

Frontline Workers: A Global Perspective



**Frontline Worker Safety
in the Age of COVID-19**
Health Watch USAsm



Webinar Sept. 14th, 2022 - Registration Now Open

<https://healthconference.org>

RUB

RUHR-UNIVERSITÄT BOCHUM

Transmission and Inactivation of SARS-CoV-2

Department for Molecular and Medical Virology

Prof. Eike Steinmann

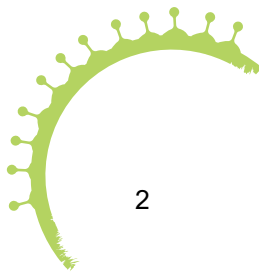
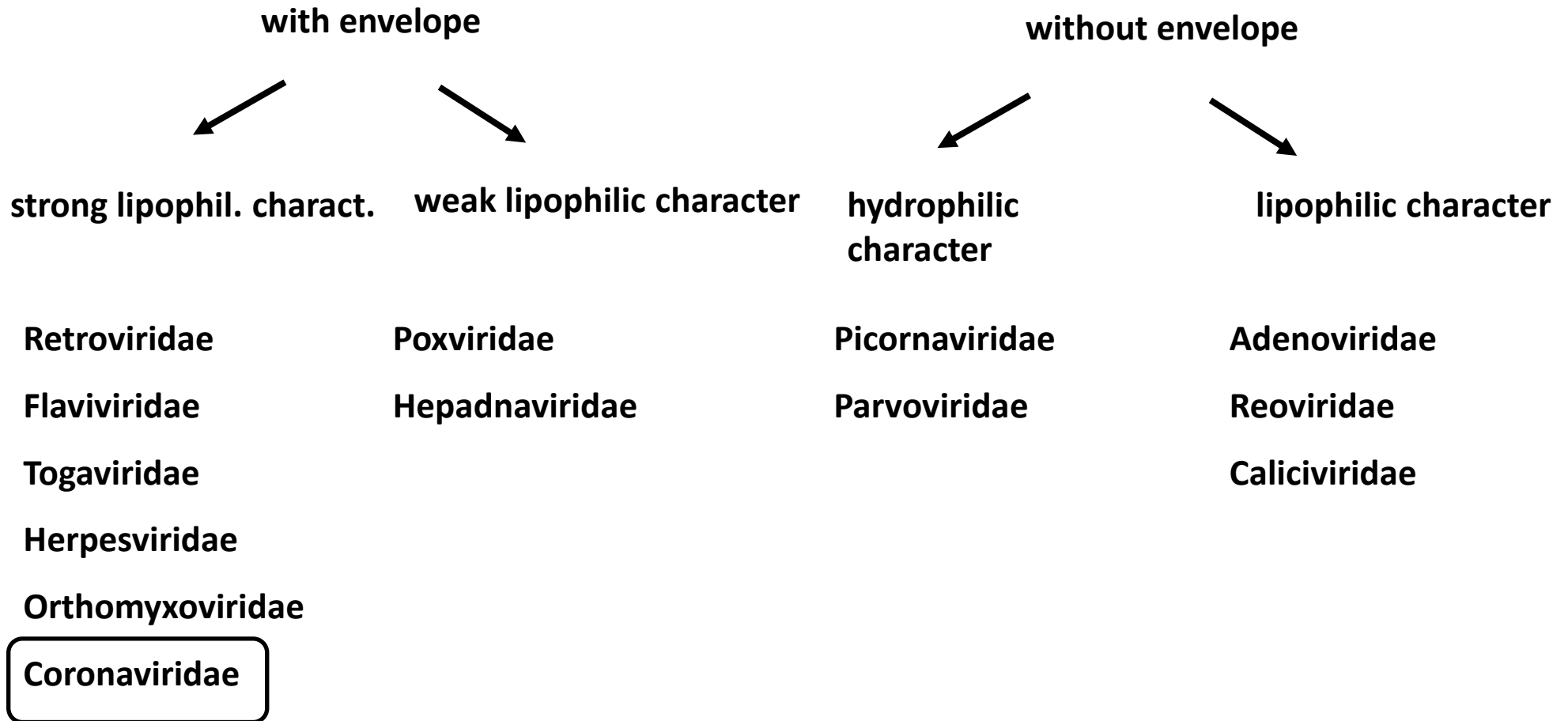
Medical Faculty

Ruhr-University Bochum

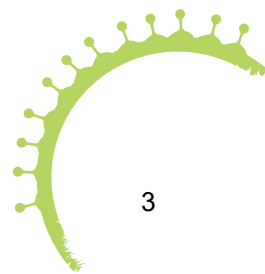
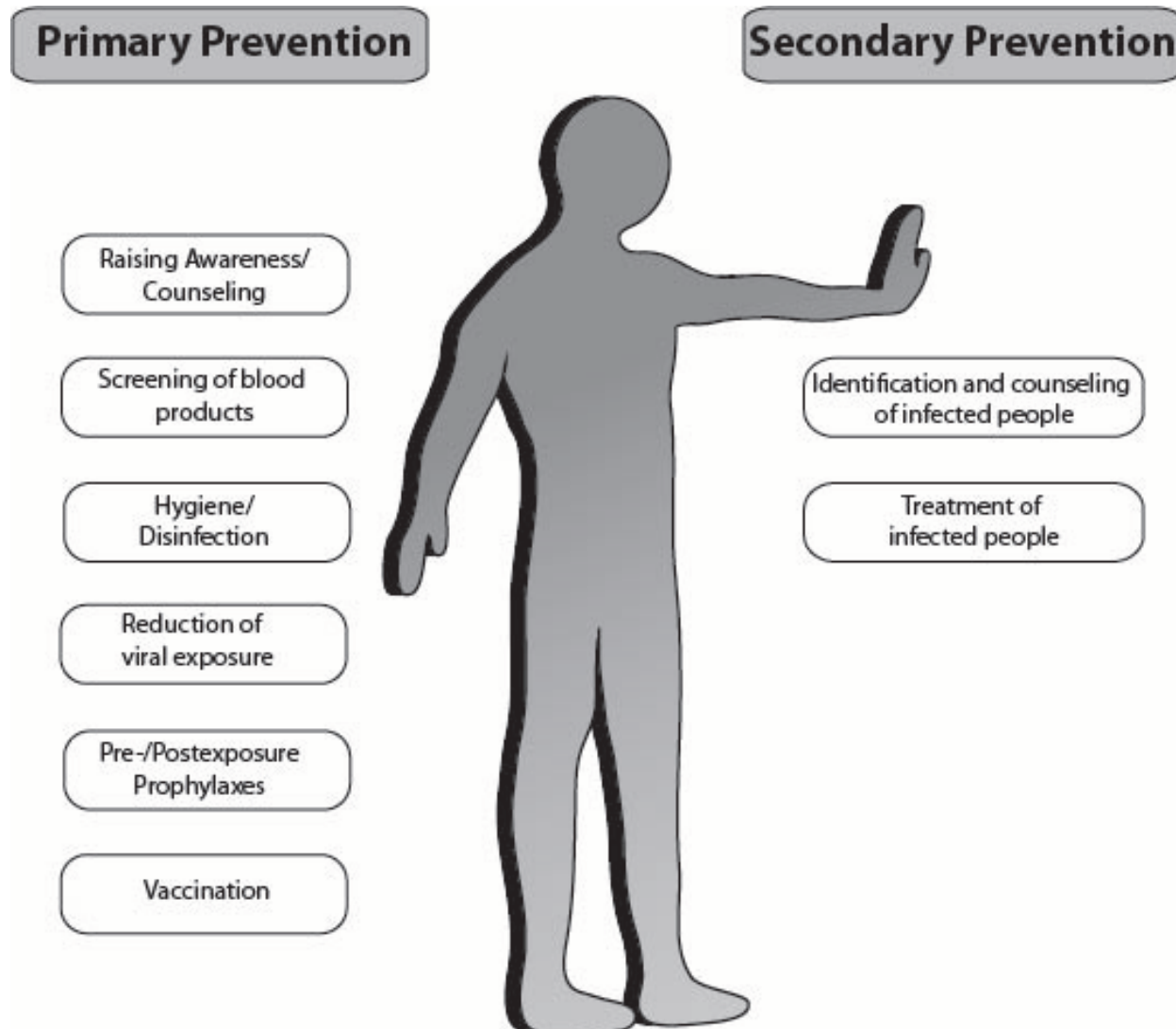
<https://www.ruhr-uni-bochum.de/virologie>



