



# PINNACLECARE



## Medical Intelligence Report

**Date: January 25, 2021**

KeyBank, NA, or its affiliates ("Key") is providing these materials for informational purposes. Key has not reviewed the materials for accuracy or completeness, and the studies and research referenced may change as more information becomes available. The material is not intended as medical advice. Please consult your personal health provider if you have any questions or concerns about any symptoms you or a member of your family are experiencing and before starting any treatments discussed in the materials. Pinnacle is not an affiliate of Key. This material should in no way be considered to be a solicitation by Key for business on behalf of Pinnacle, or an endorsement of Pinnacle. Key makes no representations regarding the suitability or otherwise of the products or services provided by the Pinnacle. Any opinions, projections, or recommendations contained herein are subject to change without notice and are not intended as individual investment advice. This material is presented for informational purposes only and should not be construed as individual tax or financial advice. KeyBank does not give legal advice.

Investment products are:

**NOT FDIC INSURED • NOT BANK GUARANTEED • MAY LOSE VALUE • NOT A DEPOSIT • NOT INSURED BY ANY FEDERAL OR STATE GOVERNMENT AGENCY**



# Topic: Update on COVID-19 Research



## Prevalence of SARS-CoV-2 Infections in the United States

A study was published in *JAMA* that reported the estimation of the disease burden from COVID-19 in the United States up to November 15, 2020 (Angulo et al., 2021). The information for the estimation was obtained from the CDC seroprevalence surveys (study measuring the presence of antibodies) that were performed in May, June, July, and August in four regional and one national report (representing a total of ten states).

**Table 1.** Reported and estimated number of cases and deaths from COVID-19 through November 15, 2020.

	Confirmed CDC Data	Estimated Data from Seroprevalence Surveys
<b>Number of COVID-19 cases</b>	10,846,373	46,910,006
<b>Number of Symptomatic Infections</b>	ND	28,122,752
<b>Hospitalizations</b>	ND	956,174
<b>Deaths from COVID-19</b>	244,810	304,915

\*ND- Not Determined

**The estimates from seroprevalence studies suggest that the disease burden in the United States may be much larger than the reported number of COVID-19 cases.**

The large disparity between the estimates from seroprevalence surveys and reported cases could result from people not seeking care, not being tested, or because 40% of individuals infected with SARS-CoV-2 are asymptomatic and may never know they were sick. The

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.



differences in the number of deaths estimated from this study suggest that up around 35% of deaths from COVID-19 are not reported.

**Using these estimates, the proportion of people who have been infected with SARS-CoV-2 in the United States is 14%, suggesting that a large majority of the population is still susceptible.**

This method for estimating the number of cases and deaths from a viral outbreak was previously shown to be successful during the 2009 novel influenza A pandemic.

### **Transmission from Non-Symptomatic People**

Transmission of COVID-19 from people who do not have symptoms while they are infectious has been found to be a significant factor in the spread of SARS-CoV-2. Researchers at the CDC have published the results from modeling of the pandemic to better define the details of transmission in people without symptoms (Johansson et al., 2021).

**The results indicate that transmission from people without symptoms accounts for more than half (59%) of all transmission in the United States.**

The group of asymptomatic individuals included both those who never had symptoms (asymptomatic) and those who had not had symptoms at the time of transmission but later experienced symptoms from COVID-19 (pre-symptomatic). The researchers found that 35% were pre-symptomatic and 24% were asymptomatic.

**Based on this analysis, the authors conclude that effective control of the pandemic will require both isolation of persons with symptomatic COVID-19 and a reduction in the risk of transmission from people who do not have symptoms.**

The measures suggested in the report include wearing masks, hand hygiene, social distancing, and strategic testing of people who are not ill.

One of the authors of the study, Jay C. Butler, who is the CDC deputy director for infectious diseases, spoke with the Washington Post about the results (Guarino, 2021). He stated:

The bottom line is controlling the COVID-19 pandemic really is going to require controlling the silent pandemic of transmission from persons without symptoms. The community mitigation tools that we have need to be utilized broadly to be able to slow the spread of SARS-CoV-2 from all infected persons, at least until we have those vaccines widely available.

