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COVID-19 Infection via the Eyes and Mask Protection Misinformation Irresponsible failure of health authorities regarding need for protective goggles?

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Introduction

Airborne virus: The number of reported cases of COVID-19 infections continues to rise worldwide in a pandemic for which there is no end in sight. Other than lockdowns, social distancing and vaccinations, the major recommendation is masking to cover the nose and mouth. This is because COVID-19 is recognized to be an airborne virus, primarily leading to infection via respiration.

As an airborne virus, it is however appropriate to ask whether infection is possible via the eyes in some way. Little is said of this possibility and it may well have been dismissed by health authorities as of low probability. Will further research discover that such negligence is highly irresponsible? Why has it been assumed that covering the mouth and nose provides an adequate degree of protection?

Eye protection? The purpose in what follows is to indicate what research there is on the matter in order to assist those concerned with the possibility of achieving a higher degree of protection than is purportedly provided by the recommended masks. **Should the eyes be covered, potentially with goggles of some kind -- or masks appropriate to biochemical warfare?** Surgeons and dentists make use of greater protection. In response to COVID-19, front-line health workers wear face shields in addition to masks.

Do these suggest that there is an undeclared degree of suspicion that infection is possible by routes other than the nose and mouth? Beyond that earlier suspicion, as variously noted below, **it has now been confirmed that this is the case** (*Ocular tissue can be infected by SARS CoV-2, Coronavirus News Source, 30 April 2021*).

Confirmation? The situation could be comparable to that regarding HIV infection by mosquitoes -- a possibility long dismissed, despite the extensive preoccupation with "dirty needles". Why is a mosquito bite in no way comparable with a "dirty needle"? Why has the matter not been more assiduously researched? Is there a correlation between dissemination of AIDS and the incidence of mosquitoes? Robert Strecker makes the point through proposing a challenge to sceptical researchers: *Would you put your arm into a space filled with mosquitoes which had recently bitten someone infected with AIDS?* (*The Strecker Memorandum*).

For those dubious of the probability of COVID infection via the eyes, a similar test might be readily undertaken. *With only the mouth and nose covered by a high quality mask, would you willingly share a space with people known to be infected with COVID -- if infection via the eyes was a possibility?*

Ignoring another "Code Red"? Following infection, one symptom following infection by COVID-19 is **conjunctivitis** ("pink eye" or "red eye"). Infection via the eye is another matter. Given recommendations worldwide for the use of billions of masks to cover mouth and nose, **it is appropriate to ask why the possibility of infection via the eyes has been ignored** -- and why warnings of that possibility have not been evident. With the "mysterious" increase in infection rates, especially following emergence of the Delta variant, does this not suggest a "Code Red" situation calling for extremely rapid response?

Also framed as a "Code Red", there is some irony to the warning for global civilization in the recent publication of the new IPCC report on the predicted climate change catastrophe (*Sixth Assessment Report, Climate Change 2021: The Physical Science Basis*, August 2021).

Irresponsibility? The vital question is whether health authorities have been totally irresponsible in failing to recommend masks appropriate to biochemical warfare. Is that what the challenge of airborne viral infection demands? **There is little point in shutting the "doors" (mouth and nose) for protection -- whilst leaving open the "window" (the eyes)**. Some clarity is offered by Daniel Wilks

(*Your Eyes Could Be the Window to COVID-19*, *Myhealth1st*, 10 November 2020).

Viability? Clearly mask manufacturers are profiting considerably from recommendations for masking by authorities -- and presumably are assiduous in lobbying for the vital protective role that they perform. Have the manufacturers of safety goggles and eye-covering masks been lax in exploring and promoting the protective value of their products?

References to COVID-19 infection via the eyes

Whilst it is accepted that [conjunctivitis](#) may be a symptomatic manifestation of COVID-19, little attention by health authorities has been given to the possibility that the eyes may be a route via which COVID-19 infection occurs. Recent references indicative of this include the following.

Minas Theodore Coroneo and Peter John Collignon: [SARS-CoV-2: eye protection might be the missing key](#) (*The Lancet: Microbe*, 2, 2021, 5)

Remarkably, a year after the COVID-19 outbreak, we remain ineffectual against widespread community infection. **Perhaps, something major is missing in our approach?** The importance of aerosols versus droplets is debated -- most viral transmission appears to be via virus-laden droplets, with the greatest risk in crowded, inadequately ventilated environments. Proximity to those infected poses the greatest risk. Currently, the presumed major viral invasion modalities involve inhalation or hand contamination of mucosal surfaces, despite studies to the contrary from a century ago showing the importance of eyes as an influenza infection route. **Ocular surface droplet deposition is greatly underappreciated as a probable, frequent route for SARS-CoV-2 transmission.** [*emphasis added*]

