The course of COVID-19 in Jamaica from outbreak to vaccination

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ABSTRACT

Objective: To describe the incidence of confirmed COVID-19 cases and deaths in Jamaica and assess the country's vaccination and prevention efforts.

Methods: This study analyzed the daily number of new confirmed COVID-19 cases and deaths in Jamaica from March 2020 to February 2023 and showed how different factors influenced rate of new cases and deaths across the island. It also assessed Jamaica's vaccination and prevention efforts from April 2021 to February 2023.

Results: In this descriptive ecological study, two variables: the daily number of new confirmed cases and deaths were analyzed to describe the incidence of COVID-19 in Jamaica during the pandemic. Changes in COVID-19 policies by the Jamaican government as well as the characteristics of different COVID-19 variants corresponded to an increased number of new daily COVID-19 cases and deaths among the Jamaican population. Currently, only 29.97% of the Jamaican population has completed the initial COVID-19 vaccination protocol which ranks Jamaica 32 out of 33 countries in Latin America and the Caribbean as of February 10, 2023, when looking at the number of COVID-19 vaccination doses per 100 population.

Conclusion: During the COVID-19 pandemic in Jamaica, the daily number of new confirmed cases and deaths corresponded to changes in COVID-19 policies and the characteristics of different COVID-19 variants. Jamaica needs to implement more strategies to increase the vaccination rate across the country.

INTRODUCTION

COVID-19 is a disease caused by the coronavirus SARS-CoV-2, which itself is a part of the Coronaviridae family, a group of viruses that can cause respiratory infections.[1] SARS-CoV-2 has the ability to evolve through genetic code changes during replication.[2] This can result in the formation of variants to the primary virus strain. SARS-CoV-2 variants of concern (VOC) are Alpha, Beta, Delta, Gamma, and Omicron.[3,4] The most common symptoms of COVID-19 are fever, dry cough and fatigue; however, elderly patients and patients with underlying comorbidities such as heart disease, diabetes or cancer may develop more severe illnesses.[5]

COVID-19 was declared a Public Health Emergency of International Concern (PHEIC) on January 30, 2020, and declared a pandemic on March 11, 2020.[6,7] Since its outbreak in the Hubei Province of the People's Republic of China in December 2019, there have been over 755 million cumulative confirmed cases of COVID-19, including over 6 million deaths globally.[8] The first mass vaccination programme for COVID-19 started in early December 2020 and as of January 30, 2023, over 13 billion vaccine doses have been administered worldwide.[8,9]

The Ministry of Health and Wellness (MoHW) of Jamaica confirmed its first case of COVID-19 on March 10, 2020; the country then implemented several measures to contain the spread of the virus.[10] These measures included using face masks in public areas, curfews, no mass gatherings, closure of schools and workplaces, quarantining several communities and international travel restrictions.[11] While these restrictions effectively limited the spread of the virus, most of these measures were not sustainable over the long term and were gradually relaxed. Therefore, like many countries worldwide, the COVID-19 pandemic led to increased hospitalization of patients in Jamaica. This paper aims to describe how different factors influenced the number of new daily confirmed cases and deaths related to COVID-19, as well as the effectiveness of the COVID-19 vaccination programme in Jamaica.

METHODS

Study design

A descriptive ecological study design was used to determine the incidence of new daily confirmed cases and deaths related to COVID-19 in Jamaica. Additionally, it examined Jamaica's vaccination and prevention efforts from April 2021 to February 2023.

Data collection

The data used in this study was obtained from Our World in Data (OWD)[12], a comprehensive source for global COVID-19 data. Permission to use, reproduce, and distribute the information was granted by Our World in Data. Data related to the number of new daily confirmed COVID-19 cases and deaths from March 2020 to February 2023 was extracted. Data on the percentage of the Jamaican population who completed the initial COVID-19 vaccination protocol was also extracted for the period April 2021 to February 2023. The figures present in this paper were generated on the OWD website using the same data.

