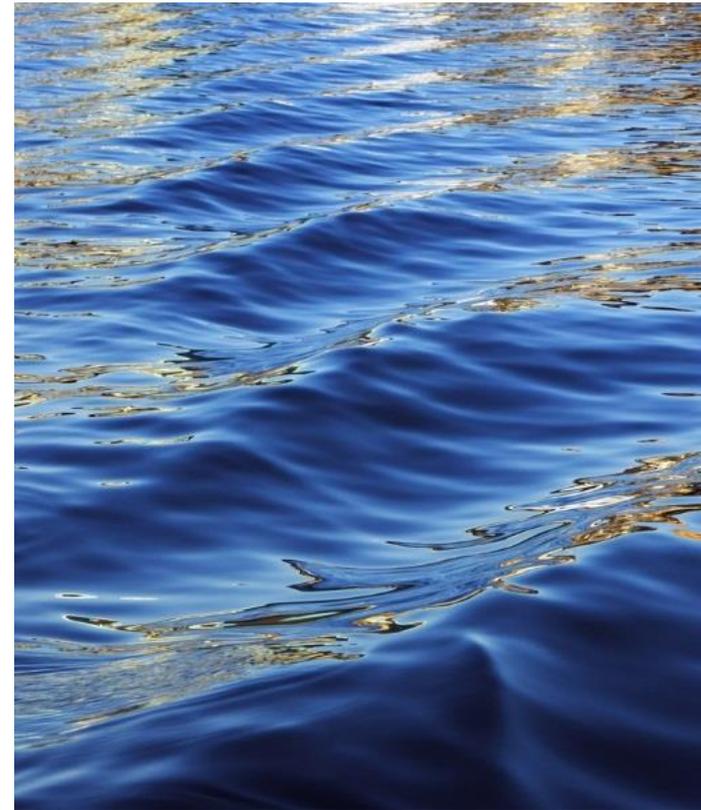


# COVID-19, Environmental Health, & Climate Change

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Health and the Environment



# Objectives for today's webinar:

- 1. Examine the interface of the COVID-19 response with environmental health
