

## TRENDS IN COVID-19 CASES AT NEW JERSEY RESIDENTIAL COLLEGES

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### **ABSTRACT**

The spread of the COVID-19 virus has had a significant impact on residential colleges and universities. The close proximity of students makes campuses a hotspot for COVID-19 transmission. However, transmission trends within colleges and universities have been researched very minimally. This study investigates trends within COVID-19 cases at New Jersey residential colleges and universities based on demographic characteristics such as location, institution type, and date of campus reopening. Average number of reported COVID-19 cases at each university was collected as well as information about their COVID-19 vaccination and mask mandates using publicly available information on university websites. The data was analyzed in order to determine if there are any trends. It was concluded that urban schools, public universities, and schools that reopened their campuses in Spring 2021 had the highest reported number of cases. This information is useful for college leaders as they continue to make choices for the university during the ongoing pandemic and carries implications for future decision-making practices for other public health emergencies.

### **INTRODUCTION**

The COVID-19 pandemic has drastically spread throughout the world. At the time of this writing, there have been 477 million diagnosed COVID-19 cases and 6.11 million COVID-19 related deaths worldwide (COVID-19 Data Explorer, 2022). Over the last two years of the virus's spread, certain communities have been disproportionately affected. Due to the large populations and economic activities that frequently occur in urban centers, cities frequently become hotspots for COVID-19 infections (Sharifi & Khavarian-Garmsir, 2020). This is evident in the United States where early surges of the virus occurred in densely populated cities with high activity, such as Seattle, Washington and New York City, New York.

Furthermore, there has been a disparity in how COVID-19 affects different economic classes. Those living in lower socioeconomic classes tend to be more likely to be impacted by the virus than those who are more affluent (Hawkins et al., 2020). Over the past two years of the pandemic, a plethora of literature has been published on the effects of COVID-19 on heavily populated areas and communities of lower socioeconomic status. However, little research has been conducted on the impact of the virus's spread in residential colleges and universities.

During the pandemic, colleges and universities faced an increased risk of virus transmission. Within a typical undergraduate institution, students are almost constantly surrounded by their peers. As has been concluded in earlier research, COVID-19 is most prevalent in crowded areas where social distancing to prevent the spread of the virus is more challenging (Lai et al., 2020). From sharing a dorm room, to attending classes, and eating meals in dining halls, these close contacts between students have the potential to create a high-risk area for the spread of COVID-19. Additionally, the average socioeconomic status of students within a university differs from institution to institution. Students at private universities tend to come from more affluent backgrounds than those at public or state universities (Seider, 2008). Therefore, each institution will have different financial abilities when it comes to supporting their students and campus during these unprecedented times.

In certain regions, most colleges and universities responded similarly to the virus. For schools in New Jersey, this included instituting university-wide masking mandates beginning Spring 2020 and COVID-19 vaccine mandates beginning in Fall 2021. One point of difference between these schools, however, is their date of campus reopenings. After closing their campuses in Spring 2020, some

universities chose to open their doors to students again in Fall 2020 while others stalled till Spring 2021. These differences may have impacted COVID-19 outbreaks at each university.

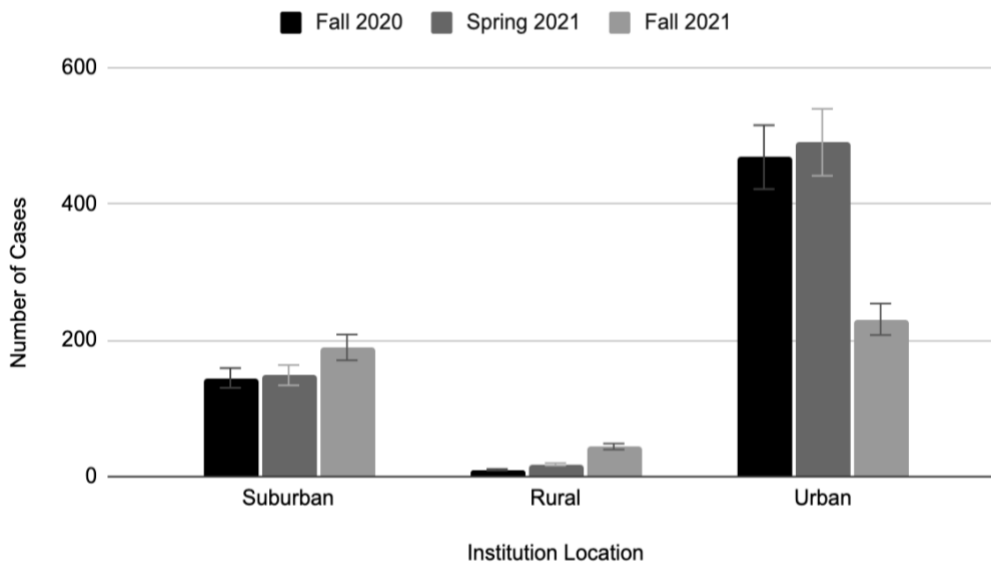
The goal of this research project is to determine if there are any significant relationships present between the transmission of COVID-19 and demographic characteristics of New Jersey residential colleges and universities. It is hypothesized that schools in urban areas, public universities, and/or schools that reopened their campuses in Fall 2020 will have the highest number of COVID-19 cases. This can be addressed by comparing publicly available COVID-19 data from different colleges and analyzing them to determine if there are any significant relationships present.

