IJS
International Journal of Sciences

Published online 03 20, 2022
ISSN 2763-5392

Comparison of SARS-COVID case numbers and decline associated with the evolution of vaccination in Brazil

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To cite this article:

Albuquerque, F.J.A.; Melo, N.F.B.; Silva, A.C.S.; Souza, A.S.S.; Bacelar, C.D.S.; Tavares, R.F.S.; Andrade, M.E.; Sousa, J.V.A.; Moura, J.L.G.; Filho, V.J.S.B.; Santos, K.R.; Feitosa, E.D.G.; Lacerda, S.D.L.; Santos, M.J.L.; Souza, M.S.A.L.; Souza, A.C.A. ***Comparison of SARS-COVID case numbers and decline associated with the evolution of vaccination in Brazil.*** *International Journal of Sciences.* Vol. 3, No. 2, 2022, pp.49-52. ISSN 2763-5392.

Received: 03 02, 2022; **Accepted:** 03 04, 2022; **Published**: 03 20, 2022

Abstract: Coronavirus began in 2019 in Wuhan city, located in China. Chinese scientists have enclosed a new coronavirus, with severe acute respiratory syndrome such as SARS-CoV-2. The mortality rate due to SARS-COVID was 82.2%. The covid-19 pandemic by the new coronavirus (SARS-CoV-2) has been one of the greatest health challenges on a global scale this century. The present work aims through epidemiological bulletins in the period from 2020 to 2021 month of September to analyze records in the notification forms for the disease 'SARS'. This is a comparative epidemiological study of the descriptive type of cross-sectional cohort, whose data were collected through the secondary database of (CIEVS).

Keywords: Coronavirus; SARS; Vaccination; Incidence

1. Introduction

In December 2019, Sars-CoV-2, popularly known as coronavirus or COVID-19, appeared in the world from Wuhan, China, which is a virus characterized by a respiratory syndrome, where it has caused thousands of deaths worldwide. And through the pandemic scenario declared by the World Health Organization (WHO), the support of the use of masks, alcohol and hand hygiene, became essential measures for combat (Sadio *et al*., 2021).

The types of coronaviruses already existed and were known in science for being responsible in past epidemics, such as: the Middle East respiratory syndrome (MERS-OV) that occurred in 2012, and SARS-CoV in 2002. Already in 2019 came the 2019-nCoV a new type of coronavirus being a strain that had not yet been found in Humans. Being a virus until then zoonotic, that is, transmitted between animals and people (WHO, 2020; PEERI *et al*., 2020).

The Ministry of Health (MS) added the test of the virus SARS-CoV-2, an effector of COVID-19, to the severe acute respiratory syndrome (SARS), an acute respiratory disease, which manifests as severe atypical pneumonia, with the majority of viral infections. COVID-19 has as main symptoms fever, tiredness and dry cough. Some patients may experience pain, nasal congestion, headache, conjunctivitis, sore throat, diarrhea, loss of taste or smell, rash or discoloration of the fingers or toes. These symptoms are usually mild and begin gradually. Some people are infected, but present only very mild symptoms (BRASIL, 2021; SES/EP, 2020).

According to the last Epidemiological Week (SE), Brazil already records 13,013.61 million cases of the new coronavirus (COVID-19). In Pernambuco, 356,326,000 cases were confirmed. Being only in recife 90,436 thousand cases (BRASIL, 2021). The cases of SARS-COVID registered in the SIVEP-Gripe in Pernambuco were 1087,000 confirmed cases, out of 1725,000 that are still under investigation. A higher number of cases were recorded in people aged 60 to 69 years, and white race/color is the most frequent among cases of SARS, followed by brown, black, yellow and indigenous cases (BRASIL, 2021).

Coronavirus is a pathogen that especially affects the human respiratory system, which has caused other outbreaks previously, such as severe acute respiratory syndrome (SARS-CoV) and Middle East Respiratory Syndrome (MERS-CoV) (ROTHAN & BYRAREDDY, 2020). COVID-19 is an RNA virus that has high aptitude for propagation in the human environment, and infection resulting from the virus has pathogenesis linked to chronic diseases, consequently, patients with comorbidities such as Systemic Arterial Hypertension (SAH), Diabetes, Cardiovascular diseases, among others, have a higher mortality rate (MOTA, 2020).

In addition, there is an affinity of SARS-Cov-2 that binds to the Angiotensin-Converter Enzyme 2 receptor (ECA2) after protein activation by Transmembrane Protease, serine 2 (TMPRSS2), ECA2 is highly released in the heart in cases such as hypertension and heart failure (ASKIN *et al*., 2020). ACE2, active in its AT1 and AT2 receptors, increases the production of inflammatory cytokines such as interleukin 1 and 6 (IL-1 and IL-6) and Tumor Necrosis Factor (TNF), affecting cardiac function (ARAÚJO & MORAIS, 2020).

Patients with COVID-19 may present from asymptomatic conditions to severe severe acute respiratory syndrome (RSOS), and may require hospitalization. In severe cases, signs and symptoms of Influenza Syndrome (GS), dyspnea/respiratory distress or oxygen saturation below 95% ($SpO2 < 95\%$) are presented in room air (BRASIL, 2021).

