

COVID-19 IN HEALTH WORKERS: AN ECOLOGICAL STUDY FROM SINAN DATA, 2020-2021

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ABSTRACT

Objective: to analyze the epidemiological and occupational profile of health workers notified for COVID-19 in Brazil, in the years 2020 and 2021.

Method: this is an ecological study, which used data from the Information System of Notifiable Diseases (SINAN) and the Annual Social Information List (RAIS), from the years 2020 and 2021. Sociodemographic and occupational variables were analyzed. The prevalence rates of COVID-19 in health workers were calculated, modeled by Poisson regression in the Stata 14 software.

Results: in 2020 and 2021, 35,545 health workers were affected by COVID-19. A higher prevalence of the disease was observed in females (79.0%), between 30 and 49 years (65.5%) and in blacks and browns (41.4%). Higher rates were observed in women (793.9/100,000 in 2020), young workers (839.9/100,000 in 2020), non-whites (1,497.4/100,000 in 2020) and in northern Brazil, with 1,688.1 cases per 100,000 workers in 2020. Nursing professionals, physicians and physical therapists had the highest rates of the disease in 2020 and 2021.

Conclusion: there was a difference between the sexes, as well as social, racial and occupational inequities that reflect the need to expand health surveillance measures in order to ensure greater prevention, protection and assistance to health workers.

DESCRIPTORS: COVID-19. Occupational health. Notifications. Health workers. Brazil.

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COVID-19 EM TRABALHADORES DA SAÚDE: UM ESTUDO ECOLÓGICO A PARTIR DE DADOS DO SINAN, 2020-2021

RESUMO

Objetivo: analisar o perfil epidemiológico e ocupacional dos trabalhadores da saúde notificados para COVID-19 no Brasil, nos anos de 2020 e 2021.

Método: trata-se de um estudo ecológico, que utilizou dados do Sistema de Informação de Agravos de Notificação (SINAN) e da Relação Anual de Informações Sociais (RAIS), dos anos de 2020 e 2021. Analisaram-se variáveis sociodemográficas e ocupacionais. Foram calculadas as taxas de prevalência de COVID-19 em trabalhadores da saúde, modeladas por Regressão de Poisson no *software* Stata 14.

Resultados: em 2020 e 2021, 35.545 trabalhadores da saúde foram acometidos pela COVID-19. Observou-se maior prevalência da doença no sexo feminino (79,0%), entre 30 e 49 anos (65,5%) e em pretos e pardos (41,4%). Foram observadas maiores taxas em mulheres (793,9/100.000 em 2020), trabalhadores jovens (839,9/100.000 em 2020), não brancos (1.497,4/100.000 em 2020) e no Norte do Brasil, com 1.688,1 casos a cada 100.000 trabalhadores em 2020. Profissionais da enfermagem, médicos e fisioterapeutas apresentaram as maiores taxas da doença em 2020 e 2021.

Conclusão: observou-se diferença entre os sexos, bem como iniquidades sociais, raciais e ocupacionais que traduzem a necessidade de ampliar medidas de vigilância em saúde, a fim de garantir maior prevenção, proteção e assistência aos trabalhadores de saúde.

DESCRITORES: COVID-19. Saúde do trabalhador. Notificações. Trabalhadores da saúde. Brasil.

COVID-19 EN PERSONAL DE SALUD: UN ESTUDIO ECOLÓGICO A PARTIR DE DATOS DEL SINAN, 2020-2021

RESUMEN

Objetivo: analizar el perfil epidemiológico y ocupacional de los trabajadores de la salud notificados por COVID-19 en Brasil, en los años 2020 y 2021.

Método: se trata de un estudio ecológico, que utilizó datos del Sistema de Información de Enfermedades de Declaración Obligatoria (SINAN) y del Registro Anual de Información Social (RAIS), de los años 2020 y 2021. Se analizaron variables sociodemográficas y ocupacionales. Se calcularon las tasas de prevalencia de COVID-19 en trabajadores de la salud, modeladas por regresión de Poisson en el *software* Stata 14.

