SAFETY CONSIDERATIONS FOR REOPENING SCHOOLS

August 2, 2020

I. ALL FACULTY AND STAFF SHOULD WEAR MASKS.

A. Ohio guidance explicitly states "school staff must wear masks" unless it would "significantly interfere with the learning process".

COVID-19 Health and Prevention Guidance for Ohio K-12 Schools ***https://coronavirus.ohio.gov/static/responsible/schools/K-12-Schools-Guidance.pdf:***

"**School staff must wear masks.**" – *Exactly as it appears in the Guidelines, bold and highlighted in red.* (Page 13)

"As with other businesses, all school staff and volunteers must wear face coverings unless it is unsafe to do so or where doing so would significantly interfere with the learning process." (Page 13)

"At minimum, facial coverings (masks) should be cloth/fabric and cover an individual's nose, mouth, and chin." (Page 13)

II. CHILDREN AGES KINDERGARTEN AND UP CAN WEAR MASKS.

A. The CDC states that children 2 years of age and older should wear a mask in public settings where social distancing is difficult.

Considerations for Wearing Cloth Face Coverings ***https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover-guidance.html* (Updated July 16, 2020):**

"CDC recommends all people 2 years of age and older wear a cloth face covering in public settings and when around people who don't live in your household, especially when other social distancing measures are difficult to maintain."

B. Ohio guidance states children Kindergarten through 5th grade can wear masks.

COVID-19 Health and Prevention Guidance for Ohio K-12 Schools ***https://coronavirus.ohio.gov/static/responsible/schools/K-12-Schools-Guidance.pdf:***

"The majority opinion among experts appears to be that children kindergarten through 5th grade can wear masks as long as consideration is given for the age and developmental level of the child and the physical situation the child is in at that moment." (Page 14)

III. CLOTH FACE COVERINGS OFFER ONLY LIMITED PROTECTION AGAINST AIRBORNE PARTICLES.

A. The CDC states that cloth masks are inferior to medical masks and respirators. They should not be used by health care workers and only used by the community when medical masks are unavailable.

Effectiveness of Cloth Masks for Protection Against Severe Acute Respiratory Syndrome Coronavirus 2
https://wwwnc.cdc.gov/eid/article/26/10/20-0948_article#r9 (July 22, 2020):

"The filtration, effectiveness, fit, and performance of cloth masks are inferior to those of medical masks and respirators. Cloth mask use should not be mandated for healthcare workers, who should as a priority be provided proper respiratory protection. Cloth masks are a more suitable option for community use when medical masks are unavailable." (Under section "Conclusions")

"The general public should be educated about mask use because cloth masks may give users a false sense of protection because of their limited protection against acquiring infection." (emphasis added, under section "Factors to Consider when Using Cloth Masks…")

"In 2015, we conducted a randomized controlled trial to compare the efficacy of cloth masks with that of medical masks and controls (standard practice) among healthcare workers in Vietnam. Rates of infection were consistently higher among those in the cloth mask group than in the medical mask and control groups." (Under "Studies of Cloth Mask Efficacy")

"Filtration effectiveness of wet masks is reportedly lower than that of dry masks." (Under "Studies of Cloth Mask Efficacy")

B. The WHO states that the filtration efficiency of cloth masks is "shown to vary between 0.7% and 60%".

World Health Organization – Coronavirus Disease (COVID-19) Advice for the Public: When and How to use Masks
https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks (Last updated June 19, 2020)
[Scroll down to Technical Guidance and "Download" PDF under subheading "Advice on the use of masks in the context of COVID-19" (June 5, 2020]:

"The filtration of cloth fabrics and masks has been shown to vary between 0.7% and 60%." (Page 9)

C. 3M states on its website that homemade masks "do not serve as respiratory protection devices and may not provide any measurable exposure reduction".

