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Impact of the SARS-CoV-2 COVID 19 pandemic on healthcare workers

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Abstract

Background: Healthcare workers are enormously stressed up during any pandemic because of their responsibility as key players in response to a pandemic. They are the main sector that has contact with patients and are often exposed to infected cases in healthcare settings.

Aim: This study aimed to analyze the official figures on the real impact of the COVID-19 pandemic on healthcare workers.

Materials and Methods: This was a documentary, exploratory and descriptive research. The data were collected from official reports from international organizations such as the World Health Organization and the International Labor Organization and figures from the different authorized spokespersons of the countries studied worldwide; during the period March - July 2020.

Results: The first three countries with the highest percentages of infected health personnel are Spain (24.1%), Mexico (19.9%), and France (13.0%). Likewise, India (7.60%), the United Kingdom (5.91%), and Germany (3.78%) are also among the first three countries with the highest percentages of deaths of health personnel from this same cause.

Conclusion: Covid-19 pandemic has directly affected health professionals, representing one of the greatest challenges that these professionals have faced in the performance of their functions.

Keywords: COVID-19, pandemic, healthcare workers

Introduction

Throughout life, the disease has been part of the history of humanity. Over time, human beings began to live in society and to coexist with each other in the same spaces, and this interrelation brought with it the spread of contagious diseases. Hence, as this integration took root, diseases began to spread and globalize, becoming intimidating for the urban areas. This is how the now-called pandemics were born, which with time could transfigure societies.

In ancient times, people believed that the gods punished societies by transmitting diseases when they deserved punishment. This belief was based on the wrath of the gods, which in some way was used to explain the appearance of certain diseases, an example of which was the deadly epidemic in 430 B.C. where the goddess Hera, wife of Zeus, was attributed to have sent a plague to the island of Aegina, due to the infidelity of her husband [1]. This corresponds to a real event, the famous plague of Athens, in which thousands of people died. The historian Thucydides described it in The History of the Peloponnesian War, as a disease that originated in Ethiopia, crossed Egypt and Libya, ended up impacting Greece, and killed thousands of Athenians and Spartans [1].

Since then and up to the present day, the 21st century, the world has experienced a large number of diseases that have globalized into epidemics and pandemics, which have put humanity in check. Among the deadliest are; The Black Plague (Black Death), smallpox, Spanish flu, and more recently the Asian flu as well as Acquired Immunodeficiency Syndrome (AIDS) [2].

Currently, another pandemic plagues the human race. In September 2019, the World Health Organization (WHO) published a report warning the world of an imminent global pandemic. A few months after, in December 2019 the WHO reported an outbreak of the new SARS-Cov-2 coronavirus (COVID-19) in Wuhan city, China [3, 4]. This new pandemic has hit all regions of the world, advancing relentlessly and leaving in its wake disarray and desolation.

These feelings are endured by all human beings who inhabit the planet; however, some people have experienced them with greater intensity, as is the case of health personnel such as doctors, nurses, stretcher-bearers, cleaning staff, who by their work face the terrible virus directly. This resulted in a confluence of feelings such as fear, anguish, and sadness,

for seeing those infected by this deadly virus. Apart from dealing with their fears for putting their lives at risk, they are also worried about putting the lives of their family members at risk of infection. According to the International Labor Organization (ILO) [5], people who continue to work in public places, particularly healthcare workers, are exposed to significant health risks in addition to economic risks.

In this same line of thought the International Labor Organization [5], states that the pandemic caused by COVID-19 has accelerated even more in terms of intensity and global extension of its scope. The measures of total or partial stoppage of work processes already affect almost 2.7 billion workers, that is, around 81% of the world's workforce. However, the health sector has not paralyzed its activities, becoming one of the most at-risk sectors because health workers are on the front line, fighting directly against the virus and ensuring that the basic needs of the population are met.

The ILO [5] also stated that there are about 136 million health care and social assistance workers worldwide, as well as support workers, such as laundry and cleaning staff, who are at serious risk of contracting COVID-19 infection in the workplace. According to ILO [5], approximately 70% of the workers in the health sector are women, which imply that they are likely to be affected more by the pandemic.

