Starting Contact Lens Practice at the Time of COVID-19 Pandemic

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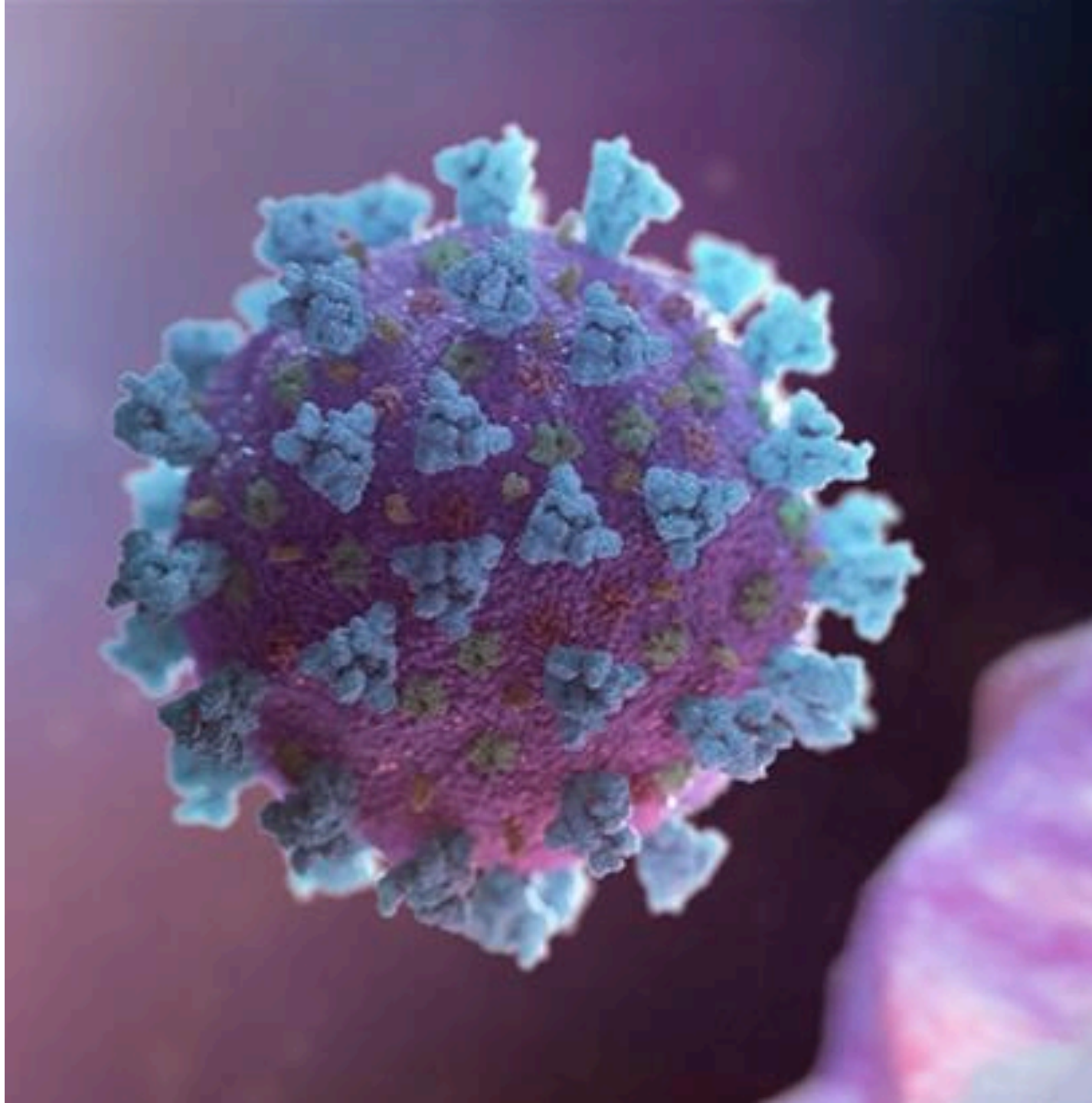
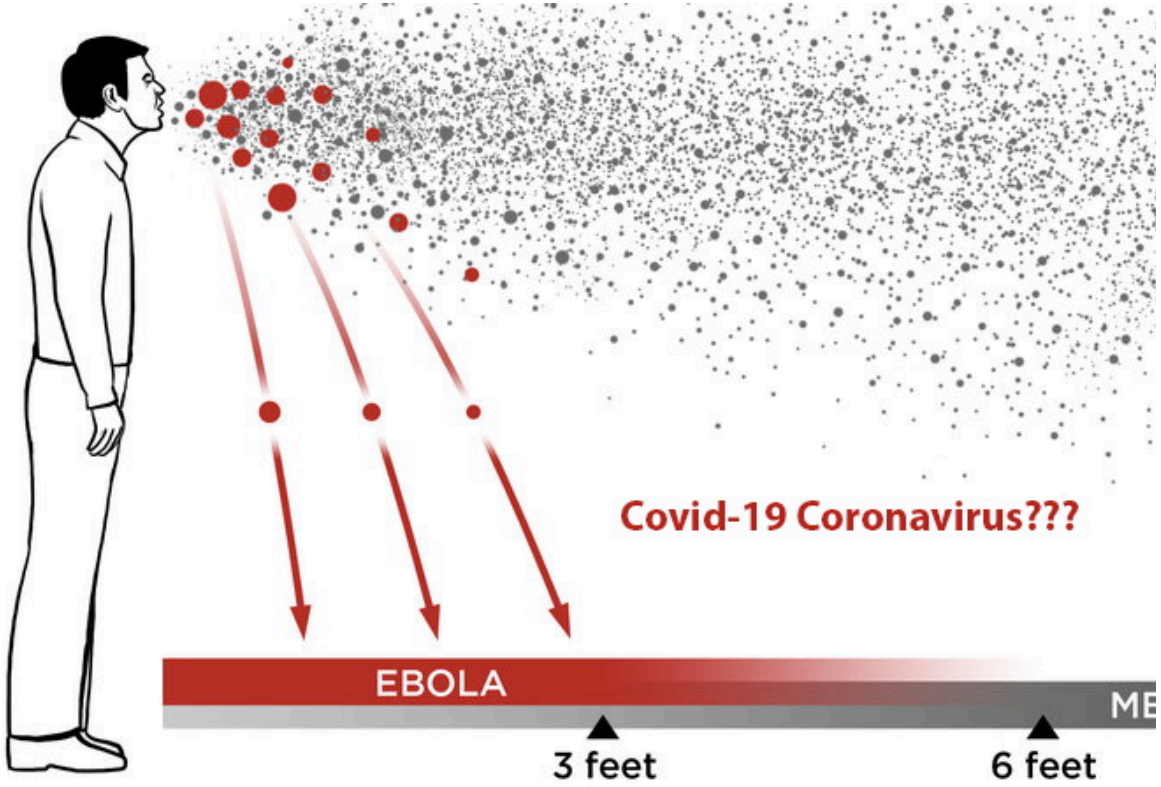
COVID-19

- **COVID-19** (coronavirus disease 2019)
- Respiratory tract infection with a newly recognized coronavirus
- Severe Acute Respiratory Syndrome Coronavirus-2 (**SARS-CoV-2**)
- Betacoronavirus similar to SARS and MERS
- Outbreak began in China
- Officially declared by WHO to be a pandemic on March 11, 2020



