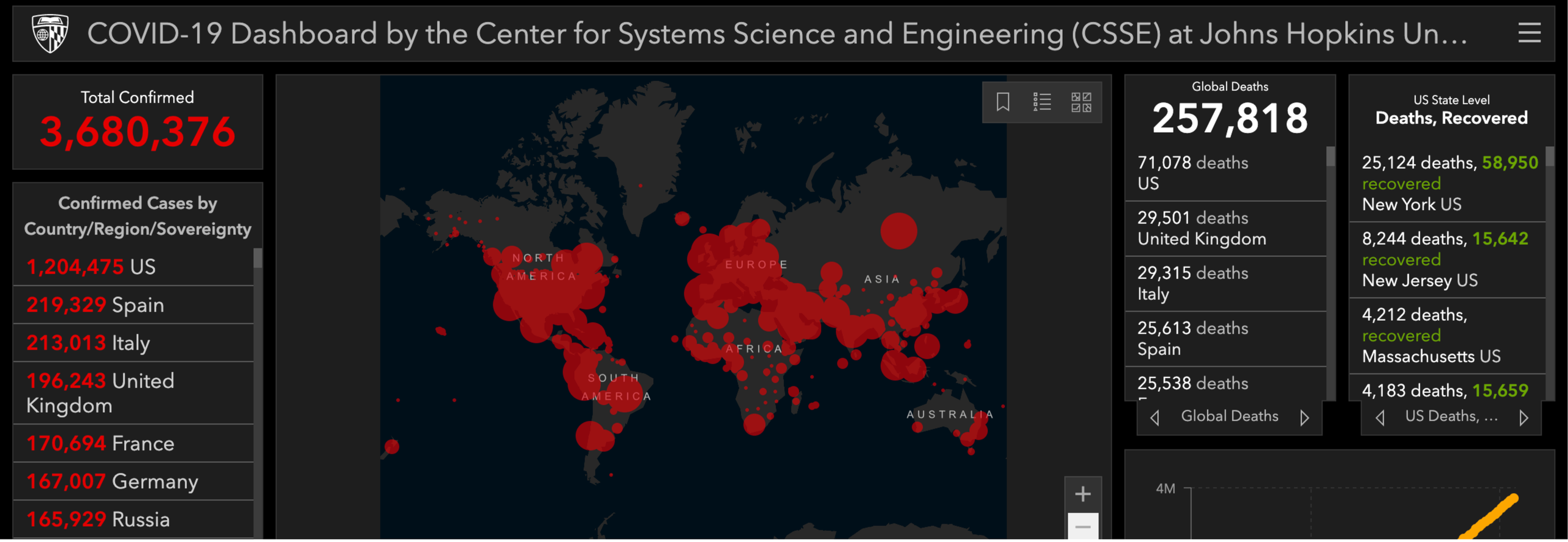
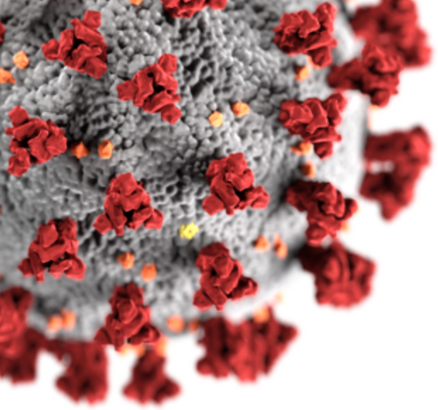


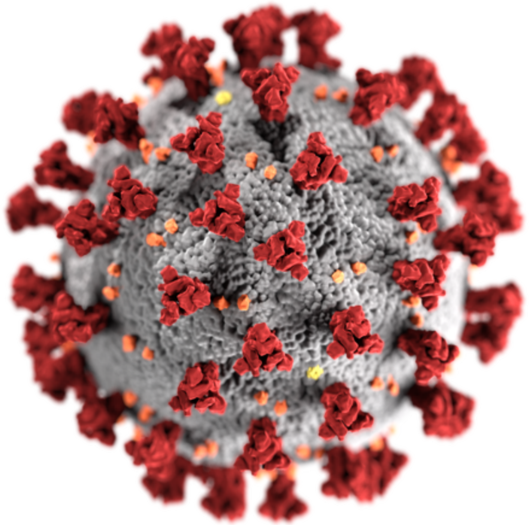
COVID-19 Research & Potential Implications for Diving

The unknowns divers worry about

May 6th, 2020



Today's Agenda

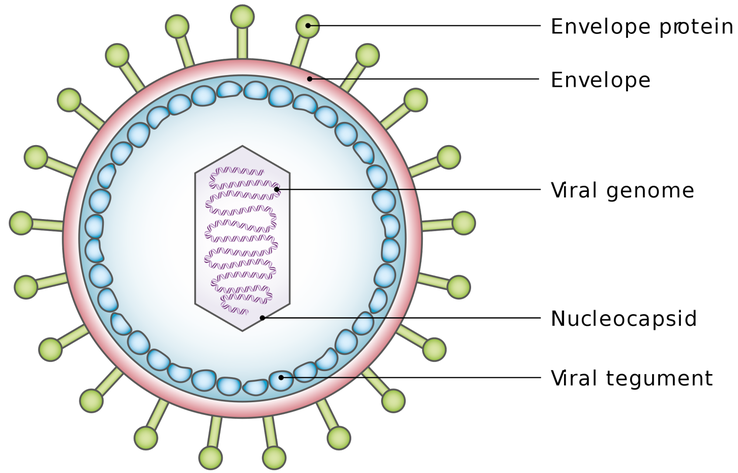


- Virology basics & Terminology
- What we know today
- Research during a pandemic
- What we don't know yet
- What divers want to know