In light of this reality, what is the real dimension of this pandemic regarding health care workers? What is the real impact of the COVID-19 pandemic on health care workers? Given these questions, the objective of the study is to analyze the official figures on the real impact of the COVID-19 pandemic on healthcare workers.

Materials and Methods

This was a documentary, exploratory and descriptive literature review of the health situation of healthcare workers in times of COVID-19 conducted from March to July 2020. The data were collected from official reports of international organizations such as the World Health Organization (WHO) and the International Labor Organization (ILO) and official figures from the various spokespersons of the studied countries worldwide. The population consisted of health personnel from all countries that were affected by COVID-19 and the sample consisted of health personnel from the first twenty countries that had the highest rates of health personnel affected by the pandemic.

The criteria for the selection of the documents were related to the following points: that they were documents from official sources; that each of them reported on the situation of health personnel and that the information was within the period from March to July 2020. A database was designed, with which the information collected was processed through the Excel program version 2007. The data were presented with simple frequencies and percentages. Descriptive analysis was obtained in tables with distribution (absolute and percentage).

Results

According to the World Health Organization[6], by 2018, the global health workforce was represented by approximately 59,220,000 health professionals, with a density of 9.3 per 1000 population, of which 39,470,000 (67%) are health service dispensers and health workers with administrative and auxiliary functions were 19,750,000 (33%), (Table 1).

Note: All data correspond to the latest year available. For countries for which data on the number of administrative and auxiliary workers were not available, estimates are based on regional averages for countries with complete data.

Also, the WHO [6], through its website, provides figures on the global health workforce, broken down by specialty (Table 2).

Note: For data processing purposes, professionals in physiatry, traditional, and complementary medicine, dentistry, pharmacy, environmental and occupational health and hygiene were excluded.

According to the WHO [6] classification of health professionals registered by region, nurses and midwives are first places, followed by physicians and technicians. It is worth mentioning that this table does not include professionals in the fields of physiatry, traditional and complementary medicine, dentistry, pharmacy, environmental and occupational health and hygiene. It is also worth clarifying that all data correspond to the latest year available for each country. In the case of countries for which data on the number of administrative and auxiliary workers were not available, estimates are based on regional averages for countries with complete data.

Table 3 shows that in the United States of America, for the period studied, 3.7% of coronavirus disease (COVID-19) infections had been reported, and a case fatality rate of 0.56% in healthcare personnel.

In Brazil, 11.9% of confirmed infections were reported for the disease with a case fatality rate of 0.08% in health personnel, and India reported 0.2% of infections with the virus with a case fatality rate of 7.60%.

At the time of this study, Peru had 0.68% of healthcare workers infected with the disease and a case fatality rate of 3.50%. Likewise, Chile reported a total of 0.59% of medical personnel infected by COVID-19 with a case fatality rate of 0.49%.

In Mexico, the data mentioned are 19.9% of confirmed cases of infection and a case fatality rate of 1.48% and in the United Kingdom, a total of 1.62% of confirmed cases of COVID-19 were documented, with a case fatality rate of 5.91%.

In South Africa, a total of 1.42% of healthcare workers was confirmed to have acquired COVID-19 during the studied period, and of these, 0.95% death. In Iran, 1.89% of health professionals were confirmed infected and 2.80% death.

In Spain, since the beginning of the SARS-CoV-2 alert, 24.1% of healthcare personnel have been notified with a diagnosis of coronavirus, of the total number of cases, 0.13% of deaths were reported. Likewise, Pakistan published data on confirmed COVID-19 cases for healthcare workers throughout the country. The data showed that there were 2.5% confirmed cases in the country and out of all these infected health workers, there was 1.8% death.

In Italy, at the time of this study, the latest figures show that healthcare workers accounted for 12.2% of the cases of COVID-19 in that country, with the number of deaths amounting to 0.73%.

It is worth noting that Saudi Arabia and Turkey are countries that, despite having high numbers of COVID-19 infections and deaths, there are no official figures for the period studied.

