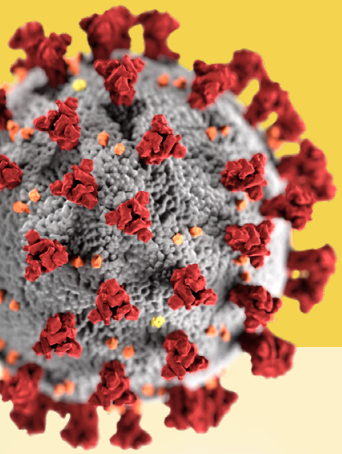

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Information on occupation of patients with COVID-19: Literature review

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RAMB
JOURNAL OF THE BRAZILIAN MEDICAL ASSOCIATION

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Associação Médica Brasileira

Em um momento em que há uma emergência mundial de saúde pública, é fundamental que o conhecimento científico gerado durante a pandemia chegue rapidamente à classe médica classe médica.

Dentro desta dinâmica a Revista da Associação Médica Brasileira (Ramb) está adotando uma série de medidas a fim de acelerar o processo editorial para publicação de artigos sobre a Covid-19. A partir de hoje (14/04/2020), a AMB publicará o Boletim Ramb Covid-19, que antecipará os artigos científicos selecionados pelos editores da Ramb sobre o tema.

"Os artigos foram escritos por especialistas e selecionados dentro dos critérios da Ramb para esclarecer temas fisiopatológicos, assim como oferecer orientações de prevenção e tratamento da doença. Dessa forma, esperamos colaborar com os médicos para o melhor atendimento aos seus pacientes, com a disponibilidade mais ágil desses artigos, antes de sua publicação na Ramb", comenta Carlos Serrano Jr., editor-chefe da Ramb.

Para o diretor científico da AMB, Antonio Carlos Palandri Chagas, "neste momento ímpar vivido no mundo por conta da pandemia de Covid-19, a AMB cumpre seu papel de estar levando à comunidade científica brasileira os recentes artigos sobre os mecanismos fisiopatológicos e aspectos clínicos relevantes dessa situação que assola a saúde pública".

Carlos Serrano Jr.

Antonio Carlos Palandri Chagas

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Information on occupation of patients with COVID-19: Literature review

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Dear Editor,

Covid-19 was recorded for the first time in Wuhan, the capital of the Hubei province, in China, in December 2019. The disease is caused by a new coronavirus (Sars-COV-2) and transmitted by the sharing of aerosols[1]. From its origin until the 21st of April of 2020, the disease had already caused the death of more than 175,000 people worldwide. There had been more than 2.5 million confirmed cases on this date[2].

The World Health Organization (WHO) declared Covid-19 a pandemic on 11 March 2020[3] and, since then, has been, along with its member countries, seeking mechanisms to control the disease. Since this is a new disease, scientists have been working hard to develop research that allows the decision making by doctors and public managers.

The number of investigations about the profile of patients with Covid-19 grows daily, with the intention of identifying characteristics that are associated with a greater risk of illness and death. Among these characteristics, occupation stands out. Identifying patients' professional profile can bring benefits for the effective control of the pandemic: i. identification of possible locations of contamination, ii. adoption of safety measures in the workplace; and iii. knowledge about the role of occupation in the transmission dynamics of the disease.

A systematic review of the literature was conducted involving scientific articles that describe the epidemiological characteristics of patients hospitalized with Covid-19 worldwide. Articles published in the PubMed, MEDLINE, and Scopus databases between 1 January and 24 April 2020 were selected using the following descriptors: Covid-19, Sars-CoV-2, 2019-nCoV, n-VOC, and coronavirus combined with clinical profile, epidemiology. The search was conducted on 24 April 2020.

