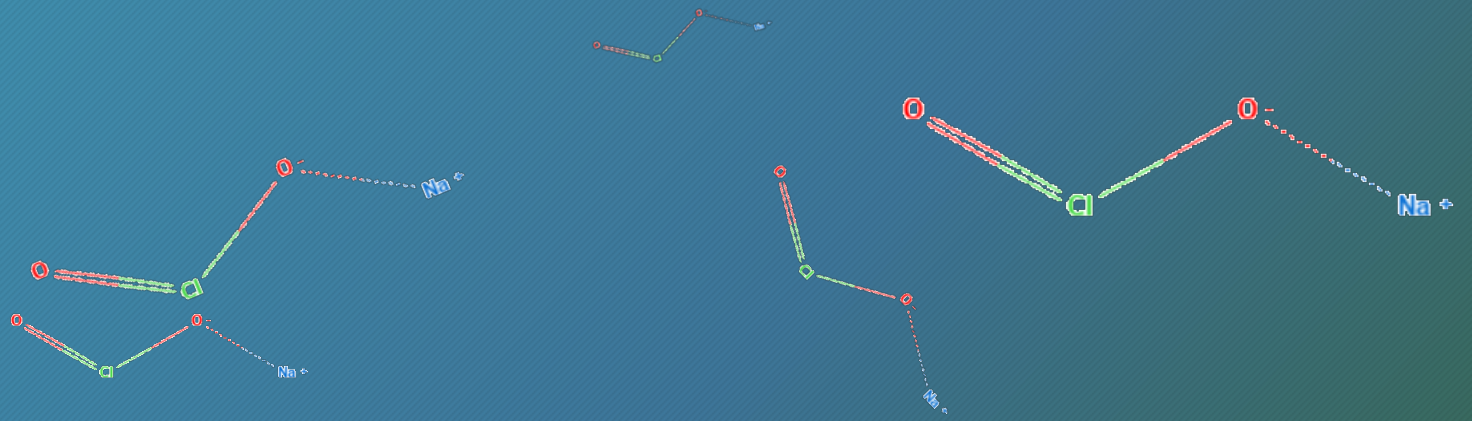


Disinfectant Health & Safety Information

Chemicals that kill germs are not likely to be without health concerns.

Who I am?

Pesticides Toxicologist with Maine Board of Pesticides Control

Pamela J. Bryer, PhD

- I am here as a resource for you, your co-workers, friends, and family for questions about pesticides.

It’s a different world

Real frustration with using disinfectants.

Leads us to wonder, why this hub-bub?

Why are we talking about the safety of cleaning chemicals?

Familiarity breeds contempt

When I say “pesticide” what do you think of?

What is a pesticide?

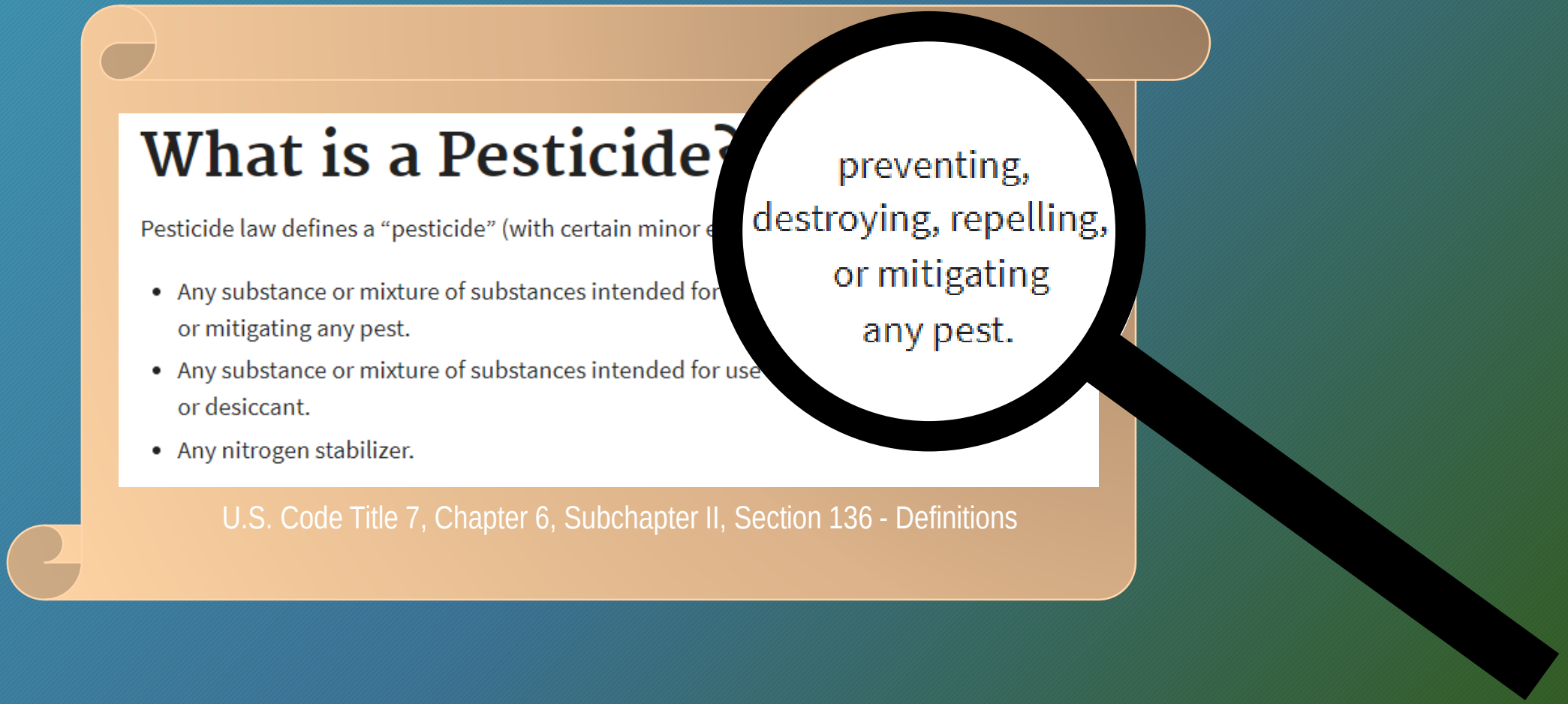
What is a Pesticide?

Pesticide law defines a “pesticide” (with certain minor exceptions) as:

- Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest.
- Any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.
- Any nitrogen stabilizer.

U.S. Code Title 7, Chapter 6, Subchapter II, Section 136 - Definitions

What is a pesticide?



Important difference between agricultural and disinfecting uses

Mainers injured from disinfectants every year

Household cleaning products accounted for 22% of the 926 substances involved in these 847 cases, with bleaches (n = 60), disinfectants (n = 31), and wall, floor and tile cleaners (n = 15) being the most common.

Taken from 2020 Annual Report Northern New England Poison Center Maine Report

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Maine case statistics were heavily influenced by three factors during this period.

- The NNEPC handled 1,293 cases called in after hours on the Maine CDC's disease reporting line—727 human exposure cases, 14 animal exposures and 552 information requests. This was more than three times the number of such cases the center typically handles, an increase that was directly tied to the COVID-19 pandemic: 63% of the cases (n = 813) were related to COVID-19.
- The pandemic also had a significant effect on the overall makeup of the NNEPC's case load. The center saw a surge in cases generated by calls from residences, largely related to unintentional misuse of household products, while generally receiving fewer calls from health care facilities. These both ran counter to recent trends.
- There were 387 cases stemming from a multipatient incident at a school. This incident was first reported to the NNEPC by a health care facility, although only one patient was treated at the facility. This affected statistics related to calls from health care facilities (see Health Care Facility Exposure Cases and Multicase Exposures below).

exposures in the past two years.

- Adults 60 years and older accounted for 12% of all exposures (n = 1,411). There was a 20% increase in cases involving older adults, largely due to the COVID-19 pandemic.

Occupational injury trends in Maine

Roughly 20 Mainers die each year on the job

INJURIES AND ILLNESSES DUE TO WORKPLACE CHEMICALS AND RELATED HAZARDS
ME DOL Publication
2012-2013 Worker's Comp claims

Source: https://www.maine.gov/labor/labor_stats/research.html

TABLE 1
NATURE OF WORKERS' COMPENSATION CLAIMS FROM EXPOSURE TO HAZARDOUS CHEMICALS OR ADVERSE ENVIRONMENTAL/MICROBIOLOGICAL CONDITIONS (2012–2013)

NATURE OF INJURY OR ILLNESS	INCIDENTS	PERCENT	PRIVATE SECTOR	PUBLIC SECTOR
Respiratory symptoms: coughing, irritation, inflammation, difficulty breathing, asthma	136	33.5%	90	46
Thermal, chemical and inhalation vapor burns	54	13.3%	47	7
Swelling, inflammation, infections	43	10.6%	39	4
Dermatitis, allergic skin reactions	37	9.1%	33	4
Unspecified injuries and disorders	35	8.6%	26	9
Unspecified allergic reactions	35	8.6%	28	7
General, physical symptoms	23	5.7%	17	6
Dizziness, weakness or nausea	20	4.9%	14	6
Headache, migraine, visual loss	9	2.2%	6	3
Shock, loss of consciousness, convulsions	7	1.7%	4	3
Other traumatic injuries	7	1.7%	7	0
TOTALS FOR ALL CLAIMS	**406**		**311**	**95**

TABLE 4
OCCUPATIONS INVOLVED WITH WORKERS' COMPENSATION CLAIMS FROM EXPOSURE TO HAZARDOUS CHEMICALS OR ADVERSE ENVIRONMENTAL/MICROBIOLOGICAL CONDITIONS (2012–2013)

OCCUPATION (SOC CODE)	INCIDENTS	PERCENT	PRIVATE SECTOR	PUBLIC SECTOR
Office and administrative support workers (43-0000)	50	12.3%	31	19
Production workers (51-0000)	39	9.6%	38	1
Healthcare practitioners and technicians (29-0000)	36	8.9%	33	3
Building/ grounds maintenance and cleaning workers (37-0000)	30	7.4%	18	12
Equipment installation, maintenance /repair workers (49-0000)	29	7.1%	24	5
Healthcare support workers (31-0000)	28	6.9%	27	1
Transportation and material moving workers (53-0000)	28	6.9%	26	2

TABLE 5
TOP EMPLOYER INDUSTRIES INVOLVED WITH WORKERS' COMPENSATION CLAIMS FROM EXPOSURE TO HAZARDOUS CHEMICALS OR ADVERSE ENVIRONMENTAL/MICROBIOLOGICAL CONDITIONS (2012–2013)

INDUSTRY (NAICS CODE)	NUMBER OF INCIDENTS	PERCENT	PRIVATE SECTOR	PUBLIC SECTOR
Hospitals (622000)	55	13.5%	53	2
Public Administration (920000)	51	12.6%	1	50
Education (610000)	42	10.3%	11	31
Manufacturing (310000 – 330000)	39	9.6%	39	0
Ambulatory Services (621000)	29	7.1%	29	0
Administrative support waste management and remediation (560000)	26	6.4%	26	0

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SOURCES OF WORKERS' COMPENSATION CLAIMS FROM EXPOSURE TO HAZARDOUS CHEMICALS OR ADVERSE ENVIRONMENTAL/MICROBIOLOGICAL CONDITIONS (2012–2013)

SOURCES	INCIDENTS	PERCENT	PRIVATE SECTOR	PUBLIC SECTOR
Cleaning and polishing agents	61	15.0%	47	14
Ambient conditions, unknown chemicals/microbes in the air	66	16.3%	38	28
Unspecified or unclassified chemicals	58	14.3%	44	14
Mold, fungi	35	8.6%	24	11
Propane, natural gas, gasoline, diesel fuel, petroleum fuels	21	5.2%	19	2
Drugs, alcohol, medications, vaccines	19	4.7%	17	2
Paint, lacquer, varnish, thinners	18	4.4%	14	4
Cosmetics, beauty preparation	18	4.4%	12	6
Other specific chemicals with less than three incidents	13	3.2%	10	3
Disinfectants	9	2.2%	8	1
Soaps detergents, shampoos	9	2.2%	8	1
Bleach	9	2.2%	8	1
Acids	9	2.2%	8	1
Smoke (non-firefighting)	9	2.2%	7	2
Freon	8	2.0%	8	0
Alkalis, wet cement, lime	7	1.7%	7	0
Pesticides, herbicides	7	1.7%	6	1
Glues, adhesives	6	1.5%	5	1
Sulfur compounds	5	1.2%	4	1
Aldehydes	4	1.0%	4	0
Antifreeze	4	1.0%	4	0
Carbon monoxide	4	1.0%	3	1
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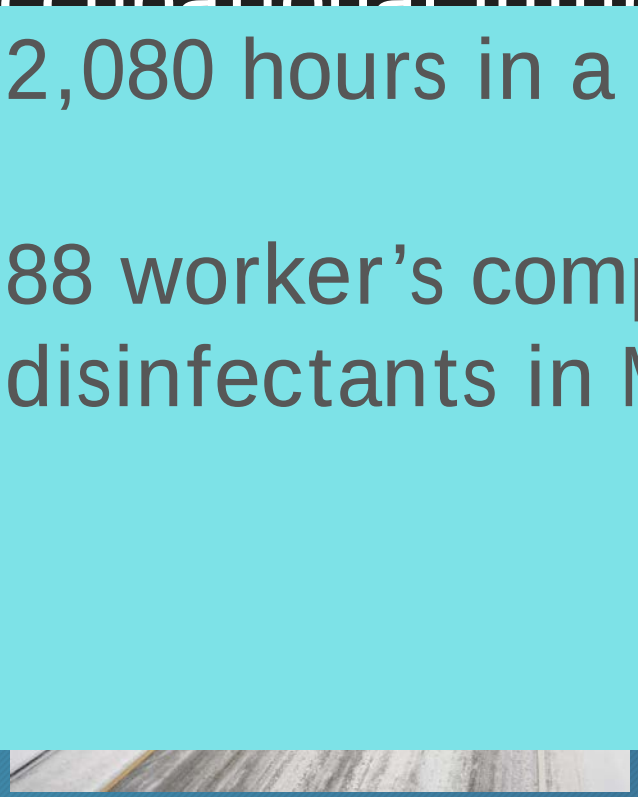
Occupational injury t

2,080 hours in a work year.

88 worker's compensation claims related to disinfectants in Maine for the 2012-2013 year.



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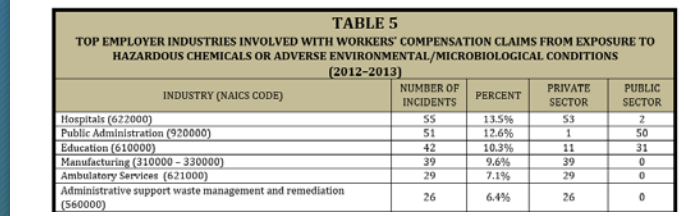

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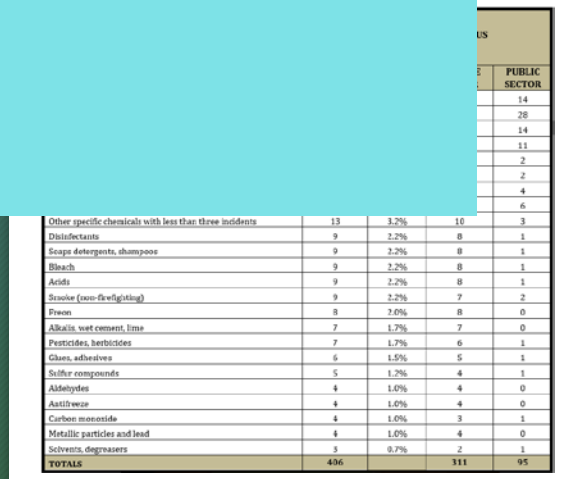

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Other specific chemicals with less than three incidents	13	3.2%	10	3
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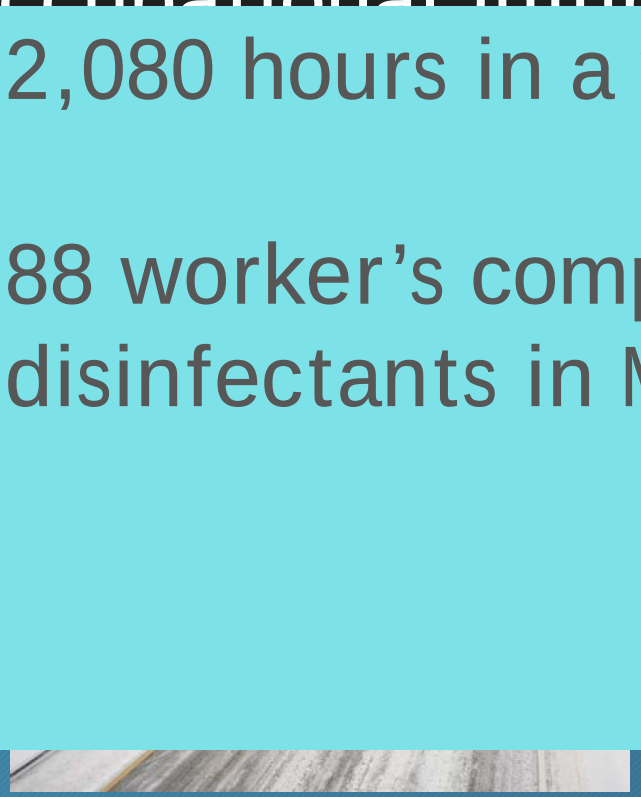

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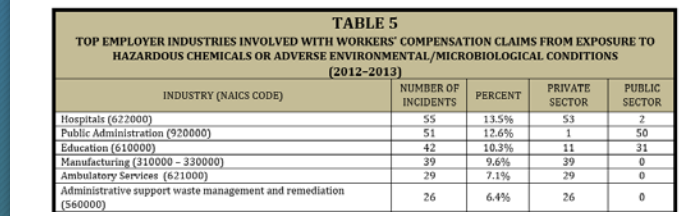

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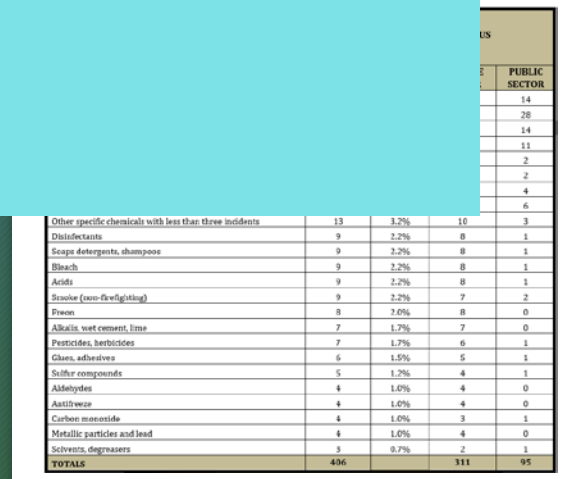

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Occupational injury trends in Maine

Roughly 20 Mainers die each year on the job

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Mold, fungi	35	8.6%	24	11
Propane, natural gas, gasoline, diesel fuel, petroleum fuels	21	5.2%	19	2
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More grizzly death/injury statistics

Annual US fatalities

- Public building ~575
- Farm ~400

For comparison the same database counted only 15 deaths from stings and bites.