In France, 13.0% of health professionals were affected by the SARS-CoV-2 coronavirus and 0.05% died from the

same cause. In Germany, 8.8% of healthcare personnel were infected with the virus and 3.78% death for infected personnel. In Bangladesh, there were 3.5% of reported cases of COVID-19 and 0.88% of these had resulted in deaths. In Colombia, 4.9% of cases were reported, with 0.82% of deaths. It should be noted that no official data were reported for Canada at the time of this study.

The data presented in the analysis shows the situation of health personnel in the face of the COVID 19 pandemic, which can be observed graphically in Figure 1 and 2, which shows the behavior of the pandemic at world level through the infection and lethality rates, respectively.

Table 1: Global health workforce, by density, year 2018.

WHO Region	Health workforce		Dispensers of health services		Healthcare workers with administrative and ancillary duties	
	Number	Density (per 1000 inhabitants)	Number	% of total health workforce	Number	% of total health workforce
Africa	1640000	2,3	1360000	83	280 000	17
The Americas	21740000	24,8	12460000	57	9280000	43
Southeast Asia	7040000	4,3	4730000	67	2300000	33
Europe	16630000	18,9	11540000	69	5 090 000	31
Eastern Mediterranean	2100000	4,0	1580000	75	520000	25
Western Pacific	10070000	5,8	7810000	78	2260000	23
Worldwide	59.220.000	9,3	39.470.000	67	19.750.000	33

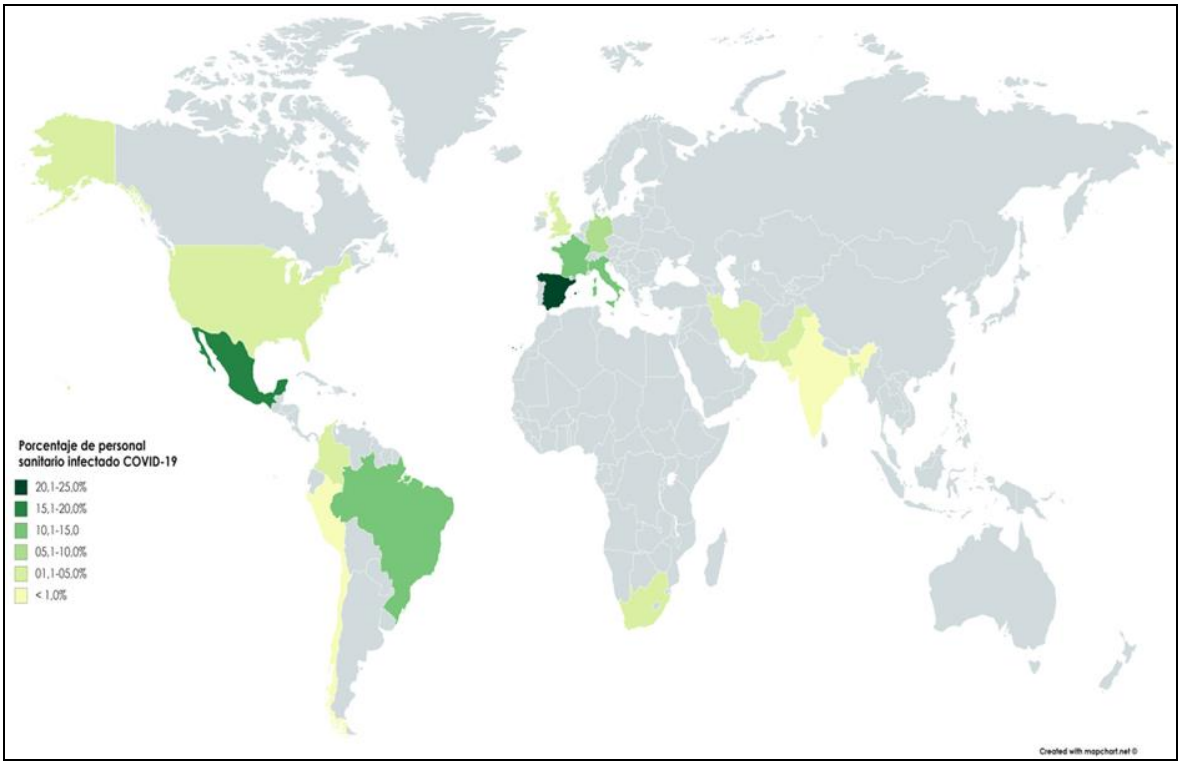
Table 2: Global health sector workforce According to WHO, year 2018.