- 2. Propose best practices in terms of environmental health for COVID-19 risk reduction

# Continuing Education Credit

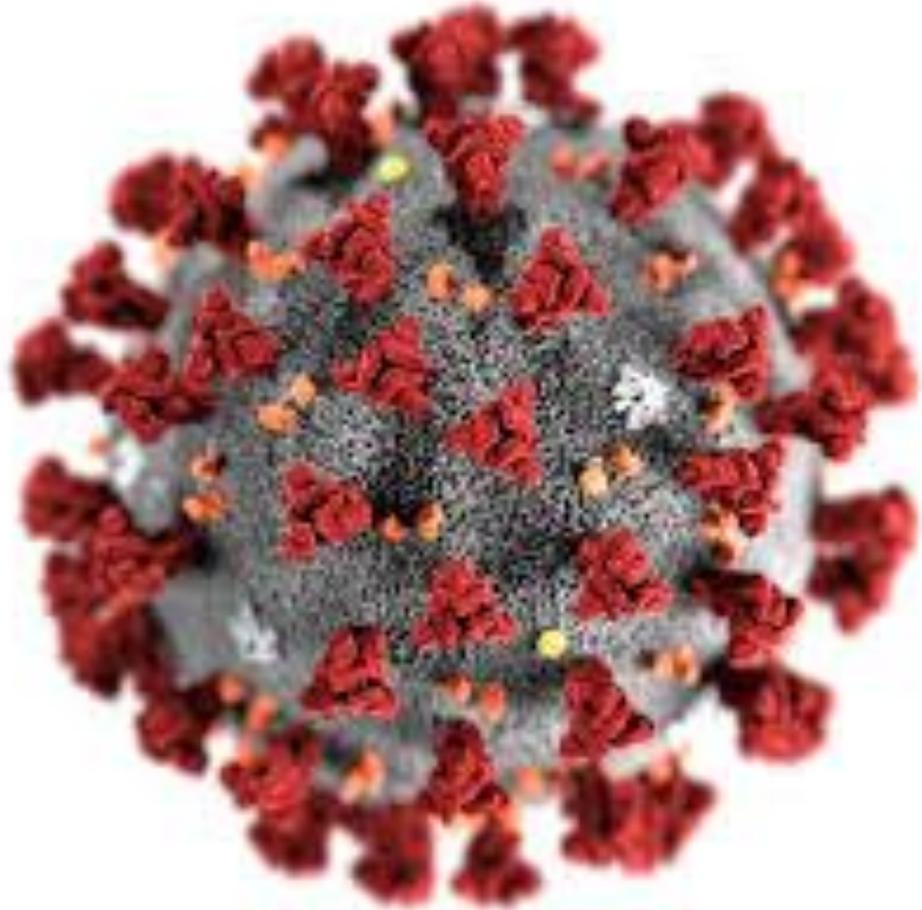
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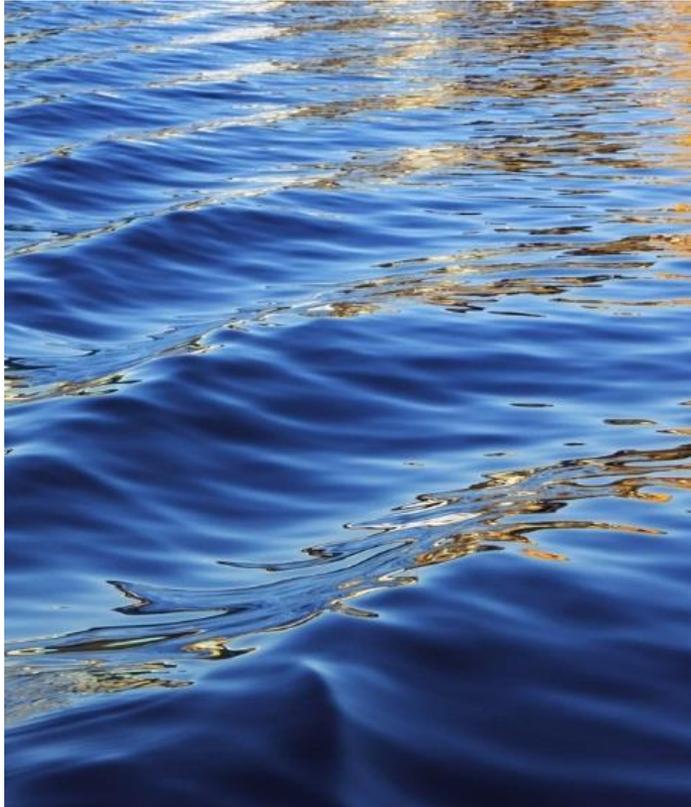