US cases involving missed days of work injured by chemical products

~1,000 janitors/cleaners

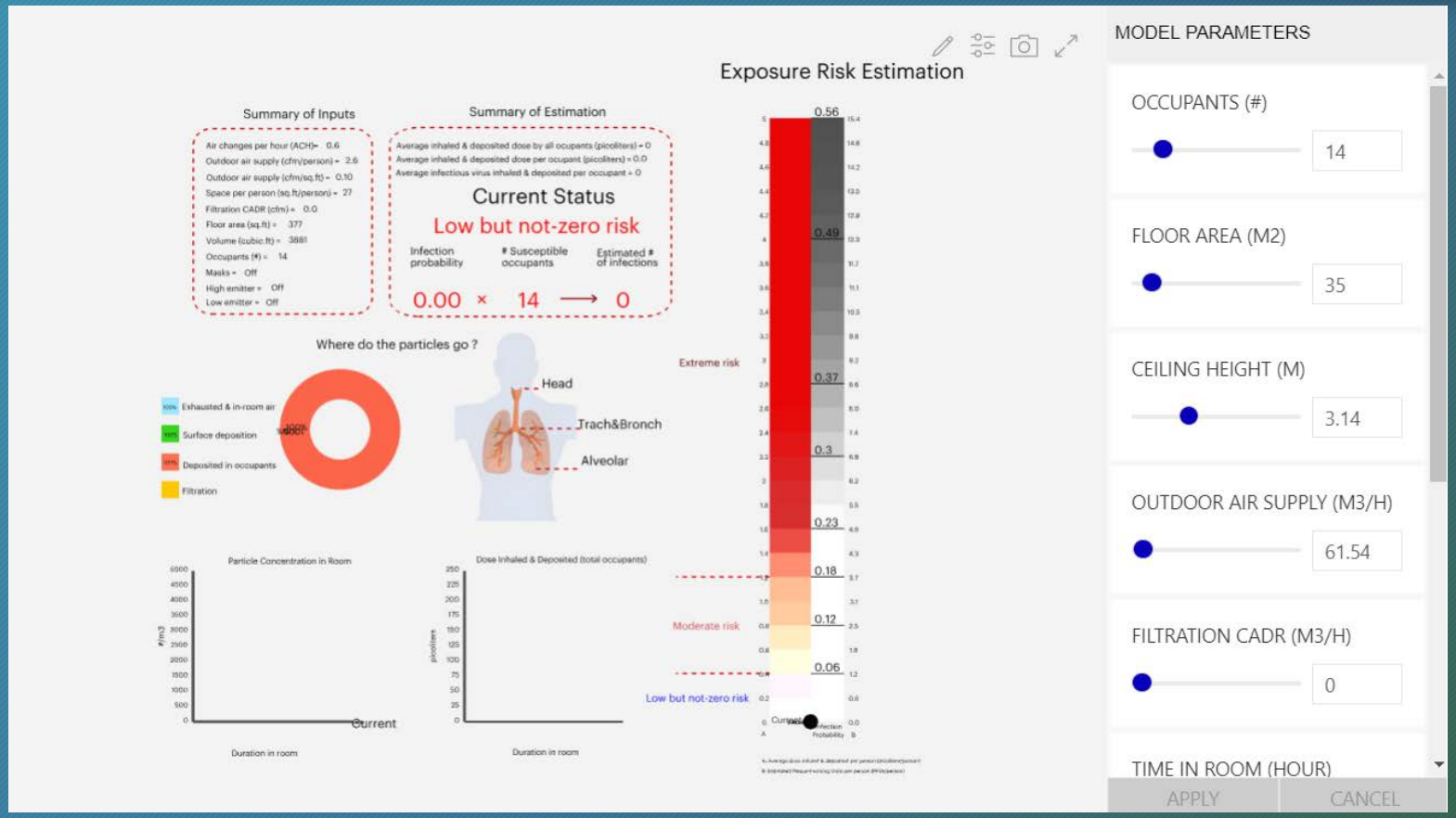
~75 pest control workers

Interesting data on COVID-19

Work in progress

https://safeairspaces.com/

https://safeairspaces.com/



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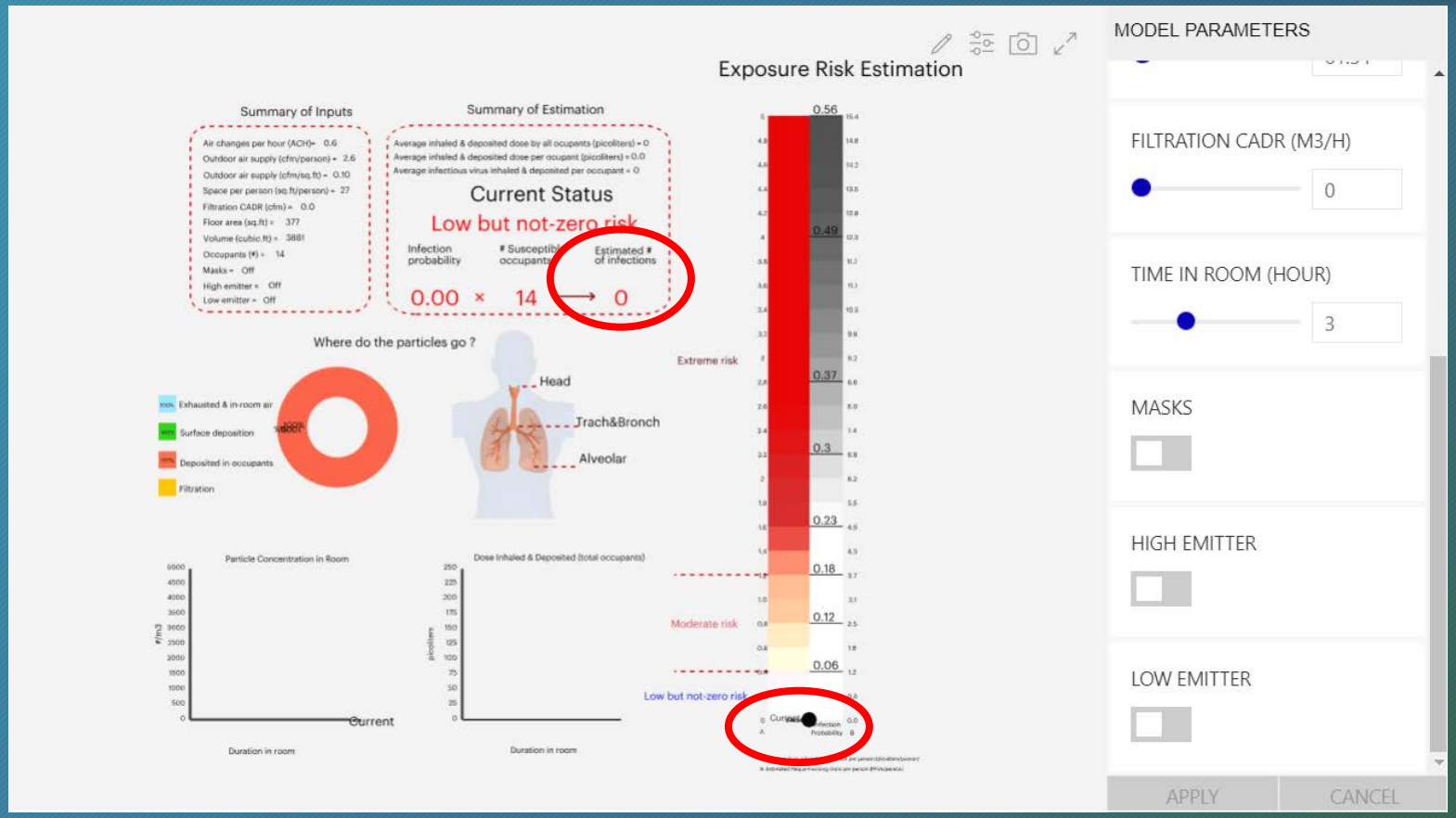

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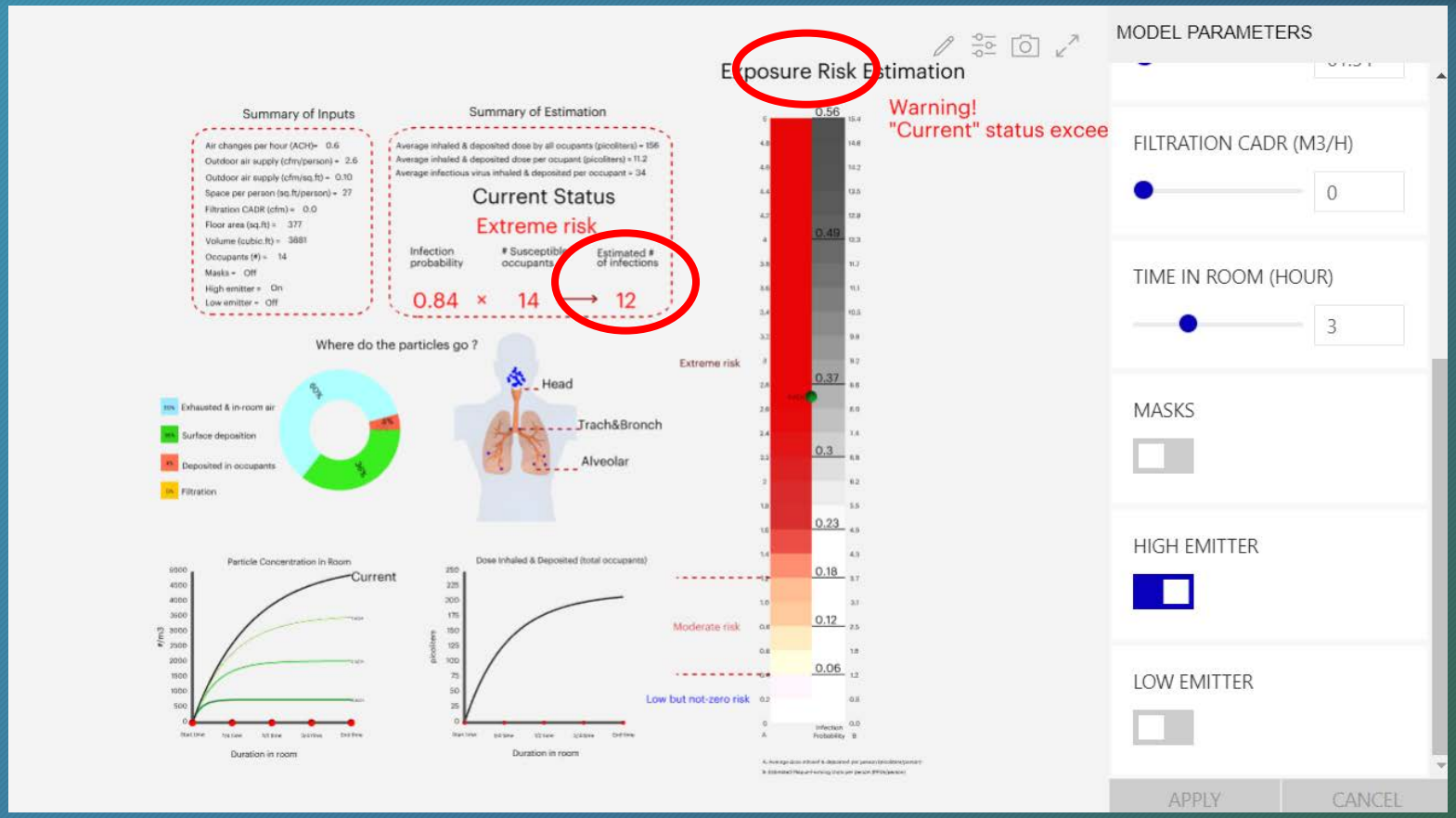
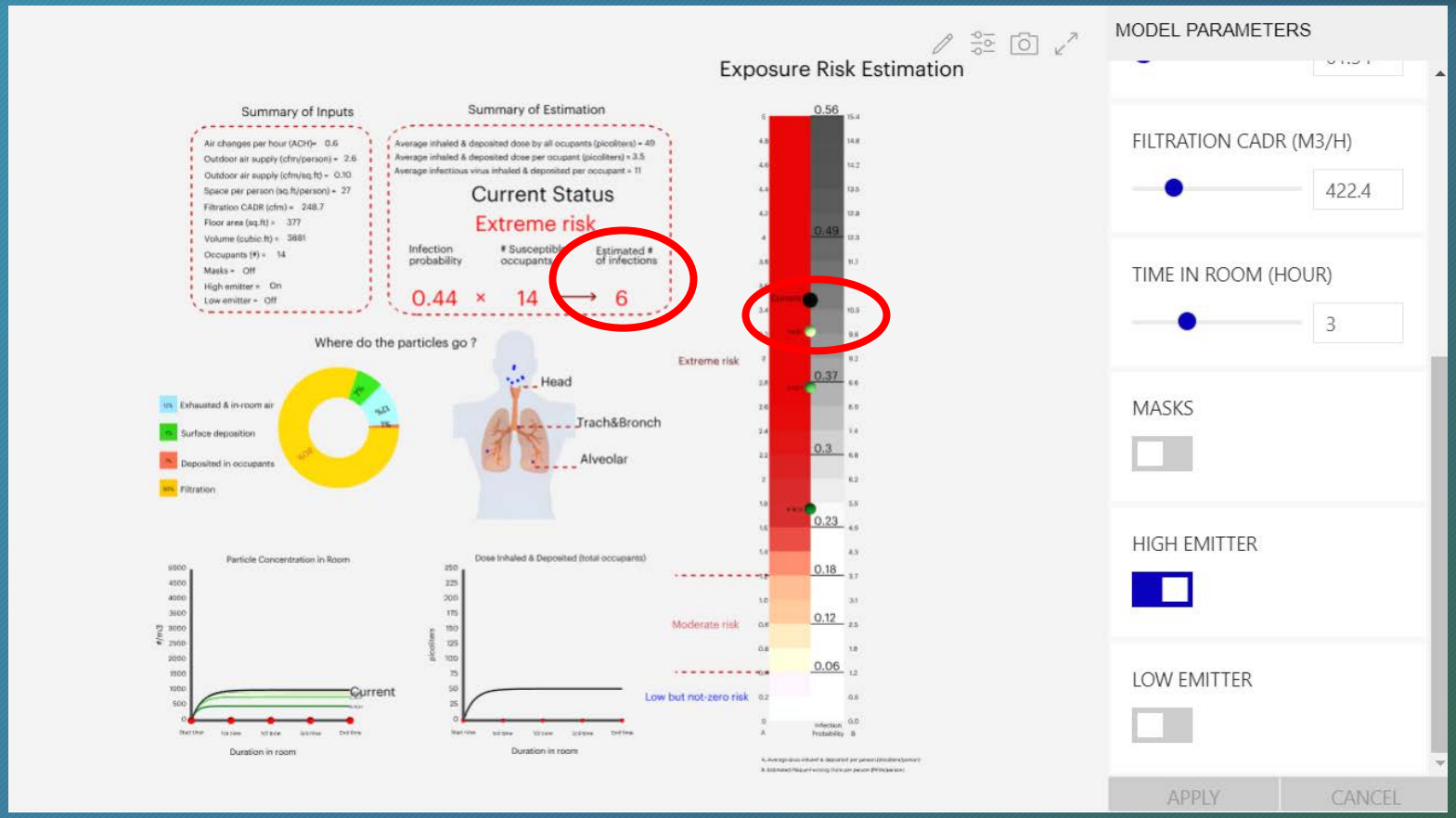