Resultados: En 2020 y 2021, 35.545 trabajadores de la salud se vieron afectados por COVID-19. Se observó una mayor prevalencia de la enfermedad en el sexo femenino (79,0%), entre 30 y 49 años (65,5%) y en negros y pardos (41,4%). Se observaron tasas más altas en mujeres (793,9/100.000 en 2020), trabajadores jóvenes (839,9/100.000 en 2020), no blancos (1.497,4/100.000 en 2020) y en el norte de Brasil, con 1.688,1 casos por 100.000 trabajadores en 2020. Profesionales de enfermería, médicos y fisioterapeutas tuvieron las tasas más altas de la enfermedad en 2020 y 2021.

Conclusión: hubo diferencia entre los sexos, así como desigualdades sociales, raciales y ocupacionales que reflejan la necesidad de ampliar las medidas de vigilancia de la salud para garantizar una mayor prevención, protección y asistencia a los trabajadores de la salud.

DESCRIPTORES: COVID-19. Salud del trabajador. Notificaciones. Personal de Salud. Brasil.

INTRODUCTION

COVID-19 is an infectious disease caused by the SARS-Cov-2 virus, characterized as a pandemic on March 11, 2020 by the World Health Organization (WHO)¹. According to the daily report of the Pan American Health Organization (PAHO), COVID-19 accumulated 68,073,235 cases and 1,346,472 deaths in South America until April 10, 2023¹.

During the course of the pandemic in Brazil, health workers were an essential part of containing the virus.² For this reason, these professionals suffered significant impacts that include occupational absenteeism, mental health impairment, greater risk of contamination and a high number of deaths². A systematic review with meta-analysis, carried out in India, pointed out that health professionals constituted a significant portion of the total number of COVID-19 cases in that country (10.1%)³.

Furthermore, data associated with mortality and lethality from this infection in health workers revealed social and labor disparities between different categories and work environments⁴. For example, a greater number of confirmed cases in work environments in the clinical area than in procedure rooms was observed⁴. In the professional aspect, a considerable lethality rate (2.65%) was observed in nursing professionals when compared at global levels, placing them as one of the high risk categories of unfavorable outcomes⁵. According to data from the Nursing Observatory of the Federal Nursing Council (COFEN), in July 2021, the number of deaths in this category reached 838, with a total of 57,626 reported cases⁵.

When it comes to sex, women workers working in various health sectors have been largely affected by COVID-19⁶. According to a review conducted in the United States, the COVID-19 pandemic has deepened inequalities in the general population and increased the risk of unfavorable health events in women working in health services⁶.

Still with regard to the socioeconomic and racial divergences of the working class, there was a higher occurrence of infection in the black population, which consisted of the highest number of cases among different populations⁷. In a multicenter study involving 11 hospitals of the English National Health System (NHS), it was highlighted that the black race is considered a risk factor for positive COVID-19 results, along with contact with suspected or confirmed cases of the disease⁸. These data confirm the persistence of inequitable relationships that manifest themselves in the work environment and translate into a higher risk of exposure to the virus in black populations.

It is also noted that health workers were submitted to the highest burden of psychiatric disorders⁹. It is estimated that these professionals have a greater chance of traumatization and psychological damage, indirectly associated with the overload and stress inherent to their work activities⁹. In addition, a higher incidence of obsessive-compulsive and somatoform disorders was found in frontline workers working on the front lines of coping with COVID-19⁹.

Regarding the data related to cases of SARS-CoV-2 infection, the underreporting rates found in the most varied public and private information systems, including the Notifiable Diseases Information System (SINAN)¹⁰, are notable. Such discrepancies may reveal levels of underreporting that interfere in the formulation of preventive measures in the health system, with an impact on working populations¹⁰.

Given this context, when considering the greater vulnerability of health workers to COVID-19, this research aims to analyze the epidemiological and occupational profile of health workers notified for COVID-19 in Brazil, in the years 2020 and 2021.

METHOD

This is an ecological epidemiological study, which estimated the prevalence rates of COVID-19 in health workers, and described the epidemiological and occupational profile of notifications of the

disease in these workers in Brazil, between January 1, 2020 and December 31, 2021. This period was delimited by presenting consolidated data in the databases.