## Three Environmental Aspects of COVID-19

How it was transmitted to humans

How and where we transmit COVID-19 to one another

COVID-19 within the environment

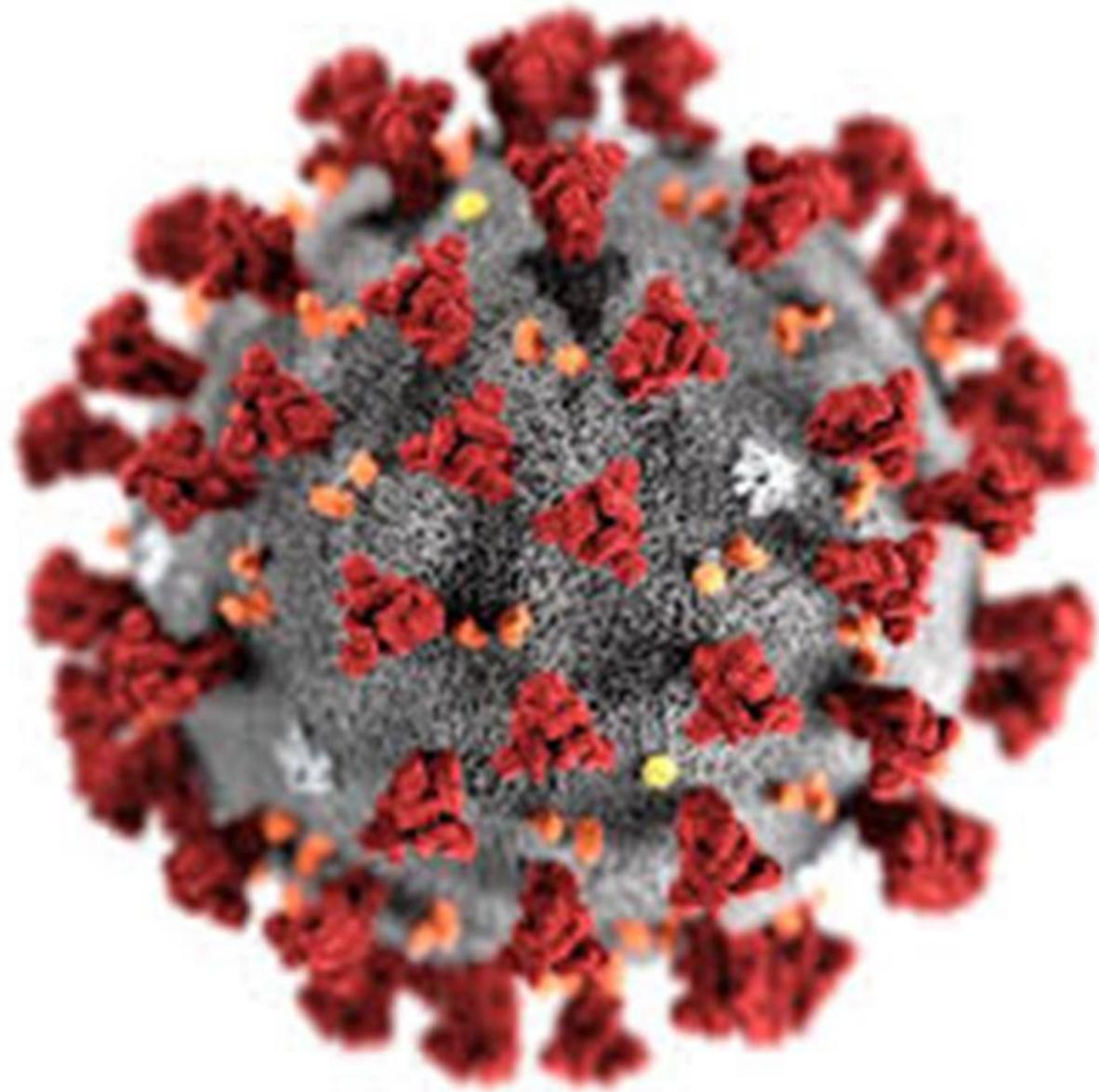


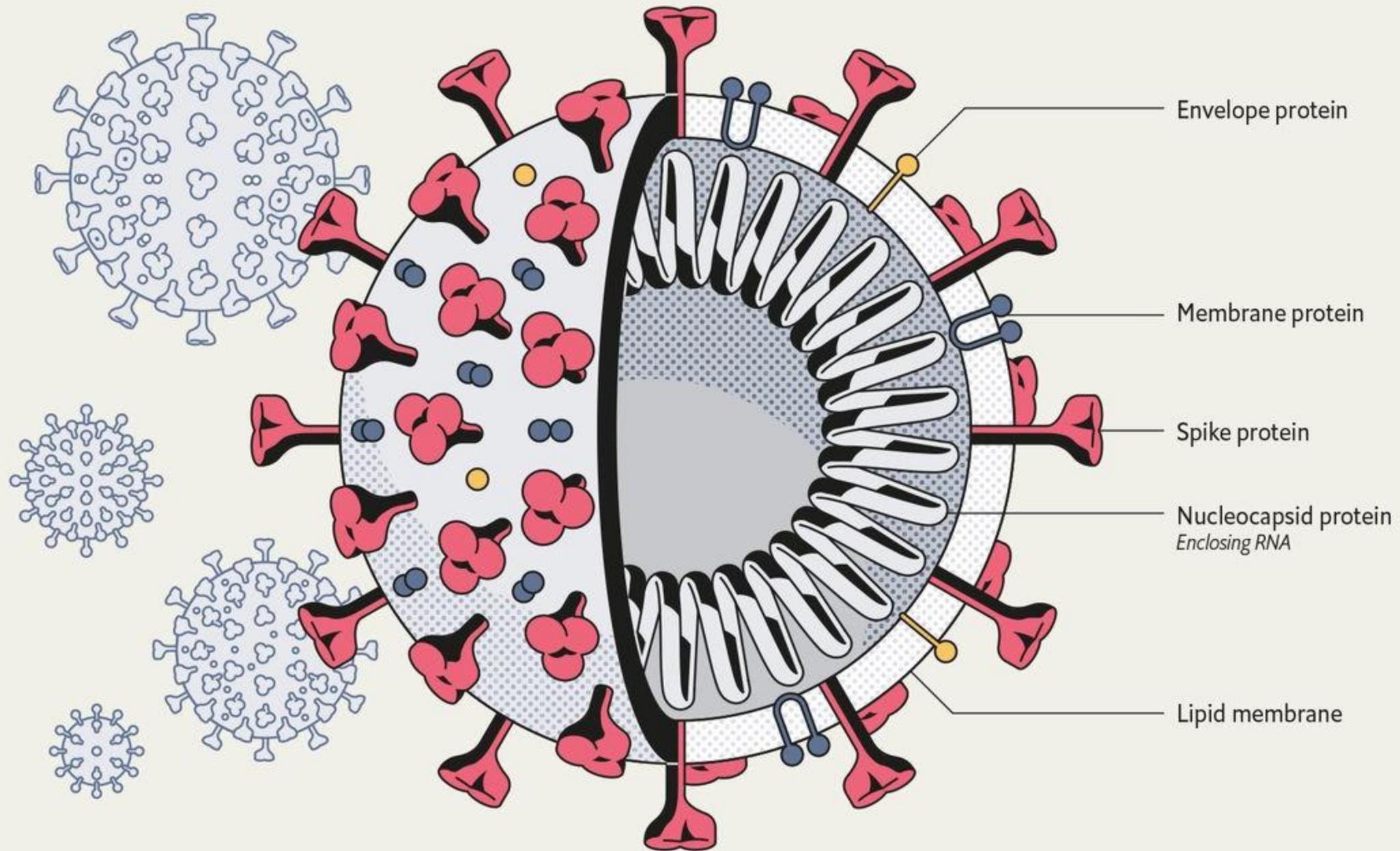
# Transmission of COVID-19 to humans

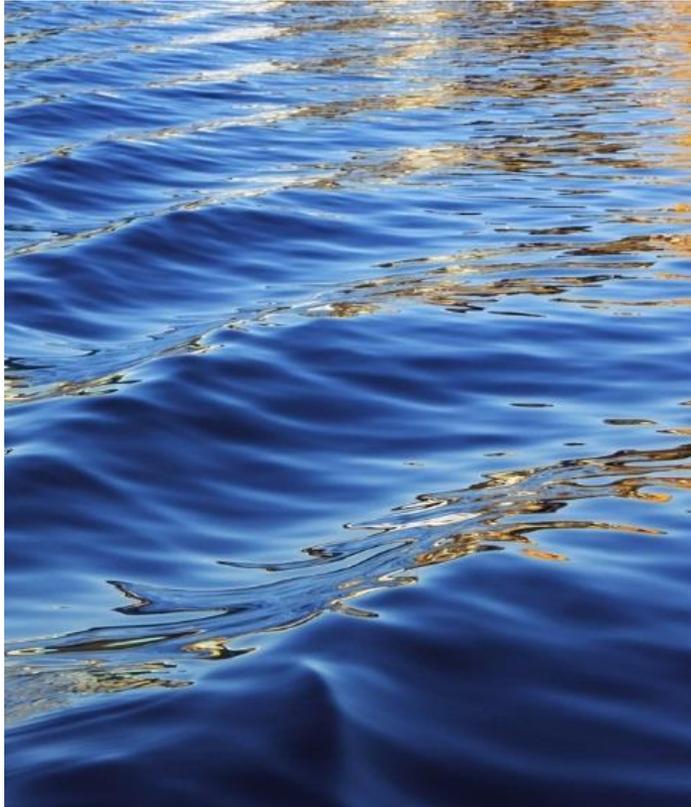
# How we suspect COVID-19 was transmitted to humans

- Believed to be zoonotic transmission from a seafood and animal market in Wuhan, China in 2019 (MMWR, 7Feb2020).
- At this time: there is no link to climate change
- BUT: Link to climate change with other infectious diseases
  - Ebola – migratory patterns of bats & people moving into forest for food.
  - Dengue
  - Lyme Disease









# How and where we transmit COVID-19 to one another

Droplet &  
respiratory  
transmission

Close contact  
with other  
people



WEAR A  
CLOTH  
MASK



PRACTICE  
SOCIAL  
DISTANCING



WASH  
HANDS  
OFTEN



**Masks:  
Not making it to the  
trash can  
450 years to biodegrade**





Image from NYTs 25JUL2020



## Waste generation in health care

Pre-COVID: U.S. hospitals generated 5 million tons of waste each year = 29 lbs./bed/day

During COVID: U.S. hospitals have generated 6 times the amount of waste that they did prior to COVID-19 ~ **30 million tons.**

Limited PPE – forced to reuse.