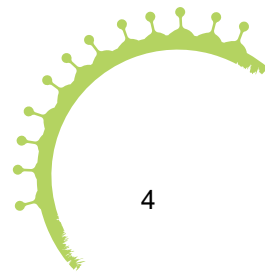
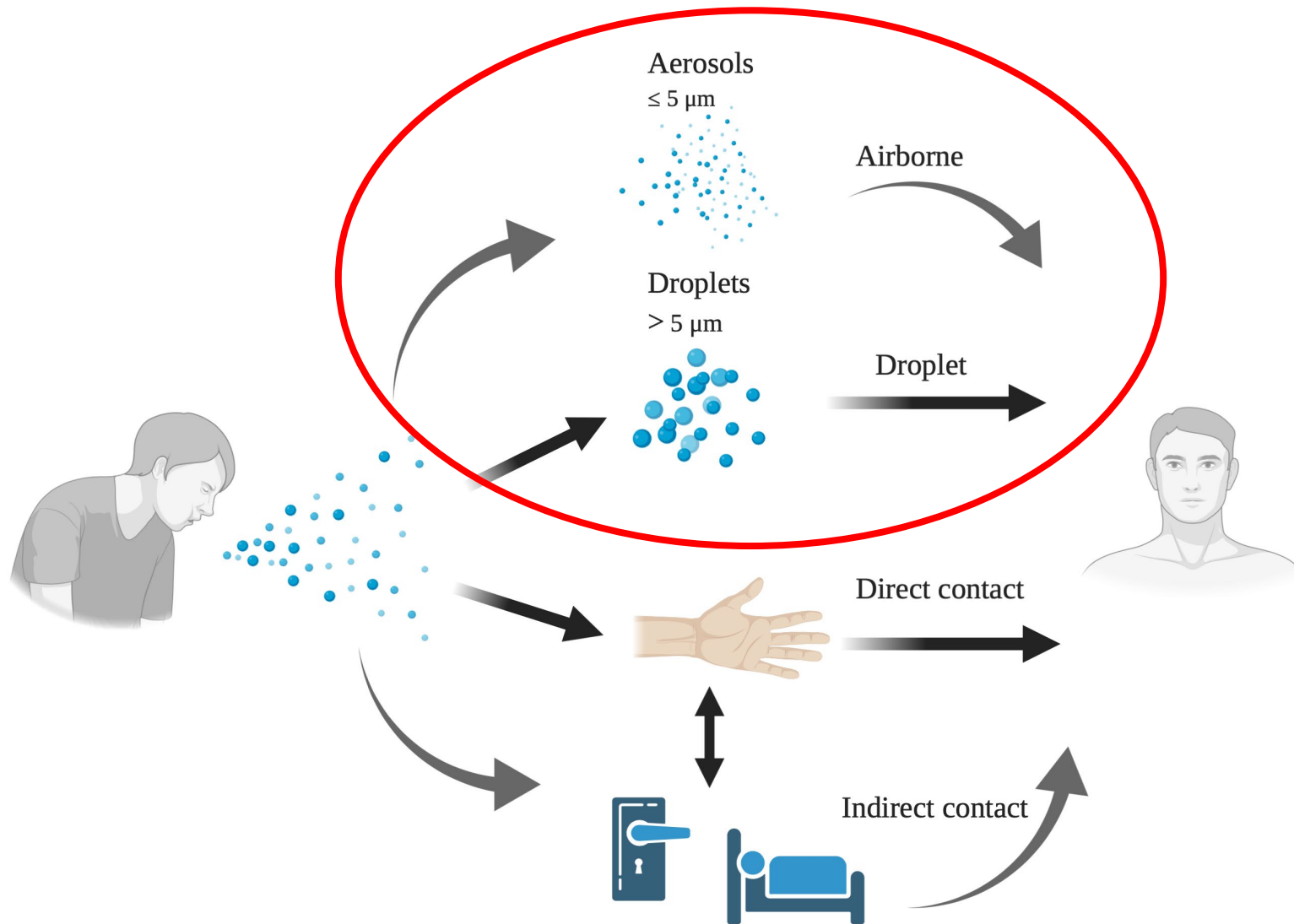
Stability of human pathogenic viruses



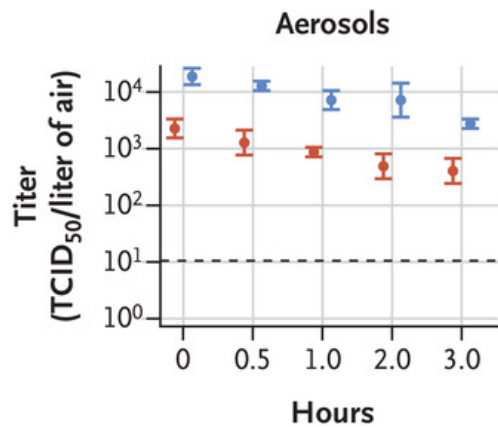
Prevention strategies



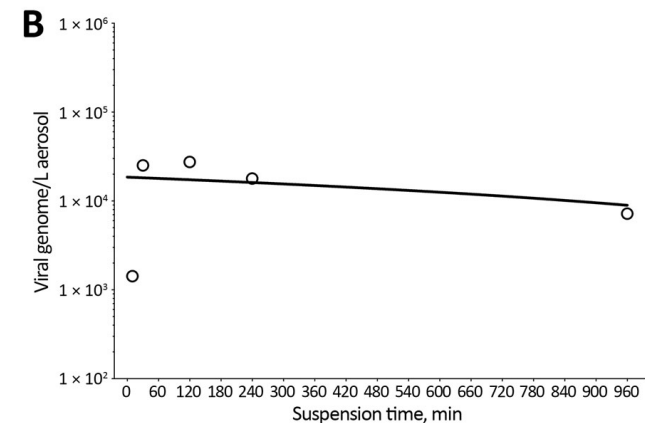
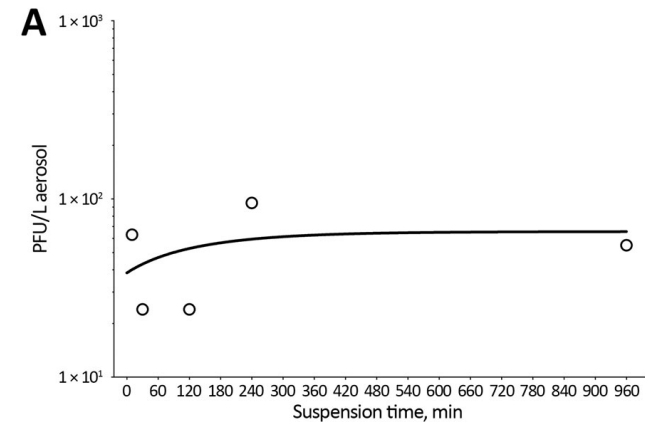
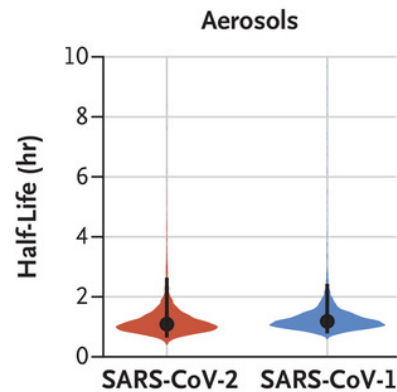
Transmission of respiratory viruses



A Titers of Viable Virus



C Half-Life of Viable Virus

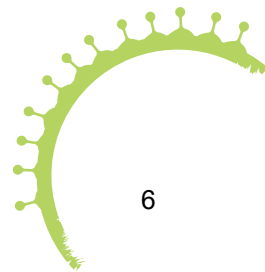
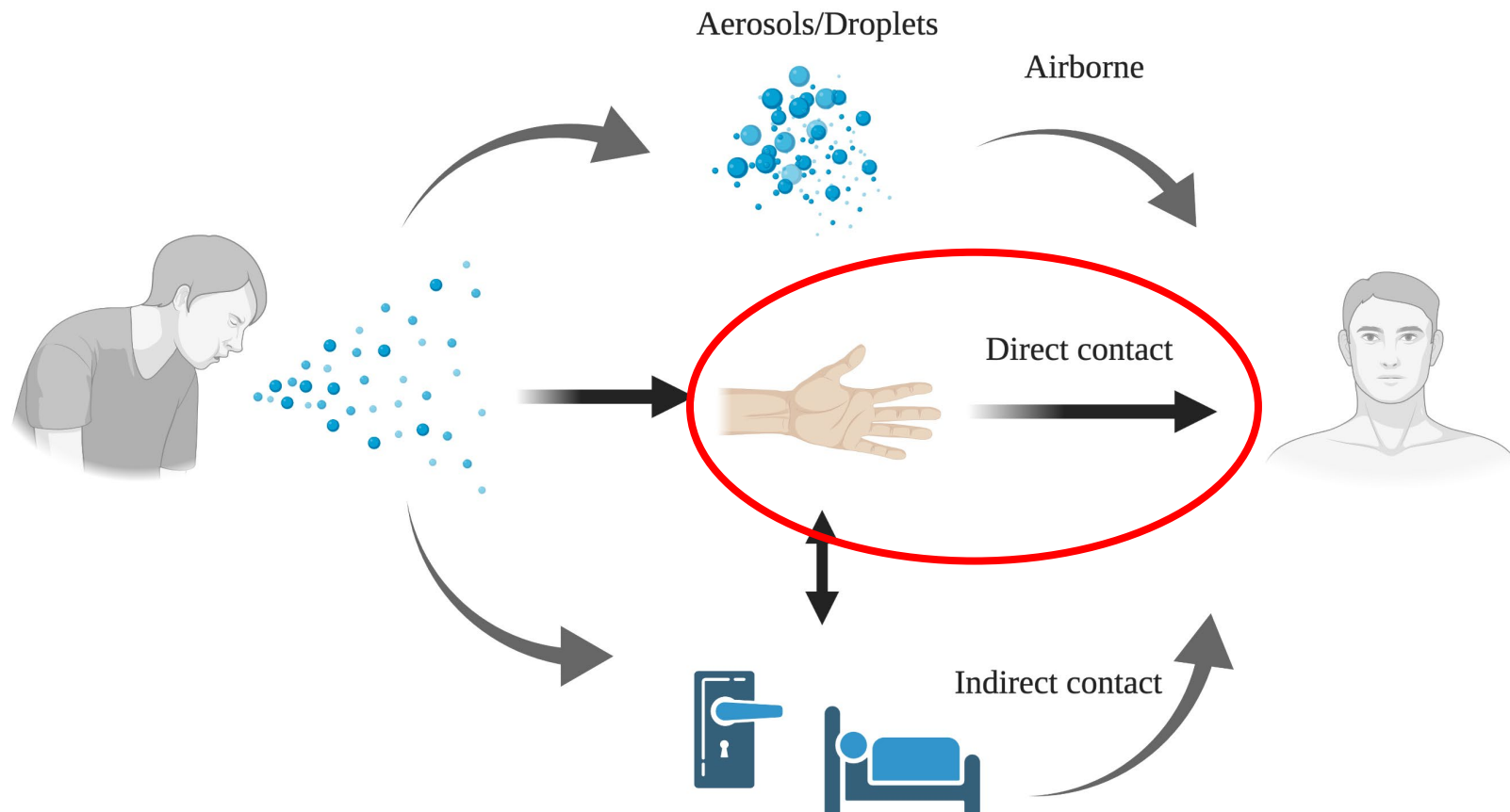


➤ Viruses in aerosols: stabil up to 16h

Van Doremalen et al. N Engl J Med 2020; 382:1564-1567

Fears et al. EID 2020 Sep;26(9).