**MATERIALS AND METHODS**

This study included 20 residential colleges and universities in New Jersey. These schools are Bloomfield College, Caldwell University, Centenary University, Drew University, Fairleigh Dickinson University, Felician University, Monmouth University, Montclair State University, New Jersey City University, Princeton University, Ramapo College, Rider University, Rowan University, Rutgers University, St. Peter’s University, Stevens Institute of Technology, Stockton University, The College of New Jersey, and William Paterson University. Five schools (Georgian Court University, Kean University, New Jersey Institute of Technology, Saint Elizabeth University, and Seton Hall University) were excluded from this study because only COVID-19 data from the past 30 days was publicly available. Data regarding each school’s location (suburban, urban, or rural), masking mandates, COVID-19 vaccine mandates, and modes of instruction (fully online, in-person, or hybrid) for the pandemic semesters was collected as well as the total number of reported COVID-19 cases per semester beginning Fall 2020. For universities with multiple campuses, data was collected university-wide. Information about the school’s location was determined through the school’s website. COVID-19 vaccine information and mask mandates were collected by searching announcement archives on each school’s website. Each school’s COVID-19 cases were found by using their university-wide COVID-19 online reporting dashboard. Data was compiled into a Google Sheets spreadsheet and statistical figures were created to compare the average number of COVID-19 cases between different locations, institution types, and semester of campus reopening.

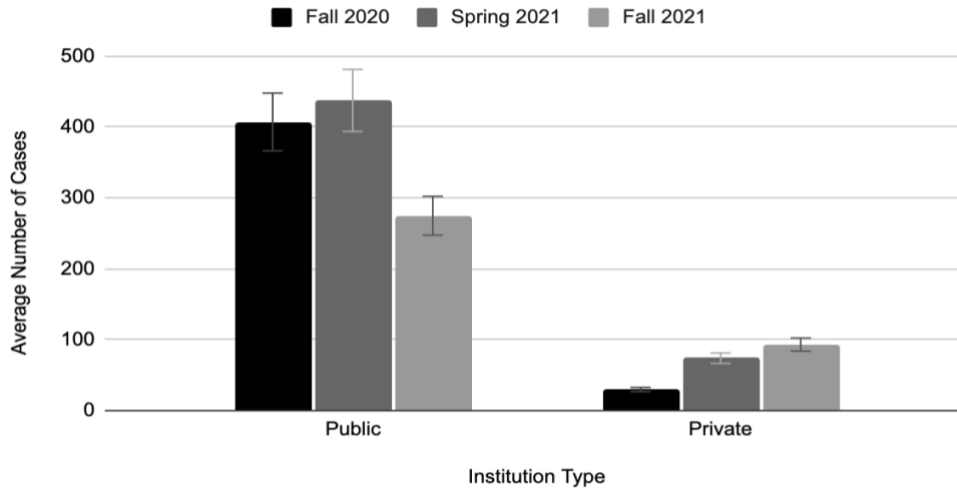
**RESULTS AND DISCUSSION**

**Figure 1**



*Note.* Average number of reported COVID-19 cases at suburban, rural, and urban New Jersey colleges and universities for the Fall 2020, Spring 2021, and Fall 2021 semesters. Data was collected from university websites. Error bars show 10% difference.

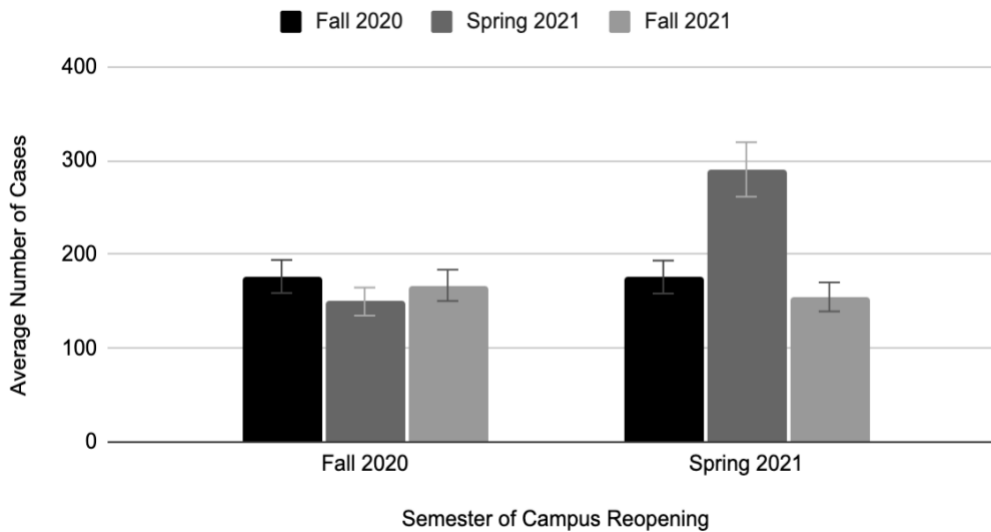
**Figure 2**



*Note.* Average number of reported COVID-19 cases at public and private New Jersey colleges and universities for the Fall 2020, Spring 2021, and Fall 2021 semesters. Data was collected from university websites. Error bars show 10% difference.

and Fall 2021 semesters. Data was collected from university websites. Error bars show 10% difference.