- Some advice from your Diving Safety Organization

Virology Basics & Terminology

- **The disease:**
  - **CO**rona**VI**rus **D**isease 20**19** – **COVID-19**
- **The virus:**
  - SARS-CoV-2
  - Enveloped



Survival on surfaces:

- https://www.diversalertnetwork.org/emailview/landing/blogs/covid19Survival20/index.html

Elimination with soap and disinfectants

- https://www.facebook.com/DiversAlertNetwork/videos/2870342669749405/

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What we know today

- Symptoms (incubation time 2-14 days)
  - Cough
  - **Difficulty Breathing**

  Or at least two of the following:
  - Fever
  - Chills / Repeated shaking with chills
  - Sore Throat
  - Headache
  - Muscle Pain
  - Loss of taste or smell

- Spread
  - Nasal and oral secretions (microdroplets) – even after resolution of symptoms
  - Hands to mouth, eyes, nose
- Treatment:
  - Symptomatic Treatment & Supportive Care
- Duration of acute disease:
  - Mild cases (80%): 1-2 weeks
  - Severe cases (20%): 3-6 weeks

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What COVID-19 does in the body

https://floridalungdoctors.com/blog/secrets-scan-lung-cancer/schematic-illustration-of-human-lungs/

- SARS-CoV-2 enters the body primarily through mouth, nose, and eyes
- Targets epithelium of alveoli
- Can cause a systemic inflammation affecting other organs
  - Blood vessels, heart, liver, kidney
- Disrupts gas exchange – causes Hypoxemia

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Hypoxemia in COVID-19

- Causes
  - V/Q (Ventilation/Perfusion) mismatch
  - Right-to-left shunt
  - Diffusion impairment
  - Hypoventilation
- Signs and symptoms
  - Tachypnea (fast breathing)
  - Shortness of breath
  - Blueish lips/fingertips
  - Confusion
  - Drowsiness
- Convalescence may be prolonged

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Research during a Pandemic

Early Studies – Big Impact

Careful with conclusions: WE DON'T HAVE MUCH DATA!!!

What is being researched?

- Testing Options
- Immunity (Antibody tests)
- Vaccines
- Treatments
- Infection Control, e.g. testing of new disinfectants

Specific to the diving community:

- Long-Term Health Effects
- Fitness to Dive after COVID

COVID-19 Long-Term Effects: Unknown

- Less than 6 months recovery after first cases
- Mild cases (80%) *presumably* no lasting effects

- What we know from other Pneumonias and ARDS [*]:
  - Risk of lung fibrosis

- Heart problems (Cardiomyopathy & Arrhythmias)

[*] From experiences with SARS- and MERS-patients and not yet documented in COVID-19 survivors

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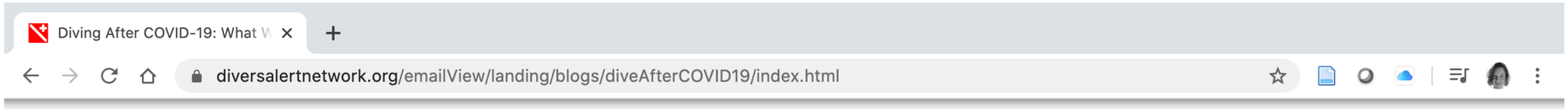
How could COVID-19 potentially affect return to exercise routines?

- Mild cases with a complete recovery – no effects expected
- Severe cases with ARDS and a need for mechanical ventilation – possible lasting damage:
  - Decreased lung functions
  - Lung scars - pulmonary barotrauma
  - A risk of cardiomyopathy and arrhythmias
  - Exercise intolerance

Webinar covering Fitness to Dive in more detail is in preparation

When can I return to diving after COVID-19?



Diving After COVID-19: What We Know Today

COVID-19 symptoms range from mild to severe. Some people have no symptoms at all while others require complicated stays in ICUs with ventilatory support to recover. In addition to the impact of the primary viral infection, factors such as underlying medical conditions, age, secondary complications and more will affect recovery.

COVID-19 shares many features with other serious viral pneumonias and requires a period of convalescence before returning to normal activities. The amount of time needed to recover will vary, as will the long-term effects of COVID-19 such as pulmonary function. As information becomes available it will be incorporated into COVID-19 prevention, treatment and follow-up guidelines.

Determination of your fitness to return to diving after a COVID-19 infection will require assessment by your physician team confirming your full recovery and ability to safely perform unrestricted vigorous activity.

