



Centre for Global Higher Education Conference, Oxford, 22<sup>nd</sup> May 2022

# Science in the public eye: communicating and debating research findings in real time in a global public health crisis

Professor Trisha Greenhalgh, University of Oxford



# Thank you

CGHE for inviting me

My research team: 18 researchers, 6 support staff, 15 PhD students

My university, collaborators and funders



UNIVERSITY OF  
OXFORD



UK Research  
and Innovation



NIHR | National Institute  
for Health Research



HDRUK  
Health Data Research UK



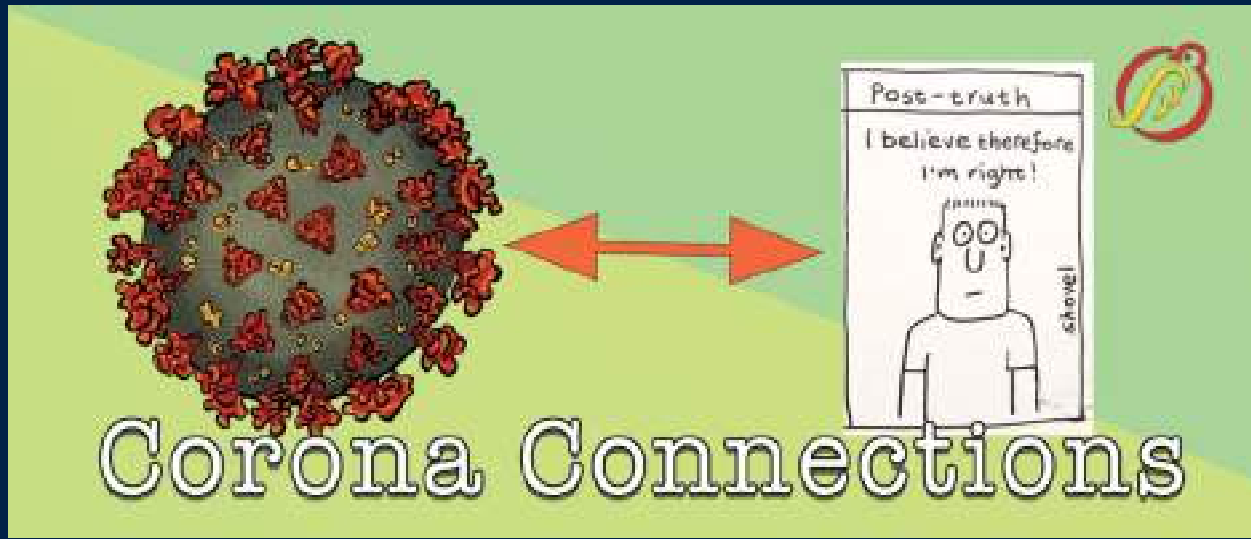
wellcome trust

MRC

Medical  
Research  
Council



Economic  
and Social  
Research Council



Credit:  
@martinshovel

*“The COVID-19 pandemic is ... the most blatant expression of dangers of the post-truth age ... characterized by less confidence in institutions, a lack of agreement on facts, and a blurring of the line between opinion and fact.”* —Roy Schulman: **Covid-19 and the Post-Truth Age**, online conference, 15<sup>th</sup> June 2020

# post-truth

/ˌpəʊs(t)ˈtruːθ/

relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief



Manu Raju   
@mkraju

"I came up with vaccines," Trump says

3:55 PM · Nov 29, 2020 · Twitter for iPhone

1.5K Retweets 2.4K Quote Tweets 16.3K Likes



Trisha Greenhalgh  #BlackLivesMatter  
@trishgreenhalgh

And I'm on the front cover of Vogue.



Manu Raju  @mkraju · Nov 29

"I came up with vaccines," Trump says

9:49 PM · Nov 29, 2020 · Twitter for iPhone



YOUR  
HEALTH  
BE HEALTHY

YOUR  
LIFE  
BE INFORMED

YOUR  
CHOICE  
BE SAFE

# FACE MASK SAFETY

KNOW THE FACTS **BEFORE** YOU WEAR ONE

1

## DECREASES OXYGEN INTAKE

BREATHING THROUGH A MASK DECREASES THE AMOUNT OF OXYGEN WE NEED TO LIVE & BE HEALTHY. INCREASES BLOOD ACIDITY & MAKES BREATHING DIFFICULT.

2

## INCREASES TOXIN INHALATION

TOXINS THAT WE NORMALLY EXHALE AS WE BREATHE BECOME TRAPPED IN THE MASK AND RE-INHALED INTO THE LUNGS, INCREASING SYMPTOMS.

3

## SHUTS DOWN IMMUNE SYSTEM

DECREASES OXYGEN INTAKE. INCREASES CARBON DIOXIDE & TOXIN INTAKE PUTTING BODY UNDER STRESS, RELEASING CORTISOL & SHUTTING DOWN IMMUNE PROCESSES.

4

## INCREASES VIRUS RISK

ENCOURAGES TRIGGERING & INFECTION FROM DORMANT RETRO VIRUSES ALREADY IN THE BODY, TAKING ADVANTAGE OF A WEAKENED IMMUNE SYSTEM DUE TO MASK WEARING.

5

## SCIENTIFICALLY INACCURATE

VIROLOGISTS MEASURE COVID-19 TO BE 80-140nm IN SIZE MAKING THE WEAVE OF MATERIAL MASKS TO BE THE EQUIVALENT OF A CHAIN-LINK FENCE TO A MOSQUITO.

6

## EFFECTIVENESS NOT STUDIED

ABSOLUTELY NO PEER-REVIEWED STUDIES HAVE BEEN CARRIED OUT OF MASK EFFECTIVENESS WITHIN A SOCIAL ENVIRONMENT TO CONTROL, PREVENT OR ELIMINATE THE SPREAD OF DISEASE.