Transmission

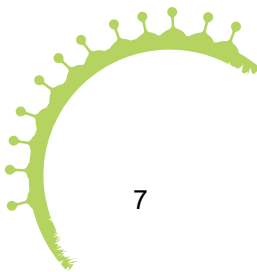


- Hand hygiene correlated with lower nosocomial transmission of SARS-CoV-1

Fung et al. Trop Med Int Health. 2006 Nov; 11(11): 1749–1758.

- Insufficient hand hygiene of medical staff correlates with higher SARS-CoV-2 infection risk

Ran et al. Clin Infect Dis. 2020 Mar 17;ciaa287. doi:10.1093/cid/ciaa287.





**World Health
Organization**

Patient Safety

A World Alliance for Safer Health Care

SAVE LIVES

Clean Your Hands

Guide to Local Production: WHO-recommended Handrub Formulations

PART A: GUIDE TO LOCAL PRODUCTION

Part A is intended to guide a local producer in the actual preparation of the formulation.

Final products

FORMULATION 1	FORMULATION 2
Final concentrations:	Final concentrations:
- Ethanol 80% (v/v), - Glycerol 1.45% (v/v), - Hydrogen peroxide 0.125% (v/v)	- Isopropyl alcohol 75% (v/v), - Glycerol 1.45% (v/v), - Hydrogen peroxide 0.125% (v/v)



Emerging viruses

Zika virus (ZikaV)

Ebola virus (EboV)

MERS-CoV

SARS-CoV

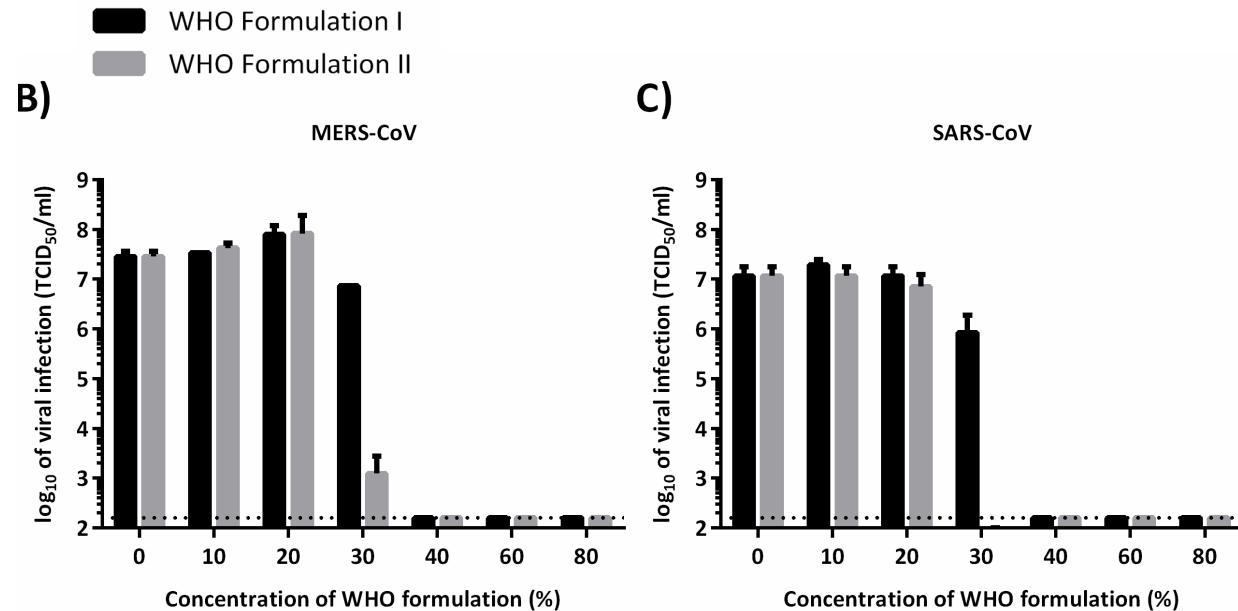
Reference virus

Modified vaccinia virus Ankara (MVA)

Hepatitis C virus (HCV)

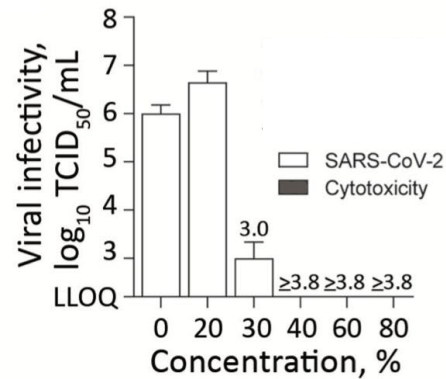
Influenza A Virus (H1N1)

Bovine coronavirus (BCoV)

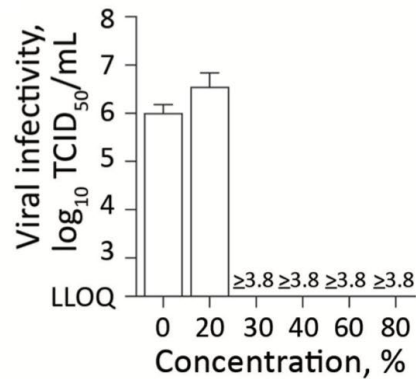


Inactivation of SARS-CoV-2

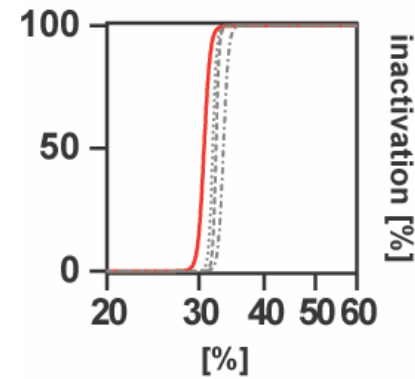
WHO Formulation I



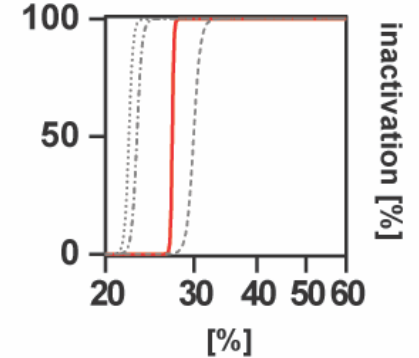
WHO Formulation II



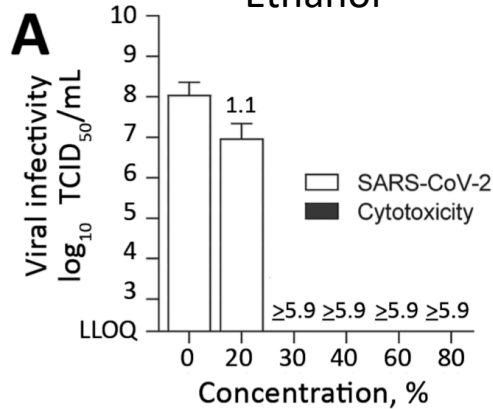
WHO Formulation I



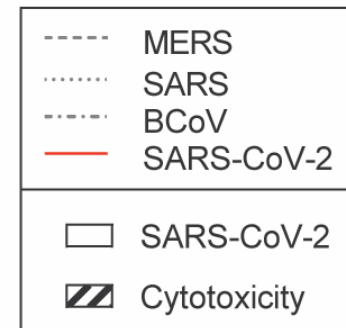
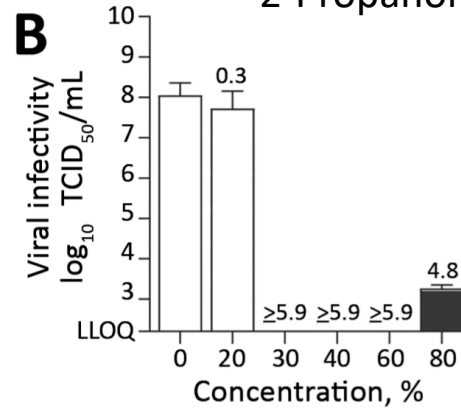
WHO Formulation II