Frequently Asked Questions About 3M and COVID-19
https://www.3m.com/3M/en_US/company-us/coronavirus/3m-covid-19-faqs/
[Scroll down to "Production" and click on "Do homemade masks help healthcare workers?"]:

”Homemade masks do not serve as respiratory protection devices and may not provide any measurable exposure reduction. Unlike government-approved respirators, homemade masks are not designed and tested to reduce wearers’ exposure to airborne particulates.”

IV. RESEARCH SUGGESTS THAT N95 EQUIVALENT MASKS WORN BY THE GENERAL POPULATION COULD “STOP THE EPIDEMIC ALTOGETHER”.

A. Harvard Business Review states that if the general population had and used N95 equivalent masks, these masks could “stop the epidemic altogether” and give people “control over their own safety, a greater incentive to wear them, and the confidence to resume economically important activities.”

We Need Better Masks
https://hbr.org/2020/06/we-need-better-masks (June 18, 2020):

“We need masks for the general population that block the virus from coming in and going out similar to what high-filtration surgical or N95 masks do for health workers. Masks like this would give people control over their own safety, a greater incentive to wear them, and the confidence to resume economically important activities.”

“If worn widely enough in crowded and indoor settings where most transmission seems to occur, these masks could potentially stop the epidemic altogether. They would also reduce flu transmission and the chance of a dreaded “double epidemic” in the fall.”

B. Civilian alternative to the N95 is now available in the US.

1. Korea’s N95 equivalent Air Queen Nano Mask is now being sold in the US and UK.

Korea’s Air Queen ‘FDA Approved N95 Equivalent’ Nano Mask Now Being Sold in USA, UK
https://nonwovens.com/nonwovens/news/korea-s-air-queen-fda-approved-n95-equivalent-nano-mask-now-being-sold-in-usa-uk-195525.html (July 3, 2020):

“Since the sudden onset of the COVID-19 pandemic the United States has faced a supply constraint of quality N95 masks. With the continued difficulty of being able to secure N95 designated products, health officials have been encouraging business and public consumers to find FDA certified "*substantial equivalents*," such as the Air Queen mask to help address this shortage.”

2. The Airbon Kids Mask by Air Queen provides maximum protection for children.

Nano-Fiber Face Mask Provides Maximum Protection to Children

***https://www.hospimedica.com/critical-care/articles/294783421/nano-fiber-face-mask-provide-maximum-protection-to-children.html* (July 13, 2020):**

> "The … AirBon, which has been specially sized for pediatric use, is based on the same technology as that of the Air Queen, a highly advanced nano-fiber surgical respirator that provide in excess of 97% particle filtration, while simultaneously allowing for advanced breathability and comfort."
>
> "Many children are using masks that are sized for adults, which reduces the protection they receive. Furthermore, many children are using cloth masks or 3-ply versions of the masks which are substantially inferior when compared to the protection provided by the AirBon."

3. **Air QUEEN Nano Mask utilized advanced nanofiber technology, exceeds N95 equivalent performance testing, is FDA cleared for use as a Class II surgical mask, and can be reused up to ten times while still maintaining the same level of filtration efficiency.**

Air QUEEN & Airbon Kids Mask
***https://www.gogadeedee.com/*:**

> "The Air QUEEN Nano Mask utilizes advanced nanofiber technology to provide a high level of protection and breathability. These nanofiber webs are so dense, that larger pieces of dust and contaminants aren't able to penetrate them. They are also waterproof, maintaining a high level of filtration efficiency for over 24 hours."
>
> "While the Air QUEEN Nano Mask is not NIOSH approved, US Testing demonstrates filtration efficiency between 96.03% ~ 98.694%, (N95 and FFP2 Equivalent)."
>
> "The Air QUEEN Nano Mask is registered and has been cleared by the US FDA for use as a Class II surgical mask through the 510(k) process."
>
> "The Air QUEEN Nano Mask filter is waterproof and can be reused up to ten times and still maintain the same level of filtration efficiency."