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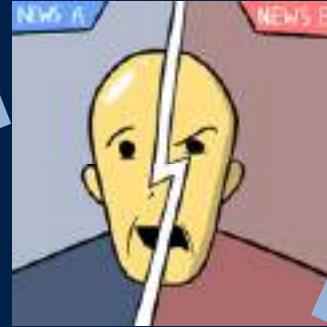
# FACE MASK SAFETY

KNOW THE FACTS **BEFORE** YOU WEAR ONE

- 1 NO IMPACT ON YOUR OXYGEN INTAKE**  
Wearing a mask or face covering does not interfere with the amount of oxygen getting to your lungs. Suggesting wear masks safely for hours.
- 2 NO INCREASE IN TOXIC INHALATION**  
Carbon dioxide from your exhaled air escapes harmlessly through the mask and around the edges.
- 3 NO DAMAGE TO YOUR IMMUNE SYSTEM**  
A face covering is made of safe, familiar materials (cloth, paper, waterproof backing). It won't stress your system.
- 4 DECREASES VIRUS TRANSMISSION**  
Depending on what it's made of, your face covering reduces emission of droplets from your mouth and nose (in coughs, sneezes and speech) by **60-95%**, making others safer. It also reduces the amount of virus that you get exposed to by approximately 20-30%.
- 5 SCIENTIFICALLY ACCURATE**  
The holes in a cloth face covering seem large in relation to tiny viral particles. But because the virus sits in droplets when it's in your mouth and nose, the holes are small enough to block them very effectively.
- 6 STRONG EVIDENCE OF EFFECTIVENESS**  
There used to be doubt about whether face coverings protect against the spread of COVID-19. New research published in May/July 2020 has strengthened the evidence base. We now know they do protect.



Honest scientists

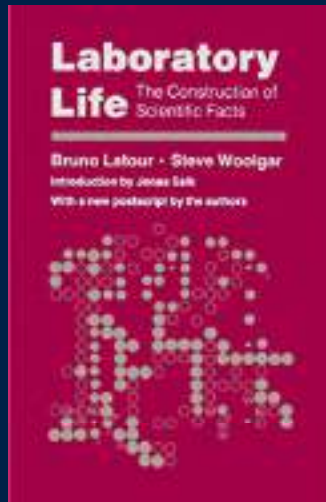
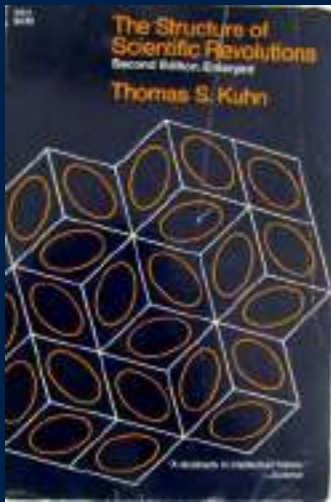


Distorted by  
bad people in  
the media

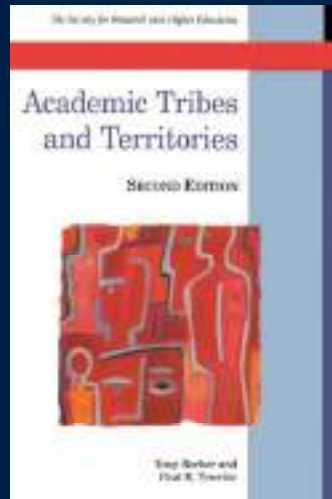
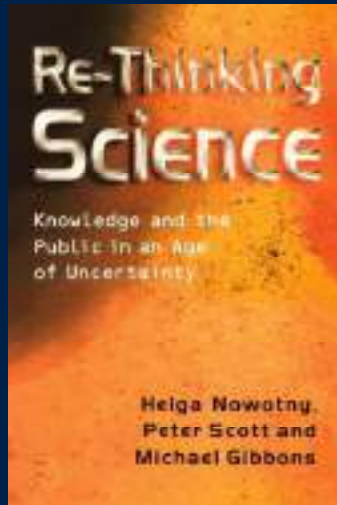


Public  
confusion





The social and philosophical study of science suggests that scientific 'truth' is more complex than many people assume



# MSc student group assignment

Go and get a fact

Carefully note the context in which it was generated

Bring it back to class to defend to your classmates



Following a tradition started by Professor Steve Woolgar

# Laboratory Life

The Construction of  
Scientific Facts

Bruno Latour • Steve Woolgar

Introduction by Jones Salk

With a new postscript by the authors

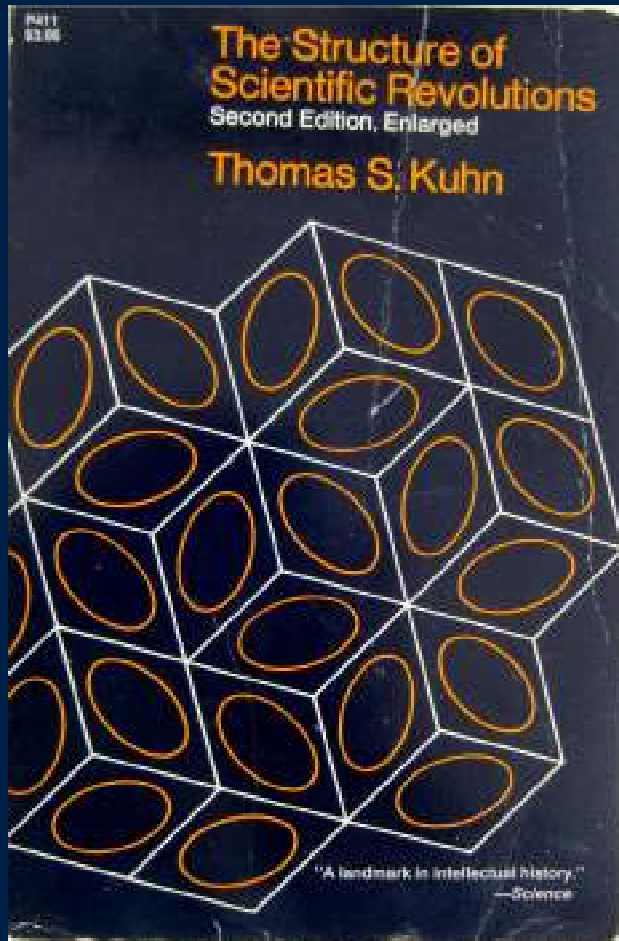


## Latour and Woolgar

The laboratory as a strange tribe with its own myths and rituals

*“some statements [made by scientists] appeared [to fellow scientists] more fact-like than others”*