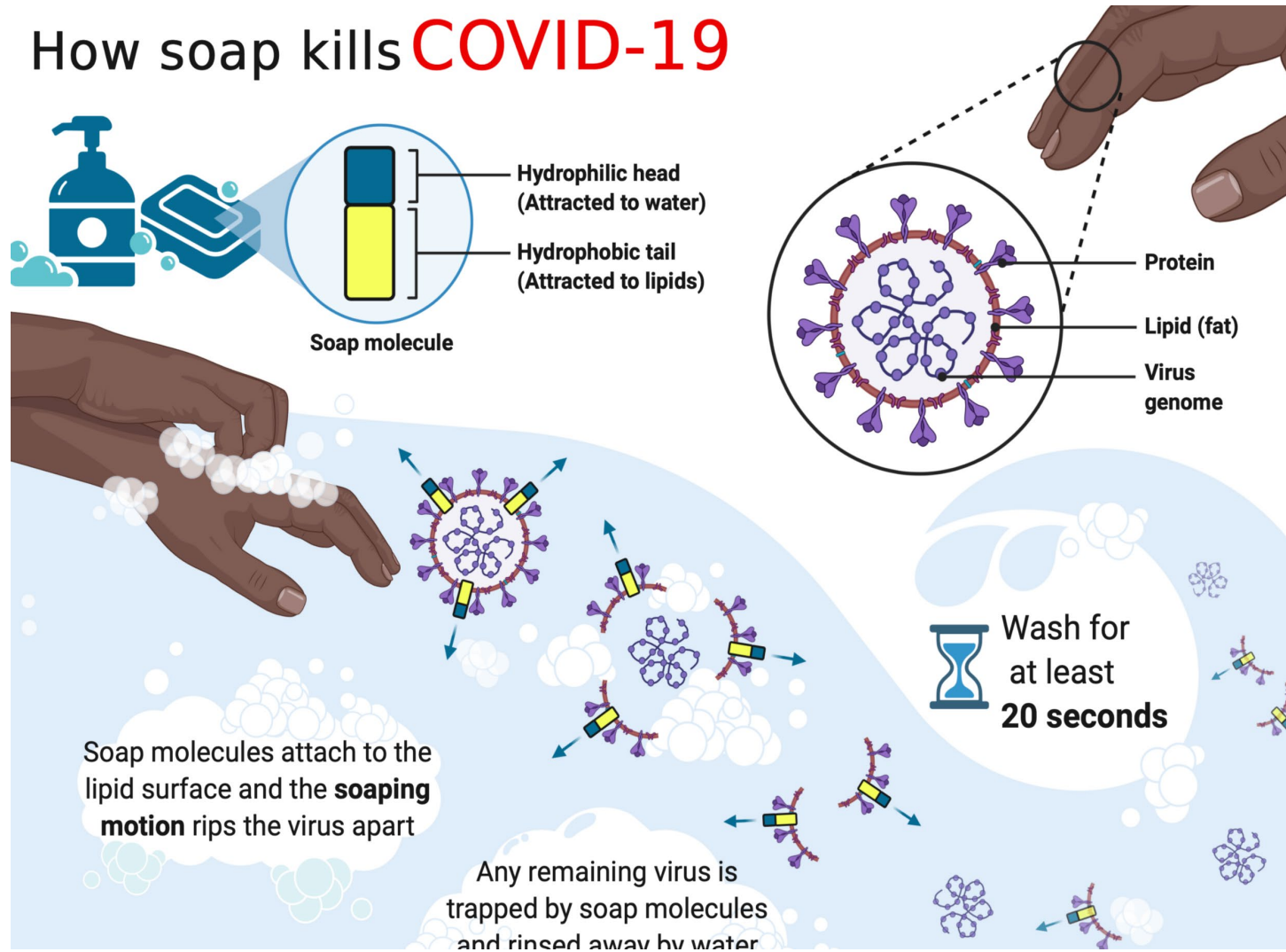
Ethanol



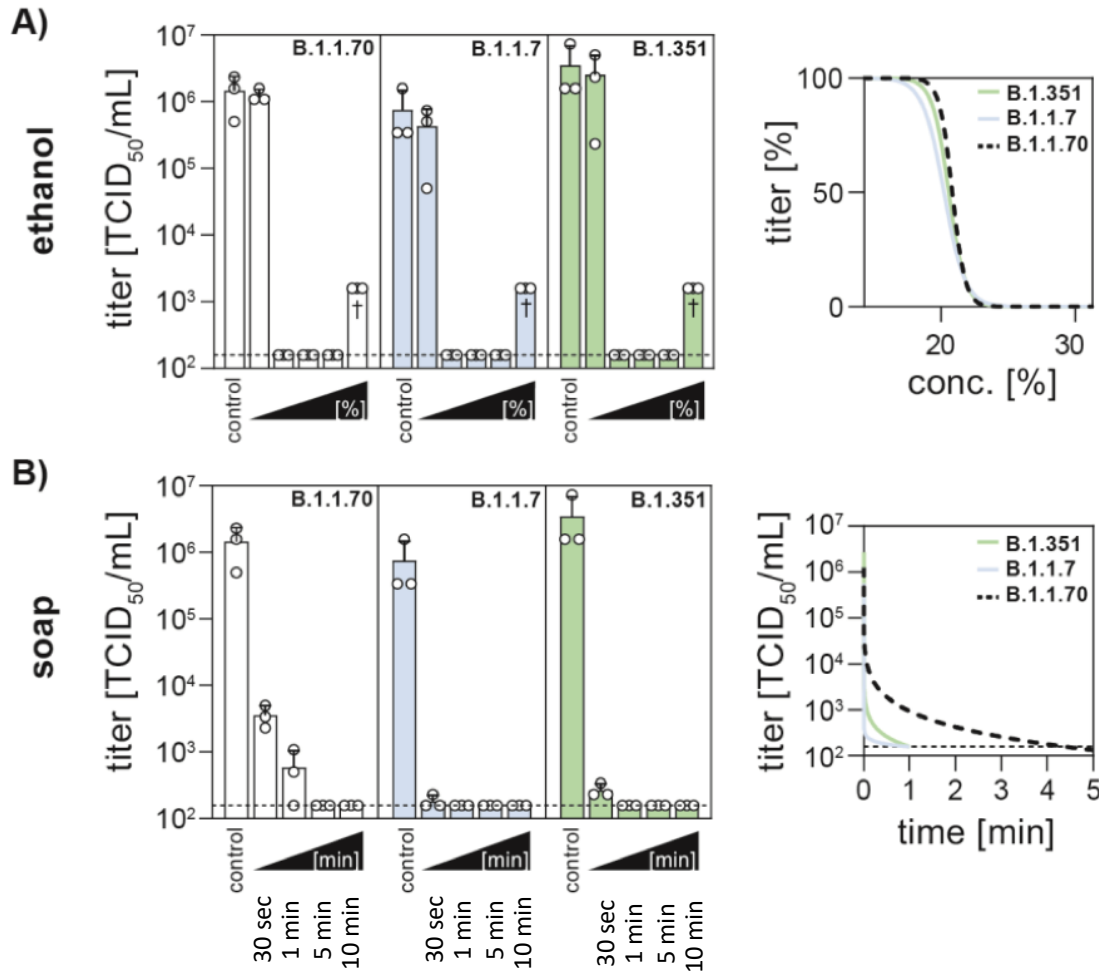
2-Propanol



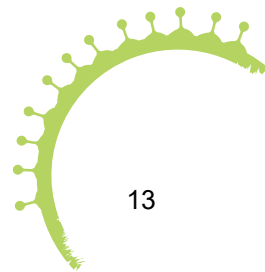
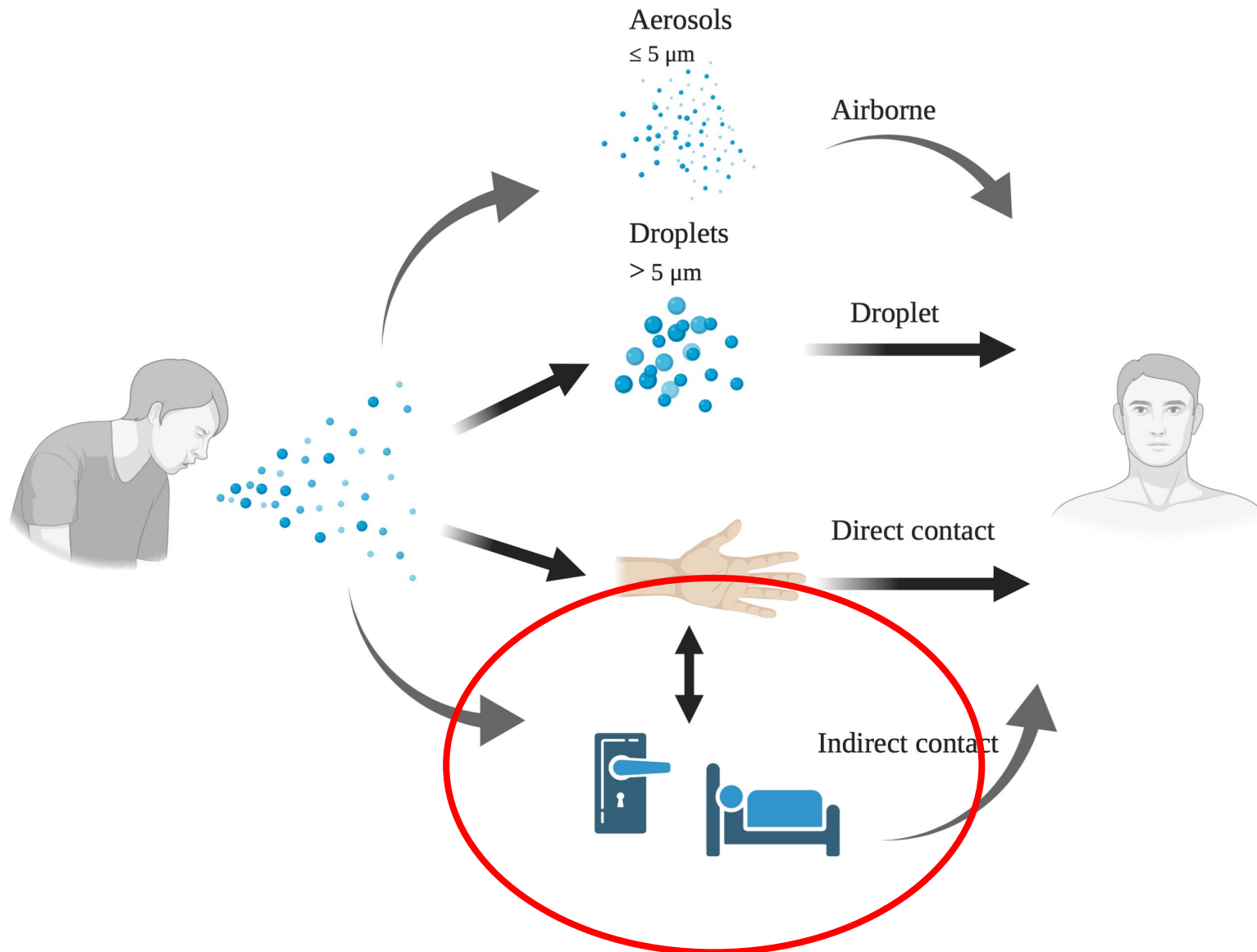
How soap kills COVID-19



