

Sanitizing Sanitizers

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In this global pandemic, COVID-19, keeping clean is very important. But the hand sanitizers that were supposed to help us with this aren't doing their job. Companies had a Gold Rush mentality, meaning that they saw an easy way to make quick money and didn't take into account all the requirements and safety procedures. Which is why many are getting recalled by the FDA. As time passed, the FDA kept discovering new reasons that the hand sanitizers sold were not suitable for use.

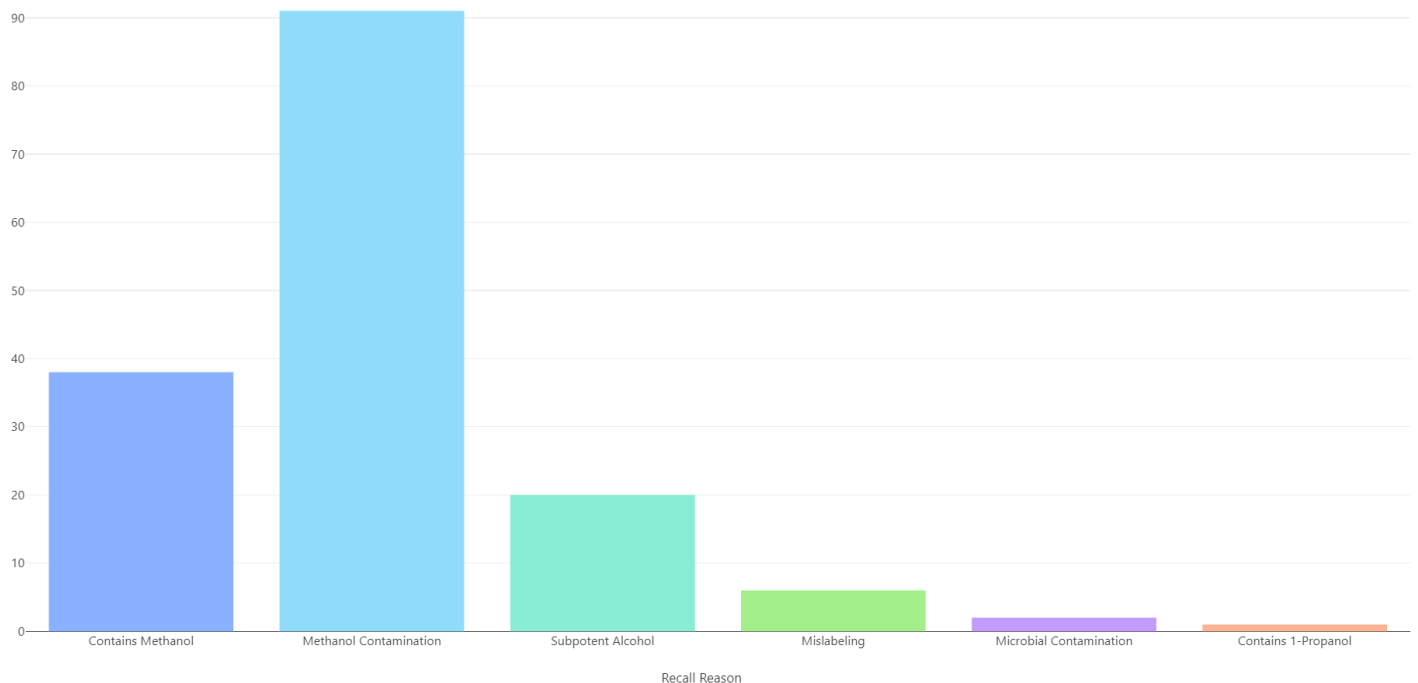
COVID-19 and Sanitizers

COVID-19 is a disease that is caused by the virus SARS-CoV-2. It is very easy to contract if you don't take the proper safety measures, like wearing a mask and maintaining social distancing. The virus originated in Wuhan, China and it spread within the country, until the first case outside of China was reported 1/13/2020. It was found in Thailand. Then cases were reported in Korea, Japan, Thailand, and Singapore. It also soon spread to Italy and the rest of Europe. The coronavirus has also spread to the US and many other countries. There are currently 5,607,993 cases of coronavirus and 174,924 deaths in the US as of 8/21/2020.

Hand sanitizer is a very important tool in making sure that you stay clean and maintain the proper safety measures so you don't get the coronavirus. It is the next best thing to washing your hands with soap and water. Hand sanitizer cleans with your hands with alcohol. Alcohols destroy disease-causing agents, or pathogens, by breaking apart proteins, splitting cells into pieces or messing with a cell's metabolism. While this can be very effective most times, hand sanitizer doesn't kill all pathogens.

