KANSAS CITY MISSOURI

Health Department

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Director's Office

Date: October 5, 2021

To: Mayor Quinton Lucas

Cc: City Council Members

Brian Platt, City Manager

From: Frank E. Thompson, Interim Director

Re: Report Supporting Order for Mask Wearing in Public Places

This report is submitted to provide the data and research necessary to make an evidence-based decision on ordering the wearing of masks in places of public accommodation. By providing this report, the Kansas City Health Department seeks to inform the Mayor and City Council of the impact that continuing the current mask order could have on reducing the spread of the COVID-19 Delta variant in our community.

Please note: Studies cited reflect the prevailing scientific research at the time of writing. Data cited is provisional and is subject to change (increase) as many indicators have a data-lag in reporting. In short, due to the exponential stressors placed upon the public health systems at this time, data is likely to show an increase as more reporting institutions are able to report.

The predominate variant active in Kansas City is the Delta variant, studies that reference earlier variants, earlier time periods of the pandemic and/or the parent COVID-19 virus may not address the issues present with the Delta or future variants.

How COVID Spreads And Why Masking Helps Decrease Spread

a. CDC STATEMENT ON MASK WEARING BASED ON AVAILABLE RESEARCH - SARS-CoV-2 infection is transmitted predominately by inhalation of respiratory droplets generated when people cough, sneeze, sing, talk, or breathe. CDC recommends community use of masks, specifically non-valved multi-layer cloth masks, to prevent transmission of SARS-CoV-2. Masks are primarily intended to reduce the emission of virus-laden droplets ("source control"), which is especially relevant for asymptomatic or presymptomatic infected wearers who feel well and may be unaware of their infectiousness to others, and who are estimated to account for more than 50% of transmissions. Masks also help reduce inhalation of these droplets by the wearer ("filtration for wearer protection"). The community benefit of masking for SARS-CoV-2 control is due to the combination of these effects; individual prevention benefit increases with increasing numbers of people using masks ***consistently and correctly***. Adopting universal masking policies can help avert future lockdowns, especially if combined with other non-pharmaceutical interventions such as *social distancing, hand hygiene, and adequate ventilation.* [*emphasis added*]

- "…wearing a face covering decreased the number of projected droplets by >1000-fold. We estimated that a person standing 2m from someone coughing without a mask is exposed to over 1000 times more respiratory droplets than from someone standing 5 cm away wearing a basic single layer mask. Our results indicate that face coverings show consistent efficacy at blocking respiratory droplets."

Bandiera L., Pavar G., Pisetta G., et al. Face coverings and respiratory tract droplet dispersion. medRxiv. 2020;doi:10.1101/2020.08.11.20145086
https://www.medrxiv.org/content/10.1101/2020.08.11.20145086v1.full.pdf

b. RANDOMIZED TRIALS SUPPORT MASKING EFFICACY TO REDUCE INFECTION:

- New large-scale research with more than adequate observations (N=806,547) has illustrated direct evidence that mask use can reduce transmission of COVID-19 specifically. Authors state that "adjusting for baseline covariates, the intervention reduced symptomatic seroprevalence by 9.3%" (Abaluck et al., 2021)

  Abaluck, Jason; Kwong, Laura H.; Styczynski, Ashley; Haque, Ashraful; Kabir, Md. Alamgir; Bates-Jeffries, Ellen; Crawford, Emily; Benjamin-Chung, Jade; Benhachmi, Salim; Raihan, Shabib; Rahman, Shadman; Zaman, Neeti; Winch, Peter J.; Hossain, Md. Maqsud; Reza, Hasan Mahmud; Luby, Stephen P.; Mobarak, Ahmed Mushfiq; All Jaber, Abdulla; Gulshan Momen, Shawkee; Laz Bani, Faika; Rahman, Aura; and Saiha Huq, Tahrima, "The Impact of Community Masking on COVID-19: A Cluster-Randomized Trial in Bangladesh" (2021). Discussion Papers. 1086. https://elischolar.library.yale.edu/egcenter-discussion-paper-series/1086

c. TRANSMISSION BY PERSONS WHO DON'T KNOW (OR DON'T ACCEPT) THAT THEY ARE INFECTED IS A FACTOR IN INCREASED CASES – The issue of asymptomatic spreaders has been of concern for most of the pandemic:

- "We found that the majority of incidences may be attributable to silent transmission from a combination of the presymptomatic stage and asymptomatic infections."
  Moghadas SM, Fitzpatrick MC, Sah P, et al. The implications of silent transmission for the control of COVID-19 outbreaks. Proc Natl Acad Sci U S A. Jul 28 2020;117(30):17513-17515. doi:10.1073/pnas.2008373117
  https://www.pnas.org/content/pnas/117/30/17513.full.pdf

- "…the identification and isolation of persons with symptomatic COVID-19 alone will not control the ongoing spread of SARS-CoV-2."
  Johansson MA, Quandelacy TM, Kada S, et al. SARS-CoV-2 Transmission From People Without COVID-19 Symptoms. JAMA Netw Open. Jan 4 2021;4(1):e2035057. doi:10.1001/jamanetworkopen.2020.35057

The Delta variant has different symptoms than the original COVID virus and previous variants. This plus the fact that a vaccinated person who becomes infected with COVID can have very mild or no symptoms at all means the potential number of asymptomatic spreaders is larger than previous case spikes.

d. ADDITIONAL STUDIES ON EFFECTIVENESS AND PROPER WEARING OF MASKS

- Moghadas SM, Fitzpatrick MC, Sah P, et al. The implications of silent transmission for the control of COVID-19 outbreaks. Proc Natl Acad Sci U S A. Jul 28 2020;117(30):17513-17515. doi:10.1073/pnas.2008373117

- Lindsley WG, Blachere FM, Law BF, Beezhold DH, Noti JD. Efficacy of face masks, neck gaiters and face shields for reducing the expulsion of simulated cough-generated aerosols. Aerosol Sci Technol. 2020; in press

- Leung NHL, Chu DKW, Shiu EYC, et al. Respiratory virus shedding in exhaled breath and efficacy of face masks. Nature medicine. Apr 03 2020;26(5):676-680. doi:https://dx.doi.org/10.1038/s41591-020-0843-2

- Ueki H, Furusawa Y, Iwatsuki-Horimoto K, et al. Effectiveness of Face Masks in Preventing Airborne Transmission of SARS-CoV-2. mSphere. Oct 21 2020;5(5)doi:10.1128/mSphere.00637-20

- Brooks JT, Beezhold DH, Noti JD, et al. Maximizing Fit for Cloth and Medical Procedure Masks to Improve Performance and Reduce SARS-CoV-2 Transmission and Exposure. MMWR Morb Mortal Wkly Rep. 2021

- Hendrix MJ, Walde C, Findley K, Trotman R. Absence of Apparent Transmission of SARS-CoV-2 from Two Stylists After Exposure at a Hair Salon with a Universal Face Covering Policy – Springfield, Missouri, May 2020. MMWR Morb Mortal Wkly Rep. Jul 17 2020;69(28):930-932. doi:10.15585/mmwr.mm6928e2

- Van Dyke ME, Rogers TM, Pevzner E, et al. Trends in County-Level COVID-19 Incidence in Counties With and Without a Mask Mandate – Kansas, June 1-August 23, 2020. MMWR Morb Mortal Wkly Rep. Nov 27 2020;69(47):1777-1781. doi:10.15585/mmwr.mm6947e2

Current Conditions In Missouri

a. VACCINATION RATES FOR MISSOURI AND SW MISSOURI - The Missouri statewide vaccination rate is 48% completed as of 10/3/2021. Areas in Missouri that are popular vacation destinations have lower vaccination rates like Taney County (36.5% completed) and Benton County (40.3% completed). These are all below the 50% vaccination level needed to begin providing community protection.

   https://health.mo.gov/living/healthcondiseases/communicable/novel-coronavirus/data/public-health/county.php accurate through August 16th, 2021

b. INCREASING RATES - Daily average cases are still up over 422% since the first week in June, from 239 to 1,008 as of October 1st , numbers comparable to late January.