We analyzed the notifications of work-related COVID-19 cases registered in SINAN as serious work accidents, according to the guidance of the Ministry of Health (MS)¹¹. In addition to SINAN, information from the Annual Social Information List (RAIS) was also used.

The SINAN data were obtained in August 2022, through the Collaborating Center for the Surveillance of Occupational Health Problems (CCVISAT), from the Institute of Collective Health of the Federal University of Bahia (ISC-UFBA) to the General Coordination in Workers' Health, Ministry of Health (CGSAT-MS). The RAIS data was obtained in October 2022 through the RAIS information panel. RAIS provides data on labor activity in Brazil and is an input for conducting technical studies of a statistical and actuarial nature, gathering social and economic information on employment ties and celetista contracts, governed by the Consolidation of Labor Laws (CLT).

Cases from the databases on "Work Accident", in which the code of the International Classification of Diseases (ICD-10) was listed as B34.2 (Coronavirus infection of unspecified location) were selected for the study¹¹.

The variables analyzed were: year (2020; 2021); gender (male; female; ignored); race (white; black/brown; yellow; indigenous; ignored); race (whites; non-whites); schooling (no education; complete and incomplete elementary school; complete and incomplete high school; complete and incomplete higher education; ignored); macro-region where the notification was made (North; Northeast; Southeast; South; Midwest); age group in full years (15 to 24; 25 to 29; 30 to 39; 40 to 49; 50 to 59; 60 or more; ignored); issuance of the Communication of the Work Accident (CAT) (yes; no; does not apply; ignored); evolution of the case (cure; temporary disability; permanent partial disability; permanent total disability; death due to a serious work accident; death from other causes; other; ignored); notification quarter (1st, 2nd, 3rd and 4th quarter of 2020 and 2021) and occupation (Nursing technicians and auxiliaries; Nurses; Doctors; Community Health Agents; Physiotherapists; Pharmacists; Dental surgeons; Health laboratory assistants; Dental technicians; Nutritionists; Others).

In the occupation variable, the category "others" included care, defense and protection professionals to the person at risk; directors and operations managers in healthcare companies; veterinarians and zootechnologists; orthopedic immobilization technicians; physical education professionals; technicians in complementary therapies; Technicians in orthopedic prostheses and speech therapists.

To characterize the sample profile, the absolute and relative frequencies of sociodemographic and occupational variables were described. In addition, COVID-19 prevalence rates and their respective 95% Confidence Intervals (95%CI) were estimated among health workers, modeled by the Poisson regression. All rates were calculated for every 100,000 workers and stratified according to sex, race, age group, occupation, trimester, states and macro-region in 2020 and 2021.

The data were organized in Microsoft Excel spreadsheets and exported for analysis in the statistical software Stata® 14.0. In this research, secondary data of public access and domain were used without the identification of the participants. According to Resolution No.510, of April 7, 2016, this project did not require approval from the Research Ethics Committee system.

RESULTS

In the years 2020 and 2021, 35,545 health workers were notified for COVID-19 in Brazil. The majority were female (79.0%), aged between 30 and 49 years (65.5%), black or brown (41.4%) and with complete or incomplete high school education (40.6%). Among the regions of Brazil, the Northeast presented the highest number of notifications (n=12,274) of the period, representing 34.5% of the total. The issuance of the communication of the work accident was not performed in 34.7% of

the cases, and the cure evolution was presented by the majority of the sample (71.3%). Regarding the main occupations affected by COVID-19 in the two years, nursing technicians and auxiliaries stand out (50.6%), followed by nurses (19.7%), physicians (9.5%) and Community Health Agents (8.4%) (Table 1).