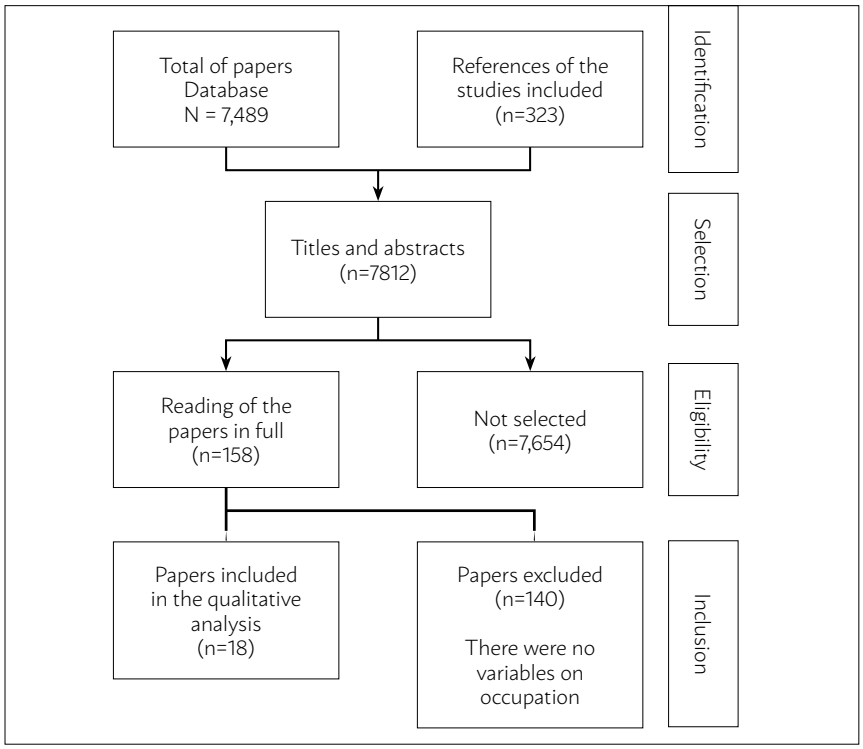
In the study, trials, cohort studies, cross-sectional studies, clinical cases, and series of cases, both published and in pre-print, were included. The following exclusion criteria were adopted: government epidemiological bulletins, comments, literature reviews, and articles without access to their full content. After the search, three authors, independently, completed the following steps: 1- reading of the title and summary, 2- reading of the full article, 3- collection of data relating to occupation, and database assembly. The analysis was done by two other researchers independently. Then, the differences were analyzed by the investigation team.

Initially, we found 7,489 scientific papers in the databases. Of these, 158 met the inclusion criteria, totaling 100,563 patients from all continents. After reading them in full, only 18[3-20] papers had information on occupation (Figure 1): Brasil (one text; 81 patients), Thailand (one text; 11 patients), USA (one text; 48 patients), and China (15 texts; 47,870 patients), totaling 48,010 individuals, homogeneously distributed between sexes (51.62% men and 48.38% women) (Table 1).

In relation to professional activity, two occupations can be highlighted: 20.76% (n=9963) of patients were farmers and 19.77% (n=9,488) retired. Among the other individuals, 7.19% (n=3,453) worked in the service industry, 4.34% (n=2,085) were health professionals, 0.68% (n=327) employees, and 0.61% (n=295) self-employed. Four studies (3, 6, 9, 18) defined the other occupancies in the category '*other*', corresponding to 43.16% (n=20,719) of individuals studied. Eight papers[3,5,7,10,11,12,12,17] characterized the occupation of part of the cases, without information on the others, which were included in the field "*not informed"(n=1,680; 3.49%)* (Table 1).

The records of health professionals with the disease were observed in 12/18 articles, and four[13,14,16,19] of them were conducted exclusively

FIGURE 1. PAPER SELECTION FLOWCHART, 2020.



on these professionals. In seven others[3,5,7,10,11,15,17], professions were not investigated, but the text highlighted the number of health professionals with Covid-19. Excluding the studies composed exclusively by health professionals, the frequency of this category varied from 3.5% to 29.0% (Table 1).

