Forty deaths are under investigation and two deaths have been confirmed. The sample of this study consisted of 275 patients notified with confirmation of infection. The period of notifications took place during the months of January, February and March 2020 (Table 1).

The following inclusion criteria were adopted for research participa-

Table 1 – Scenario of notifications for COVID-19 infection in Minas Gerais during the 1st quarter of 2020.

Variables	n	%
Suspected cases	34.224	100,0
Confirmed cases	275	0,80
Deaths under investigation	40	0,11
Confirmed deaths	02	0,0058

Source: COES MINAS/COVID-19/SESMG. Updated on 03/31/2020.

tion: cases of COVID-19 duly notified and confirmed during the 1st quarter of 2020 in the State of Minas Gerais. So far, 40 suspected deaths have been reported, 20 of which have been discarded for COVID-19. The other suspected deaths await laboratory tests and survey of clinical and epidemiological information. Considering that the MS classified the entire country as community transmission, in addition to the need to qualify information on the circulation of COVID-19 in Minas Gerais, as of 03/23/2020, the COVID-19 Daily Newsletter published details only of the confirmed cases.

A semi-structured form was used as a data collection instrument. Data were tabulated by the Statistical Package for Social Sciences (SPSS), represented by tables and graphs constructed using Microsoft Excel®, version 2007, and made available by SESMG. Quantitative variables were exposed through absolute frequencies (n) and percentages (%). Data analysis was performed using simple descriptive non-parametric and non-probabilistic epidemiology. The study followed the ethical precepts established by Resolution No. 466, of December 12, 2012, of the National Health Council (CNS), which regulates the conduct of research involving human beings. (9) As this data is in the public domain, there was no need to submit the research for consideration and approval by the Research Ethics Committee (CEP - Comitê de Ética em Pesquisa).

RESULTS

Profile of suspected cases and confirmed deaths

The deaths under investigation are suspected cases which await laboratory tests and survey of clinical and epidemiological information. To date, 61 suspected deaths have been reported, with 19 discarded for COVID-19.

The first patient who died is a fe-male, 82 years old, resident in the city of Belo Horizonte. She was admitted to Hospital Biocor, in Nova Lima, on 03/21/2020, with fever, cough and respiratory distress. Transferred to the ICU on 03/23/20. Swab of oropharyngeal secretion was collected for COVID-19 investigation on 03/23/2020. She presented with the following comorbidities: chronic cardiovascular disease (CVD), Diabetes Mellitus (DM) and chronic lung disease. The death occurred on 03/29/2020. The detectable swab test for COVID-19 was performed in a private laboratory.

Regarding the second patient, male, 66 years old, resident of the city of Belo Horizonte, with heart disease and DM. The test was detectable through reverse transcriptase reaction followed by polymerase chain reaction (RT-PCR) in a private laboratory. Another oropharyngeal sample was collected to perform a swab at the Ezequiel Dias Foundation (FUNED). The death occurred on 03/30/2020.

Profile of confirmed cases

Confirmation of the disease was observed in 32 cities in Minas Gerais during the 1st quarter of 2020. As a result, notifications were less frequent in January and February and more frequent throughout the month of March, as well as their confirmations. Thus, COVID-19 was mostly prevalent in the city of Belo Horizonte (59,3%), in the State of Minas Gerais, followed by Juiz de Fora (8,4%) and Nova Lima (7,3%) (Table two).

It emphasizes the existence of five cases that are still under investigation and awaiting test results for confirmation or discarding (Table 2). This etiological agent showed a greater manifestation as to its confirmation via laboratory serology tests in male patients (59,6%), these being young adults aged between 20 and 59 years (80,7%) (Table 3).

In Minas Gerais, during the months of January and February, the notifica-

tions were not so frequent. As of March, these notifications became more effective. From Epidemiological Week (EW) No. 10 to EW No. 11, there was a variation of 451 notifications throughout the territory of Minas Gerais. In EW #12, this difference was 12 times greater when compared to the previous week, with 7.371 notifications. In the last EW of this month, this being No. 13, notifications reached a peak three times greater than in the previous week, totaling 12.341 new cases to be investigated (Figure 1).