Koji Kitazawa, et.: [The Transmission of SARS-CoV-2 Infection on the Ocular Surface and Prevention Strategies](#) (*Cells*, March 2021)

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a global health problem. Although the respiratory system is the main impaired organ, conjunctivitis is one of its common findings. However, it is not yet understood if SARS-CoV-2 can infect the eye and if the ocular surface can be a potential route of SARS-CoV-2 transmissions. Our review focuses on the viral entry mechanisms to give a better understanding of the interaction between SARS-CoV-2 and the eye. We highlighted **findings that give evidence for multiple potential receptors of SARS-CoV-2 on the ocular surface.** Additionally, we focused on data concerning the detection of viral RNA and its spike protein in the various ocular tissues from patients. [*emphasis added*]

Ziyan Chen, et al: [Ocular Involvement in Coronavirus Disease 2019: Up-to-Date Information on Its Manifestation, Testing, Transmission, and Prevention](#) (*Frontiers in Medicine: Ophthalmology*, 30 November 2020)

The coronavirus disease 2019 (COVID-19) pandemic, caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is still underway. An understanding of the virus's mode of transmission and infection is required for its effective containment. Besides the respiratory and digestive tracts, the ocular surface presents an additional mucosal surface that is exposed to infectious droplets and direct/indirect contact. The relationship between SARS-CoV-2 infection and the eye remains controversial. This review examines up-to-date information on ocular manifestation, laboratory testing, transmission, and prevention of COVID-19. Based on clinical observations, the risk of conjunctivitis in COVID-19 is low. Despite the low incidence, positive SARS-CoV-2 results in eye specimens suggest that the ocular surface may harbor SARS-CoV-2, which may increase the infection and transmission risk. **We conclude that the ocular surface remains a potential transmission route for the virus that should not be ignored.** [*emphasis added*]

Mrittika Sen, et al: [COVID-19 and Eye: A Review of Ophthalmic Manifestations of COVID-19](#) (*Indian Journal of Ophthalmology*, 69, 2021, 3)

The pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has had health implications of unprecedented magnitude. The infection can range from asymptomatic, mild to life threatening respiratory distress. It can affect almost every organ of the body. Ophthalmologists world over are reporting various manifestations of the infection in the eye. This review was undertaken to help ophthalmologists recognize the possible manifestations and the stage of the viral disease when they commonly appear. Literature search was performed for the publications on ophthalmic manifestations of coronavirus disease-19 (COVID-19) between January 1, 2020 and January 31, 2021. 46 case reports, 8 case series, 11 cross sectional/cohort observational studies, 5 prospective interventional studies, 3 animal models/autopsy studies and 6 reviews/meta-analysis were included. Conjunctivitis is the most common manifestation and can develop at any stage of the disease. Direct effect due to virus, immune mediated tissue damage, activation of the coagulation cascade and prothrombotic state induced by the viral infection, the associated comorbidities and drugs used in the management are responsible for the findings in the eye. The viral ribonucleic acid (RNA) has been isolated from ocular tissues but **the role of eye as a route for infection is yet to be substantiated.** [*emphasis added*]

Xuhui Chen, et al: [SARS-CoV-2 on the ocular surface: is it truly a novel transmission route?](#) (*British Journal of Ophthalmology*, 25 August 2020):

Since December 2019, the novel COVID-19 outbreak has spread rapidly around the globe and infected millions of people. Although the major transmission route of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is considered to be airborne droplets and close contact, the ocular transmission route has been reported with great concern. The current work summarises the characteristics of SARS-CoV-2, the ocular distribution of the major SARS-CoV-2 binding protein, and the experimental and clinical evidence of the ocular transmission route. Although it seems that the likelihood of the ocular surface being an infection gateway is low, SARS-CoV-2 infection or transmission via the ocular surface may cause conjunctivitis and other ocular discomfort. Therefore, **good eye protection is an essential safeguard procedure, especially for medical staff.** [emphasis added]

Ahmed Almazroa, et al: *Ocular transmission and manifestation for coronavirus disease: a systematic review* (*International Health*, ihab028, 27 May 2021):

There is currently a lack of information regarding ocular tropism and the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Globally, the cumulative number of coronavirus disease 2019 (COVID-19) cases is increasing daily. Thus **the potential for ocular transmission and manifestations of SARS-CoV-2 requires more investigation.** [emphasis added]

Jing-Yu Qu, et al: *Evidence of SARS-CoV-2 Transmission Through the Ocular Route* (*Clinical Ophthalmology*, 2021, February 18;15)