V. EFFICACY OF SURGICAL MASKS CAN VARY WIDELY AND MOST IN THE US HAVE NOT BEEN CLEARED BY THE FDA.

A. Surgical masks that have been cleared for medical use by the FDA have better filtration efficiencies, but in the US, most have not gone through the FDA approval process.

A User's Guide To Masks: What's Best At Protecting Others (And Yourself)
https://www.npr.org/sections/goatsandsoda/2020/07/01/880621610/a-users-guide-to-masks-what-s-best-at-protecting-others-and-yourself
(July 1, 2020):

"How well a surgical mask protects *you*, the wearer, from smaller particles can vary widely when tested with the same methods used to test N95 respirators. For example, one surgical mask that … [was] tested blocked around 30% of small particles, while others filtered out up to 80%."

"Some surgical masks … have been cleared for medical use by the FDA and have better filtration efficiencies, but most masks sold in the U.S. haven't gone through the FDA approval process."

VI. FACE SHIELDS SHOULD NOT BE USED AS A SUBSTITUTE FOR FACE COVERINGS

A. The CDC explicitly states that face shields should not be used as a substitute for face coverings.

Considerations for Wearing Cloth Face Coverings
https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover-guidance.html (Updated July 16, 2020):

"CDC does not recommend use of face shields for normal everyday activities or as a substitute for cloth face coverings." (emphasis added)

B. By design, face shields cannot contain droplets or airborne particles released from someone who coughs, sneezes or speaks.

Can Face Shields Protect Me the Same as a Regular Mask
https://www.brgeneral.org/healthy-lifestyle-blog/2020/july/can-face-shields-protect-me-the-same-as-a-regula/ (July 6, 2020):

"The main downside to face shields is that the droplets released when someone coughs, sneezes or speaks can be dispersed through the sides and bottom of the shield."

"Research suggests that the coronavirus usually spreads via large droplets expelled out of a person's mouth or nose, which are pulled down by gravity within a radius of six feet. (Hence the six-foot rule.) Masks absorb droplets when we sneeze or cough, but face shields do not."

"If you do choose to wear a face shield over a face mask, you will need to sanitize it frequently. Research has found that this virus likes to live on plastic a lot better than it lives on porous materials like cloth, paper or cardboard. You can disinfect it with an antibacterial wipe, alcohol pad or soap and water. If it gets any cracks in it, you should also throw it out and get a new one."

C. Recent outbreaks demonstrate that face shields will not protect against COVID-19.

1. The top doctor in the Swiss mountain region told restaurants not to rely on face shields to protect their employees.

Swiss Doctor Pans Plastic Visors After COVID-19 Hits Restaurant Workers

https://www.reuters.com/article/us-health-coronavirus-swiss-visor/swiss-doctor-pans-plastic-visors-after-covid-19-hits-restaurant-workers-idUSKCN24F239 (July 14, 2020):

> "The doctor's warning was a reminder that visors play a "complementary role" in protecting against COVID-19 infections, and that proper social distancing and face masks are also necessary to be effective."

2. **A recent outbreak at a Switzerland hotel shows only those wearing face shields were infected with coronavirus, and those wearing a mask were not.**

'Only Those With Plastic Visors Were Infected': Swiss government Warns Against Face Shields
http://www.pharmafile.com/news/554149/face-shields-did-not-protect-people-covid-19-outbreak-switzerland-masks-did-according-he (July 23, 2020):

> "It has been shown that only those employees who had plastic visors were infected. There was not a single infection among employees with a mask."

> "Leuthold told Swiss news outlet 20 Minutes that a guest of the hotel was also infected: "We know that the guest was served by employees with plastic visors.""

VII. MASK REMOVAL, HANDLING AND STORAGE ARE JUST AS IMPORTANT AS MASK WEARING.

A. Do not touch the front of your mask as it may be contaminated.

How to Properly Put On and Take Off a Disposable Respirator
https://www.cdc.gov/niosh/docs/2010-133/pdfs/2010-133.pdf
[Scroll down to "Removing Your Respirator"]:

> "DO NOT TOUCH the front of the respirator! It may be contaminated!"