DISCUSSION

COVID-19, in Brazil and in the world, is a totally unknown and still unstudied threat. It is not known for sure all the pathophysiological consequences, as well as the severity of these, that this antigen is able to establish after its infection in the human body. The virus is more easily spread as the geospatial agglomeration of people in the same environment. Large metropolitan regions contribute to this rapid viral circulation in view of the high population rate of inhabitants, as well as the high rate of visitors. (10) The city of Belo Horizonte, capital of the State of Minas Gerais, located in the southeast region of Brazil, has an estimated population of 2.512.070 inhabitants. (11) Still, it is a reference for quality education, being a pole of multiple faculties. It features sights that are attractive to travelers. Thus, these factors contribute to a faster viral spread and consequent symptomatic manifestation and possible clinical worsening in people who make up the vulnerability group. In this study, the infection was confirmed in 32 cities in Minas Gerais from January to March 2020. Therefore, COVID-19 was predominantly prevalent in the capital of Minas Gerais, as well as in surrounding cities, due to the demographic flow.

In Minas Gerais, vulnerability

Table 2 – Distribution of confirmed COVID-19 cases according to municipality of residence. Minas Gerais, March 2020. (n=275)					
	n	%	Municipality of Residence*	n	%
Belo Horizonte	163	59,3	Bom Despacho	01	0,4
Juiz de Fora	23	8,4	Campo Belo	01	0,4
Nova Lima	20	7,3	Campos Altos	01	0,4
Uberlândia	10	3,6	Carmo do Cajuru**	01	0,4
Divinópolis	09	3,3	Coronel Fabriciano	01	0,4
Betim	05	1,8	Extrema	01	0,4
Contagem	05	1,8	Guimarânia***	01	0,4
Sabará	03	1,1	Ipatinga	01	0,4
Uberaba	03	1,1	Manhuaçu****	01	0,4
Governador Valadares	02	0,7	Muriaé	01	0,4
Lagoa da Prata	02	0,7	Patrocínio	01	0,4
Mariana	02	0,7	Santa Luzia	01	0,4
Poços de Caldas	02	0,7	Serra do Salitre	01	0,4
São João del Rei	02	0,7	Timóteo	01	0,4
Sete Lagoas	02	0,7	Unaí	01	0,4
Alfenas	01	0,4	Em investigação	05	1,8
Boa Esperança	01	0,4			

Source: COES MINAS/COVID-19/SESMG.

*Data updated daily by Regional Health Units.

**Case initially notified as a resident in Divinópolis.

***Case initially notified as a resident in Patos de Minas.

****Case initially notified as a resident in Curvelo. Updated on 03/31/2020.

showed a higher prevalence in males (59,6%) when compared to females (40,4%). Through a researcher from the Department of Molecular Microbiology and Immunology at the School of Public Health at Johns Hopkins University, USA, it is discussed that estrogen – the female sex hormone – may be the explanation for the different responses to COVID-19. Estrogen can stimulate aspects of immunity that are important to clearing a viral infection and responding well to vaccines. Based on this information, it is believed that estrogen may be a contributing factor to greater female immunity in the current outbreak of coronavirus, however, given that the outbreak is recent, there is still no effective research to demonstrate this in a definitive way. [12]

COVID-19 was shown to be more prevalent in young adult patients, aged between 20 and 59 years (80,7%). This data suggests that younger people may have greater capacity to transmit, which may facilitate viral transmissibility. The disease is linked to a great socioeconomic impact on a global scale, being more severe in the elderly due to low immunity and physical resistance, in addition to associated comorbidities. When compared to a young individual, they are in the risk group and are more susceptible to the most serious consequences of this virus, such as death. [13] COVID-19 in children and adolescents accounts for a small proportion of patients with relapses, being generally milder than adults, but it can progress to severe disease in some cases. Even newborns (NB) can suffer from COVID-19 and children can play a disseminating role in the community. [14]

Until the month of March 2020, the municipality of Montes Claros, a macro-region in the north of Minas Gerais, had 389 suspected patients reported with suggestive clinical symptoms. Of these, 60 were discarded for the disease, four were hospitalized in Montes Claros and presented hemodynamically

Table 3 – Distribution of confirmed COVID-19 cases according to sex and age group. Minas Gerais, March 2020. (n=275)		
Variable	**n**	**%**
Sex		
Male	164	59,6
Female	111	40,4
Age group (years)		
< 01	01	0,4
1-9	01	0,4
10-19	04	1,5
20-59	222	80,7
60-79	44	16,0
>80	03	1,1

Source: COES MINAS/COVID-19/SESMG. Updated on 03/31/2020.

