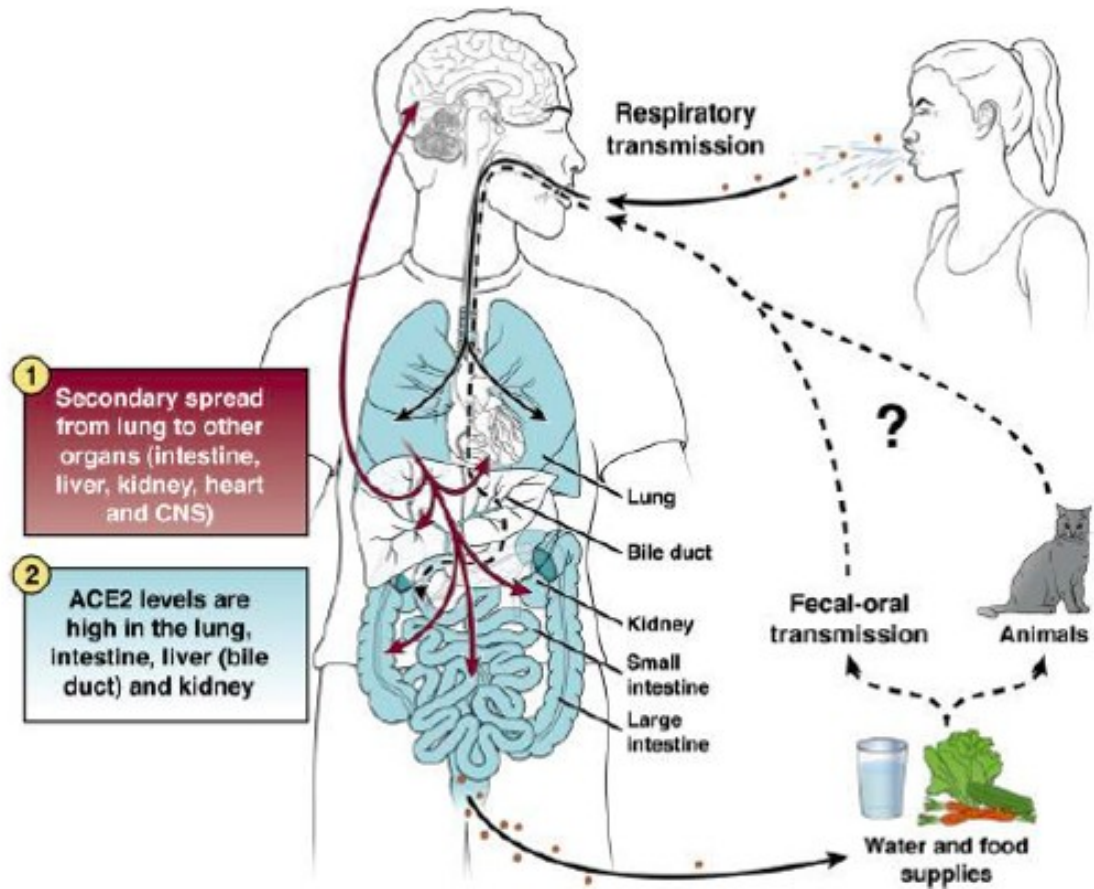




MINISTERSTVO
ZDRAVOTNÍCTVA
SLOVENSKEJ REPUBLIKY

**Using wastewater data
for modelling COVID-19 -
why it does not work**

Detection of SARS-CoV-2 in fecal matter



² Evidence for Gastrointestinal Infection of SARS-CoV-2

Fei Xiao,^{1,2,3,*} Meiwen Tang,^{4,*} Xiaobin Zheng,^{5,*} Ye Liu,⁶ Xiaofeng Li,⁷ and Hong Shan^{2,3,8}



Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv



First confirmed detection of SARS-CoV-2 in untreated wastewater in Australia: A proof of concept for the wastewater surveillance of COVID-19 in the community