In the most severe cases, patients of SARS-Cov-2 are at risk of developing pneumonia with bilateral interstitial infiltrates, causing serious changes in the ventilation/perfusion ratio and probable shunt, causing hypoxemic respiratory failure (BRUGLIERA, 2020). Hypoxia can lead to multiple organ failure, establishes a relationship dependent on the severity of the case, in which there may be a need for the use of oxygen therapy, noninvasive mechanical ventilation (NIV), including the use of Continuous Positive Airway Pressure (CPAP), if there is no improvement in the condition, admission to the Intensive Care Unit (ICU) and intubation (KIEKENS, 2020).

The mortality rate from SARS-COVID until the last SE (epidemiological week) that occurred at the end of March was 82.2% (30,305). In relation to the previous epidemiological week that occurred from February 14 to 20, 8,415 new deaths from SARS-COVID were reported. In Pernambuco, 383 confirmed cases of SARS were reported by covid-19. (Ministry of Health. Epidemiological bulletin of coronavirus COVID-19 (BRASIL, 2021).

Regarding treatment, studies are still being done, no drug is available that has demonstrated efficacy and safety in the treatment of patients with SARS-CoV-2 infection. And any prescribed drug should be administered under clinical protocol by applying a free and informed consent form (DIAS *et al*., 2020).

Articles show overload in health systems, which makes clear the state of pandemic and a global public health problem.

However, most studies are focused on the management of critically obese patients within the ICU, such as ventilatory and pharmacological methods. However, with the advent of vaccination and its evolution and number of cases of the disease is declining. Then, the objective of the research is through the database of the incidence of pathology and vaccination records, to compare the number of cases of COVID/SARS, the decline, and the number of vaccinated populations, upward curve.

2. Methodology

This is a comparative epidemiological study of the descriptive type of cross-sectional coorte, whose data were collected through the secondary database of the (CIEVS), provided by the Pernambuco State Health Department (SES-PE) and the Cota repository (COVID -19) (COTA, 2021). The population consisted of the records in the notification forms for the disease "SARS" in the CIEVS Database and notification COVID-19 Brazil, through epidemiological bulletins in the period from 2020 to 2021 month of September. The Informatics Department of the Unified Health System (DATASUS) provides information that can serve to support objective analyses of the health situation, evidence-based decision-making and the development of health action programs.

The tabulation of the data was through an Excel spreadsheet, with the variables: vaccination, number of cases of the disease. The compilation of data was through BioStat 2009.

3. Results and Discussion

Table 1. Number of cases in Brazil, period (April, July and October) of 2020 and 2021.

COVID-19 IN BRAZIL	
Month	**Number of cases**
APRIL/2020	21.807
JULY/2020	56.059
OCTOBER/2020	66.150
APRIL/2021	87.969
JULY/2021	124.248
OCTOBER/2021	124.878

Source: Prepared by the researcher, according to data found.

Table 2. Numbers of vaccinated in Brazil, from February to October 2021.

COVID-19 VACCINATION IN BRAZIL	
MONTH	**Number OF VACCINATED**
FEBRUARY/2021	6.518.628
MARCH/2021	14.112.509
APRIL/2021	29.149.512
MAY/2021	45.376.214
JUNE/2021	72.772.360
JULY/2021	105.057.816
AUGUST 2021	134.521.410
SEPTEMBER/2021	151.150.943
OCTOBER/2021	159.200.858

Source: Prepared by the researcher, according to data found.

Table 3. Numbers of vaccinated in Brazil in categories in the period 2021.

VARIABLE	CATEGORIES	N*	%
Vaccination	First	157.321.637	73,75
	Second	107.574.095	50,43
	Only	4.822.836	
	Third	5.523.350	2,59
TOTAL		**265.596.246**	**100,0**

Source: Prepared by the researcher, according to data found.

According to table 1, it is observed that from July 2021, there was a large sustained increase in the number of cases by Covid-19, being considered the second wave, with performances through different strategies in other areas. In early 2021, with the development of multiple vaccines with proven efficacy and safety, the main challenge related to the response of Covid-19 is the guarantee of timely mass immunization, which prevents millions of deaths and controls the evolution of various diseases.

In Brazil, vaccination coverage began with two priority groups: health professionals because they are on the front line and elderly population, because of the higher risk of death from COVID-19 that increases with age, especially among patients with chronic diseases and the laboratories responsible for producing CoronaVac, Oxford/AstraZeneca and Pfizer/BioNTech recommend applying two doses of immunizer scans for a more efficient fight against the disease.

Vaccination against covid-19 in Brazil began on January 17, 2021 with the application of the CoronaVac vaccine, which has a partnership between the Butantan Institute and the pharmaceutical company Sinovac BioNTech. The second vaccine used for combat was Oxford-AstraZeneca, being applied for the first time in Brazil on January 23, 2021, having a partnership in Brazil with the Oswaldo Cruz Foundation (FIOCRUZ). The Pfizer/BioNTech vaccine was the third used by the Brazilian Ministry of Health to combat Covid-19, beginning to be applied on July 15.

By April 2021 (Table 2 and 3), in Brazil, a total of 49,780,530 people had been vaccinated with at least one dose of CoronaVac vaccine or Oxford-AstraZeneca (pfizer/biontech vaccine doses had not yet been applied), which is equivalent to 14.95% of the Brazilian population.

Decision-making regarding vaccination is a complex behavioral phenomenon in relation to its determinants. Thus, accelerating the vaccination process is an indispensable measure to reduce mortality, severe cases of the disease and even cases of covid-19 in general. Finally, with regard to vaccination against Covid-19 in Brazil, more accurate studies can be conducted, especially when more information is

available and with more reliable results.

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