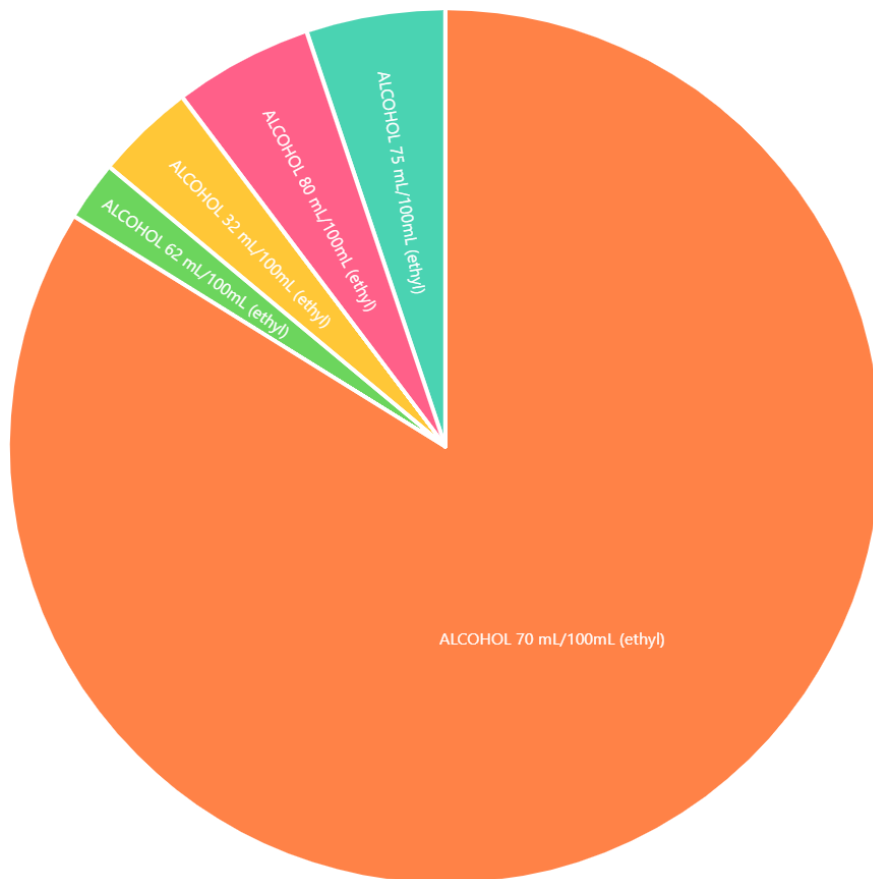
Hand Sanitizer Recalls

The current hand sanitizer recalls are caused by multiple reasons. The main reasons include methanol contamination, containing methanol, subpotent alcohol, and mislabeling. While this list of recalls is growing everyday, the data is as of 8/13/2020. Evidently, methanol

