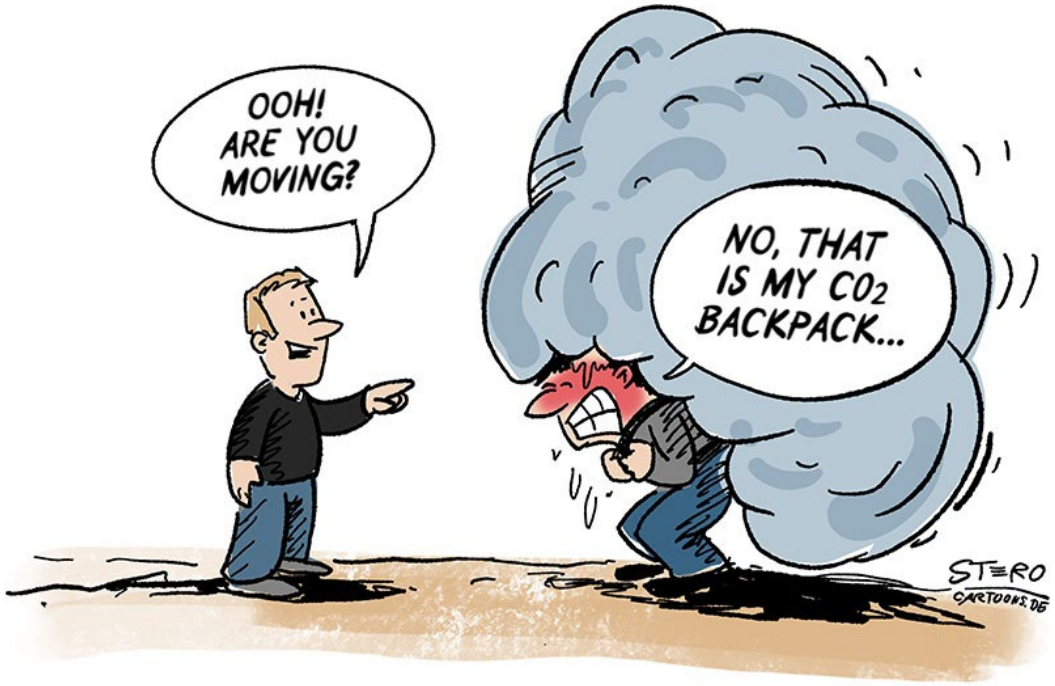
How the pandemic has changed the medical perception of safe indoor air

Enni Sanmark

Helsinki University Hospital

Before 2020: **CO2 and SICK BUILDINGS**



https://en.roth-cartoons.de/project/cartoon-co2-backpack/

https://www.akcp.com/blog/sick-building-syndrome-causes-and-prevention/

After 2020: **VIRUS TRANSMISSION**

https://cartoonmovement.com/cartoon/coronavirus-1

Available online at www.sciencedirect.com

Journal of Hospital Infection

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

Detection of influenza virus in air samples of patient rooms

A. Chamseddine [a], N. Soudani [b,c], Z. Kanafani [d], I. Alameddine [a], G. Dbaibo [e],

RESEARCH

REVIEW SUMMARY

CORONAVIRUS

Airborne transmission of respiratory viruses

Chia C. Wang*, Kimberly A. Prather*, Josué Sznitman, Jose L. Jimenez, Seema S. L
Zeynep Tufekci, Linsey C. Marr