Warish Ahmed ^{a,*}, Nicola Angel ^b, Janette Edson ^b, Kyle Bibby ^c, Aaron Bivins ^c, Jake W. O'Brien ^d, Phil M. Choi ^d, Masaaki Kitajima ^c, Stuart L. Simpson ^f, Jiaying Li ^d, Ben Tscharke ^d, Rory Verhagen ^d, Wendy J.M. Smith ^g, Julian Zaugg ^b, Leanne Dierens ^b, Philip Hugenholtz ^b, Kevin V. Thomas ^d, Jochen F. Mueller ^d

scientific reports

Initial research

OPEN

Long-term monitoring of SARS-CoV-2 RNA in wastewater of the Frankfurt metropolitan area in Southern Germany

Shelesh Agrawal ¹, Laura Orschler & Susanne Lackner



EPIDEMIOLOGY

Tracking COVID-19 with wastewater

Wastewater testing captures the rise and fall of novel coronavirus cases in a mid-sized metropolitan region.

David A. Larsen and Krista R. Wigginton



This article is made available via the [ACS COVID-19 Subject](https://doi.org/10.1039/c9sc02414a) for unrestricted RESEARCH re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for the duration of the World Health Organization (WHO) declaration of COVID-19 as a global pandemic.



pubs.acs.org/journal/estcu

Letter

Presence of SARS-Coronavirus-2 RNA in Sewage and Correlation with Reported COVID-19 Prevalence in the Early Stage of the Epidemic in The Netherlands

Gertjan Medema, ^{*} Leo Heijnen, Goffe Elsinga, Ronald Italiaander, and Anke Brouwer