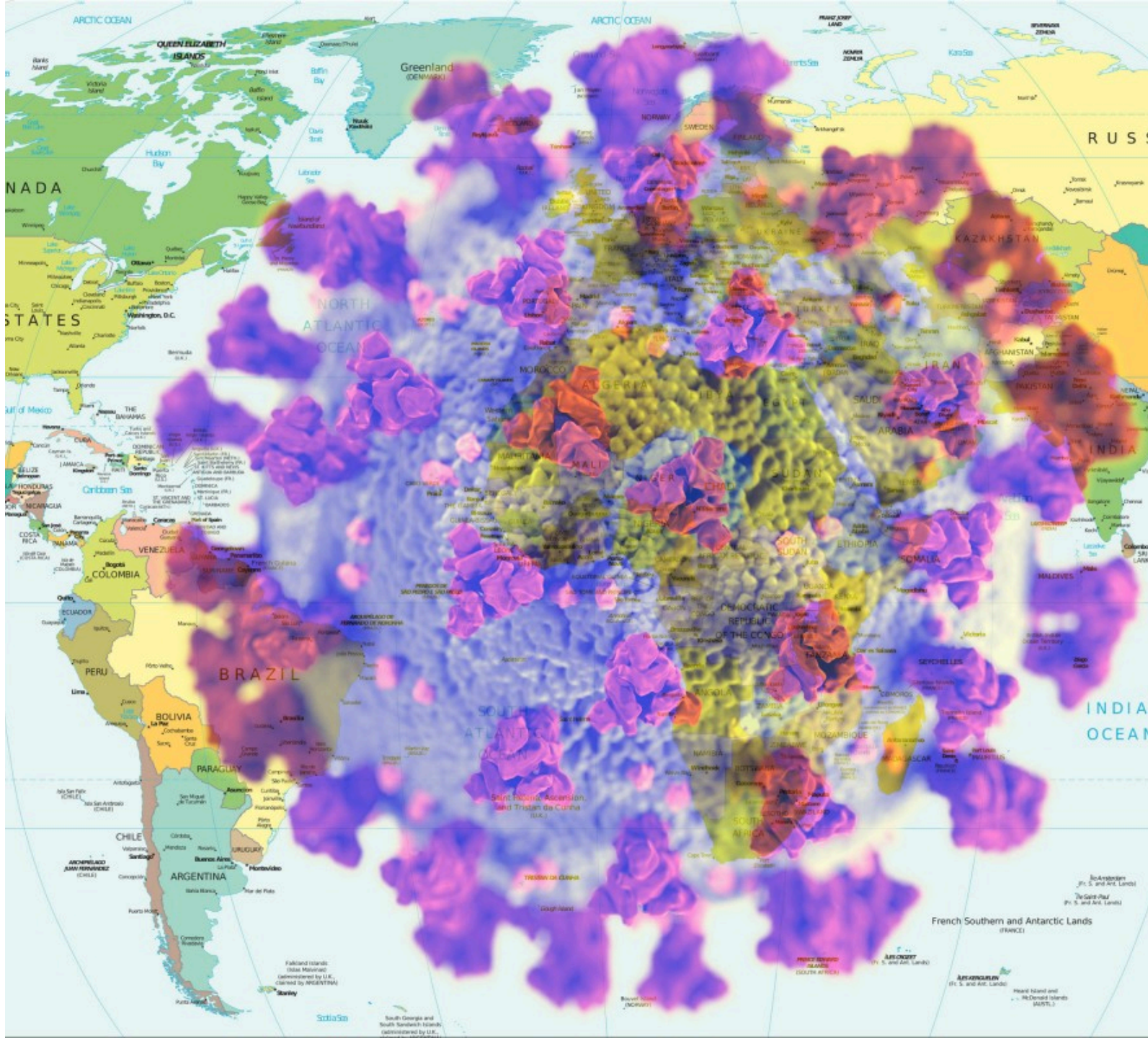
COVID-19

- Transmission
  - airborne aerosol (coughing)
  - direct touching (shaking hands)
  - indirect touching (handles)??
- Higher transmissibility and wider community spread than other betacoronaviruses
- Viral shedding can occur in the early asymptomatic phase
  - Isolation of patient after onset of symptoms ineffective
  - Temperature screening less effective



COVID-19

- Illness ranges in severity from asymptomatic/mild to severe
- Severe disease may be complicated by acute respiratory distress syndrome and shock
- Mortality rate varies by country –
  about 2% to 3%
- **Knowledge of this disease is incomplete and evolving**



