

THE RELATION BETWEEN VACCINATION AGAINST COVID-19 AND MORTALITY IN BRAZIL

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RESUMO

THE RELATION BETWEEN VACCINATION AGAINST COVID-19 AND MORTALITY IN BRAZIL

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KEYWORDS: Coronavirus; Vaccination; Morbidity and Mortality Indicators.

SUMMARY

Introduction: The World Health Organization (WHO) Emergency Committee classified the Covid-19 infection as a pandemic in March 2020, immunization being the best method to prevent its spread. In Brazil, population vaccination has been carried out since January 2021. This study aims to investigate if mass immunization against Covid-19 has effectively brought mortality reduction. **Methods:** An original, quantitative and documentary research was carried out. For theoretical basis, a narrative literature review was performed. The inclusion criteria were articles published between 2020 and 2021, in English, Portuguese and Spanish. The database used was the Virtual Health Library, using the following descriptors: "Vacinação", "Eficácia", "Mortalidade", "Coronavírus". To assist the search, the following Boolean operator was used: AND. **Results and Discussion:** An increase in population mortality was evidenced between February and April, with a peak in the last month of 12.86% deaths per million inhabitants. During this same period, even though population vaccination had already started, some factors contributed to the fact that mortality remained high, such as the arrival of new viral variants, such as Delta, and the lack of compliance with social isolation measures. From June onwards, there was a decline in the Covid-19 mortality rate, which continues until the month of September. This fact is related to the significant increase in vaccination, going from 12.11% at the beginning of June to 31.05% of individuals partially vaccinated at the end of September. **Conclusion:** The Covid-19 pandemic is a serious public health problem, with Brazil being one of the most affected countries. Only in mid-April, with the expansion of the distribution of immunizing agents, it was possible to observe the beginning of the drop in mortality, which continued until the month of September. However, we cannot minimize the number of deaths, which so far surpass the mark of 500 deaths per day. Thus, it is necessary to maintain protective measures and population vaccination so that the pandemic can come to an end.

INTRODUCTION

The disease caused by the new coronavirus (Sars-Cov-2), which emerged in late 2019, had its epicenter in Hubei province, China, later spreading across the globe¹. On January 30th, 2020, the World Health Organization (WHO) Emergency Committee declared the disease as a global health emergency, and in March 2020 classified it as a pandemic¹. Since then, mass vaccination has been considered the greatest strategy for combating the coronavirus, in view of the exponential increase in contamination rates worldwide^{1,2}. In 2020, Brazil was one of the five nations with the most confirmed cases of Covid-19, reaching an average of 30,000 notified cases every 7 days³. The vaccines used in Brazil so far are: ChAdOx1 (Oxford/Astrazeneca) and BNT162b (Pfizer/Biontech), which are definitely registered, while Ad26.COV2.S (Johnson & Johnson), CoronaVac (Sinovac), and mRNA-1273 (Modern) are authorized for emergency use, while Sputnik V (Gamaleya) and Covaxin (Bharat Biotech) are for exceptional import

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only⁴. Currently, around 80 million brazilians are fully vaccinated against Covid-19 and around 65 million are partially vaccinated⁵. With the start of mass vaccination, it was believed that mortality would reduce its rates in the country immediately, but with the emergence of new variants, such as Delta, and the inefficiency of social isolation, the effectiveness of this process ended up being reduced in the brazilian scenario⁶. Therefore, this study seeks to demonstrate the relation between mortality rate and the administration of vaccines against Covid-19.

METHODS

This is an original research, documentary and quantitative, that investigated the relation between mass vaccination against Covid-19 and mortality. The data regarding [share of people vaccinated against COVID-19](#) and mortality in Brazil, during the period [06-02-2021 to 19-09-2021](#), was obtained and extracted from the Our World in Data (<https://ourworldindata.org/>) dataset with recent official numbers. To support the theoretical framework, a narrative literature review was carried out. A search was performed in the Virtual Health Library database, using the following keywords: “Vacinação”, “Eficácia”, “Mortalidade”, “Coronavírus”. To assist in the searches, the following Boolean operator was used: AND. The inclusion criteria applied were all bibliographic productions published between 2020 and 2021, in English, Portuguese and Spanish. Letters to the editor, documents and audiovisual materials and books were not considered for the searches. Three independent authors performed a non-systematic analysis of the results found.

RESULTS AND DISCUSSION

Graph 1 shows the correlation between the three variables considered in this study: the percentage of deaths per million people, the percentage of partially vaccinated individuals, and the percentage of fully vaccinated individuals in Brazil. An exponential increase in mortality values was registered between February and April 2021, with a peak, in this last month, of 12.86% deaths per million people. During this period vaccination had already started in the country, but only 6.32% of the population was partially vaccinated and 2.49% fully vaccinated. The increase in mortality rate after the vaccination had already started can be explained by relaxation of social isolation measures and the emergence of new variants of the coronavirus^{6,7}. From June onwards, the Covid-19 mortality rate began to decline. This fact is related to the significant increase in partially vaccinated individuals, going from 12.11% at the beginning of June to 18.56% at the end of this month. Over time with the advance of vaccination, there was a great reduction in the number of daily deaths, reaching 2.6 per million people in September, with 31.05% of the population being partially vaccinated and 37.08% fully vaccinated, totaling 68.13% of vaccinated individuals. Studies show that the first dose alone of any Covid-19 immunizer can significantly reduce the risk of passing the infection from one person to another, thus also reducing the associated mortality⁷. Most vaccines used to fight the pandemic are given in two doses^{7,8}. The second dose works as a “prime-boosting”, since it maximizes immune protection and memory⁷. When the Pfizer, Moderna and Astrazeneca vaccines were first being tested, it was shown that the first dose caused an immune weak response, with a lower amount of antibodies, compared to a very effective response after the “prime-boosting” dose was administered^{7,8}. Another study shows that the immune response after the second dose of the Pfizer vaccine also increases protection against Alpha and Delta variants⁹. It is necessary to take into account the time of seroconversion, that is, the real time of immunization, which occurs 14 days after the vaccine application^{8,9}. Thus, when analyzing the graph, one should consider that people are only effectively immunized two weeks after the last dose, causing a delay on how the vaccination data impacts on the mortality rate.

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CONCLUSION

The Covid-19 pandemic is a serious public health problem that has caused the death of millions of people worldwide, with Brazil being one of the most affected countries. Thus, a relentless search for the discovery of an immunizing agent capable of reversing this scenario began. However, after the vaccination of the population had started, the mortality rate didn't drop as expected. Only in mid-April, with the expansion of the distribution of immunizing agents, was it possible to observe the beginning of the decrease in numbers, which continues until the month of September. Although mortality rates have reduced considerably in the country, we cannot minimize the number of deaths, which to date, surpass the mark of 500 deaths per day. Thus, it is necessary to maintain protective measures of social distancing, wearing masks, and that people complete their vaccination schedule so that the pandemic can come to an end.

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PALAVRAS-CHAVE: Coronavirus, Vaccination, Morbidity and Mortality Indicators

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