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Short Communication

# Increasing impact of COVID-19 on young adults: evidence from hospitalisations in Brazil

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ABSTRACT

*Objectives:* Concerns about the increasing impact of severe COVID-19 in younger individuals in Brazil came after a recent synchronised country-wide wave of cases in Brazil. This communication analyses how hospitalisations due to COVID-19 changed in the age groups 18–49 years and ≥70 years.
*Study design:* Longitudinal study based on secondary data.
*Methods:* Data from SIVEP-Gripe, a public and open-access database of Severe Acute Respiratory Illness records (including COVID-19 notifications), were used in this study. Statistical control charts examined changes in the magnitude and variation of younger (18–49 years) and older (≥70 years) adults who were hospitalised between 15th March 2020 and 19th June 2021.
*Results:* During the few first weeks of the pandemic in Brazil, the number of COVID-19 hospitalisations increased in older adults but decreased in younger adults. Subsequently, hospitalisations reached statistical control zones in epidemiological weeks (EW) 19–48 of 2020 (EW 19-48/2020) and EW 03-05/2021 (18–49 y, mean = 26.1%; ≥70 y, mean = 32.8%). Between EW 49/2020 and EW 02/2021, the number of hospitalisations of younger adults dropped to levels below the lower control limit. In contrast, the number of hospitalisations of older adults surpassed the upper limit of the corresponding statistical control zones. However, from EW 06/2021, numbers of hospitalisations changed from statistical control zones, with hospitalisations of younger adults increasing and reaching 44.9% in EW 24/2021 and hospitalisations of older adults decreasing until EW 19/2021 (14.1%) and reaching 17.3% in EW 24/2021.
*Conclusions:* An increasing number of COVID-19 hospitalisations were observed in younger adults from EW 06/2021. This could be a result of the successful vaccination programme in older adults, who were initially prioritised, and possibly an increased exposure to highly transmissible variants of COVID-19 in younger adults who had to go to work in the absence of social protection (i.e. government financial support). Potential consequences of COVID-19 hospitalisations in younger adults could include a reduced life expectancy of the population and an increased number of people unable to perform daily activities due to post-COVID-19 conditions.


## Introduction

Since the first severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections in Brazil, the COVID-19 pandemic has evolved unequally across different regions.[1] From late 2020, a new scenario emerged due to a combination of neglecting control measures, the circulation of new variants and insufficient social protection (i.e. government financial support). Between March and April 2021, there was a synchronised country-wide wave of new COVID-19 cases, reaching more than 70,000 new cases and 3000 deaths daily, in addition to high intensive care unit (ICU) occupancy (above 90% in most states).[2] Concerns about an increased incidence of severe COVID-19 cases in younger individuals in Brazil arose as a result of changes in the age distribution of COVID-19 cases. Population age structure is a relevant factor for the understanding of mortality differentials.[3] Age and health are linked variables. This short communication describes how hospitalisations due to COVID-19 changed in the age groups 18–49 years and ≥70 years.

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## Data analyses

We used data from SIVEP-Gripe, a public and open-access database of Severe Acute Respiratory Illness records (including COVID-19). Data are collected by the Brazilian Ministry of Health, covering hospitalised cases and deaths due to respiratory diseases. Data from SIVEP-Gripe were accessed from their website (https://opendatasus.saude.gov.br) on 18 July 2021 to obtain all records from 15 March 2020 to 19 June 2021. Cases were selected based on the following two variables: hospitalisation and COVID-19 confirmation. We used statistical control charts to examine the proportions of hospitalisations by age groups over time, considering the date of symptom onset between the 12th epidemiological week (EW) of 2020 (EW 12/2020) and the 24th EW of 2021 (EW 24/2021). We excluded epidemiological weeks before EW 12/2020 due to the relatively low numbers of cases in some age groups and epidemiological weeks after EW 24/2021 to avoid bias due to reporting delays. We established statistical control zones bounded by ± three standard deviations around the mean value based on data from 2020. Trends outside the statistical control zone suggest significant changes in the pattern.[4] We examined hospitalisations among the younger and older adults from the beginning of 2021, which is when frontline health care professionals reported an increase in COVID-19 cases among the younger adult population group.