Diagrams, graphs, tracings are “inscriptions” which come to depict “the way things are”



# Thomas Kuhn

Science progresses in paradigms (concepts + theories + methods + instruments)

‘Normal science’

‘Paradigm shifts’

Paradigms constrain our thinking but they also support and refine our thinking

*The Society for Research into Higher Education*

# Academic Tribes and Territories

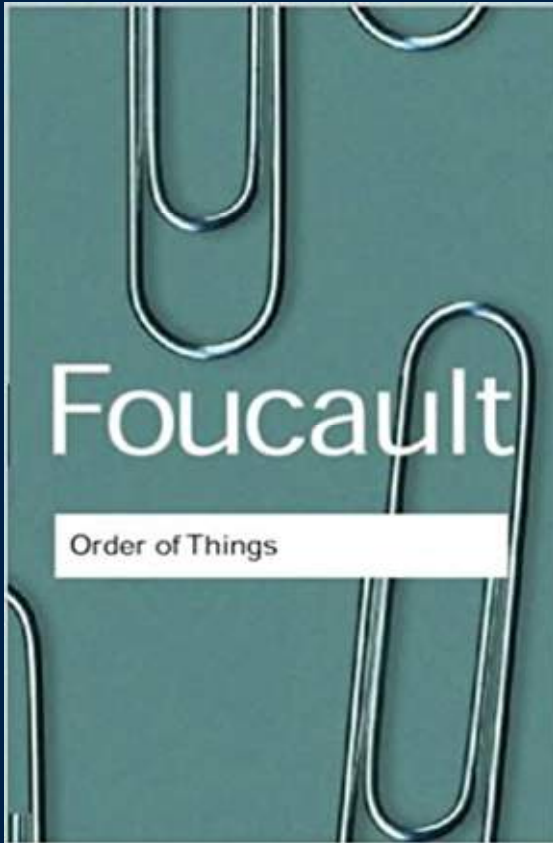
SECOND EDITION



Tony Becher and  
Paul R. Trowler

# Becher & Trowler

Academics (not just scientists) hang out in 'tribes' and defend their 'territories'



# Foucault

Knowledge is closely linked to power

*“In any given culture and at any given moment, there is always only one épistémè [scientific world view] that defines the conditions of possibility of all knowledge, whether expressed in a theory or silently invested in a practice.”*

The image shows the front cover of the book 'Science of Science and Reflexivity' by Pierre Bourdieu. The cover is a solid, bright blue color. The title is printed in a white, sans-serif font, centered in the upper half of the cover. The author's name, 'Pierre Bourdieu', is printed in a smaller white font at the bottom center of the cover.

Science of Science  
and Reflexivity

Pierre Bourdieu

# Bourdieu

Knowledge is “academic capital”.

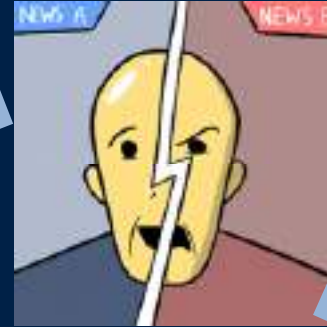
Orthodoxy v heterodoxy



Scientific TRIBE with shared mental models of “the way things are” AND vested interests in existing power and prestige structures



In-paradigm 'truth'



Some media run with this 'truth'; others follow different 'tribes'



Public confusion



EXAMPLE



World Health Organization (WHO) @WHO

28<sup>th</sup> March 2020

FACT: #COVID19 is NOT airborne.

The #coronavirus is mainly transmitted through droplets generated when an infected person coughs, sneezes or speaks.

To protect yourself:

- keep 1m distance from others
- disinfect surfaces frequently
- wash/rub your 🧴
- avoid touching your 👤 👄



PAHO/WHO and 8 others

8:44 PM · Mar 28, 2020 · Twitter Web App

41K Retweets · 3,459 Quote Tweets · 45.5K Likes

# IS SARS-CoV-2 AIRBORNE? March-April 2020



ANALYSIS

2nd April 2020

## Face masks for the public during the covid-19 crisis

Trisha Greenhalgh and colleagues argue that it is time to apply the precautionary principle

Trisha Greenhalgh professor<sup>1</sup>, Manuel B Schmid consultant<sup>2,3</sup>, Thomas Czypionka chief health economist<sup>4,5</sup>, Dirk Bassler professor<sup>2,3</sup>, Laurence Gruer professor<sup>6,7</sup>

Precautionary principle: we don't have 100% proof yet, but let's act pragmatically on the basis of the many stories we have

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President Trump's Covid-19  
adviser, September 2020  
↓↓↓↓↓

Scott W. Atlas @S... 1d

Masks work? NO: LA, Miami, Hawaii, Alabama, France, Philippnes, UK, Spain, Israel.