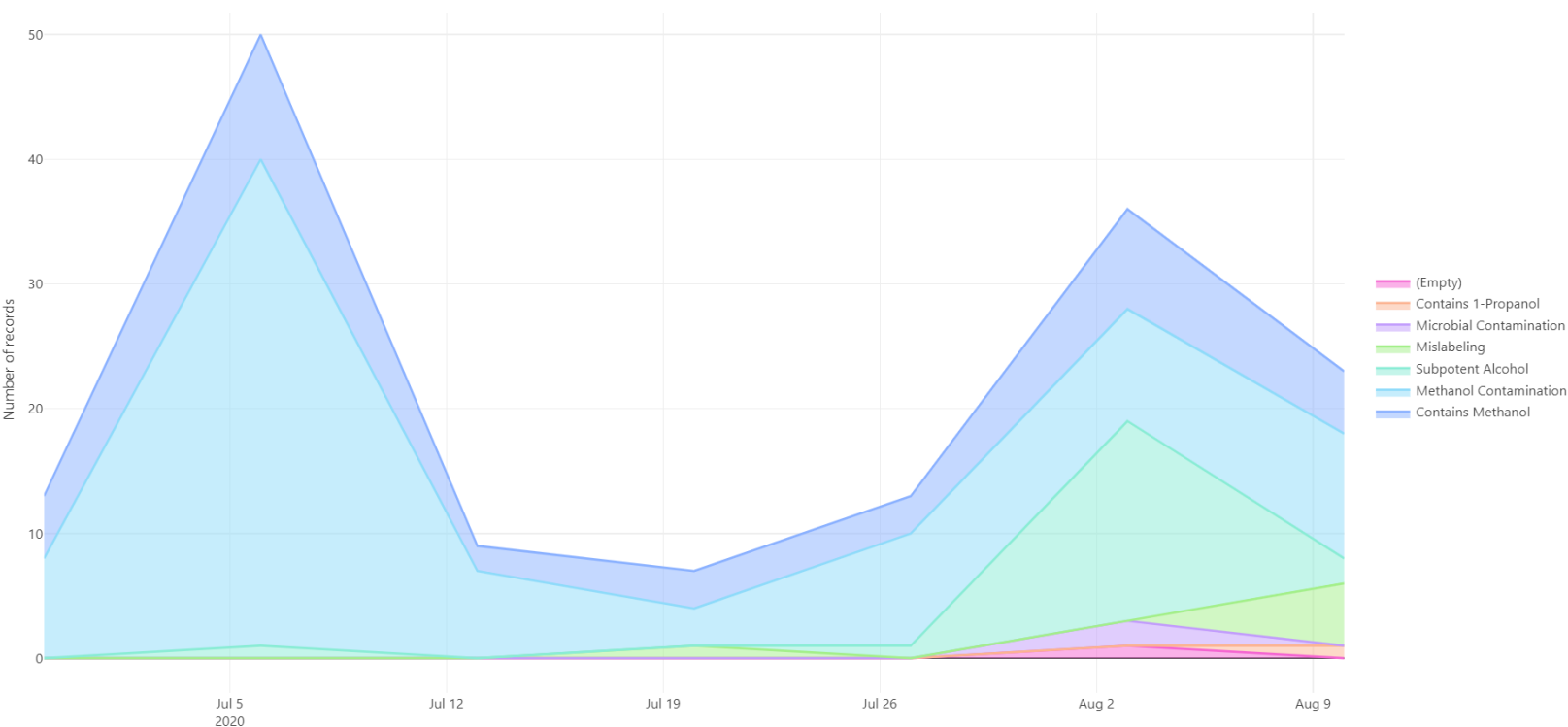


contamination is the main reason for sanitizers being recalled. This might be because one of the most used active ingredient in hand sanitizers is ethanol, or ethyl alcohol. This could be connected to the methanol problem, because when distilling ethyl alcohol, methanol is a residue that forms and if not cleaned out properly, will end up in your hand sanitizer. Since so many companies have a Gold Rush mentality, like I said before, they don't have the proper facilities or the sterile equipment and they might not get most of the methanol out of the distilled ethyl alcohol. Here is a pie chart that shows 5 of the most common active ingredients used in recalled hand sanitizers. The potency of alcohol ranges from 32/100mL to 80/100mL.

Methanol is a volatile, colorless, flammable liquid with a distinctive alcoholic odor. It can



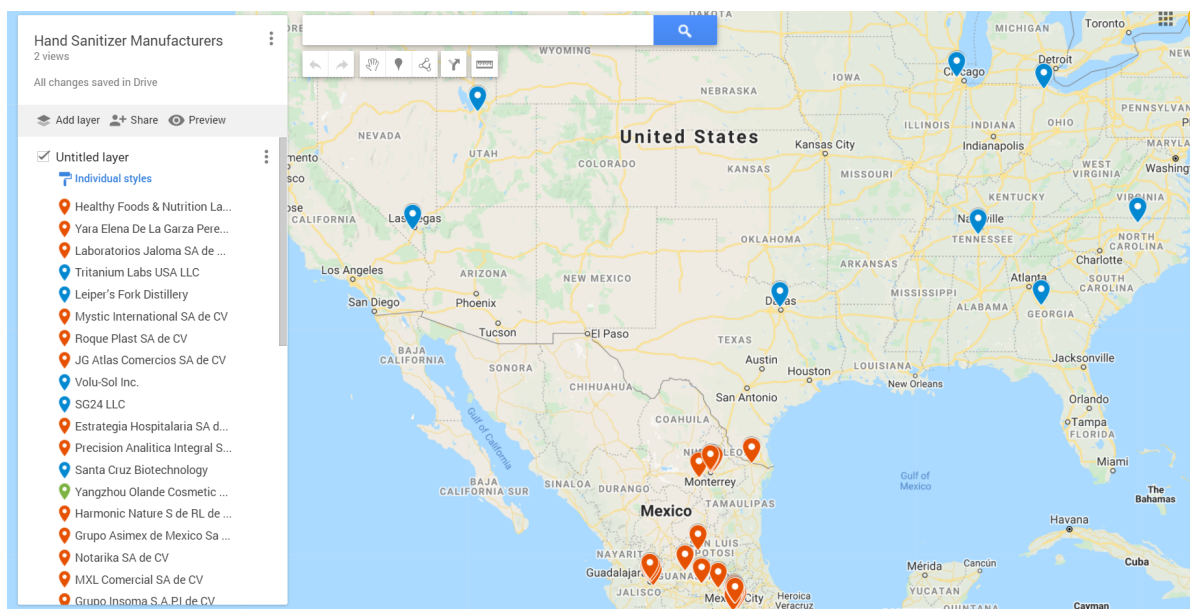
cause poisoning when absorbed through your skin and blindness or death when swallowed. Drinking just 25-90 mL of methanol is fatal. It poisons you by breaking down into formic acid in your body, which lowers the pH of your blood making it very acidic. The acidity disrupts the metabolisms of your cells causing a buildup of waste products. This combination of acidity and metabolic disruption hurts nerve cells, specifically retina and optic nerves, which causes blindness.