Now with
-high emitter

https://safeairspaces.com/

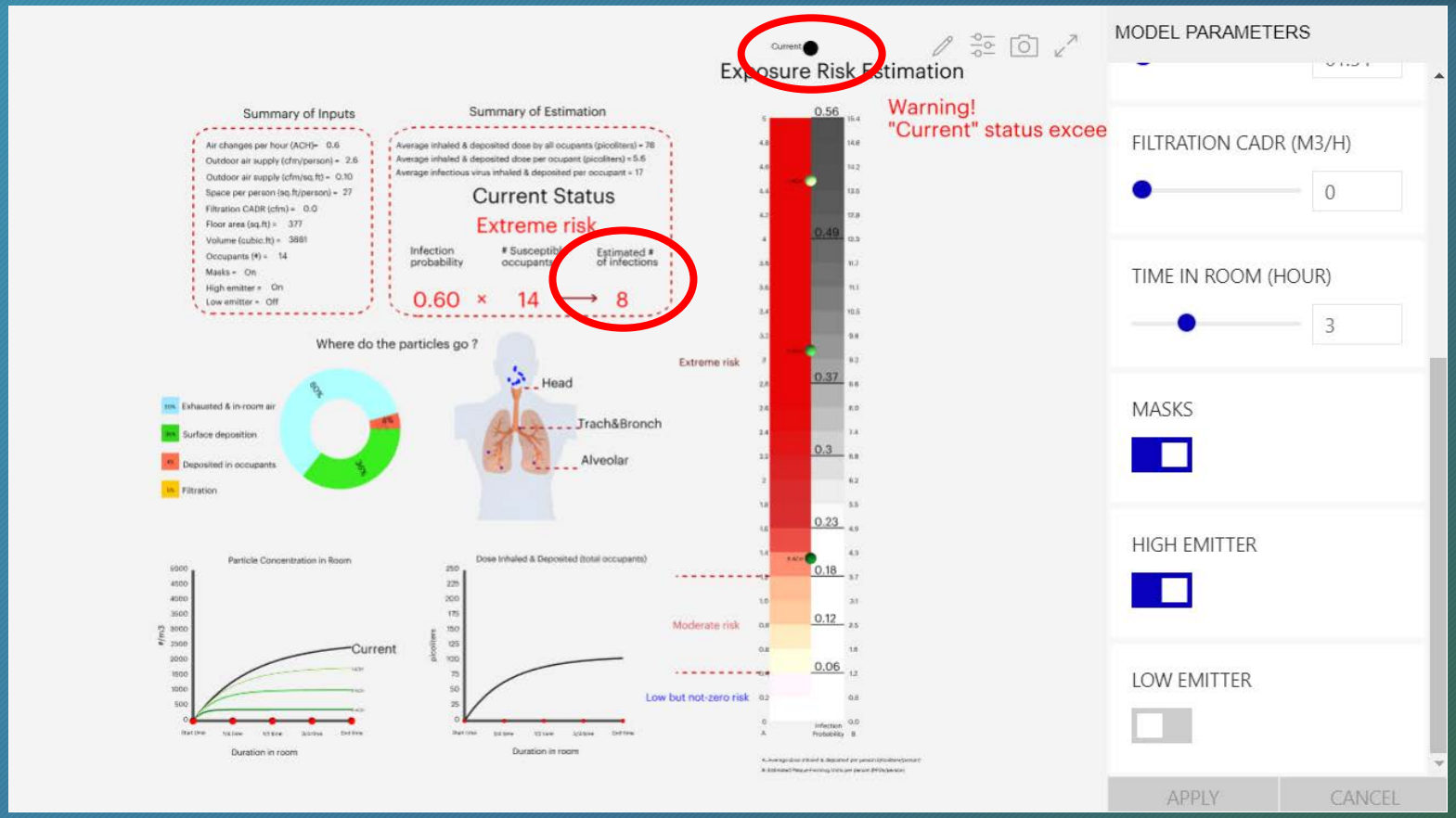


Now with
-high emitter

&

-filtration at 420 m^3/h

https://safeairspaces.com/

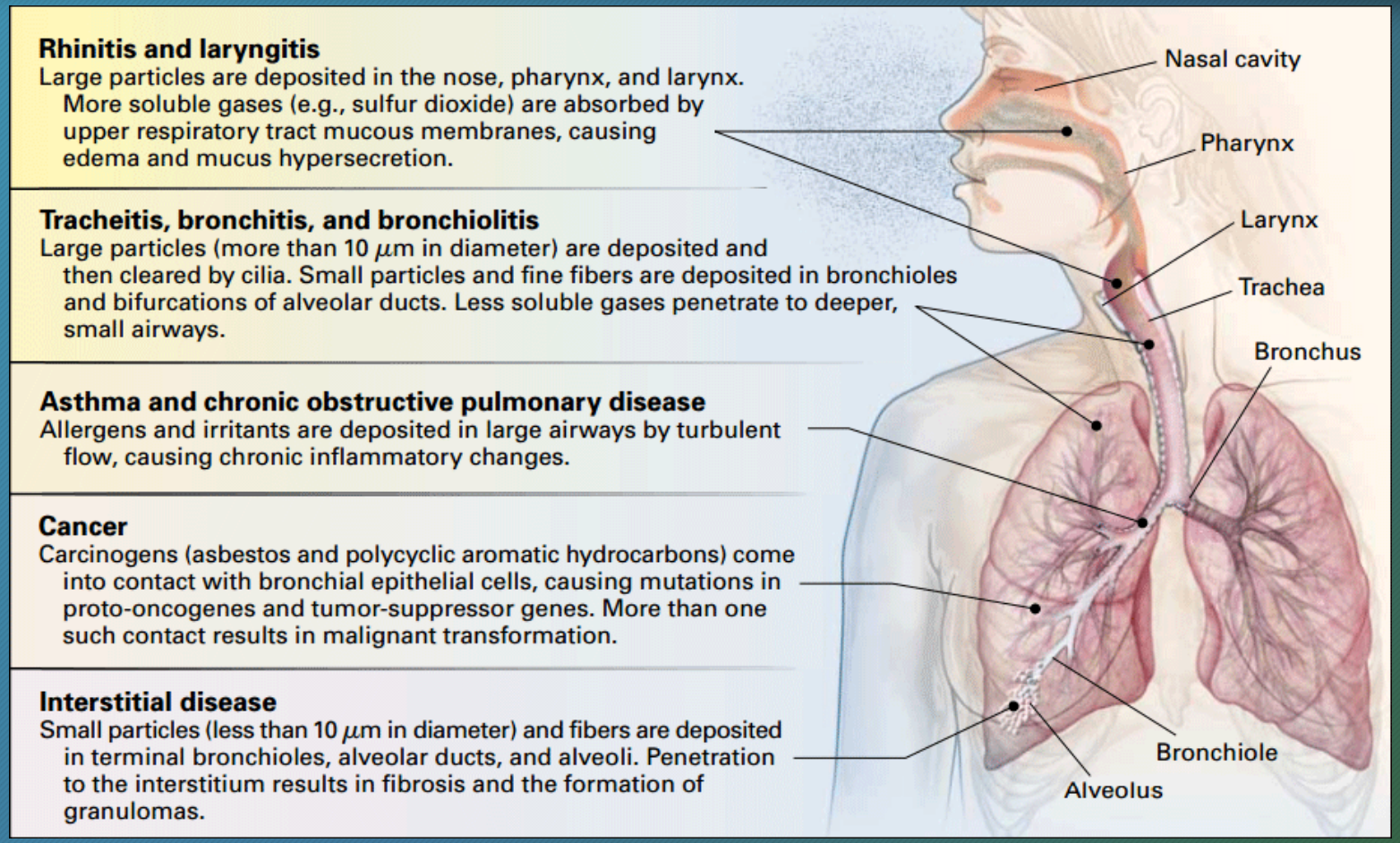


Now with
-high emitter

&

-masks (but no filtration)

Ventilation reduces all exposures ⇆ Biological Chemical



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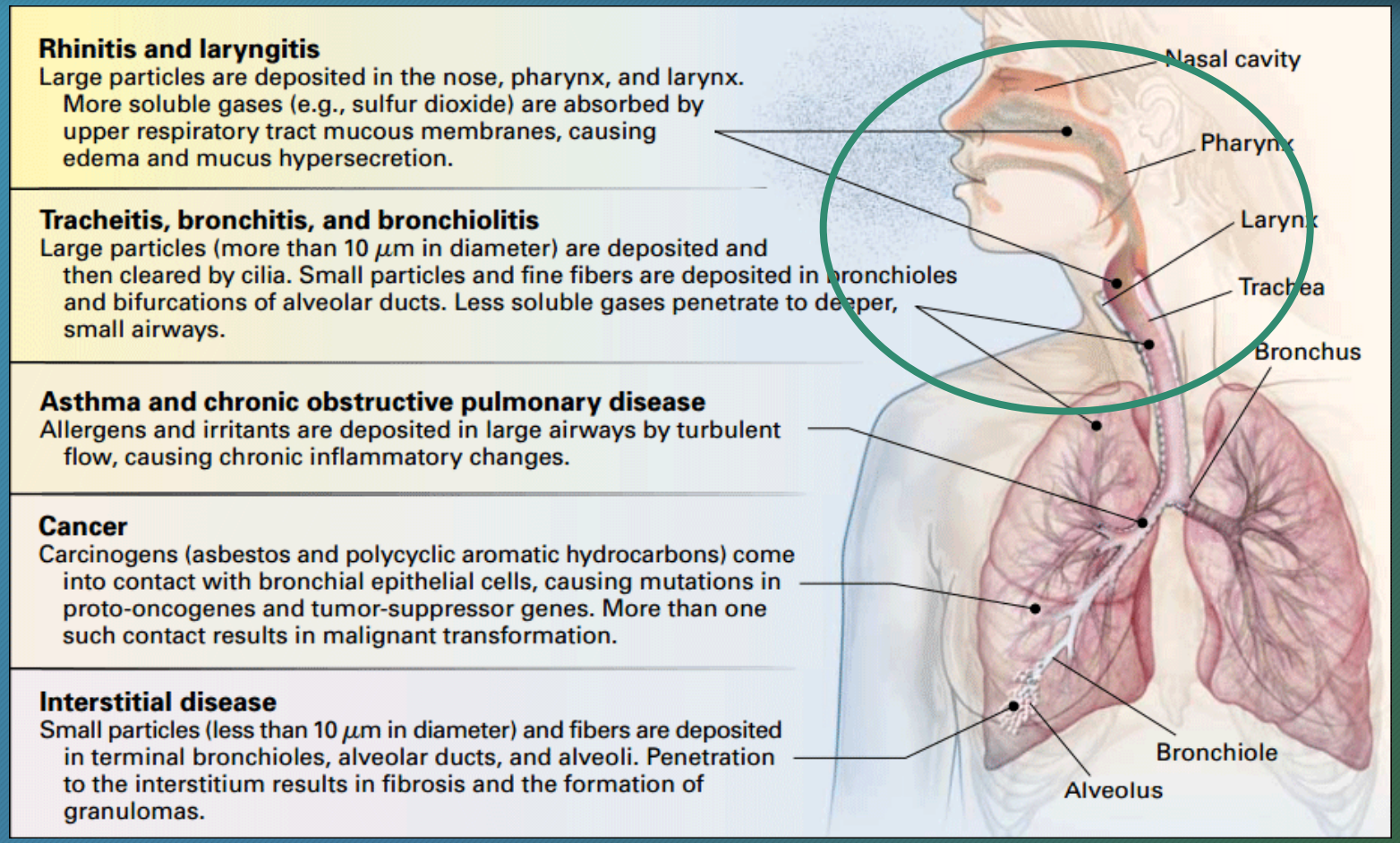

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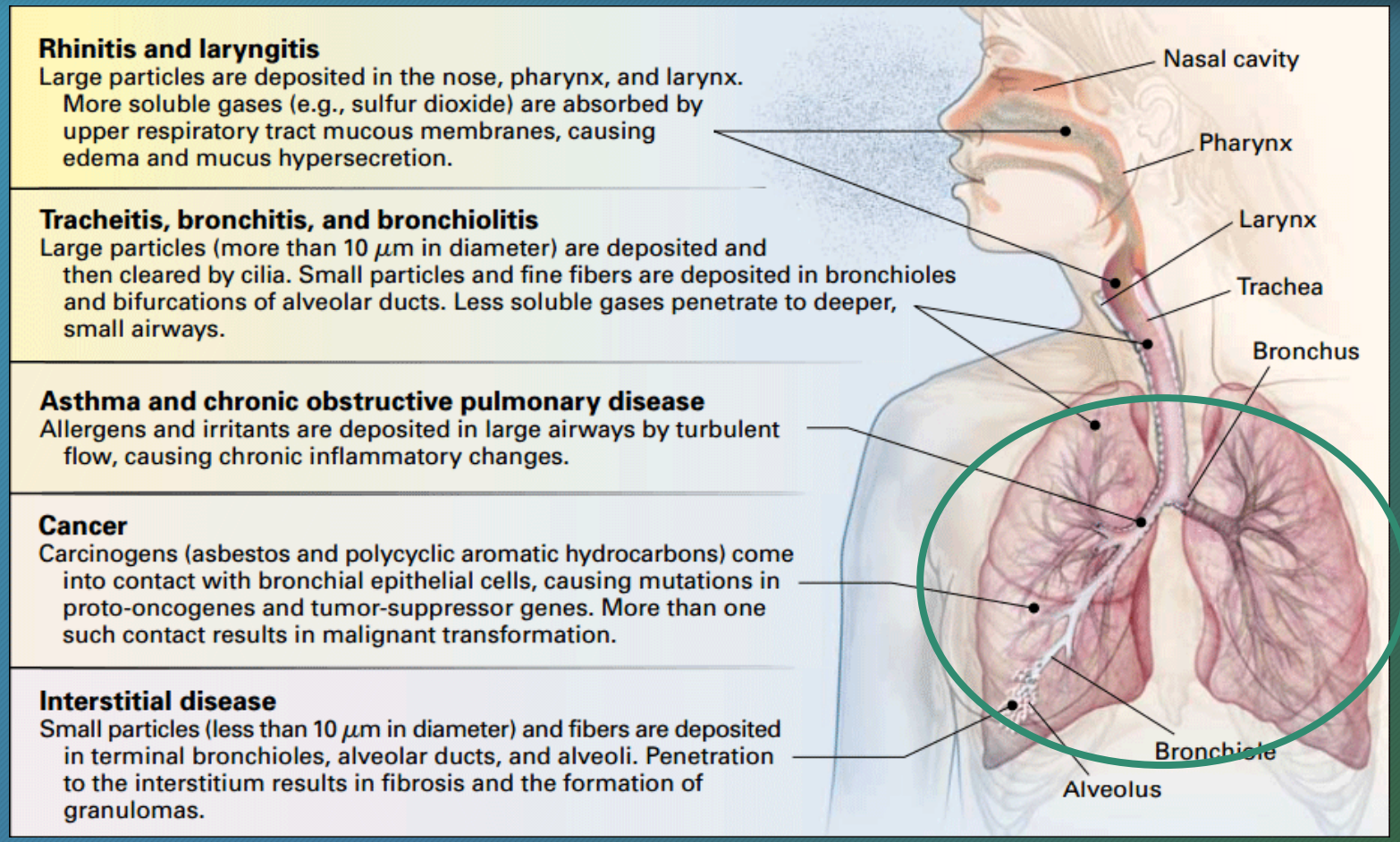
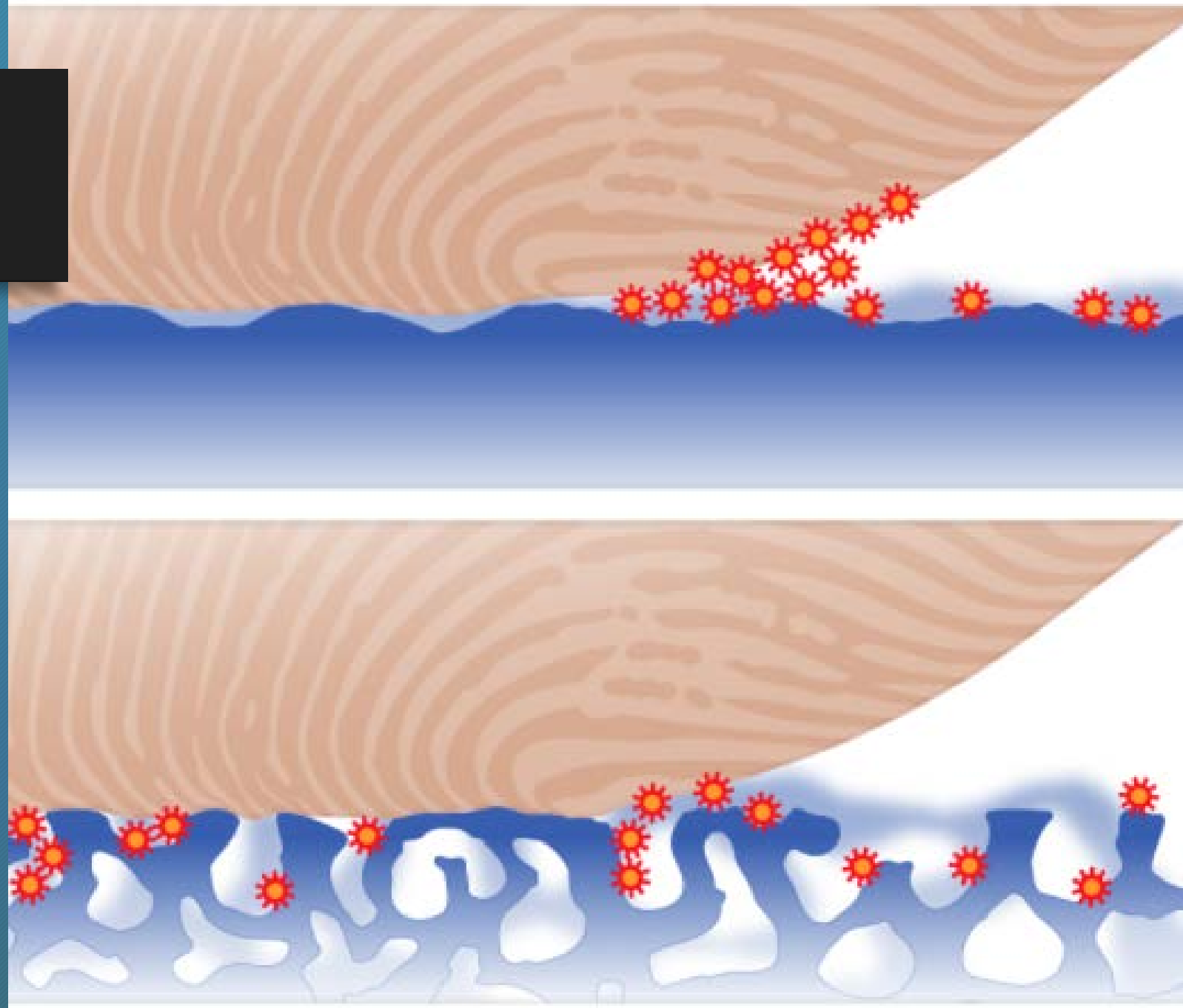
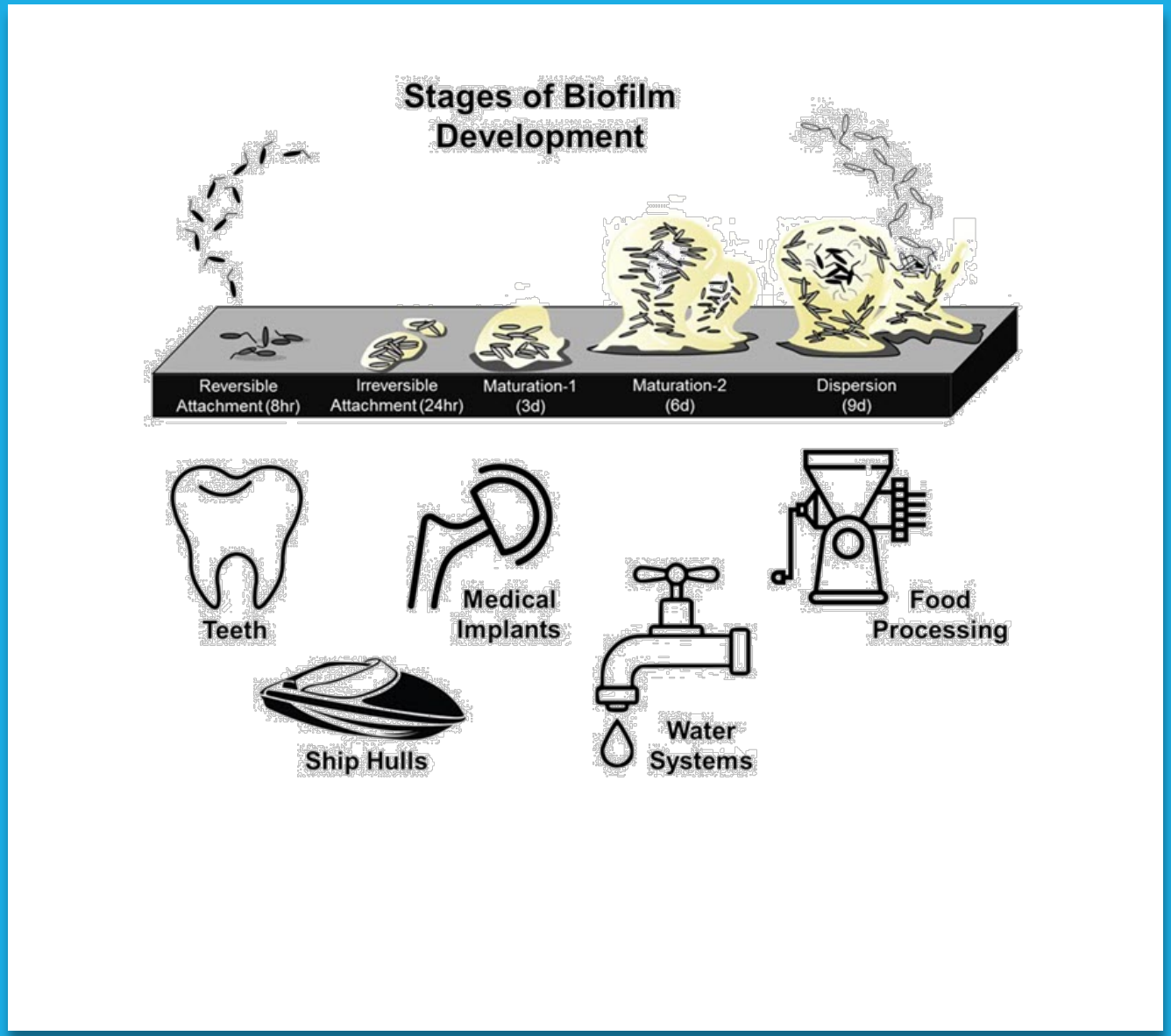