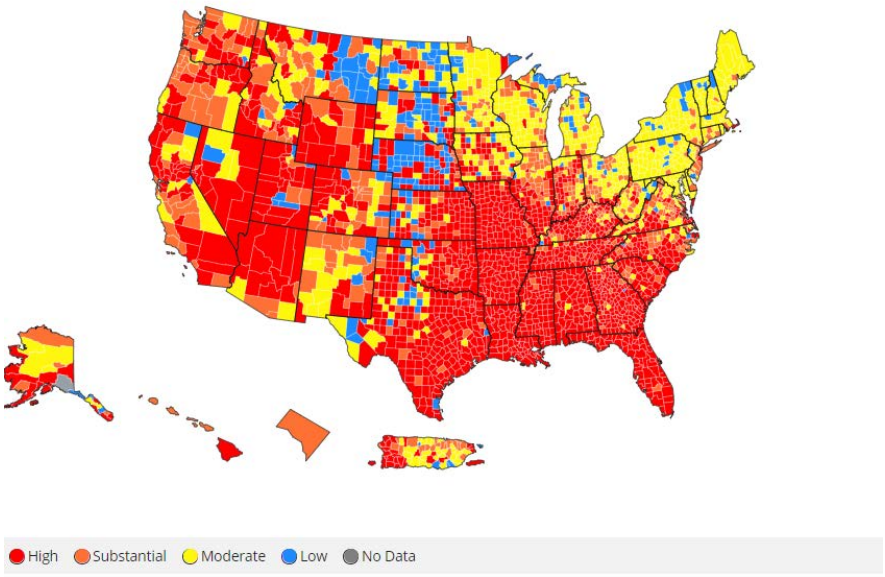
c.
   - Data source: MODHSS, COVID-19 in Missouri Dashboard based on confirmed PCR cases on June 1, 2021 and October 1, 2021 https://health.mo.gov/living/healthcondiseases/communicable/novel-coronavirus/data/public-health/statewide.php

d. SPREAD OF DELTA VARIANT – The estimated R0 (average number of persons each new case will infect) for the delta variant of COVID-19 is between 4.8 and 6, meaning that each individual infected with COVID-19 Delta will transmit the disease to 4-6 others. Sewer shed data show that 100% of collection sites in Missouri now show Delta variant, with 100% showing Delta variant exclusively.

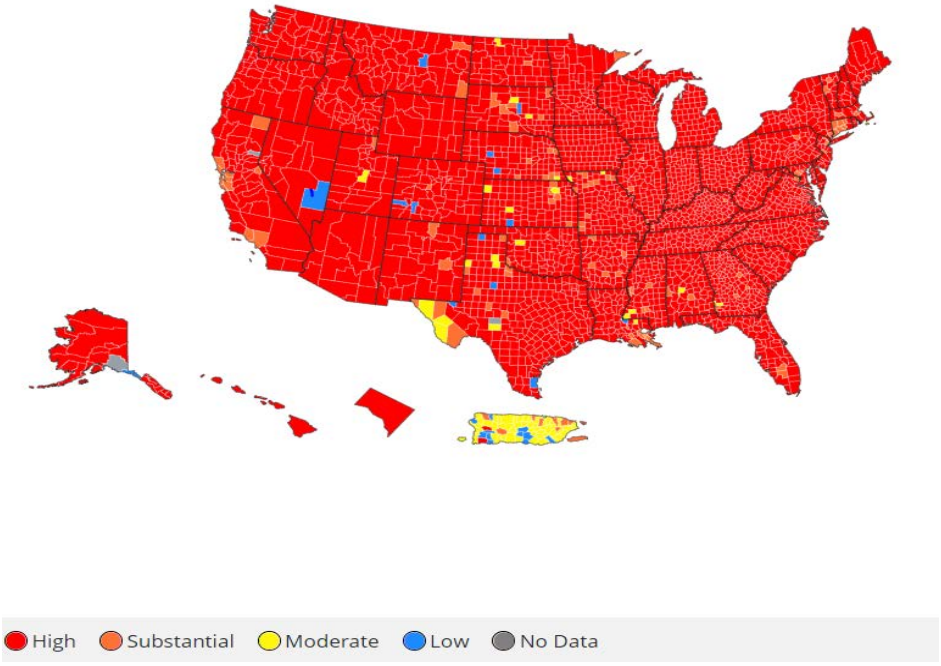
   - R0 data source: https://www.fil.ion.ucl.ac.uk/spm/covid-19/forecasting/
   - Sewer shed data source: https://storymaps.arcgis.com/stories/f7f5492486114da6b5d6fdc07f81aacf accurate through September 13, 2021

e. LOCATION OF HOT SPOTS - The CDC designates 88% of Missouri counties as experiencing “High” levels of community transmission (see map pulled 10/4/2021 at 3:12 PM)