# Cleaning



- Clean frequently used surfaces: coffee pot, salt & pepper shakers
- EPA has a list of disinfectant products that can be used against COVID-19 (N List)
- Environmental Working Group – 16 safer products
- FOLLOW LABEL DIRECTIONS
- MOST DISENFECTANTS MUST REMAIN ON SURFACES FOR A TIME
- HOME RECIPES HAVE NOT BEEN TESTED



## Cleansers and Disinfecting Agents

Can be respiratory irritants -> IAQ

Select products that contain

**Hydrogen peroxide**

**Alcohol** (Isopropyl alcohol or Ethanol)

AVOID Ammonia and Bleach (and NEVER combine them)

Family member with Asthma or respiratory disease, select

Cleaning creams

Wipes (DO NOT FLUSH WIPES)



# OTIS PACKAGE STORE

EST. 1979

Parking  
WALKWAY TO  
JUNIOR  
CENTER  
EST. 1979

Hand sanitizer

Hand sanitizer

Hand sanitizer



WASH YOUR HANDS  
PROPERLY  
TO PREVENT  
THE SPREAD OF  
GERMS

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5-55 SAFETY SITE SINK

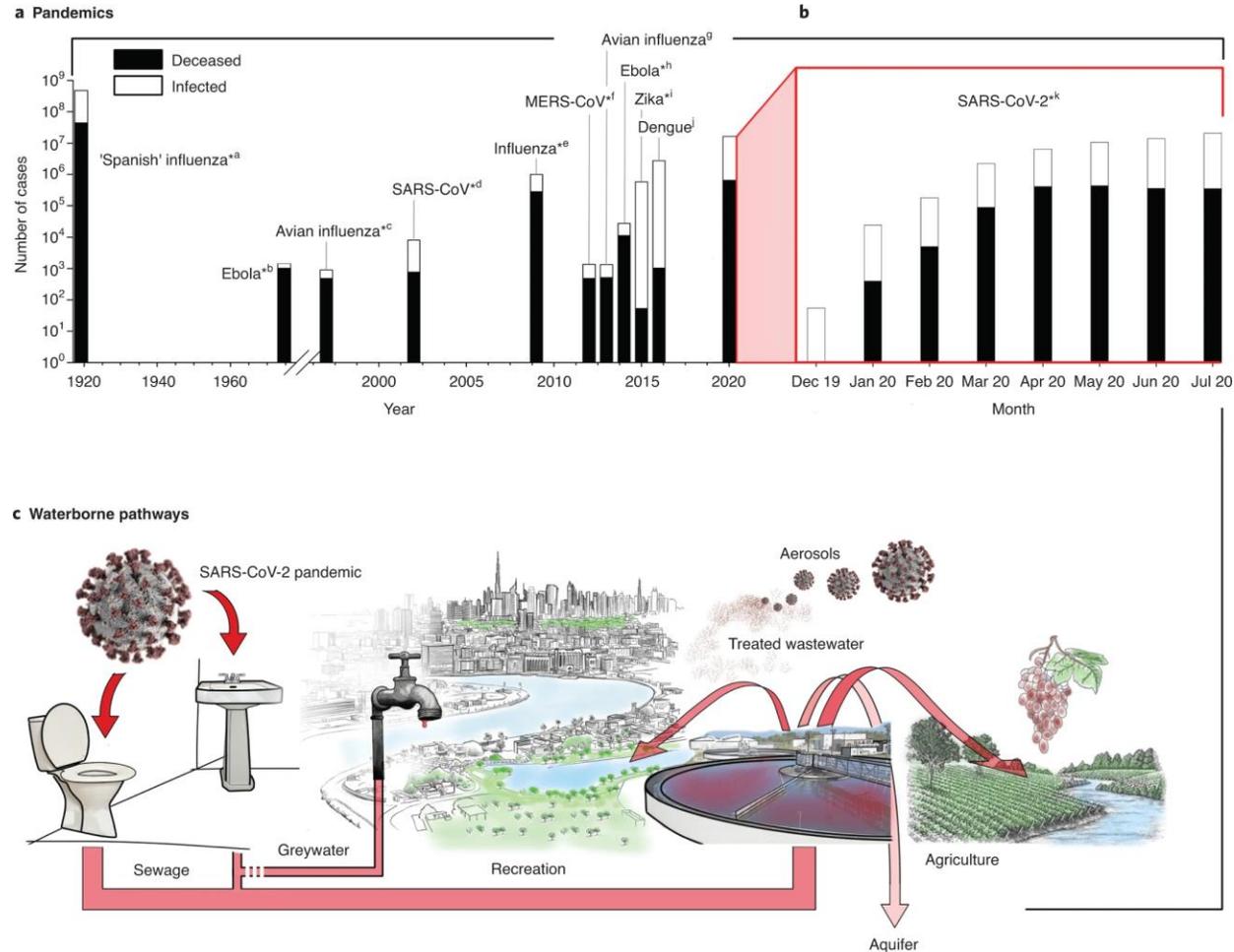
5-55 SAFETY SITE SINK

SAFETY SITE SINK

SAFETY SITE SINK



# Wastewater concerns with COVID-19





## Waste generation by the public

Increased residential recycling – diversion to landfills.

