

**A personal account for family and friends.**

I first circulated a similar document in February or March 2020, but more is now known, and known more widely:

1. The disease is spread mostly through the air, by droplets from speaking, singing, or breathing.
2. Although contagion is largely by inhalation, there is an unspecified hazard from fomites-- the SARS-CoV-2 virus picked up from surfaces by the hand (or glove) and spread to the mouth, nose, eyes.
3. Since February 2020, or so, several ways for "killing" the virus have been demonstrated and adopted, some of which are readily available to most individuals. I use and give details on how to make and use "augmented weak bleach."

So here is what I do.

**I WEAR A MASK**

Whenever I am outside my home, I wear a mask. The N95 mask with an exit valve that makes it more comfortable to wear provides no filtration of outgoing air, so I wear a non-N95 cloth mask over it, to protect other people. Indeed, a non-valved mask (or a non-valved mask overlaying a valved mask) is required for airplane travel and is the responsible thing to do.

Occasionally, I bake my masks at 170 F for 5 minutes or more in the pre-heated gas oven to reliably destroy all the virus responsible for COVID-19; reliable scientific publications show that the masks retain their virus filtering capability after many repetitions of this procedure. Dry heat is effective, as is hot water, but soap or detergent added to water to remove stains or dirt reduces the efficacy of the internal plastic fibrous layer responsible for filtering sub-micron particles; I don't know how to restore a clean-as-new appearance to an N95 mask. Putting one or more of your own N95 masks in a Ziploc bag submerged in water at 170 F would also work; I have not researched how well the filtering efficacy survives 212 F (boiling water). Surgical masks or cloth face coverings can be washed like any item of clothing.

**THE VACCINE IS COMING FOR ME AND YOU**

Vaccines by Moderna and Pfizer have been approved in the U.S.A, after substantial testing, and for both Moderna and Pfizer astonishing effectiveness is in the range of 95%. I will take this vaccine as soon as it is available to me. But to benefit from it, I need to be alive and well at the time it is offered, and to receive the second shot after three or four weeks. Until then, I practice these Personal Protective Measures— PPM— as a specific implementation of what I and Steve Morse and Paula Olsiewski recommended in our 2006 paper,

- ["Next Flu Pandemic: What to Do Until the Vaccine Arrives?"](https://fas.org/rlg/929_morse_garwin_olsiewski.pdf) by Stephen S. Morse, Richard L. Garwin, Paula J. Olsiewski. regarding the urgent need for information on how best to protect the public until a vaccine can be made available, SCIENCE VOL 314 10 NOVEMBER 2006. [https://fas.org/rlg/929\\_morse\\_garwin\\_olsiewski.pdf](https://fas.org/rlg/929_morse_garwin_olsiewski.pdf)

When a person speaks, droplets are carried through and by the air, particularly with "plosive" sounds such as "b", "t", or "p" or similar, in the form of vortex rings, out to six feet or more. Even a simple cloth mask disrupts these long-distance local effects and helps protect others from a person who is infected, even though 30% or more of those infected have no symptoms. Of course, the mask must be worn covering the mouth and the nose properly to protect others.

The cloth masks or surgical masks help also to protect the wearer against infection, and I now have a Powered Air-Purifying Respirator— PAPR— that has come down in price and is a nicely engineered package that I bought from Amazon.com:

<https://tinyurl.com/Amazon-Aurora-Air-Purifier>

This comes with 12 N95 masks, each of which has a small hole for the lightweight corrugated silicone hose from the battery-powered fan and the HEPA intake filter— "high efficiency particulate air" filter— used in N95 masks. The benefit of this PAPR over an N95 mask is twofold:

1. If there is a small gap in fitting of the mask over the nose, an ordinary mask allows ambient air to enter when one inhales, but the three-speed PAPR can provide enough instantaneous airflow so that one is always breathing HEPA-filtered air. One uses the lowest speed for sedentary times, the highest speed when exercising, climbing stairs, and the like. Of course, unless one is in a crowded outside venue, masks are far less necessary outside, but should be worn whenever there is the possibility of approaching others.
2. The HEPA filter in the PAPR is not exposed to exhalation, humidity, and the like, so is good for 500 hours or more. An ordinary N95 mask, relied on for filtration of inhaled air should be washed occasionally, or otherwise cleaned, as I have indicated.

