Why so much misinformation?

(and how do we fix the situation?)

Where does the mis- (and dis-) information come from?

- We often associate this problem with “anti-vax” positions
- This part is easier to deal with, as it’s better recognized
- The more dangerous kind appears to come from “inside the house” – mis/disinformation disguised as science
- Directly bad, but also erodes trust in actual science, and ends up encouraging the other kind of misinformation as well

Medical vs scientific literature

- "*It is simply no longer possible to believe much of the clinical research that is published, or to rely on the judgment of trusted physicians or authoritative medical guidelines. I take no pleasure in this conclusion, which I reached slowly and reluctantly over my two decades as an editor of The New England Journal of Medicine.*" – Dr. Marcia Angell, MD[1]
- Institutional medicine has a very different culture, structure and training from science, engineering etc[2]
- There is no effective mechanism to require someone with high status to reconcile their positions with evidence provided by someone with lower status(!)
- This carries over into publishing, where all sorts of things get published in mainstream medical journals that wouldn't pass peer review in the scientific literature outside "fringe"
- Not saying it's all junk – just that there's not much QC

1. https://web.archive.org/web/20151208022937/https://www.nybooks.com/articles/2009/01/15/drug-companies-doctorsa-story-of-corruption/

2. Bennett, S. The 2018 Gosport Independent Panel report into deaths at the National Health Service's Gosport War Memorial Hospital. Does the culture of the medical profession influence health outcomes? *Journal of Risk Research* **23**, 827–831 (2020).

A representative example – "harms"

"*Respiratory consequences of N95-type Mask usage in pregnant healthcare workers – a controlled clinical study*"[1]

Reported: "*Although harm was not demonstrated in the context of this experimental protocol, the significant changes to respiratory physiology caused by breathing through N95 mask materials raise the concern regarding prolonged use of N95-masks by pregnant healthcare workers.*"

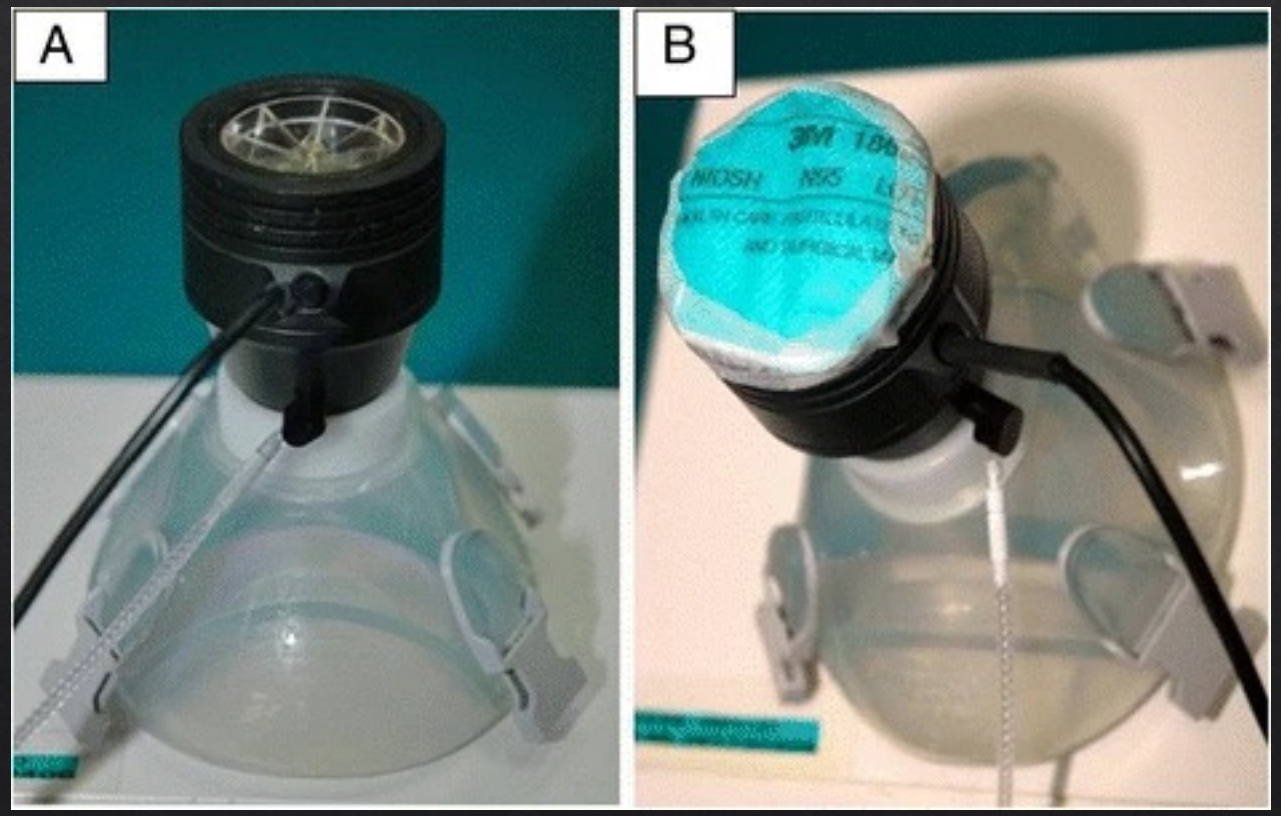
Widely cited in the pandemic, including in a 2020 publication by the IPCRDEG-C19[2] on whose advice WHO policy over the first year of the pandemic was largely based,[3] as justification for opposing "…*the precautionary principle with consequent use of particulate respirators instead of medical masks as a component of PPE for routine care of COVID-19 patients…*".[2]