## Results

At the beginning of the pandemic, the number of COVID-19 hospitalisations of younger adults (18–49 years) was representative of the population (see Fig. 1). In EW 12/2020, this corresponded to 32.9% of hospitalisations, while older adults (≥70 years) totalled 23.4% of hospitalisations. Hospitalisations of younger adults decreased during the first few weeks of the pandemic and then remained in the statistical control zone (mean = 26.1%) in EW 19-48/2020 and in EW 03-05/2021. Between EW 49/2020 and EW 02/2021, hospitalisations of younger adults dropped slightly below the lower limit of the statistical control zone; however, from EW 06/2021, they surpassed the upper limit and continued increasing until the end of the study period, at which point they had reached 44.9%. In contrast, hospitalisations of older adults increased during the initial weeks of the pandemic until they reached the statistical control zone (mean = 32.8%), where they stayed in EW 19-48/2020 and EW 03-05/2021. Between EW 49/2020 and EW 02/2021, hospitalisations of older adults were a little above the upper limit of the statistical control zone; however, they decreased from EW 06/2021 until EW 19/2021, when they represented 14.1% of hospitalisations, and comprised 17.3% in EW 24/2021.

The change in the contribution of the age groups to the number of hospitalisations, consequently, shifted the age distribution curve in the occurrence of hospitalisations. Throughout 2020, there was a shift to the right, signalling a more significant hospitalisation of the elderly population; however, since the beginning of 2021, there has been a shifted curve to the left, highlighting the rejuvenation of the pandemic and the impact on younger adults.

## Considerations about the results

Brazil has lacked a country-wide coherent strategy for the testing of SARS-CoV-2 infection; therefore, hospitalisation data on moderate and severe cases is a valuable resource to examine COVID-19 pandemic trends, despite any bias involved in inferences for a number of cases in the general population. The likelihood of hospitalisation is expected to be higher among older adults, who tend to present more comorbidities and other vulnerabilities. On the other hand, data on hospital admissions of younger adults are likely to underestimate their involvement in the distribution of COVID-19 cases, even though the prevalence of comorbidities in this group in Brazil is not negligible. However, hospitalisation data contributes to a greater understanding of the COVID-19 pandemic and how it is evolving. To monitor hospitalised cases of COVID-19 in Brazil, the Ministry of Health has incorporated testing of the SARS-CoV-2 virus into the surveillance of severe acute respiratory syndrome (SRAG). Notification of cases is compulsory, and records are stored in the computerised database SIVEP-Gripe. General trends of the pandemic are expected to be captured by the data.

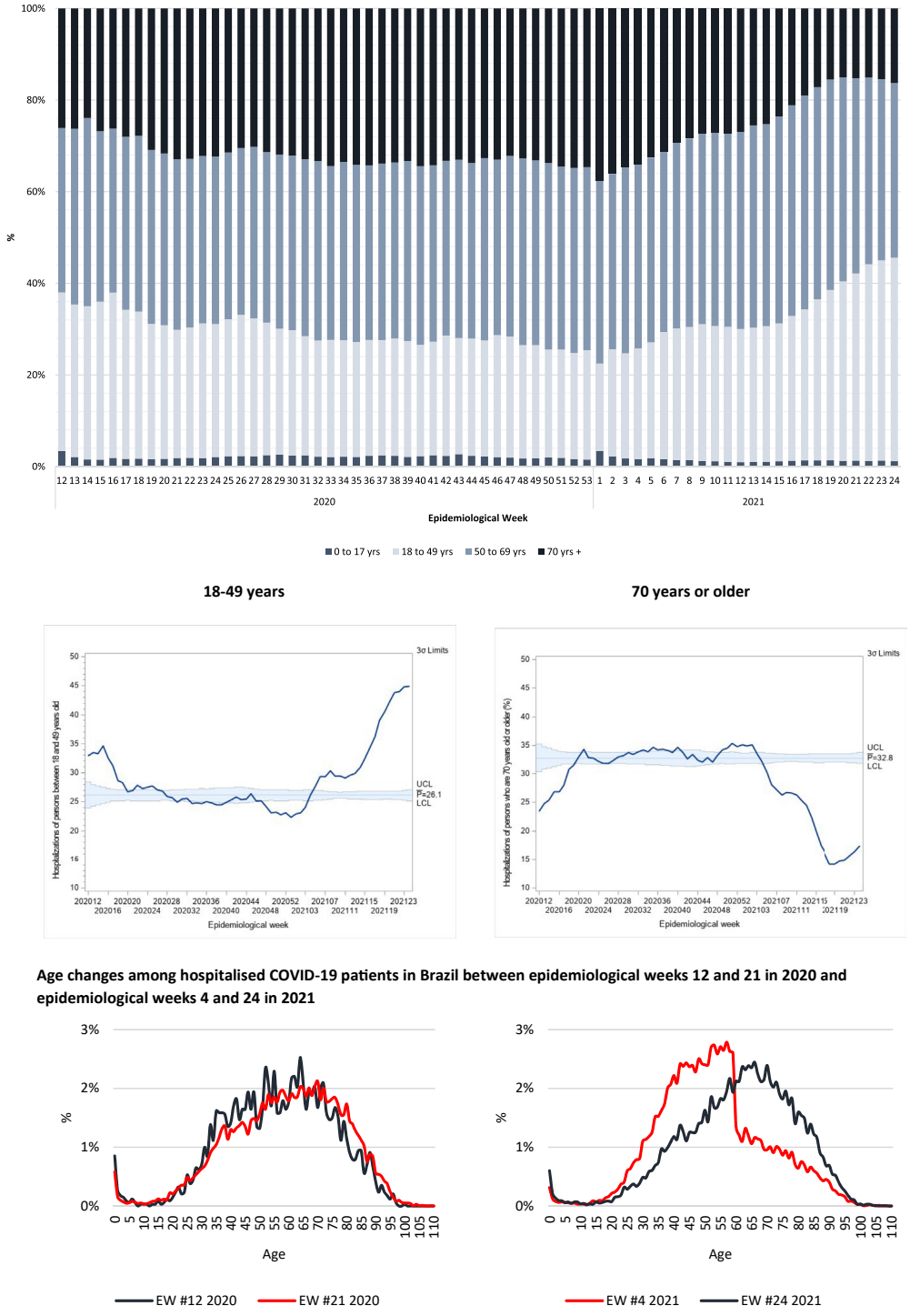
Compared to statistical control zones observed between the 18th and the 48th EW in 2020, the beginning of the pandemic in Brazil was marked by higher proportions of hospitalisations of younger adults, which was probably related to this population group having increased exposure to the virus when they went to out work. There was also, possibly, a selection bias. The message that the older adult population had a significantly increased risk of developing severe disease and should therefore stay protected at home and only visit a hospital for emergencies or with evident respiratory symptoms was widely disseminated.