## PROTECTION AGAINST CONTAMINATION BY PACKAGES, MAIL, AND FOOD

I wear blue nitrile gloves when I leave my apartment, or when I am bringing in items possibly with surfaces contaminated with the Covid-19 virus.

Specifically, I wear blue nitrile gloves, 5-mil thick, that I purchase either in person or online from <https://tinyurl.com/RLGs-Blue-Nitrile-Gloves>

These come in various sizes. I have a stock of M (medium) for visitors and guests, and for myself XL. The gloves are durable. I wear them whenever I am processing food, or when I go out, primarily because it is a lot easier reliably to clean gloved hands with the weak bleach that I use to clean my hands, and although I don't know quantitatively how long an exposure to mild bleach causes injury to the skin, I would rather expose my gloves. (I see that they are now \$17 per 100, compared with \$7 per 100 when I bought them and are out of stock for delivery).

Occasionally, I put the clean gloves into the oven when I am treating the newspaper or the mail. They survive the 170 F exposure without problem, and that ensures that any virus that may have got to the room or the inside of the glove is disabled as well. Fifteen minutes at 150 F in a convection oven is enough, or 5 minutes at 170 F. I have used a non-contact infrared thermometer to check surface temperatures, so you don't have to do that.

Whenever I bring anything into the home, I regard it as potentially contaminated with the virus. Studies published in March 2020 provide reliable data on the survival of the virus on various surfaces, but not on all of interest. Typically, viable virus— that capable of causing infection in cell culture and, presumably, in the body— can be reliably "killed" by five minutes exposure at 170 F (77 C) which is how I treat my U.S. mail and my daily newspaper, by putting it carefully for 30 minutes into the oven

set to that temperature. Any virus contamination on the New York Times is on the surface of the folded newspaper; I have been separating the sections so that the heat penetrates more rapidly through the many sheets (as in roasting a turkey or a cut of beef, it takes longer for the temperature at the center of a thick cut to rise than for a thin cut), but I am now changing to baking the intact multi-section paper. However even the surface temperature is depressed below oven temperature while heat is still flowing to the cool interior. Practically, I use 30 minutes at 170 F.

I need to be careful with the oven, because at the back, sides, or front of the oven, the heated air from the under-oven gas flame is much hotter and can scorch the paper or even cause an oven fire—in which case I would leave the oven closed until I ready the fire extinguisher to put out the fire, carefully. But one can't treat the groceries or many packages with oven exposure. Here I either leave the package out for three days or so, if it is made of cardboard and does not require refrigeration, or carefully swab it with "mild bleach" made according to the CDC standard, but enhanced with a small amount of sink detergent (Dawn in my case) and now an amount of white vinegar added to the mild bleach. You can also fill a squirt bottle (or a spray bottle) to clean certain containers. Kept out of sunlight, the mild bleach lasts for weeks; perhaps surprisingly, the weaker the solution, the longer it lasts. I treat eggs by gently placing the eggs in a bowl of weak bleach, removing them and letting them sit in the sink, wet, for a minute or so, then rinsing them with a spray and letting them dry in the dish drainer. Then I put them into an old egg carton for the refrigerator, or I bake the empty new egg carton at 170 F for 5 minutes. Onions or scallions will rot if moistened, so I just age them at room temperature for 4 days or so and store them in a bin under the sink.

For controlling pandemics such as Ebola or other viruses or germs, CDC has the attached poster from <https://www.cdc.gov/vhf/ebola/pdf/making-hand-washing-solution-bleach-hth.pdf>. In recent months, I have enhanced the oxidizing and hence disinfecting power of the mild bleach by adding to the 100:1 diluted laundry bleach an amount of white vinegar equal to the amount of 5%-chlorine bleach that was diluted a further 100:1.

### **Recipe for enhanced weak bleach solution**

English units	metric units
3 Cup tepid water in a bowl	500 g water in bowl
1/2 Tbsp bleach labeled "5% chlorine"	5.0 g bleach
1/2 Tbsp white vinegar	5.0 g vinegar
1/4 Tbsp liquid detergent	3.0 g sink detergent

Keep it out of the sunlight. Lasts for at least a week.