Table 1 – Description of the sociodemographic and occupational characteristics of the sample. Brazil, 2020-2021. (n=35,545)

Variable	Total n	%
Sex		
Male	7,449	21.0
Female	28,091	79.0
Not informed/ignored	5	0.0
Race		
White	11,865	33.4
Black/Brown	14,710	41.4
Yellow	798	2.2
Indigenous	93	0.3
Not informed/ignored	8,079	22.7
Education		
Uneducated	5	0.0
Complete and incomplete elementary school	383	1.1
Complete and incomplete high school	14,431	40.6
Complete and incomplete superior	14,030	39.5
Not informed/ignored	6,695	18.8
Macroregion		
North	4,371	12.4
Northeast	12,274	34.5
Southeast	7,892	22.2
South	8,993	25.3
Central-West	2,015	5.6
Age group (years)		
15 to 24	2,147	6.0
25 to 29	4,239	11.9
30 to 39	12,894	36.3
40 to 49	10,366	29.2
50 to 59	4,581	12.9
≥ 60	1,125	3.2
Not informed/ Ignored	193	0.5
Communication of Work Accident		
Yes	6,027	17.0
No	12,333	34.7
Not applicable	3,236	9.1
Not informed/ Ignored	13,949	39.2

Table 1 – Cont.

Variable	Total	%
	n	
Evolution		
Cure	25,327	71.3
Temporary incapacity	5,664	15.9
Permanent partial disability	179	0.5
Total permanent disability	6	0.0
Death due to a serious occupational accident	155	0.4
Death from other causes	72	0.2
Other	395	1.1
Not informed/ignored	3,747	10.6
Occupation		
Nursing technicians and auxiliaries	17,997	50.6
Nurses	7,004	19.7
Medical	3,391	9.5
Community Health Agents	3,007	8.4
Physiotherapists	1,263	3.5
Pharmacists	621	1.7
Dental surgeons	585	1.6
Health laboratory assistants	562	1.6
Dental technicians	359	1.5
Nutritionists	339	1.0
Other	417	0.9
Total	35,545	100.0

Source: Notifications of work-related COVID-19 cases recorded in SINAN as serious work accidents.

Regarding COVID-19 rates in health care workers, in the third quarter of 2020 (July, August and September) there were 315.3 cases per 100,000 workers. From the third quarter, there was a decrease in rates, with a rate of 60.5/100,000 recorded in the fourth quarter of 2021 (Figure 1).

When the results were analyzed according to sex, higher rates were observed among women, highlighting the rate observed in 2020, with 793.9 cases per 100,000 health workers (95%CI: 781.6 – 806.1). Regarding race, among non-white workers the highest rates were observed in both periods (1,497.4/100,000 in 2020; 856.8/100,000 in 2021). The younger age groups were the most affected, especially workers up to 24 years of age in 2020, with a rate of 839.9 (95%CI: 793.3 – 886.6) cases per 100,000 individuals. Health workers from the North and Northeast macro-regions had the highest rates in 2020, especially in the North region, with 1,688.1 cases per 100,000 health workers (95%CI:1,626.8 – 1,749.5). In 2021, the North region continues to lead with the highest rate (1,403.0/100,000), followed by the South region of Brazil (1,020.3/100,000) (Table 2).

In 2020, nurses had the highest rates of COVID-19, with 1,155.5 cases per 100,000 nurses (95%CI:1,120.1 – 1,190.9). The second most affected group were nursing technicians and auxiliaries (1,049.4/100,000), followed by physiotherapists (989.0/100,000) and physicians (717.3/100,000). In 2021, it was observed that the rates decreased for all professional categories, however, physical therapists were among the main affected by the disease (856.1/100,000), followed by nurses (823.7/100,000) and nursing technicians and auxiliaries (741.8/100,000) (Table 2).

