COVID-19, Environmental Health, & Climate Change

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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
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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
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 DISINFECTANTS 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)
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 ≥10% in 125 countries (Forester et al., 2020)
• Google found that in 114 countries ≥50%
• Global fossil fuel emission (CO2 & NOx) decreased by 30%
• NOx comes from road transport – we reduce it, is 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 PM2.5, PM10, CO, NO2 and O3 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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