Data analysis

IBM SPSS Statistics tool was utilized to analyze the collected data. Descriptive statistical analysis was performed to summarize and describe the incidence of COVID-19 in Jamaica. The number of new daily confirmed cases and deaths were examined to identify trends and patterns throughout the pandemic. Furthermore, the data on the percentage of the population completing the initial COVID-19 vaccination protocol was used to forecast the vaccination rate by January 2024, employing past vaccination rates from April 2021 to February 2023.

The forecasting analysis aimed to estimate the percentage of the Jamaican population that would complete the initial COVID-19 vaccination protocol by January 2024. This analysis provides insight into the current vaccination trend and the potential trajectory towards achieving the national vaccination target. The model type used for forecasting was the AutoRegressive Integrated Moving Average (ARIMA) model. The ARIMA model is a statistical method used for forecasting time series data by combining autoregressive, differencing (integration) and moving average components to handle patterns, trends, and seasonality.[13]

RESULTS

Figure 1 shows the daily new confirmed COVID-19 cases per million people in Jamaica from March 2020 to February 2023.[14,15] The implementation of restrictions in March 2020 initially helped to limit the spread of the virus.

However, these restrictions gradually relaxed over time. Around February-March 2021, there was a peak in confirmed cases, which coincided with the resumption of face-to-face classes by 129 schools on January 15, 2021.[16]

Figure 2[14,15] displays the daily new confirmed COVID-19 cases and deaths per million people in Jamaica from March 2020 to February 2023. The Delta variant was the most dominant in August 2021 which coincided with a small spike in the number of new cases[17], however there was a disproportionate increase in the number of new COVID-19 related deaths. Between January 5, 2022 and February 12, 2022, the Omicron variant became the most dominant variant in Jamaica.[18] The dominance of the Omicron variant coincided with the largest spike in COVID-19 cases throughout the pandemic. Although there was an increase in new cases during this period, the data did not show a drastic spike in COVID-19 related deaths compared to the Delta variant.

Figure 3[14,15] represents the percentage of the Jamaican population that completed the initial COVID-19 vaccination protocol from April 2021 to February 2023. As of February 1, 2023, 1,512,562 COVID-19 vaccines had been administered to the Jamaican population.[19] However, only 29.97% of the population had completed the initial vaccination protocol.

Figure 4 shows the predicted percentage of the Jamaican population that will complete the initial COVID-19 vaccination protocol by January 2024. Based on the current trend of vaccination, it is estimated that only 30.31% of the population will complete the protocol by that time. This suggests that additional strategies need to be implemented in 2023 to increase vaccination rates in order to meet the government's target of 65% vaccination coverage.[20]

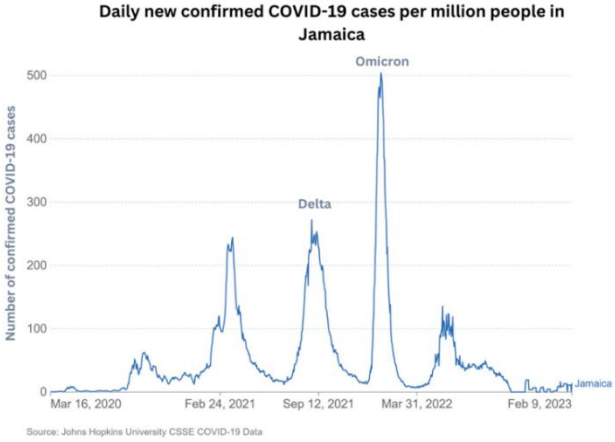

Figure 1. Daily new confirmed COVID-19 cases per million people from March 2020 to February 2023 in Jamaica.

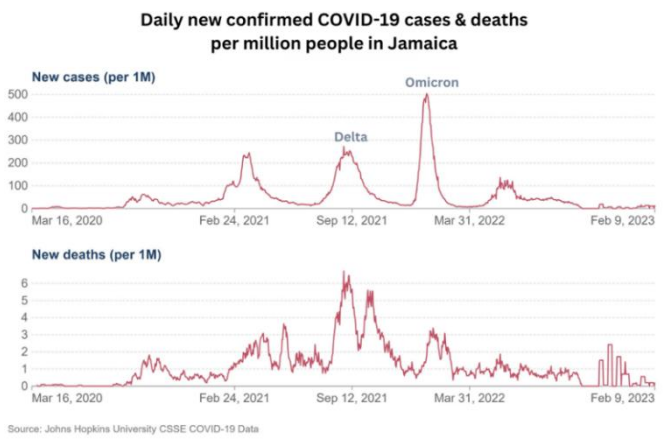

Figure 2. Daily new confirmed COVID-19 cases & deaths per million people from March 2020 to February 2023 in Jamaica.