WHO: "widesprd use not supported" + many harms;

Heneghan/Oxf CEBM: "despite decades, considerble uncertainty re value"; CDC: "w May: "no sig red'n in intinfz transm'n"; learn why



The Year of Disguises  
aier.org

# IS SARS-CoV-2 AIRBORNE? March-April 2021

No (“living” systematic review, not peer-reviewed):  
Heneghan et al F1000 Research; 24<sup>th</sup> March 2021

Yes (commentary, peer-reviewed):  
Greenhalgh et al Lancet 15<sup>th</sup> April 2021



**Research** F1000Research 2021, 10:232 Last updated: 24 MAR 2021

53

Check for updates

**SYSTEMATIC REVIEW**

## SARS-CoV-2 and the role of airborne transmission: a systematic review [version 1; peer review: awaiting peer review]

Carl Heneghan<sup>1</sup>, Elizabeth A. Spencer<sup>2</sup>, Jon Brassey<sup>3</sup>, Annette Plüddemann<sup>1</sup>, Igbo J. Onakpoya<sup>1</sup>, David Evans<sup>3</sup>, John M. Conly<sup>4</sup>, Tom Jefferson<sup>1</sup>

<sup>1</sup>University of Oxford, Oxford, Cotlandshire, UK  
<sup>2</sup>Tris Database, Tris, Bristol, UK  
<sup>3</sup>Li Ka Shing Institute of Virology and Dept of Medical Microbiology & Immunology, University of Alberta, Alberta, Canada  
<sup>4</sup>University of Calgary and Alberta Health Services, Calgary, Canada

**VT** First published: 24 Mar 2021, 10:232  
<https://doi.org/10.12688/f1000research.52061.1>

Latest published: 24 Mar 2021, 10:232  
<https://doi.org/10.12688/f1000research.52061.1>

**Open Peer Review**

**Reviewer Status:** AWAITING PEER REVIEW



**THE LANCET**

2021

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

Heneghan and colleagues' systematic review, funded by WHO, published in March 2021 as a preprint, states "The lack of reasonable viral culture samples of SARS-CoV-2 prevents firm conclusions to be drawn about airborne transmission". This conclusion, and the wide circulation of the review's findings, is concerning because of the public health implications.

If an infectious virus spreads predominantly through large respiratory droplets that fall quickly, the key control measures are reducing direct contact, cleaning surfaces, physical barriers, physical distancing, use of masks within droplet distance, respiratory hygiene, and wearing high-grade protection only for so-called aerosol-generating health-care procedures. Such policies need not distinguish long-range transmission and overdispersion of the basic reproduction number ( $R_0$ ), discussed below – consistent with airborne spread of SARS-CoV-2 that cannot be adequately explained by droplets or fountains.<sup>1</sup> The high incidence of such events in only suggests the dominance of aerosol transmission.

Second, long-range transmission of SARS-CoV-2 between people in adjacent rooms but near in each other's presence has been documented in quarantine hotels.<sup>2</sup> Historically, it was possible to prove long-range transmission only in the complete absence of community transmission.<sup>3</sup>

Third, asymptomatic or presymptomatic transmission of SARS-CoV-2 from people who are not coughing or



www.lancet.com  
April 10, 2021  
https://doi.org/10.1016/S0140-6736(21)00492-1

# Academic Tribes and Territories

SECOND EDITION



Tony Becher and  
Paul R. Trowler



TRIBE 1: Evidence-based medicine  
Totem: The hierarchy of evidence



TRIBE 2: Pragmatic public health  
Totem: The real-world case study

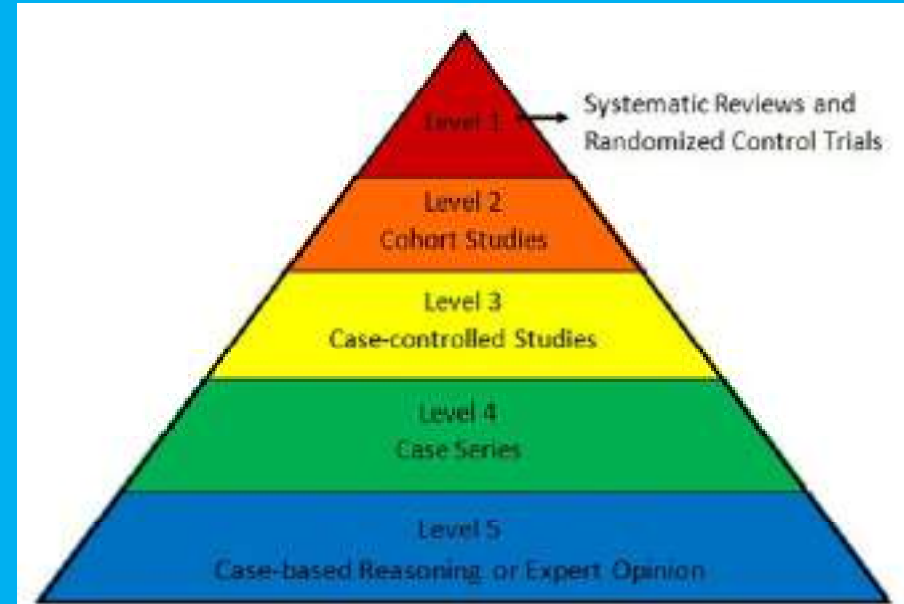
# Evidence-based medicine

There is a *hierarchy* of evidence – with randomised controlled trials at the top

Good science is assumed to be defined by the use of *correct methods*

Some methods are better than others

If participants are randomized in an experiment, that is good science; if they're not, it is less good science



Evidence-based medicine's hierarchy of evidence



# President Trump's Covid-19 adviser, September 2020



 **Scott W. Atlas**  @S... 1d

Masks work? NO: LA, Miami, Hawaii, Alabama, France, Philippnes, UK, Spain, Israel. WHO:"widesprd use not supported" + many harms; Heneghan/Oxf CEBM:"despite decades, considerble uncertainty re value"; CDC rvw May:"no sig red'n in inflnz transm'n"; learn why



The Year of Disguises  
[aier.org](http://aier.org)



# Pragmatic public health

There is *no universally applicable hierarchy of evidence* – though some methods may be more or less fit for purpose

Good science is assumed to be defined by the use of multiple methods, adaptively and pragmatically, to build a *nuanced narrative of what has happened and why*

*Theory* is at least as important as method

All the evidence needs to be explained (we can't simply say "low quality => ignore").



