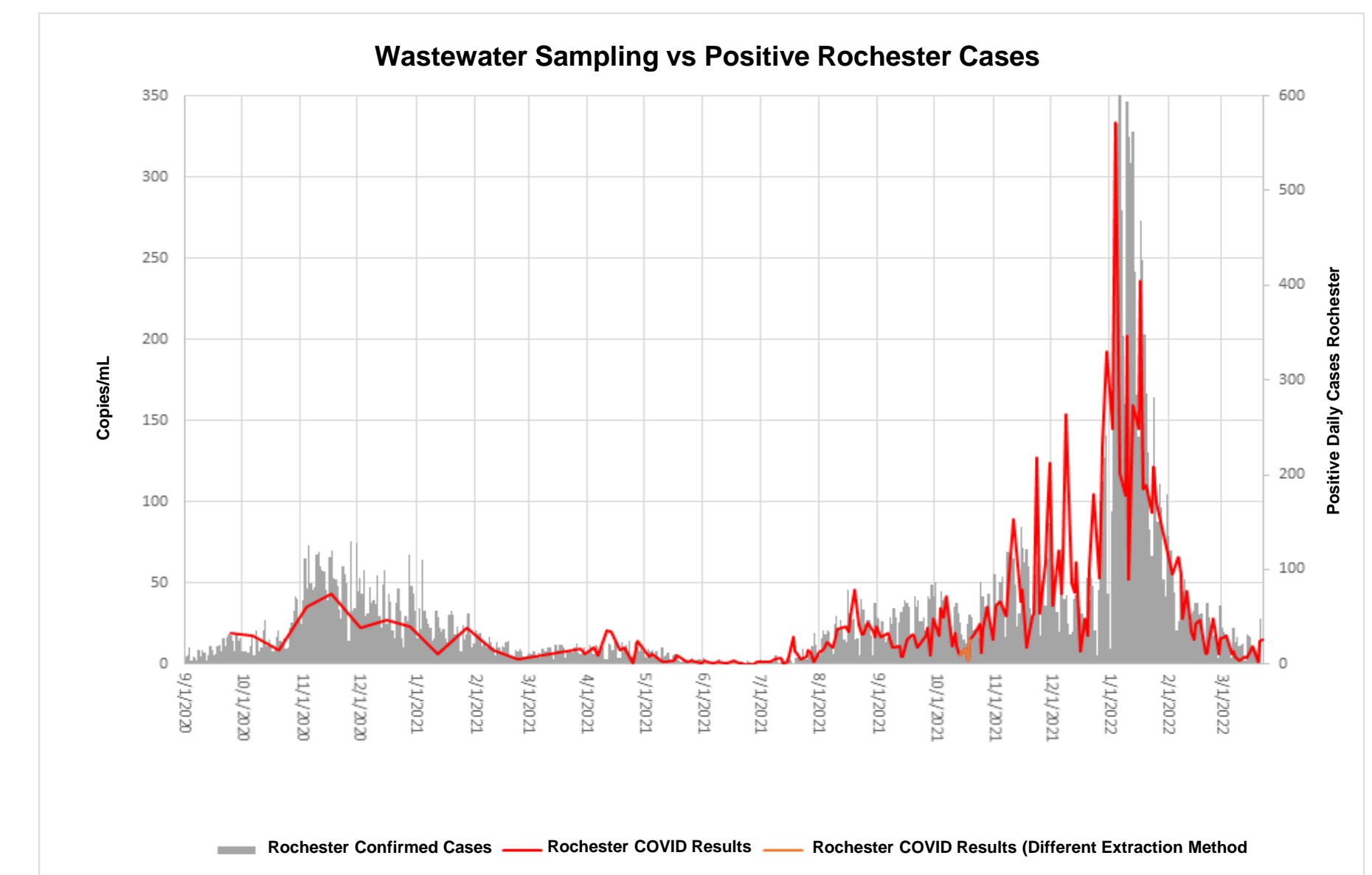