B. Do not wear the mask around your neck or anywhere the inside of your mask can become contaminated.

1. **CDC states that you should not wear the mask around your neck.**

How to Wear Masks
https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-to-wear-cloth-face-coverings.html (Last Updated July 6, 2020):

> "Don't put the mask around your neck."

2. **If there is any contamination on the mask you are wearing and then you place that mask around your neck or anywhere else where the inside of the mask can touch another part of the body or clothing contaminated with the mask, then "infection can occur".**

5 Mistakes People Make When Wearing Face Masks for Coronavirus ***https://www.huffpost.com/entry/mistakes-wearing-face-masks-coronavirus_l_5e99d8eac5b67370b2133f65 (Updated April 24, 2020):***

> "Concern for improperly wearing a mask is based on the risk of contamination."
>
> "If the inside of the mask touches another part of the body that is contaminated with the virus — hair, forehead, chin, neck, hands, other clothing — then the inside of the mask is returned to the nose and mouth area [where there are] vulnerable mucous membranes, infection can occur."
>
> "Don't leave it resting on your neck when not on your face."
>
> "It's better for the mask not to be around your neck if you've already been wearing it, because then if there was any type of contamination, you don't want [to be] wearing that around your neck."

C. Store your mask in a breathable container such as a paper bag between uses.

1. **CDD recommends that masks are stored in a "clean sealable paper bag or breathable container".**

   Strategies for Optimizing the Supply of Facemasks ***https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/face-masks.html (Updated June 28, 2020)***
   [Scroll down to "Crisis Capacity Strategies", subheading "Implement limited re-use of facemasks"]:

   > "The folded mask can be stored between uses in a clean sealable paper bag or breathable container."

2. **Masks should not be stored in less porous containers, such as a plastic bag because they can "lock in infectious material without clean air moving into or out of the bag".**

   No. 1 Way to Store Your Face Mask ***https://www.msn.com/en-ph/health/wellness/no-1-way-to-store-your-face-mask/ar-BB13WUAy (May 11, 2020)***

   > "The best material to store your mask in is something that most people can easily buy and find: a paper lunch bag."
   >
   > "Paper bags are more breathable than most other containers, which makes them a less favorable environment for microbes."
   >
   > "Some people are making the mistake of using plastic bags, which are "less porous and lock in any infectious material without clean, new air moving into or out of the bag."'

VIII. CORONAVIRUS CAN BE AIRBORNE, LINGER IN THE AIR FOR HOURS AND MAY SPREAD MORE EASILY INDOORS.

A. W.H.O. acknowledges that transmission of the virus by airborne particles may be responsible for outbreaks in closed settings.

The Coronavirus Can Be Airborne Indoors, W.H.O. Says
https://www.nytimes.com/2020/07/09/health/virus-aerosols-who.html
(July 9, 2020):

"An aerosol is a respiratory droplet so small it may linger in the air. In its latest description of how the virus is spread, the agency said transmission of the virus by aerosols may have been responsible for "outbreaks of Covid-19 reported in some closed settings, such as restaurants, nightclubs, places of worship or places of work where people may be shouting, talking or singing."

"The W.H.O. had maintained that airborne spread is only a concern when health care workers are engaged in certain medical procedures that produce aerosols. But mounting evidence has suggested that in crowded indoor spaces, the virus can stay aloft for hours and infect others, and may even seed so-called superspreader events."

"People should "avoid crowded places, close-contact settings, and confined and enclosed spaces with poor ventilation," the agency said."

B. Recent study using 8 asymptomatic carriers of coronavirus demonstrates that only 10% of aerosols released were filtered out, with the majority of particles deposited on the walls.

