

HCPH's Wastewater-Based Epidemiology Program

Background

Wastewater-based infectious disease surveillance systems monitor and test untreated wastewater to detect the presence of pathogens and chemicals that are shed by persons into the municipal sewer system. While clinical laboratory testing detects individual cases of disease, sampling and analysis performed on wastewater collections, provides aggregate disease data from homes and institutions that share a common sewer system. Following the outbreak of COVID-19, wastewater surveillance has shown to be an important complement to existing public health surveillance.

Key Benefits

EARLY WARNING SYSTEM

Detect outbreaks and surges in a community before clinical data, allowing for prompt public health response

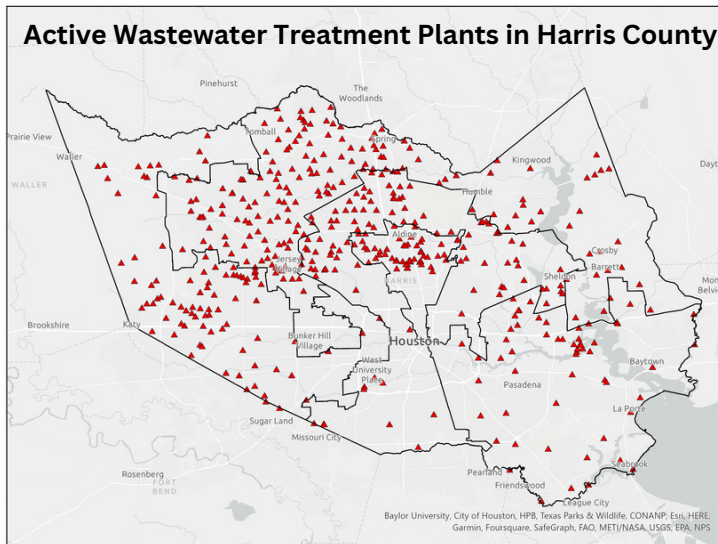
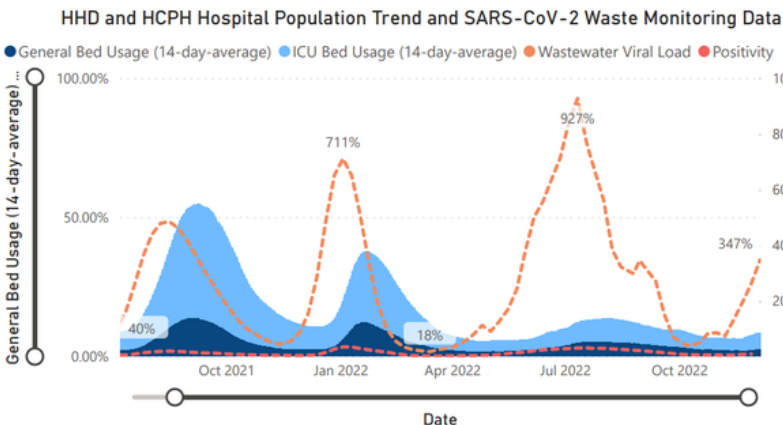
EQUITABLE MONITORING

Provides a more equitable approach to obtaining positivity rates in underserved communities, including the Hispanic and Black communities, disproportionately affected by COVID-19 and other diseases

DATA-DRIVEN DECISIONS

Aid health authorities in making data-driven decisions to effectively protect communities

Wastewater Data Lead-Time and Harris County's Vast Wastewater Network



The orange dash represents wastewater viral load and the blue, ICU bed usage. Wastewater data has proven to have a significant lead-time on clinical and hospital data, as displayed. Because of wastewater surveillance's ability to help predict potential disease surges in an area, and in this case, Harris County, it can be an invaluable public health tool to help prepare public health and hospital systems.

With over 465 active wastewater treatment plants (WWTPs), displayed in the figure above, Harris County is a prime candidate for the establishment of a comprehensive wastewater surveillance program.

This vast wastewater network services a population of nearly 5 million residents.

Sampling Device and Laboratory Testing



Automatic Refrigerated Sampler

Placement and installation of an automatic refrigerated sampler, purchased by Harris County, will be located near the point of influent. Historically, this has been done at on-site lift stations or near the bar-screens. Preliminary site visits are recommended to ensure all criteria for sampling are met, i.e. feasible sampler placement to meet pump specs. and a functioning power outlet.

PCR Testing & Target

Polymerase Chain Reaction (PCR) Testing will be used to test for many pathogens, including but not limited to: SARS-CoV-2, Human Adenovirus B, Influenza, Hepatitis A, Noroviruses, Mpox, and Respiratory syncytial virus, or RSV.



Methodology

SAMPLE COLLECTION

Field technicians employed with Harris County will pick up from every partner-site twice a week. This will require access to enter the plant each morning and, unless there are technical issues, should take around ten minutes.

LAB ANALYSIS

Samples retrieved will then be delivered to Houston Health Department (HHD) and Baylor University Labs for analyses.

DATA ANALYSIS

Lab results will be sent every week and shared with respective partner sites. This data will be used to better understand disease trends in respective areas and the county at large.

DATA VISUALIZATION

The data will be visualized on a public-facing dashboard in which the public, and health officials, can be informed on disease values and trends in their communities.

Outcomes



PARTNERSHIPS

Once a site has been visited and it has been determined to be a good fit for the program, an agreement between the parties will be drafted in the form of an Interlocal Agreement (ILA). It isn't until the ILA is signed and approved that HCPH will have the samplers delivered to the site and begin sampling.

We are excited at the prospect of partnership with your organization and the value that it will bring to our program as well as the service that it will be to your community.

For any questions or concerns, please contact: James Hatch at james.hatch@phs.hctx.net or Kendra Davis at kendra.davis@phs.hctx.net