

**To:** (10)(2e) [ (10)(2e) @rivm.nl]  
**Cc:** (10)(2e) [ (10)(2e) @rivm.nl]  
**From:** (10)(2e)  
**Sent:** Tue 9/8/2020 11:05:16 AM  
**Subject:** RE: riool water e aerosolen  
**Received:** Tue 9/8/2020 11:05:17 AM

Dank voor je uitleg!

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**From:** (10)(2e) <(10)(2e)@rivm.nl>  
**Sent:** dinsdag 8 september 2020 09:38  
**To:** (10)(2e) <(10)(2e)@rivm.nl>; lchv <(10)(2e)@rivm.nl>; (10)(2e) <(10)(2e)@rivm.nl>; (10)(2e) <(10)(2e)@rivm.nl>  
**Cc:** (10)(2e) <(10)(2e)@rivm.nl>  
**Subject:** RE: riool water e aerosolen

Hoi (10)(2e)

Deze casus (van Kang et al.) was al in april of mei gepubliceerd. Daarna verdween deze studie opeens online. En nu blijktbaar weer gepubliceerd.

Samen met Z&O heb ik hier nog naar gekeken ivm vragen over rioolwater. We hebben toen geconcludeerd dat dit nog onvoldoende bewijs is dat via sanitair/riool aerogene transmissie plaatsvindt. Het betreft een unieke situatie met niet goed functionerend sanitair (drooggevallen U buizen); een situatie die niet snel in NL zal zijn. Ook de auteurs zelf geven beperkingen aan (zie ook onder). Vooral nog is er weinig evidence voor aerosolen via WC waardoor – al dan niet via oppervlakken – transmissie is. Overigens is in onze huidige hygienerichtlijnen al veel aandacht voor sanitair (vanwege preventie noro etc). REHVA vond het echter wel aanleiding om onderdruk in WC's te adviseren.

WHO adviseert ook geen aanvullende maatregelen: [https://apps.who.int/iris/bitstream/handle/10665/333560/WHO-2019-nCoV-IPC\\_WASH-2020.4-eng.pdf?ua=1](https://apps.who.int/iris/bitstream/handle/10665/333560/WHO-2019-nCoV-IPC_WASH-2020.4-eng.pdf?ua=1)

Groeten, (10)(2e)

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**Van:** (10)(2e) <(10)(2e)@rivm.nl>  
**Verzonden:** maandag 7 september 2020 09:48  
**Aan:** lchv <(10)(2e)@rivm.nl>; (10)(2e) <(10)(2e)@rivm.nl>; (10)(2e) <(10)(2e)@rivm.nl>; (1 (10)(2e) <(10)(2e)@rivm.nl>  
**Onderwerp:** riool water e aerosolen

Nieuwe info, nieuwe hypothese.

Groet, (10)(2e)

[3] China: Wastewater role in transmission, susp.

Date: 1 Sep 2020

Source: Annals of Internal Medicine [abridged, edited] <<https://www.acpjournals.org/doi/10.7326/M20-6134>>

ref: Gormley M. SARS-CoV-2: The growing case for potential transmission in a building via wastewater plumbing systems. [published online ahead of print, 2020 Sep 1]. Ann Intern Med. 2020; 10.7326/M20-6134. doi:10.7326/M20-6134

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 The coronavirus disease 2019 pandemic is a stark reminder of the role people and buildings play in the transmission of viruses. The pandemic has led us to review all building systems, particularly those involving airflow, and all procedures and system phenomena that produce aerosols. There is a growing body of evidence that built environment systems contribute to the spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). In their current report, Kang and colleagues (1) add wastewater plumbing systems to the catalogue of potential transmission pathways in buildings (1).

Viral transmission dynamics fall into 2 main groups: direct contact between an infected and a susceptible person and indirect contact by a susceptible person with virus shed in droplets or aerosols from an infected person. Indirect transmission occurs when a susceptible person touches a surface contaminated by droplets or aerosols containing infectious virus and then touches their mouth or nose, or by inhaling infective droplets or aerosols from environmental systems.

Kang and colleagues report a case in which transmission probably occurred by indirect contact in an apartment building: Viral particles seem to have been carried on air streams within the pipe network and entered the interior of the building from the wastewater system. Aerosols, typically less than 5 microm in diameter, are light enough to be carried in air, whereas larger droplets tend to fall out of the air before traveling long distances. Kang and colleagues describe a situation in which infectious aerosols may have been formed as the result of turbulent flows within a wastewater plumbing system containing virus-laden feces.

Work by my team identified the mechanisms involved in transmission dynamics between 2 different interconnected yet separate spaces within a building (4,5). The work was in response to the World Health Organization (WHO) report in 2003 (6) of a SARS outbreak in Amoy Gardens, a housing complex in Hong Kong, which led to the infection of 321 persons and resulted in 42 deaths (7,8). The WHO hypothesized that empty U-traps in the plumbing system created a pathway for virus-laden droplets and aerosols to enter bathrooms and spread the infection as residents touched contaminated surfaces. The transmission pathway was aided by mechanical bathroom extract fans and favorable outdoor air conditions, which allowed an additional transmission pathway on the outside of the building.

However, the authors cast appropriate caution about their findings and have not overstated the evidence. Although evidence is building, it is not yet strong enough to warrant wide-scale intervention -- but does warrant some precautions. The authors and others working in this field highlight the possibility that a virus, such as SARS-CoV-2, may be transmitted in the manner described by Kang and colleagues (1). However, building wastewater systems are a potential reservoir for many other viruses and bacteria; even in the absence of SARS-CoV-2, this is a cause for concern.

In conclusion, Kang and colleagues add to the growing body of evidence that wastewater plumbing systems, particularly those in high-rise buildings, deserve closer investigation, both immediately in the context of SARS-CoV-2 and in the long term, because they may be a reservoir for other harmful pathogens.