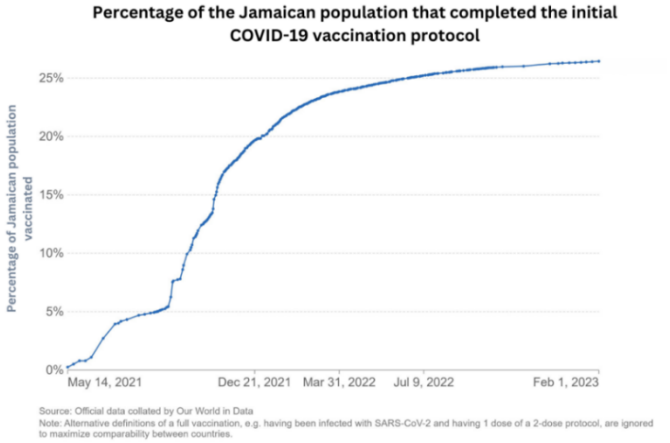

Figure 3. Percentage of the Jamaican population that completed the initial COVID-19 vaccination protocol from April 2021 to February 2023.

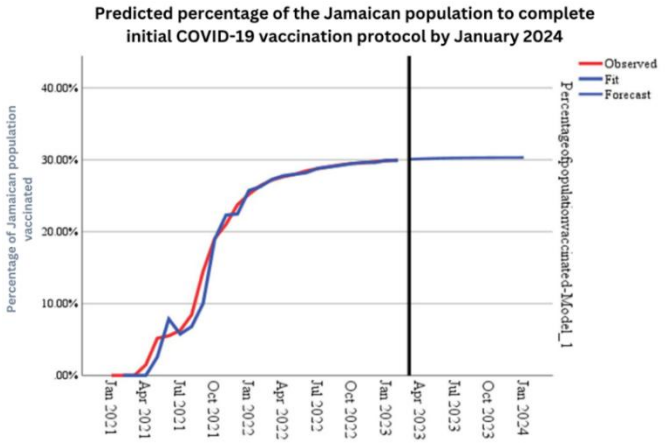

Figure 4. Predicted percentage of the Jamaican population to complete initial COVID-19 vaccination protocol by January 2024.

DISCUSSION

This study described the incidence of new daily confirmed COVID-19 cases and deaths in Jamaica from March 2020 to February 2023. The implementation of restrictions in Jamaica on March 12, 2020, initially had a positive effect on limiting the spread of the virus. However, these restrictions gradually relaxed over time. Notably, on January 15, 2021, 129 schools were approved to resume face-to-face learning, coinciding with the first peak of confirmed COVID-19 cases observed around February-March 2021 (Figure 1).

In August 2021, the confirmation of the Delta variant in Jamaica led to a slight increase in the number of new cases, but there was a significant rise in the number of deaths related to COVID-19 (Figure 2).[17] The Omicron variant exhibited enhanced human-to-human transmission compared to the previous variants of COVID-19 and the original SARS-CoV-2 virus.[4] It became the most dominant variant in Jamaica, with 100% of samples collected between January 5, 2022 and February 12, 2022, yielding positive results for Omicron BA1.[18] Notably, this period coincided with the largest spike in COVID-19 cases observed throughout the pandemic (Figure 1).

While the Omicron variant is highly contagious, studies have indicated that it causes less severe disease among the general population compared to other variants, including the Delta variant.[19] This finding may explain the absence of a significant spike in deaths during the period when the Omicron variant was predominant, despite the increase in the number of new cases (Figure 2). On the other hand, the Jamaican healthcare system could have also improved in dealing with the pandemic and more people could have gained immunity through prior infection which could have impacted the number of new deaths seen during this period.