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.



He then stressed that the emergence of more transmissible strains of the virus has made the significance of reducing the risk of transmission from people who do not have symptoms even more apparent.

### **Effect of New SARS-CoV-2 Variants on Transmission in the United States**

Four different variants of SARS-CoV-2 that appear to have mutated in a way that may allow for an increased rate of transmission have been identified by researchers at this time (Schnirring, 2021). The four variants evolved independently of each other, but have some of the same mutations in the spike protein that are expected to increase the interactions between the virus and human cells.

#### **The variants are referred to as**

- **B.1.1.7** or **VUI-202012/01**- originated in the United Kingdom
- **501Y.V2** or **B.1.351**- originated in South Africa
- **COH.20G/501Y**- originated in the United States
- **B.1.1.28**- includes two potential variants: one that originated in Brazil and the other first observed in Japan

Experiments to determine the characteristics of the new variants are still underway and will be described in future PinnacleCare reports. However, the apparent increase in transmission observed in areas where the variant is widespread has led officials to be concerned about a further increase in the number of cases in the United States. Overall, the number of cases increased by more than 30% between January 3 and January 9, 2021 in the Western Pacific, Africa, and Americas regions defined by the WHO (Schnirring, 2021).

As of January 13, 2021, 50 countries around the world have reported cases of B117, and 20 countries have identified a case of 501Y.V2

#### **Cases of COVID-19 from B117 have been reported across the United States, but so far the variant is not present at high levels.**

However, data from Ireland show how quickly B117 can spread in a region (Joseph, 2021). In the week starting December 20, 2020, it was found that 8.6% of cases of COVID-19 were caused by B117. In the next week, 12.8% of COVID-19 cases were from B117 and the following week 24.9% were the variant. Three weeks later, as of January 11, the proportion of B117 cases was 45%. This change in the number of B117 cases was accompanied by a ten-fold increase in the 14-day infection rate, which is thought to be caused by a combination of the new

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.



variant and the reopening of shops, restaurants, and relaxing of a ban on household visits ahead of Christmas (Reuters, 2021).

Even without the possibility of new, more transmissible strains, there was a record setting number of deaths from COVID-19 in the last week on both a world-wide level and in the United States. The surge in cases and deaths in the United States differs from surges seen earlier in the pandemic in that previously there were regional hotspots in one part of the country and now there are widespread hotspots across the country (Soucheray, 2021).

### **United States-Based Variant**

Researchers in Ohio have isolated a new variant with some of the same mutations thought to increase the transmissibility of SARS-CoV-2 in B117 and 501Y.V2 (Ohio State University, 2021). The variant, called **COH.20G/501Y**, is thought to have evolved within the United States independently from the other variants. The evolving strain has become the dominant SARSCoV-2 variant in the Columbus, Ohio area during a three week period in late December, 2020 and January, 2021.

### **Treatments for COVID-19**

Development of treatment for COVID-19 remains an important focus because of the large number of individuals in the United States who currently have COVID-19, which in turn leads to a large number of hospitalized individuals. While the release of vaccines for SARS-CoV-2 infections is expected to gradually reduce the number of people infected with the virus, until this reduction occurs, treatments will still be needed to prevent COVID-19-related deaths.

### **Convalescent Plasma**

There have been conflicting results in previous clinical trials investigating the efficacy of convalescent plasma, in part due to a lack of controls and standardization of the treatments. In a new publication, the researchers describe the results from a randomized, double-blind, placebocontrolled clinical trial that included 160 participants (Libster et al., 2021). The participants were adults over the age of 65 who were treated with either convalescent plasma with high levels of antibodies against SARS-CoV-2 (80 participants) or a placebo (80 participants) within 72 hours of developing symptoms of mild COVID-19.

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.



The researchers found that 16% of participants who received convalescent plasma progressed to severe COVID-19 disease while 31% of those who received the placebo treatment progressed to severe COVID-19.

