

## 1 Eye health in older people at the time of corona

2 Oscar H.Franco

3 University of Bern, Institute of Social and Preventive Medicine, Bern, Switzerland

4 Juan G.Gaviria

5 Private Practice, Nazar Grupo Oftalmológico, Ibagué, Colombia

6 Jose M.Varas

7 Centro Oftálmico Varas Samaniego, Guayaquil, Ecuador

8 RajivChowdhury

9 University of Cambridge, Department of Public Health and Primary Care, School of Clinical  
10 Medicine, Cambridge, United Kingdom

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12 A day before the start of 2020, Dr Li Wenliang, a 33-year-old ophthalmologist working at the Wuhan  
13 Central Hospital sent a series of mobile texts that predicted a global tragedy in the offing, changing the  
14 course of his life in the process [1]. In these texts, sent to his medical school friends through the popular  
15 Chinese messaging service WeChat, Dr. Wenliang raised the alarm for 7 confirmed cases of an illness  
16 that resembled acute respiratory syndrome (SARS), with no clear subtype, in his hospital. In the  
17 following days, his texts went public, leading to government censorship and admonishment, and he was  
18 sent back to work with a warning. Only a few days later, on January 8, 2020, Dr. Wenliang himself  
19 contracted the mysterious virus while treating a glaucoma patient (who worked at Wuhan's seafood  
20 market), and developed what we now know as Coronavirus Disease 2019 (COVID-19). Despite his  
21 relatively young age and no underlying comorbidities, the disease progressed rapidly, leading to Dr  
22 Wenliang's death on February 7, 2020. Soon after his passing, his early signals transformed into a major  
23 global pandemic [1].

24 Three months later, at the time of writing on May 18, COVID-19 has reached all countries in the world,  
25 infected almost 5 million people and caused deaths of over three hundred thousand globally. The  
26 disease has led to a near-collapse of some of the best global healthcare systems, and an existential  
27 threat to many global economies. As the pandemic represents an on-going global crisis, unlikely to  
28 disappear in 2020, a Doctor—once viewed as a “rumour-spreader”—is now heralded for his early  
29 communication and alarm. Ironically, the very eyes of this ophthalmologist that saw the crisis coming,  
30 may also be the route through which Dr Wenliang was exposed to SARS-CoV-2 [2].

31 Much has been written of the transmission of SARS-CoV-2 through aerosols and surfaces encountering  
32 the mucous tissue in the mouth and nose as main points of entry. However, besides these conventional  
33 routes, the virus may also be transmitted through the conjunctiva if people touch their eyes after  
34 touching an infected surface or through direct exposure with aerosols suspended in the air [3].  
35 Additionally, there has been a case report of an anaesthesiologist developing ocular symptoms, fever  
36 and cough after practicing intubation without goggles and later confirmed positive for SARS-CoV-2 [2].

37 About 1% of patients with COVID-19 manifest ocular signs of conjunctivitis, including conjunctival  
38 hyperemia, chemosis, epiphora, or increased secretions. Additionally, conjunctivitis has been reported  
39 in 0.7% of patients with mild COVID and 3% of patients with severe COVID-19. Furthermore, SARS-CoV-2  
40 has been isolated in lacrimal secretions [4,5]; albeit patients with symptoms of upper respiratory tract  
41 infections did not demonstrate substantial viral shedding in tears, suggesting that the transmission  
42 through tears, irrespective of disease stage, is likely to be low. While the exact mechanisms of these

43 manifestations remain poorly understood, it is noteworthy that the angiotensin-converting enzyme-2  
44 host receptor, which the virus typically uses to exert its effect, are also located in human eyes as well as  
45 other receptors that the virus could use for entry [3].

#### 46 **1. Visual health at the time of corona**

47 Until there is definitive evidence of SARS-CoV-2 transmission through the conjunctiva, it is important to  
48 avoid touching eyes frequently and to maintain optimal hygiene practices. Thus far, protective glasses  
49 and face shields have been recommended solely for health care personnel. However, face shields, in  
50 particular, could also be a practical solution to prevent contagion in the general population, especially  
51 given the gradual relaxation of containment measures worldwide. In this regard, production of face  
52 shields will need to be ramped up substantially, so that the enhanced demands from both healthcare  
53 and general community sectors could be met appropriately [6].

54 For contact lens wearers, it is recommended to switch to eyeglasses for a while in order to reduce  
55 contagion, keeping in mind that people with contact lenses often touch their eyes and face more  
56 frequently than others, owing to irritation and the need to manipulate contact lenses. Glasses do not  
57 completely protect them from potential infection; however, they serve as a barrier to reduce the  
58 likelihood of touching the eyes frequently. Nevertheless, frequent and optimum handwashing is  
59 recommended for anyone using contact lenses or eyeglasses to avoid contagion. This is particularly  
60 important in patients with reduced dexterity due to concomitant disease or advanced age (e.g., people  
61 with co-morbid conditions and/or over 65 years of age) since they are at higher risk of death attributed  
62 to COVID-19 [6].

