



National Institute for Public Health
and the Environment
Ministry of Health, Welfare and Sport

A stylized illustration of a globe with continents in light blue and oceans in dark blue. The globe is surrounded by numerous small, light blue virus-like particles with spherical heads and thin tails. The background is a dark blue space with small white stars.

COVID-19 advise and research @MLU

RIVM CDC

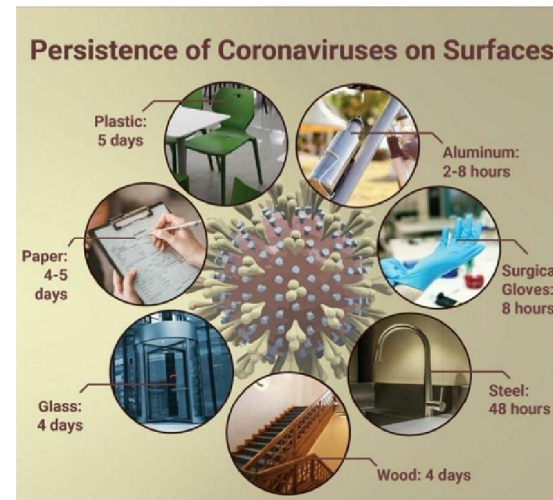
Supported by Dutch MOH, I&W
WHO CC for Risk Assessment of
Pathogens in Food and Water
UU Chair in global changes and
environmentally infectious disease

Environmental surveillance @RIVM | 22-04-2020



COVID-19 and wastewater

- From January 31st SARS-CoV-2 RNA in faecal samples (Holshue et al. 2020)
- Ministeries MOH and I&W, STOWA, RIONED, UvW were contacted
- Subsequent advise for the protection of sewage workers
- Update of Arbocatalogus
- Q&A on wastewater
<https://www.rivm.nl/coronavirus/covid-19/vragen-antwoorden#Rioolwater>
- Tweede Kamervragen
- Laboratory research on infectious SARS-CoV-2 by cell culture at BSL3, quantification, persistence
- National COVID-19 surveillance in humans and wastewater





Some lessons learned from AMR surveillance

Lesson 1

Contribution largely from open population since resistant bacteria of concern were detected at Sewage Treatment Plants without discharges from health care facilities. Information complementary to clinical surveillance.

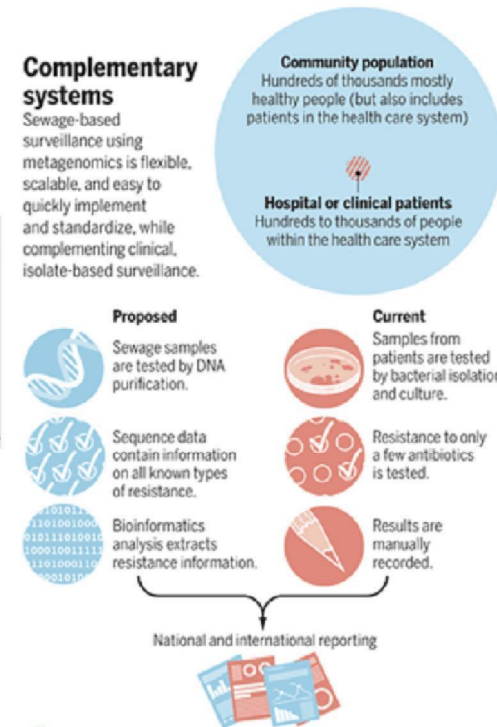


Lesson 2

As shown previously for different viruses e.g. polioviruses, resistant bacteria originated from few people among thousands.

Lesson 3

Global sewage surveillance useful in data-limited regions. improving sanitation and health potentially limit global AMR burden.





Proofs of principle for SARS-CoV-2 in wastewater

Wastewater sampled at different locations, analysed for SARS-CoV-2

1. In absence of severe cases Schiphol: in line with the contribution of virus in feces or other excreta from for instance presymptomatic people
 2. Near the first notified case Tilburg: showing wastewater surveillance is a sensitive tool detecting few in 1000s of cases
 3. Complementary to COVID-19 and SARS-CoV-2 in people yielding other information e.g. for contact tracing or need for hospitalization.
- Wastewater of importance for COVID-19 surveillance
 - But less so for spread of SARS-CoV-2
 - Protection for those working with human waste and wastewater needed