New Study Explores How Coronavirus Travels Indoors
https://cse.umn.edu/college/news/new-study-explores-how-coronavirus-travels-indoors (July 28, 2020):

"Using precise experimental measurements of aerosols released by eight asymptomatic individuals with COVID-19, the researchers were able to numerically model the external flow of the virus through the air in three interior spaces—an elevator, a classroom, and a supermarket. Then, they compared how the virus faired among different levels of ventilation and with different spacing among the rooms' occupants."

"The researchers found that in indoor spaces, good ventilation will filter some of the virus out of the air, but may leave more viral particles on surfaces. In the classroom setting, after running a 50-minute simulation with an asymptomatic teacher consistently talking, the researchers found that only 10 percent of the aerosols were filtered out. The majority of the particles were instead deposited on the walls."

""Because this is very strong ventilation, we thought it would ventilate out a lot of aerosols. But, 10 percent is really a small number," said Yang, who holds the Richard and Barbara Nelson Assistant Professorship in Mechanical Engineering. "The ventilation forms several circulation zones called vortexes, and the aerosols keep rotating in this vortex. When they collide with the wall, they attach to the wall.

But, because they are basically trapped in this vortex, and it's very hard for them to reach the vent and actually go out.""

"In a classroom setting, the virus aerosols spread significantly less throughout the room when the teacher—who is likely doing the most talking—was placed directly under an air vent. This insight could inform how classrooms are arranged and disinfected."

C. Optimizing ventilation in indoor settings, frequent cleaning of surfaces, and wearing masks can lower risk of airborne infection.

Risk Assessment of Airborne Transmission of COVID-19 by Asymptomatic Individuals Under Different Practical Settings
https://arxiv.org/abs/2007.03645 (July 24, 2020)
[Click on "PDF Only" to access the entire study]:

"Combining novel in situ measurements and CFD simulations, our study provides the first quantitative assessment of risks due to airborne transmission of viruses generated by asymptomatic individuals in a confined space under ventilation." (Page 9)

"Specifically, our results suggest that optimizing ventilation settings (e.g., adding more sites of ventilation and/or more turbulence to disrupt stable circulation zones) even under the current ventilation capacity can significantly improve the efficiency of particle removal. Adjusting the placement of occupants (e.g., students or cashier in our cases) in the room to avoid hot spots and frequent cleaning of surfaces prone to contamination can reduce the risks. Wearing masks to cut down the source of particle generation can significantly lower the risks of airborne infection." (Page 10)

IX. BEING OUTDOORS AND PORTABLE HEPA 13 AIR PURIFIERS MAY BE MOST EFFECTIVE AND COST-EFFECTIVE VENTILATION SOLUTIONS FOR SCHOOLS.

A. History and recent studies have shown that outdoor learning reduces risks and improves learning.

Schools Beat Earlier Plagues With Outdoor Classes. We Should, Too.
https://www.nytimes.com/2020/07/17/nyregion/coronavirus-nyc-schools-reopening-outdoors.html (July 20, 2020):

"Following education trends in Germany, they proposed the creation of an open-air schoolroom. Within a matter of months, the floor of an empty brick building in Providence was converted into a space with ceiling-height windows on every side, kept open at nearly all times."

"The experiment was a success by nearly every measure — none of the children got sick. Within two years there were 65 open-air schools around the country either set up along the lines of the Providence model or simply held outside."

"At the same time, one of the few things we know about the coronavirus with any degree of certainty is that the risk of contracting it diminishes outside — a review of 7,000 cases in China recorded *only one instance* of fresh-air transmission."

"Hundreds of studies over the years have demonstrated a positive correlation between engagement with nature and academics; some researchers have found that outdoor learning can improve both standardized test scores and graduation rates."

B. Using "better" air filters alone are not enough to reduce particle concentration. Adding more sites of ventilation and/or more turbulence to disrupt air circulation, such as opening windows in a classroom, can "significantly improve the efficiency of particle removal".