In outbreaks of infectious diseases, occupation and work environment can play an important role in the dissemination of infection due to a variety of actions that can promote this spread, such as contact with customers, food preparation, and others[21]. Studies on other diseases have already stressed the importance of professional activity in the dynamics of transmission: Danovaro-Holliday et al.[22], for example, showed that agglomerations and precarious living conditions favored outbreaks of rubella.

Approximately 10% (n=14.4 million) of workers in the United States are employed in occupations in which exposure to diseases occurs at least once a week; and 18.4% (n= 26.7 million) workers there are employed in occupations in which exposure to morbidities occurs at least once a month[21]. Given this scenario, it becomes relevant, in studies and research carried out on Covid-19, to identify the professional activities of individuals and their place of work to understand the relationship between occupation and the spread of the disease.

In this review, we observed that of 48,010 individuals, 1,680 were in the category of occupation *not informed* and 20,719 in the *other* category, which represents a shortage in specific definitions of occupation in 46,65% of the population studied. This lack of information, in general, can compromise the reliability of epidemiological information and generate false correlations in the diagnoses of health (23).

The correct identification of patients' occupational profiles can bring benefits for the effective control of the pandemic, guiding the adoption of effective safety measures in work environments. In the study by Wang et al.[4], of the 16 retail professionals contaminated by Covid-19, 11 and their relatives worked in the same supermarket. This scenario reinforces the need for rigorous monitoring of occupations and workplaces of patients, which is essential to prevent and/or reduce the spread of the virus in these locations and from them to their families and the community in general.

From the mapping of the professions most vulnerable to contagion, it is possible to develop actions of infection prevention and containment, as shown in the study by Wang et al.[13], in which health professionals present peculiar clinical and laboratory characteristics, which differ from those of people with other occupations and, therefore, require special attention and targeted biosafety.

According to data from the US Department of Health and Human Services/Centers for Disease Control and Prevention, 19% (n=9,282) of the confirmed Covid-19 cases in the United States were identified in health professionals. These data may be underestimated since the health professional occupation was available only in 16% of the cases reported throughout the country[24]. In our analysis, 12 studies reported this occupation, making it necessary to ensure control in healthcare environments to reduce transmission. The contamination of these professionals has implications for the health system, both regarding the occupation of hospital beds as well as the reduction of the labor force available.

The papers used in this study present limitations. The diversity of classifications of the occupation variable hinders the identification of a risk profile. Another obstacle is the restriction of geographical area, since out of the 18 studies reviewed, 15 were conducted in the same country (China), which represents a percentage of 99.70% (n=47,870) of the entire study population, making it difficult to have comparative analysis between countries.

Based on the results presented, we

TABLE 1. CHARACTERIZATION OF THE PAPERS INCLUDED IN THE STUDY (N=18), 2020.