**Based on this information, there was a 48% reduction in the risk of severe COVID19 in participants who received convalescent plasma.**

There were also fewer people who progressed to life-threatening illness in the group given convalescent plasma (5% versus 12%).

The key points that differed from previous studies were that the participants were treated early in the course of the disease and that the amount of antibodies in the plasma was known and found to be high. Because the previous studies were performed early in the pandemic, it was difficult to standardize the treatment protocols or determine the level of antibodies in the plasma.

**Beneficial results from convalescent plasma seem to require administration early in the course of COVID-19, before the activation of the patient's immune response as well as use of plasma that has high levels of antibodies.**

There have been additional difficulties with assessing the effects of convalescent plasma because areas that initially had high numbers of cases experienced a large reduction in the number of sick individuals once widespread lockdowns were introduced, making it hard to recruit participants. Additionally, use of convalescent plasma was authorized for emergency use in many places so that patients had access to the treatment outside of clinical trials, which can also make it difficult to recruit new participants. This trial was performed in Argentina, which, as a country, saw a delayed surge of cases compared to countries in North America and Europe, allowing for organization of a trial. Even so, the trial was stopped early as cases waned in the area, and it was no longer possible to recruit new participants.

**Based on the results from this trial, the researchers concluded that early administration of high-titer convalescent plasma against SARS-CoV-2 to mildly ill infected older adults reduced the progression of COVID-19.**

## **Anti-inflammatory Medications**

The importance of a controlled inflammatory response to COVID-19 has been shown to be important to avoid severe symptoms of the disease. Previous clinical trials have shown that the anti-inflammatory drug dexamethasone can help treat individuals experiencing a severe inflammatory response associated with COVID-19, but there are also other medications readily available that would be expected to work in a similar manner.

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.



**Tocilizumab** and **sarilumab** are immunosuppressant medications that inhibit the function of the inflammatory molecule IL-6, and they are used to treat forms of arthritis caused by autoimmune diseases. Tocilizumab has been tested previously for use in people with COVID-19, but evidence of an effect was not observed, possibly due to problems with the trial design.

The following study is part of a trial investigating several potential medications that could be repurposed for treatment of COVID-19 (REMAP-CAP Investigators, 2021). The REMAP-CAP trial is one of the adaptive platform trials that allows for a quicker assessment of the efficacy of drugs for the treatment of COVID-19 through use of a common placebo group as well as other procedural modifications. A preprint of the results from the section investigating the efficacy of tocilizumab and sarilumab was published and describes the outcome of a randomized and placebo controlled trial of participants who were hospitalized for treatment of COVID-19 in an intensive care unit. There were 353 participants in the trial who received tocilizumab, 48 participants who received sarilumab, and 402 who received the standard of care for COVID-19 but did not receive immune modifying medications.

**Use of the two immunosuppressant medications reduced the number of days the participants required respiratory or cardiovascular support while in the intensive care unit.**

In participants receiving tocilizumab, the median number of days without needing support was ten, and with sarilumab, the median number of days without support was eleven while those in the control group had no days without needing respiratory or cardiovascular support.

**There was also an improvement in mortality while in the hospital with the use of the immunomodulating medications.**

In participants taking tocilizumab, the hospital mortality was 28%, and it was 22.2% for sarilumab. The mortality was higher for those in the control group who did not receive an immunomodulating medication at 35.8%.

**Based on the results from the trial, the authors conclude that, in critically ill patients with COVID-19 receiving organ support in intensive care, treatment with the IL-6 receptor antagonists, tocilizumab and sarilumab, improved outcome, including survival.**

## **Incidence of Anaphylaxis after Vaccination**

The CDC released a report of how many cases of anaphylaxis have been reported after vaccination for COVID-19 between December 14 and December 23, 2020 (CDC COVID-19

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.



Response Team, 2021). During this time period, 1,893,360 first doses of the Pfizer-BioNTech COVID-19 vaccine were administered in the United States. There were a total of 4,393 adverse events reported to the Vaccine Adverse Event Reporting System, and 175 were evaluated as possible cases of severe allergic reaction. There was no indication of a geographical clustering of the cases, and the specific doses of vaccine used were from multiple lots, suggesting an individual response and not a contamination from the manufacture. Of the 175 potential cases, 21 cases were determined to be anaphylaxis after more detailed inspection.