International Journal of
Environmental Research and Public Health

Article

Airborne or Fomite Transmission for Norovirus? A Case Study Revisited

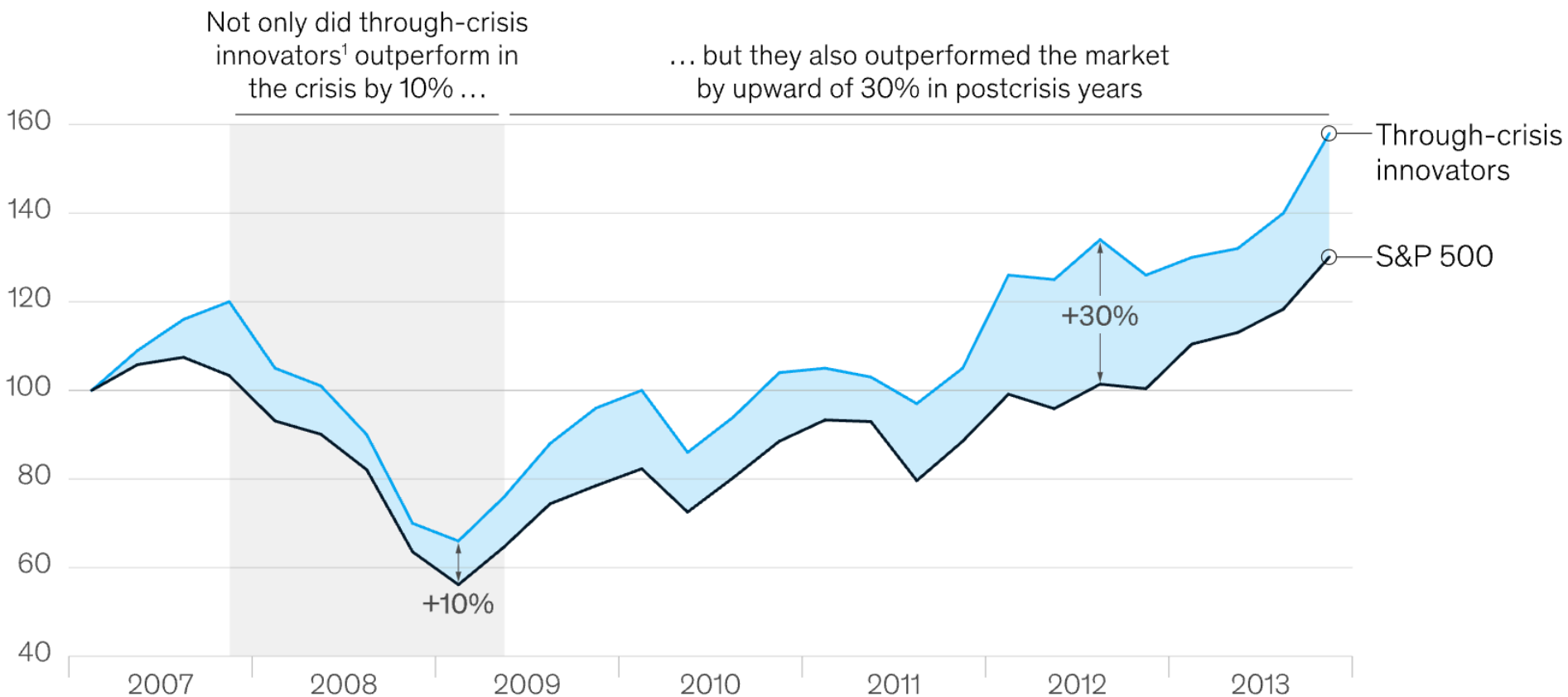
Shenglan Xiao [1,*], Julian W. Tang [2,3] and Yuguo Li [1]

THE LANCET

Ten scientific reasons in support of airborne transmission of SARS-CoV-2

History suggests that companies that invest in innovation through a crisis outperform peers during the recovery.

Normalized market capitalization, index (Q1 2007 = 100)



[1]Identified as companies on the *Fast Company* World's 50 Most Innovative Companies list for ≥2 years through a crisis, normalized to 2007.

McKinsey

nature communications

SARS-CoV-2 disease severity and transmis efficiency is increased for airborne compa fomite exposure in Syrian hamsters

Transmission of SARS-CoV-2 is driven by contact, fomite, and airborne transmission. The relative contribution of different transmission routes remains subject to debate. Here, w show Syrian hamsters are susceptible to SARS-CoV-2 infection through intranasal, aeros and fomite exposure. Different routes of exposure present with distinct disease manifestations. Intranasal and aerosol inoculation causes severe respiratory pathology, higher virus loads and increased weight loss. In contrast, fomite exposure leads to milde disease manifestation characterized by an anti-inflammatory immune state and delayed shedding pattern. Whereas the overall magnitude of respiratory virus shedding is not lin to disease severity, the onset of shed severity. Airborne transmission is m on the direction of the airflow. Caref

nature COMMUNICATIONS

ARTICLE

Check for updates

https://doi.org/10.1038/s41467-021-21918-6 OPEN

SARS-CoV and SARS-CoV-2 are transmitted through the air between ferrets over more than one meter distance

Jasmin S. Kutter[1], Dennis de Meulder[1], Theo M. Bestebroer[1], Pascal Lexmond[1], Ard Mulders[1], Mathilde Richard[1], Ron A. M. Fouchier[1] & Sander Herfst[1]✉