Map as of 7/26/2021



Map as of 10/4/21



Current KCMO Numbers

b. TOTAL CASES AND DEATHS FOR KC REGION - on October 4th, 2021, the Kansas City Health Department confirmed 217,061 total cases of COVID-19 in Kansas City metro-wide and 2,957 deaths from COVID-19 in Kansas City metro-wide.
   - KC Region data source: MARC KC Region COVID-19 Data Hub https://marc2.org/covidhub/

c. INCREASED CASES IN KC REGION AND KCMO – In the KC Region, average weekly cases went from 58 new cases per day in early June to 465 cases per day in early October.
   - KC Region data source: MARC KC Region COVID-19 Data Hub https://marc2.org/covidhub/
   - Weekly new cases for KCMO are still up nearly **800%** since the first week in June, from 96 (6/5/21) to 718 (10/2/21). KCMO is currently averaging about 105 new cases per day.
   - KCMO Data source: MODHSS (EpiTrax) internal report of confirmed cases, data accurate through October 4th, 2021
   - On June 6 hospitalizations due to COVID-19 were at a pandemic low, averaging 7 per day. As of Thursday September 30th, the average daily hospitalizations have increased by 614% to 43 resulting in 8% of all hospital beds being taken by COVID patients and only 31% of hospital beds being available.
   - KC Region data source: MARC KC Region COVID-19 Data Hub https://marc2.org/covidhub/
   - Hospitalizations reported by the Health Department on the KCMO Data dashboard represent those individuals that have been interviewed by Health Department staff or may have provided information to the department due to mandatory laboratory reporting by KCMO Reportable Disease Ordinances: Kansas City Ordinances (Article II, Sec. 34-51, 34-53, 34-54, 34-55, 34-56, 34-68, 34-72 or statute Diseases and Conditions Reportable In Missouri (19 CSR 20-20.020) or through the Missouri Department of Health and Senior Services reporting mechanism EpiTrax. The Mid-America Regional Council's dashboard represents a 2-day lag in reporting from data obtained from HHS Protect data system which is the hospital reporting structure. Both dashboards combined provide insight to the scope and scale of the burden of COVID-19 cases on the hospital system.
   - The Public Health Systems continue to experience challenges with staffing critical roles, such as investigators (including our contract for contact tracing), nurses and call center staff. This increases the need for masking as the mitigation efforts of vaccinations, social distancing, and surveillance efforts stall and genomic testing is low.
   - The mitigation efforts of contract tracing are severely compromised by affected individuals not cooperating with investigations leading to the need for a mask mandate. When individuals who are COVID positive will not talk to investigators, choose to go to work sick or not take appropriate measures in workplace environments, the rate of infection increases and places additional burdens on an already compromised medical and public health system.
   - Due to volume of cases and insufficient staffing, the health department has prioritized investigating cases that are between the ages of 12 years old and 40 years old and those who are hospitalized. This decision was made as that is where there are the lowest vaccination rates, and the bulk of new cases occur. There are 1277 unassigned cases form September 10 – September 23 forward that meet priority but remain unassigned to an investigator. This number increases every day. Masking will help slow the rate of new cases and help stop hyper-local outbreaks of COVID-19.

CDC Guidance

d. DEFINITIONS – A high transmission area is a jurisdiction (city, county or state) with a COVID case rate higher than 100 per 100,000 population over the past seven days and a test positivity rate of greater than 10% over the over the past seven days. A substantial transmission area is a jurisdiction (city, county or state) with a COVID case rate between 50-99 per 100,000 population over the past seven days and a test positivity rate of between 8-9.99% over the past seven days.

e. WHY KC MEETS THE DEFINITION OF HIGH AND/OR SUBSTANTIAL TRANSMISSION AREA – Kansas City's two-week positivity rate from September 19th –October 2nd is 20.9%, and our case rate is 145 per 100k from September 26th to October 2nd

Source – MODHSS Confirmed Cases Database (accurate through October 4, 2021)

Kids And Masking:

f. KIDS ARE GETTING INFECTED - The monthly case rate in those under 12 increased by 12x between June and September 2021, to 877 per 100,000. This rate is significantly higher than the previous peak of COVID-19 for this age group so far, from November 2020 (467 per 100,000). In the month of September there were 647 cases in those under 12, and 1,008 cases in those under 18.

Source – MODHSS Confirmed Cases Database (accurate through Oct 4th, 2021)

g. MASKS NEED TO MAINTAIN IN PERSON LEARNING – Cases in children 18 and under have increased as a proportion of the total case count in a drastic fashion. In September children 18 and underrepresented 27% of all new confirmed cases, by far the highest of the pandemic. For the first time in the pandemic the monthly new case rate in this age group (881 per 100k) exceeds the case rate of the 18+ population (719 per 100k). Studies have clearly illustrated the added benefits of masking in schools to reduce the spread of COVID-19:

"These findings add to evidence that in-person elementary schools can be opened safely with minimal in-school transmission when critical prevention strategies including mask use are implemented, even though maintaining ≥6 ft between students' seats might not be possible."