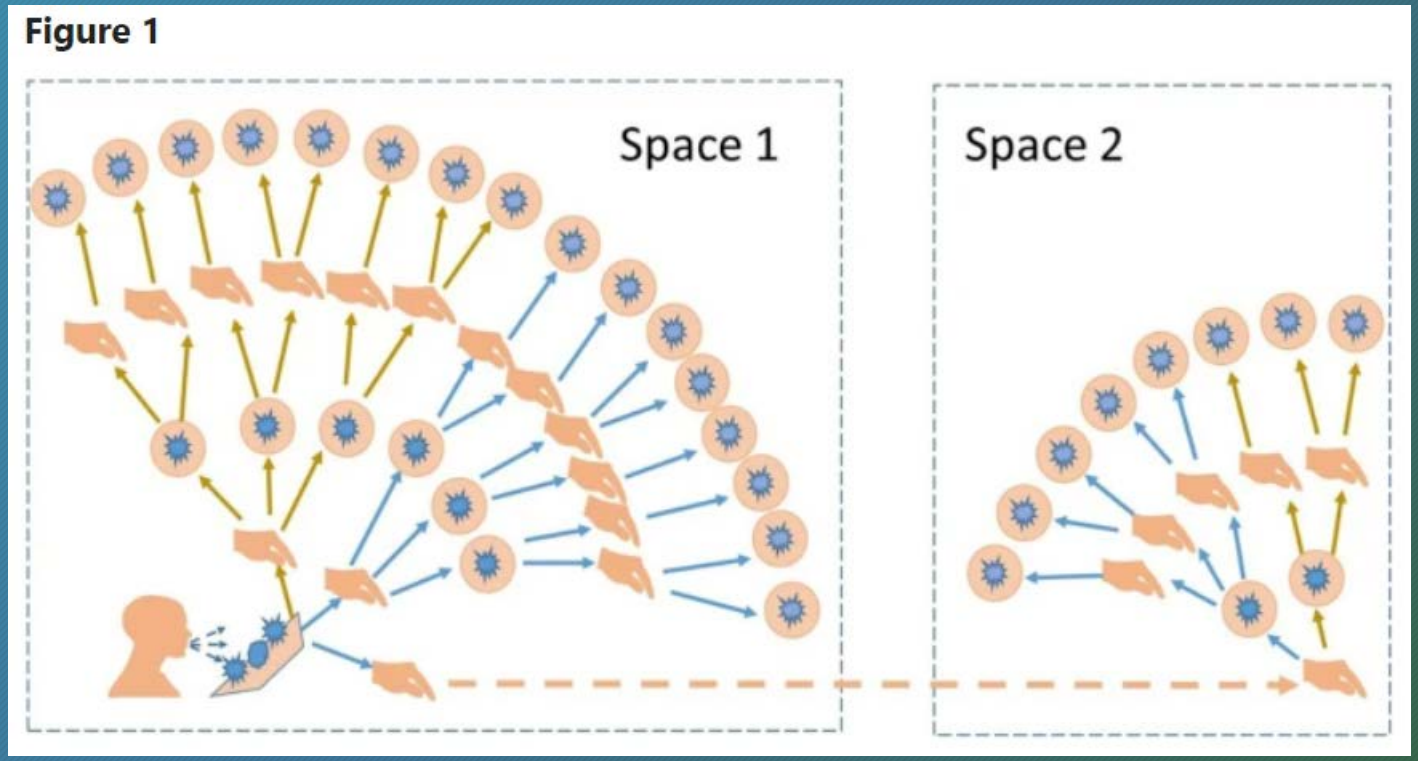
Surface transfer



Residue from cleaning/disinfecting leading to biofilm growth



Norovirus outbreak from plane



A hand contaminated … can contaminate up to seven other surfaces

Lei, H., Li, Y., Xiao, S. *et al.* Logistic growth of a surface contamination network and its role in disease spread. *Sci Rep* **7,** 14826 (2017). https://doi.org/10.1038/s41598-017-13840-z

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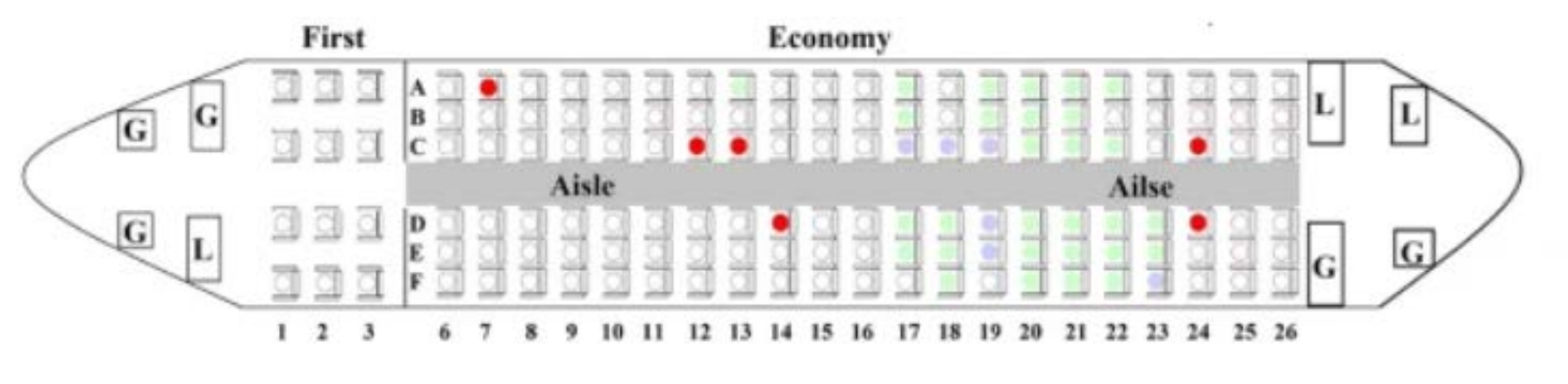

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One hour after routine cleaning

Table 1. SARS-CoV-2 RNA test results from environmental surfaces in a COVID-19 designated hospital

	Sampling locations	Number of samples[a]	Number of positive samples[b]
High-risk area	Bed rails and nightstands in the ICU ward for COVID-19 patients	9	–
	Patients' personal belongings (mobile phone, clothes, pillowcase, towel)	12	–
	Surfaces of medical supplies (infusion pump, operating table in nurse station, temperature gun etc.)	12	–
	Hands of doctor/nurse in the ICU	6	–
	Toilet and sink in isolation ward	6	–
	Door handle in isolation ward	6	–
	Inside of the patient's mask	3	2 (first and second)
	Goggles after use	6	–
Medium-risk area	Door handle in buffer zone	6	–
	Inner wall of waste container	6	–
Low-risk area	Hands of doctor/nurse in clean zone	6	–
	Computer keyboard in nurse station	6	–
	Computer mouse in nurse station	6	
Total		90	2

[a]All samples were collected 1 h after routine cleaning.
[b]All samples were tested by qualitative RT-PCR. Sampling and testing were repeated three times at each location.

INSIDE PATIENT'S MASK

Li YH, Fan YZ, Jiang L, Wang HB (2020). Aerosol and environmental surface monitoring for SARS-CoV-2 RNA in a designated hospital for severe COVID-19 patients. Epidemiology and Infection 148, e154, 1–5. https://doi.org/10.1017/S0950268820001570

Table 2. Environmental and PPE Sites Sampled and Corresponding RT-PCR Results

Sites[a]	Positive samples (patient C; before routine cleaning)[b]	Cycle threshold value[c]
Environmental sites[d]		
Patient's room		
1. Cardiac table, including handle	1/1	35.44
2. Entire length of bed rail	1/1	37.95
3. Control panel on bed	0/1	
4. Call bell attached to bed	0/1	
5. Locker with hand slot	1/1	36.21
6. Chair	1/1	37.07
7. Light switches behind bed	1/1	37.54
8. Stethoscope	1/1	38.24
9. Sink, external rim	1/1	
10. Sink, internal bowl	1/1	
11. Floor	1/1	30.64
12. Glass window in room	1/1	35.79
13. Glass door interior	1/1	35.71
14. PPE storage area over sink	1/1	34.89
15. Air outlet fan	2/3	32.96, 37.94
Toilet area		
16. Door handle	1/1	35.83
17. Toilet bowl, surface	1/1	37.75
18. Hand rail	0/1	
19. Sink, external rim	0/1	
20. Sink, internal bowl	1/1	37.11

TABLE

3 patients in hospital

- 2 no COVID anywhere in room
- 1 COVID everywhere

Postcleaning samples were negative, suggesting that current decontamination measures are sufficient.

Ong SWX, Tan YK, Chia PY, et al. Air, Surface Environmental, and Personal Protective Equipment Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) From a Symptomatic Patient. *JAMA*. 2020;323(16):1610–1612. doi:10.1001/jama.2020.3227

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6. Chair	1/1	37.07
7. Light switches behind bed	1/1	37.54
8. Stethoscope	1/1	38.24
9. Sink, external rim	1/1	37.[illegible]
10. Sink, internal bowl	1/1	
11. Floor	1/1	30.64
12. Glass window in room	1/1	35.79
13. Glass door interior	1/1	35.71
14. PPE storage area over sink	1/1	34.89
15. Air outlet fan	2/3	32.96, 37.94
Toilet area		
16. Door handle	1/1	35.83
17. Toilet bowl, surface	1/1	37.75
18. Hand rail	0/1	
19. Sink, external rim	0/1	
20. Sink, internal bowl	1/1	37.11

BED RAIL

3 patients in hospital

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- 1 COVID everywhere

Postcleaning samples were negative, suggesting that current decontamination measures are sufficient.

Table 2. Environmental and PPE Sites Sampled and Corresponding RT-PCR Results

Sites[a]	Positive samples (patient C; before routine cleaning)[b]	Cycle threshold value[c]
Environmental sites[d]		
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Toilet area		
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17. Toilet bowl, surface	1/1	37.75
18. Hand rail	0/1	
19. Sink, external rim	0/1	
20. Sink, internal bowl	1/1	37.11

CHAIR

3 patients in hospital

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Postcleaning samples were negative, suggesting that current decontamination measures are sufficient.

Table 2. Environmental and PPE Sites Sampled and Corresponding RT-PCR Results

Sites[a]	Positive samples (patient C; before routine cleaning)[b]	Cycle threshold value[c]
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18. Hand rail	0/1	
19. Sink, external rim	0/1	
20. Sink, internal bowl	1/1	37.11

3 patients in hospital

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LIGHT SWITCH

Postcleaning samples were negative, suggesting that current decontamination measures are sufficient.

Table 2. Environmental and PPE Sites Sampled and Corresponding RT-PCR Results

Sites[a]	Positive samples (patient C; before routine cleaning)[b]	Cycle threshold value[c]
Environmental sites[d]		
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3 patients in hospital

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SINK

Postcleaning samples were negative, suggesting that current decontamination measures are sufficient.

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Toilet area		
16. Door handle	1/1	35.83
17. Toilet bowl, surface	1/1	37.75
18. Hand rail	0/1	
19. Sink, external rim	0/1	
20. Sink, internal bowl	1/1	37.11

FLOOR

3 patients in hospital

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Environmental sites[d]		
Patient's room		
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18. Hand rail	0/1	
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20. Sink, internal bowl	1/1	37.11

3 patients in hospital

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WINDOW

Postcleaning samples were negative, suggesting that current decontamination measures are sufficient.

Table 2. Environmental and PPE Sites Sampled and Corresponding RT-PCR Results

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DOOR

3 patients in hospital

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AIR VENT

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18. Hand rail	0/1	
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TOILET