Human Influenza Resulting from Aerosol Inhalation

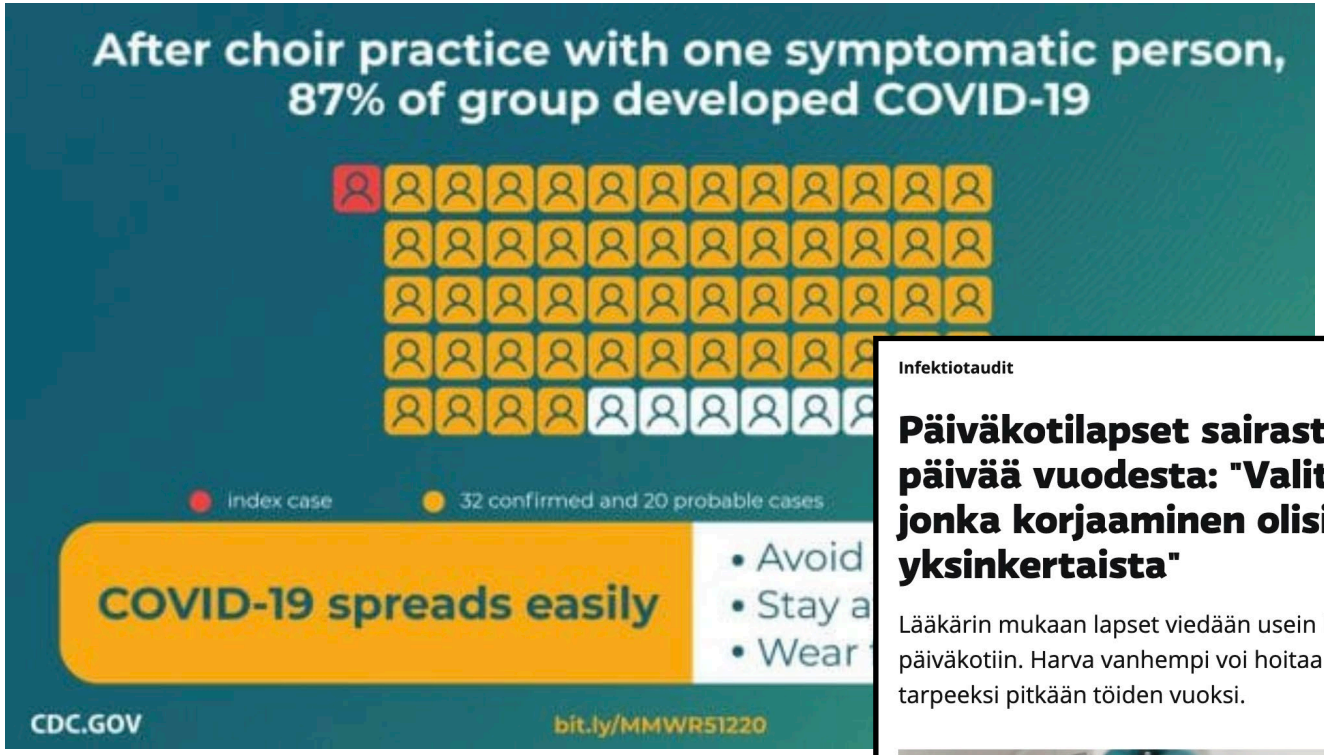
Robert H. Alford, Julius A. Kasel, Peter J. Gerone, more...

First Published July 1, 1966 | Research Article

Volunteers were given A2 influenza virus in a small-particle aerosol. Infection and typical influenza resulted from low doses of virus administered in this manner. Low levels of serum neutralizing antibody were not completely effective in preventing infection and illness. The human infectious dose of this influenza strain when administered by aerosol to subjects free of serum neutralizing antibody was approximately 3 $TCID_{50}$.

EXCELLENCE IN PANDEMIC RESPONSE AND ENTERPRISE SOLUTIONS

WHAT, HOW and WHY?



Infektiotaudit

Päiväkotilapset sairastavat jopa sata päivää vuodesta: "Valitettava totuus, jonka korjaaminen olisi hyvin yksinkertaista"

Lääkärin mukaan lapset viedään usein liian aikaisin takaisin päiväkotiin. Harva vanhempi voi hoitaa sairasta lastaan kotona tarpeeksi pitkään töiden vuoksi.