**This means that there were 11.1 cases of anaphylaxis per one million first doses of vaccine.**

Of the 21 cases of anaphylaxis, 17 people had a documented history of allergies or allergic reactions (from a combination of reactions to drugs or medical products, foods, and insect stings), and seven had a history of anaphylaxis (or a serious allergic reaction requiring treatment). Two of the individuals reported they had an anaphylactic reaction to vaccination in the past.

The time interval between vaccination and onset of anaphylaxis symptoms was within the first 15 minutes in 71% of the cases (with a range between 2 minutes and 150 minutes), suggesting that the reaction occurs quickly. The median age of persons with anaphylaxis was 40 years with a range between 27 and 60 years, and 19 (or 90%) of the cases occurred in females. Within this group of individuals, 64% of the vaccine doses were administered to women, suggesting that the effect may be more prevalent in females.

After the reaction, 90% of the people with an anaphylactic reaction were treated with epinephrine to reverse the allergic reaction. Four (or 19%) of the individuals were hospitalized (including three who required intensive care), and 17 (or 81%) were treated in an emergency department. There were no deaths due to anaphylaxis reported to the Vaccine Adverse Event Reporting System, and of the 21 reported cases, specific additional information was available for 20, which indicated all had recovered and been discharged.

Of the cases not determined to be anaphylaxis from the initial 175 reports, 86 were later determined to be non-anaphylaxis allergic reactions while 61 were considered non-allergic adverse events. The allergic symptoms included itchy skin, rash, itchy and scratchy sensations in the throat, and mild respiratory symptoms and were classified as non-serious in 87% of instances. The time until the onset of symptoms for a non-anaphylaxis allergic reaction ranged from less than one minute to 20 hours after administration of the vaccine.

**Based on the results from the study, the authors state that widespread use of vaccination is an important tool for the control of the SARS-CoV-2 pandemic, and vaccination should continue with certain precautions to limit adverse events from anaphylaxis.**

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.

**The precautions recommended for vaccination locations include:**

- The necessary supplies to manage anaphylaxis, especially sufficient quantities of epinephrine in pre-filled syringes or autoinjectors
- Screening of potential vaccine recipients to identify persons with contraindications and precautions
- Implementation of observation periods after vaccination of between 15 or 30 minutes depending on each patient's previous history of allergic reactions
- Ensure that health care providers can recognize the signs and symptoms of anaphylaxis at early stages of the reaction
- Immediate treatment of suspected anaphylaxis with intramuscular epinephrine

As of January 6, there had been a total of 29 cases of anaphylaxis reported through the CDC reporting system, which was seven more than in the report above (Branswell, 2021). With the additional number of vaccinations, the CDC reports that the rate of anaphylaxis had decreased to 5.5 per one million vaccinations, down from 11.1 per one million in the above study.

**Officials from the CDC's National Center for Immunization and Respiratory Diseases have stated that the risk of anaphylaxis, at 11 cases per one million as initially calculated, was very low, and with the high rate of COVID-19 deaths every day, the benefits of vaccination outweigh the potential risks.**

## Shortened Quarantine

The CDC recently updated the recommendations for the length of quarantine after a known exposure to someone with COVID-19, and CDC researchers from Tennessee and Wisconsin have evaluated the potential implications of this change (Rolfes et al., 2021). Initially, the CDC recommended staying in quarantine for 14 days after exposure to COVID-19, but there was evidence that a longer quarantine could be difficult to maintain as well as evidence that the risk of transmission in the last four days was small.

**The CDC recommendations for a shortened quarantine are**

- Quarantine can end on day 10 without a test
- Quarantine can end on day 7 after receiving a negative test result

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.



To determine the possible effects of this change on individuals who required quarantine, researchers had participants who were household contacts of people with COVID-19 complete a daily symptom diary and collected respiratory specimens for 14 days.