Currently, the coronavirus disease 2019 (COVID-19) pandemic is raging around the world. However, the transmission of its pathogen, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is not fully clear. **It is still controversial whether the ocular transmission of SARS-CoV-2 exists.** This review aimed to summarize the evidence of SARS-CoV-2 ocular transmission. [emphasis added]

Dominique M. Dockery, et al: *The Ocular Manifestations and Transmission of COVID-19: Recommendations for Prevention* (*The Journal of Emergency Medicine*, 59, 2020, 1):

Research has demonstrated that SARS-CoV-2 is spread primarily through close contact via respiratory droplets, but there is the possibility for ocular transmission, with the conjunctiva as a conduit as well as a source of infection.... All health care professionals should ask patients about ocular symptoms consistent with SARS-CoV-2, and **use eye protection such as goggles or face shields as part of the standard personal protective equipment** for high-risk patients in addition to wearing of masks by both the patient and provider, and should consider tears to be potentially infectious. [emphasis added]

Dawn Ho, et al: *COVID-19 and the Ocular Surface: A Review of Transmission and Manifestations* (*Ocular Immunology and Inflammation*, 28, 2020, 5):

It is controversial whether the virus can be transmitted via tears and its ocular implications have not been widely studied. In this article, the current evidence related to ocular transmission and ocular manifestations is reviewed. [emphasis added]

New Finding: COVID-19 Virus Can Infect Your Eyes (*Medical Forum Weekly*, 6 May 2021):

New study shows that **SARS-CoV-2 can infect ocular tissue. Eye protection is advised in addition to face masks and social distancing** to prevent the spread of the virus. SARS-CoV-2, the causative agent behind the COVID-19 pandemic, has been confirmed to infect ocular tissue, strongly suggesting the need to protect our eyes from infection by this deadly virus. The study was presented 2021 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO) by Dr Sneha Singh and Dr Ashok Kumar, from the Kresge Eye Institute at Wayne State University, in the USA. (*Ocular tissue can be infected by SARS CoV-2, Coronavirus News Source, 30 April 2021*) [emphasis added]

As further clarified by Daniel Wilks (*Your Eyes Could Be the Window to COVID-19, Myhealth1st*, 10 November 2020), whilst sore eyes and conjunctivitis may well be **symptoms** of COVID-19 infection, **direct infection through the eyes** remains a strong possibility:

Your eyes are considered mucous membranes, and viruses are usually transmitted via the mucous membranes. This is the simple version. It gets a little more complicated when you consider that the transmission vector for COVID-19 is "respiratory droplets", aerosolised saliva and mucus expelled when someone with the virus coughs or sneezes. Inhaling one of these droplets through the nose or mouth, not droplets coming in contact with the surface of the eye, is the major cause of infection, but **hand to mucous membrane contact can also transmit the virus....** Most people touch their faces, often unconsciously, multiple times an hour. Although there is no conclusive evidence available as yet as to whether touching a surface covered with infectious material and then **rubbing your eyes can give you COVID-19**, the typical modes of viral infections would suggest this is the case. [emphasis added].

Comparison with research dismissal of HIV infection via mosquitoes

The "dirty needle" argument for the transmission of HIV infection via mosquito bites is widely dismissed, as indicated by the following:

- [Why Mosquitoes Can't Spread HIV, and Which Viruses They Transmit](#) (HealthLine, 17 October 2019)
- M J Bockarie and R Paru: [Can mosquitoes transmit AIDS?](#) (*P N G Medical Journal*, 39, 1996, 3)
- M. M. Iqbal: [Can we get AIDS from mosquito bites?](#) (*Journal of the Louisiana State Medical Society*, 151, 1999, 8)
- Laurence Corash: [If a used needle can transmit HIV, why can't a mosquito?](#) (*Scientific American*, 4 June 2001) ,
- Josh Bloom: [Why Is HIV Not Spread By Mosquitoes?](#) (*American Council on Science and Health*, 2 October 2018)

The arguments tend to focus -- correctly -- on theories regarding the inability of mosquitoes to carry the virus **internally**. However they tend to avoid the "dirty needle" possibility and to avoid exploration of the degree of statistical correlation between the incidence of AIDS and the incidence of mosquitoes.

There is little evidence of the willingness of sceptical researchers to follow through on the challenge of [Robert Strecker](#): *Would you put your arm into a space filled with mosquitoes which had recently bitten someone infected with AIDS?* (*The Strecker Memorandum*). The challenge is ironically consistent with the argument of [Nassim Nicholas Taleb](#) (*Skin in the Game: hidden asymmetries in daily life*, 2018).