WHO Region	Nurses and midwives	physicians	general practitioners	specialist physicians	Medical and pathology laboratory scientists	Medical and pathology laboratory technicians	Community physicians	*Total*
Africa	1.052.241	300.954	142.946	60.455	41.064	75.754	280.632	1.954.046
The Americas	8.318.625	2.355.408	510.399	1.295.514	591.838	471.215	452.968	13.995.967
Eastern Mediterranean	1.016.794	709.015	189.158	199.927	39.932	70.759	52.015	2.277.600
Europe	7.491.676	3.140.912	716.634	2.077.601	374	40.359	17.417	13.484.973
Southeast Asia	3.434.845	1.599.179	149.603	157.460	557.770	40.992	2.110.106	8.049.955
Western Pacific	6.940.034	3.582.043	99.035	149.437	10.990	277.591	1.134.186	12.193.316
Total	28.254.215	11.687.511	1.807.775	3.940.394	1.241.968	976.670	4.047.324	51.955.857

Table 3: shows the country's most affected by SARS-CoV-2 for the period March - July 2020

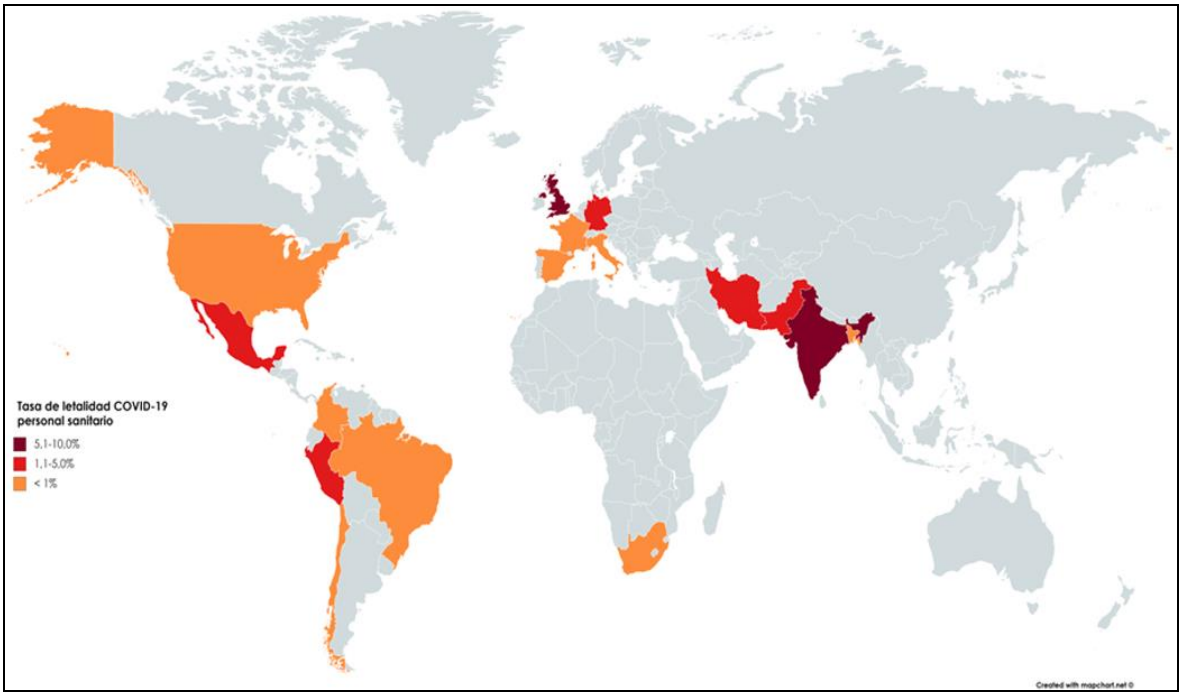
Nº	Country	% Health Care Workers infected by SARS-CoV-2	Case fatality rate
1	United States	3,71%[a]	0,56%[a]
2	Brazil	11,0%[b]	0,08%[b]
3	India	0,2%[c]	7,60%[c]
4	Russia	No official figures	
5	Peru	0,68%[d,e]	3,50%[d,e]
6	Chile	0,59%[f]	0,49%[f]
7	Mexico	19,9%[g]	1,48%[g]
8	United Kingdom	1,62%[h]	5,91%[h]
9	South Africa	1,42%[i]	0,95%[i]
10	Iran	1,89%[j]	2,80%[j]
11	Spain	24,1%[k]	0,13%[k]
12	Pakistan	2,5%[l]	1,8%[l]
13	Italy	12,2%[m]	0,73%[m]
14	Saudi Arabia	No official figures	-
15	Turkey	No official figures	-
16	France	13,0%[n]	0,05%[n]
17	Germany	8,8%[o]	3,78%[o]
18	Bangladesh	3,5%[p]	0,88%[p]
19	Colombia	4,9%[q]	0,82%[q]
20	Canada	No official figures	-

