COVID-19 Seasonality
What we know about COVID-19 seasonality

• Virtually nothing

• This all started in late 2019, the pandemic is still expanding, and our knowledge of # of infected people is uneven at best
Why might COVID-19 be seasonal?

- Most, though not all, human respiratory pathogens exhibit seasonality in temperate regions, with a winter peak.
- This includes several established coronaviruses and influenza, such that we might expect SARS-CoV-2 to be the same.

Dowell & Ho (2004)
What causes seasonality in human respiratory pathogens?

• Classically, this has been attributed to some unknown combination of behavioral and direct environmental sensitivity.

• Recent research indicates that direct environmental sensitivity plays the dominant role, as best demonstrated for influenza.

• Pathways include virus survival and dispersion (as demonstrated in the lab for influenza) and host defense response.
Which environmental factors matter?

• Again, our best information is for influenza.

• Both temperature and humidity have been explored, but **absolute humidity** appears to be the best predictor
  • This has been demonstrated in lab and epidemiological studies, many led by Jeff Shaman’s group

• Why?
  • Lab studies show that vapor pressure is a better predictor of transmission than is relative humidity or temperature
  • Meteorological measurements of absolute humidity are a useful proxy for indoor conditions: AH is ~conserved between indoor and outdoor settings
State of knowledge for COVID-19

• Several rapidly released, non peer reviewed studies have claimed to find COVID-19 sensitivity to AH or to Temperature
• The state of case data and lack of confirmatory lab studies lead most experts to conclude that these studies are speculative
• Anthony Fauci has suggested that evidence of seasonality is emerging in the geographic patterns of COVID-19 expansion

Importantly: the answer is unlikely to be black and white—i.e., it’s unlikely that COVID-19 will “go away” or will never make it in tropical environments. But
From the GEO-Health perspective:

- The seasonality question would seem to hinge on the potential for direct environmental sensitivities.
- The leading candidate predictor is not well-monitored beyond synoptic weather stations, and the range of tested predictors is limited.
- There are critical open questions about both temperate zone seasonality and tropical/subtropical hydrometeorological sensitivities.

But, but, but:

- There is no lab evidence for SARS-CoV-2 environmental sensitivity.
- Case count data are not yet reliable or consistent indicators of transmission rates. This is likely to change in coming months, but it will always be messy.