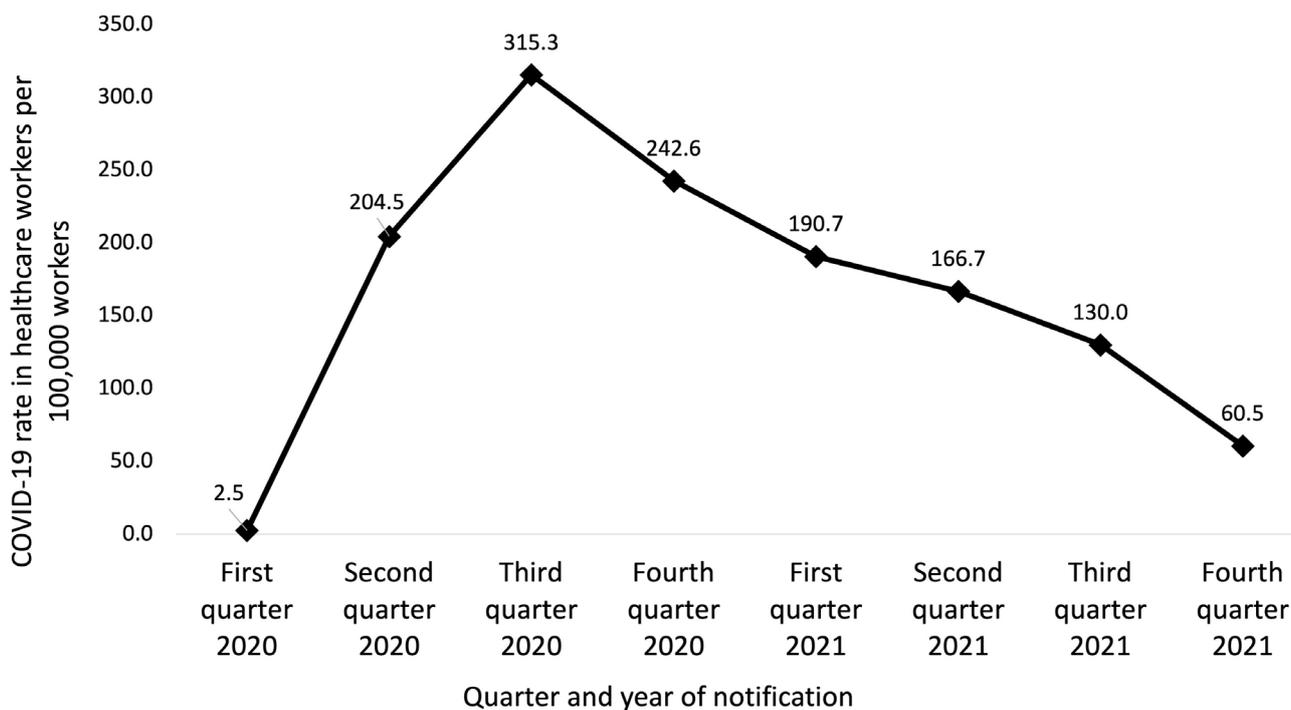


Figure 1 – Rates of COVID-19 in health care workers second year and quarter of notification. Brazil, 2020-2021.

Table 2 – COVID-19 rates in health workers according to year, sex, race, age group, macro-region and occupations. Brazil, 2020-2021.

Variables	2020		2021	
	Rate*	IC95%	Rate*	IC95%
Sex				
Male	675.3	655.6 – 695.1	446.0	430.0 – 462.1
Female	793.9	781.6 – 806.1	580.9	570.5 – 591.4
Race				
White	850.2	830.0 – 869.9	566.2	550.1 – 582.3
Non-whites	1,497.4	1,467.9 – 1,526.8	856.8	834.5 – 879.1
Age group				
15 to 24 years	839.9	793.3 – 886.6	607.4	567.7 – 647.0
25 to 29 years	834.9	802.4 – 867.4	560.1	533.5 – 586.7
30 to 39 years	806.8	788.6 – 824.9	565.4	550.2 – 580.6
40 to 49 years	777.6	757.7 – 797.4	580.8	563.7 – 597.9
50 to 59 years	666.0	640.9 – 691.0	456.5	435.7 – 477.2
60 years or older	386.0	354.0 – 418.0	392.2	359.9 – 424.5
Macroregion				
North	1,688.1	1,626.8 – 1,749.5	1,403.0	1,331.1 – 1,475.0
Northeast	1,220.8	1,192.7 – 1,248.8	834.3	811.1 – 857.5
Southeast	344.7	334.3 – 355.0	292.1	282.5 – 301.6
South	1,216.6	1,182.5 – 1,250.0	1,020.3	989.0 – 1,051.5
Central-West	565.4	535.2 – 595.6	280.4	259.1 – 301.7

Table 2 – Cont.