Among the 185 household contacts enrolled, 59% were found to have SARS-CoV-2 with 76% of test results indicating an infection within 7 days and 86% indicating a positive test within 10 days after the index patient's onset of illness.

Among those who were asymptomatic through seven days, there was an 81% chance of remaining negative for COVID-19 through 14 days. In individuals who were asymptomatic through day ten, the chance of remaining negative through 14 days increased to 93%.

Based on this study, the researchers concluded that there is a potential for onward transmission from household contacts who quarantine for less than 14 days. However, in those with a negative test who remain asymptomatic for seven to ten days after exposure, there is a low risk for spreading COVID-19, and better adherence to a shorter quarantine may be effective.

**Persons released from quarantine before 14 days should continue to avoid close contact and wear masks when around others until 14 days after their last exposure.**

The Vermont Department of Health released a short report describing their experiences after the implementing new recommendations for shortened quarantine (Jones et al., 2021). Between May 8 and November 16, the Vermont Health Department identified 8,798 people who had had contact with someone with COVID-19, and 45% of those in this group sought testing within 14 days of their exposure. A subset of the group who received testing on days seven to ten after exposure were included in the analysis.

Out of the 977 people who had testing on day seven after exposure, 3% had positive test results, 96% had negative results, and 1% had indeterminate results. Of those who received a positive result (35 individuals), 35% were asymptomatic. Of those who were symptomatic at the time of their positive test, approximately one half had developed symptoms on days 4 to 7 after exposure.

There were 1,223 people who had testing on days 8, 9, or 10 after exposure, and 4% tested positive, 95% had results that were negative, and 1% had results that were indeterminate. Of the 53 people who were positive in this group, 23% were asymptomatic with a mean time since symptom onset of 6 days.

When the two groups were combined to determine the positivity rate of all 2,200 people tested between day 7 and 10 after exposure, 4% had a positive test result, and 28% were asymptomatic.

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.



**Additionally, of the persons who tested negative on day 7 and had another test between day 8 and 14, none tested positive.**

The authors concluded that there was no evidence of transmission in asymptomatic people who tested negative on day seven or later, upholding the validity of the policy of a shortened quarantine.

## **Transmission at Off-Campus Gatherings in College-Aged Individuals**

Cases of COVID-19 at some colleges around the country increased rapidly after the start of classes in August, and the CDC released a report on the network of contacts that facilitated the transmission at one Arkansas university (Vang et al., 2021). Classes at the university began on August 24, and both in-person and online classes were offered for a student body of around 20,000 individuals. The majority of students opted for online instruction, but many lived in the area in both on-campus and off-campus housing.

There were a total of 965 university-associated COVID-19 cases identified between August 22 and September 5, 2020.

**Of these cases, 97% were in persons aged 18–24 years, and less than 1% were in persons identified as faculty or staff.**

The researchers performed a network analysis to determine the potential relationships between activities attended or between residential communities.

**Based on this analysis, the researchers found that there were 54 gatherings that could be linked to transmission that in turn led to further spread in places of residence.**

Of the 54 gatherings where transmission occurred, 49 were found to be part of sorority and fraternity rush events. Of the 49 rush gatherings, 72% of the activities included individuals that attended more than one event and created a link between the gatherings. The largest number of links (corresponding to 72%) between gatherings were associated with fraternity or sorority activities, 19% of the links were between gatherings at on-campus dormitories, and 9% of the links occurred at gatherings at on-campus apartments and houses.

In total, 31% of the people identified with COVID-19 between August 22 and September 5 participated in fraternity or sorority activities, and 15% lived in fraternity or sorority houses. Only

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.



5% of the university-associated cases had received in-class instruction. The transmission of COVID-19 was also linked to 56 residences, including 16 dormitories, 20 apartments and houses, and 20 fraternity or sorority houses.

**Analysis of the network of contacts indicates that transmission likely occurred mainly outside the classroom as most of the people who tested positive reported participating in online classes and there was a very small percentage of faculty and staff who were infected.**

There was also a correlation between the sexes of those who tested positive during the timeframe. While the student body is 54% women, women accounted for 70% of the COVID-19 cases included in this study. This association was thought to have occurred because sorority rush occurred before the start of classes and included an in-person bid-day event while the fraternity events occurred after classes began and infections were starting to be identified. The increase in COVID-19 cases led to implementation of targeted mitigation activities, and the fraternity interactions, such as bid day, were moved to an online platform.

