Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

However, our methods contain several important caveats, and we acknowledge the large bounds of uncertainty around the prevalence estimates produced. We need more high-quality mental health survey data across many parts of the world throughout 2020 and 2021 to better understand the effect of COVID-19 on the prevalence of mental disorders. Our method and results reflect the best approach and best estimates available, given the limitations and sparsity of available data. We appreciate the work by researchers like Daly and Robinson in doing these surveys during challenging circumstances brought about during the pandemic. We hope to see more work of this kind in the future.

We declare no competing interests.

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Transmission of SARS-CoV-2: still up in the air

Trisha Greenhalgh and colleagues claim that the dominant mode of SARS-CoV-2 transmission is likely to be airborne.[1] However, many of the reasons that are cited as support for airborne transmission do not hold up to scrutiny. We acknowledge that transmission occurs along a spectrum and airborne spread is possible, particularly in crowded and poorly ventilated settings, but the epidemiology and scientific literature do not support airborne spread as the predominant mode of transmission.

First, the notion that asymptomatic or presymptomatic transmission implies an airborne mode of transmission is inaccurate, as asymptomatic and presymptomatic shedding have been described with other respiratory viruses.[2] Similarly, decreased risk of transmission in an outdoor setting has been described with other viruses that are transmitted by the droplet and contact routes.[3]

Second, in many reports of nosocomial infections, health-care workers used incomplete or inappropriate personal protective equipment, such as absence of eye protection, and these reports cannot rule out other modes of transmission. Reports of transmission despite appropriate personal protective equipment also do not consider whether personal protective equipment was doffed appropriately. Most health-care workers make errors during doffing, which has been shown to be associated with self-contamination.[4]

Finally, Greenhalgh and colleagues do not account for the fact that containment measures focusing on prevention of droplet transmission have been effective at bringing the basic reproduction number below 1 in many jurisdictions.[5]

The science is far from settled, and we need studies of improved quality to further understand the role of short-range and long-range aerosol transmission of SARS-CoV-2.

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Authors' reply


Julien Mattia/Anadolu Agency/Getty Images

We welcome the opportunity to clarify the misconceptions that were raised by Alison Lopez and Jocelyn Srigley, which reflect a widely held but fundamentally flawed paradigmatic view among infection control clinicians.

In our Comment,[1] we list the streams of evidence that suggest that the most plausible explanation for mode of transmission is predominantly an airborne method.[2–4] A predominantly droplet mode (ie, spread mainly via coughing and sneezing) cannot explain the epidemiological pattern of this pandemic: transmission is far lower outdoors; asymptomatic or presymptomatic spread is common; superspreading is almost solely indoors; and when comprehensive studies are done, transmission beyond droplet distance of 1·8 m occurs commonly, sometimes with only fleeting exposure.[1–4]

That other respiratory diseases show asymptomatic shedding and are less transmissible outdoors suggests

that they too are transmitted via smaller aerosols, which float and build up in indoor air. Many diseases were originally misclassified as transmitted by droplets because of the same flawed reasoning.[4] Measles, for example, was considered to be transmitted by droplets until the 1980s, when its airborne character was shown beyond doubt.[2,4]

Scarcity of personal protective equipment for droplet transmission or poor donning–doffing technique could hypothetically explain nosocomial cases, although we know of no studies that have shown this directly. The US Centers for Disease Control and Prevention states that surface transmission is rare.[5] However, the sheer number of health-care workers affected and the substantial reduction in nosocomial infections after the universal use of masks was introduced in hospitals[6] makes airborne transmission a more likely explanation. Nosocomial transmission occurs despite personal protective equipment for droplet transmission and eye protection.[7]

Containment measures aimed at reducing droplet transmission, which include use of masks and physical distancing, have indeed reduced transmission of SARS-CoV-2. This is because they are effective against both droplet and aerosol transmission—especially since most aerosol transmission occurs in close proximity (eg, where exhaled cigarette smoke or the smell of garlic breath are strongest).

Lopez and Srigley's response to our Comment[1] shows a logical fallacy: droplets (which quickly fall) dominate transmission at short range; since SARS-CoV-2 is transmitted mainly at short range, it must be transmitted primarily via droplets. The best explanation for the observed transmission pattern of SARS-CoV-2—ie, short-range infection producing most new cases along with shared-room infection producing substantial numbers of cases and superspreading—is dilution of exhaled aerosols with distance from a person who is infected.[4]

The idea that close proximity transmission is droplet transmission is a basic error of logic that is widely propagated in the scientific literature.[8] We exhort editors and reviewers to be alert to this bibliographic virus (ie, a claim that gets reproduced from one publication to the next without being independently verified) and take steps to help to stop its transmission.

DF has served on advisory boards for Pfizer, AstraZeneca, Sanofi, and Seqirus vaccines and has provided legal advice to the Elementary Teachers Federation of Ontario and Ontario Nurses' Association. RS has received consulting fees from Sempra Energy and Lysentech; honoraria from the International Antiviral Society–USA; has a patent application submitted for oral anti-coronavirus compounds; has been on a data safety monitoring board for Merck and Vir Biotechnology; has a voluntary (unpaid) leadership role in the Conference on Retroviruses and Opportunistic Infections Foundation Board of Directors and International Antiviral Society–USA; and has stocks or shares in Antiva Biosciences, CytoDyn, and Arcturus. All other authors declare no competing interests.

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Department of Error

NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in hypertension prevalence and progress in treatment and control from 1990 to 2019: a pooled analysis of 1201 population-representative studies with 104 million participants. Lancet *2021;* **398:** *957–80*—In this Article, Marialaura Bonaccio, Maria Benedetta Donati, and Francesco Gianfagna have been added to the NCD Risk Factor Collaboration list, and Steinar Krokstad's name has been corrected. These corrections have been made to the online version as of Feb 3, 2022

Miras AD, le Roux CW. Metabolic surgery versus conventional therapy in type 2 diabetes. Lancet *2021;* **397:** *256–57—In this Comment, the declaration of interest statement for Carel W le Roux has been corrected to read* "CWlR reports grants from the Irish Research Council, Science Foundation Ireland, Anabio, and the Health Research Board. He serves on advisory boards of Novo Nordisk, Herbalife, GI Dynamics, Eli Lilly, Johnson & Johnson, Sanofi Aventis, AstraZeneca, Janssen, Bristol-Myers Squibb, Glia, and Boehringer Ingelheim. ClR is a member of the Irish Society for Nutrition and Metabolism outside the area of work commented on here. He is the chief medical officer and director of the Medical Device Division of Keyron since January 2011. Both of these are unremunerated positions. CWlR was a previous investor in Keyron, which develops endoscopically implantable medical devices intended to mimic the surgical procedures of sleeve gastrectomy and gastric bypass. The product has only been tested in rodents and none of Keyron's products are currently licensed. They do not have any contracts with other companies to put their products into clinical practice. No patients have been included in any of Keyron's studies and they are not listed on the stock market. ClR was gifted stock holdings in September 2021 and divested all stock holdings in Keyron in September, 2021. He continues to provide scientific advice to Keyron for no remuneration." These corrections have been made to the online version as of Feb 3, 2022.