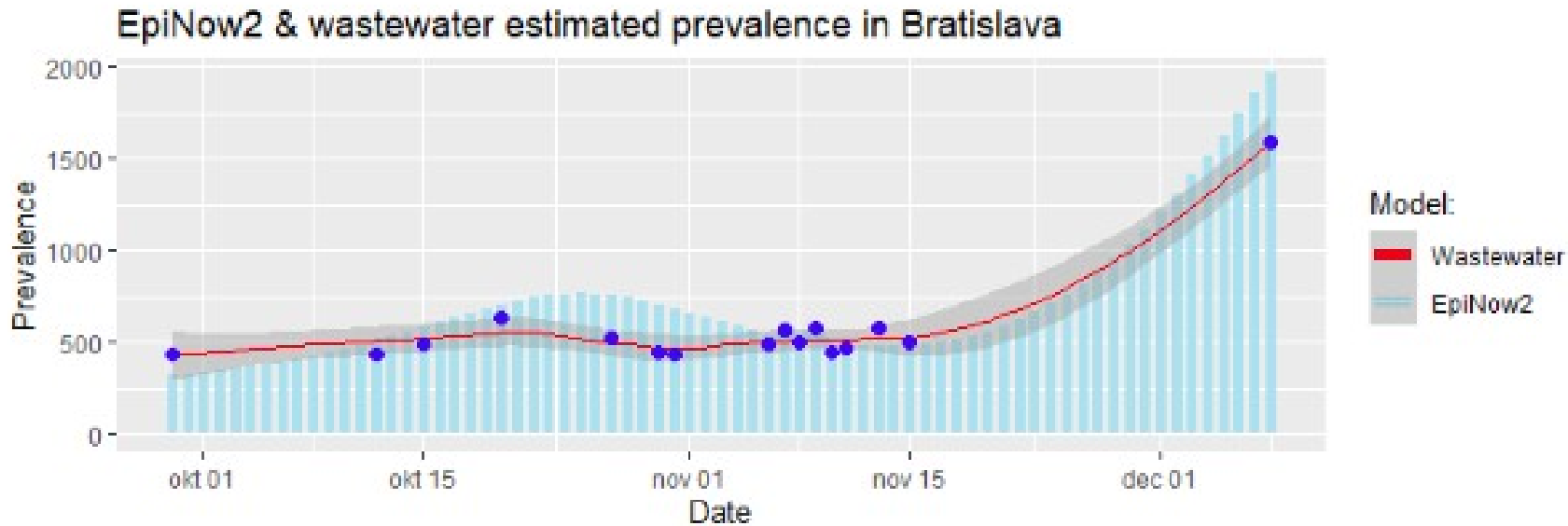
Expectations

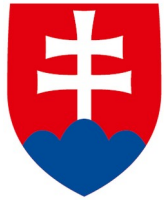
- Calculating one constant that would enable conversion from wastewater data into accurate number of actively infectious persons.
- Slovakia's mass testing data provided the most accurate number of actively infectious persons at every time of testing. Around 80% of the country's total population was tested repeatedly in October and November 2020. Half of the country's total population was tested weekly January to April 2021.
- **RNA CONCENTR. x COEFF. = NUMBER OF INF. PEOPLE**

Why it didn't work

- Each sewage system is **UNIQUE**
- Chemical, physical and biological properties of wastewater result in extremely different detection levels.
- This means that: (1) detection thresholds are different across sewage systems.
- (2) RNA fragments concentrations translate to different infection incidence levels across sewage systems.
- As a result, finding the “conversion coefficient” is not possible.

The model worked in Bratislava

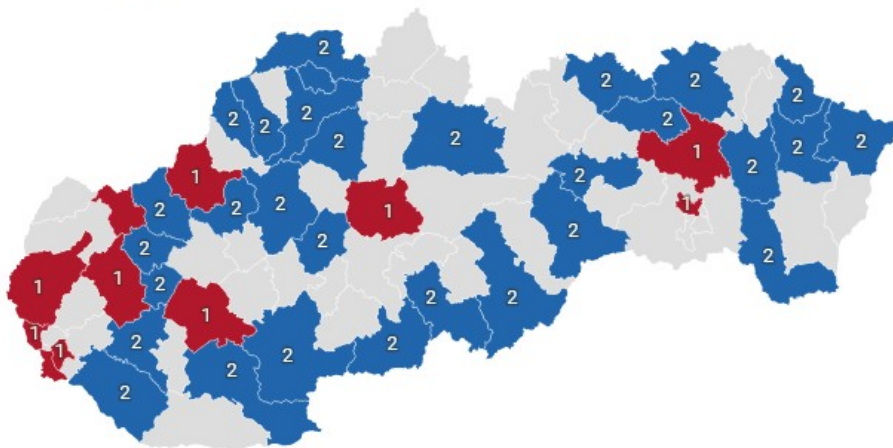




**Wastewater analysis is still
useful thou**

Wastewater surveillance network for SARS-CoV-2 in Slovakia

Sampling points

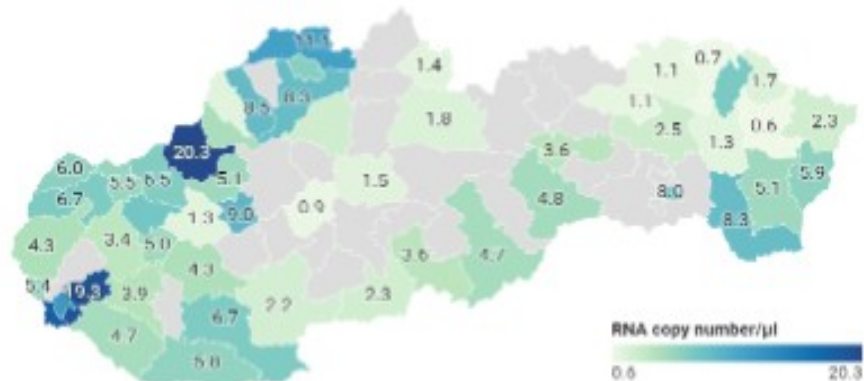


RED - 1 phase - regional PHAs sample collection points (11 samples), BLUE - 2nd phase, namely marginalised population groups, tourist and spa locations, border areas (44 samples)

Map: RÚVZ SR • Source: ÚVZ SR • Map data: ZBGIS® • [Get the data](#) • Created with [Datawrapper](#)

SARS CoV2 virus in wastewater in district - 14th week 2022 (Copy)