## **Reduction in Transmission at Colleges Implementing Remote Classes**

A CDC evaluation of the rate of transmission of COVID-19 in individuals between the ages of 18 and 22 years showed that the incidence increased in early August, 2020 while the overall county-level incidence decreased (Liedner et al., 2020). While this younger age-group has been found to have less risk of severe symptoms or death from COVID-19, the increases in incidence of infection in people 20 to 39 have been shown to be followed by increases in the incidence of COVID-19 for people over the age of 60. The increase in incidence in young adults was found to be associated with colleges and universities, suggesting that changes in the opening of colleges and universities may help to control transmission on a community-wide level as well.

Researchers evaluated the instructional format, mainly in-person or remote, of all not-for-profit colleges and universities with over 20,000 enrolled students.

**They found that in counties with remote instruction, the incidence of COVID-19 declined by 17.9% around the start of classes while counties with in-person instruction experienced a 56.2% increase in COVID-19 incidence during the same time period.**

Counties without a large college or university experienced a 5.9% decline in COVID-19 incidence over the same period.

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.



**The researchers conclude that in-person instruction at colleges and universities was associated with increased county-level COVID-19 incidence and percentage test positivity.**

## **SARS-CoV-2 Transmission on Flights**

Previously published information on the transmission of COVID-19 during long flights was collected early in the pandemic when mask wearing was less prevalent. The following report from the CDC describes a flight on September 29, 2020 that originated in Dubai, United Arab Emirates and arrived in Auckland, New Zealand (Swadi et al., 2020). There were 86 passengers on the 18-hour flight that allowed citizens and permanent residents to return home to New Zealand. The aircraft, a Boeing 777–300ER, has a capacity of between 350 and 450, depending on configuration, so the flight was mostly empty. Masks were not required during the flight, but five of the seven passengers who tested positive reported wearing masks on the flight and in the airport. The passengers originated from different countries before the flight from Dubai and reported no direct contact at the airport.

After the flight, seven passengers tested positive for COVID-19 during the required two-week quarantine in New Zealand. Five of those who tested positive after the flight had had negative tests before the flight. Two passengers (designated A and B) who traveled together from Switzerland reported having had negative test results in their country of origin less than 72 hours before boarding the flight from Dubai. Passenger A began having symptoms on October 1 while passenger B had symptom onset on October 2. The third person to test positive (Passenger C) departed from Kiev, Russia and also tested positive on October 2, but never experienced symptoms. Passenger D had originally left Dublin, Ireland and tested negative for COVID-19 on October 2. Passenger D reported the start of symptoms on October 5 and tested positive on October 7. Passenger E departed from Kochi, India and tested negative on October 2. Passenger E later tested positive on October 6, but reported not having symptoms. The final two passengers who tested positive were part of a group of four family members traveling from South Africa and are referred to as Passengers F and G. All four tested negative on October 2, but Passenger F reported symptoms later on October 2, Passengers F and G tested positive on October 8. The other two travelers in the group did not test positive.

The index patient for the flight is thought to be Passenger A, who was the first to experience symptoms. The timing of Passenger A's symptoms is consistent with the known time-line of SARS-CoV-2 infectivity about two days before the onset of symptoms. Passenger B was traveling with Passenger A, and it was not possible to establish if they were exposed at the same time or if Passenger A infected Passenger B. Passengers C, D, E, and F, who tested positive after the flight, are thought to have been infected during the flight. The timing of Passenger G's illness suggests infection in the quarantine facility after the flight from their traveling companion Passenger F.

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.



The viral samples of all seven passengers were sequenced to determine if they were genetically related. All were genetically identical except for Passenger D who had a single mutation. Comparison of the viral sequence with world-wide databases indicated that the strain of virus was circulating in Switzerland and the United Kingdom. This aligns with Passengers A and B being the first people to be infected on the plane. All 7 passengers that tested positive were seated in aisle seats within two rows of where Passenger A and B were seated.