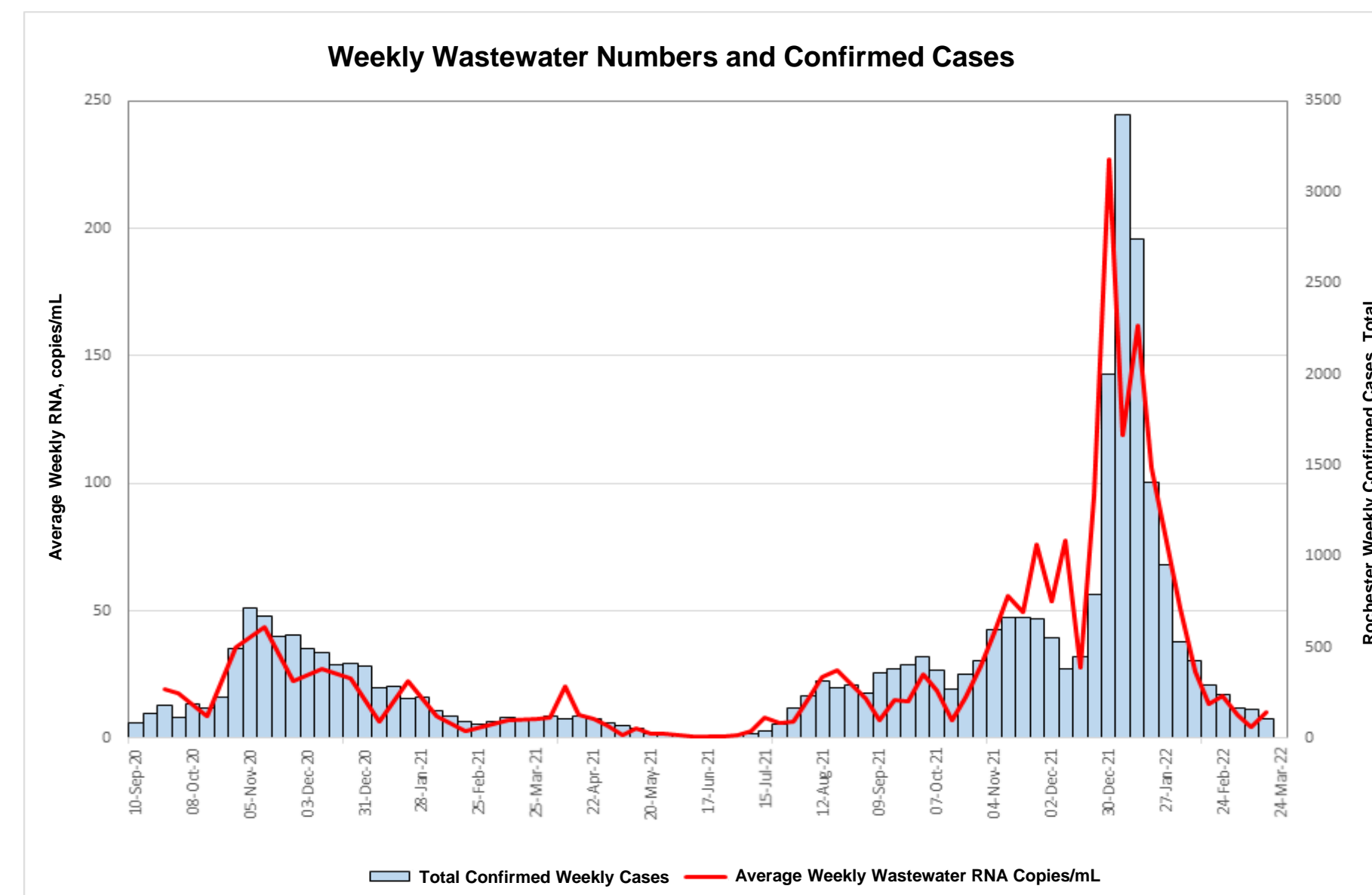# UNIVERSITY OF MINNESOTA ROCHESTER