Figure 1 – Number of reported cases of COVID-19, according to epidemiological week and notification date. Minas Gerais, March 2020.
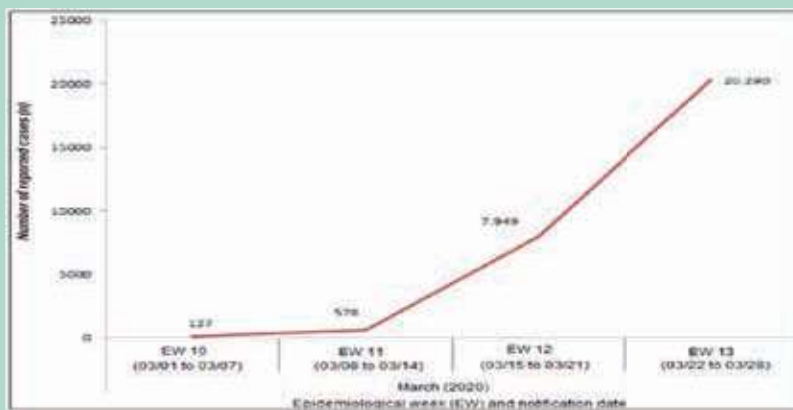
Source: FormSUSRedCap and e-SUS VE/COES MINAS/COVID-19/SESMG. Updated on 03/31/2020

stable, one was admitted to the Intensive Care Unit (ICU), 34 are awaiting the result of a confirmatory examination, 328 under investigation and four hospitalized patients from Montes Claros in other municipalities. There have been no deaths reported or confirmed by COVID-19 in the northern region of Minas Gerais. (15) In Espinosa, another municipality in the north of Minas Gerais, 17 symptomatic and suspected patients were also notified, one suspected death and no confirmed or discarded case. (16)

This disease has taken on pandemic dimensions with chaotic repercussions.

Expressive numbers of illnesses and deaths in a short period of time, direct impact on the world economy and insufficiency of beds in the Intensive Care Unit (ICU) of hospitals for hospitalization in the most severe symptomatic cases of the disease. (17) Given the current situation in Brazil and the world, social isolation was adopted as the main prophylactic measure in order to avoid direct contact and, consequently, delay viral transmission, as well as deaths, making health institutions support the demand of patients affected in the long term until an effective treatment against this disease is established and

that satisfactorily supplies all the emergency demand. [18,19,20]

CONCLUSION

Through this study, it was possible to identify the epidemiological profile of notified and confirmed cases of CO-VID-19 infection in the State of Minas Gerais, Brazil, during the 1st quarter of 2020. Brazil, in its current situation, is experiencing a health crisis through the COVID-19 pandemic. The economy is affected as the virus spreads rapidly in a way that the healthcare sector cannot effectively manage given the high demand and high influx of patients infected by the disease. It was necessary to adopt, on an emergency basis, social isolation in order to delay viral transmission and the demand of these patients in the hospital, in order to contribute to the reduction of deaths from this disease.

Therefore, COVID-19 showed high transmissibility, as well as high diffusibility, in a short period of time in the territory of Minas Gerais. The greatest concentration of infected victims took place in the capital of Minas Gerais, this being Belo Horizonte, and surrounding cities. In this study, there was confirmation of two deaths of elderly people by COVID-19. This shows that the elderly are the main risk group for the involvement of this disease, as well as for serious complications and death. It can be inferred that the young adults in this study are the vehicles for the most susceptible target audience, which are the elderly.

This study included the discussion of unpublished but partial data. Notifications and confirmations will continue to be made continuously by Brazilian municipalities and states in order to feed the MS information systems on a daily basis as the diagnosis is confirmed. The first case of COVID-19 was discovered in December 2019, but the first notifications were made from Fe-

bruary 2020. Therefore, the study was limited to the database of confirmed notifications of the disease in Minas Gerais, only of the first three months of 2020. As confirmations are later released, it is suggested to complement new comparative studies on the progression of the disease. 🐦

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