Source: [a]Centers for Disease Control and Prevention (2020), [b] Ministério da Saúde, Brasil (2020), [c]Indial Medical Association (2020), [d]Colegio de Médico de Perú (2020), [e]Colegio de enfermería del Perú (2020), [f]Confederación nacional de funcionarios de salud municipal (2020), [g]Gobierno de México (2020), [h]Office for National Statistics (2020), [i]Departament Health Republic of South Africa (2020), [j]Ministry of Health of Iran (2020), [k]Red Nacional de Vigilancia Epidemiológica de España (2020), [l]Ministry of the National Health Services, Pakistan (2020), [m]Istituto Superiore di Sanità, Italia (2020), [n]Santé publique France (2020), [o]Robert Koch Institute (2020), [p]Bangladesh Medical Association (2020), [q]Instituto Nacional de Salud, Colombia (2020).



Source: Research data (2020)

Fig 1: Geographic location of infection rates of healthcare personnel by COVID- 19.



Source: Research data (2020)

Fig 2: Geographic location of healthcare personnel case fatality rates by COVID-19.

Discussion

Healthcare professionals, particularly those specializing in the COVID-19 pandemic, are vulnerable to both the high risk of infection and mental health problems. In other words, they run the risk of contracting COVID-19 when performing their duties, excessive working hours, psychological distress and fatigue. They may also experience fear of contagion, and the spread of the virus to family, friends, or colleagues. In this regard, Ricci *et al* [7], argue that the global health emergency caused by the current COVID-19 pandemic is probably posing one of the greatest challenges that healthcare professionals have ever faced in their careers. These same authors agreed that Laboral stresses the risk of contagion and the lack of adequate material and human resources for the fight against the virus, added to the quarantine situation, could cause significant mental health problems for health professionals in the face of the current pandemic. Ricci *et al* [7], after conducting literature searches in Medline, Embase and PsycINFO, on March 23, 2020 without applying temporal restrictions, identified 61

empirical studies on the impact of the COVID-19 pandemic on the mental health of healthcare professionals, we're able to determine that the frequency of mental health problems in healthcare professionals at the frontline of emergencies caused by viral epidemics is particularly high, certain socio-demographic, social, and occupational factors significantly increase the risk of suffering mental health problems and the level of scientific evidence regarding interventions to protect the mental health of health professionals is very low. Finally, these authors suggested that governments and health authorities should take urgent action to protect the mental health of healthcare professionals at the forefront of the fight against Covid-19.