Shift to single use plastics: Take out containers

Not allowed to reuse bags or buy in bulk.

More on-line shopping – more packaging.

Stockpiling of food



## Food waste

Prior to COVID – Americans wasted 80 billions lbs. of food a year (219 lbs/person) –goes to landfill

COVID-19:

- Disruptions on food supply chains

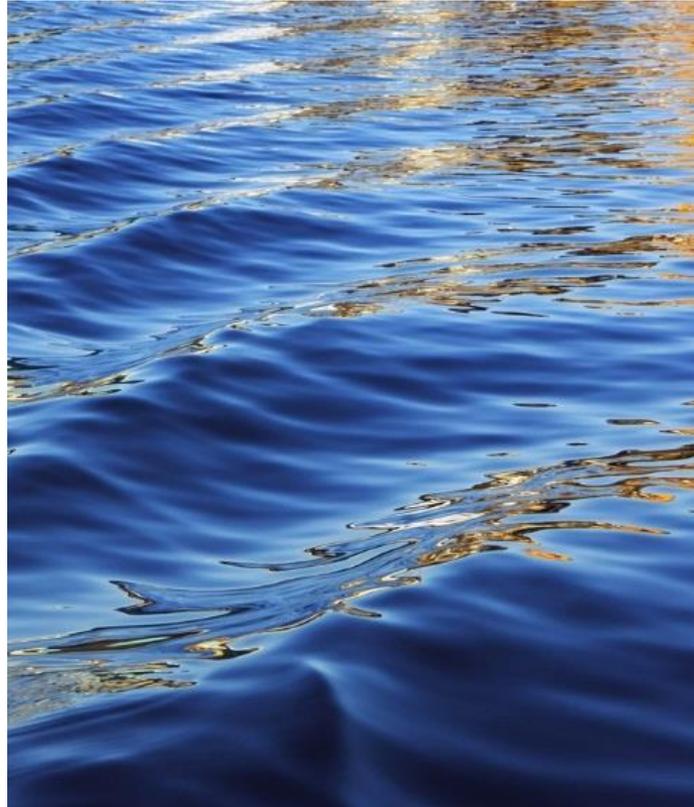
- Produce and milk wasted

- Farming industry not able to pivot to the grocery store/home market.

- Meat & poultry packing- COVID outbreaks

- Donations to foodbanks and shelters (loss of farmer income)

NYT (11APR2020): "Dairy Farmers of America, estimates that farmers are dumping as many as 3.7 million gallons of milk each day. A single chicken processor is smashing 750,000 unhatched eggs every week."



# COVID-19 within the Environment

## Some facts since COVID-19

- April 2020: Mobility studies using Google & Apple showed travel declined  $\geq 10\%$  in 125 countries (Forester et al., 2020)
- Google found that in 114 countries  $\geq 50\%$
- Global fossil fuel emission ( $\text{CO}_2$  &  $\text{NO}_x$ ) decreased by 30%
- $\text{NO}_x$  comes from road transport – we reduce it, it can influence cooling short-term





## While we stayed at home

Globally 5-6% reduction in energy usage

US 9% reductions

EU 11%

Overall, expected to be a 6% reduction in GHGs

Negative economic consequences.

Less GHG emissions, cleaner air, less noise.

# Poor COVID-19 outcomes linked to outdoor (ambient) air pollution

- Early studies:
- Densely populated areas & air pollution greater risk of COVID-19 infection (Brandet et al, 2020)
- China: Short-term exposure to higher concentrations of PM<sub>2.5</sub>, PM<sub>10</sub>, CO, NO<sub>2</sub> and O<sub>3</sub> is associated with an increased risk of COVID-19 infection (Zhu et al., 2020).
- PM 2.5 greater risk of dying from COVID-19 (Wu & Nethery, in review)
- Need more research: Areas of low income, communities of color are also areas of high air pollution – Environmental (in)Justice Communities