World Health Organization

Search by Country, Territory, or Area

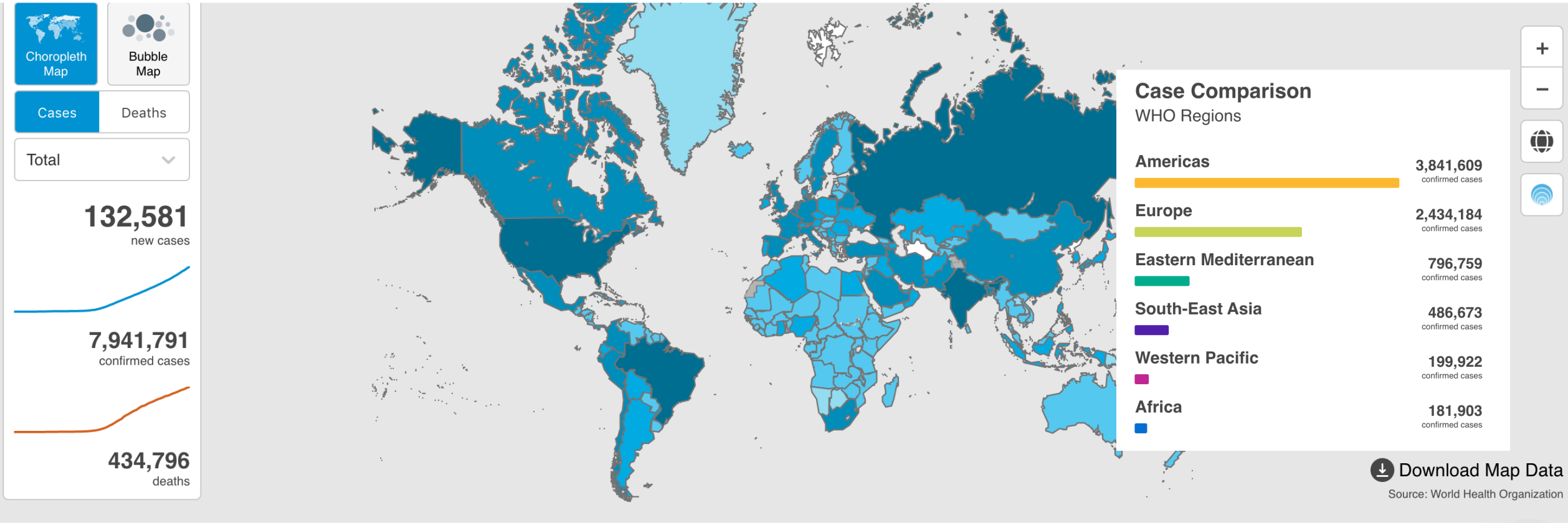
Covid-19 Response Fund

Donate

WHO Coronavirus Disease (COVID-19) Dashboard

Data last updated: 2020/6/16, 1:57pm CEST

Overview Explorer

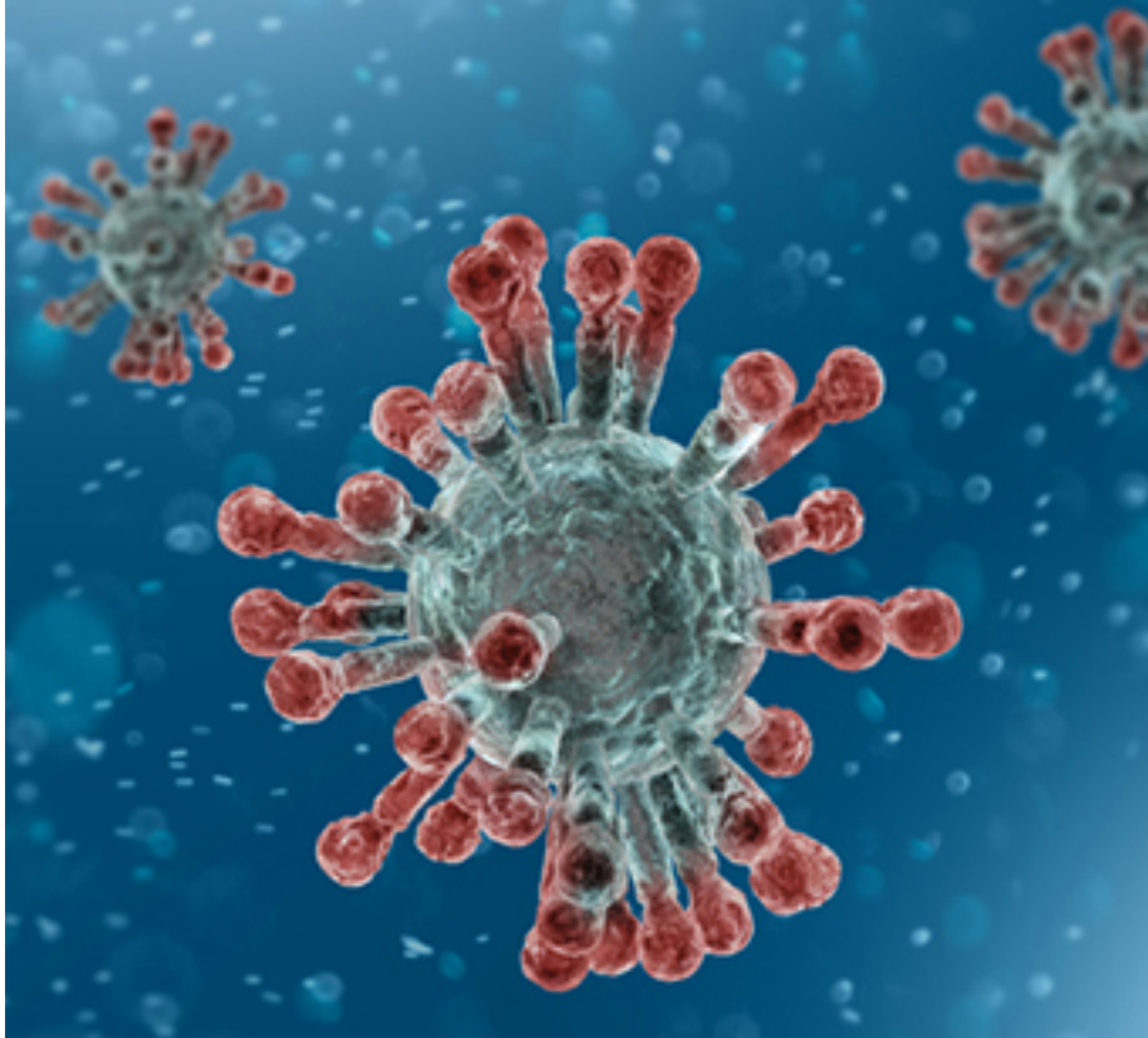


Globally, as of **1:57pm CEST, 16 June 2020**, there have been **7,941,791 confirmed cases** of COVID-19, including **434,796 deaths,** reported to WHO.

Worldwide

Animals & CoronaViruses

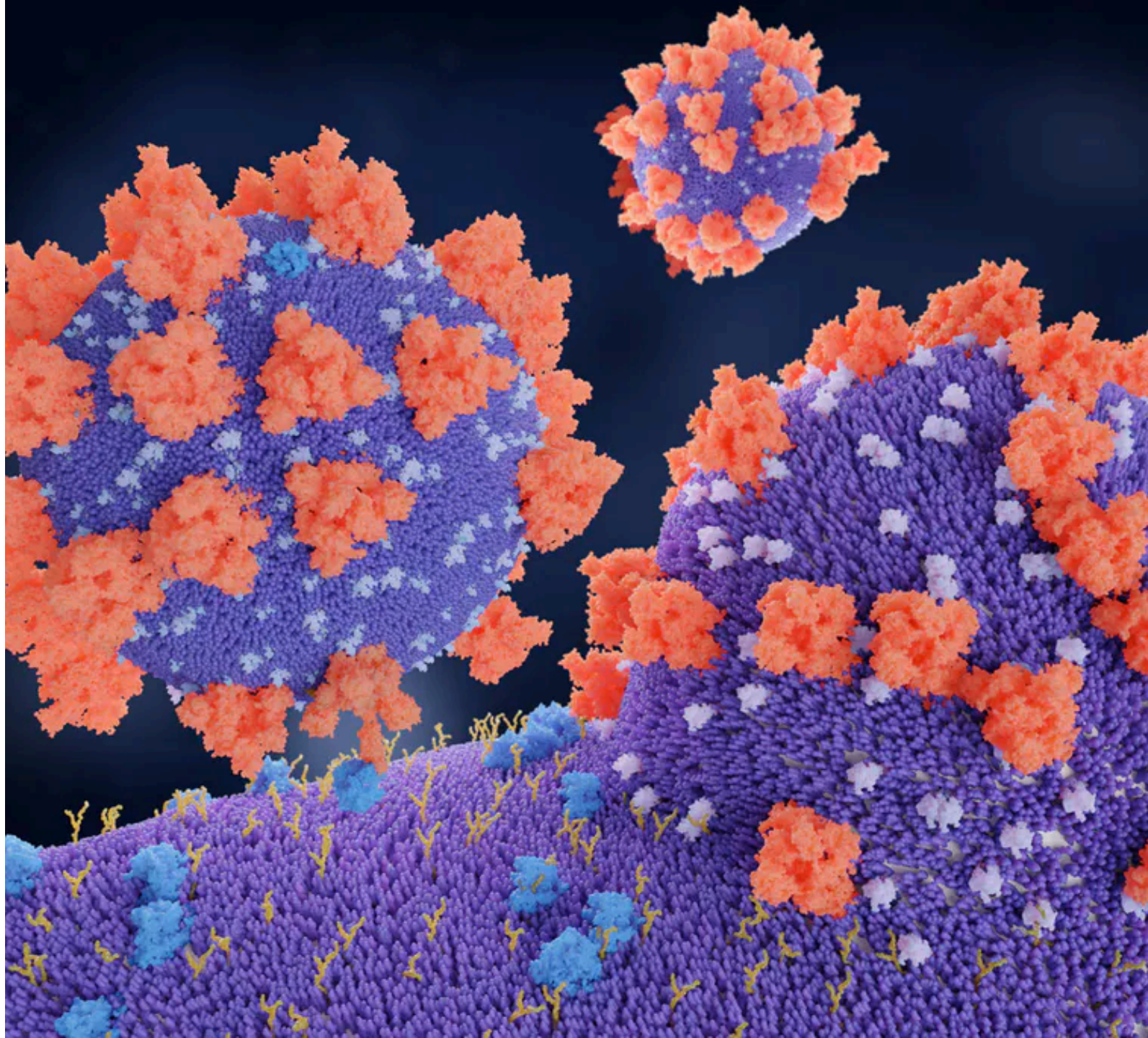
- Conjunctivitis
- Anterior uveitis
- Retinitis
- Optic neuritis



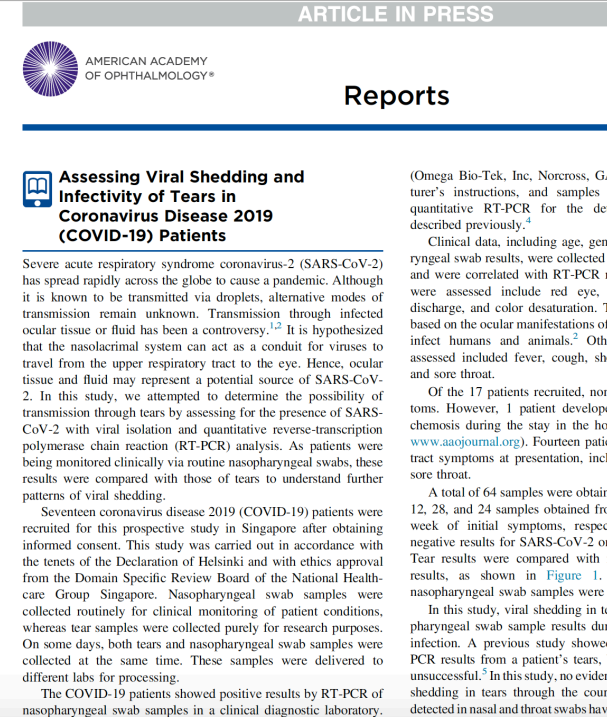
Human COVID-19

- Ocular trophism of respiratory viruses – not uncommon
  - Anatomic linkage, structure and distribution of cellular receptors, immunologic interdependence

- Conjunctivitis reported in human COVID-19



Wu P et al, 2020



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Reports

Assessing Viral Shedding and Infectivity of Tears in Coronavirus Disease 2019 (COVID-19) Patients

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has spread rapidly across the globe to cause a pandemic. Although it is known to be transmitted via droplets, alternative modes of transmission remain unknown. Transmission through infected ocular tissue or fluid has been a controversy.[1,2] It is hypothesized that the nasolacrimal system can act as a conduit for viruses to travel from the upper respiratory tract to the eye. Hence, ocular tissue and fluid may represent a potential source of SARS-CoV-2. In this study, we attempted to determine the possibility of transmission through tears by assessing for the presence of SARS-CoV-2 with viral isolation and quantitative reverse-transcription polymerase chain reaction (RT-PCR) analysis. As patients were being monitored clinically via routine nasopharyngeal swabs, these results were compared with those of tears to understand further patterns of viral shedding.