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Balance of risks

Image by Gerd Altmann from Pixabay

Balance of risks

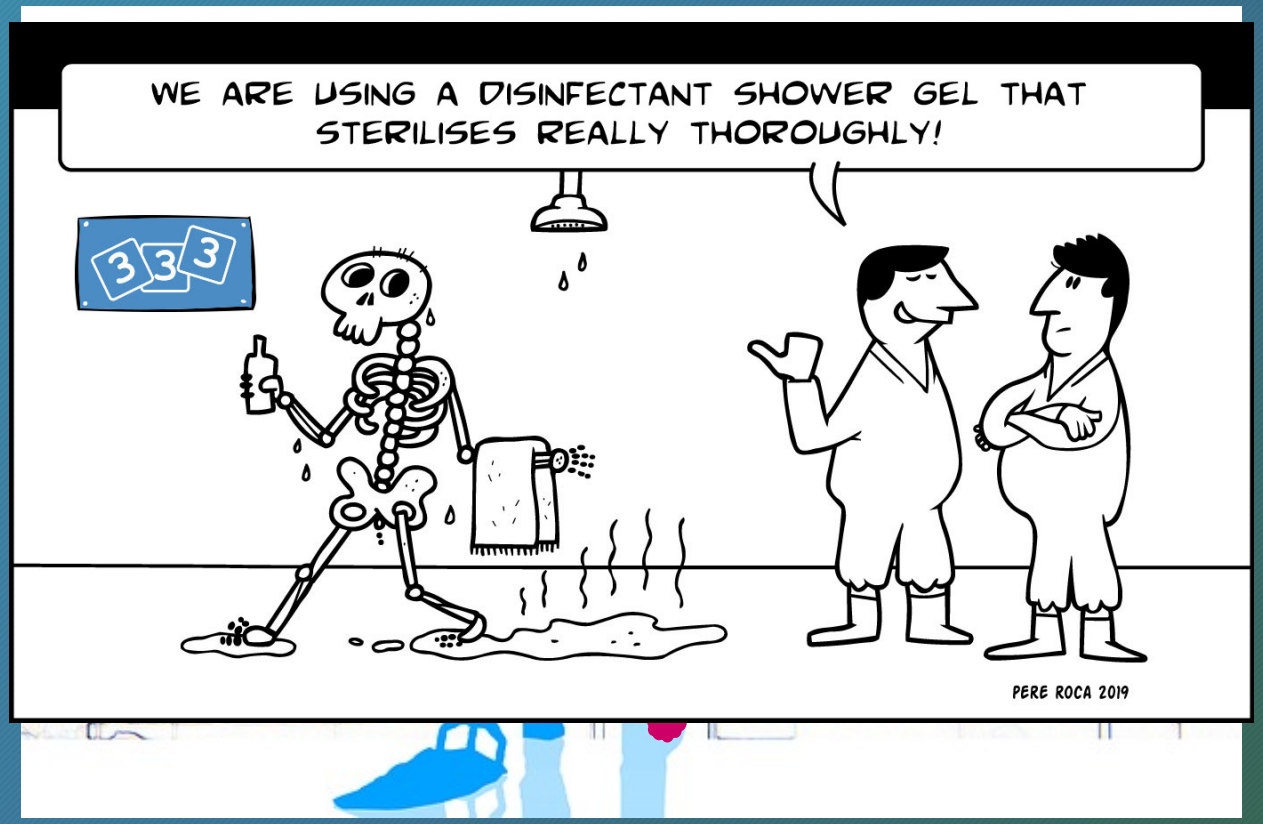


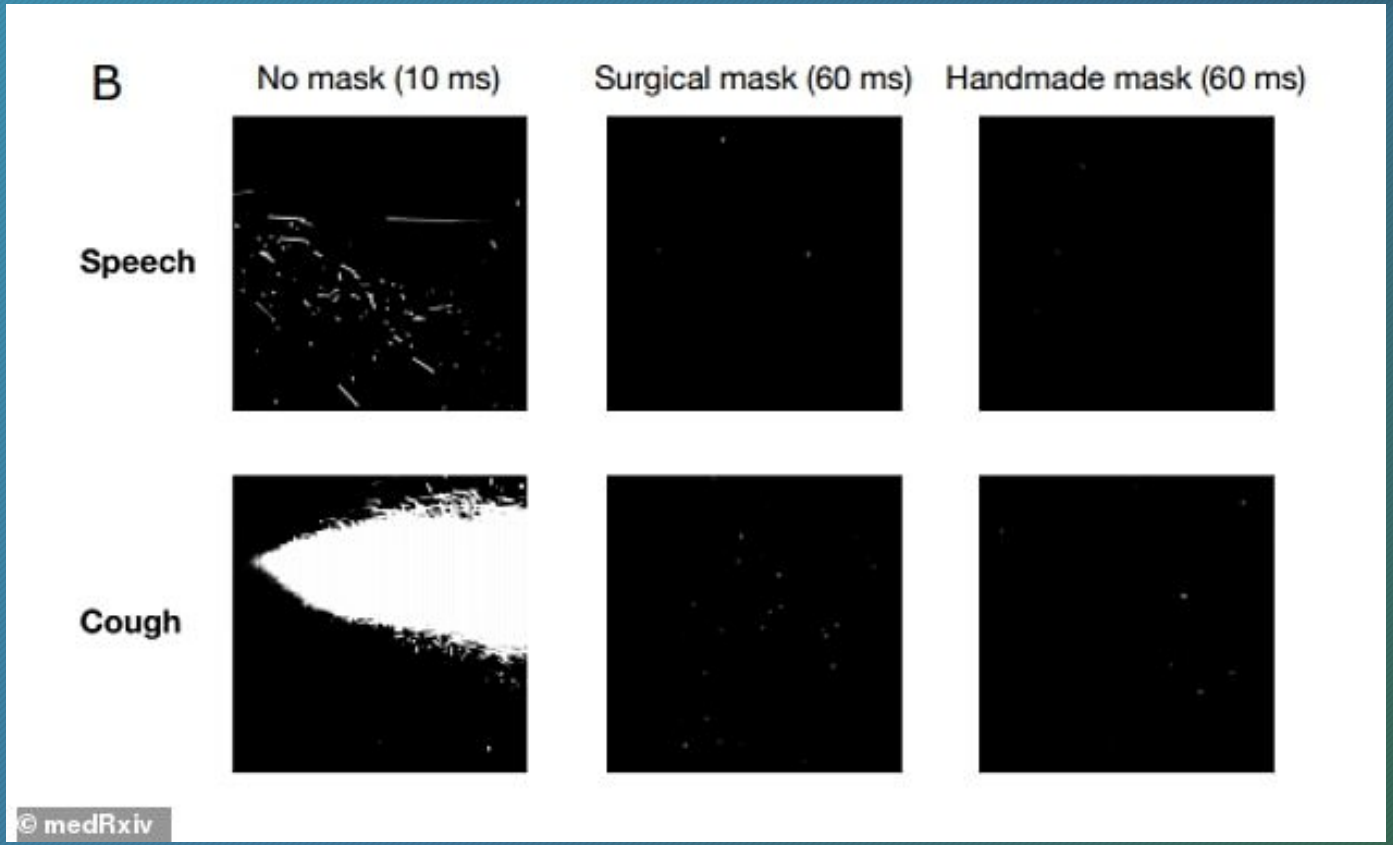
Image by Gerd Altmann from Pixabay

COVID-19 persistence will vary

Humidity
Temperature
Sunlight
…

- Glass: five days
- Wood: four days
- Plastic and stainless steel: three days
- Cardboard: 24 hours
- Copper: four hours.

People are constantly spreading germs



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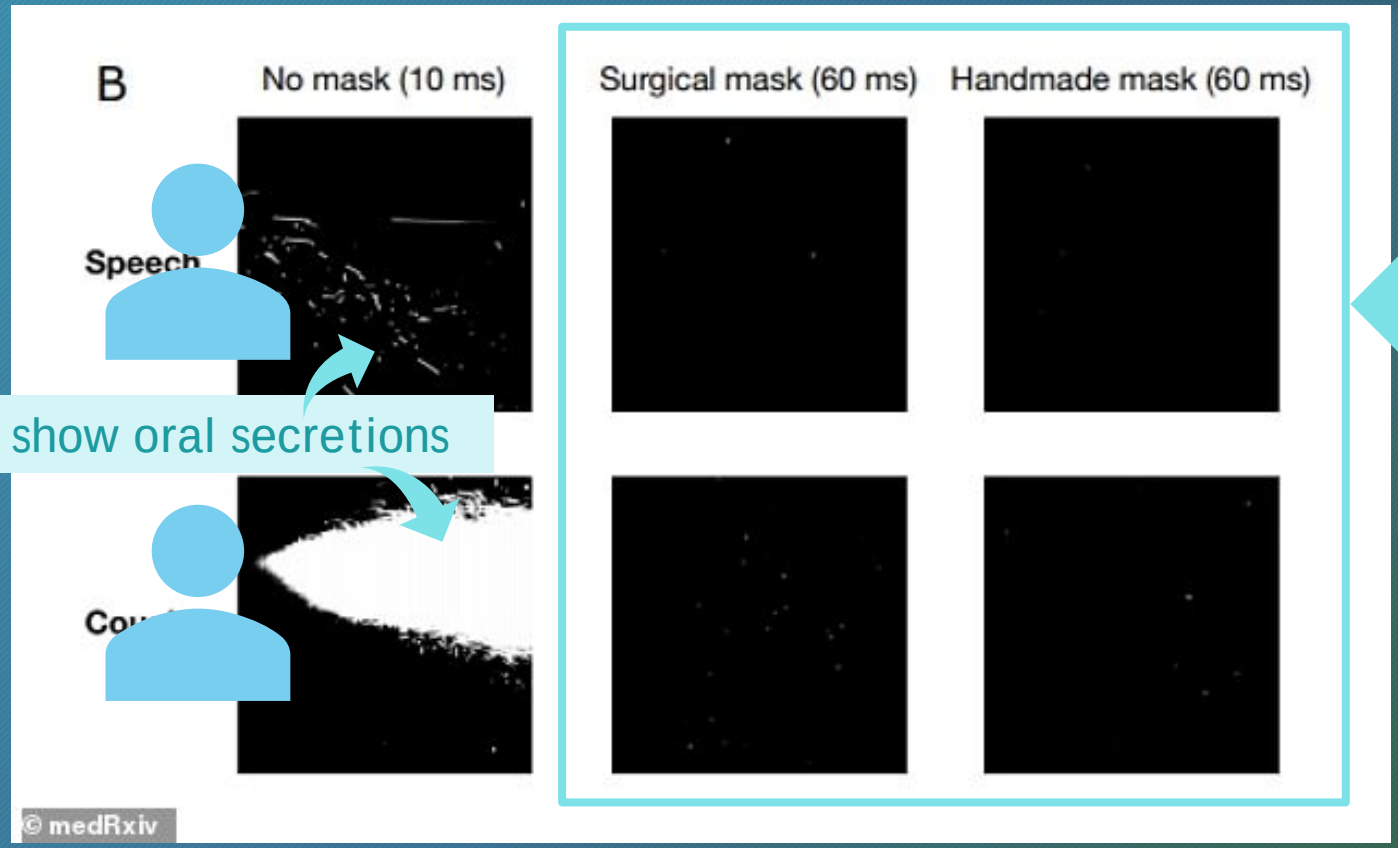


White marks show oral secretions

Masks shown to reduce bulk

Choosing priority surfaces

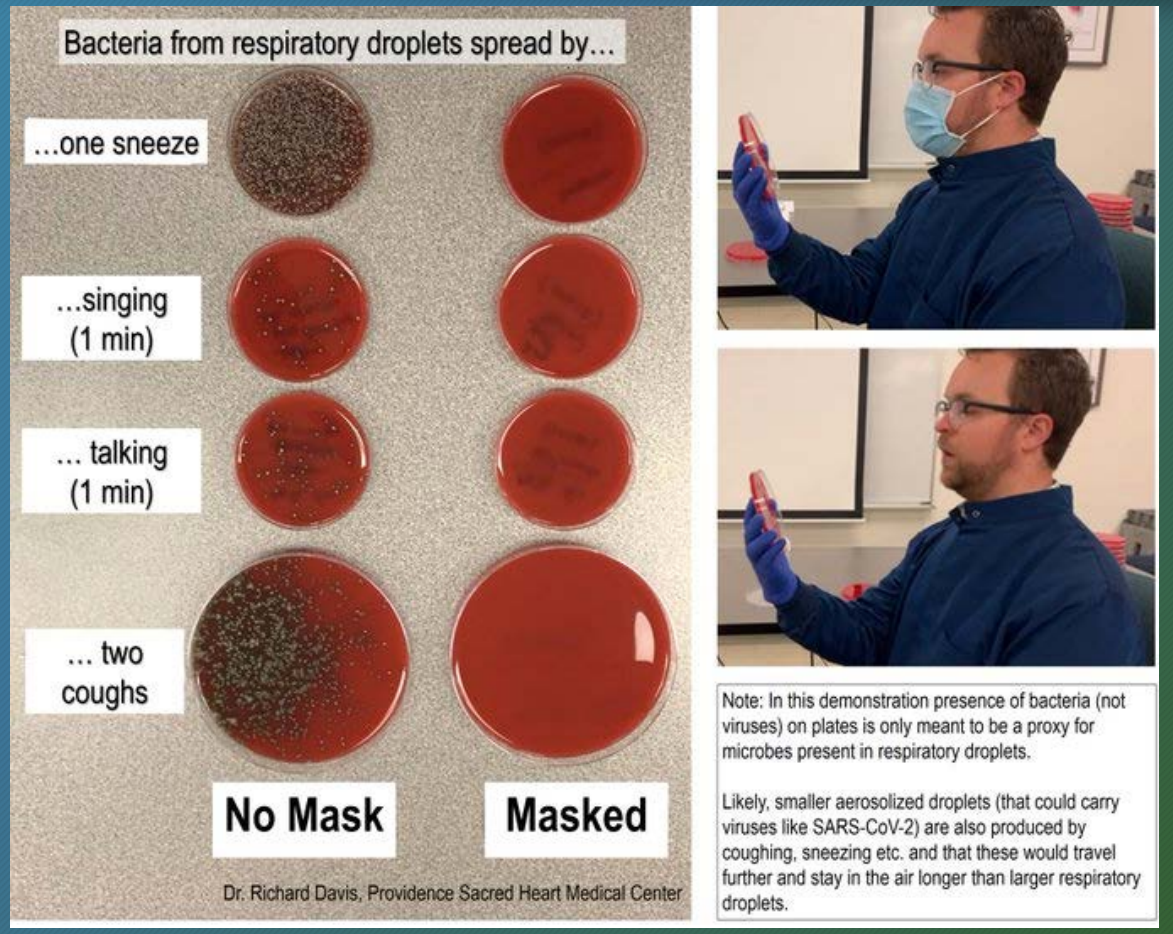
-particles from the air (greatest on upward-facing surfaces),

-direct emission through coughing,

-aerosolization due to vomiting and diarrhea incidents,

-toilet flushing,

-and hand touching (greatest on high-touch surfaces).



IPM -a common sense approach to pest management

Germs only travel so far.

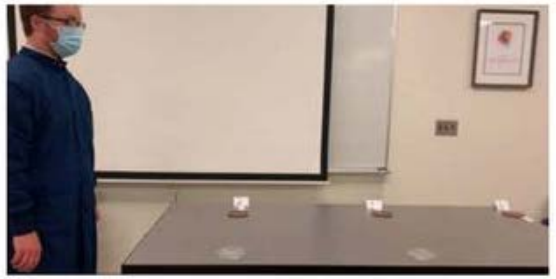
-The entire facility doesn't need constant intense disinfection.

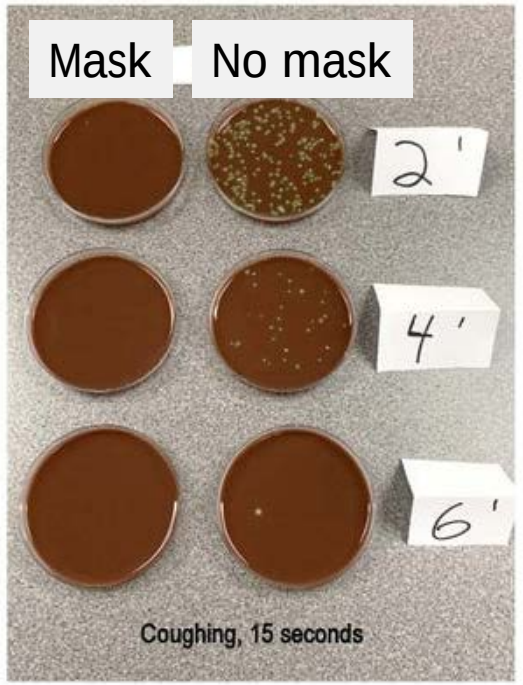
-Areas with unmasked people will need greater disinfection.

PROVIDENCE Health Care

Masks limit the spread of most microbe-containing droplets produced by coughing. Even without a mask, these droplets mostly traveled less than 6 feet.

Demonstration: To show the value of appropriate masking and distancing, bacteria culture plates were placed 2 feet, 4 feet and 6 feet away from a person who coughed aggressively for ~15 seconds. Droplets from the upper respiratory tract and mouth landed on the plates and after culturing for 24 hours, colonies of bacteria (not viruses*) can be seen.





***Note**: It is likely that smaller aerosolized droplets (that could carry viruses like SARS-CoV-2) are also produced by coughing, sneezing etc. and that these would travel further and stay in the air longer than larger respiratory droplets.

Experiment performed by: Richard E. Davis, PhD, PHC Regional Director of Microbiology Providence Sacred Heart Medical Center and Children's Hospital

IPM -a common sense approach to pest management

Germs only travel so far.

-The entire facility doesn't need constant intense disinfection.

-Areas with unmasked people will need greater disinfection.

*yes, viruses are smaller and will travel farther but gravity still applies

PROVIDENCE Health Care

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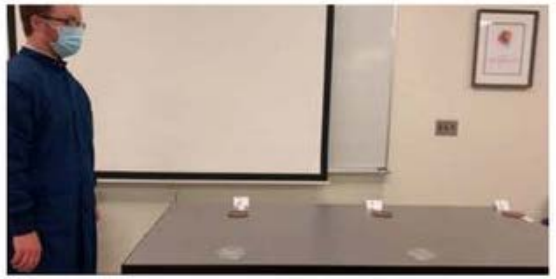
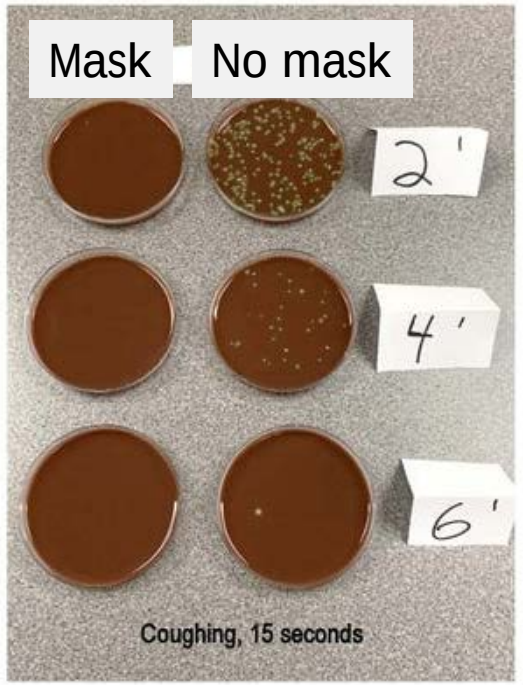
Demonstration: To show the value of appropriate masking and distancing, bacteria culture plates were placed 2 feet, 4 feet and 6 feet away from a person who coughed aggressively for ~15 seconds. Droplets from the upper respiratory tract and mouth landed on the plates and after culturing for 24 hours, colonies of bacteria (not viruses*) can be seen.





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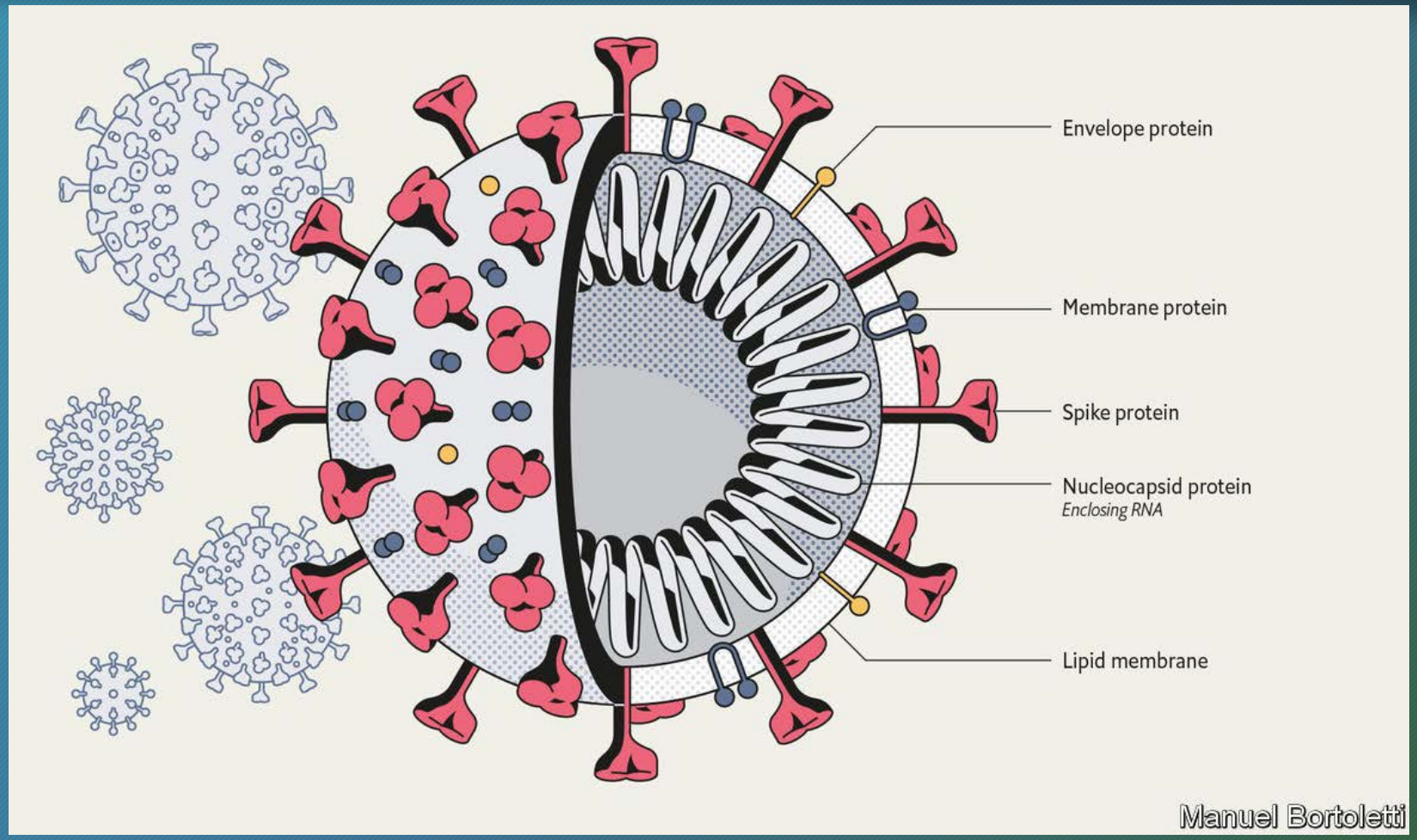
"Yuck! Am I crazy or do they all taste like disinfectant?!"