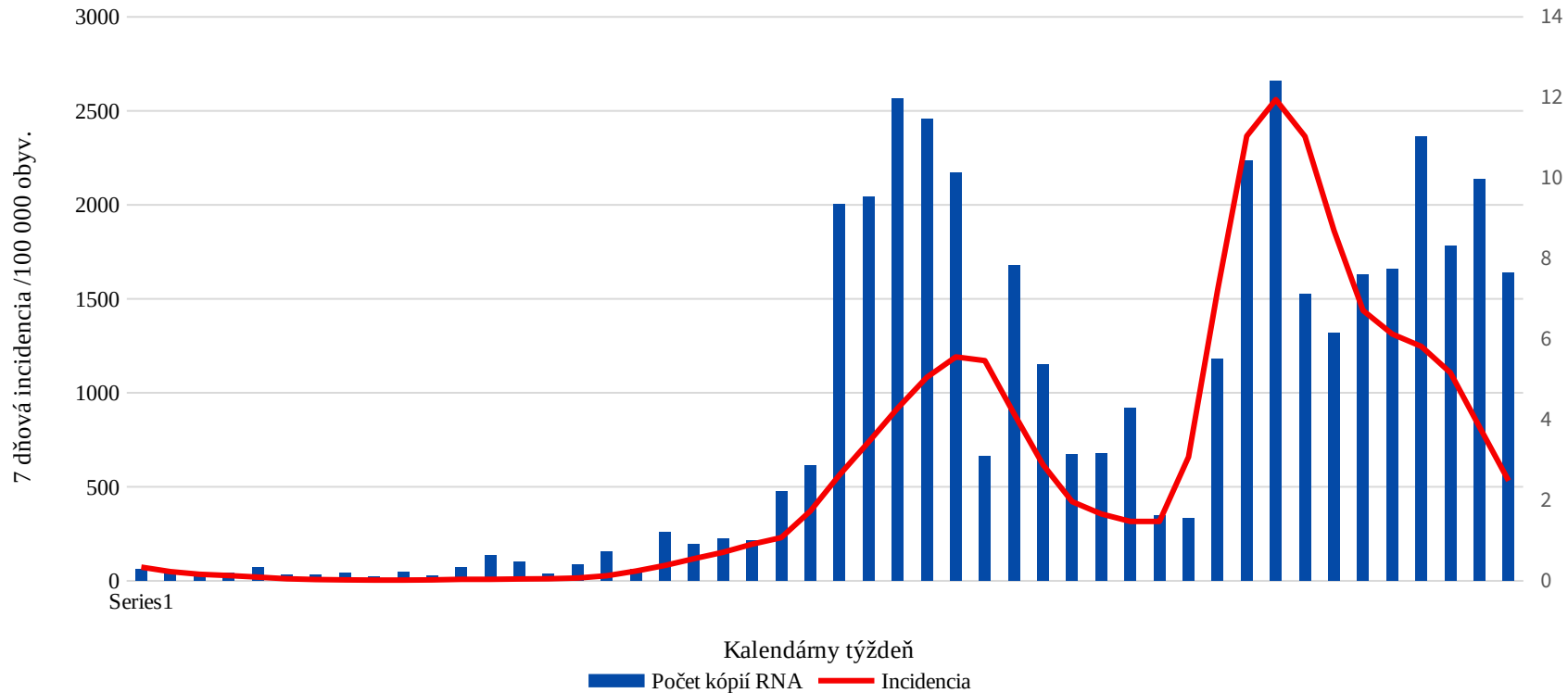
Analyzed by dd PCR



Average copy number in SR: 5,6/µl

Map: NRC pre kontrolu a prevenciu NN, RÚVZ Trenčín • Source: NRC pre environmentálnu mikrobiológiu, ÚVZ SR • Map data: ZBGIS® • [Get the data](#) • Created with [Datawrapper](#)

Reported incidence (red) vs wastewater detection (blue)



Dominance of SARS-CoV-2 variants (calendar weeks, regions)