Seventeen coronavirus disease 2019 (COVID-19) patients were recruited for this prospective study in Singapore after obtaining informed consent. This study was carried out in accordance with the tenets of the Declaration of Helsinki and with ethics approval from the Domain Specific Review Board of the National Healthcare Group Singapore. Nasopharyngeal swab samples were collected routinely for clinical monitoring of patient conditions, whereas tear samples were collected purely for research purposes. On some days, both tears and nasopharyngeal swab samples were collected at the same time. These samples were delivered to different labs for processing.

The COVID-19 patients showed positive results by RT-PCR of nasopharyngeal swab samples in a clinical diagnostic laboratory. (Omega Bio-Tek, Inc, Norcross, G… turer's instructions, and samples … quantitative RT-PCR for the de… described previously.[4]

Clinical data, including age, gen… ryngeal swab results, were collected … and were correlated with RT-PCR … were assessed include red eye, … discharge, and color desaturation. … based on the ocular manifestations of … infect humans and animals.[2] Oth… assessed included fever, cough, sh… and sore throat.

Of the 17 patients recruited, nor… toms. However, 1 patient develope… chemosis during the stay in the ho… www.aaojournal.org). Fourteen patie… tract symptoms at presentation, incl… sore throat.

A total of 64 samples were obtain… 12, 28, and 24 samples obtained fr… week of initial symptoms, respec… negative results for SARS-CoV-2 o… Tear results were compared with … results, as shown in Figure 1. … nasopharyngeal swab samples were …

In this study, viral shedding in t… pharyngeal swab sample results du… infection. A previous study showe… PCR results from a patient's tears, … unsuccessful.[5] In this study, no evide… shedding in tears through the cour… detected in nasal and throat swabs hav…

d: 19 February 2020 | Accepted: 24 February 2020

.1002/jmv.25725

EARCH ARTICLE

JOURNAL OF MEDICAL VIROLOGY

aluation of coronavirus in tears and conjunctival secretio patients with SARS-CoV-2 infection

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Abstract

Objective: This study aimed to assess the presence of novel coronavirus i… and conjunctival secretions of SARS–CoV-2-infected patients.

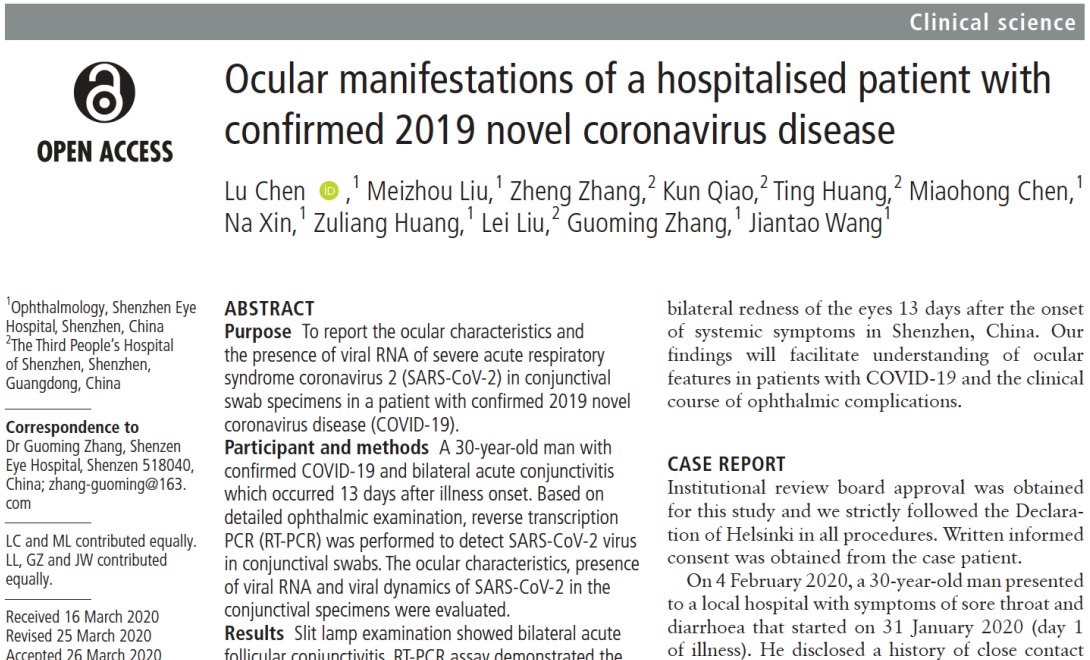
Methods: A prospective interventional case series study was performe… 30 confirmed novel coronavirus pneumonia (NCP) patients were selected … First Affiliated Hospital of Zhejiang University from 26 January 2020 to 9 Fe… 2020. At an interval of 2 to 3 days, tear and conjunctival secretions were co… twice with disposable sampling swabs for reverse-transcription polymerase … reaction (RT-PCR) assay.

Results: Twenty-one common-type and nine severe-type NCP patients … enrolled. Two samples of tear and conjunctival secretions were obtained fr… only one patient with conjunctivitis yielded positive RT-PCR results. Fift… samples from other patents were all negative.

Conclusion: We speculate that SARS-CoV-2 may be detected in the tea… conjunctival secretions in NCP patients with conjunctivitis.

KEYWORDS

coronavirus, horizontal transmission, infection



Clinical science

OPEN ACCESS

Ocular manifestations of a hospitalised patient with confirmed 2019 novel coronavirus disease

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ABSTRACT

Purpose To report the ocular characteristics and the presence of viral RNA of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in conjunctival swab specimens in a patient with confirmed 2019 novel coronavirus disease (COVID-19).

Participant and methods A 30-year-old man with confirmed COVID-19 and bilateral acute conjunctivitis which occurred 13 days after illness onset. Based on detailed ophthalmic examination, reverse transcription PCR (RT-PCR) was performed to detect SARS-CoV-2 virus in conjunctival swabs. The ocular characteristics, presence of viral RNA and viral dynamics of SARS-CoV-2 in the conjunctival specimens were evaluated.

Results Slit lamp examination showed bilateral acute follicular conjunctivitis. RT-PCR assay demonstrated the bilateral redness of the eyes 13 days after the onset of systemic symptoms in Shenzhen, China. Our findings will facilitate understanding of ocular features in patients with COVID-19 and the clinical course of ophthalmic complications.

CASE REPORT

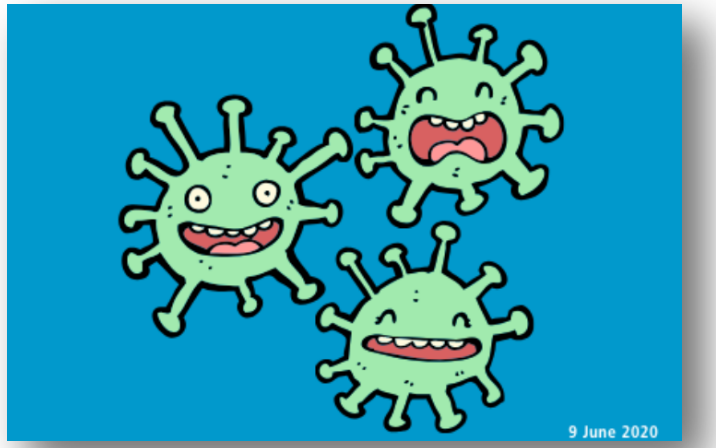
Institutional review board approval was obtained for this study and we strictly followed the Declaration of Helsinki in all procedures. Written informed consent was obtained from the case patient.