Variables	2020		2021	
	Rate*	IC95%	Rate*	IC95%
Occupation				
Nursing technicians and auxiliaries	1,049.4	1,029.4 – 1,069.5	741.8	724.9 – 758.6
Nurses	1,155.5	1,120.1 – 1,190.9	823.7	793.8 – 853.7
Medical	717.3	684.8 – 749.8	580.6	551.4 – 609.8
Community Health Agents	528.7	505.2 – 552.3	289.1	271.7 – 306.5
Physiotherapists	989.0	914.5 – 1,063.5	856.1	786.7 – 925.4
Pharmacists	223.5	199.7 – 247.4	188.4	166.5 – 210.3
Dental surgeons	506.0	449.3 – 562.7	461.4	407.2 – 515.5
Health laboratory assistants	321.9	286.2 – 357.5	256.1	224.3 – 287.9
Dental technicians	192.8	164.9 – 220.8	185.4	158.1 – 212.8
Nutritionists	427.2	367.9 – 486.6	300.5	250.7 – 350.3
Other	121.5	106.3 – 136.7	85.3	72.6 – 98.1

Legend: 95%CI: 95% Confidence Interval.*Calculated for every 100,000 workers.

Figure 2 shows the rates of COVID-19 in health workers according to the Federative Units of Brazil. Tocantins and Rondônia, states in the northern region of the country, ranked first and second with the highest rates of the disease in both years. In 2020, the lowest rate was observed for Pará (4.4/100,000), and in 2021 for the Federal District (15.2/100,000). It is noteworthy that the state of Espírito Santo did not make notifications of the disease in both periods and the state of Pará did not make notifications of COVID-19 in health workers in 2021 (Figure 2).