[One tablespoon (Tbsp) is 0.5 fluid ounces, so 1/2 tablespoon is 0.25 fluid ounces, and the half-Tbsp of 5% laundry bleach thus dilutes to make 25 oz of "mild bleach". Once one has the mild bleach, adding a half-Tbsp of white vinegar acidifies the mild bleach and shifts the chemical equilibrium from hypochlorite to hypochlorous acid, which is about 100 times a more powerful oxidizing agent than hypochlorite. I also add a bit of sink detergent to the mild bleach-- specifically half as much as the amount of laundry bleach, so 1/4 Tbsp in this example of 25 oz of solution. The mild bleach can't attack the virus if it doesn't wet the surface-- i.e., if it "beads up" on the gloves or plastic, or fruit skin-- so that is fixed by the addition of detergent. The detergent survives many days of exposure to the mild bleach, as evidenced by the continue chlorine-like smell of the solution. Interestingly, hypochlorous acid, in about this concentration of 0.05% available chlorine, is sold both by prescription and over the counter (well, at about 0.02% available chlorine) for problems of infected eyelids and such. I would avoid using it in my eyes, except as prescribed by a physician.]

Anyhow, that is what I do, and as I bring cans and bottles of plastic or glass into the home, I either immerse them in a bowl of mild bleach, stand them in the sink for 10 or 20 seconds or so, or, if they are too big to go into a bowl, sponge them to wet the surface. The purpose of the detergent is to enable this wetting of the surface. If the surface is not wet, the mild bleach can't do its job.

## GLOVES

Of course, especially if the hands are sweaty, it is easier to remove the gloves by pulling on the cuffs and thus reverting them. However, that captures whatever dirt or contamination was on the outside, to the inside, where it is impossible to wash it off. For that reason, I almost always wash the gloves in my enhanced weak bleach and dry my gloved hands before removing the gloves, but if I should take them off with contamination potentially on the inside, I bake them for a couple of minutes at 170 F in the oven. My microwave has a convection setting, but the lowest is 150 F, and the next higher is 275 F, which is too hot for decontaminating most things that might have Covid-19 virus on them. Baking at 150 F for 15 minutes is reported by Ford Motor Company also to disable the virus.

A pair of the blue nitrile gloves lasts a month or so, and then typically either I damage one by accident-- tearing it or pulling off a fingertip while removing the gloves from my fingers. They cost only a few cents each, so no problem, but I do find them desirable in helping to save my old skin, as well as the rest of me.

I wash fruits and vegetables by immersing them in the enhanced mild bleach, letting them sit in the sink for a couple of minutes, still wet with mild bleach, and then rinsing them and allowing them to dry, or wiping them dry. Because any Covid-19 contamination is on the surface, there is no need to get the mild bleach inside, so on things such as celery or cabbage, I immerse the head or stalk so that the mild bleach doesn't enter among the leaves, and then when I rinse, first I rinse the outside in the same orientation, and then I turn over so that rinse water does get to some extent wherever there might be a trace of the mild bleach, and drain in the optimum orientation. For a loose piece of lettuce or cabbage leaf, I immerse it and then rinse the whole thing and allow it to dry, largely, before putting it in the refrigerator.

Some items come sealed into plastic bags (e.g., carrots) so those I just immerse the bag, allow it to drain, then rinse it and drain and dry it. Other items come with plastic bags with one or two holes; for these I dunk the bag and then let it sit for a few minutes in the sink in an orientation that allow any mild bleach to drain from the holes. Of course, if the contained vegetables are very fresh, they might be contaminated, too, but I dub them not contaminated.

Frozen foods present a particular problem, because any virus on the surface of the plastic bag or ice cream tub will last for months at temperatures of the ordinary freezer or even refrigerator. So I immerse a frozen food package in the weak bleach (or if it's a 3 pound 5 pound package of frozen foods, I sponge it with weak bleach) bringing the surface of the package up to room temperature, then after a minute or so rinse it, dry it, and put in the freezer. This does not significantly warm the contents, even of ice cream.