Mechanics of soap & disinfectants



COVID-19 virus

Mechanics of soap & disinfectants

Soap:

water-y head & oi

Oil & Water don't

Oily part of soap s

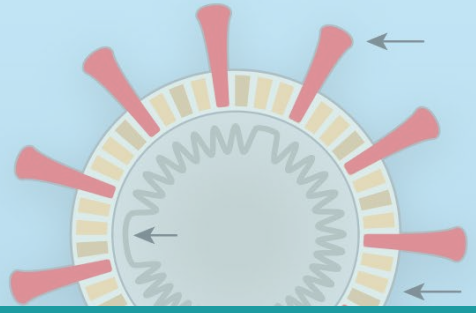
Watery part seeks out watery areas

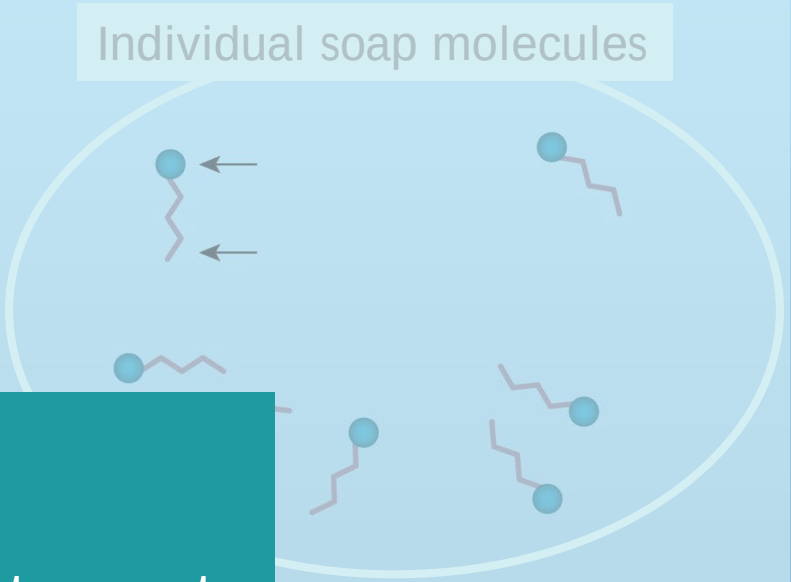
Bacteria, viruses, cells in general effected by soaps

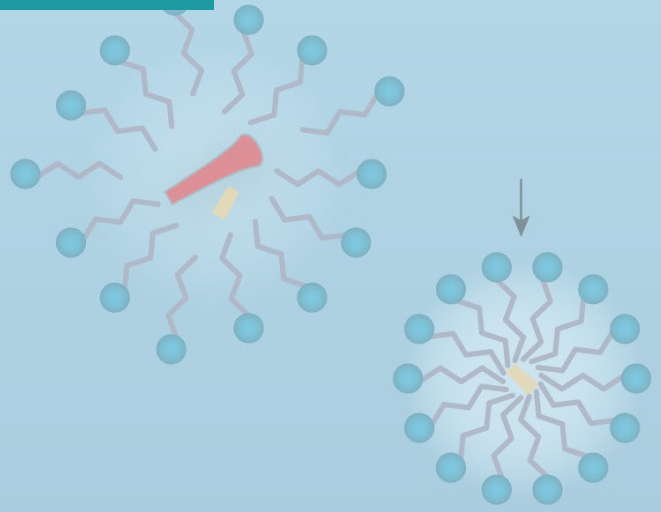
Quick word on "soap" vs "detergent":

I'm using "soap" to mean both soap and detergent.

Yes, there are small differences.







Mechanics of soap & disinfectants

Soap:

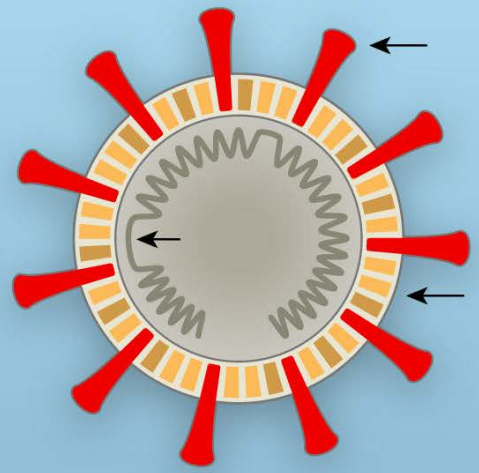
water-y head & oil-y tail

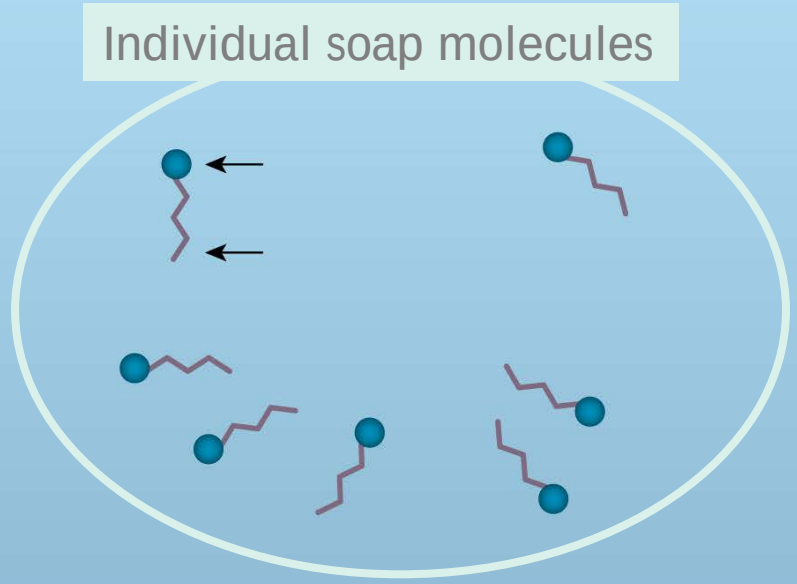
Oil & Water don't mix

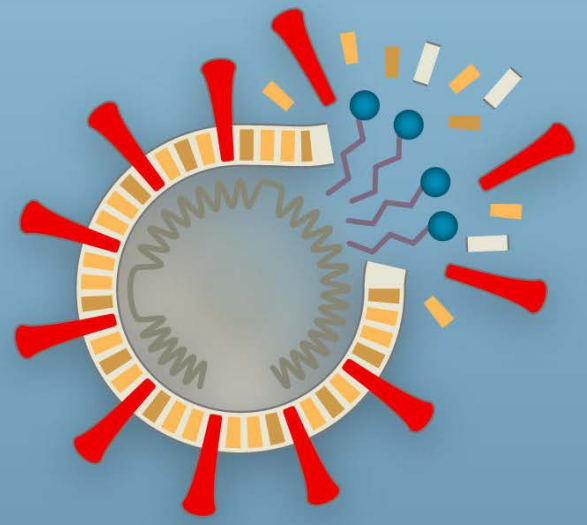
Oily part of soap seeks out oily areas

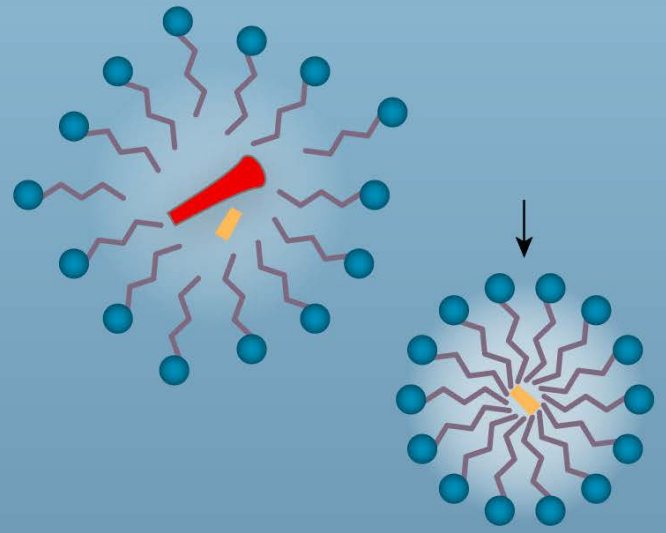
Watery part seeks out watery areas

Bacteria, viruses, cells in general effected by soaps









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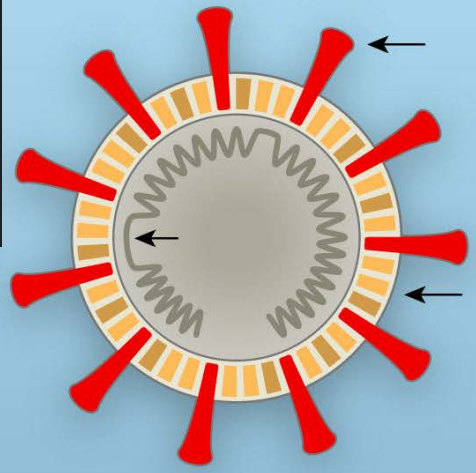

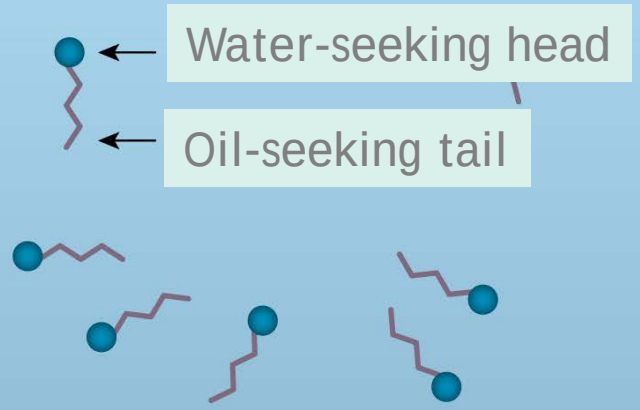

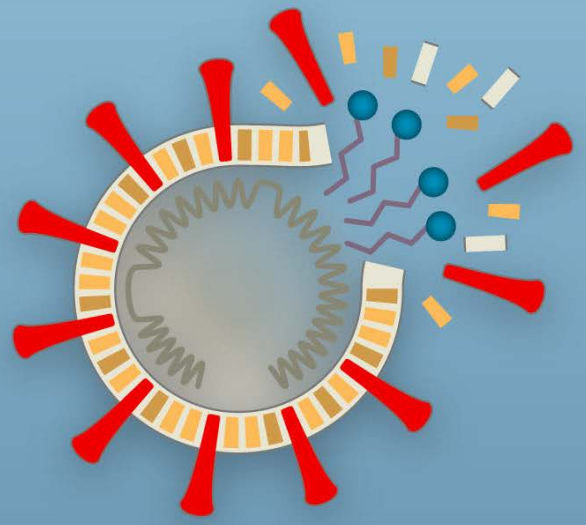

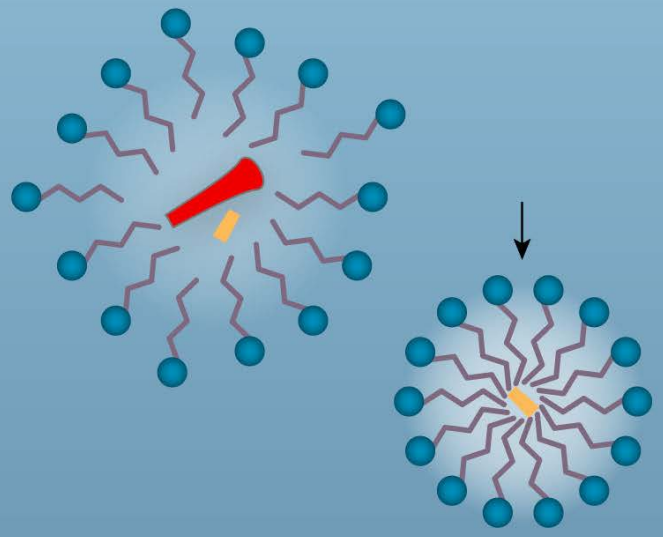

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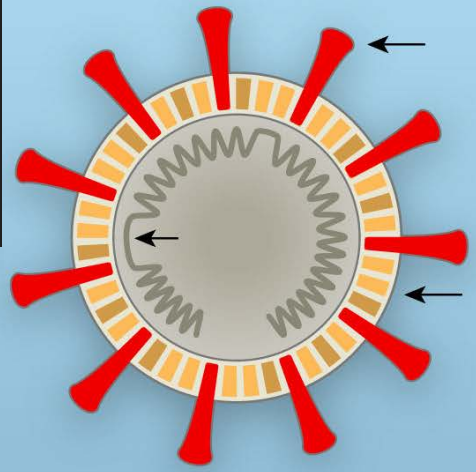
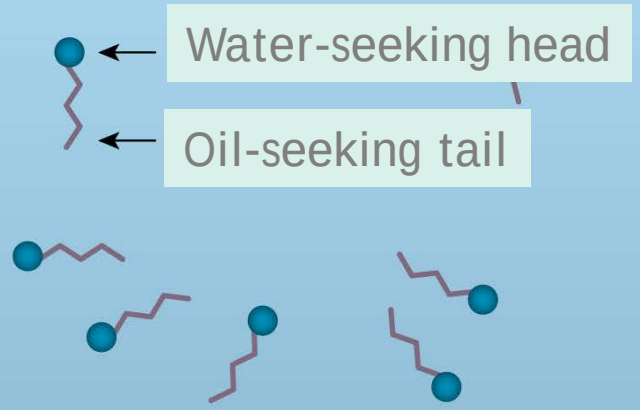
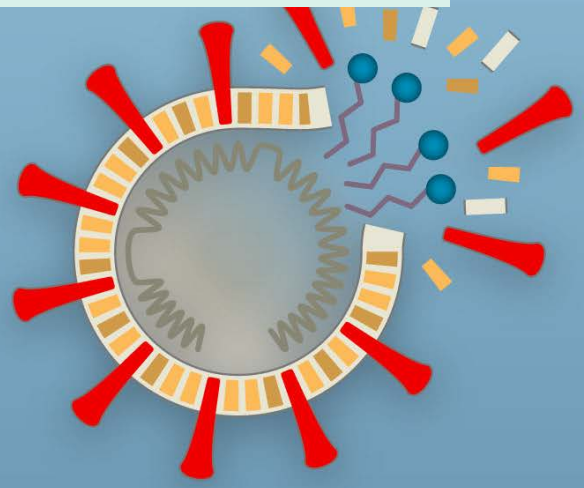
Watery part seeks out watery areas

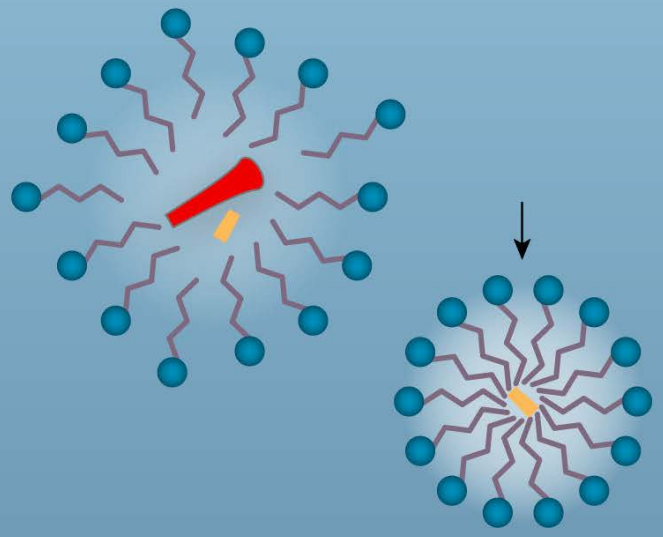
Bacteria, viruses, cells in general effected by soaps





Oil-seeking tails slip right into the protective layer





Mechanics of soap & disinfectants

Soap:

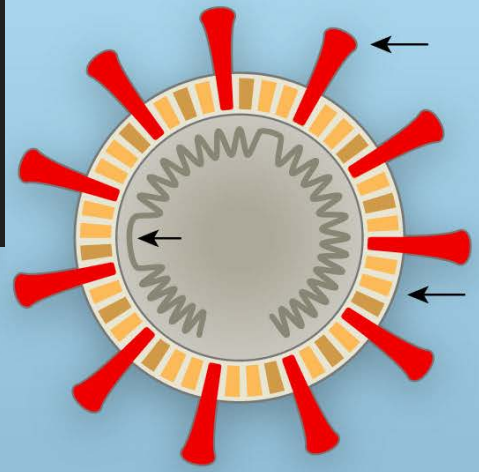
water-y head & oil-y tail

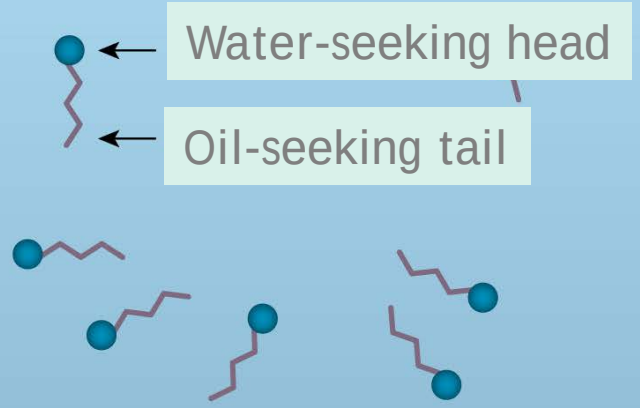
Oil & Water don't mix

Oily part of soap seeks out oily areas

Watery part seeks out watery areas

Bacteria, viruses, cells in general effected by soaps





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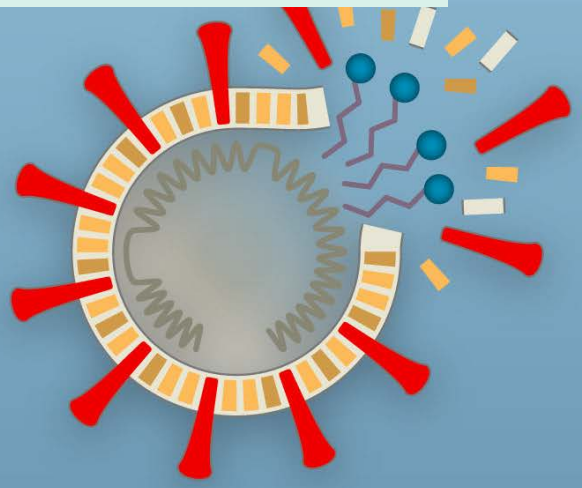
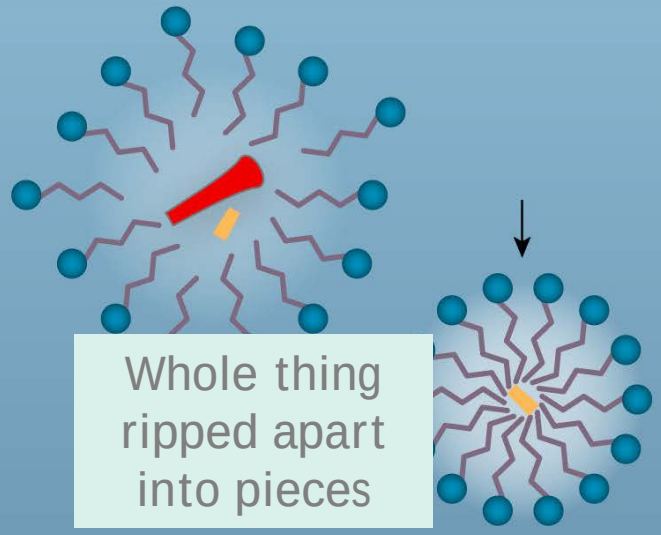
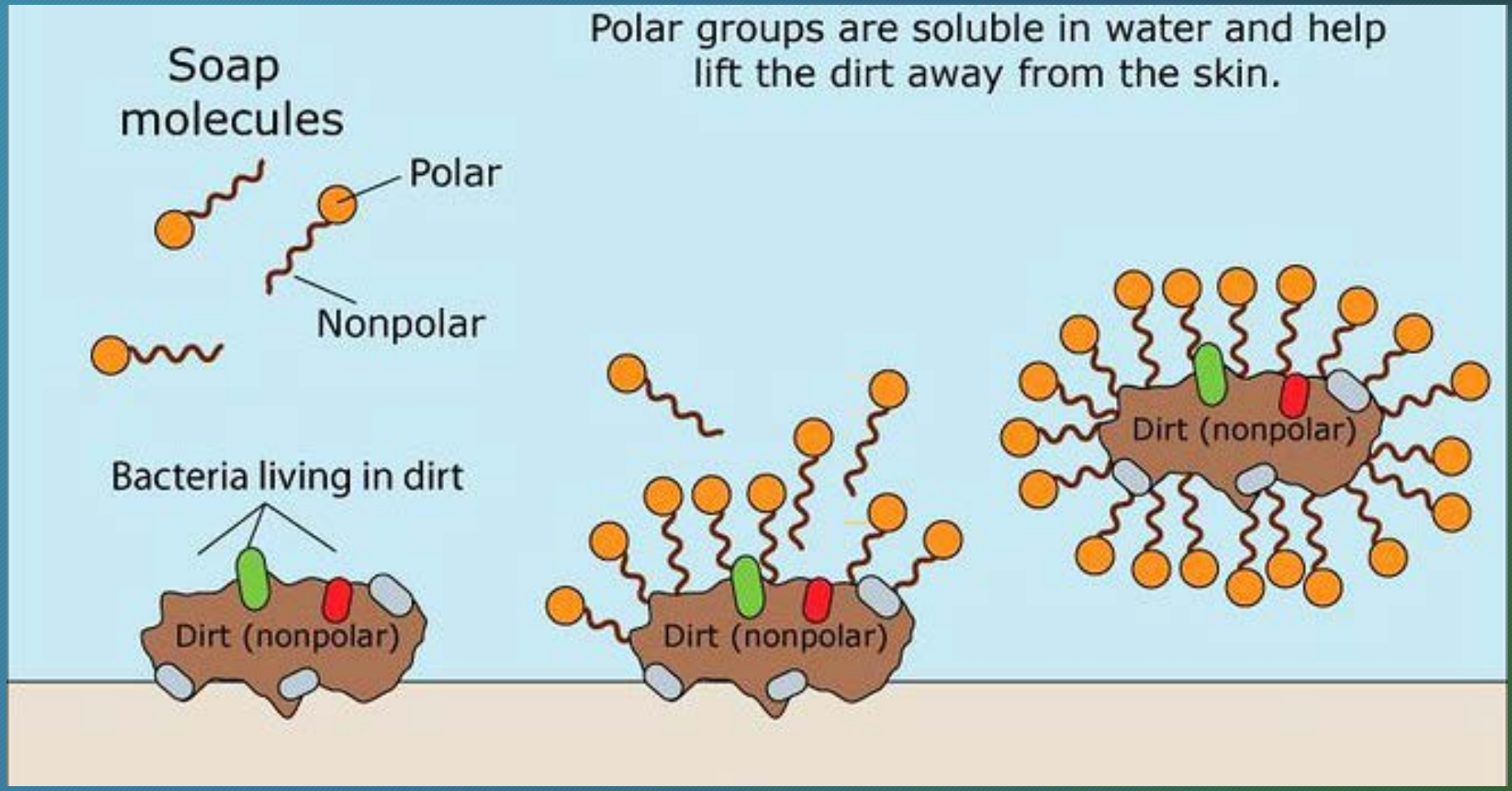




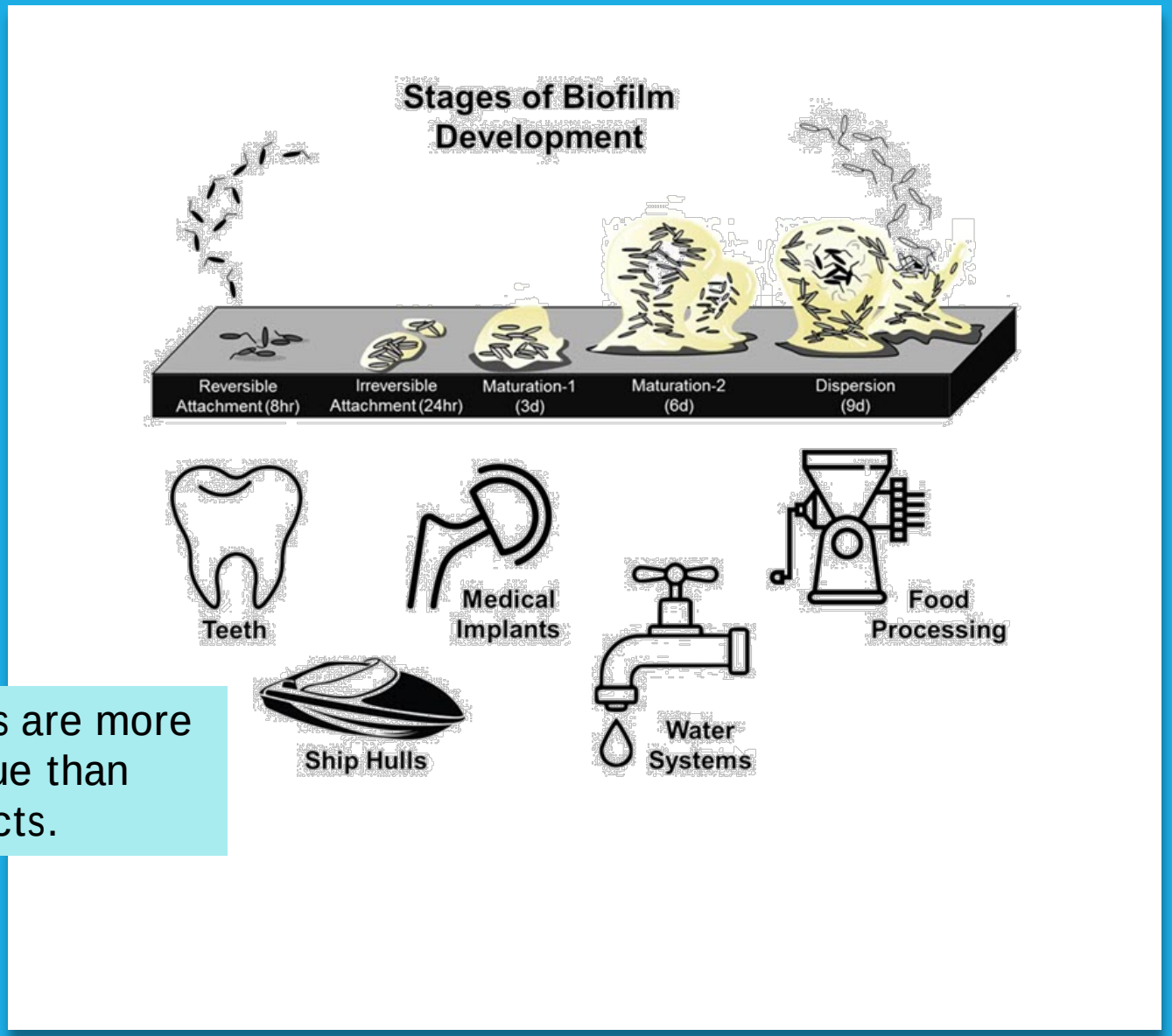
Whole thing ripped apart into pieces

Works for dirt too

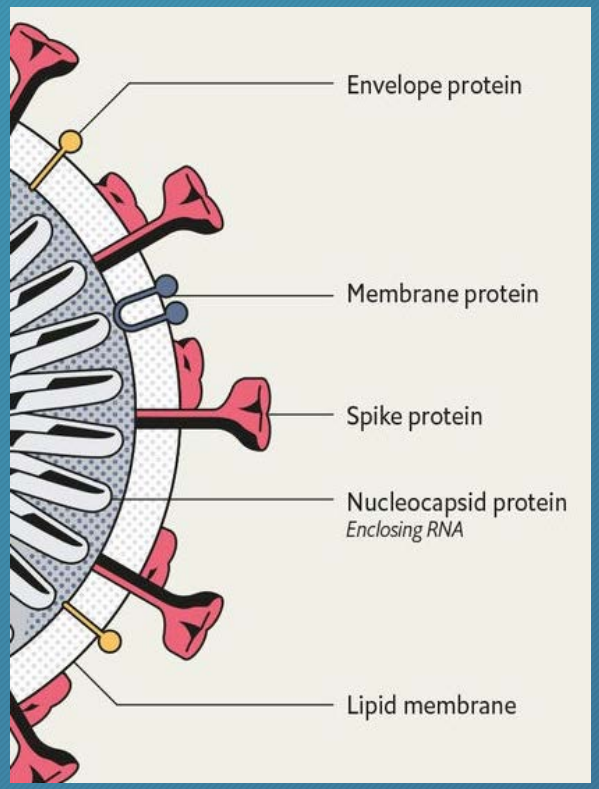


Residue from cleaning/disinfecting leading to biofilm growth

"Natural" soap products are more likely to leave residue than detergent products.



Disinfectants also can ruin proteins



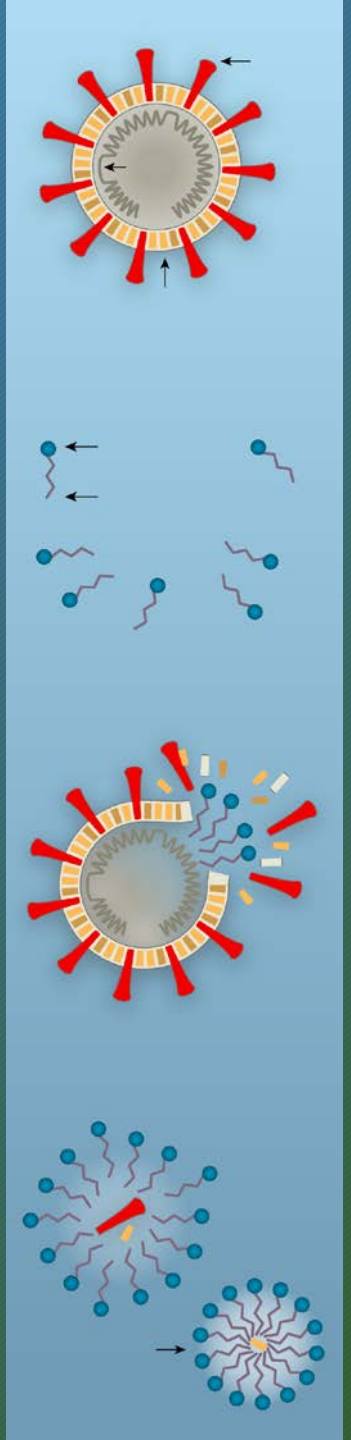
Mechanics of soap & disinfectants

This is why more doesn’t always help

This is why timing is important

This is why agitation is frequently needed

This is why disinfectants can affect us too



Risk = Hazard + Exposure

- Risk: how safe/dangerous something is for you
- Hazard: inherent danger of something
- Exposure: amount or time around the thing

Risk = Hazard + Exposure

- Risk: how safe/dangerous something is for you
  - Swimming vs swimming when you can't swim

  Accidents happen in all scenarios but some are higher risk than others
- Hazard: inherent danger of something
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  Accidents happen in all scenarios but some are higher risk than others.

- Hazard: inherent danger of something
  - Sand vs glass (both silica)

  There is nothing without hazard.

- Exposure: amount or time around the thing

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  Accidents happen in all scenarios but some are higher risk than others.

- Hazard: inherent danger of something
  - Sand vs glass (both silica)

  There is nothing without hazard.

- Exposure: amount or time around the thing
  - Oxygen in air vs. 100% oxygen from tank
  - 10 minutes in bright sun vs. 10 hours in bright sun

Risk equation

Risk = Hazard + Exposure

Acute vs Chronic Exposures

Alcohol as example

- (Toxicologist's perspective alcohol is a poison)

Acute alcohol poisoning, cognitive deficits, vomiting, & worse.

Acute exposures happen over short period of time

Think

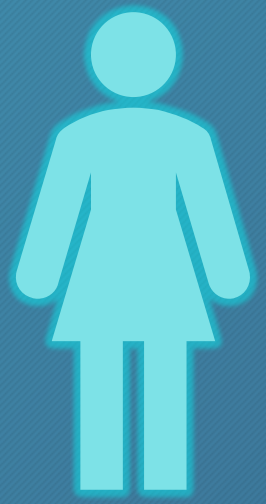
24 hrs

Acute vs Chronic Exposures

Alcohol as example

- (Toxicologist's perspective alcohol is a poison)

Acute exposures happen over short period of time



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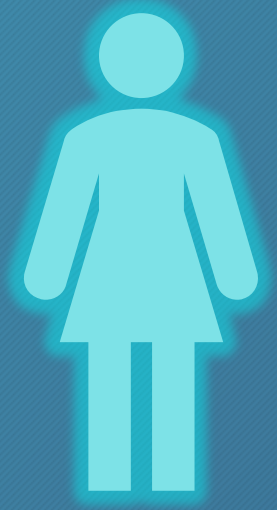

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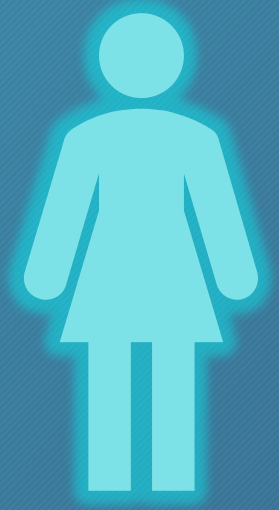

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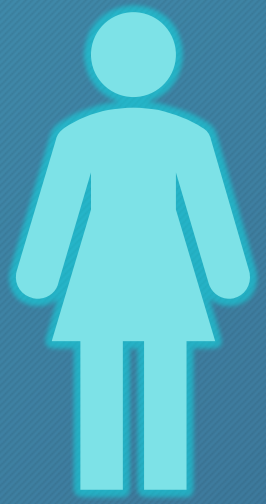

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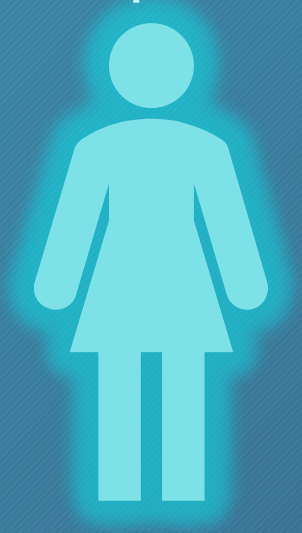


Acute vs Chronic Exposures

Alcohol as example

- (Toxicologist's perspective alcohol is a poison)

Chronic alcohol poisoning, heart disease, liver disease, cancer.