Pragmatic public health's  
real-world case study

# IGNORED MASK STUDIES: TOO FAR DOWN THE “HIERARCHY OF EVIDENCE”?



sneeze  
videos!



choir  
stories!

THE NEW ENGLAND JOURNAL OF MEDICINE

CORRESPONDENCE

## Visualizing Speech-Generated Oral Fluid Droplets with Laser Light Scattering

**TO THE EDITOR:** Aerosols and droplets generated during speech have been implicated in the per- speech-generated droplets and their trajectories were visualized.

Morbidity and Mortality Weekly Report (MMWR)

CDC

## High SARS-CoV-2 Attack Rate Following Exposure at a Choir Practice — Skagit County, Washington, March 2020

Weekly / May 15, 2020 / 69(19):606-610

On May 12, 2020, this report was posted online as an MMWR Early Release.

Lee-Hammer, MPH; Polly Dubbel, MPH; Ian Capron; Andy Ross, MPH; Amber Jordan, MPH; Jaxon Lee, MPH; Joanne Lynn<sup>1</sup>; Amelia Ball<sup>1</sup>; Simranjit Narwal, MSc; Sam Russell<sup>1</sup>; Dale Patrick<sup>1</sup>; Howard Leibrand, MD<sup>1</sup> (View author affiliations)

[View suggested citation](#)

### Summary

**What is already known about this topic?**  
Superspreading events involving SARS-CoV-2, the virus that causes COVID-19, have been reported.

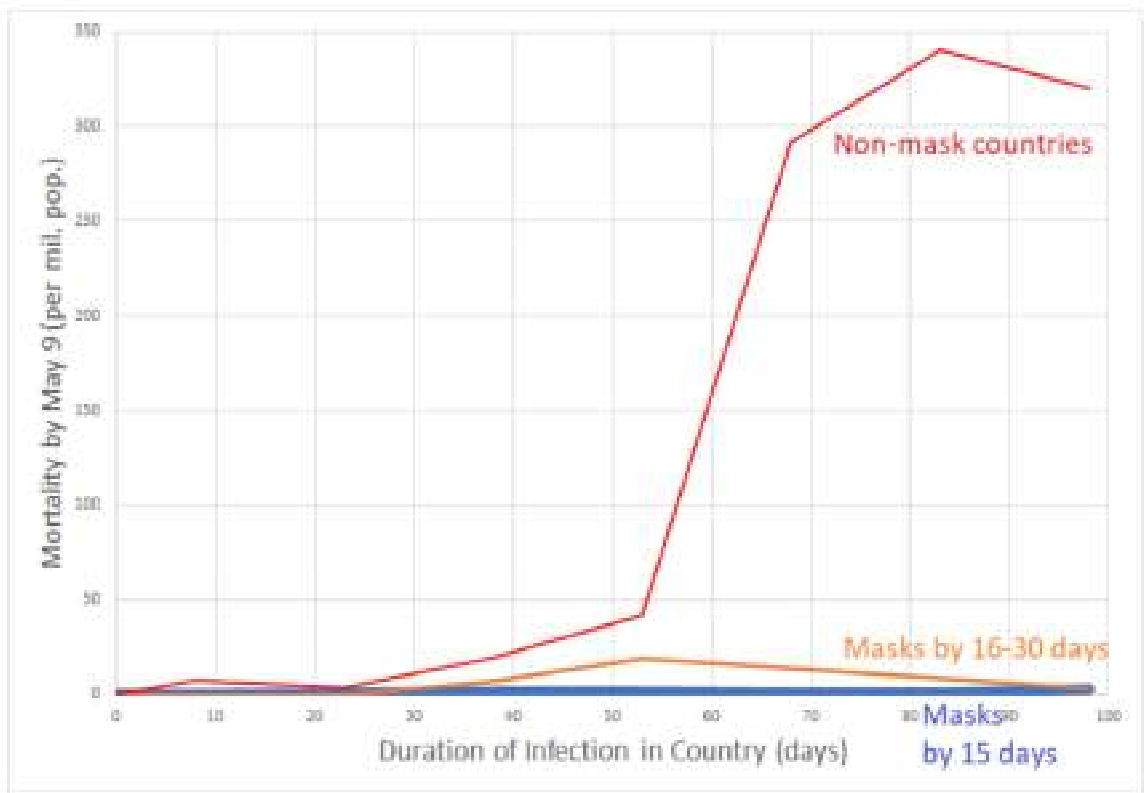
**What is added by this report?**  
Following a 2.5-hour choir practice attended by 61 persons, including a symptomatic index patient, 32 confirmed and 20 probable secondary COVID-19 cases occurred (attack rate = 53.3% to 86.7%); three patients were hospitalized, and two died. Transmission was likely facilitated by close proximity

**Article Metrics**

Altmetric

News (47)  
Blogs (28)  
Policy documents (2)  
Twitter (1267)  
Facebook (20)  
Wikidata (0)  
Reddit (0)