Risk Assessment of Airborne Transmission of COVID-19 by Asymptomatic Individuals Under Different Practical Settings
https://arxiv.org/abs/2007.03645 (July 24, 2020)
[Click on "PDF Only" to access the entire study]:

"Ventilation at a single location, even at the highest rate in the current practice, is highly inefficient at removing particles, due to the presence of relatively stable flow circulation zones in the space and the large amount of particle deposition on surfaces. **This result suggests that improvements to air filters alone are not enough to reduce the particle concentration.**" (Page 10)

"Our study can directly lead to practical guidelines and science-driven policy for mitigating the risks of airborne infection of COVID-19 with minimal impact on the economy and social activities, which are critical for the safe re-opening of many businesses. Specifically, our results suggest that optimizing ventilation settings (e.g., adding more sites of ventilation and/or more turbulence to disrupt stable circulation zones) even under the current ventilation capacity can significantly improve the efficiency of particle removal." (Page 10)

C. Portable air purifiers placed in bathrooms and classrooms can increase ventilation in areas where outdoor air ventilation is not possible.

US EPA – Air Cleaners, HVAC Filters, and Coronavirus (COVID-19)
https://www.epa.gov/coronavirus/air-cleaners-hvac-filters-and-coronavirus-covid-19 (Last updated July 16, 2020):

"Portable air cleaners (also known as air purifiers) may be particularly helpful when additional ventilation with outdoor air is not possible without compromising indoor comfort (temperature or humidity), or when outdoor air pollution is high."

"Consider using portable air cleaners to supplement increased HVAC system ventilation and filtration. Directing the airflow so that it does not blow directly from one person to another reduces the potential spread of droplets that may contain infectious viruses. Air cleaning may be useful when used along with source control and ventilation, but it is not a substitute for either method."

D. There are many cost-effective air purifiers on the market starting at $100. Be sure to check for HEPA 13 air purifiers and do not use ozone generators.

1. **Some options for air purifiers that are HEPA 13 and not an ozone generator include Levoit, Medify Air, and IQAir.**

2. **Ozone is harmful to your health.**

   Ozone Generators That Are Sold As Air Cleaners ***https://www.epa.gov/indoor-air-quality-iaq/ozone-generators-are-sold-air-cleaners (Last updated December 23, 2019):***

   "Whether in its pure form or mixed with other chemicals, ozone can be harmful to health."

   "Some studies show that ozone concentrations produced by ozone generators can exceed health standards even when one follows manufacturer's instructions."

   "Available scientific evidence shows that, at concentrations that do not exceed public health standards, ozone is generally ineffective in controlling indoor air pollution." (Access PDF version here.)

3. **Ozone generators sold as air purifiers should not be used in schools.**

   US EPA – Air Cleaners, HVAC Filters, and Coronavirus (COVID-19 ***https://www.epa.gov/coronavirus/air-cleaners-hvac-filters-and-coronavirus-covid-19 (Last updated July 16, 2020):***

   "Some products sold as air cleaners intentionally generate ozone. These products are not safe to use when people are present because ozone can irritate the airways. **Do not use ozone generators in occupied spaces.** When used at concentrations that do not exceed public health standards, ozone applied to indoor air does not effectively remove viruses, bacteria, mold, or other biological pollutants."

X. CHECK YOUR KN95 RESPIRATOR AGAINST THE FDA'S RECALL LIST.

A. There are currently 67 KN95 respirators that are no longer authorized by the FDA.

FDA Reverses Decision to Authorize Use of Chinese KN95 Respirators ***https://www.natlawreview.com/article/fda-reverses-decision-to-authorize-use-chinese-kn95-respirators (May 8, 2020):***

"Citing poor quality, the U.S. Food and Drug Administration (FDA) has barred the importation of certain KN95 filtering facepiece respirators manufactured in China."

B. FDA list of KN95 respirators no longer authorized.

Respirator Models No Longer Authorized ***https://www.fda.gov/media/137928/download (Updated June 12, 2020)***

XI. CHECK YOUR HAND SANITIZER AGAINST THE FDA'S RECALL LIST AND ENSURE IT CONTAINS AT LEAST 60% ALCOHOL.

A. FDA issues another warning on July 27, 2020 because they continue to see hospitalizations and deaths rise as related to the use of dangerous hand sanitizers that contain methanol. There are currently 101 hand sanitizers on this list.