Hershow RB, Wu K, Lewis NM, et al. Low SARS-CoV-2 Transmission in Elementary Schools — Salt Lake County, Utah, December 3, 2020–January 31, 2021. MMWR Morb Mortal Wkly Rep 2021; 70:442–448. DOI: http://dx.doi.org/10.15585/mmwr.mm7012e3

"Proper masking is the most effective mitigation strategy to prevent secondary transmission in schools when COVID-19 is circulating and when vaccination is unavailable, or there is insufficient uptake [of vaccine]."

Benjamin, DK and Zimmerman, K. Final Report for North Carolina School Districts and Charters in Plan A. June 30, 2021. The ABC Science Collaborative: abcsciencecollaborative.org_ABCs-Final-Report-June-2021.06

"Schools implementing strategies including mask mandates, physical distancing, and increased ventilation had much lower SARS-CoV-2 transmission than in the community. K–12 schools should continue implementing these measures and following CDC isolation and quarantine guidance to minimize secondary transmission in schools" (Dawson et al., 2021)

Dawson P, Worrell MC, Malone S, et al. Pilot Investigation of SARS-CoV-2 Secondary Transmission in Kindergarten Through Grade 12 Schools Implementing Mitigation Strategies — St. Louis County and City of Springfield, Missouri, December 2020. MMWR Morb Mortal Wkly Rep 2021;70:449–455. DOI: http://dx.doi.org/10.15585/mmwr.mm7012e4

h. KIDS CAN SPREAD IT - Studies that have systematically tested children and adolescents, irrespective of symptoms, for acute SARS-CoV-2 infection (using antigen or RT-PCR assays) or prior infection (through antibody testing) have found their rates of infection can be comparable, and in some settings higher, than in adults. Outbreaks among children attending camps and sports events have demonstrated that children can transmit SARS-CoV-2 to others. This includes previous and current outbreaks in youth camps and sporting events in the Kansas City region.

   Source - Szablewski CM, Chang KT, Brown MM, et al. SARS-CoV-2 Transmission and Infection Among Attendees of an Overnight Camp – Georgia, June 2020. MMWR Morb Mortal Wkly Rep 2020;69(31):1023-1025. doi:10.15585/mmwr.mm6931e1

   Atherstone C, Siegel M, Schmitt-Matzen E, et al. SARS-CoV-2 Transmission Associated with High School Wrestling Tournaments – Florida, December 2020-January 2021. MMWR Morb Mortal Wkly Rep 2021;70(4):141-143. doi:10.15585/mmwr.mm7004e4

i. KIDS CAN GET SICK – From January to October 3rd, 2021 there have been 2,640 children in Kanas City hospitals due to COVID-19
   Source – HHS Protect/TeleTracking

j. KIDS (UNDER 12) CANNOT GET VACCINATED AND ARE COMPLETELY EXCLUDED FROM THAT POSSIBLE PROTECTION – Although Emergency Use Authorization for 5-12-year-old children is expected within the coming months, the clinical trials for the Pfizer and Moderna vaccine may begin expanding the number of children in this age range who can participate.

k. MASKS HELP PREVENT COVID-19 FROM SPREADING IN SCHOOLS:

Regional Guidance on Masking and Vaccinations

l. REGIONAL NEWS RELEASE FOR PUBLIC HEALTH ADVISORY - Ten Kansas City area health departments (including Cass, Clay, Jackson and Platte Counties in Missouri) issued a Public Health Advisory through a Regional News Release on July 16, 2021 recommending mask wearing while indoors for all unvaccinated persons and vaccinated individuals with underlying health conditions. This advisory was a result of discussions during a joint meeting with the Chief Medical Officers from several metropolitan area hospitals. The Chief Medical Officers found that due to the rapidly increasing COVID-19 cases and hospitalizations in the Kansas City Area due to emergence of the delta variant, unvaccinated residents of all ages who have resumed normal activities without adequate protection (masking and vaccinations) are most at risk, particularly immune-compromised individuals.