On 4 February 2020, a 30-year-old man presented to a local hospital with symptoms of sore throat and diarrhoea that started on 31 January 2020 (day 1 of illness). He disclosed a history of close contact

Human COVID-19

- Viral RNA
  - not detected in symptomatic patients without conjunctivitis
  - detected in conjunctival swabs of only few patients with COVID-19
    - during the symptomatic phase
    - in patients with conjunctivitis
  - Levels in conjunctival specimens were dramatically lower than those in respiratory samples
- Virus not isolated
- ACE-2 receptor not detected on ocular surface

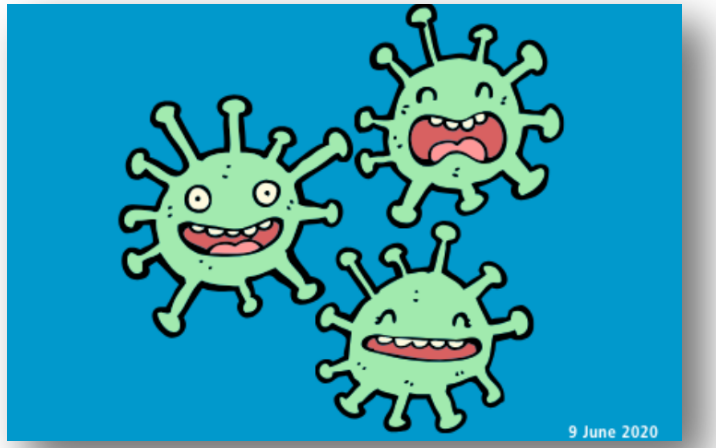
What We Know?



- The eye is sometimes involved in human COVID-19
- Conjunctivitis encountered during URT infection
- Weak (+) RT-PCR test for viral RNA reported in conjunctival swabs of few patients with conjunctivitis and COVID-19 (5%=9/178)
- The virus could not be isolated from the conjunctival swabs

- **→ SARS-CoV-2 is probably present at the ocular surface during COVID-19 if patient has conjunctivitis**

What We Know?



- Knowledge evolving!
- In vivo mutations…
- Protective measures still required! – err on the safe side….


Is it safe to wear contact lenses during the COVID-19 Pandemic?

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1. The coronavirus may cause pink ey discharge.

If you see someone with pink eye, don't panic. It doesn't mean that person is infected with coronavirus. But a recent study from China suggests that up to one third of people hospitalized with coronavirus experience eye pro conjunctivitis. It's important to know that the virus infected person's eyes, or from objects that carry

2. If you wear contact lenses, consider switching to glasses for a while.

There's no evidence that wearing contact lenses increases your risk of coronavirus infection. But contact lens wearers touch their eyes more than the average person, Dr. Tuli points out. "Consider wearing glasses more often, especially if you tend to touch your eyes a lot when your contacts are in. Substituting glasses for lenses can decrease irritation and force you to pause before touching your eye," she advises. If you continue wearing contact lenses, follow these hygiene tips.

3. Wearing glasses may add a layer of protection.

Corrective lenses or sunglasses can shield your eyes from infected respiratory droplets. But they don't provide 100% security. The virus can still reach your eyes from the exposed sides, tops and bottoms of your glasses. If you're caring for a sick patient or potentially exposed person, safety goggles may offer a stronger defense.

5. Avoid rubbing your eyes.

We all do it. While it can be hard to break this natural habit, doing so will lower your risk of infection. If you feel an urge to itch or rub your eye or even to adjust your glasses, use a tissue instead of your fingers. Dry eyes can lead to more rubbing, so consider adding moisturizing drops to your eye routine. If you must touch your eyes for any reason — even to administer eye medicine — wash your hands first with soap and water for at least 20 seconds. Then wash them again afterwards.

Frequently Asked Qu

Is contact lens disinfecting solution effective against COVID-19?

- Hydrogen peroxide-based systems for cleaning, disinfecting, and storing contact lenses should be effective against the virus that causes COVID-19.
  - For other disinfection methods, such as multipurpose solution and ultrasonic cleaners, there is currently not enough scientific evidence to determine efficacy against the virus.
- Always use solution to disinfect your contact lenses and case to kill germs that may be present.
- Handle your lenses over a surface that has been cleaned and disinfected.

Should contact lens wearers take special precautions to prevent COVID-19?

- Currently there is no evidence to suggest contact lens wearers are more at risk for acquiring COVID-19 than eyeglass wearers.
- Contact lens wearers should continue to practice safe contact lens wear and care hygiene habits to help prevent against transmission of any contact lens-related infections, such as always washing hands with soap and water before handling lenses.
- People who are healthy can continue to wear and care for their contact lenses as prescribed by their eye care professional.

Find more information about how coronavirus spreads and how to protect yourself.

Visit CDC's contact lens website for more information on healthy contact lens wear and care.

Contact Lens Wear and coronavirus (COVID-19) guidance

Healthy contact lens wear and care for your patients

There is no evidence to date that contact lens wear should be avoided by healthy individuals, or that contact lens wearers are more at risk for a coronavirus infection compared to those wearing spectacles.

There is currently no evidence to suggest any correlation between the usage of contact lenses and the spread of COVID-19 or a coronavirus infection related to contact lens use.

To help maintain healthy contact lens wear all contact lenses wearers should follow correct lens wear and care instructions, as prescribed by you their Eye Care Professional.

These will of course include following good hygiene practices and advice to avoid lens wear if the contact lens wearer is feeling unwell, in parti

Please encourage your patients to seek guida

any queries.

- **Always wash and dry your hands thoroughly before handling contact lenses and lens cases.**
- **Always wash and dry your hands thoroughly before applying a contact lens, even if the lens is new and directly from the packaging.**
- **Always wash and dry your hands before removing your contact lenses.**

BCLA Wearing and Caring guides are available

Always wash your hands

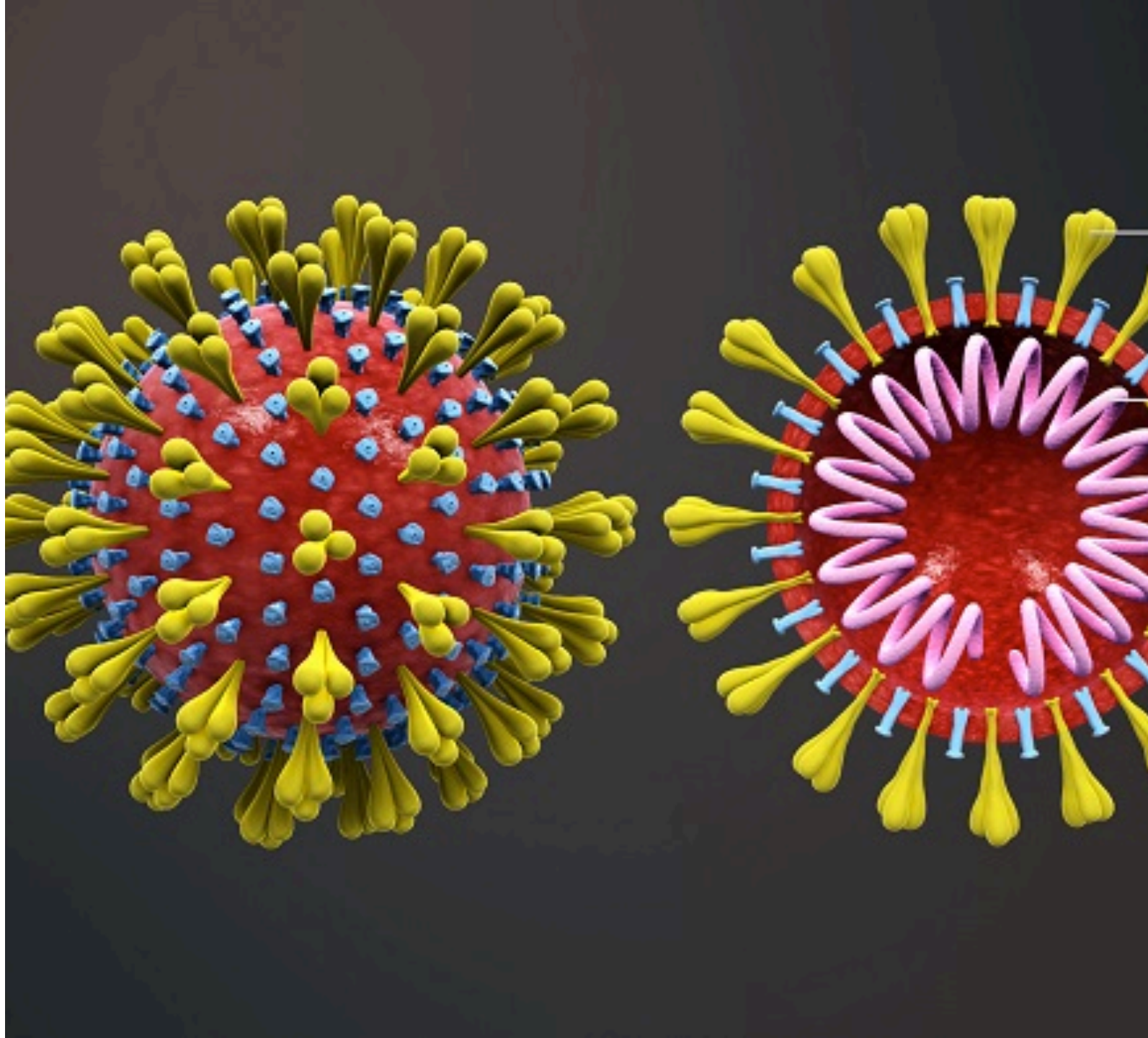
Public health messages from across the world are urging people to wash their hands to help prevent the spread of the virus. The US-based Centers for Disease Control and Prevention has issued coronavirus guidance stating that eyes should not be touched with *unwashed* hands.