**Figure 3**



*Note.* Average number of reported COVID-19 cases at New Jersey colleges and universities that reopened their campuses in Fall 2020 and Spring 2021 for the Fall 2020, Spring 2021, and Fall 2022 semesters. Data was collected using university websites. Error bars show 10% difference.

The results of this study support the predicted hypothesis that the average number of COVID-19 cases at New Jersey residential colleges and universities differs based on location, institution type, and semester of campus reopening. As shown in Figure 1, urban universities had the highest average number of reported COVID-19 cases for the Fall 2020, Spring 2021, and Fall 2021 semesters. This supports previous studies that show cities as frequent hotspots for COVID-19 outbreaks due to their high concentrations of people and areas of economic activity (Sharifi & Khavarian-Garmsir, 2020). Notably, while suburban and rural schools experienced a significant rise in cases during the Fall 2021 semester, urban schools showed a significant decrease in cases for the same semester. This semester was notable in

that all schools in New Jersey were offering fully in-person classes once again and required a COVID-19 vaccination or vaccine exemption from students in order to attend classes. This suggests that the fully in-person classes caused a rise in COVID-19 cases for suburban and rural schools. However, the requirement of vaccines played a significant role in decreasing COVID-19 cases in urban schools for the Fall 2021 semester.

Figure 2 shows that there were significantly more reported COVID-19 cases for public schools than private schools in New Jersey. However, this may be attributed to the fact that there are more students in New Jersey who attend public schools than private. Of the schools studied, about 42,437 students attended private schools in Fall 2020 whereas 138,705 students attended public schools during the same time period. Once the COVID-19 vaccine mandates were established in Fall 2021, there was a significant drop in reported COVID-19 cases for public schools but no similar drop for private schools. This suggests that the vaccine mandate had the greatest impact for reducing COVID-19 cases in public schools rather than private schools in New Jersey.

Lastly, Figure 3 demonstrates that while schools that reopened their campuses in Fall 2020 experienced consistent average number of COVID-19 cases among all three semesters studied, schools that reopened in Spring 2021 experienced a significant increase in average COVID-19 cases during that semester. During the first summer of the pandemic, schools had to make the difficult decision of whether to open their campuses in the fall. While opening campuses would allow students to return to preferred in-person and hybrid classes, it also increases the chances of a virus outbreak occurring (Felson & Adamczyk, 2021). Eleven schools chose to reopen their campus to students who were willing to attend in-person or hybrid classes in the Fall of 2020, while seven schools chose to hold only online classes for Fall 2020 and delay their campus reopening till Spring 2021. Schools that reopened during Fall 2020 may have avoided a COVID-19 spike because students who were returning to campus in Fall 2020 were doing so during a time when a COVID-19 surge was not occurring in the country (Maragakis, 2022). Therefore, the likelihood of students bringing the virus to campus with them decreased. However, students who returned to campus in Spring 2021 did so following the winter holidays. During this time, many people gathered with their friends and families which led to a large COVID-19 surge (Maragakis, 2022). Therefore, these students who were returning to campus for the first time since the beginning of the pandemic may have had a higher likelihood of bringing the virus with them to their campuses, leading to a surge in campus cases during the Spring 2021 semester.

As the pandemic endures, research into how the virus affects campus communities should be continued. Future research should examine how the addition of a COVID-19 booster vaccine impacts the average number of COVID-19 cases, as colleges in New Jersey have already begun to mandate the booster for the Spring 2022 semester. Furthermore, research into this topic should continue as mask mandates continue to be shifted. As of March 7th, 2022, schools in New Jersey are no longer required to mandate mask-wearing (Executive Order No. 292, 2022). This leaves the decision to require masks up to the schools themselves, with some schools choosing to immediately revoke their own mandates while others choose to delay. The choices in continued masking could be researched to see if it affects the average number of COVID-19 cases at each university.

## **CONCLUSION**

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All in all, the results of this study demonstrate that demographic characteristics of residential colleges and universities affect the average number of reported COVID-19 cases. Urban area schools had the greatest average number of COVID-19 cases when compared to suburban and rural schools. Public schools had the greatest number of average COVID-19 cases when compared to private schools. Schools that reopened their campuses in Spring 2021 experienced the greatest spike in average number of reported COVID-19 cases compared to schools that reopened their campuses in Fall 2020. The results of this study will help inform colleges in making decisions on COVID-19 and future infectious disease protocols at their schools based on their location, institution type, and semester of reopening.

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