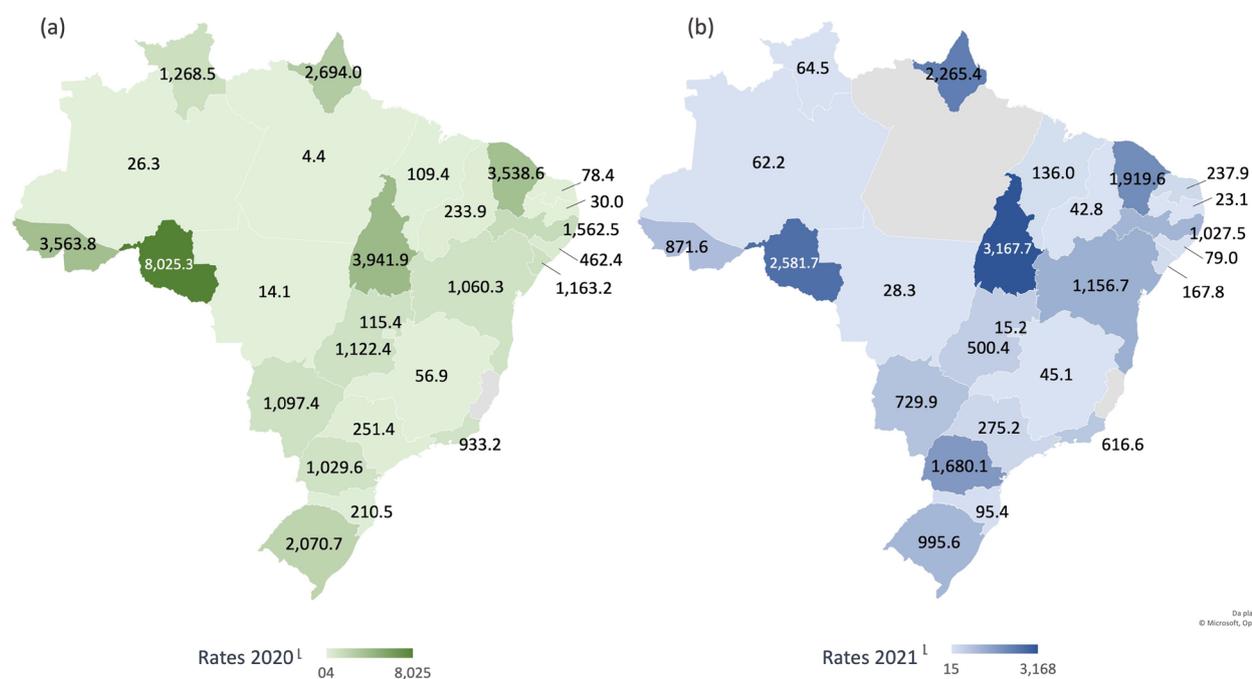


Figure 2 – Rates of COVID-19 in health workers according to states in Brazil.
 Legend = (a) 2020; (b) 2021
 Note: states in gray did not present notifications in the period.

DISCUSSION

Significant differences were identified in the profile of disease notifications, in relation to gender, race, age group and type of occupation, accentuating social, racial and occupational inequalities among health workers. On the other hand, failure to complete the SINAN notification forms showed the low quality of the database, especially in relation to the variables issuing CAT, education and race/color/ethnicity. With regard to the analyzed rates, higher rates were observed in females, non-white individuals, younger age groups and states in the North region of Brazil. Nursing professionals, physicians and physiotherapists had the highest rates of the disease in 2020 and 2021.

Regarding the gender variable, there is a higher rate and frequency of cases in females compared to males. This fact may point to the inequalities between men and women in the country¹², as well as the disparity in the distribution of this profile among health workers, mostly composed of women¹³. It was estimated that a female participation was close to 70% in the health sector, according to data from the 2000 Census in Brazil¹⁴. At the same time, according to the Centers for Disease Control and Prevention, between February and April 2020, women working in health areas were proportionally more affected, reflecting their majority among health professionals in that country¹⁵.

Regarding race, it is essential to elucidate the reasons why blacks and browns accounted for 41.4% of the reported cases among health workers. Furthermore, higher rates were presented by non-white individuals. Continuing its historical and social process, racial inequality deepened in the COVID-19 pandemic in the most diverse sectors of society, no different in the labor field⁷. This finding is even more aggravated when analyzing gender and race, as observed in the greater exposure of black women in health and essential jobs¹². That said, it was found that self-declared black frontline health workers in the fight against the pandemic received less training, instructions, personal protective equipment (PPE), leadership guidance and general support when compared to “white” professionals of the same activity during the fight against the virus, as evidenced in data collected from September to October 2020 by the Center for the Study of Bureaucracies of the Getúlio Vargas Foundation (FGV) in partnership with the Oswaldo Cruz Foundation (Fiocruz) and the COVID-19 Humanities Network¹⁴.

Regarding occupations, health professionals demonstrated the highest rates of work-related COVID-19¹⁶ throughout the pandemic course, which varied even by occupational profile. Several factors influence the higher rate of reported cases among health workers, such as direct contact with infected patients, risk factors inherent to the work environment, the scarcity or inadequacy of PPE, as well as the greater instrumentalization and ease of access to the means of notification of SINAN^{17,18}. However, from this study, the greater involvement of certain occupational categories was noted, with emphasis on the rates among nursing technicians and auxiliaries, nurses, doctors and physiotherapists, which together corresponded to about 83.3% of COVID-19 notifications. These data express the inequalities present in the exercise of health work itself, even among the different categories of health workers, mostly affecting professionals who are in frequent contact with the patient¹⁹. Only COFEN highlighted that Brazil is the country with the highest number of deaths of nurses from COVID-19 in the world during this period²⁰. The lack of qualification and availability of PPE was also evident in these workers, in addition to workloads that intensified the process of biopsychosocial illness in this category^{21,22}.

Other professionals heavily contaminated by the SARS-CoV-2 virus in Brazil were the Community Health Agents (CHA), in their work context in Primary Health Care (PHC). During the pandemic waves, The CHA and its Family Health Teams (FHT) gradually became one of the central axes of articulation of flows and counterflows within the Health Care Network (HCN), where people seek assistance when symptomatic or as a longitudinal instrument of their care process²³. In this way, workers working in the FHT were exposed to different situations of infectious risk²⁴, in particular the CHA when coming into direct contact with the community enrolled in the territory of the Basic

Health Unit (BHU), including in their homes. Furthermore, this type of occupation is associated with a greater profile of health inequity, compatible with the country's regional inequalities¹⁰, as it accesses heterogeneous regions of geographic space, marked by lesser or greater social vulnerability. Higher infection rates were found in less vulnerable districts, while higher CHA mortality was identified in more vulnerable locations²⁵.