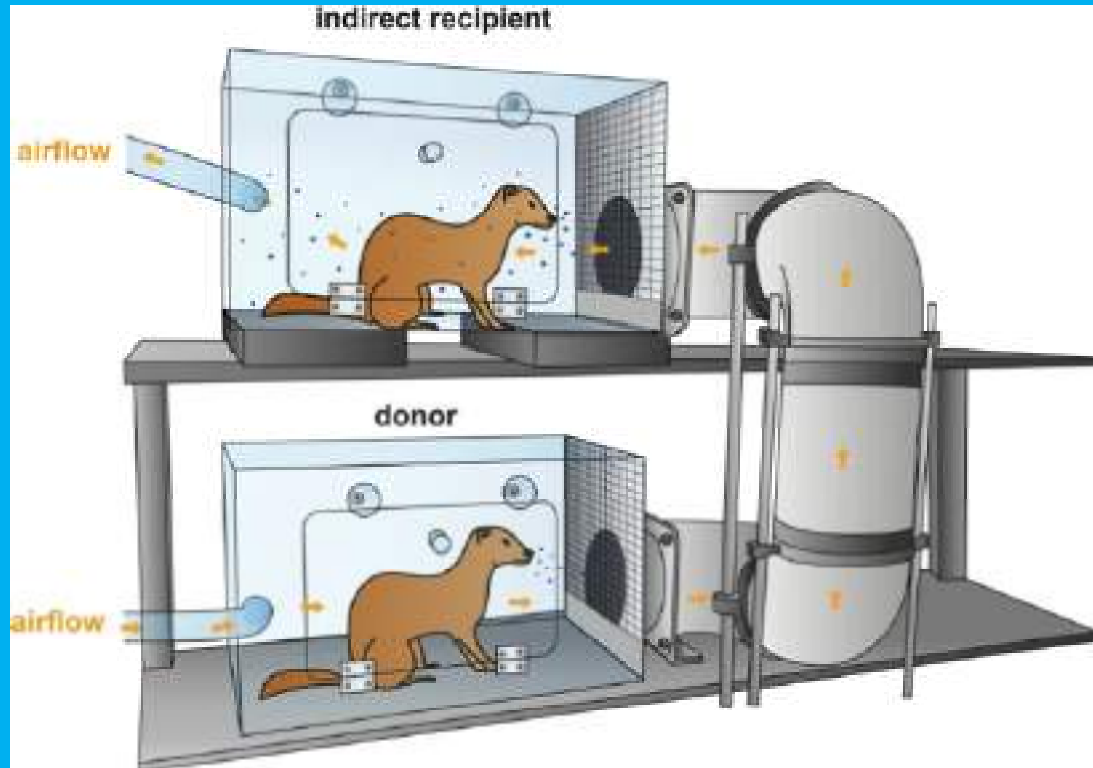
# IGNORED MASK STUDIES: EVIDENCE FROM “THOSE OTHER COUNTRIES”



UK: 128,000 deaths  
USA: 610,000 deaths  
Brazil: 450,000 deaths

Vietnam: 44 deaths  
Taiwan: 29 deaths  
Hong Kong: 210 deaths

# IGNORED MASK STUDIES: ANIMAL EXPERIMENTS



Ferrets became infected with Covid-19 when connected only by an air duct with 4 x 90-degree bends

# IS SARS-CoV-2 AIRBORNE?



## EBM traditionalists:

- Ideally, RCTs ✗
- Consistent, direct isolation of viable virus from air samples ✗
- Consistent, direct infection of humans from sharing air ✗

## Aerosol Scientists + Public Health:

- Super-spreader events e.g. choir practices ✓
- Long-range transmission e.g. quarantine hotels ✓
- Asymptomatic transmission ✓
- Indoors >> outdoors ✓
- Ferrets in cages ✓
- Air sampling sometimes ✓
- Air filters ✓
- Hospital-acquired Covid reduced++ by mask-wearing ✓


No

Yes



*“The lack of recoverable viral culture samples of SARS-CoV-2 prevents firm conclusions to be drawn about airborne transmission. **The current evidence is low quality, and there is an urgent need to standardise methods and improve reporting.**”*

- Heneghan et al, “living” systematic review on the evidence for airborne transmission of SARS-CoV-2, March 2021 (and not updated since)



Orthodoxy  
power move

# Open Peer Review

Reviewer Status **X ? X**

## Reviewer Reports

### Invited Reviewers

	1	2	3
<b>Version 2</b> (revision) 06 Sep 21	<b>X</b> read		<b>X</b> read
	▲		▲
<b>Version 1</b> 24 Mar 21	<b>X</b> read	<b>?</b> read	<b>X</b> read

1. **David R. Tomlinson**, University Hospitals Plymouth NHS Trust, Plymouth, UK
2. **Nancy H. L. Leung**, The University of Hong Kong, Hong Kong, Hong Kong
3. **Maosheng Yao**, Peking University, Beijing, China

F1000Research

1100Research 2021, 10(231) Last updated: 24 MAR 2021

Check for updates

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<sup>1</sup>University of Oxford, Oxford, Oxfordshire, UK  
<sup>2</sup>Public Health Agency of Canada, Ottawa, Ontario, Canada  
<sup>3</sup>1) Ka Shing Institute of Virology and Dept of Medical Microbiology & Immunology, University of Alberta, Alberta, Canada  
<sup>4</sup>University of Calgary and Alberta Health Services, Calgary, Canada

**V1** First published: 14 Mar 2021, 10:231  
<https://doi.org/10.12688/f1000research.52091.1>  
Latest published: 24 Mar 2021, 10:232  
<https://doi.org/10.12688/f1000research.52091.1>

Open Peer Review

Reviewer Status: AWAITING PEER REVIEW

“Living” systematic review questioning airborne transmission failed peer review x2; authors appear to have decided not to update it.

The orthodoxy has been (partially) overcome.



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



Heneghan and colleagues' systematic review, funded by WHO, published in March, 2021, as a preprint, states: "The lack of recoverable viral culture samples of SARS-CoV-2 prevents firm conclusions to be drawn about airborne transmission." This conclusion, and the wide circulation of the review's findings, is concerning because of the public health implications.