Epidemiological Situation

As presented in various documents such as reports from the World Health Organization (WHO), the Pan American Health Organization (PAHO), the Inter-American Development Bank (IDB), the Centers for Disease Control and Prevention, and the Ministries of Health or Sanitation of each country, among others, the new zoonotic SARS-CoV-2 coronavirus was first identified during an outbreak of pneumonia in Wuhan City, Hubei Province, China, in November 2019. On January 9, 2020, WHO announced that this is a new strain of coronavirus not previously identified in humans. On March 11, WHO declared a pandemic. The virus spread rapidly in Europe, Asia and North America, with cases reported in Africa, the Middle East , and Latin America.

As an elementary fact, much is still unknown about the new 2019 coronavirus as of the date of this study. The SARS-CoV-2 pandemic so far, according to reports presented by various international and national health organizations, shows a globally diverse pattern. Despite the lack of a definitive cure, several Asian countries have achieved successful blockades, although some are now experiencing a second 'wave' of new infections. In many European countries, the implemented blockades are effective in curbing the spread. In multiple regions of the world, including North America and Europe, the health systems are facing major challenges. It can also be highlighted that there are many countries, such as those in the Middle East and Africa, where SARS-CoV-2 testing remains at very low levels [8].

From December 31 through July 30, 2020, there have been 17,308,288 (+277,065) confirmed cases of COVID-19, 673,160 (+6,053) deaths and 9, 9811,555 (+184,419) recovered worldwide, according to the Johns Hopkins University Center for Systems Science and Engineering [9].

As of July 31, 2020, it has become evident that there are a limited number of publications and national status reports that provide information on the number of healthcare worker infections. In other publications, epidemiological and clinical characteristics of infections among healthcare workers have been described [1014]. As an example of these publications, we can mention the one made by the Centers for Disease Control and Prevention (CDC) of China on February 17, 2020 in which 44,672 cases were confirmed with Covid-19, of which there were 1,688 (3.8%) infections among healthcare workers, including five deaths [15]. Another situation has to do with the Report prepared by the Italian National Institute of Health (ISS), presenting the situation in the country as of April 10, 2020, recording 15,314 infections among healthcare workers, representing 11% of all infections at that time [16]. These situations allow us to see and value more and more the essential role of these workers who are on the front line serving other people, regardless of race, color, nationality or danger to their own lives; they are the ones who provide critical care to patients and ensure that infection prevention and control measures are implemented and complied with in healthcare facilities to limit healthcare-associated infections.

On the other hand, healthcare workers are subject to long working hours, fatigue, occupational burnout, stigma, physical and psychological violence, and back injuries from patient handling. It is important that efforts are made to maintain the physical fitness and mental health of healthcare workers and the quality of care [6]. Data from the International Council of Nurses (ICN) from 30 countries indicated on average, 6% of all confirmed cases of COVID-19 are found among healthcare workers, with a range of 0% to 18%. If that proportion were repeated globally, the 3.5 million confirmed cases of COVID-19 worldwide would yield a figure for the number of infected health care workers of 210,000.

Conclusions

Of the global health workforce, health care workers who provide health services constitute the largest percentage globally, with the largest share of health care workers being nurses and midwives followed by physicians and to a lesser extent laboratory scientists and technicians.

This new pandemic has spread to all regions of the world, advancing relentlessly, affecting humanity and especially the so-called "frontline" health care workers. In the review carried out, it was found that in most of the countries of the world, the official figures reported for the pandemic do not discriminate against healthcare workers.

The actual worldwide impact of the pandemic on healthcare workers during the period from March to July 2020 shows that the top three countries with the highest percentages of healthcare workers infected with COVID 19 were Spain, Mexico and France and the top three countries with the highest percentages of healthcare worker deaths from COVID 19 were India, the United Kingdom and Germany.

Another aspect that stands out in the research is that countries such as Russia, Saudi Arabia, Turkey and Canada do not have official figures on cases of infection and lethality by the virus in health personnel. It should be noted that in the survey conducted some data from these countries were found, but they were not incorporated into the research because they did not have the endorsement of official bodies in these countries.