Inactivation: SARS-CoV-2 variants of concern



Transmission of respiratory viruses



Review

Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents

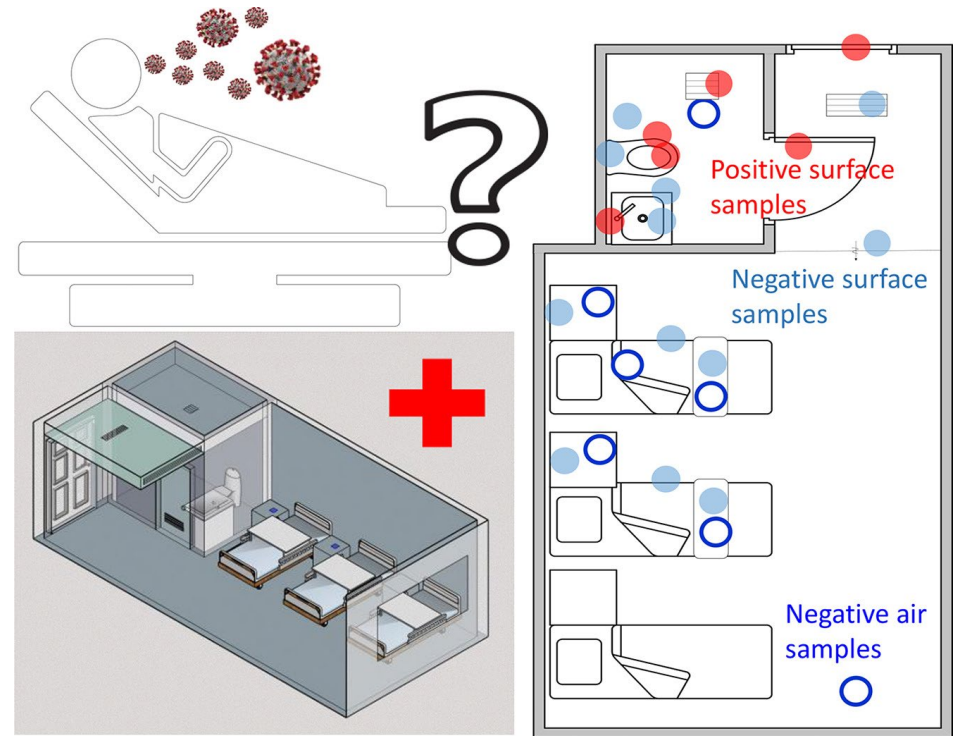
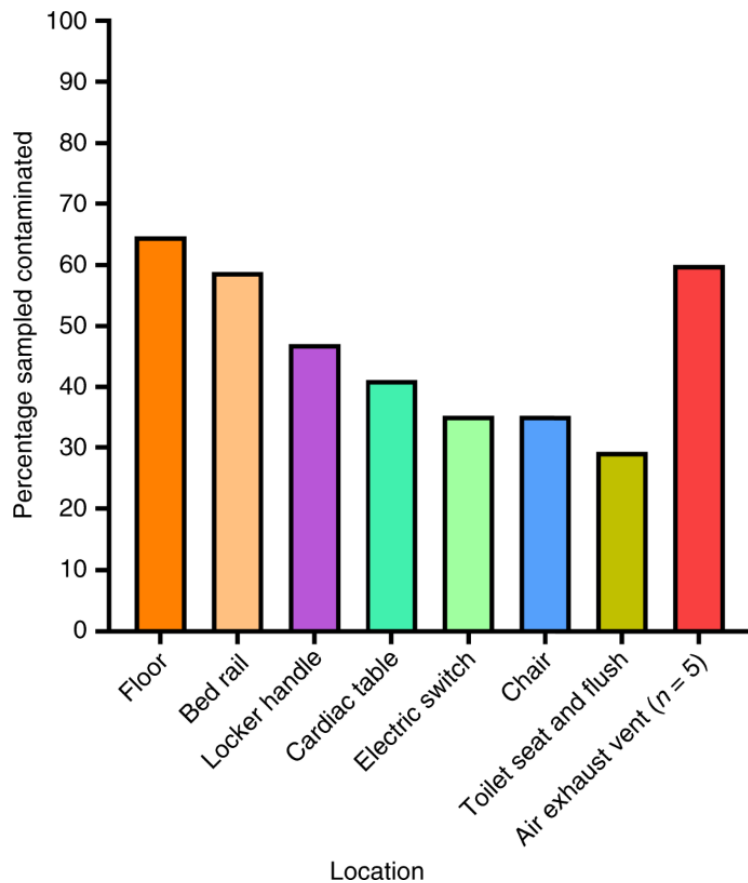
G. Kampf^{a,*}, D. Todt^b, S. Pfaender^b, E. Steinmann^b

^a University Medicine Greifswald, Institute for Hygiene and Environmental Medicine, Ferdinand-Sauerbruch-Straße, 17475 Greifswald, Germany

^b Department of Molecular and Medical Virology, Ruhr University Bochum, Universitätsstrasse 50, 44801 Bochum, Germany



Detection of SARS-CoV-2 RNA

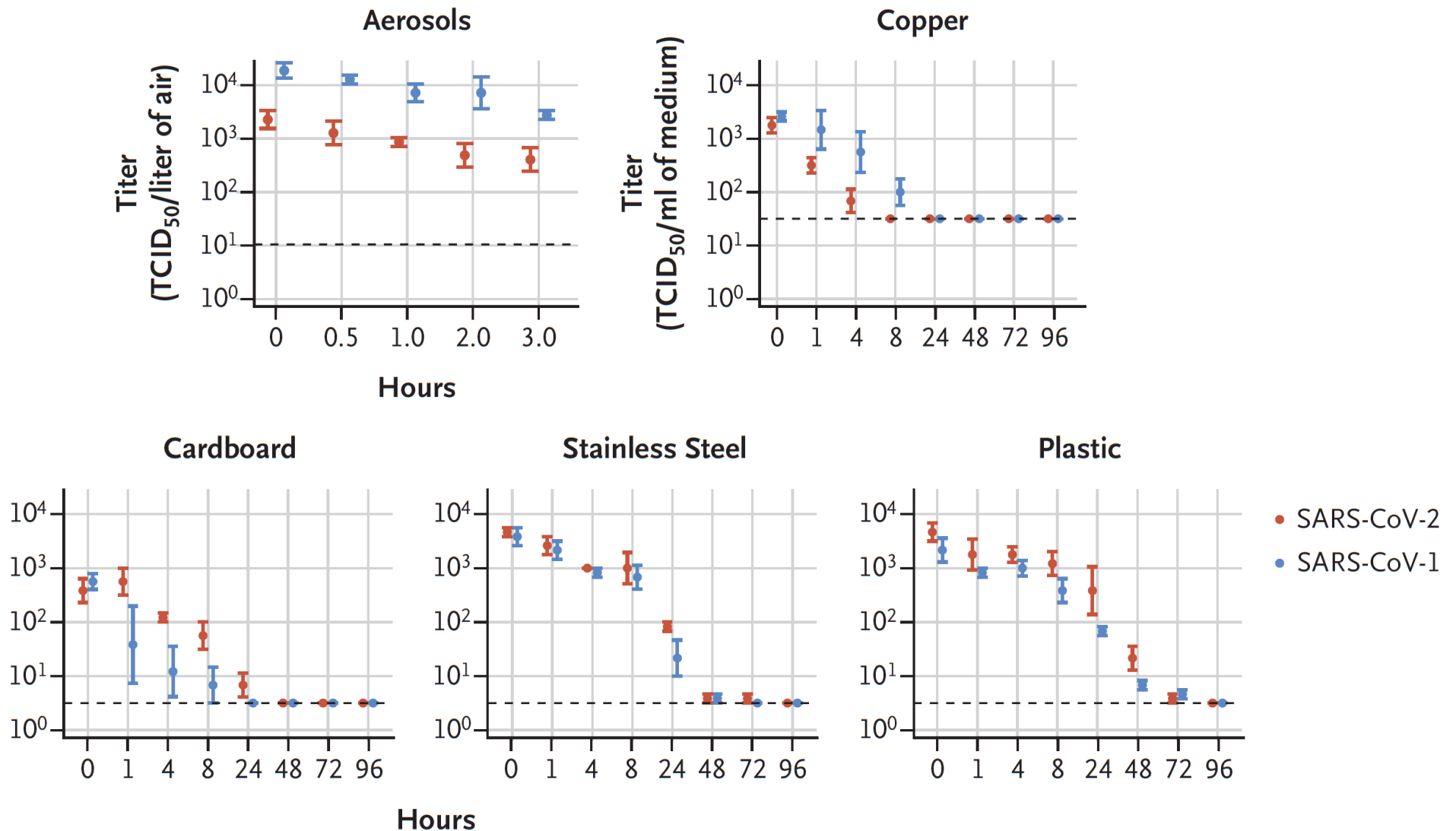


Chia et al. Nat Commun 2020 May 29;11(1):2800.