Patterns in the Data

There are also some patterns in the data that I have found. The number of reasons for hand sanitizers being recalled is increasing over time. In the line graph above you will see, in the beginning when the recalls just started, there were only a couple of recall reasons. But as time passed the FDA found new reasons and they are finding new reasons every day. This will probably continue in the future too. 😞

Another pattern I found was that most of the manufacturers were in Mexico, compared to other countries like the US or China. Particularly in Mexico, a lot of the manufacturers were near Mexico City, according to this map of all the manufacturers (34 out of 44). This might be because manufacturing in Mexico is generally cheaper than manufacturing in the US and it is closer. Here's an interesting fact: in the 1960s, Mexico offered tax incentives to chemical producers to produce their products there. The first chemical plants started near Mexico City, and they stayed in Mexico until today.



FDA to the Rescue

You might be asking, what is the FDA doing about this methanol crisis, as hand sanitizer is a very important component in this pandemic. The FDA has made a list of all the recalled sanitizers and all the information about each product including the manufacturer, the distributor, the NDC (National Drug Code), the date it was added to table, and the product status/why it was recalled. They update this list every couple days. Once the product is recalled, the FDA will notify the manufacturer and retailers informing them that the product was recalled and telling them to pull it off the shelves.

Buying a Hand Sanitizer

After hearing all this, buying hand sanitizer might seem very complicated and dangerous, with so many factors to consider to make sure you don't get poisoned, etc. There are a few things you should consider before buying your hand sanitizer to make sure it's safe.

1. The alcohol content and what type of alcohol you are buying. The CDC says that it should at least be 60% alcohol, otherwise it won't be effective. The two types of alcohol used in hand sanitizer are Isopropyl Alcohol and Ethyl Alcohol. Ethyl alcohol, or ethanol, is more effective than Isopropyl alcohol and smells better, but there is a higher risk of methanol contamination because that is a residue of distilling the ethanol. You can also choose a non-alcoholic hand sanitizer, but those aren't as effective as alcoholic ones.
2. Another thing you should consider are the other ingredients. Glycerin, hydrogen peroxide, and sterile water are necessary ingredients, according to the FDA. While other ingredients can be added, make sure that they are not toxic or harmful in any way. For example, the manufacturer might add aloe vera gel to make it more moisturizing for your hands.
3. If you don't recognize an ingredient on the label, check the FDA's list of recalled hand sanitizers before you buy one to make sure you don't buy a recalled product.



After considering all these things, it's still important to understand that the FDA is finding new recall reasons all the time and it is hard to predict which hand sanitizers will be recalled. Your best bet is to stick to known and established hand sanitizer brands, even if they may be

more expensive than the unknown brands, but if they are not there, make sure to thoroughly check the list of recalled items before you buy it and during your use.

Also, the FDA recommends that you do not make your own hand sanitizer unless it is absolutely necessary, there are so many things that could go wrong and have major consequences.

With this research, I hope it clears all the bad sanitizers out of the way, and helps you choose the right one. As there are so many bad sanitizers out there, I'm starting to think, how do I create a sanitizer that sanitizes sanitizers? Hence, the story is not done! I'm on a mission, Sanitizing Sanitizers! 😊

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Acknowledgements:

- All my sources for research which are listed below
- The FDA especially for their list of recalled hand sanitizers
- And most of all, my Dad for guiding me through the whole process and helping me!

Sources:

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