1. Tong, P. S. Y. *et al.* Respiratory consequences of N95-type Mask usage in pregnant healthcare workers—a controlled clinical study. *Antimicrobial Resistance & Infection Control* **4**, 48 (2015).

2. Conly, J. *et al.* Use of medical face masks versus particulate respirators as a component of personal protective equipment for health care workers in the context of the COVID-19 pandemic. *Antimicrobial Resistance & Infection Control* **9**, 126 (2020).

3. Greenhalgh, T., Ozbilgin, M. & Contandriopoulos, D. Orthodoxy, illusio, and playing the scientific game: a Bourdieusian analysis of infection control science in the COVID-19 pandemic. *Wellcome Open Res* **6**, 126 (2021).

A representative example – "harms"



"*Tight fitting Hans Rudolph respirator masks used in Phase II. (a) Control cycles with outlet open to air, and (b) N95 cycles with outlet covered by N95 mask materials*"

"*N95-mask materials were trimmed to form an airtight seal over the Hans Rudolph mask outlet so that the air flow resistance on inspiration and expiration would come from the mask material,* ***simulating the actual wearing of an N95 respirator*** *(Fig. 2)*" (emphasis added).

Roughly 12.5 cm^2, cut from a 3M 1860(S?) of ~150 cm^2 – or equivalent resistance to wearing >10 well-sealed respirators on top of one another!

2015 paper, cited 79 times as of 2024.03.15 – 73 of which include the term "COVID"

https://scholar.google.com/scholar?&cites=7724111734987342274&scipsc=1&q=COVID

So many more examples…

- The "big 3" papers used to argue that respirators do not provide better protection against infections were all designed as "intermittent use"
- Recent paper in JAMA Pediatrics claiming "*Only 1 child (1/271 [0.4%]), after exclusions, met the WHO PCC definition…*".[1] In response to our letter,[2] they admitted: "*Ideally, we would have asked about the 24 symptoms listed in the WHO long COVID definition. These criteria did not come out until February 2023, after our study was finished.*"[3] No retraction!
- Etc…