Siihen, miltä koronatesti tuntuu, voi vaikuttaa omalla käyttäytymisellä – Asiantuntija neuvoo, miten testi-tilanteessa kannattaa toimia

Kysyimme koronatestissä käyneiltä, miltä testin ottaminen nenänielusta tuntuu. Testi on yleensä ohi sekunneissa. Toiset eivät ole testistä millänsäkään, ja toiset kuvaavat testiä karseaksi kokemukseksi. Yksi keino helpottaa toimenpidettä.

TILAAJILLE

WHO, HOW and WHEN?

COULD we limit the spread?

INTERNATIONAL JOURNAL OF
OCCUPATIONAL MEDICINE
AND ENVIRONMENTAL HEALTH

6/2022 vol. 35 Get citation CC BY-NC 3.0 Poland Stats

ORIGINAL PAPER

Mental well-being of healthcare workers in 2 hospital districts during the first wave of the COVID-19 pandemic in Finland: a cross-sectional study

Noora Rantanen [1,2], Johannes Lieslehto [3], Lotta-Maria A.H. Oksanen [1,4], Sampo A. Oksanen [5], Veli-Jukka Anttila [1,6], Lasse Lehtonen [1,7], Ahmed Geneid [1,4], Enni Sanmark [1,4]

scientific reports

OPEN

A machine learning approach to predict resilience and sickness absence in the healthcare workforce during the COVID-19 pandemic

Johannes Lieslehto[1,11], Noora Rantanen[2,3,11], Lotta-Maria A. H. Oksanen[2,4], Sampo A. Oksanen[5,6], Anne Kivimäki[7], Susanna Paju[7], Milla Pietiäinen[7], Laura Lahdentausta[7], Pirkko Pussinen[7], Veli-Jukka Anttila[2,8], Lasse Lehtonen[2,9], Tea Lallukka[10], Ahmed Geneid[2,4] & Enni Sanmark[2,4]