Meticulous hand and lens hygiene

The risk of viral transmission through an ophthalmological examination is not new but has become of utmost importance since the COVID-19 outbreak. The situation for fitting lenses is even more complex because the virus has been shown to be present in the tears and on the conjunctiva. We hope we can be of assistance to your practice by sharing with you the article “Contact lens practice in the time of COVID-19” by Zeri and Nahroo, just published in Contact Lens & Anterior Eye (1). Particularly reference 17 “Infection control guidelines for optometrists” by Lian et al (2) reminds us of the practical guidelines that we need to adhere to; both publications can be reached free online.

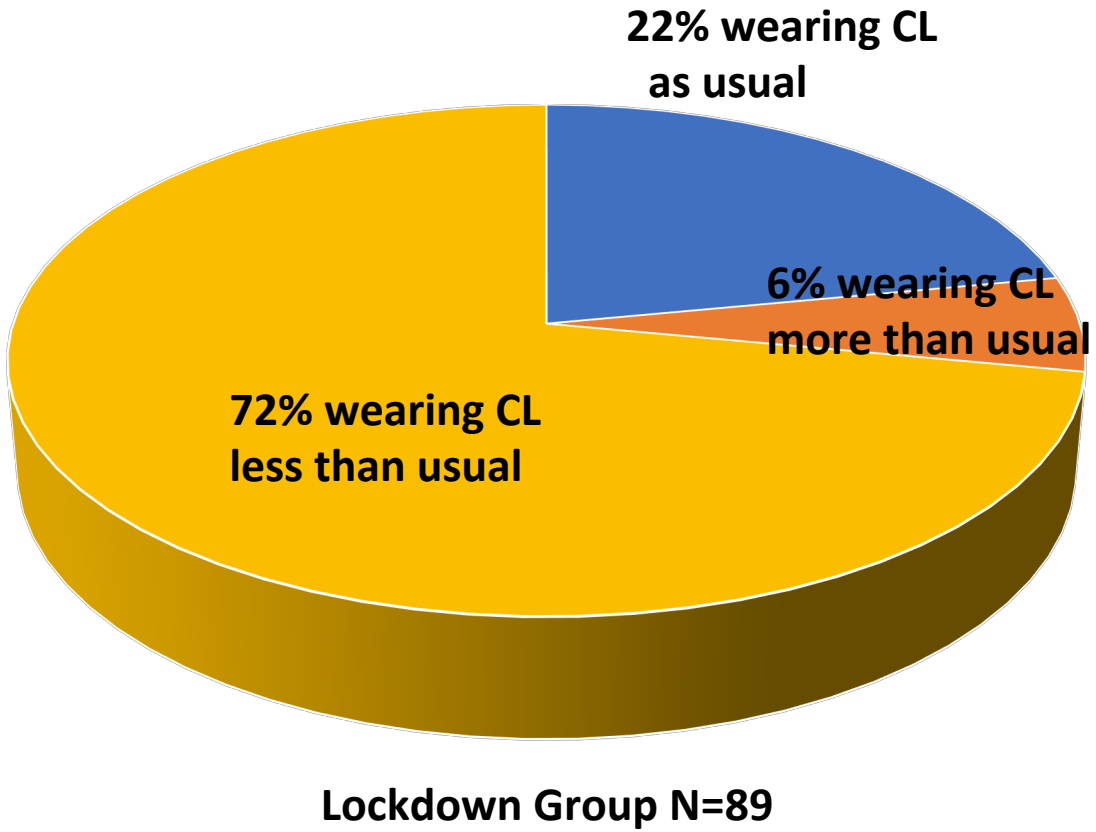
COVID-19 Pandemic and CL Wear

- No clear evidence
  - showing viral binding to CL in vivo
  - showing difference between CL materials
  - to suggest an increased risk of contracting COVID-19 through contact lens (CL) wear compared to spectacle lens



Eurolens Research
a look into patient perspective

- 433 CL wearers were e-mailed a survey – 23% responded (n=100)
- 89% living in a ‘lockdown’
- 11% working – living normally



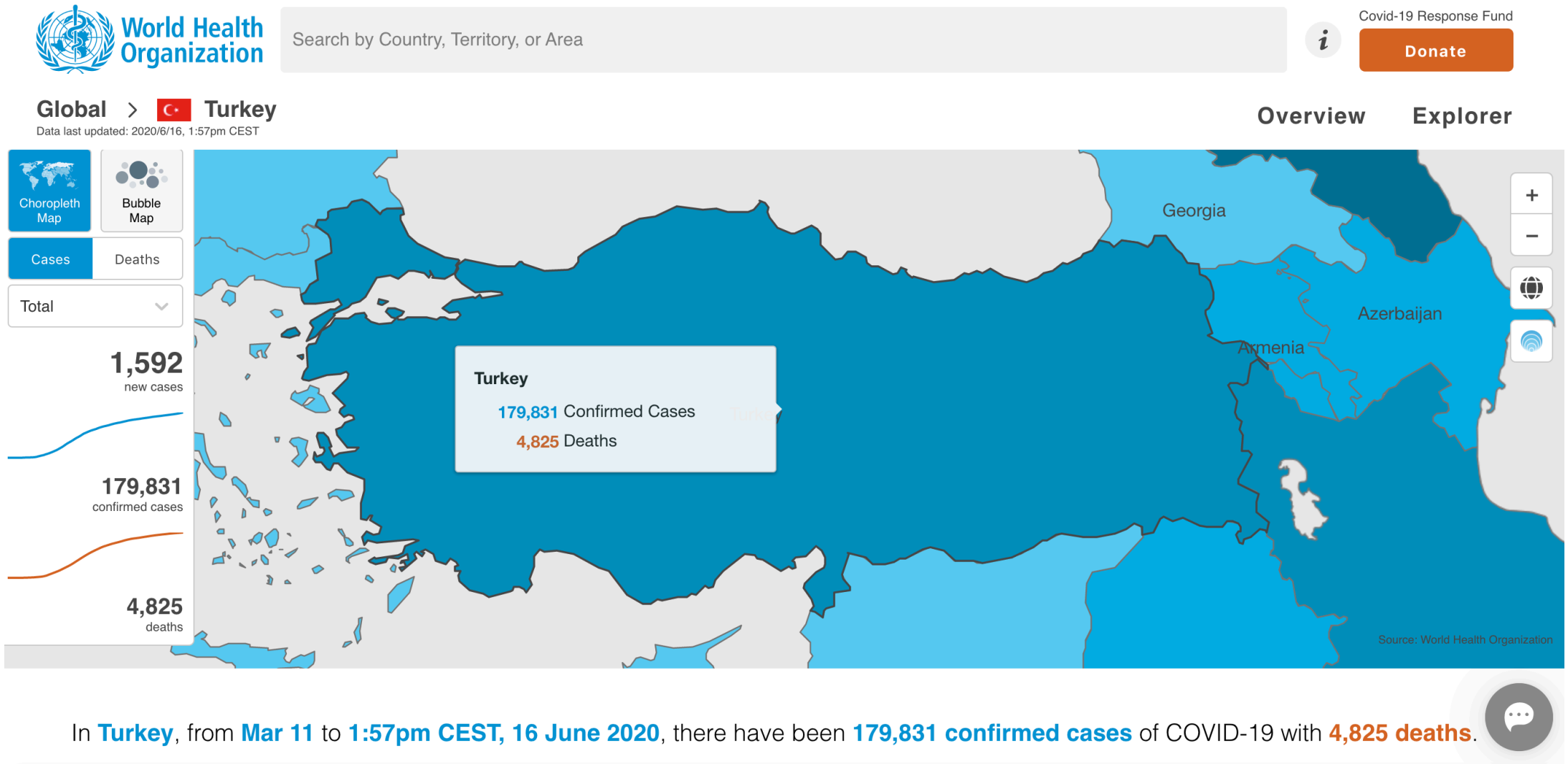
Morgan PB. Contact lens wear during the COVID-19 pandemic.Cont Lens Anterior Eye. 2020 Apr 22. pii: S1367-0484(20)30078-3. doi:10.1016/j.clae.2020.04.005. [Epub ahead of print]

