EVIDENCE-BASED MEDICINE INFOSHEET: EPIDEMIOLOGY AND HEALTH SYSTEMS
Updated [2/8/2021]
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Effectiveness of Stay-At-Home Orders and Effects of Re-Openings

Are the stay at home orders effective in reducing the transmission of SARS-CoV-2? How are business re-openings impacting the spread of SARS-CoV-2?

Key Findings

- Stay-at-home-orders
  - In the Blackfeet Tribal Reservation where stay-at-home orders and mandated use of face coverings in public were strictly enforced, a thirty-three-fold reduction in COVID-19 incidence was observed, from its peak of 6.40 cases per 1,000 residents per day on October 5 to 0.19 on November 7, 2020. [14]
  - A model determined that unless there is almost 100% adherence to stay at home orders, SARS-CoV-2 will continue to spread in Italy.[1]
  - A less strict stay at home protocol may still be effective flattening the curve, but will increase the time necessary for these orders to be in place.[1]
  - After implementing additional stay at home measures, the percent of people leaving their homes from February 26th to April 1st decreased from around 80% to 42% in New York City, 47% in San Francisco, 52% in Seattle, and 61% in New Orleans.[2]
    - There are very early indications that this may be decreasing the number of cases in these locations.[2]
      - The average 3-day percent change in the number of cases showed an overall decline in all four cities from February 26th to April 1st.[2]
        - In New Orleans, the average 3-day percent change went from ~80% to ~60%.[2]
        - In New York, the average 3-day percent change went from ~80% to ~40%.[2]
        - In San Francisco, the average 3-day percent change went from ~80% to ~50%.[2]
        - In Seattle, the average 3-day percent change went from ~80% to ~50%.[2]

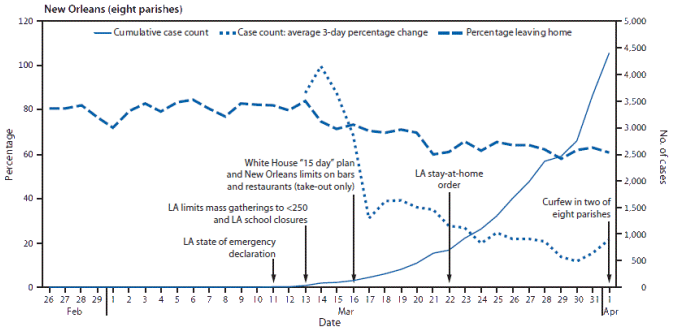

FIGURE. Selected community mitigation interventions, cumulative COVID-19 case counts, average 3-day percentage change in case counts, and percentage leaving home — four U.S. metropolitan areas, February 26–April 1, 2020[2]

- When comparing areas across America that implemented stay-at-home orders versus areas that did not, a decrease in the number of weekly confirmed cases and fatalities was found. Data was collected from March 24, 2020 through May 7, 2020.[3]
  - In the number of weekly cases, there was a 30.2% reduction after one week (1 week after the stay-at-home orders were initiated), a 40.0% reduction after 2 weeks, and a 48.6% reduction after 3 weeks.[3]
  - In the number of weekly fatalities, there was a 59.8% reduction after 3 weeks.
  - This suggests that the stay-at-home orders decreased the number of confirmed cases by 390,000 and the number of fatalities by 41,000.[3]
  - Other factors that may have influenced these numbers include other measures being put into place around the same time (banning of mass gatherings and closure of schools, non-essential businesses, and public areas). There was also an increase in the testing capacity during this time.[3]

- Re-openings
  - In Wisconsin, there was an increase in university associated outbreak cases in mid-August (1,739 cases which is 12.9% of outbreak associated cases from May 13 – September 2) which correlated to the time students returned to campus. Beginning on September 3, there was an increase in outbreak associated cases at long-term care facilities, correctional facilities, colleges/universities, and schools/childcare facilities. The authors state that these findings suggest that outbreaks in college/university campuses may indicate that an increase in community transmission may follow.[13]
  - From March 1 – December 12, there were 2,871,828 cases in people aged 0-24 in the United States. People 0-4 years old made up 7.4% of cases, 5-10 was 10.9%, 11-13 was 7.9%, 14-17 was 16.3%, and 18-24 was 57.4% of cases. Spikes in the young adult population (ages 18-24) were in mid-July and early September which was prior to increases in other age groups which may suggest that this age group contributed more to community spread than younger age groups.[12]
  - In Kansas, a mask mandate was put in place and data was taken from June 1 – August 23. 24/105 counties chose to follow the mandate or have their own mask wearing requirements, and the COVID-19 incidence decreased by 0.08 cases per 100,000 people per day. 81/105 counties opted out of following the mask mandate and the COVID-19 incidence increased by 0.11 cases per 100,000 people per day.[11]
  - In Florida, counties that continued to teach remotely had no increase in COVID-19 cases, but in counties that began to teach in person had a 1.2 increase in cases in elementary schools and a 1.3 increase in cases in high schools.[10]
  - A wedding with 55 attendees in a rural town in Maine that previously had no COVID-19 cases resulted in 27/55 testing positive, 3 cases from other people who were present, and 177 total linked cases. Guests were told to wear masks, but many did not.[9]
  - An overnight summer camp in Georgia had 597 people present. The campers slept in cabins with multiple people and sang/cheered. The attendees were required to have a negative COVID-19 test that was ≤ 12 days old before arriving at camp.