If your doctor needs to consult with a dive medicine specialist, DAN doctors are here to help. We also have a database of dive medicine doctors and can provide referral information. Call us at +1 (919) 684-2948, 9am-5pm ET, Monday thru Friday.

In addition, we urge all divers who have recovered from COVID-19 infection to call DAN for up-to-date information. As always, continue to follow all recommended precautions and stay safe!

Does Oxygen help against the virus?

Emergency First Aid Oxygen

- If you feel someone needs oxygen, consult a physician

Hyperbaric Oxygen Treatment

- No evidence - Hypotheses are being tested

Hyperbaric Oxygen to treat COVID-19 is experimental

ClinicalTrials.gov Search Results 05/05/2020

	Title	Status	Study Results	Conditions	Interventions	Locations
1	Hyperbaric Oxygen Therapy Effect in COVID-19 RCT (HBOTCOVID19)	Recruiting	No Results Available	•COVID-19 •Desaturation of Blood	•Device: Hyperbaric oxygen therapy •Device: Normobaric oxygen therapy	•Amir Hadanny, Zerifin, Israel
2	Management by Hyperbaric Oxygen Therapy of Patients With Hypoxaemic Pneumonia With SARS-CoV-2 (COVID-19)	Recruiting	No Results Available	•Covid-19	•Combination Product: Hyperbaric oxygen treatment (HBOT) i.e. inhalation of pressurized oxygen delivered by a hyperbaric chamber (drug/device)	•Sainte Anne Military Teaching Hospital, Toulon, France
3	Hyperbaric Oxygen Therapy (HBOT) as a Treatment for COVID-19 (COVID-19) Infection	Not yet recruiting	No Results Available	•COVID-19	•Device: Hyperbaric Oxygen Therapy	•Ochsner Medical Center, New Orleans, Louisiana, United States
4	Hyperbaric Oxygen for COVID-19 Patients	Recruiting	No Results Available	•COVID-19	•Device: hyperbaric oxygen therapy (HBOT)	•NYU Winthrop Hospital, Mineola, New York, United States
5	Safety and Efficacy of Hyperbaric Oxygen for ARDS in Patients With COVID-19	Not yet recruiting	No Results Available	•SARS (Severe Acute Respiratory Syndrome) •Cytokine Storm •ARDS, Human •COVID-19 •Sars-CoV2 •Acute Respiratory Failure	•Drug: Hyperbaric oxygen	
6	Closed-Loop Oxygen to Verify That Healthcare Workers Interventions Decrease During SARS-CoV-2 Pneumonia (COVID-19)	Recruiting	No Results Available	•Coronavirus •Pneumonia •Oxygen Toxicity	•Other: Standard administration of oxygen flow •Device: Automated oxygen administration - FreeO2	•Institut universitaire de cardiologie et de pneumologie de Québec - Université Laval, Quebec, Canada

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Have you had COVID-19?

- If you are a diver and have recovered from Coronavirus disease and have returned to diving, we want to hear from you!
  - Contact: medic@dan.org

Travel Safety Advice following the Pandemic

- Risk of Spreading the virus is still apparent
  - Clinically recovered patients can still be contagious - keep your distance
  - No vaccine, no immunity, no new treatment options

- Precautions are still necessary
  - Use hand sanitizer and disinfectant wipes while traveling
  - Avoid big groups and crowded spaces
  - Follow national and local gov't laws and be up to date on travel restrictions/warnings

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Travel Safety Advice following the Pandemic

Disinfection of Rental Equipment

Make sure the dive operator / shop follows best hygiene practices (DAN's recommendations on gear disinfection: https://www.diversalertnetwork.org/emailview/landing/coronavirus/gearDisinfection/index.html)

Prepping for Return – Infection Control

https://www.diversalertnetwork.org/emailview/landing/blogs/prepareForReturn20/index.html

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MAKE WISE CHOICES

- Make choices that are best for yourself and your loved ones!
- Comply with federal and state social distancing orders and stay up to date on the recommendations of the CDC, WHO, and health departments.
- Avoid Exposure – Assume that everyone is a potential carrier
- Wash your hands!

STAY EDUCATED

Rumor Control

- Find trusted sources of information.
- Share information from trusted sources.
- Discourage others from sharing information from unverified sources.

Trusted Resources

https://www.diversalertnetwork.org/covid-19/

https://www.who.int

https://www.cdc.gov/coronavirus/2019-nCoV

https://www.fema.gov/coronavirus/rumor-control

https://www.coronavirus.gov/

https://coronavirus.jhu.edu/map.html

https://www.uhms.org/covid-19-information.html

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Take Home Messages

- The pandemic is ongoing
- Everyone can be a potential carrier
- Early research is preliminary and can easily be misleading
- Fitness to Dive after severe respiratory illness needs an individual evaluation by a physician
- Save your oxygen first aid kit for its intended use
- The curve still needs to be kept flat – take precautions!

Questions about COVID-19?

Medical Questions	Operational Questions	Research Studies
Medic@dan.org	RiskMitigation@dan.org	Research@dan.org

Medical Information Line +1 (919) 684 2948

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