RIVM Nieuwsbericht 25 maart 2020

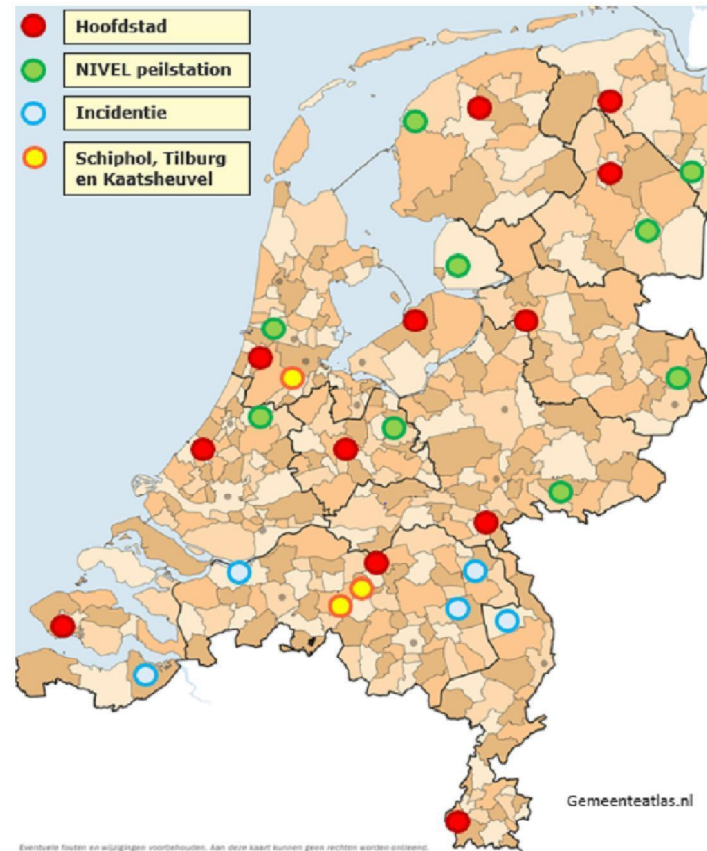
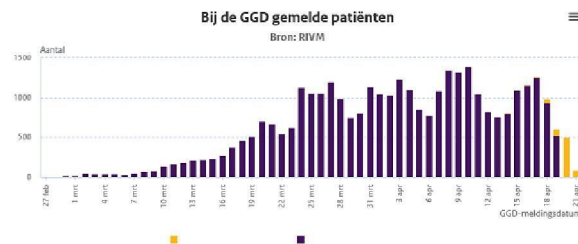
<https://www.rivm.nl/nieuws/nieuwe-coronavirus-aangetroffen-in-rioolwater> and Lancet G&H
SARS-CoV-2 in wastewater: potential health risk, but also data source, published on 1 April 2020

Lodder and de Roda Husman 2020 Lancet Gastroenterology and Hepatology



Continued environmental COVID-19 surveillance

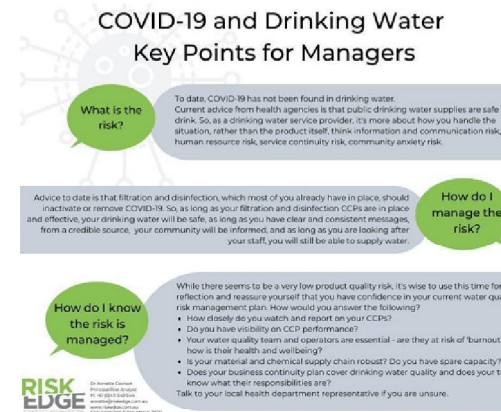
- Weekly sampling at Schiphol and Tilburg continued
- In alignment with clinical surveillance
 - 12 provincial capitols
 - NIVEL-huisartsenpeilstations
 - Municipalities with low/high notifications





Waterborne transmission

- Advise and Q&A on
 - Swimming pools
 - Bathing water
 - Public tap points
 - Fountains
 - Safe laboratory practices
 - Pests such as rats



<https://www.stowa.nl/onderwerpen/diversen/diversen/het-coronavirus-afvalwater-laatste-update-2-maart>

<https://www.riool.net/nieuws/hoe-beschermst-de-stedelijk-waterbeheerder-zich-tegen-het-nieuwe-coronavirus-update-10-maart>

<https://www.riool.net/nieuws/stedelijk-waterbeheer-en-het-coronavirus-strikt-de-bekende-persoonlijke-bescherming-toepassen>



Intervention measures

Infection Prevention and Control

- Effectiveness of PPE
 - HCW masking
 - Gowns
 - Gloves
- Community masking
- Desinfecting agents
- Hand hygiene
- Asymptomatic transmission
- Literature research and laboratory experiments

What does hand sanitizer actually work on?

Standard alcohol-based hand sanitizer (i.e. alcohol content of 60%) only kills certain microorganisms

✓ COVID-19	✓ MRSA	✓ Influenza	✓ hepatitis B
✓ Escheria coli	✓ hepatitis C	✓ Acinetobacter baumannii	✓ Enterococcus faecalis
✓ zika	✓ Candida albicans	✓ HIV	✓ Pseudomonas aeruginosa
✓ tuberculosis	✓ MERS	✓ ebola	✓ SARS
✗ norovirus	✗ foot and mouth disease	✗ calicivirus	✗ poliovirus
✗ hepatitis A	✗ Cryptosporidium	✗ Clostridium difficile	✗ polyomavirus



Collaboration with WHO

- Part of WHO Health Emergencies Programme (WHE) Ad-Hoc Advisory Panel of Infection Prevention and Control Experts for Preparedness, Readiness and Response to COVID-19 (WHE-IPC-AP)
- Weekly teleconferences on IPC issues such as Personal Protective Equipment such as masks, transmission routes
- Contributed to WHO Technical brief on Water, sanitation, hygiene and waste management for COVID-19 and multiple updates
- And to Webinars on WASH for the prevention of COVID-19 e.g. organized by the ECEH Programme on Water and Climate
- Development of Global Protocol
- Participation in Global Sewage Project



Water, sanitation, hygiene, and waste management
for the COVID-19 virus

Interim guidance
19 March 2020



<https://www.rivm.nl/en/who-collaborating-centre-risk-assessment-of-pathogens-in-food-and-water/current-news>

Background

This interim guidance supplements the infection prevention and control (IPC) documents by summarizing

1. COVID-19 transmission

There are two main routes of transmission of the COVID-19 virus: respiratory and contact. Respiratory droplets are generated when an infected person coughs or sneezes. Any