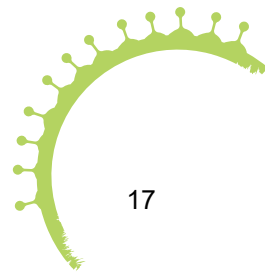
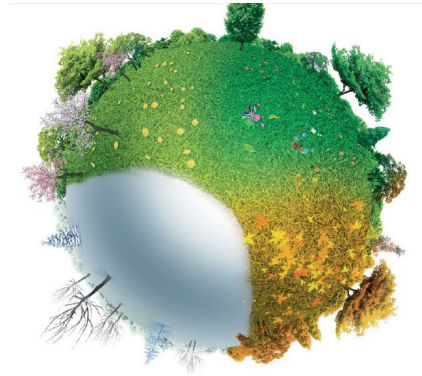
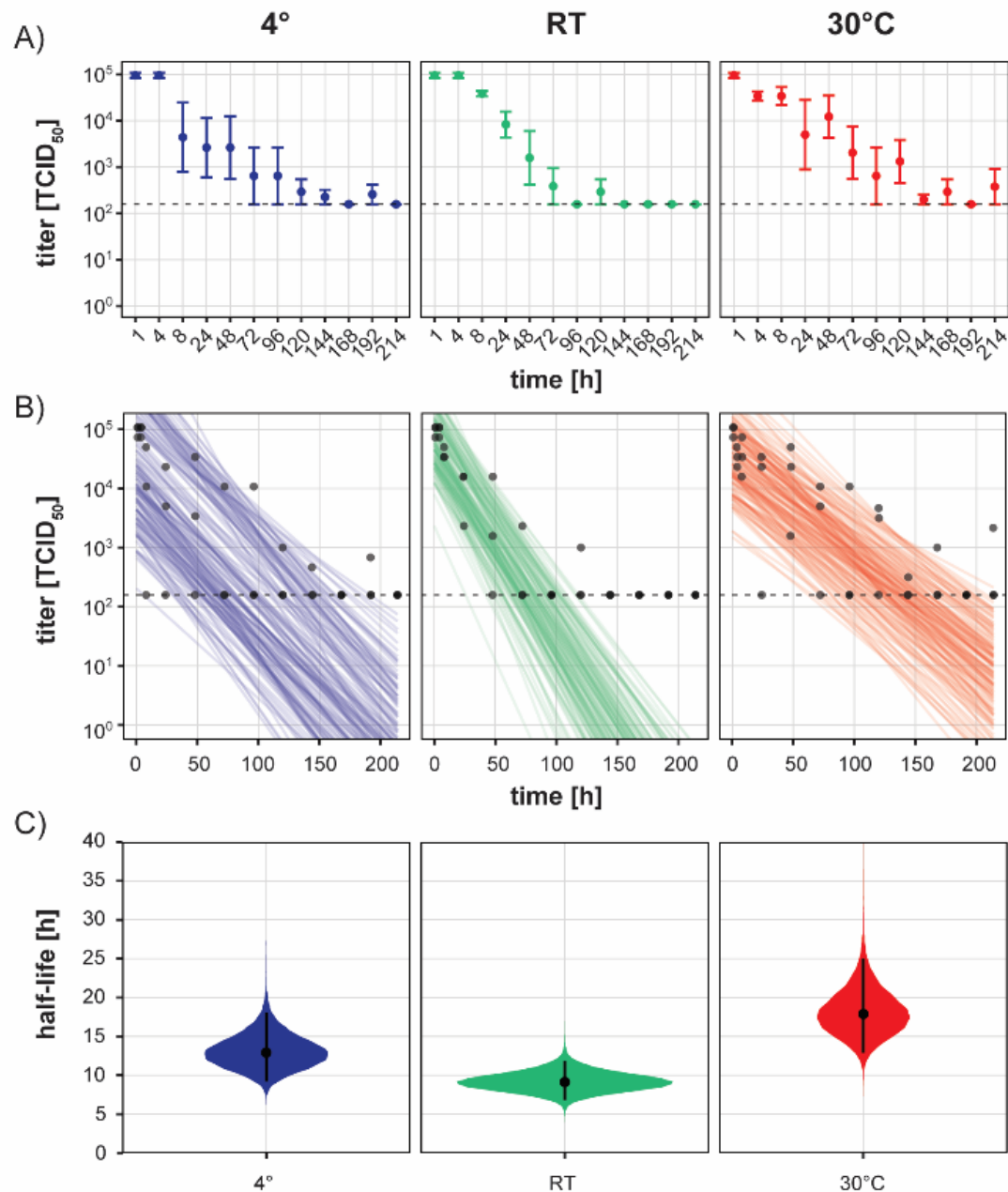
Ding et al. Sci Tot Env 2021 Jan 20;753.