Conflict of interest

None declared among the authors

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References

1. Leal R. Breve historias de las pandemias. Revista Psiquiatría.com, Disponible en,2020:24:2-19. http://www.codajic.org/sites/www.codajic.org/files/Breve%20historia%20de%20las%20pandemias.pdf
2. Castañeda G, Carlos, Ramos S, Gerardo. Principales pandemias en la historia de la humanidad. *Revista Cubana de Pediatría*, Epub 20 de julio de 2020.

Recuperado en 08 de junio de 2021, de,2020:92(1):e1183. http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0034-75312020000500008&lng=es&tlng=es
3. Zhu N, Zhang D, Wang W, Li X, Yang B, *et al*. A Novel Coronavirus from Patients with Pneumonia in China, 2019. N Engl J Med,2020:382:727-733.
4. Ogolodom MP, Mbaba AN, Alazigha N, Erondu OF, Egbe NO, *et al*. Knowledge, Attitudes and Fears of HealthCare Workers towards the Corona Virus Disease (COVID-19) Pandemic in South-South, Nigeria Health Sci J,2020:1:002.
5. International Labor Organization. Observatory: COVID-19 and the world of work. Second edition Updated estimates and analysis, 2020.
6. World Health Organization. Coronavirus disease (COVID-2019), situation reports. [Available in:], 2020. www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports.
7. Ricci Cabello Ignacio y Ruiz Pérez Isabel. El impacto de la pandemia por COVID-19 sobre la salud mental de los profesionales sanitarios. Disponible en, 2020. https://medrxiv.org/cgi/content/short/2020.04.02.20048892v1
8. Achim R. COVID-19 – CMO Update and Overview-9th, Edition. May 7, *Partner Re*, 7 de mayo de. Disponible en, 2020. https://partnerre.com/opinions_research/covid-19-cmo-update-and-overview-9th-edition/.
9. Johns Hopkins University. COVID-19 dashboard by the center for systems science and engineering (CSSE) at Johns Hopkins University (JHU), 2020.
10. Kluytmans M, Buiting A, Pas S, *et al*. SARS-CoV-2 infection in 86 healthcare workers in two Dutch hospitals in March med Rxiv, 2020. 2020:2020.03.23.20041913. doi: 10.1101/2020.03.23.20041913.
11. Liu M, He P, Liu HG, *et al*. [Clinical characteristics of 30 medical workers infected with new coronavirus pneumonia]. ZhonghuaJie He He Hu Xi ZaZhi,2020:12:43(3):209-14. doi: 10.3760/cma.j.issn.1001-0939.2020.03.014. PMID: 32164090.
12. Liu J, Ouyang L, Guo P, *et al*. Epidemiological, Clinical Characteristics and Outcome of Medical Staff Infected with COVID-19 in Wuhan, China: A Retrospective Case Series Analysis. 2020; medRxiv.2020.03.09.20033118. doi: 10.1101/2020.03.09.20033118.
13. McMichael TM, Currie DW, Clark S, *et al*. Epidemiology of Covid-19 in a Long-Term Care Facility in King County, Washington. New England Journal of Medicine, 2020. doi: 10.1056/NEJMoa2005412.
14. McMichael TM, Currie DW, Clark S, *et al*. Evolving Epidemiology and Impact of Non-pharmaceutical Interventions on the Outbreak of Coronavirus Disease 2019 in Wuhan, China. Med Rxiv, 2020, 03(03). 20030593. doi: 10.1101/2020.03.03.20030593.
15. Centers for Disease Control and Prevention (CDC). The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team. The epidemiological characteristics of an outbreak of 2019 Novel Coronavirus Diseases (COVID-19) – China, 2020. http://weekly.chinacdc.cn/en/article/id/e53946e2-c6c4-41e9-9a9b-fea8db1a8f51
16. Istituto Superiore di Sanità (ISS). Integrated surveillance of COVID-19 in Italy: Marzo Disponible en, 2020, 29. https://www.epicentro. iss.it/coronavirus/bollettino/Infografica_29marzo%20ENG.pdf