Masks without Goggles or Masks with Goggles?

As the leading health authority with respect to COVID-19, it would be expected that the Centers for Disease Control (CDC) would provide any necessary indication on the need for eye protection -- given the recommendations they provide on wearing masks. No such recommendations appear to have been endorsed by the World Health Organization.

The following is all that is offered by the CDC with no further explanation: [Infection Control Guidance for Healthcare Professionals about Coronavirus \(COVID-19\): Eye Protection](#) (3 June 2020):

Use of eye protection is recommended in areas with moderate to substantial community transmission. For areas with minimal to no community transmission, eye protection is considered optional, unless otherwise indicated as part of standard precautions....Eye protection should be worn during patient care encounters to ensure the eyes are also protected from exposure to respiratory secretions.

Given the impact of mask-wearing recommendations worldwide -- often mandatory, and increasingly so -- **has the world been misled with regard to the adequacy of protection by masks alone?** To what extent are masks relatively useless without safety glasses of some kind -- [goggles](#)? Clearly these are considered vital in the case of certain surgical and dental procedures for other reasons. How does their use relate to the argument for [face shields](#) in the case of COVID-19 health workers? Why is it recommended that face shields should be used with spectacles and/or goggles?

Use of masks has been widely recommended in response to the pandemic in part because of their cost/benefit advantages. They are relatively cheap to produce and distribute by the millions. Any additional requirement for goggles would constitute a major burden, and a considerable difficulty for those who wear prescription spectacles. The possible requirement for face shields on the part of the general population would be clearly an even greater step -- even though this is now a requirement on some airlines ([What to Wear if you are Taking a Flight During the Pandemic](#), *Outlook Traveller*; [Qatar Airways is requiring passengers to wear face shields](#), *The Washington Post*, 7 July 2020).

The question raised by these considerations is whether **health authorities have effectively engaged in a massive exercise in misinformation to claiming the adequacy of protection using masks**, irrespective of aspirations with regard to universal vaccination and herd immunity. Should serious consideration be given to supplementing masks with goggles to achieve the standard of protection which masks have been held to offer by health authorities?

How will this be achieved, given the investment required in millions of goggles? Why is the matter not raised in public debate? Just how ineffective may masks prove to be in the light of rising rates of infection?

Ironically there would appear to be a need for health authorities to keep an "eye on the ball"

Indication of range of full-face pandemic masks

For the many who have been impressed by the requirement to wear a flimsy "mask" as protection in pandemic times, it is amazing to discover the range of full-face masks recommended for the security and other services -- on the assumption that humanity is "at war" with the virus as politicians have declared. It is also curious to discover how seriously masks are taken by the survivalist communities ([12 Best Survival Gas Masks \(and Filters\) On The Market In 2021](#), *Skilled Survival*; [4 Best Gas Masks for Biological Warfare or Chemical Attacks](#), *Survival Freedom*).

Have health authorities indeed seriously misled the population with regard to the adequacy of the masks now held to be a requirement? Are new variants of the virus, with a higher rate of infection, going to require the kinds of masks envisaged for biochemical warfare?

Mira Safety CM-6M	PD-100	Dräger 6300	3M FR-7800B	MSA Millennium



Avon FM12	Israeli Respirator	Avon M50	M15 Rubber Respirator	DHgate
				

Convergence on face-covering norms in Muslim-majority countries?

Consideration has been given to the viral protection adequacy of traditional face-coverings in countries with Muslim populations, as separately clarified (Camille Caldera, *Fact check: Post makes faulty assertions about women and face coverings in Muslim-majority countries*, *USA Today*, 19 July 2020). They are considered inadequate with respect to the standards required of COVID-19 masks -- being too loose in contrast to masks. The situation is rendered more complex with any future requirement for goggles, since the traditional face-coverings do not necessarily cover the eyes.

The shift towards face-shields and goggles does not necessarily imply the lack of transparency required of Muslim face-coverings. Curiously masks themselves have not been designed to be transparent and little effort has been made to produce masks which are. There is therefore a degree of convergence towards the Muslim face-covering -- potentially increased if the safety goggles are not transparent, as with sunglasses.

Clearly any design requirement for face-shields could include non-transparent options -- as already offered with some spectacle designs. Presumably the designs of traditional face-coverings could also be adapted to achieve the levels of protection required -- including that for the eyes.

There is of course considerable irony to such trends, given the strong human rights case made against Muslim face-covering and the associated security challenges in identity profiling (*Facism as Superficial Intercultural Extremism: burkha, toplessness, sunglasses, beards, and flu masks*, 2009)



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