Coronavirus (COVID-19) Update: FDA Reiterates Warning About Dangerous Alcohol-Based Hand Sanitizers Containing Methanol, Takes Additional Action to Address Concerning Products
https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-reiterates-warning-about-dangerous-alcohol-based-hand-sanitizers (July 27, 2020):

> "The FDA first warned about some of the methanol-containing hand sanitizers being sold in retail stores and online in June. The agency issued a further warning earlier this month about an increasing number of adverse events, including blindness, cardiac effects, effects on the central nervous system, and hospitalizations and death, primarily reported to poison control centers and state departments of health. The agency continues to see these figures rise."

B. A week ago, the FDA had recalled at least 77 hand sanitizers.

FDA Says at Least 77 Hand Sanitizer Products May Be Toxic
https://www.washingtonpost.com/business/2020/07/24/hand-sanitizer-recall/ (July 24, 2020):

> "Because the products are mislabeled, consumers would not be able to tell which hand sanitizers actually contain methanol."

> "The recalled products are manufactured by various companies, all in Mexico, and have been carried by such retailers as BJ's Wholesale Club, Costco and Walmart."

C. FDA has now recalled 101 hand sanitizers, as of August 2, 2020.

FDA Updates on Hand Sanitizers with Methanol
https://www.fda.gov/drugs/drug-safety-and-availability/fda-updates-hand-sanitizers-methanol (Content current as of 7/28/2020):

> "FDA is warning consumers and health care providers that the agency has seen a sharp increase in hand sanitizer products that are labeled to contain ethanol (also known as ethyl alcohol) but that have tested positive for methanol contamination. Methanol, or wood alcohol, is a substance that can be toxic when absorbed through the skin or ingested and can be life-threatening when ingested."

D. Hand sanitizer should have at least 60% alcohol.

Hand Hygiene Recommendations
https://www.cdc.gov/coronavirus/2019-ncov/hcp/hand-hygiene.html (Updated May 17, 2020):

"CDC does not have a recommended alternative to hand rub products with greater than 60% ethanol or 70% isopropanol as active ingredients. Benzalkonium chloride, along with both ethanol and isopropanol, is deemed eligible by FDA for use in the formulation of healthcare personnel hand rubs. However, available evidence indicates benzalkonium chloride has less reliable activity against certain bacteria and viruses than either of the alcohols.

E. Germ-X and Purell sell alcohol-free products that use benzalkonium chloride as the active ingredient, which may not be clear on the listing.

Why Your Hand Sanitizer Might Not Protect Against the New Coronavirus ***https://www.advisory.com/daily-briefing/2020/03/12/hand-sanitizer?WT.ac=Twitter_DB_DBA_RESEARCH+DOM_x_HandSanitizer_x_Q120_Social+Media+Organic (March 12, 2020):***

"Some of the most popular hand sanitizer brands, including Germ-X and Purell, sell alcohol-free products that use benzalkonium chloride as the active ingredient instead of alcohol. And in some cases, it can be hard to tell the difference between the non-alcohol products and the ones that are more effective. *ProPublica* found that a search for "coronavirus hand sanitizer" on Amazon produces results for alcohol-free products that do not clearly state they don't contain alcohol."

This document is not an endorsement to have schools reopen in the fall. Rather, it presents some, but certainly not all, important research to consider when determining whether and how to reopen schools safely. This document is made available for informational purposes only. Adherence to any recommendations included in this document will not ensure complete protection against COVID-19. This document and the information contained within reflect the best available information at the time the document was prepared. MO6 Consulting does not warrant the accuracy or completeness of the document and assumes no responsibility for any injury or damage to persons or property arising out of or related to any use of this document or for any errors or omissions.