STREAM TRACING

Tracking COVID-19 through the Municipal Sewage System

June 2020

POLYNATION
VENTURES

The Challenge

As the COVID-19 virus (SARS-CoV-2) is spreading on a global scale, the economic impact of Lock-Down is being felt just as hard as the effects of the pandemic.

There is a clear need to identify a sustainable Tracking Model that will enable to re-open the economy, while continuously monitor for the outbreak of the virus.

Solution

A technique was developed to identify outbreaks of the COVID-19 by conducting regular sewage sampling in key points along the municipal sewer network.

Having developed a proven testing protocol for PCR and qPCR testing equipment, evidence of the virus can be traced back into certain neighborhoods in the city.

These findings, placed upon GIS mapping service, can provide health officials a clear map of where the next virus outbreak in about to occur.

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Track Record

Stream Tracing in the sewage network was used in Israel already back in 2013 to identify a polio outbreak in Israel's southern region.

Currently, raw sewage data is being collected, representing specific districts, and crosslinking this data with the number of infected people from each location, enable us to derive and provide quantitative surveillance tools. In particular, this will provide important means to:

1. Estimate the extent of outbreaks and their spatial distributions, based primarily on in-sewer measurements

2. Manage the early-warning system quantitatively and efficiently (and similarly, verify disease elimination).

In addition, a virus concentration method has been developed for SARS-CoV-2 RNA in sewage and relating it to the local populations and geographic information. This provided a Proof of Concept (POC) for the use of sewage associated virus data as a reliable epidemiological tool.
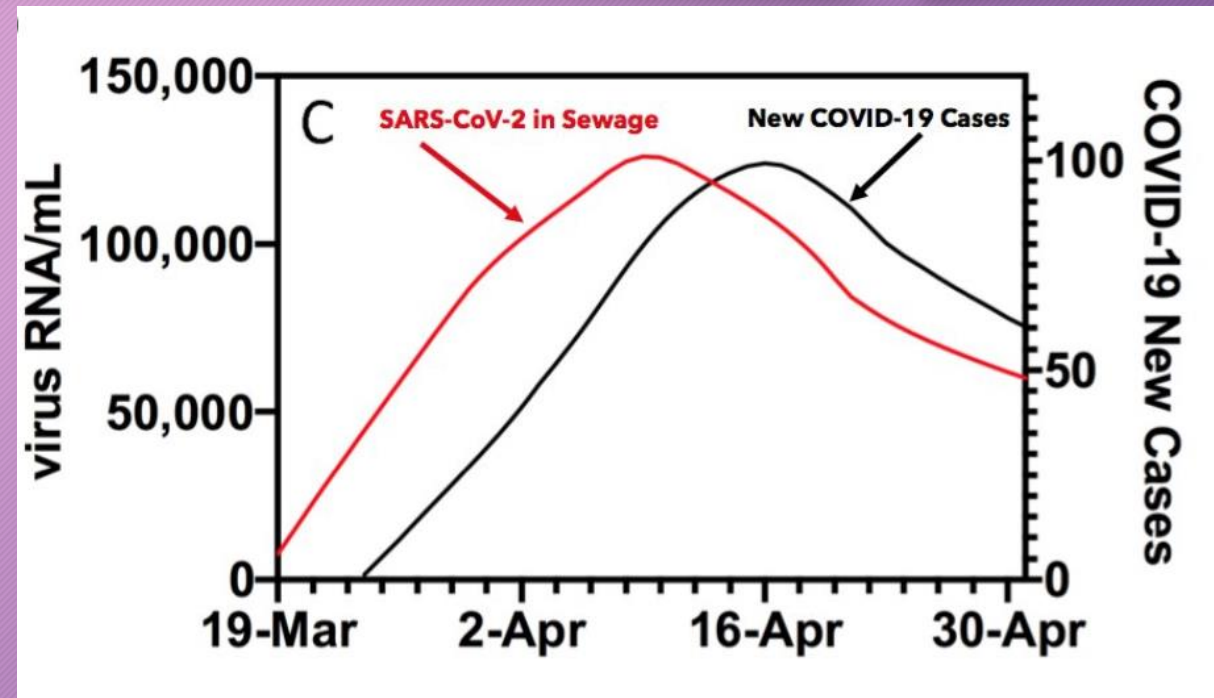
Scientific Research

Links to academic papers:

- March 30, 2020, KWR Water Research Institute, The Netherlands

[Presence of SARS-Coronavirus-2 in sewage](#)

- 22 May 2020, Yale University, California USA

[SARS-CoV-2 RNA concentrations in primary municipal sewage sludge as a leading indicator of COVID-19 outbreak dynamics](#)

Results from Yale University study show identification of COVID19 in the sewage 1 week before it appeared in the public.

MEDIA CLIPINGS

Climate and Environment

An early warning system for coronavirus infections could be found in your toilet

From the U.S. to Europe to Australia, scientists have detected the virus in wastewater ahead of spikes in local cases

Researchers from Brazil's National Institute of Science and Technology and Minas Gerais sanitation employees collect sewage samples to try to detect the coronavirus on April 16 in Belo Horizonte, Brazil. (Douglas Magno/AFP/Getty Images)

By **Brady Dennis**

May 1, 2020 at 8:43 p.m. GMT+3

David Hirschberg has a simple explanation for why a growing number of scientists are looking to sewage to help track the spread of the novel coronavirus in communities around the world.

"S--- is a great source of information," said Hirschberg, founder of a nonprofit biotech firm and professor at the University of Washington at Tacoma. "This is the kind of early warning system you want to have. When people start showing up at hospitals and start dying, that's not the indicator you want to have. That's too late."

Researchers say the virus can be detected in untreated wastewater within days of infection and as much as two weeks before a person grows ill enough to seek medical care — that is, if symptoms ever materialize at all.

Washington Post, 1 May 2020

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link to article

Down the tubes: How Israel's poop may help prevent second coronavirus wave

Scientists say analyzing sewage from across the nation can help pinpoint infection areas and nip new cases in the bud

By **NATHAN JEFFAY**
Today, 2:00 pm | 💬 0

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The toilet flushes of every Israeli could soon play a central part in efforts to prevent a second wave of the coronavirus pandemic.

As Israel's COVID-19 cases wane, health officials are worried about future outbreaks. They are determined to catch them early, on a local level, using data from swab tests. But testing capacity isn't increasing as fast as they'd hoped.

Now, a team of scientists has revealed that it has been monitoring the nation's excrement for most of the COVID-19 crisis, and has the know-how to document where outbreaks are occurring based on the level of genetic material or proteins of the virus found in feces.

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Times of Israel, 4 May 2020

Local Requirements

In order to offer Stream Tracing, here is a list of key requirements:

1) A local laboratory capable of:

- PCR or qPCR (preferred) testing
- Lab operations at Level BSL #2 (biological safety level)
- Table-top centrifuge

2) Two local teams to be trained:

- Sewage sampling team
- Lab team

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About Us

Polynation Ventures is a business consulting company, specializing in promoting innovative Israeli technologies into emerging markets. Currently, the company is focused on offering proven COVID-Tech solutions to health authorities around the world (see company web site).

Founded by Yuval Susskind, formerly active in the hi-tech & cleantech sector (solar, water).

Support team is comprised of Israel's leading experts currently involved in the research conducted on COVID19 tracking in the sewage system (slide #4).

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