Finding an Accurate Way to Track the Pandemic

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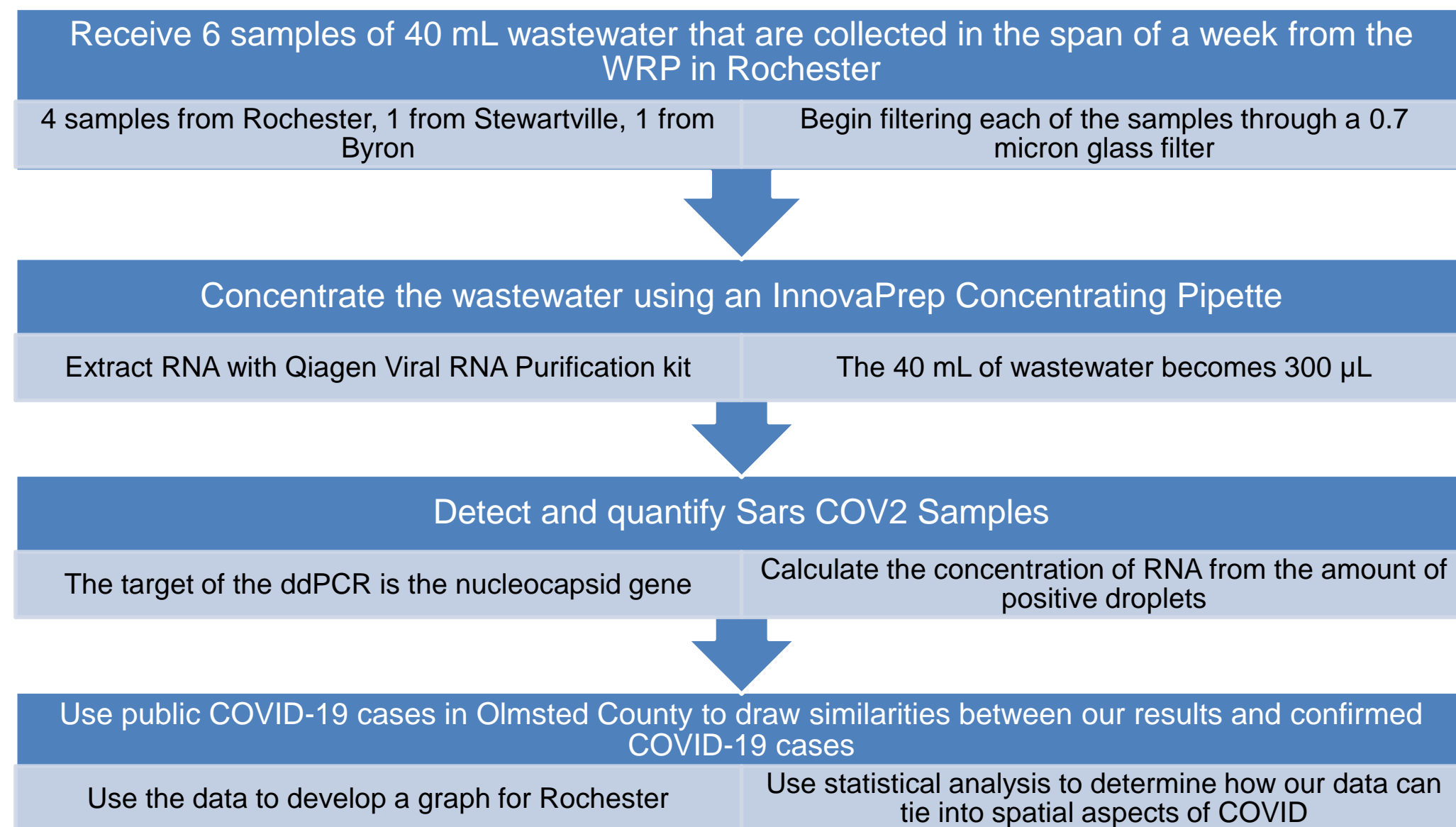
Background

- COVID-19 is a novel and detrimental human pathogen.
  - Methods to accurately track COVID-19 cases are lacking.
  - At-home testing is believed to confound the accuracy of public health tracking of COVID-19 cases.
- Researchers and Employees of Olmsted County, Mayo Clinic, UMR, and Rochester Public Works are collaborating to test the following hypothesis:

- **Wastewater is hypothesized to provide an advanced and accurate notice in public COVID-19 cases [1].**

Wastewater Accurately Depicting Population COVID-19 Cases

Methods

Receive 6 samples of 40 mL wastewater that are collected in the span of a week from the WRP in Rochester

4 samples from Rochester, 1 from Stewartville, 1 from Byron | Begin filtering each of the samples through a 0.7 micron glass filter

Concentrate the wastewater using an InnovaPrep Concentrating Pipette

Extract RNA with Qiagen Viral RNA Purification kit | The 40 mL of wastewater becomes 300 μL

Detect and quantify Sars COV2 Samples

The target of the ddPCR is the nucleocapsid gene | Calculate the concentration of RNA from the amount of positive droplets

Use public COVID-19 cases in Olmsted County to draw similarities between our results and confirmed COVID-19 cases

Use the data to develop a graph for Rochester | Use statistical analysis to determine how our data can tie into spatial aspects of COVID

Discussion

- The results indicate that our novel techniques to evaluate wastewater for COVID-19 incidents, accurately depicts population COVID-19 cases.
- The newfound accessibility of at-home antigen test options, such as those made available through Covidtests.gov in February, 2022, are believed to contribute to reduced reported COVID-19 infections.
- However, our testing can depict a more accurate case amount since it is focused more on the actual water people use rather than relying on them to report their results.
  - Therefore, we can confidently say our testing accurately estimates future trends in COVID cases.

References

1. Peccia, J, Zulia, A. et al., Nature News. 2020, Sept. 8
2. Luckstein, A., Navaratnarajah, C., Casper, J., Bjork, M. "Rochester COVID-19 Wastewater Project - A collaboration between the City of Rochester, Olmsted County, Mayo Clinic, and the University of Minnesota, Rochester"