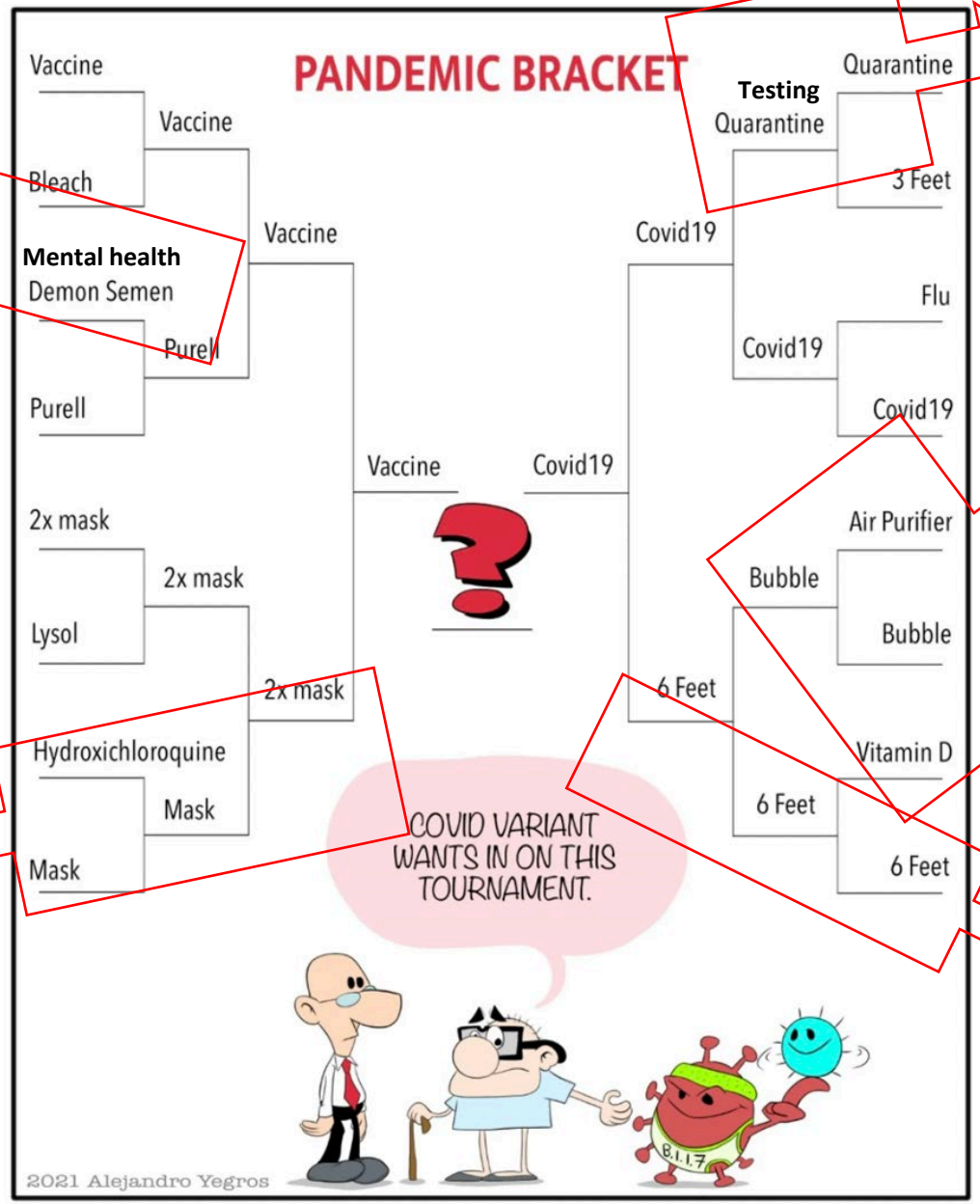
INTERNATIONAL JOURNAL OF
OCCUPATIONAL MEDICINE
AND ENVIRONMENTAL HEALTH

2/2021 vol. 34 Get citation CC BY-NC 3.0 Poland Stats

ORIGINAL PAPER

Sources of healthcare workers' COVID-19 infections and related safety guidelines

Lotta-Maria A.H. Oksanen [1,2], Enni Sanmark [1,2], Sampo A. Oksanen [3,4], Veli-Jukka Anttila [1,5], Jussi J. Paterno [6,7], Maija Lappalainen [1,8], Lasse Lehtonen [1,8], Ahmed Geneid [1,2]



Blood and saliva SARS-CoV-2 antibody levels in self-collected dried spot samples

Laura Lahdentausta[1] · Anne Kivimäki[1] · Lotta Oksanen[3] · Marika Tallgren[2] · Sampo Oksanen[4] · Enni Sanmark[3] · Aino Salminen[1] · Ahmed Geneid[3] · Mikko Sairanen[2] · Susanna Paju[1] · Kalle Saksela[5] · Pirkko Pussinen[1,6] · Milla Pietiäinen[1,7]

Combining Phi6 as a surrogate virus and computational large-eddy simulations to study airborne transmission of SARS-CoV-2 in a restaurant

Lotta Oksanen[1,2] | Mikko Auvinen[3] | Joel Kuula[3] | Rasmus Malmgren[4] | Martin Romantschuk[4,5] | Antti Hyvärinen[3] | Sirpa Laitinen[6] | Leena Maunula[7] | Enni Sanmark[1,2] | Ahmed Geneid[1,2] | Svetlana Sofieva[3,4] | Julija Salokas[4] | Helin Veskiväli[4] | Tarja Sironen[8,9] | Tiia Grönholm[3] | Antti Hellsten[3] | Nina Atanasova[3,4]

ORIGINAL ARTICLE WILEY

SARS-CoV-2 indoor environment contamination with epidemiological and experimental investigations

Lotta-Maria A. H. Oksanen[1,2] | Jenni Virtanen[1,3] | Enni Sanmark[1,2] | Noora Rantanen[1,2] | Vinaya Venkat[1,3] | Svetlana Sofieva[4,5] | Kirsi Aaltonen[1,3] | Ilkka Kivistö[1,3] | Julija Svirskaite[4] | Aurora Díaz Pérez[3] | Joel Kuula[5] | Lev Levanov[1] | Antti-Pekka Hyvärinen[5] | Leena Maunula[3] | Nina S. Atanasova[4,5] | Sirpa Laitinen[6] | Veli-Jukka Anttila[1,7] | Lasse Lehtonen[1,8] | Maija Lappalainen[1,8] | Ahmed Geneid[1,2] | Tarja Sironen[1,3]

Original Study

OPEN

Aerosol Generation During Otologic Surgery

*†‡Mari Lahelma, *†Lotta Oksanen, *†Noora Rantanen, *†Saku Sinkkonen, *†Antti Aarnisalo, *†Ahmed Geneid, and *†Enni Sanmark

*Faculty of Medicine, University of Helsinki; †Department of Otorhinolaryngology and Phoniatrics–Head and Neck Surgery, Helsinki University Hospital; ‡Faculty of Science, Mathematics, and Statistics, University of Helsinki, Helsinki, Finland