- The staff was required to wear masks, but the campers were not. They did not have windows open to increase circulation.
- One camper developed COVID-19 symptoms, was sent home, and tested positive. Test results on 344 attendees were obtained and 76% (260/344) were positive.[4]

- Combinations of factors affect the probability of infection: social distance, % occupancy of a room, time exposed, and ventilation.[5]
  - The safe social distance is 5.2ft - 9.8ft when considering spread via aerosol transmission of large droplet particles from talking.[5]
  - Ventilation plays a key role in keeping the probability of infection low: the longer people are in a room for or the higher the % occupancy is, the higher the ventilation needs to be.[5]
    - In a Dutch nursing home where there was inadequate ventilation (only re-circulated outside air when CO_2 level fell below a certain point) 17 residents (81%) and 17 healthcare workers with masks (50%) tested positive for COVID-19 within 6 days. In the 6 other wards in the nursing home that had good ventilation, 0/95 residents and 0/106 healthcare workers tested positive.[6]

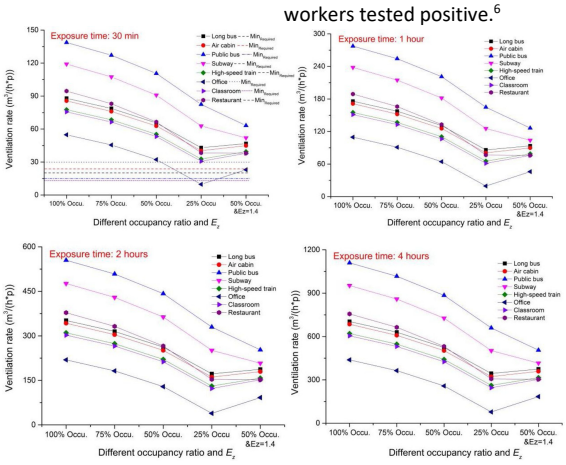

Figure. The requested ventilation rate for controlling the low infected probability.[5]

- 22/101 people who were at a childcare facility tested positive and 12/22 cases were pediatric. These 12 children had 46 contacts who did not work at the childcare center, and 12/46 of these contacts later had confirmed or probable COVID-19 from the children, despite the children only experiencing mild to no symptoms.[7]
- In school aged children (5-17 years old), there have been 277,285 positive tests with 37% of them in children 5-11 years old and 63% of them in adolescents 12-17 years old from March 1 – September 19. The weekly positive test results in school aged children went from 10% on May 31 to 14% on July 5 which correlates with the time many states relaxed stay at home orders.[8]

Commented [RJ1]: I was just looking at this study. NOt sure this should go here. I was thinking it woudl go with aerosolized transmission...since it is loosly related. I can be convinced otherwise.

Commented [GA2R1]: I was just thinking that it should go here because it talks about other factors than just aerosol spread like the exposure time and size of the rooms. And with all of that, I was thinking that it applied more to what precautions should be taken and the chance of infectivity based on where you are going and how long you spend there and scenarios like that now that things are re-opening. But if you believe that it would fit better in aerosolized transmission, I will move it there!

Recommendations

- Stay-at-home orders
  - Stay at home orders should be continued to be adhered to in order to increase the chance of the reduction of spread of SARS-CoV-2 and decrease the time it may take to flatten the curve.[1,2]
  - Though there are other factors that may have influenced the decreased in the number of confirmed cases and fatalities, these results suggest that the stay-at-home orders are helping in limiting the spread of COVID-19.[3]
- Re-openings
  - An increase in transmission at universities may be an early indicator of an increase in community transmission so these patterns should be followed to allow for mitigation planning.[13]
  - The young adult age group (18-24) may be contributing more to community spread, therefor the importance of COVID-19 precautions should be re-enforced in this age group.[12]
  - Wearing masks has been shown to decrease COVID-19 incidence compared to places that did not, so continuing to wear masks is important in decreases the number of cases.[11]
  - Places that have begun teaching in person may want to reconsider remote schooling again since in person schooling has been related to increasing COVID-19 cases.[10]
  - Social distancing and mask wearing should be done by everyone in a large group setting, even when attendees have evidence of negative COVID-19 test.[4,9]
  - In addition to social distancing, ventilation rates must also be adjusted as it plays a key role in decreasing the chance of infectivity. With adequate ventilation rates in conjunction with the other factors (social distance, % occupancy of a room, and exposure time), the risk for infectivity is low; therefore, the benefits of reopening can outweigh the risk of spread, if the appropriate measures are taken.[5,6]
  - In childcare facilities, masks should be worn by staff and all children who are able to (children ≥2); COVID-19 transmission has still been seen in children ≤ 2, so caution should be taken. Testing should be done in close contacts of children who tested positive regardless of symptoms to minimize the spread. Frequent cleaning and handwashing and staying home when ill should be practiced as well.[7]
  - As schools re-open, education on the importance of mask wearing and hand hygiene should be emphasized in school aged children in order to minimize the spread of COVID-19.[8]
  - This study that in seven of the eight states whose data was evaluated, reopening of schools resulted in an initial 5-day increase in COVID-19 infections. With schools reopening across the country in the fall of 2021, the Delta variety is projected to see a major increase in infections.[15]

Sources

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Commented [RJ3]: My question is…what do we recommend now that our society is opening up more and more. We know that stay at home orders are effective. So, how do we integrate what we know about stay at home orders with that of the risks and opportunities with reopening? Some form of interpretation like this needs to go in to our executive summary.

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