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Published Online  
April 15, 2021  
<https://doi.org/10.1016/j.lan.2021.03.049>

1. Moved FAST to summarise the heterodox view in a 1200-word paper.
2. Persuaded the Lancet to publish it.
3. Mobilized our social media networks → most-tweeted Lancet paper EVER.
4. Radio (live phone-ins), TV (breakfast sofas), newspapers x100.



# MENTAL MODELS

# INTERFACE FOCUS

[royalsocietypublishing.org/journal/rsfs](https://royalsocietypublishing.org/journal/rsfs)

## Review



**Cite this article:** Greenhalgh T. 2021

Miasmas, mental models and preventive public health: some philosophical reflections on science in the COVID-19 pandemic. *Interface Focus* **11**: 20210017.  
<https://doi.org/10.1098/rsfs.2021.0017>

# Miasmas, mental models and preventive public health: some philosophical reflections on science in the COVID-19 pandemic

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Trisha Greenhalgh

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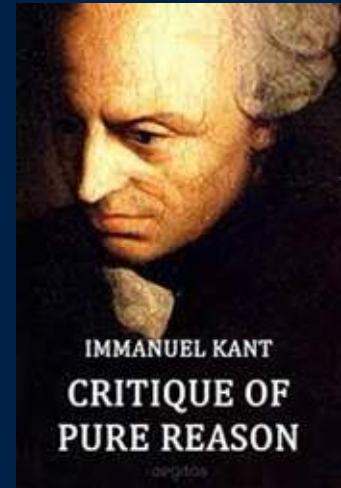
Primary Care Health Sciences, University of Oxford, Oxford OX2 6GG, UK

 TG, 0000-0003-2369-8088

When the history of the COVID-19 pandemic is written, it is likely to show that the mental models held by scientists sometimes facilitated their thinking, thereby leading to lives saved, and at other times constrained their thinking, thereby leading to lives lost. This paper explores some competing mental models of how infectious diseases spread and shows how these models influenced the scientific process and the kinds of facts that were generated.

“Thoughts without content are empty; intuitions without concepts are blind”

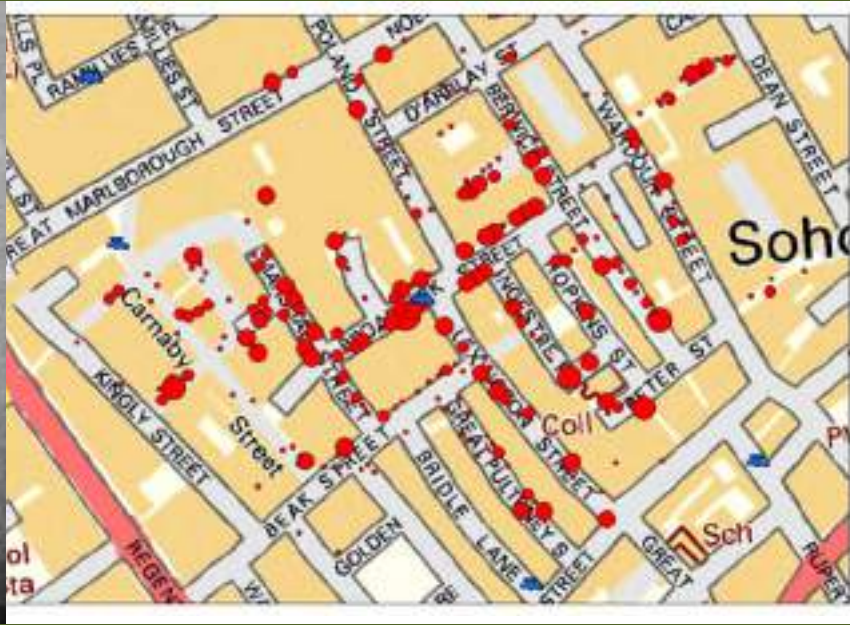
— Immanuel Kant ‘Critique of pure reason’, 1781



“Theory without data is blind; data without theory is lame”

—Sean Carroll ‘The Big Picture’, 2016

ANOTHER EXAMPLE



Dr John Snow - - - - Cholera epidemic mid-1800s - - - - Broad St Pump



Edwin Chadwick's  
miasma theory:  
cholera spread by  
"foul air" (smell  
of sewage)



# Data collected in mid-1800s to inform the science of cholera spread

- Weather conditions
- Temperature and humidity of air
- Whether air smelt foul
- Elevation of the land (because miasma was believed to stay low to the ground)
- Whether houses looked and smelt clean
- Whether containers used for water were clean

# Data requested by Dr John Snow and his partner Henry Whitehead

- “Which pump did people get their water from?”
  - Question added to weekly statistical returns in 1853
  - Broad St pump handle removed Sept 1854



*“it has been suggested by Dr Snow, that the real cause [of the epidemic] lay in the general use of one particular well, situated at Broad Street ... and having (it was imagined) its waters contaminated with the rice-water evacuations of cholera patients. **After careful enquiry, we see no reason to adopt this belief. We do not find it established that the water was contaminated in the manner alleged; nor is there before us any sufficient evidence to show** whether inhabitants of the district, drinking from that well, suffered in proportion more than other inhabitants of the district who drank from other sources.”*

National Board of Health report on Soho cholera epidemic, 1855

*After careful enquiry, we see no reason  
to adopt this belief. We do not find it established  
nor is there before us any sufficient  
evidence*



Orthodoxy  
power move



*Thomas Wakley*

M.P. FOR FINCHBURY, AND EDITOR OF THE LANCET

*“in riding his hobby [horse] very hard [Dr Snow] has fallen down through a gully-hole and has never since been able to get out again”*

Dr Thomas Wakley (founding editor of The Lancet). The Public Health and Nuisances Removal Bill: Dr Snow’s evidence. Lancet 1855; 66: 634-637.