   This Advisory was prior to the CDC's Morbidity and Mortality Weekly Report from July 27, 2021, that stated: "Based on emerging evidence on the Delta variant (2), CDC also recommends that fully vaccinated persons wear masks in public indoor settings in areas of substantial or high transmission." (2) CDC. Science brief: COVID-19 vaccines and vaccination. Atlanta, GA: US Department of Health and Human Services, CDC; 2021. https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/fully-vaccinated-people.html

m. Further guidance was issued following CDC guidance on administration of booster shots and third doses on September 27th, 2021where public health directors across the metro recommended "eligible Pfizer vaccine recipients to continue protecting themselves and their families by getting the Pfizer COVID-19 booster shot from a primary care provider or local pharmacy." Eligibility includes:
   - Individuals 65 years of age and older.
   - Individuals 18 through 64 years of age at high risk of severe COVID-19.
   - Individuals 18 through 64 years of age whose frequent institutional or occupational exposure puts them at high risk of serious complications of COVID-19, including severe COVID-19.

Masking Is Needed Because Vaccinations Alone are not Working

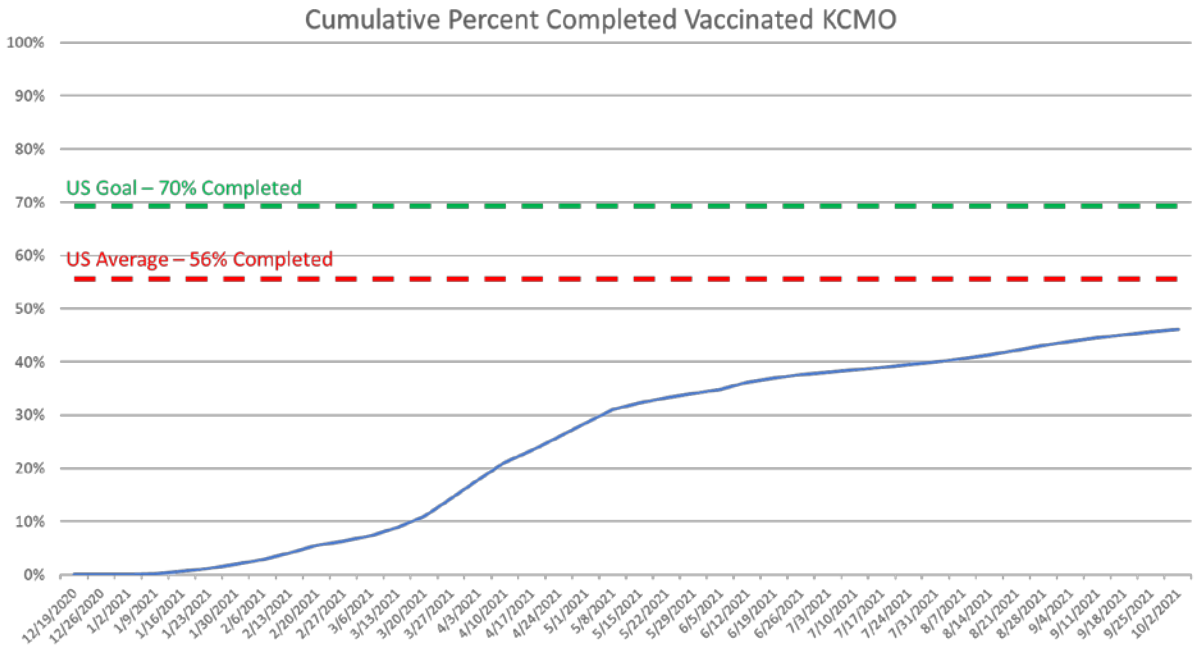
n. VACCINES ALONE CAN'T STOP COVID-19 IF ENOUGH PEOPLE DON'T RECEIVE THEM - In November 2020, Molecular Diversity Preservation International (MDPI) a publisher of online scientific journals, published an article titled "Is a COVID-19 Vaccine Likely to Make Things Worse?". In this article (written before the first COVID-19 vaccine was approved), the authors used mathematical modeling to predict what impact the introduction of a highly effective vaccine would have on COVID-19 infections. The authors concluded that "use of a vaccine in combination with these measures *[contact tracing, masks wearing, physical distancing, travel quarantine and isolation of infected persons]* will reduce the per-day risk of infection **so long as at least 50%** of people receive it, with significant benefits if more than 80% people do. However, **if there is too much vaccine defiance and a concomitant abandoning of other protection options, then we run the risk of a perverse outcome: the introduction of an excellent vaccine could nevertheless make the overall situation worse**." In short, the mathematical models used by the authors predicted the exact situation Kansas City and other communities now find us in – we removed the protective measures before enough people were vaccinated and so the virus had a resurgence. It is important to note that the version of COVID-19 the models factored in was not as contagious or as virulent as the Delta variant. This article closed with the following cautionary statement: "**unless these vaccines are given to a sizable majority of people, vaccination is unable to fully replace existing protection measures**. Until this goal is achieved, it is vital that public-health education about the importance of non-medical protection options remain in place."