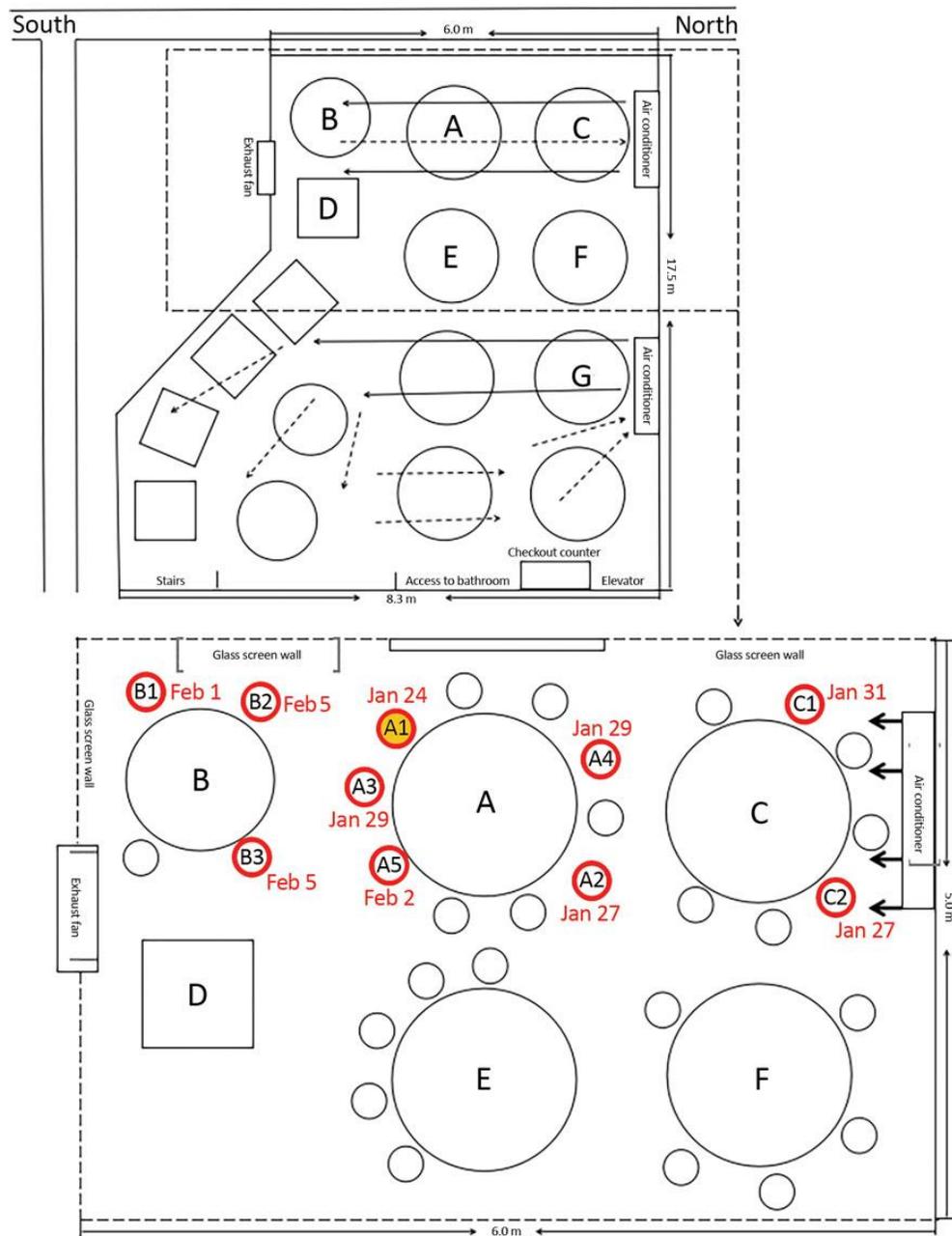




## COVID-19 is an indoor air quality issue

Indoor ventilation

Dry air (winter-time and heating) the virus can travel further.



# Ventilation requirements during COVID-19 from WHO

Consider using natural ventilation, opening windows if possible and safe to do so.

For mechanical systems, increase the percentage of outdoor air, using economizer modes of HVAC operations and potentially as high as 100%. Before increasing outdoor air percentage, verify compatibility with HVAC system capabilities for both temperature and humidity control as well as compatibility with outdoor/indoor air quality considerations.

Increase total airflow supply to occupied spaces, if possible.

Disable demand-control ventilation controls that reduce air supply based on temperature or occupancy.