John Snow died in 1858.

The miasma theory of cholera persisted and continued to influence policy—until the devastating cholera outbreak in London in 1866, where 93% of all victims were customers of a particular water company.

Slowly and quietly, the miasma theory of cholera was replaced by a waterborne theory.

ANOTHER EXAMPLE

ANOTHER (BRIEF)  
EXAMPLE



**Dr. Deepti Gurdasani**

@dgurdasani1

...

Can someone please explain to me how @UKHSA has written an entire protocol on how to assess the association of Adenovirus, SARS-CoV-2 and HHV-6 with acute hepatitis \*without\* including testing for COVID-19 serology. Seriously. How?

[khub.net/documents/1359...](https://khub.net/documents/1359...)

23<sup>rd</sup> May 2022: UK Health Security Agency's protocol for investigating fulminant hepatitis published.

If your mental model of Covid-19 is that it is "mild in children", you won't look for evidence of SARS-CoV-2 infection in a mystery illness that is causing liver failure and death in children

# WHY THE WHO TOOK TWO YEARS TO SAY COVID IS AIRBORNE

Early in the pandemic, the World Health Organization stated that SARS-CoV-2 was not transmitted through the air. That mistake and the prolonged process of correcting it sowed confusion and raises questions about what will happen in the next pandemic. **By Dyani Lewis**

**A**s 2021 drew to a close, the highly contagious Omicron variant of the pandemic virus was racing around the globe, forcing governments to take drastic actions once again. The Netherlands ordered most businesses to close on 19 December, Ireland set curfews and many countries imposed travel bans in the hope of taming the spread of COVID-19 cases in their hospitals.

The website says that transmission can occur through “long-range airborne transmission” in poorly ventilated or crowded indoor settings “because aerosols can remain suspended in the air or travel farther than a conversational distance”.

“It was a relief to see them finally use the word ‘airborne,’ and to say clearly that airborne transmission and aerosol transmission are synonymous,” says aerosol chemist Louisa Hopper

thought to fall to the ground – along with hand washing and surface disinfection to stop transfer of droplets to the eyes, nose and mouth.

It took until 20 October 2020 for the agency to acknowledge that aerosols – tiny specks of fluid – can transmit the virus, but the WHO said this was a concern only in specific settings, such as indoor, crowded and inadequately ventilated spaces. Over the next six months, the agency gradually altered its advice to say that aerosols could carry the virus for more than a metre and remain in the air.

But this latest tweak is the WHO’s clearest statement yet about airborne transmission of SARS-CoV-2. And it places the virus among a select group of ‘airborne’ infections, a label long reserved for just a handful of the world’s most virulent pathogens, including measles, chickenpox and tuberculosis.

The change brings the WHO’s messaging in line with what a chorus of aerosol and public-health experts has been trying to get it to say since the earliest days of the outbreak. Many decry the agency’s slowness in stating – unambiguously – that SARS-CoV-2 is airborne. Interviews conducted by Nature with dozens of specialists on disease transmission suggest that the WHO’s reluctance to accept and communicate evidence for airborne transmission was based on a series of problematic assumptions about how respiratory viruses spread.

For example, even in the middle of the fast-moving epidemic, the WHO dismissed field epidemiology reports as proof of airborne transmission because the evidence was not definitive, something that is difficult to achieve quickly during an outbreak. Other criticisms are that the WHO relies on a narrow band of experts, many of whom haven’t studied airborne transmission, and that it shows a precautionary approach that could have protected countless people in the early stages of the pandemic.

Critics say that inaction at the agency led to national and local health agencies around the world being similarly sluggish in addressing the airborne threat. Having shifted its position incrementally over the past two years, the WHO also failed to adequately communicate its changing position, they say. As a result, it

Dyani Lewis, Nature Comms 7<sup>th</sup> April 2022 p 604

WHO March 2020 “fake news: Covid is not airborne”

In July 2020, 237 aerosol scientists offered help to WHO, “overwhelming evidence”; offer was rejected

Dr John Conly was a coauthor on the Heneghan review and chair of the key WHO committee that rejected airborne theory for two years





RESEARCH ARTICLE

**REVISED** **Orthodoxy, *illusio*, and playing the scientific game: a Bourdieusian analysis of infection control science in the COVID-19 pandemic**

Trisha Greenhalgh <sup>1</sup>, Mustafa Ozbilgin <sup>2</sup>, Damien Contandriopoulos <sup>3</sup>

<sup>1</sup>Nuffield Department of Primary Care Health Sciences, University of Oxford, Oxford, OX2 6GG, UK

<sup>2</sup>Brunel University London, Uxbridge, UB8 3PH, UK

<sup>3</sup>School of Nursing, University of Victoria, Victoria, British Columbia, V8P 5C2, Canada

Mental models are not neutral – they are linked to scientific capital (power, prestige, accolades, influence). Those who hold them defend them fiercely.



# TAKE-HOME POINTS

Scientists operate within shared mental models developed by previous scientists in our field.

Orthodox ways of doing science bring us status and power (“capital”) which we have a vested interest in defending.

Media will pick the science that aligns with their narrative and offers a good story.

If you don't ride the tiger of mainstream and social media, it will ride you.

# VOGUE

NOV 2020

TRISH GREENHALGH PUTTING THE WHITE SHIRT BACK ON THE RUNWAY

POLYMERASE CHAIN REACTIONS EXPLAINED

FROM FOLLOWING FASHION TO FOLLOWING THE SCIENCE

## Trish

*"Kate Moss taught me everything I know about Primary Health Care"*

 @trishgreenhalgh



UNIVERSITY OF OXFORD



# THANK YOU FOR YOUR ATTENTION

Professor Trisha Greenhalgh,  
University of Oxford