63 As globally populations are aging, vision loss from eye disease has become a public health issue. With  
64 increasing age, issues with vision augment, including seeing close-up objects clearly, difficulty to  
65 distinguish colors and more light is needed to see well [7]. Furthermore, poor sight or progressive loss of  
66 sight can also lead to falls, injuries and car accidents, all major public health priorities for prevention.

67 It is unclear how COVID-19 and the lockdown measures taken to control the pandemic might affect  
68 visual health in the long run, but protection of the vulnerable, including of the elderly, might imply  
69 elderly populations in confinement for many months in a row in the coming months. Therefore, as the  
70 scientific knowledge evolves, below is a set of recommendations, which aims to facilitate optimal care in  
71 order to maintain good visual health (Fig. 1):

- 72 1. Apply the 2020 tip: After every 20 min of work, close your eyes for 20 s. This can be specially  
73 helpful for patients working long hours in front of a computer at home.
- 74 2. Avoid touching eye discharge.
- 75 3. Make sure you have sufficient supply of medications needed, especially in chronic conditions  
76 such as glaucoma or dry eye disease.
- 77 4. Avoid eye-rubbing.
- 78 5. Avoid direct exposure to chemicals such as bleach or other household cleaners.
- 79 6. Avoid direct air conditioning exposure to your eyes.
- 80 7. When reading assure a well lighted surrounding environment.
- 81 8. As quarantine measures are released and outdoor exposure returns, wear sunglasses when  
82 taking a stroll.

83 **2. When to call the ophthalmologist?**

84 One of the key aspects to prevent vision loss is to have regular comprehensive dilated eye exams among  
85 the elderly as many age-related eye disorders (e.g. age-related macular degeneration, cataract, diabetic  
86 retinopathy, glaucoma and dry eye) do not present early symptoms [7]. Furthermore, strict lockdowns  
87 could keep people from seeking emergency healthcare and thus treatable conditions and regular  
88 examinations (e.g. retinal detachments, retinal screenings for diabetics) would not be attended on time  
89 or at all, leading to longlasting consequences such permanent loss of sight. In line with this, eye  
90 specialists have seen more than 75% drop in consultations as fear of COVID-19 exposure has spread in  
91 addition to mitigation measures to manage the pandemic. While for many conditions an eye specialist  
92 can provide guidance via telephone or electronic means (tele-consultation), as listed below, additional  
93 ocular conditions may require a physical visit to the optalmologists in order to ensure appropriate  
94 diagnosis and care [[8], [9], [10]]:

- 95 1. Age-related macular degeneration or diabetic retinopathy that require regular intra-ocular  
96 injections.
- 97 2. Changes in vision: blurred vision, changes in the visual field, sudden visual loss.
- 98 3. Accident/eye injury (even if it is mild).
- 99 4. Vision of flashes of light and floaters which may indicate a retinal tear or detachment.
- 100 5. Eye pain associated with headache, red eye, photophobia, nausea or vomiting.
- 101 6. Complex cases requiring close monitoring such as corneal transplantation follow-up,  
102 uncontrolled glaucoma, etc.

103 COVID-19 will remain a threat until adequate treatment is discovered, an efficient vaccine is developed  
104 or at least two-thirds of humankind is infected. None of these conditions are likely to occur in 2020.  
105 Doctor Wenliang’s warnings proved right and the world only wishes to have seen them in a different -  
106 and earlier- light. This pandemic will bring despair and isolation but also opportunities to adapt and  
107 identify efficient forms of care that guarantee patients’ health and physicians’ safety. Perhaps with a  
108 better utilisation of resources leading to more efficient care, the experiences accumulated during this  
109 period of crisis could constitute the foundations of future ophtalmological and general health care. 2020  
110 could see the genesis of a new era of reinforced safety for patients and healthcare practitioners  
111 together with optimal utilization of technological advances gravitating around telemedicine, which could  
112 also result in improved access for elderly populations and those with restricted mobility. Adaptation to  
113 times of need and crisis could lead to advances and improvements not previously foreseen in a  
114 compressed period of time.

115 Conflict of interest

116 The authors declare that they have no conflict of interest.

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143 Fig. 1. Recommendations to maintain optimal visual health.

**Tips for a 2020 vision in times of containment** 

- *Apply the 2020 tip:* After every 20 minutes of work, close your eyes for 20 seconds. This can be specially helpful for patients working long hours in front of a computer at home.
- Avoid touching eye discharge
- Make sure you have sufficient supply of medications needed, especially in Chronic conditions such as Glaucoma or Dry Eye Disease
- Avoid Eye-rubbing
- Avoid direct air conditioning exposure to your eyes.
- When reading assure a well lighted surrounding environment
- As quarantine measures are released and outdoor exposure returns, wear sunglasses when taking a stroll