The recent increase in COVID-19 hospitalisations of younger adults reflects the vaccination programme, which started in Brazil on 17th January 2021 and initially prioritised older adults. In addition, many younger adults, who have to go to work in the absence of social protection, have increased exposure to highly transmissible variants of COVID-19.[5] A concurrent economic crisis in Brazil has predominantly impacted the young and deprived population groups. This has led to unemployment, and thus, informal jobs are now a significant practice to obtain some form of income in these social groups. These factors contributed to the number of cases and the health care system's capacity to respond to that demand.

In countries with younger population structures, such as Brazil, the expected incidence of symptomatic cases was lower than in countries with older population structures. However, two factors contribute to change this expectation in incidence rate. First, comorbidities such as obesity, hypertension and diabetes in low- and middle-income countries also influence disease severity at younger ages. In Brazil, the prevalence of risk factors for severe COVID-19 begins to emerge from the age of 40 years in a significant way; in this sense, the shift in age is a worrying scenario.[6] Second, these countries have seen the middle-aged population gradually return to face-to-face activities without effective control measures in place and with low vaccination coverage. Countries in these situations have been facing large and rapid epidemics in the absence of interventions, as observed in Latin America.[7]

The proportion of symptomatic infections, the adoption of social distancing measures and the unequal vaccination coverage determine the differentiation of severe COVID-19 between age groups. Therefore, age distribution, low testing capacity, and untimely vaccination can comprise a health crisis scenario in countries with low social protection.[8] Each country is a unique case; however, countries with these characteristics need to be monitored carefully to warn for alternative courses of the pandemic, which could pose a global risk to mitigating COVID-19.

In a disastrous scenario, the differentiated increase in COVID-19 cases of younger adults in Brazil may incur extra concerning consequences, such as premature mortality impacting the life expectancy of the population.[9] In addition, many people remain unable to perform daily activities due to post-COVID conditions and may lose




**Source:** SIVEP-Gripe, Ministry of Health, 2021.

**Fig. 1.** Age distribution and statistical control charts for the proportions of COVID-19 hospitalisations of young and old adults during the COVID-19 pandemic. Brazil, epidemiological weeks 12/2020 to 24/2021.

work and have a reduced quality of life for the rest of their lives.[10] Finally, we believe that analysis of the effects of the pandemic in Brazil is unique due to the current social, economic, political and epidemiological local contexts. This study differs from results observed in developed countries but remains valuable to understanding the dynamics of the pandemic in other countries.

## Author statements

### *Ethical approval*

Ethical approval was not required for this study. Data were obtained from an open-access database.

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*Competing interests*

None declared.

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