Eurolens Research – Why wear CL less often?

- **75% - simply a perception of 'less need' for CL**
  - Wearing CL while socialising
  - Part of looking and feeling appropriately dressed for work
  - CL wear is particularly beneficial in a 'distance-orientated' world rather vs indoors
- **8% concern about infection due to contact lens use**

Morgan PB. Contact lens wear during the COVID-19 pandemic.Cont Lens Anterior Eye. 2020 Apr 22. pii: S1367-0484(20)30078-3. doi:10.1016/j.clae.2020.04.005. [Epub ahead of print]

1st case on March 11, 2020



Started outpatient care on June 1, 2020


How Do We Protect Ourselves and Our Patients?

Protecting Ourselves + Staff + Patients

- Manage patient care
- Facility care / Disinfect of CL equipments and CL trial sets
- Personal protective equipment
- Sanitize hand properly

Zeri F, Naroo SA. Contact lens practice in the time of COVID-19. Cont Lens Anterior Eye. 2020 Mar 19. pii: S1367-0484(20)30050-3. doi: 10.1016/j.clae.2020.03.007. [Epub ahead of print]

Patient Management During the Outbreak (Mid-March to June)

- Very low patient attendance to CL practices
- Telemedicine:
  - Depending on individual unit facilities – quite limited
  - Calls answered to meet patient needs/to explore the possibility of **rescheduling non-urgent appointments (June/mid-June)**
  - Phone contact with patients reporting contact lens problems and/or a video consultation
- In case of a patient showing up/emergency:
  - Triage
  - If no increased risk, examined and treated as needed
  - If increased risk, advised properly and consulted through telemedicine

Patient Management During the Outbreak (Mid-March to June)

- **Any patient calling to ask about CL wear/care during the outbreak or**
- **While Rescheduling an Appointment**
- Advise to try to minimize the risk of CL complications
- Healthy subjects continue CL wear only if they have an appropriate care regimen and are compliant with care
- Patient re-education on safe wear and care practices

Patient Management After the Outbreak (June 1st and on)

- Limited number of patients
- Patients also cautious – calling to postpone appointments
- Triage (phone contact before appointment & at hospital entrance)
  - Triage questions (flu-like /suspicious contact within 2 wk)
  - Fever check-up
- If patients deemed to have increased risk factors, CL appointment postponed for at least 14 days
- If no risk – ask to come alone / limit accompanying persons
- Number accompanying persons entering the hospital as limited as possible – waiting areas outside the hospital – open-air

Facility Care / Disinfection

- Adequate airflow with good ventilation
- Adequate interval between patients – ventilation
- Clean room and waiting areas (10% sodium hypochlorite) once daily
- Surface disinfection of instruments (trial frames/lenses used/chin rest/
  head rest etc) between patients
  - 70% isopropyl alcohol or 0.5% hydrogen peroxide or 1% sodium hypochlorite
  - 10% sodium hypochlorite if symtommatic/COVID+

Personal Protective Equipment

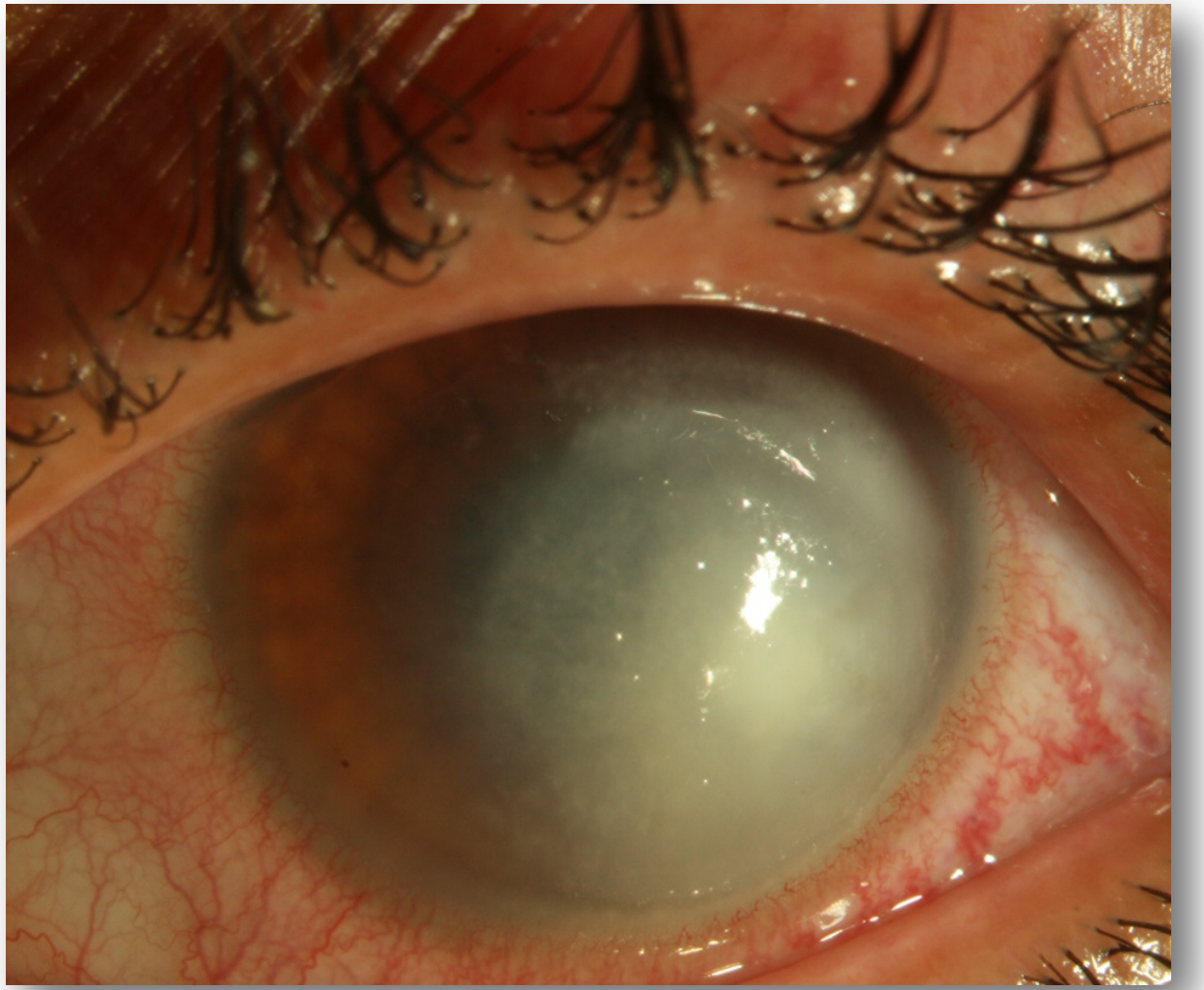
- Reduce the likelihood of infection via either airborne or direct transmission
  - Eye protection (goggles or safety spectacles)
  - Surgical-style face masks (standard for asymptomatic patients)
  - Install protective shields on slit lamps
  - Water-resistant gloves with long tight-fitting cuffs
- Avoid touching eyes, nose, mouth
- Avoid air-puff tonometers
- Establish safe distance between patients during examination/CL fit or while waiting