## SHOPPING

A person my age is one hundred times more likely to die if infected with COVID-19 than a person aged 20 to 40, so I have not shopped personally in a store for many months. Twice for a few minutes I have been in a UPS store to return Amazon.com items— a very efficient process. When I leave my home, I wear my nitrile gloves because they are easier to clean thoroughly than my hands. In

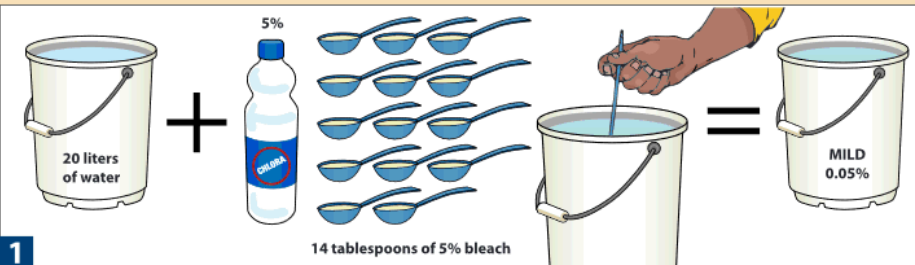
preparation, I would moisten a few pieces of paper towel with my augmented mild bleach, carrying them in a “Before” plastic bag. I would use the moistened paper towel to clean my gloved hands occasionally to avoid transferring germs (virus) from the glove to my pocket, car door handle, steering wheel or the like, and put the used wipe in a labeled “After” plastic bag for disposal at home.

I would wipe off any visible dirt from the gloved hand and then wipe it again, because the powerful augmented weak bleach can destroy only a limited amount of surface contamination. When I bring the purchases into my home, I would treat them as contaminated and handle them as detailed above.

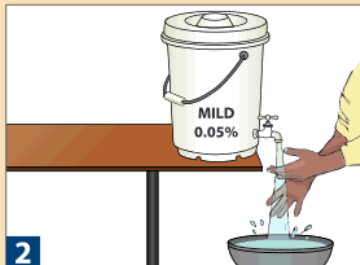
In general, my gloves and the disinfecting solution or wipes serve to keep “clean” places clean, aided by timely wiping of the gloved hands.

## Making hand washing solution from 5% liquid bleach

Use the **MILD** chlorine water to wash hands.  
Make new **MILD** chlorine water every day.



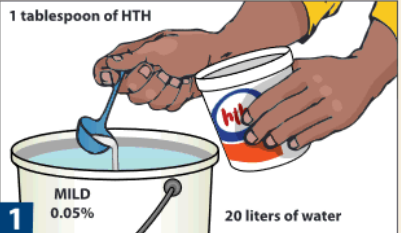
**1** Mix 14 tablespoons of 5% bleach into 20 liters of water every day. Stir well. Label bucket **MILD 0.05%**.



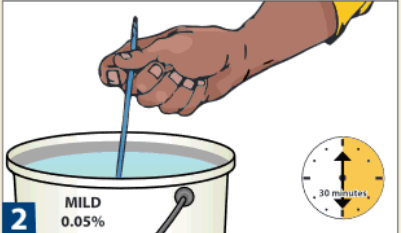
**2** Use the **MILD** chlorine water to wash hands.

## Making hand washing solution from HTH chlorine powder

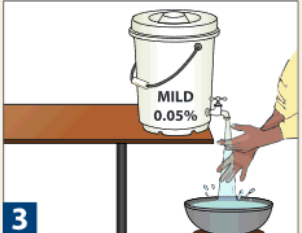
Use the **MILD** chlorine water to wash hands.  
Make new **MILD** chlorine water every day.



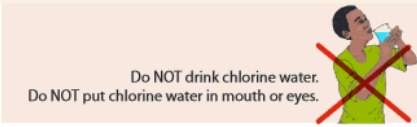
**1** Mix 1 tablespoons of HTH chlorine powder into 20 liters of water every day. Stir well. Label bucket **MILD 0.05%**.



**2** Stir well and wait 30 minutes.



**3** Use the **MILD** chlorine water to wash hands.



Do **NOT** drink chlorine water.  
Do **NOT** put chlorine water in mouth or eyes.

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U.S. Centers for Disease Control and Prevention