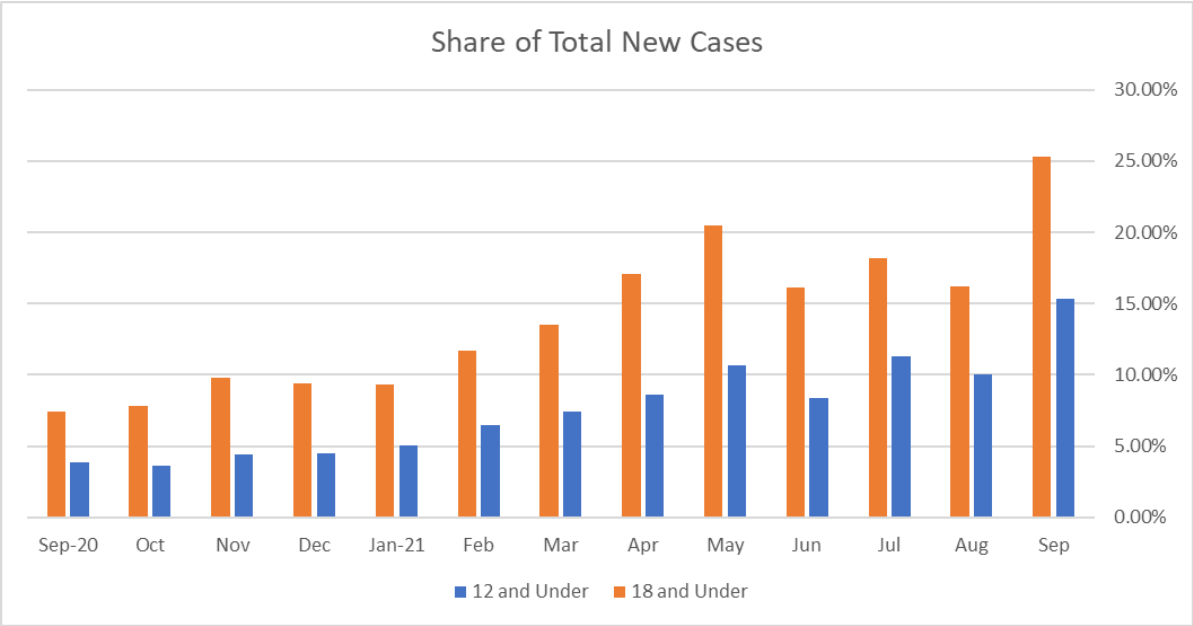
o. VACCINATION AVAILABILITY CANNOT BE A SUBSTITUTE FOR OTHER PROTECTIVE MEASURES SUCH AS MASKING – COVID-19 vaccines are available to most Kansas City residents. In addition to community based, COVID vaccination clinics offered each day by the Health Department, clinics under contract with the Health Department and other medical providers/community organizations in this community, there are vaccinations available at pharmacies, in hospital emergency rooms, COVID specific private clinics and urgent care centers.

Vaccine uptake is shifting from an availability problem to a desirability issue. Financial incentives being introduced by the state of Missouri may have some impact, but preliminary studies of the impact of financial incentives in other states show mixed results. One study that looked at the impact of $10 and $100 financial incentives found that "While having to pay a $20 co-pay for the vaccine did deter individuals, the additional economic incentives had no positive effect although they did not discourage vaccination. Consistent with past research further analysis shows that the negative effect of the $20 co-pay was concentrated among low-income earners. Financial incentives failed to increase vaccination willingness across income levels."

Source - Kreps, S., Dasgupta, N., Brownstein, J.S. et al. public attitudes toward COVID-19 vaccination: The role of vaccine attributes, incentives, and misinformation. npj Vaccines 6, 73 (2021). https://doi.org/10.1038/s41541-021-00335-2

p. In a similar fashion, CDC guidance was updated on May 14th to and dropping masking requirements for those fully vaccinated. With no way to enforce a mask mandate for only those unvaccinated, the city was left with no choice but to drop the mandate. This precipitated fastest increase in cases over the entire pandemic, with cases rising nearly 1,600% in a 9-week period. At that time the vaccination rate in the city was just over 32%. In addition, between April 9 (the date of full eligibility) and May 13 (the day before the mask mandate ended) the vaccination rate had been increasing at an average rate of 2.4% per week. Subsequently, the vaccination rate slowed to a rate of 0.5% increase per week. At this rate, estimates suggest we would reach 50% completed in mid-November and would not surpass 60% completed until mid-March 2022.

