


PRESENTERS:
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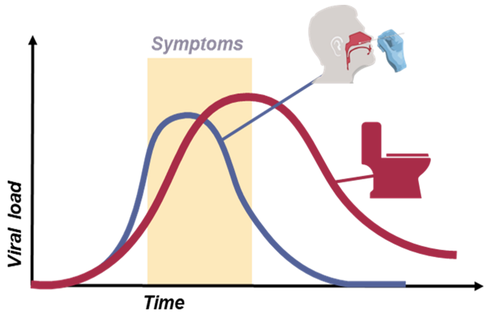
Changing Offsets: An Analysis of the Temporal Offset Between Case-Based and Wastewater-Based Epidemiology

TRADITIONAL VS WASTEWATER BASED EPIDEMIOLOGY

- **Traditional epidemiology** relies on voluntary community testing. State governments then aggregate data from reporting sites to the community level.
- **Wastewater based epidemiology** is created from samples collected by local sewer sheds and analyzed for gene concentration. This can give the level of infection at the community level.

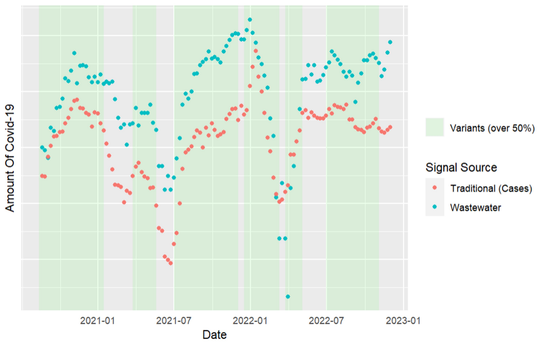


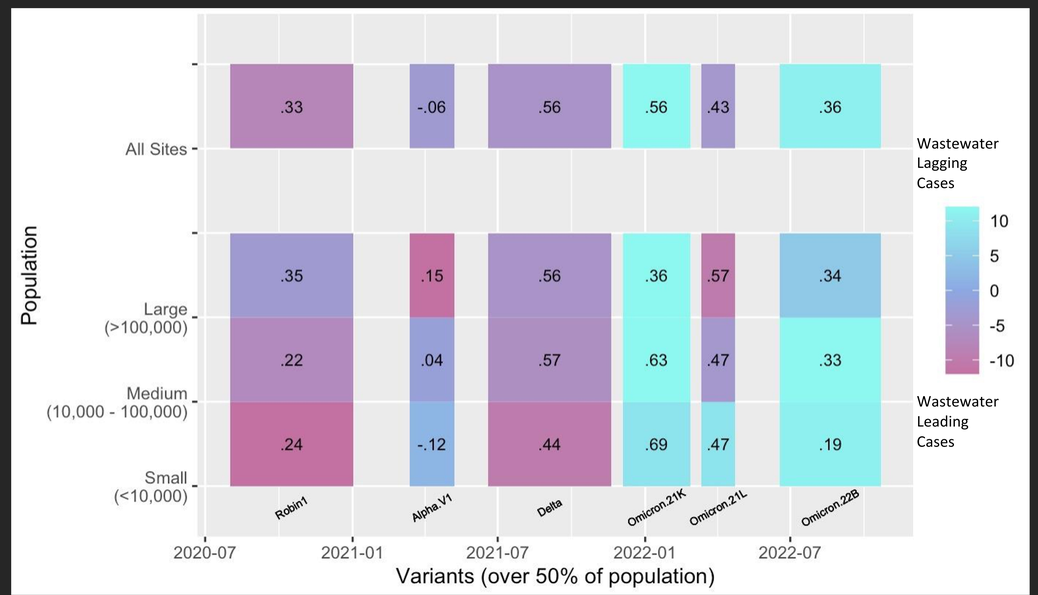
THE TEMPORAL OFFSET

A time window exists where an individual is infected but has not yet been tested however, they are shedding which can be picked up by the wastewater testing. This can cause wastewater data to lag or lead behind the traditional case data.

DATA:

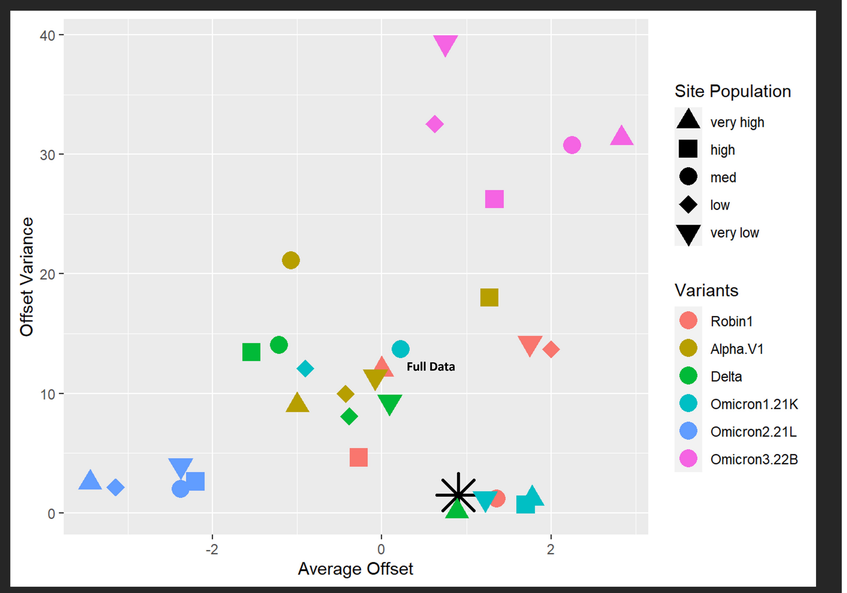
We have over two years of wastewater data, sampled 1-6 times per week, at 63 locations. We combined this with case data from the DHS to get a very high-fidelity signal of the traditional and wastewater-based methods to detect Covid.





Variation in Temporal Offsets Over Time

Connection Between Group Average Offset and Variance



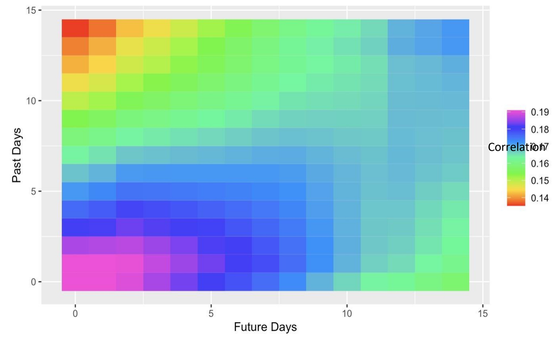
Take a picture to view the **full paper**

Take a picture to view the **GitHub repo**

ANALYSIS METHODS:

Using a changing window size, we were able to find the window of case data that correlates best with wastewater data.

Correlation of X number of future days and Y number of past days



Using this window, we can now find how far we need to offset the two data sets to find the best Kendall correlation.

FINDINGS:

- The temporal offset between cases and wastewater fluctuates.
- Fluctuations in offset may be due to a variety of factors including:
  - Virus variant
  - Public behavior towards getting tested
  - Wastewater testing methods (qPCR/dPCR)

SIGNIFICANCE OF THE FINDINGS:

The ability to determine the temporal offset can help us to better understand case rates when case data is less reliable and when more testing is needed. It improves the synergy between these two epidemiology methods by helping us to understand how they are connected.

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