Improve central air filtration:

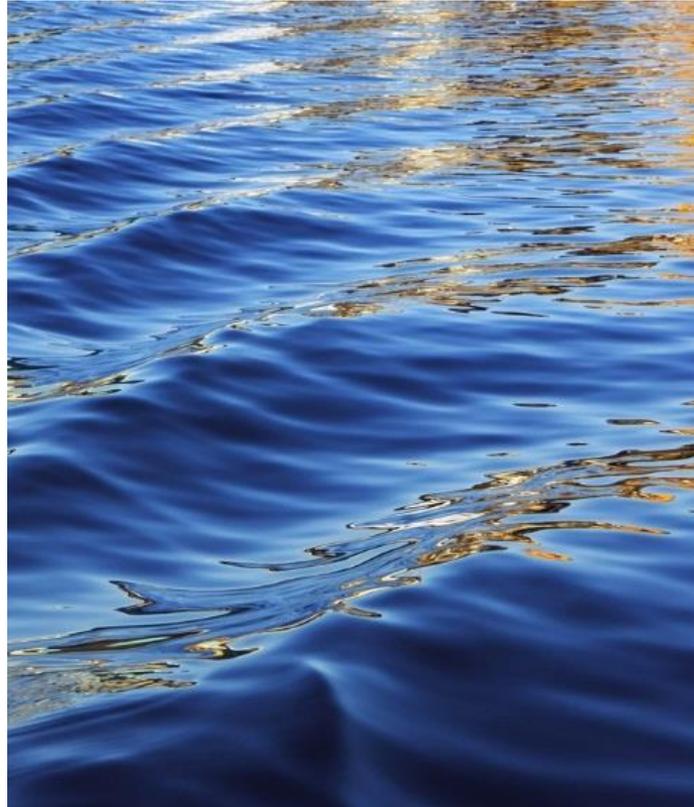
Increase air filtration to as high as possible without significantly diminishing design airflow.

Inspect filter housing and racks to ensure appropriate filter fit and check for ways to minimize filter bypass.

Consider running the HVAC system at maximum outside airflow for 2 hours before and after spaces are occupied, in accordance with manufactory recommendations.



What have we learned  
about ourselves during  
COVID-19?







## 66 days to change behavior

Milan, Italy will be adding more bike lanes to continue the health benefits.

Consider collective life-style changes related to energy and material use.

Influence policy to support those changes.

Just transition.

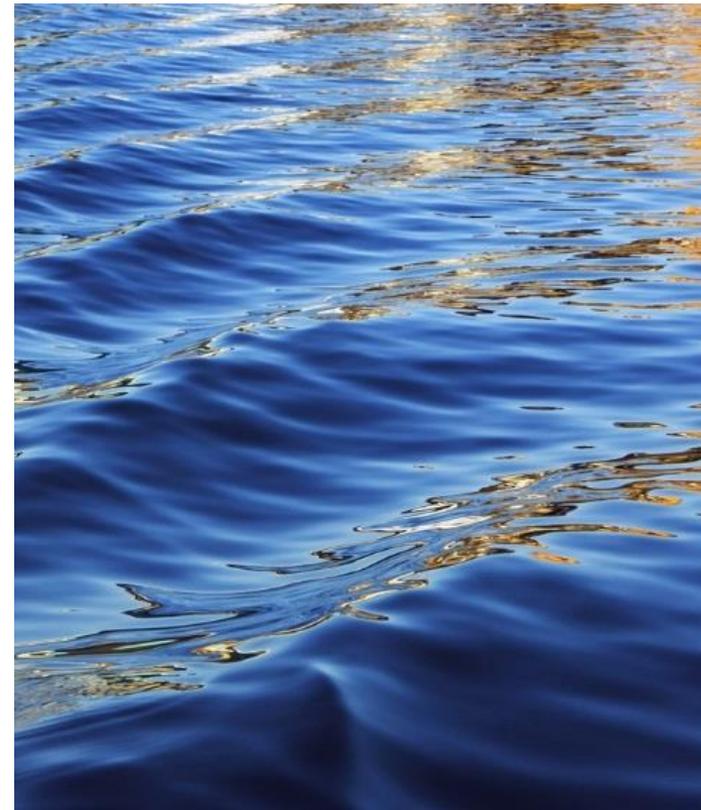


**The virus has a lipid  
outer shell.  
WASH YOUR HANDS  
WEAR A MASK  
SOCIAL DISTANCE  
MONITOR  
VENTILATION  
VOTE for public health**



# Thank you.

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