Paper	Country	N	Sex		Occupations reported							
			Male (%)	Female (%)	Agriculture (%)	Services (%)	Self-employed (%)	Employed (%)	Retired (%)	Health professionals (%)	Others (%)	Not informed (%)
Borba et al. (3)[a]	Brasil	81	61 (75.4%)	20 (24.7%)	-	-	-	-	-	5 (6.2%)	-	76 (93.8%)
Wang et al. (4)[b, c]	China	26	11 (42.3%)	15 (57.7%)	2 (7.7%)	-	1 (3.9%)	16 (61.5%)	4 (15.4%)	-	3 (11.5%)	-
Li et al. (5)[a]	China	548	279 (50.9%)	269 (49.1%)	-	-	-	-	-	45 (8.2%)	-	503 (91.8%)
Shi et al. (6)[c]	China	487	259 (53.2%)	228 (46.8%)	140 (28.7%)	-	219 (45%)	82 (16.8%)	38 (7.8%)	-	8 (1.6%)	-
Wang et al. (7)[a]	China	138	75 (54.3%)	63 (45.7%)	-	-	-	-	-	40 (29.0%)	-	98 (71%)
Chen et al. (8)	China	99	67 (67.7%)	32 (32.3%)	2 (2%)	-	63 (63.6%)	15 (15.1%)	19 (19.2%)	-	-	-
CCDCP (9)[d]	China	44672	22,981 (51.44%)	21,691 (48.55%)	9,811 (22%)	3,449 (7.7%)	-	-	9,193 (20.6%)	1,716 (3.8%)	20,503 (45.9%)	-
Lai et al, 2020. (10)[a]	China	278	172 (61.88%)	106 (38.12%)	-	-	-	-	-	40 (14.4%)	-	238 (85.6%)
Li et al, 2020. (11)[a]	China	425	240 (56.47%)	185 (43.53%)	-	-	-	-	-	15 (3.5%)	-	410 (96.5%)
An et al. (12)[e]	China	25	17 (68%)	8 (32%)	-	-	-	3 (12%)	-	-	-	22 (88%)
Wang et al. (13)	China	80	31 (38.75%)	49 (61.25%)	-	-	-	-	-	80 (100%)	-	-
Liu et al. (14)	China	30	10 (33.3%)	20 (66.6%)	-	-	-	-	-	30 (100%)	-	-
Cao et al. (15)[a]	China	102	53 (52%)	49 (48%)	-	-	-	-	-	24 (23.5%)	-	78 (76.5%)
Zhan et al. (16)	China	23	17 (73.9%)	6 (26.1%)	-	-	-	-	-	23 (100.0%)	-	-
Chen et al. (17)[a]	China	274	171 (62.4%)	103 (37.6%)	-	-	-	-	-	19 (6.9%)	-	255 (93.1%)
Zhang et al. (18)[d]	China	663	321 (48.4%)	342 (51.6%)	8 (1.2%)	-	12 (1.8)	211 (31.8)	227 (34.2%)	-	205 (30.9%)	-
Chow et al. (19)	USA	48	11 (22.9%)	37 (77.1%)	-	-	-	-	-	48 (100.0%)	-	-
Pongpirul et al. (20)	Thailand	11	6 (55%)	5 (45%)	-	4 (36.4%)	-	-	7 (63.6%)	-	-	-
Total	-	48,010 (100.0%)	24,782 (51.62%)	23,228 (48.38%)	9,963 (20.76%)	3,453 (7.19%)	295 (0.61%)	327 (0.68%)	9488 (19.77%)	2,085 (4.34%)	20,719 (43.16%)	1,680 (3.49%)

Legend: **a**- The study does mention the professions, but highlights the number of health professionals; **b**- The study highlights that the 'Retail Staff' occupation was the most common, with 11 individuals working in the same supermarket. This occupation was classified as "employed"; **c**- The work includes the occupation 'Student' reclassified as "other"; **d**- Occupation classified as "other" was not specified; **e**- The study shows that three patients were involved in medical waste cleaning. The 22 classified as not informed are relatives of these patients.

advocate that studies on the profile of Covid-19 patients should include the occupation variable. In Brasil, this recommendation is of the utmost importance because it will allow us to know the risk profile and the impact of occupations in the magnitude of the pandemic. Such knowledge may subsidize the development of policies aimed at health workers and guide the process of reopening of companies/trade after this critical stage of the pandemic.

Author's Contribution

Carlos DFSouza; Aisla GG Santos; Euclides JO Cunha; Tatiana F Oliveira; Saulo HS Aquino; Rodrigo da Rosa Mesquita; Luiz CFS Junior; Fernanda MS Santana; Rafaela C Alcântara; Gabriel M Arnozo; Etvaldo RS Filho participated in the concept development, planning of the study, data collection and analysis, discussion of the results, scientific drafting, as well as in the review and approval of the final version of the paper. ■

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