CL Fitting

- Fitting postponed if:
  - Red eye/conjunctivitis
  - Elderly
  - Chronic disease (DM, asthma, COLD)
  - Immunosuppressed
  - Post-COVID:
    - Positive IgG for at least 1 month
    - 2 consecutive (-) PCR tests
    - > 6 weeks from onset of symptoms

Fitting CLs After June 1st

- 1-2 appointments per day (different trial sets)
- **Every patient placed in a surgical mask**
- **Eye protection+Mask**
- Trial contact lenses
  - Discard soft trial lenses following fitting
  - H_2O_2 disinfection of specialty trial lenses after fitting (<6-8 hours)



Worst CL Complication!

- Microbial keratitis rate:

  0.2-2 per 100,000

  Schein OD, et al. Ophthalmology 2005

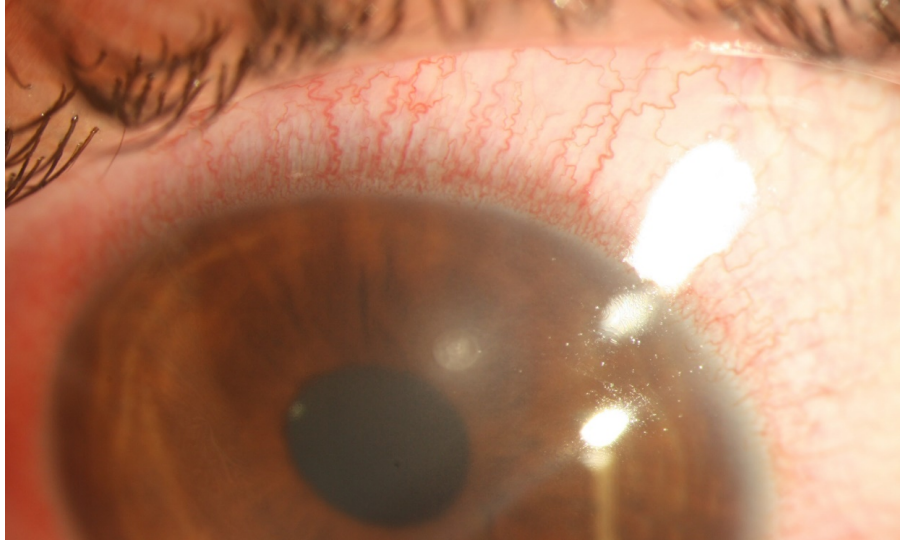
- Accidental homebased injuries that required medical care in U.S in 2012:

  24.17 per 100,000

  A.C. Gielen, et al. Annu Rev Public Health 2015

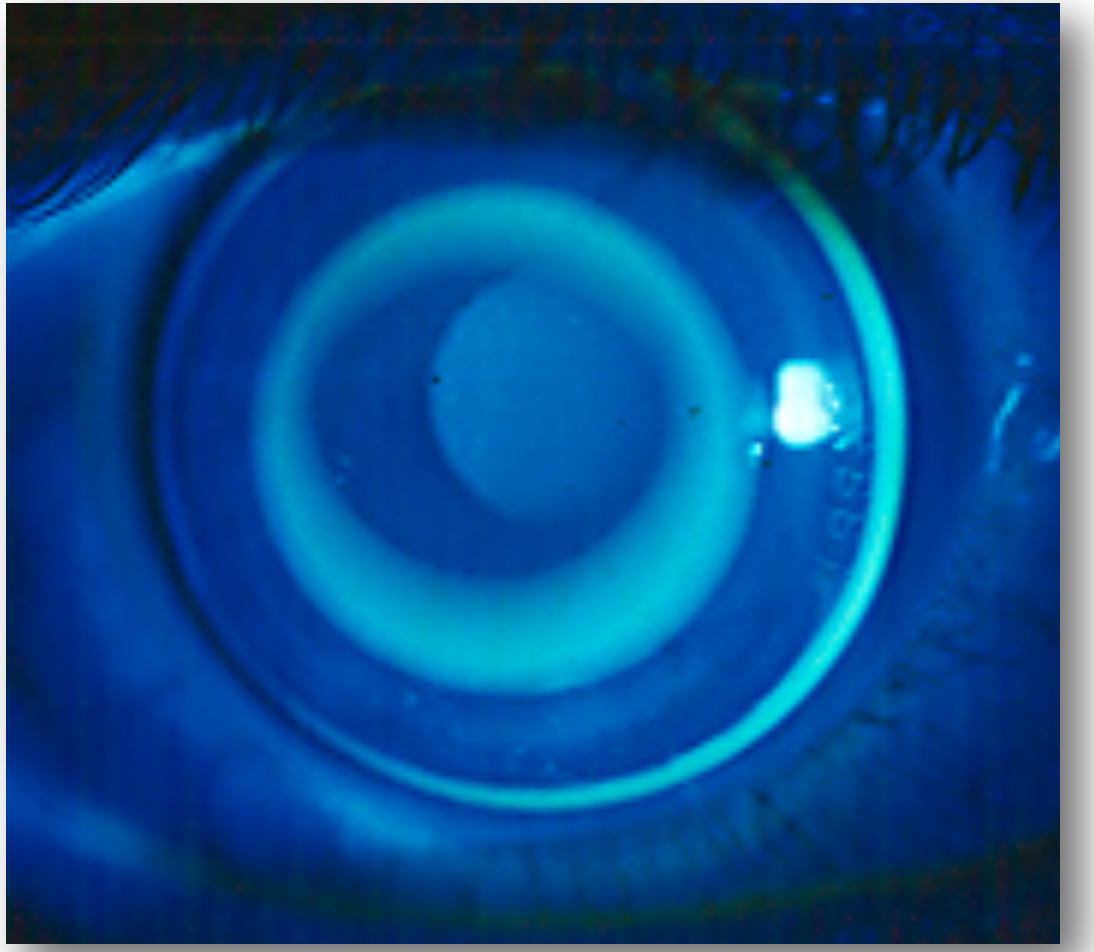
Modifiable Risk Factors for CIE/MK

- Overnight wear
- Poor lens and storage case hygiene
- Infrequent lens / lens case replacement
- Exposure of lens with water
- Smoking



During the Pandemic CL Wearer Should

- Stop overnight wear
  (except Overnight Ortho-K for myopia control or other medical reasons such as therapeutic use)
- Watch hand hygiene
- Watch lens and case hygiene
- Avoid water contact
- Shift to hydrogen peroxide-based lens care solution / rub and rinse with MPS
- Replace lenses on time and more frequently
- Shift to daily disposable lenses?
  (and do NOT use longer than a day)
- No CL if hyperemia/secretion
- No Cl if COVID-19 nasopharyngeal PCR+



CL Wearer

- Avoid rubbing eyes/ touching face (eyes, nose and mouth) with unwashed hands
- Avoid CL wear altogether if unwell (particularly with any cold or flu-like symptoms)
  - Discard CL, solution, case
  - Re-start following full recovery with a new pair

Future Work

- Possibility of conjunctival transmission of SARS-CoV-2?
- Other ocular manifestations of COVID-19?
- Viral binding to CL surface?
- Interaction of SARS-CoV-2 with CL materials?
- Efficacy of currently marketed CL solutions to disinfect SARS-CoV-2?
- Any antiviral action of tears on SARS-CoV-2?

Keep Yourself and Your Staff Motivated

Thank You and Stay Safe

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