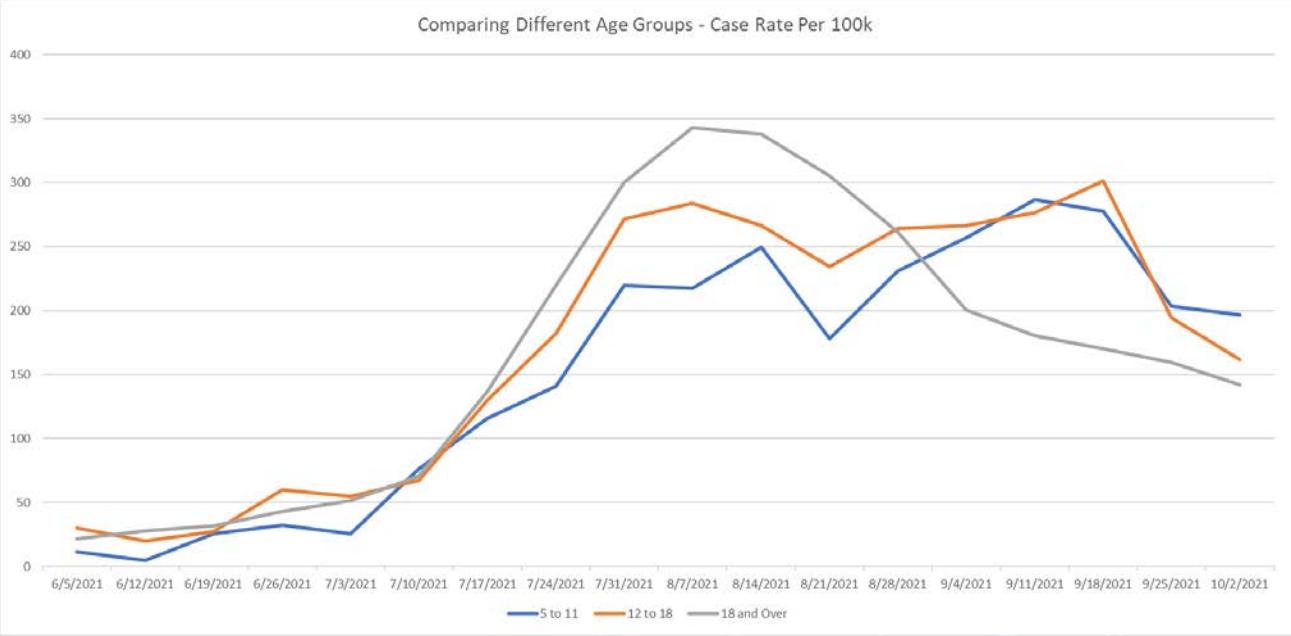




q. Furthermore, the share of cases in those under 12 rose from just 4% of all cases in January 2021, to over 17% of all cases in September 2021. These children cannot be vaccinated. In the absence of higher vaccination rates, the only method left to protect the children of Kansas City is through mask mandates. Those 18 and under now make up 27% of all new cases – in the final two weeks of September 2020 we had 1371 new cases, and those under 18 made up just 10% of those cases. In the final two weeks of September 2021, we have similar numbers of total cases (1484) yet those 18 and under made up 25% of those, clearly illustrating the gravity of the situation in our children.

r. THE CURRENT MASK ORDER HAS FLATTENED THE CURVE: Following a two-week delay, the mask mandate has flattened what was previously illustrated to be exponential growth in the number of new cases. The mask order preceded a drop in the overall case rate in the following month, illustrated below: However, the decline was at first only taking place in those over 18, as cases in children continued to rise. In fact, the week of September 12 to September 19 was the highest single week on record for new

cases in kids 18 and under (276 new cases). Cases in these age groups have decreased yet remain higher than the rest of the population. Removal of mask mandates in schools and in public places would likely lead to a further increase in cases for this population, which cannot be fully vaccinated:



Based on the information included in this report, as Interim Director of the Kansas City Health Department, I strongly support the issuance of an Order from the City Council extending the requirement of masks in all indoor, public accommodations within Kansas City, MO, for at least the next 30 days. Such an order is needed to provide relief to local hospitals, to continue efforts to "turn the curve" of Kansas City's latest COVID-19 surge, and to protect the public health of Kansas Citians.