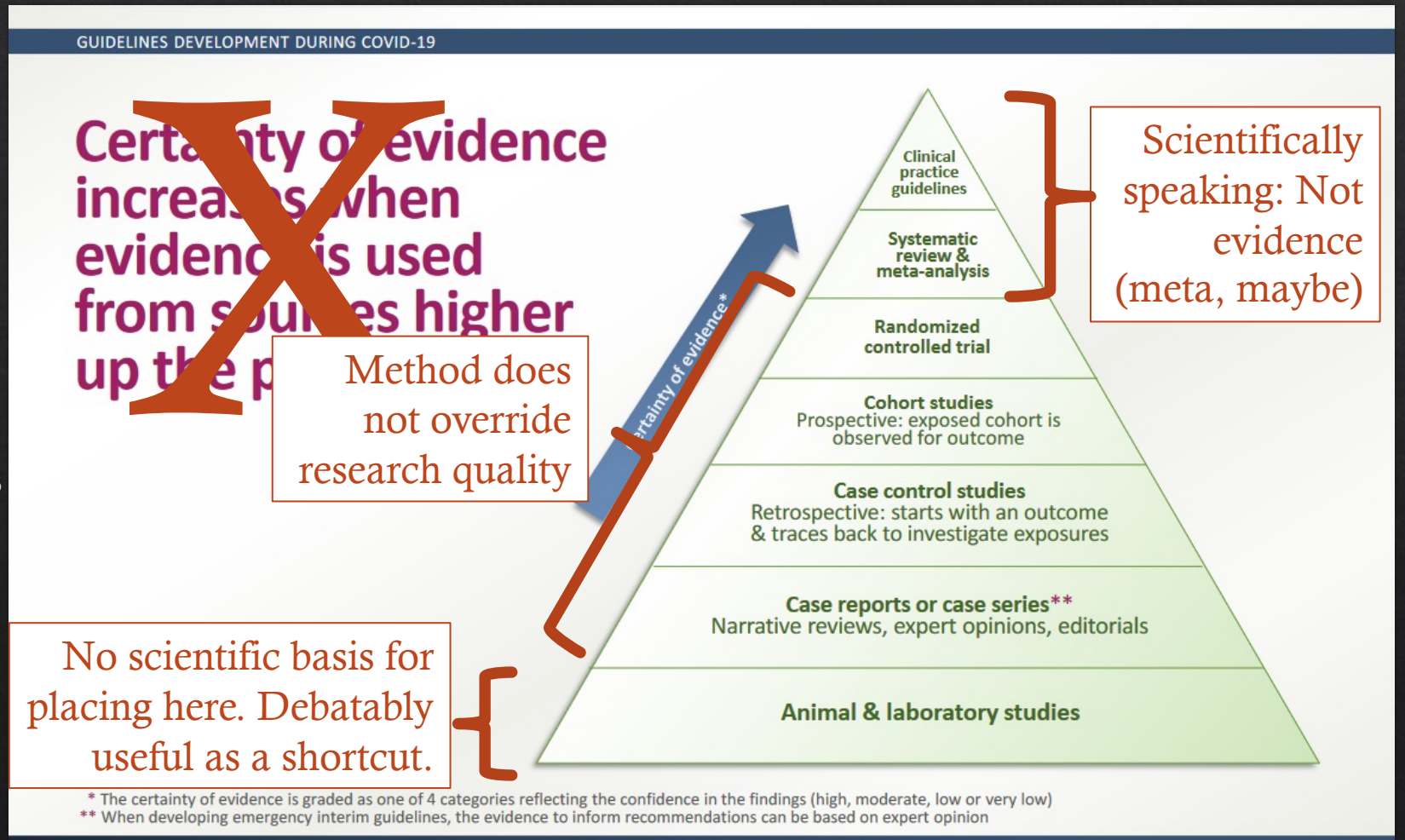
Photo credit rhododendrites via Wikimedia Commons

1. Hahn, L. M. *et al.* Post–COVID-19 Condition in Children. *JAMA Pediatrics* (2023) doi:10.1001/jamapediatrics.2023.3239.
2. Murdoch, B., Gasperowicz, M. & Ungrin, M. Definitional and Methodological Errors in Pediatric Post-COVID-19 Condition Research Letter. *JAMA Pediatr* **178**, 319 (2024) doi:10.1001/jamapediatrics.2023.6141.
3. Hahn, L., Robinson, J. & Mandhane, P. J. Definitional and Methodological Errors in Pediatric Post–COVID-19 Condition Research Letter—Reply. *JAMA Pediatrics* (2024) doi:10.1001/jamapediatrics.2023.6136.

Epidemic and Pandemic Preparedness and Prevention (EPP). *Update 55 – WHO COVID-19 Guidelines Development Process*. https://www.who.int/publications/m/item/update-55-who-covid-19-guidelines-development-process (2021).

How does this happen?

- EBM's hierarchy of evidence is a subjective policy on how to take shortcuts when interpreting science
- EBM is useful under the right circumstances, but **not** "how science works"[1-3]
- Over-emphasis in early clinical training means many do not realize this



1. Rawlins, M. De Testimonio: on the evidence for decisions about the use of therapeutic interventions. *Clinical Medicine* **8**, 579–588 (2008).
2. Rosenfeld, J. A. The view of evidence-based medicine from the trenches: liberating or authoritarian? *Journal of Evaluation in Clinical Practice* **10**, 153–155 (2004).
3. Greenhalgh, T., Fisman, D., Cane, D. J., Oliver, M. & Macintyre, C. R. Adapt or die: how the pandemic made the shift from EBM to EBM+ more urgent. *BMJ Evidence-Based Medicine* **27**, 253–260 (2022).

Get involved!

- An MD is not the same thing as a PhD – not better, not worse, but the training is very different
- It's not too complicated for you to make a contribution
  - This is a widespread tactic used to claim "ownership" over e.g. PPE vs infectious diseases
  - "Authoritarian epistemic trespass" ≠ "Inquisitive epistemic trespass"
- If you see suspicious research, look into it and speak up
  - Especially in the medical literature, the people doing the study often have no more advanced science training than you do
- There's so much junk out there – we need your help!