

To: 5.1.2e [redacted] 5.1.2e [redacted] @rivm.nl]; 5.1.2e [redacted] 5.1.2e [redacted] @rivm.nl]; 5.1.2e [redacted] @rivm.nl]
 Cc: 5.1.2e [redacted] @rivm.nl]; 5.1.2e [redacted] @unsw.edu.au]
 From: 5.1.2e [redacted]
 Sent: Tue 3/31/2020 11:31:49 PM
 Subject: RE: Role of porous media in the coronavirus context
 Received: Tue 3/31/2020 11:32:29 PM

Hi 5.1.2e [redacted]

I have been thinking about this on first principles at least and noting my review is not yet comprehensive.

1. How different masks perform is unclear to me at least fully. There are so many manufacturers and models. The standards I have seen relate to performance not materials or technology used though I imagine its like with bacteriological membrane.....Nuclepore are very different to Sartorius though they achieve the same result I sent you something about the US regulation.
2. Assuming transfer is possible, any surface must be suspect. Also remember the hand to nose, face scratch or mouth pathway. Also consider that they will be a bit a little moist from your breath so back transfer is possible. Where they end on the mask will depend on droplet size almost certainly.
3. Fisher below seems to show this survival could be for a long time.
4. Impregnated iodine may provide in situ control but I doubt this is routine yet – see Eninger
5. On decontamination methods see Darnell and Viscusi below and literature that cites them. Darnell reckons that these viruses are somewhat heat tolerant so you need to get to 60 C at least for an extended period but the masks start to break down above 100 C based on Viscusi.
6. Hence a simple disinfection method could be a dry container floating in a water bath at 60-80 C if you don't have access to other things like ethylene oxide though I would not trust a microwave oven. At home I can use a reheat cycle with my Phillips pressure cooker – does cook but heats to 80-90C.
7. Given this I suggest relatively frequent decontamination may be highly desirable along with continual use of hand washing and sanitizer use.

5.1.2e [redacted]

FISHER, E. & SHAFFER, R. 2010. Survival of Bacteriophage MS2 on Filtering Facepiece Respirator Coupons. *Applied Biosafety*, 15, 71-76.

ROBERGE, R. J., BAYER, E., POWELL, J. B., COCA, A., ROBERGE, M. R. & BENSON, S. M. 2010. Effect of Exhaled Moisture on Breathing Resistance of N95 Filtering Facepiece Respirators. *The Annals of Occupational Hygiene*, 54, 671-677.

ENINGER, R. M., ADHIKARI, A., REPONEN, T. & GRINSHUPUN, S. A. 2008. Differentiating Between Physical and Viable Penetrations When Challenging Respirator Filters with Bioaerosols. *CLEAN – Soil, Air, Water*, 36, 615-621.

DARNELL, M. E. R., SUBBARAO, K., FEINSTONE, S. M. & TAYLOR, D. R. 2004. Inactivation of the coronavirus that induces severe acute respiratory syndrome, SARS-CoV. *Journal of Virological Methods*, 121, 85-91.

WAKE, D., BOWRY, A. C., CROOK, B. & BROWN, R. C. 1997. Performance of respiratory filters and surgical masks against bacterial aerosols. *Journal of Aerosol Science*, 28, 1311-1329.

VISCUSI, D. J., BERGMAN, M. S., NOVAK, D. A., FAULKNER, K. A., PALMIERO, A., POWELL, J. & SHAFFER, R. E. 2011. Impact of Three Biological Decontamination Methods on Filtering Facepiece Respirator Fit, Odor, Comfort, and Donning Ease. *Journal of Occupational and Environmental Hygiene*, 8, 426-436.

VISCUSI, D. J., BERGMAN, M. S., EIMER, B. C. & SHAFFER, R. E. 2009. Evaluation of Five Decontamination Methods for Filtering Facepiece Respirators. *The Annals of Occupational Hygiene*, 53, 815-827.

From: 5.1.2e [5.1.2e@rivm.nl]

Sent: Wednesday, 1 April 2020 3:59 AM

To: 5.1.2e; 5.1.2e; 5.1.2e

Subject: Role of porous media in the coronavirus context

Dear 5.1.2e

Just talked with 5.1.2e

The question was raised what role have porous media (anything that has pores) in the spread of SARS-cov-2.

What came to mind was how masks (different types) work: what are the processes that retain the viruses/to what extent/what is actually known?

We suggest this might be a brief communication in the INTERPORE newsletter.

Also: what happens with the virus on porous surfaces. How do HEPA filters work, etc.

In this regard is the focus on processes that retain virus; what are the mechanisms; what factors (surface charge, pore size) are important.

Who could pick this up (5.1.2e you have a overview how masks work and perform)?

Has this enough relevance?

Vriendelijke groeten / kind regards,

5.1.2e

5.1.2e

5.1.2e @rivm.nl

Phone +31 5.1.2e

5.1.2e

National Institute of Public Health and the Environment
P.O. 5.1.2e 3720 BA Bilthoven, the Netherlands

5.1.2e

Department of Earth Sciences, Utrecht University
Princetonlaan 8a, 5.1.2e
3584 CB UTRECHT; The Netherlands



Dit bericht kan informatie bevatten die niet voor u is bestemd. Indien u niet de geadresseerde bent of dit bericht abusievelijk aan u is verzonden, wordt u verzocht dat aan de afzender te melden en het bericht te verwijderen. Het RIVM aanvaardt geen aansprakelijkheid voor schade, van welke aard ook, die verband houdt met risico's verbonden aan het elektronisch verzenden van berichten.

www.rivm.nl De zorg voor morgen begint vandaag

This message may contain information that is not intended for you. If you are not the addressee or if this message was sent to you by mistake, you are requested to inform the sender and delete the message. RIVM accepts no liability for damage of any kind resulting from the risks inherent in the electronic transmission of messages.

www.rivm.nl/en Committed to health and sustainability