Chronic exposures happen over a long period of time

Acute vs Chronic Exposures

Alcohol as example

- (Toxicologist's persp

Chronic exposures ha

Work-Related Asthma

Two types:

Occupational asthma

Asthma caused by something in the workplace

Enzymes (in detergents or laboratories) and moulds

Proteins from animals, plants, foods, insects, fish and shellfish

Wheat or other flour and enzyme exposures

Western red cedar dust

Isocyanates in spray paints, some glues, foundry moulds, polyurethane foam

Work-exacerbated asthma

Something in the workplace aggravates existing asthma

Perfumes

Dusts (construction, grains)

Ozone (some swimming pools, bottling plants, photocopiers)

Ammonia (farming environments such as barns)

Fumes, vapours, smoke and gases (metalworking fluids, paint fumes, cleaning chemicals)

Environment (cold, heat and humidity)

15%

Internationally, up to 15% of adult onset asthma may be related to the workplace.

What employers can do…

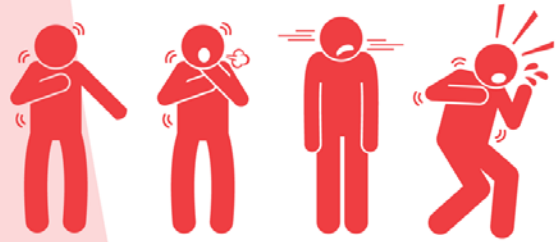
- Read and be aware of safety data sheet information about respiratory health effects.
- Replace substances with less harmful ones.
- Minimize exposure (ventilation, enclosures).
- Develop administrative controls (such as changing the job or tasks).
- Educate workers on proper handling, avoiding spills and good housekeeping practices.
- Provide personal protective equipment. This should be the last option.

If there is one worker with asthma symptoms, it may warrant a closer look at the air quality of the workplace and its ventilation controls.

Asthma is a respiratory disease

It creates a narrowing of the air passages that makes it difficult to breathe.

Symptoms



Tightness of the chest

Difficulty breathing

Wheezing

Coughing

Symptoms are usually worse on work days and improve when away from the workplace.

Industries affected

- Cleaning and janitorial services
- Bakeries
- Healthcare
- Manufacturing
- Construction
- Agriculture
- Automobile spray painting
- Insulation and polyurethane work
- Fisheries and fish processing
- Forestry

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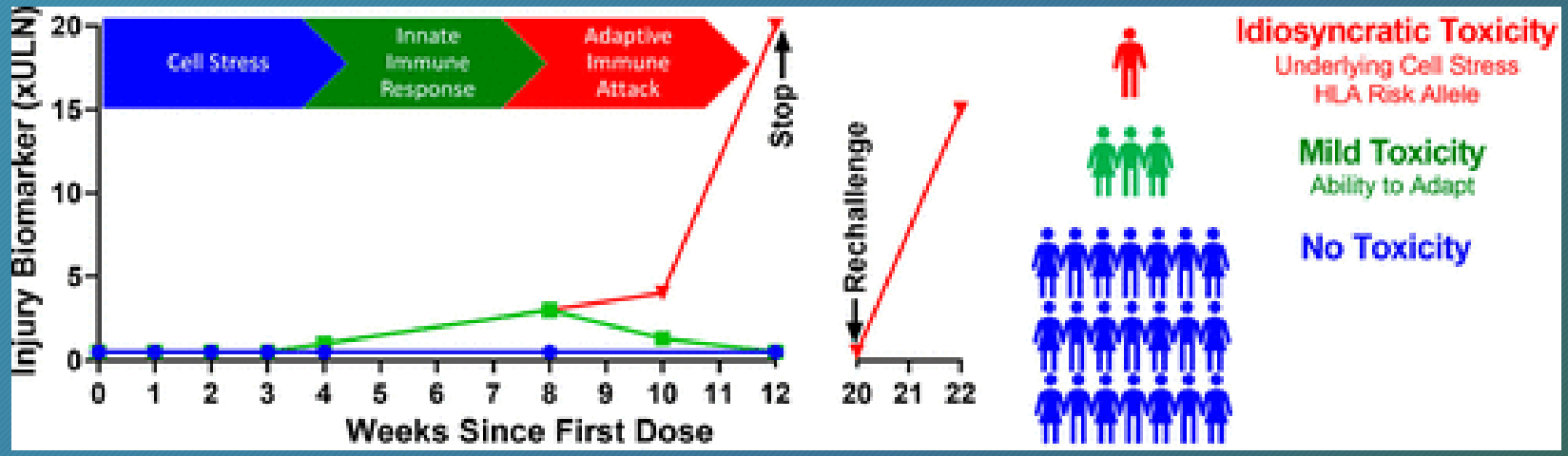
Canadian Centre for Occupational Health and Safety

Response to chemicals is different between and within people



DOI: 10.1021/acs.jmedchem.9b01297

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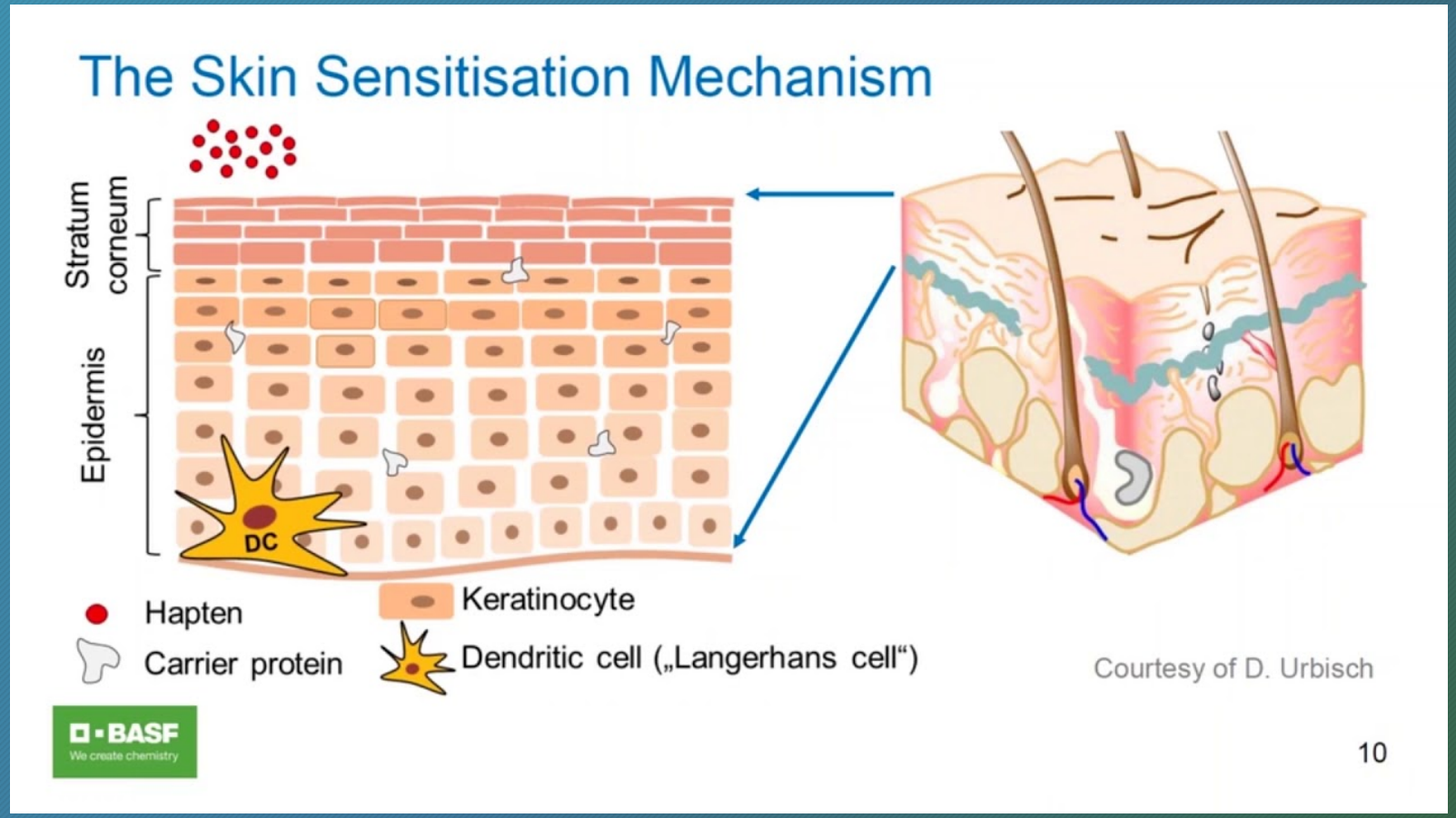
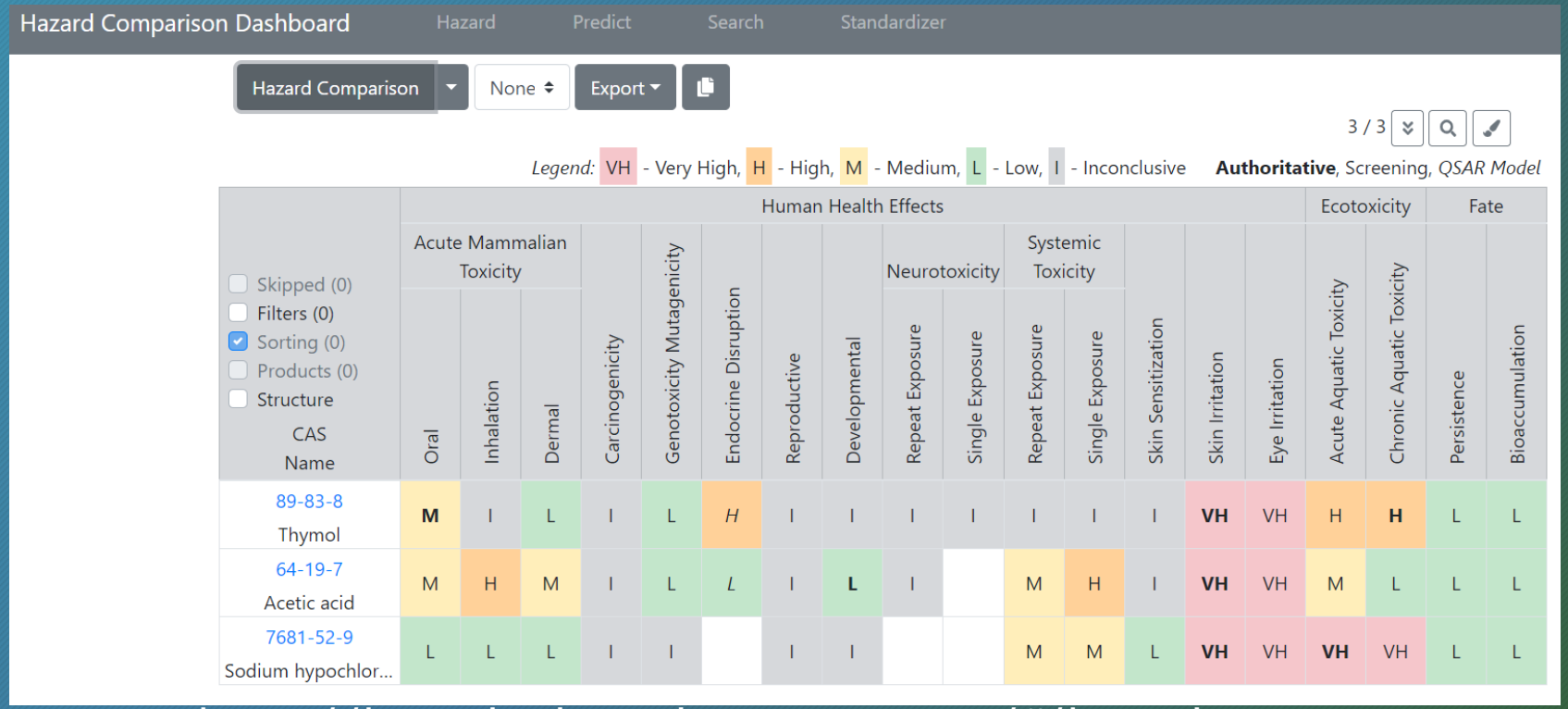


Tools for evaluating chemicals



https://hazard.sciencedataexperts.com/#/hazard

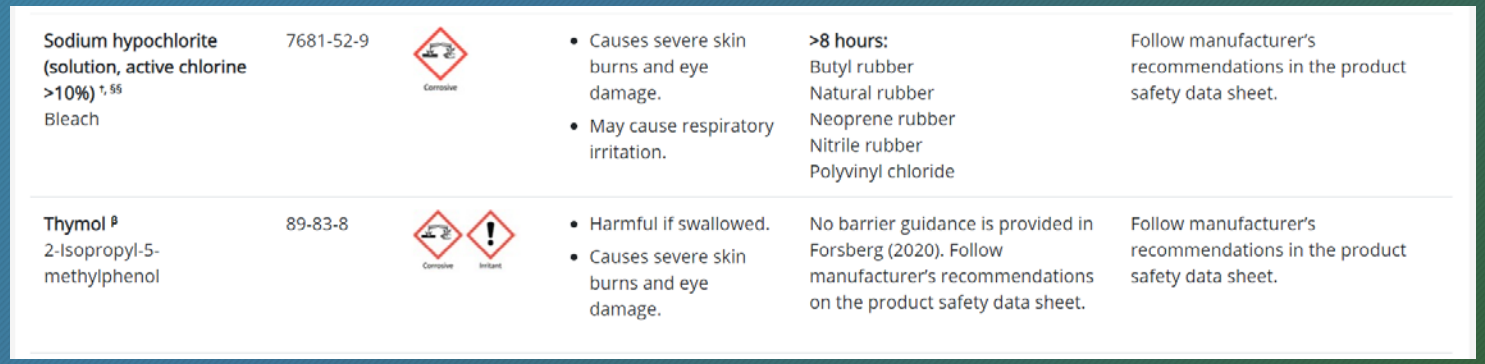
Growing safety literature

- Better Ways to Clean
- Walk-off mats placed inside and outside of entry-ways (to prevent dirt from being tracked into the building);
- Microfiber mops, cloths and dusters;
- High-filtration HEPA vacuums;
- Walk-behind hard floor auto-scrubbers;
- Hands-free mops; and
- Chemical-free cleaning systems.

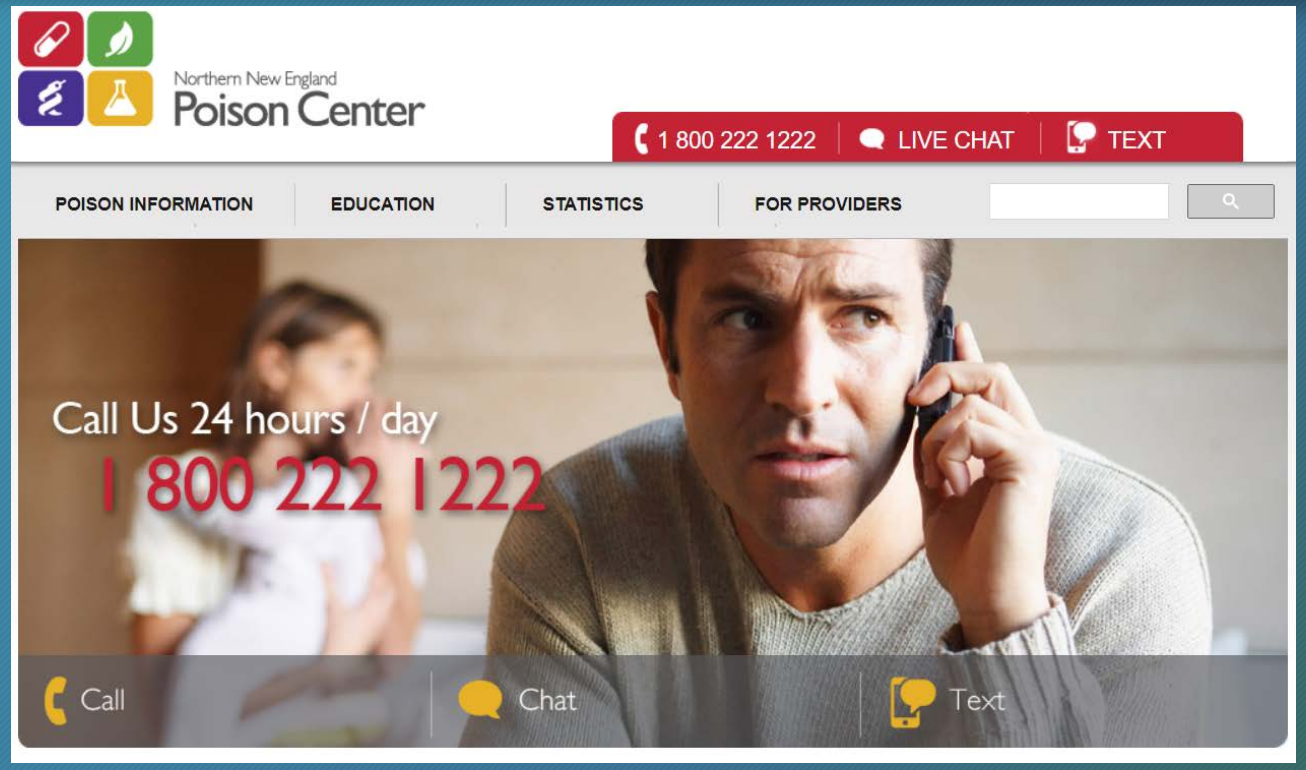
Source: https://www.osha.gov/Publications/OSHA3512.pdf

Reducing exposure beyond PPE

- Saferchoice
- https://www.cdc.gov/niosh/topics/disinfectant/default.html



Sodium hypochlorite (solution, active chlorine >10%) [†, §§] Bleach	7681-52-9	Corrosive	• Causes severe skin burns and eye damage. • May cause respiratory irritation.	**>8 hours:** Butyl rubber Natural rubber Neoprene rubber Nitrile rubber Polyvinyl chloride	Follow manufacturer's recommendations in the product safety data sheet.
Thymol [β] 2-Isopropyl-5-methylphenol	89-83-8	Corrosive Irritant	• Harmful if swallowed. • Causes severe skin burns and eye damage.	No barrier guidance is provided in Forsberg (2020). Follow manufacturer's recommendations on the product safety data sheet.	Follow manufacturer's recommendations in the product safety data sheet.



- POISON SAFETY DURING A PANDEMIC: GUIDANCE FOR SCHOOL NURSES, TEACHERS AND DAYCARE PROVIDERS

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