Jamaica implemented various strategies to increase vaccination rates, such as a dedicated COVID-19 vaccination web portal on the Ministry of Health and Wellness website.[19] This web portal allows the Jamaican public to find accurate information on COVID-19 vaccines, locate vaccination sites around the country and book appointments to get vaccinated. The aim of this initiative was to increase vaccination rates and ease the public's anxiety around COVID-19 vaccines. However, vaccination rates in the country continue to decline.

According to the interim vaccination plan presented to the Jamaican Parliament in January 2021, the country had planned to vaccinate 65% of the population by March 31, 2022.[21] However, the data shows that only 23.83% of the population was vaccinated at that time (Figure 3). Based on the current vaccination rate, it is estimated that only 30.31% of the Jamaican population will complete the initial COVID-19 vaccination protocol by January 2024. These numbers are nowhere near the initial goal of the Jamaican government, nor is it comparable to the global average of 69.4% as of February 12, 2022.[22] However, Jamaica's vaccination effort is above the average of low-income countries, which is 26.4%.[19] When looking at the number of COVID-19 vaccination doses per 100 population, Jamaica is ranked 32 out of 33 countries in Latin America and the Caribbean as of February 10, 2023.[23]

Jamaica has seen a decrease in the number of new cases from the last half of 2022 through to the beginning of 2023 (Figure 1). However, Jamaica still needs to implement more strategies to increase the vaccination rate in the country. On January 12, 2023, the Medical Officer of Health (MOH) for Hanover, Dr. Kaushal Singh, highlighted that despite the low number of new cases in December 2022, there is no room for complacency.[24] The results showed that changes to COVID-19 policies or the emersion of different COVID-19 variants could increase the number of new cases and the number of COVID-19-related deaths in the population.

Countries in the Caribbean region, such as Barbados, have fully vaccinated 57.2% of their population as of February 3, 2023.[25] Barbados has a dedicated web portal for COVID-19-related materials, similar to Jamaica. However, Barbados also created an Immunization Unit affiliated with the Ministry of Health and Wellness. This Unit started operation in February 2021 at the height of the pandemic to manage Barbados' COVID-19 vaccination programme and stayed in operation until January 2023.[26] An initiative such as this could see an increase in the vaccination rate in Jamaica. The contracts for the temporary staff that aided in Jamaica's National Vaccine Programme expired in March 2022, which coincided with the period in which Jamaica's vaccination rate commenced slowing down (Figure 3).[27] Antigua and Barbuda, another country in the Caribbean region, was able to fully vaccinate 63.49% of its population by August 2022.[28] One measure the government of Antigua and Barbuda implemented to increase vaccination rates was vaccination incentive campaigns.[29,30] These campaigns successfully increased the rate of vaccination in the country. Jamaica can also adopt some of these strategies to ensure that a large portion of the population is vaccinated. This would be very beneficial if a more

contagious and deadlier variant of the COVID-19 virus should emerge.

Limitations

It is important to acknowledge some limitations of this study. Firstly, the data used in the analysis was obtained from a single source, OWD, which may introduce potential biases or data discrepancies. Secondly, the study relied on aggregated ecological data, which limits the ability to establish individual-level associations or causal relationships. Thirdly, the forecasted vaccination rate is based on past trends and assumes the continuation of similar vaccination patterns in the future, which may not account for unforeseen circumstances or changes in vaccination strategies.

Despite these limitations, this study provides valuable insights into the incidence of new daily confirmed COVID-19 cases and deaths in Jamaica, the impact of policy changes and variant characteristics, as well as the country's vaccination efforts. The findings underscore the importance of continuous efforts to improve vaccination rates and implement strategies employed by other countries in the region to protect the population from potential future outbreaks.

CONCLUSION

The study revealed that various factors influenced the number of new cases and deaths related to–COVID-19 deaths throughout the pandemic. Three key factors were: changes to COVID-19 policies, the transmissibility of different COVID-19 variants and the severity of illnesses caused by different COVID-19 variants. The study also highlighted that the vaccination effort of the Jamaican government needs to be improved. The country can adopt strategies being used by other countries in the region in order to protect the population from any future COVID-19 outbreaks.

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