**These transmission events occurred despite reported use of masks and gloves while on a flight that was well under capacity.**

The results also cast doubt on the usefulness of testing before departure as Passenger A and B both reported negative tests within 72 hours of the flight.

## References

Angulo FJ, Finelli L, Swerdlow DL. Estimation of US SARS-CoV-2 Infections, Symptomatic Infections, Hospitalizations, and Deaths Using Seroprevalence Surveys. *JAMA Netw Open*. 2021 Jan 4;4(1):e2033706. doi: 10.1001/jamanetworkopen.2020.33706. PMID: 33399860; PMCID: PMC7786245.

Branswell H. CDC reports more allergic reactions to Covid-19 vaccines, but cases remain few. *STAT News*. Published January 6, 2021. Accessed on January 8, 2021 at <https://www.statnews.com/2021/01/06/cdc-reports-more-allergic-reactions-to-covid-19-vaccinesbut-cases-remain-few/>

CDC COVID-19 Response Team; Food and Drug Administration. Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Pfizer-BioNTech COVID-19 Vaccine - United States, December 14-23, 2020. *MMWR Morb Mortal Wkly Rep*. 2021 Jan 15;70(2):46-51. doi: 10.15585/mmwr.mm7002e1. PMID: 33444297.

Schnirring L, Global COVID rise continues; 50 nations report B117 variant. *CIDRAP*. Published January 13, 2021. Accessed on January 14, 2021 at <https://www.cidrap.umn.edu/newsperspective/2021/01/global-covid-rise-continues-50-nations-report-b117-variant>

Guarino B. People without symptoms spread virus in more than half of cases, CDC model finds. *The Washington Post*. Published January 7, 2021. Accessed on January 8, 2021 at <https://www.washingtonpost.com/science/2021/01/07/covid-asymptomatic-spread/>

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.



Johansson MA, Quandelacy TM, Kada S, Prasad PV, Steele M, Brooks JT, Slayton RB, Biggerstaff M, Butler JC. SARS-CoV-2 Transmission From People Without COVID-19 Symptoms. *JAMA Netw Open*. 2021 Jan 4;4(1):e2035057. doi: 10.1001/jamanetworkopen.2020.35057. PMID: 33410879.

Jones A, Fialkowski V, Prinzing L, Trites J, Kelso P, Levine M. Assessment of Day-7 Postexposure Testing of Asymptomatic Contacts of COVID-19 Patients to Evaluate Early Release from Quarantine - Vermont, May-November 2020. *MMWR Morb Mortal Wkly Rep*. 2021 Jan 8;70(1):12-13. doi: 10.15585/mmwr.mm7001a3. PMID: 33411700.

Joseph A. Covid-19 deaths are the highest they've ever been — and the more infectious variants could make things much worse. *STAT News*. Published January 14, 2021. Accessed on January 14, 2021 at <https://www.statnews.com/2021/01/14/more-infectious-variants-couldmake-things-much-worse/>

Libster R, Pérez Marc G, Wappner D, Coviello S, Bianchi A, Braem V, Esteban I, Caballero MT, Wood C, Berrueta M, Rondan A, Lescano G, Cruz P, Ritou Y, Fernández Viña V, Álvarez Paggi D, Esperante S, Ferreti A, Ofman G, Ciganda Á, Rodriguez R, Lantos J, Valentini R, Itcovici N, Hintze A, Oyarvide ML, Etchegaray C, Neira A, Name I, Alfonso J, López Castelo R, Caruso G, Rapelius S, Alvez F, Etchenique F, Dimase F, Alvarez D, Aranda SS, Sánchez Yanotti C, De Luca J, Jares Baglivo S, Laudanno S, Nowogrodzki F, Larrea R, Silveyra M, Leberzstein G, Debonis A, Molinos J, González M, Perez E, Kreplak N, Pastor Argüello S, Gibbons L, Althabe F, Bergel E, Polack FP; Fundación INFANT–COVID-19 Group. Early High-Titer Plasma Therapy to Prevent Severe Covid-19 in Older Adults. *N Engl J Med*. 2021 Jan 6. doi: 10.1056/NEJMoa2033700. Epub ahead of print. PMID: 33406353.