From the perspective of the temporal evolution of cases, this study found a greater number of notifications and a higher rate in the third quarter of 2020, compared to the other quarters analyzed. It is noteworthy that in 2020 there were no diagnostic tests for the entire population²⁶. Due to the shortage of tests, public policies emphasized that their distribution should be directed towards serious cases and health professionals, which may have impacted on the results found in the present study²⁶. In addition, it should be considered that the diagnostic methods for detecting COVID-19 at the beginning of the pandemic course added up to a high number of false negative results, a fact that changed with the qualification of these tests, allowing the identification of greater number of health professionals affected²⁷.

When analyzing the cases notified by Brazilian state, the difference in the level of notification at the state level was recognized. While the states of Tocantins and Rondônia were among the states with the highest rates, states such as Espírito Santo and Pará did not register notified cases. This marks the validity of different public measures for testing and notifying the population, a process observed among health workers in each state²⁸. In this process, there is also the fact that hospitals and public or private institutions adopt different, non-standard means of notification, varying even within the state itself²⁸. In the present study, differences were identified between the rates of the Brazilian macro-regions, with emphasis on the North and Southeast regions. This finding may also be related to the fact that the measures to combat COVID-19 were not national, but carried out at the state level, that is, they varied according to the federative unit²⁹. Corroborating this point, results of a serological survey carried out in 27 Brazilian states suggested that the pandemic is highly heterogeneous, with rapid escalation in the North and Northeast regions of Brazil²⁹.

This study has some limitations. The low quality of the completion of some variables in the SINAN bank is notable, noting a large proportion of unknowns in the variables education, race and issuing of CAT. Also, the incompleteness in filling out the race variable in the RAIS bank is highlighted, which may affect the estimation of the rate found. Similar to what happened with other diseases of epidemiological importance in Brazil, such as tuberculosis³⁰, together with numerical differences in other databases, it points to the maintenance of the historical process of underreporting by SINAN²⁸, which leads to a lack of essential data for health surveillance services and public policy formulation. Despite this, it is worth noting that SINAN is one of the few national databases that provide information on accidents, diseases and injuries related to workers' health in the country.

CONCLUSION

It is concluded that the results found showed differences between the sexes, as well as social, racial and occupational inequities that reflect the need to expand health surveillance measures in order to ensure greater prevention, protection and care to health workers. This study intended to contribute to the field of workers' health by demonstrating the presence of racial and occupational inequalities, which determined a higher proportion of contamination and morbidity and mortality among health professionals. Identifying the specific needs of the different productive sectors is essential for developing strategies to prevent exposure to the virus. Race and gender seem to play an important role in the occurrence of the disease. In this sense, worker health surveillance actions should strongly consider these aspects, in order to outline interventions that reduce risks, such as rapid testing and the distribution of PPE, and to increase safety standards in work environments. To this end, it is also

important to prepare and qualify professionals to improve the quality of filling in the SINAN notification forms, in order to provide more reliable data in the field of occupational health, which may support more resolute prevention, protection and assistance actions for Brazilian workers.

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NOTES

ORIGIN OF THE ARTICLE

Extracted from the Course Conclusion Paper – Notifications of COVID-19 in health workers: analysis of the epidemiological and occupational profile from the data of SINAN, Brazil, 2020, presented to the Undergraduate Course in Medicine, of the Universidade Federal de Santa Catarina, in 2022.

CONTRIBUTION OF AUTHORITY

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APPROVAL OF ETHICS COMMITTEE IN RESEARCH

Secondary data of public access and domain were used without the identification of the participants. According to Resolution No.510, of April 7, 2016, this project did not require approval from the Research Ethics Committee system.

CONFLICT OF INTEREST

There is no conflict of interest.

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