Stability of SARS-CoV-2 on different surfaces

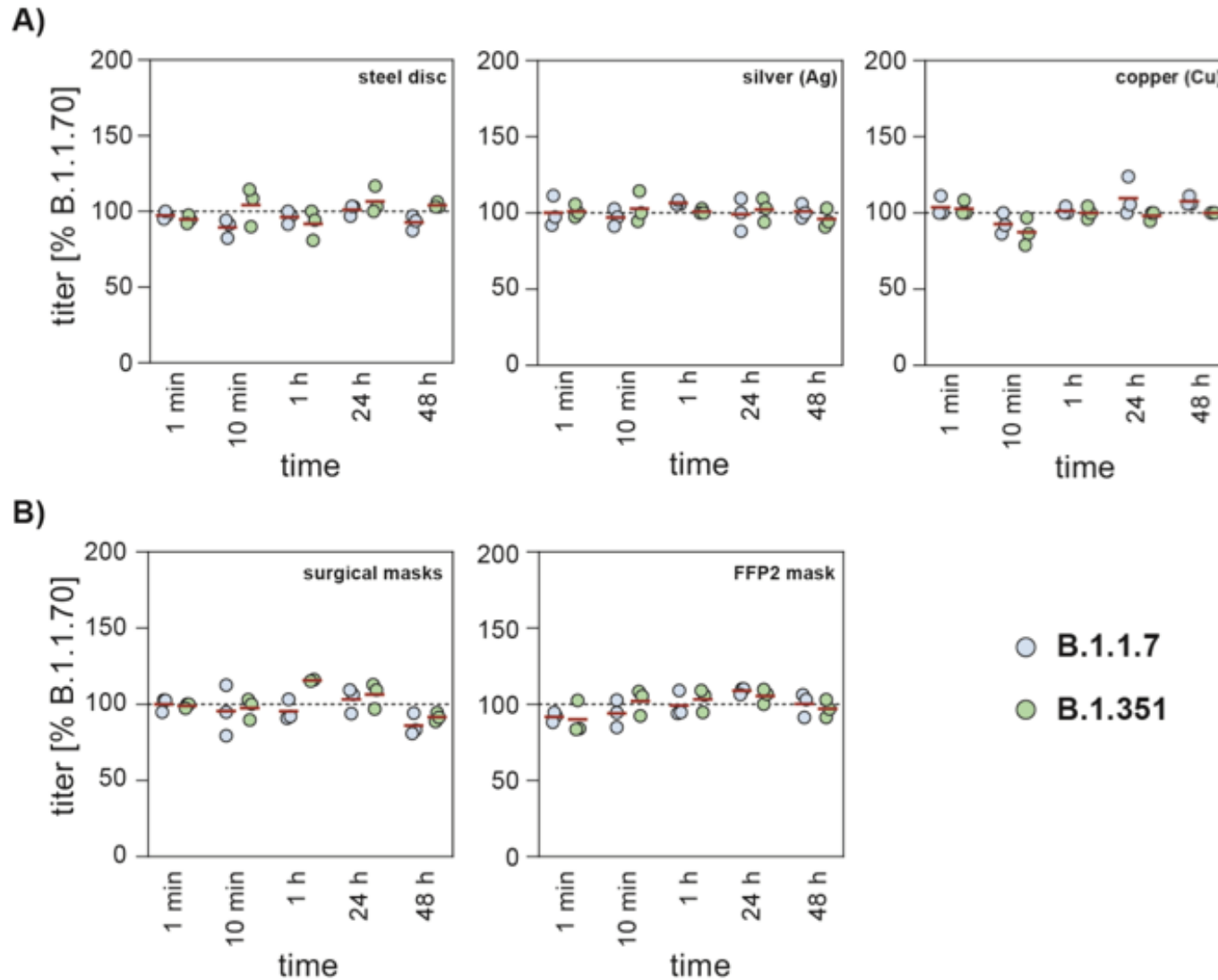
A Titers of Viable Virus



SARS-CoV-2 and seasonality



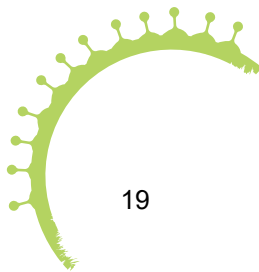
Surface stability variants of concern



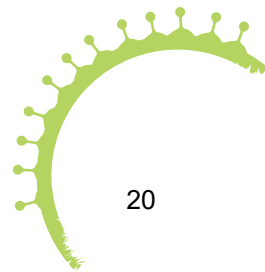
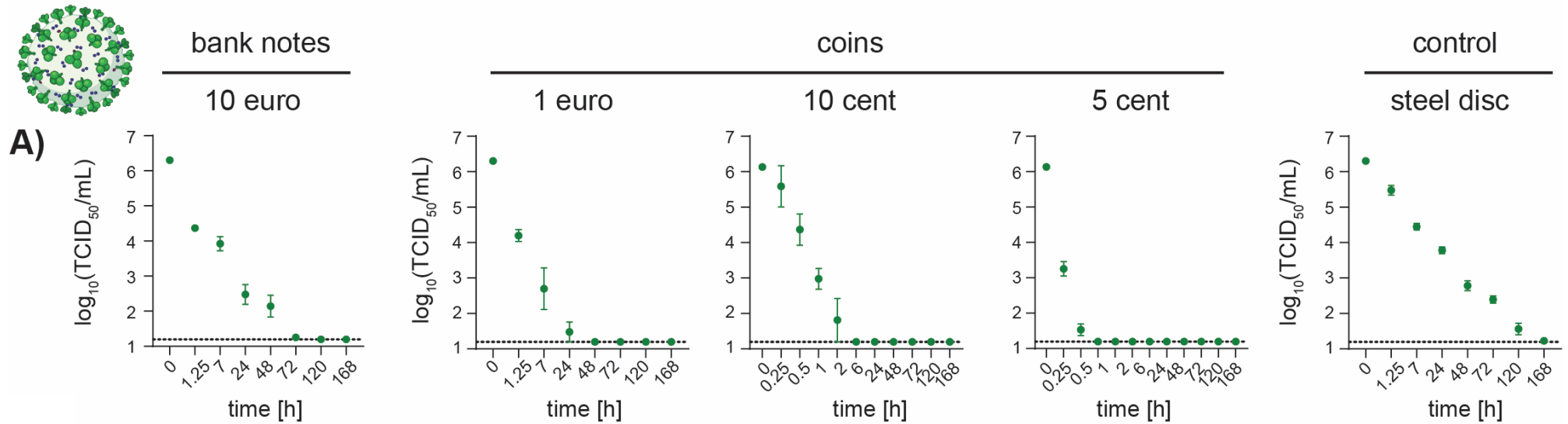
Viral stability on coins and bank notes



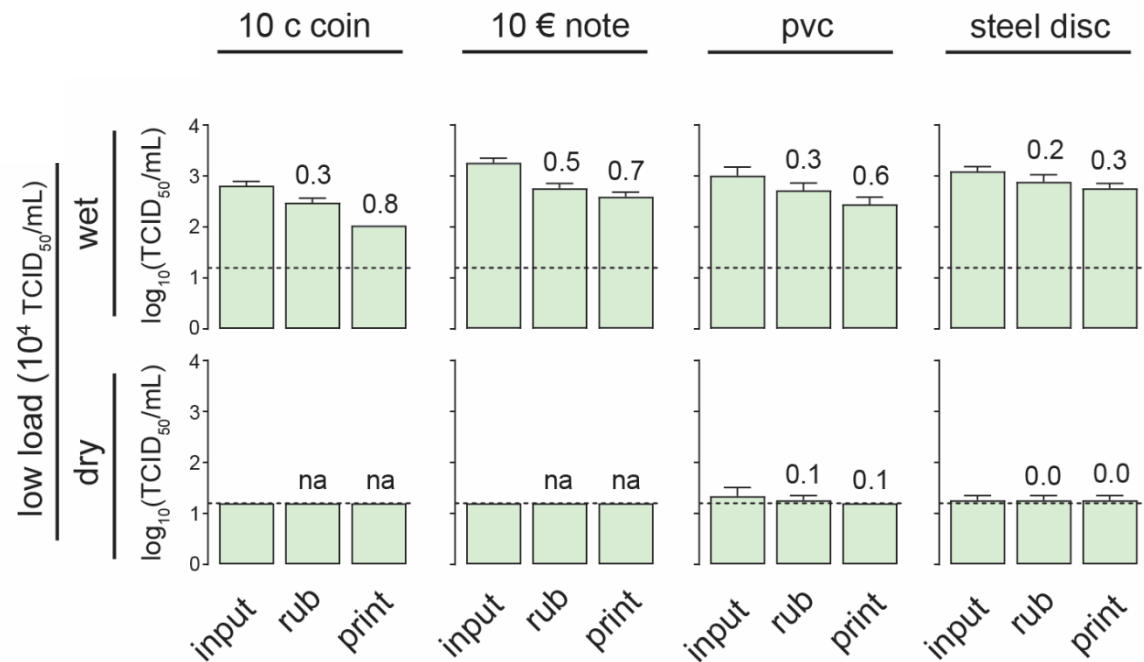
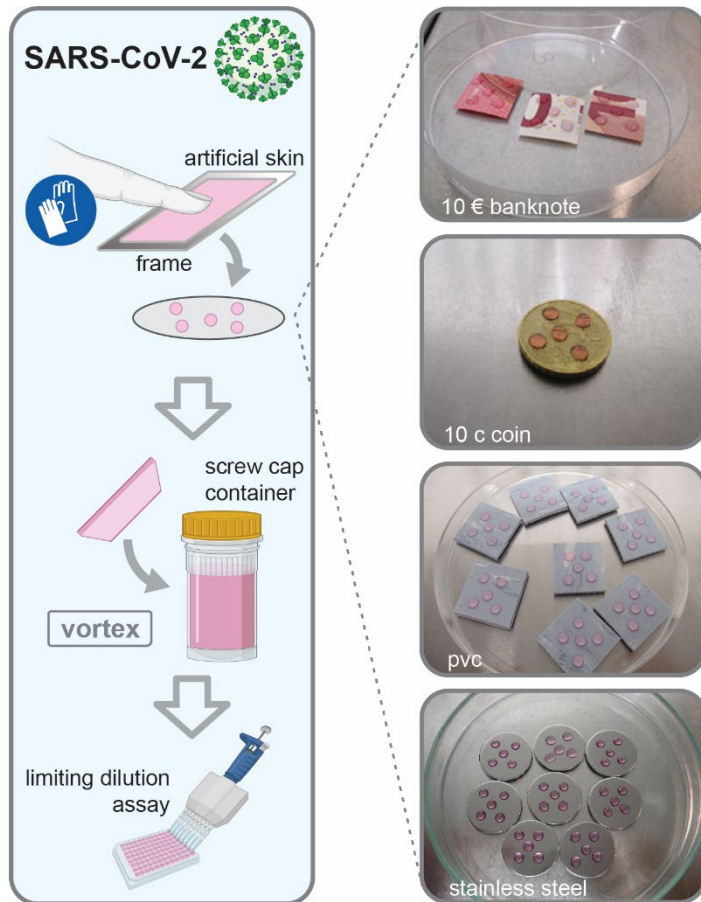
<https://www.bloomberg.com/news/>



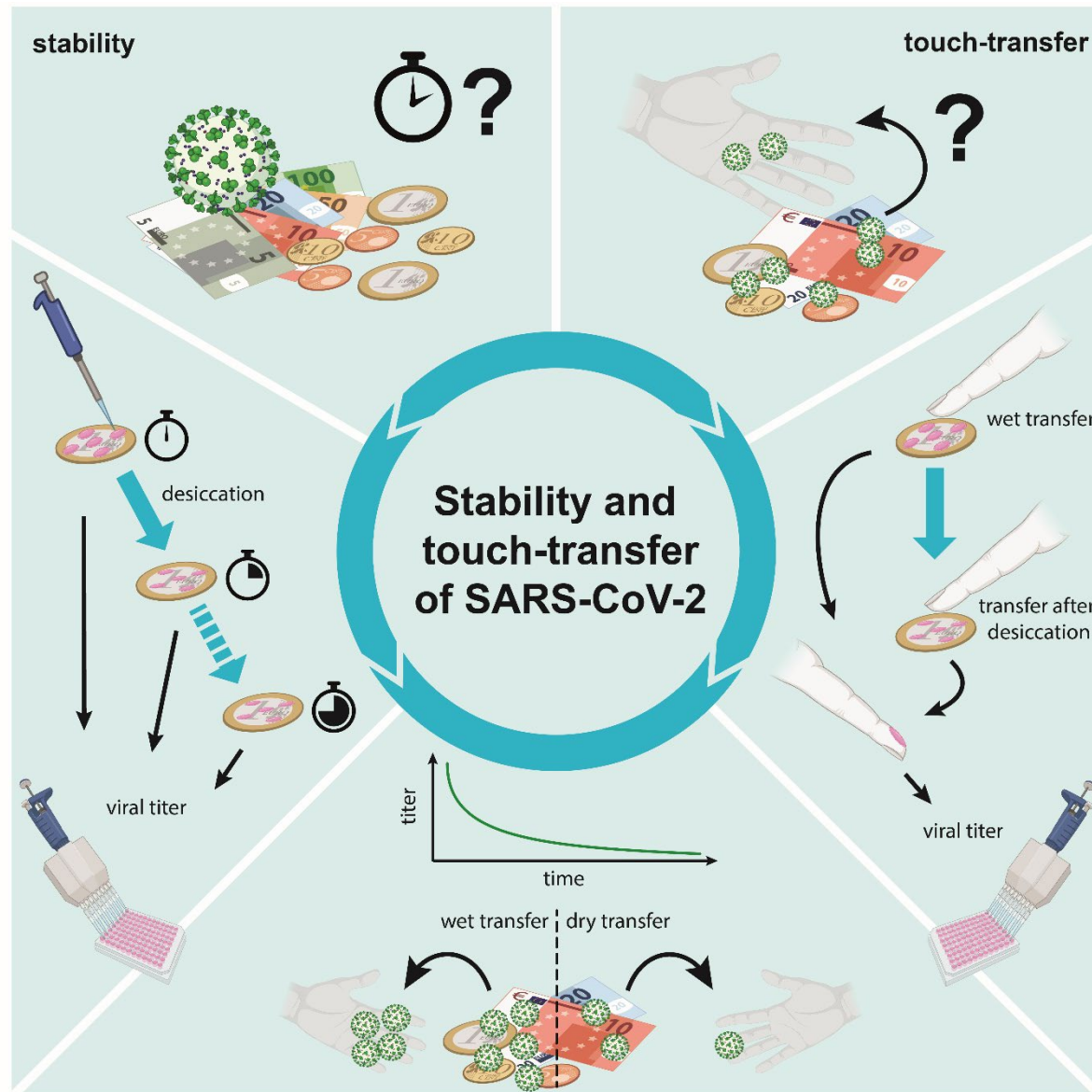
SARS-CoV-2



Realistic Touch Transfer



Stability and inactivation on cash



What roles do surfaces really play?



