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Subject: DOM Covid Communication
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Attachments: Science Magazine.pdf
Genetic Variants of SARS-CoV-2—What Do They Mean ..pdf
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Dear Friends and Colleagues.
I hope you and family are doing well. While the number of cases of Covid (6% decrease over the past 2 weeks), hospitalizations (20% decrease over the past 2 weeks), and deaths (45% decrease over the past 2 weeks) in Colorado are continuing to decrease, new cases (9% increase over the past 2 weeks), hospitalizations (5% increase over the past 2 weeks), and deaths (27% increase over the past 2 weeks) are increasing nationally. The heterogeneous pattern of disease raises an obvious question: Are these different rates of Covid caused by the host or the virus?
Not being an epidemiologist or virologist, I'll venture to say that it's multifactorial. There is general consensus among epidemiologist that:

- At least 50% of transmission events are from pre-symptomatic individuals
- Transmission is primarily facilitated by close and high frequency contacts and confined environments
  - Household contacts > social and extended family contacts > community exposures > healthcare contacts in terms of transmission (**see figure and attached paper**)
- Kids are less susceptible than adults, but just as infectious
- Quarantine/isolation of the case is not enough in itself, control of transmission requires a comprehensive approach that includes contact tracing and quarantine, and population-level interventions.
- More information can be found at the January 7th DOM Town Hall: **"**COVID-19: What Happened post-Thanksgiving and What's Next?":

However, given the emergence of genetic variants of SARS-CoV-2 that are estimated to be 50% more transmissible than the wild-type virus (see attached paper from JAMA), I think the characteristics of the virus may have something to do with the heterogeneous pattern of disease in the U.S. Below are several points that Eric Poeschla (division head of ID and expert in RNA viruses) would like you to consider:

- New SARS-CoV-2 variants have been identified in the U.K, South Africa & Brazil.
- Variant B.1.1.7 (aka N501Y.V1) rapidly became dominant and replaced other variants in the U.K. and then in Ireland in December. It has an unusually large number of amino acid substitutions (over 20) and some small deletions too.
- Variant B.1.1.7 is also present in the U.S. and at least 45 other countries. The first U.S. case identification was by the CDPHE here in Colorado in the last week of December, and multiple other states quickly reported this variant too.
- The increased transmissibility hypothesis is not yet fully proven, but on a practical level we must plan as if it is true. If there is a roughly 50% increase in transmissibility as suggested by the extensive recent U.K. data, it is possible the U.S. and Colorado will see a substantial further Covid-19 surge between late February and later in the spring.
- Variant B.1.1.7 can be detected in standard diagnostic PCR assays with some assays (e.g., TaqPath) due to how a six nucleotide deletion in the Spike gene prevents binding of a probe to the amplicon for this gene but not the probe to other viral genes. However, a small percentage of viral isolates are genotyped so it's likely that we're underestimating the penetrance of B.1.1.7 in the U.S.
- There is no evidence for increased pathogenicity for any of these variants.
- The mechanism(s) for the increased transmissibility are as yet unclear. Some mutations observed increase affinity of the spike protein for the ACE2 receptor, but other things may also be in play.
- For some of the variants, the possibility that they could partially evade some antibody responses in some people has been raised by lab analyses and experiments but this is still a hypothesis. Importantly there is no evidence that the vaccines will not work against these variants. The overwhelming probability is that the polyclonal antibody responses produced by the mRNA vaccines will be protective for at least this next year.
- It is critical for us to double down on (a) decreasing transmission better with nonpharmaceutical interventions and (b) vaccine rollout.
- More information can be found at the January 13 DOM Covid-19 Town Hall: "Implications of Genetic Variants of SARS-CoV-2: A New Pandemic Phase?"**.**

So basically we have a race between administration of vaccines to enough of the population and potential acceleration in the spread of Covid-19. These more transmissible genetic variants of SARS-CoV-2 place more pressure on the vaccine rollout, and we all hope that President-elect Biden's goal of getting 100 million doses of Covid-19 vaccines administered by the end April is achievable. While Colorado is doing well in terms of vaccine administration (>220,000 receiving one dose and approximately 50,000 receiving two doses as of today; https://covid.cdc.gov/covid-data-tracker/#vaccinations) and has a clear plan in terms of vaccine distribution (**see Vaccine Distribution Plan**), there are some inconsistencies in who is getting vaccinated at each healthcare facility and this has been a source of confusion. Thus, vaccine distribution in Colorado will be the topic of our next DOM Town Hall (January 21).

Town Halls: Last week's Town Hall with Eric Poeschla focused on the genetic variants of SARS-CoV-2 ("Implications of Genetic Variants of SARS-CoV-2: A New Pandemic Phase?"). Given the need to accelerate our vaccination efforts, I've decided to have our next DOM Town Hall to focus on statewide and medical center distribution of the vaccine; John Douglas and his colleagues from CDPHE will join us for this discussion. DOM Town Halls are accessible at our website (https://medschool.cuanschutz.edu/medicine/faculty-affairs/covid-19). Recent Town Hall include:

- **Dec 2, 2020** "UCH COVID Command Center "What it is and How it Works"
- **Dec 10, 2020** "Vaccine Distribution"
- **Dec 17, 2020** "Your Charge is Low: How to Manage Pandemic Depletion"
- **Jan 7, 2021 "**COVID-19: What Happened post-Thanksgiving and What's Next?"
- **Jan 13, 2021** "Implications of Genetic Variants of SARS-CoV-2: A New Pandemic Phase?"
- **Jan 21, 2021 (7-8 PM):** "Vaccine Distribution: Statewide vs. Medical Center Allocation"

  Join Zoom Meeting: https://ucdenver.zoom.us/j/96282507513?pwd=V3FlbGo0Y0VBcGhoRWlsL2xYSUZQZz09
  Meeting ID: 962 8250 7513; **Passcode:** 961584

In closing, please find a way to celebrate Martin Luther King Jr. Day tomorrow. While we've come a long way and should take some time to celebrate our successes, last week made me realize again how much more work is in front of us. Although only some of us have experienced direct discrimination, all of us have been witness to discriminatory words and actions. As healthcare providers, educators, and scientists, we're obliged to level the playing field, provide care to all who need it, educate and train those who seek knowledge, and make discoveries that improve human health. Our profession, by its very nature, embodies the values of the civil rights movement, and every other movement that promotes equality and inclusion. Let's celebrate tomorrow and not forget there's a lot of work to do after the celebrations are over.

Covid-19 will be with us for a while but we'll get through this together. Please let me know how I can help you and whether there are topics or concerns you'd like me to address. My very best wishes.
David

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