Leidner AJ, Barry V, Bowen VB, Silver R, Musial T, Kang GJ, Ritchey MD, Fletcher K, Barrios L, Pevzner E. Opening of Large Institutions of Higher Education and County-Level COVID-19 Incidence - United States, July 6-September 17, 2020. *MMWR Morb Mortal Wkly Rep*. 2021 Jan 8;70(1):14-19. doi: 10.15585/mmwr.mm7001a4. PMID: 33411699.

Ohio State University. Researchers Discover New Variant of COVID-19 Virus in Columbus, Ohio. Published January 13, 2021. Accessed on January 14, 2021 at <https://wexnermedical.osu.edu/mediaroom/pressreleaselisting/new-sars-cov2-variant>

REMAP-CAP Investigators. Interleukin-6 Receptor Antagonists in Critically Ill Patients with Covid-19. *medRxiv*. Published January 9, 2021. Accessed on January 8, 2021 at <https://www.medrxiv.org/content/10.1101/2021.01.07.21249390v2>

Reuters. Incidence of faster-spreading COVID-19 has risen more in Ireland –PM. *Reuters*. Published January 11, 2021. Accessed on January 14, 2021 at

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.



<https://www.reuters.com/article/us-health-coronavirus-ireland/incidence-of-faster-spreading-covid-19-has-risen-more-in-ireland-pm-idUSKBN29G13Q>

Rolfes MA, Grijalva CG, Zhu Y, McLean HQ, Hanson KE, Belongia EA, Halasa NB, Kim A, Meece J, Reed C, Talbot HK, Fry AM. Implications of Shortened Quarantine Among Household Contacts of Index Patients with Confirmed SARS-CoV-2 Infection - Tennessee and Wisconsin, April-September 2020. *MMWR Morb Mortal Wkly Rep.* 2021 Jan 1;69(5152):1633-1637. doi: 10.15585/mmwr.mm695152a1. PMID: 33382676.

Soucheray S. COVID-19 case counts spike in hot spots across US. *CIDRAP.* Published January 11, 2021. Accessed January 12, 2021 at <https://www.cidrap.umn.edu/newsperspective/2021/01/covid-19-case-counts-spike-hot-spots-across-us>

Swadi T, Geoghegan JL, Devine T, McElnay C, Sherwood J, Shoemack P, Ren X, Storey M, Jefferies S, Smit E, Hadfield J, Kenny A, Jelley L, Sporle A, McNeill A, Reynolds GE, Moulden K, Lowe L, Sonder G, Drummond AJ, Huang S, Welch D, Holmes EC, French N, Simpson CR, de Ligt J. Genomic Evidence of In-Flight Transmission of SARS-CoV-2 Despite Predeparture Testing. *Emerg Infect Dis.* 2021 Jan 5;27(3). doi: 10.3201/eid2703.204714. Epub ahead of print. PMID: 33400642.

Vang KE, Krow-Lucal ER, James AE, Cima MJ, Kothari A, Zohoori N, Porter A, Campbell EM. Participation in Fraternity and Sorority Activities and the Spread of COVID-19 Among Residential University Communities - Arkansas, August 21-September 5, 2020. *MMWR Morb Mortal Wkly Rep.* 2021 Jan 8;70(1):20-23. doi: 10.15585/mmwr.mm7001a5. PMID: 33411698.

The information provided in this report is not intended to represent a complete compilation of all treatment options available nor is it to be interpreted as medical advice. The information is intended to serve solely as a guide to facilitate a discussion between you and your medical provider(s). Medical decisions should be made only after consultation with and at the direction of your treating physician(s).

Copyright © 2021 PinnacleCare International, LLC. All rights reserved.

No part of this material may be reproduced in any form, or by any means, without the prior written consent of PinnacleCare

International, LLC.