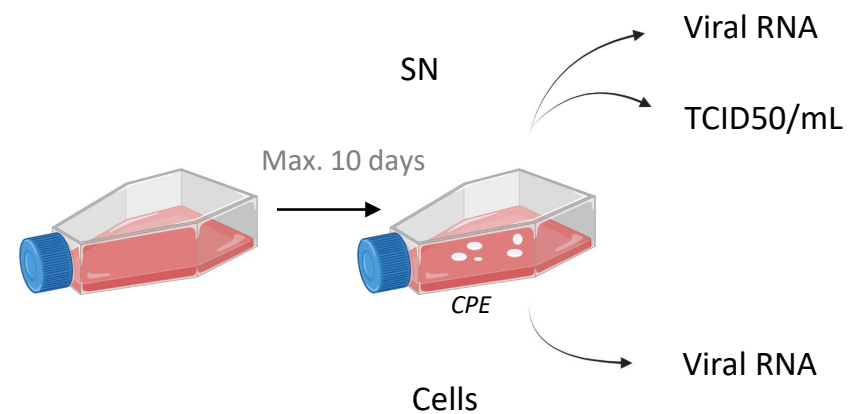
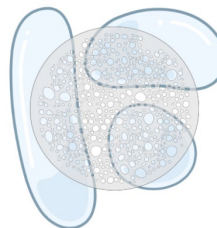
Swab



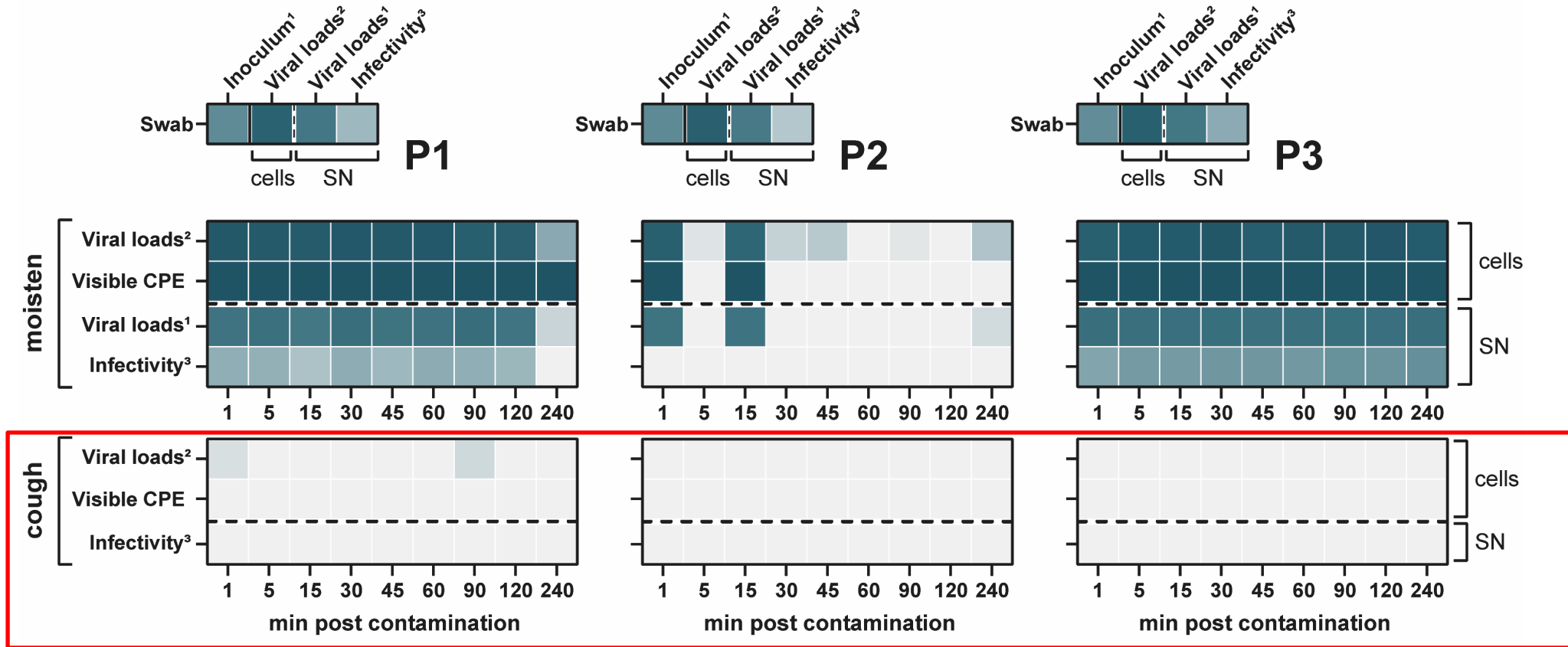
Cough



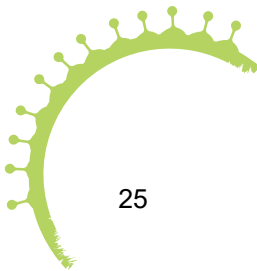
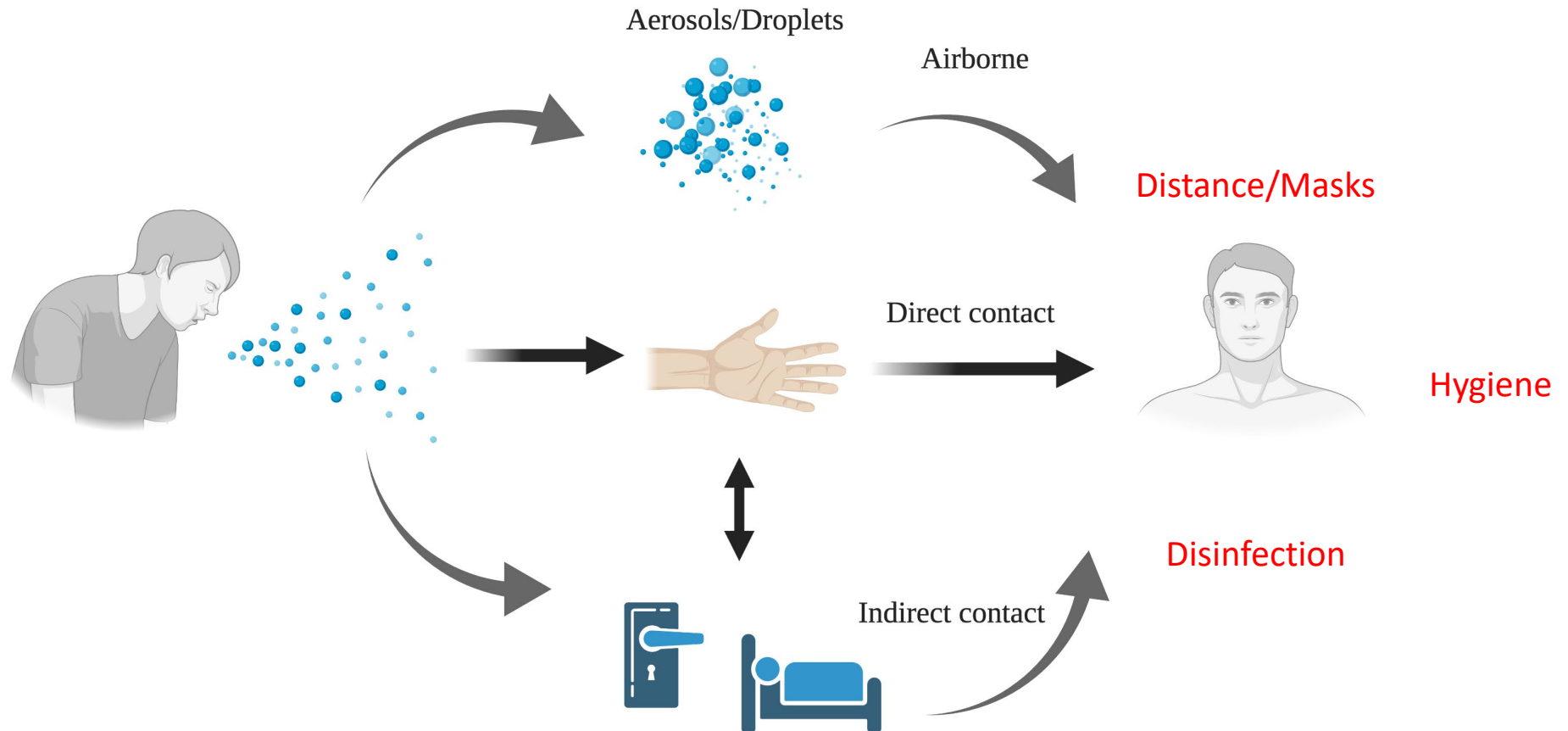
Moisten



Low risk of transmission



Transmission, Prevention and Inactivation



Acknowledgments



Cooperation partners and funding sources

