

APPRAISAL TODAY

How to keep safe from COVID-19, including tips for appraisers

This article focuses is an overview of COVID. It includes the risk of going inside homes and relevant factors such as overcrowding. For example, now we know that outside is better than inside and 20-50% of infected people are asymptomatic. This article focuses on houses.

The best way to stay safe it to never leave your home and have no one come inside your home. Every time you leave you could be exposed to COVID. But, few people do this. I leave my home regularly.

Fortunately, appraisers don't spend much time inside a home. We control the amount of PPE we have and how much time per day we spend inside homes. We can choose not to go inside a home if it looks too risky.

The virus is a "novel" coronavirus. Humans had never been infected. We are learning more every day about how it is very, very different from any other virus such as the seasonal flu coronaviruses and SARS, a very similar recent coronavirus.

Information is changing daily, as are recommendations for staying safe. It is always this way with pandemics.

"We've been studying the flu for 102 years and still don't know for

sure how it's transmitted," said Dr. Don Milton, an environmental health researcher and aerosol transmission expert at the University of Maryland.

NOTE: Information on COVID-19 is changing very fast, on a daily or hourly basis, especially vaccines. THE EFFECTIVE DATE OF THIS ARTICLE IS JULY 31, 2020. This newsletter comes out monthly. I will have updates in my free Friday weekly newsletter.

Some of the links are very long, so I included text to use for a Google search. This article is very long, so you may want to look at the bold topic descriptions to see what you want to read.

How much has changed since my first coronavirus newsletter articles, published April 1, 2020?

The focus was on the basic science part of COVID-19, such as stages of pandemics, pandemics from the past, and the role of data (testing), herd

immunity, vaccines, etc.

Most of what I wrote is still relevant today, especially "no one knows", unfortunately. But, there has been much more detail available on on topics, such as COVID-19 as airborne virus particles, percent deaths, vaccines, therapeutics, etc. This newsletter covers many of those topics.

The April newsletter is available at appraisaltoday.com/coronavirus

SARS-Cov-19, the virus that causes the disease COVID-19, is a very efficient virus

Viruses are not alive. Their only reason for existing is to reproduce and spread to as many hosts as possible.

This is a new (novel) type of coronavirus. Humans have no immunity. Every human can be infected

The virus kills a relatively low percentage of people (estimated 0.6% to 1%), as with as with Ebola at 50%.

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With Covid, more people are left alive to infect.

It is easily transmitted through the air (respiratory), much more efficient than requiring close physical contact, as with Ebola.

20-45% of people infected with the virus have no symptoms (asymptomatic) and can spread the virus. This is unusual for a virus and greatly increases its ability to expand into many humans. (Note: the percent depends on location and other factors and has been changing.)

People are most infectious just at the point when they first begin to feel unwell with relatively few symptoms, not when they have obvious symptoms.

It "waits" for humans to help it expand by leaving their homes, not using face masks or doing physical distancing, gathering inside rooms with lots of unmasked people and poor ventilation, inadequate testing, etc.

If you are infected no one knows if you will be immune or for how long. Some viruses, such as in the seasonal flu, regularly mutate, so humans have relatively short immunity time.

On the plus side, it is a "starter" virus, much less deadly than with SARS, with a 10% death rate. It is less contagious than measles, which has very tiny droplets, that can remain suspended in the air for up to two hours after someone with measles has left an area. Also, COVID has not mutated much in the past 6-7 months, making vaccines easier to pursue. Flu viruses mutate every year with new vaccines required.

How to "defeat" COVID-19

There are two ways, looking at Europe and East Asia (and New York):

1. Get the case numbers (infections) way down by lock downs and 95% of people wearing face masks (plus physical distancing).

2. An effective vaccine that is taken by 75 to 85% of the population.

Fast testing is critical, especially for asymptomatic people. Getting test results back quickly (24-28 hours or sooner) is very important. Then quarantine and contact tracing is done to find others who have been exposed.

If testing takes 2 weeks, the infected person is spreading the virus for the 2 weeks.

The National Institutes of Health has set up a "shark tank" competition to quickly identify promising rapid tests, such as 15 minute results, and has received more than 600 applications. The goal is to have new testing options in mass production by the fall.

It is unlikely the coronavirus will ever be eradicated. For example, measles is very, very contagious and vaccines are 90% effective. But, there are periodic outbreaks of it, typically individuals or groups of unvaccinated people, which are quickly controlled.

Dr. Fauci's reply to a question on when will the pandemic be over: "You don't make the timeline, the virus makes the timeline."

Summary of appraiser personal risks

- Age - the older the higher the risk
- Underlying health conditions
- Who is in your household and their risk factors
- Your level of personal protection - from none to a lot

Everyone decides their own level of risk. Some rarely leave their homes or only leave to go to the grocery store. Others, such as appraisers, are essential workers who must leave their homes to work.

If you get infected, you could infect your household members. To me, that is the most significant risk.

Many essential workers, for example, work in risky health care or grocery stores with long hours. Appraisers are only exposed to the

virus when going inside homes, apartments and other buildings for relatively short periods of time. We decide our own safety precautions.

For example, I live alone, with my cat and am 77 years old. I go to the grocery store weekly, the dentist, my office a few times a week, and have my hair cut on my rear deck by my regular hair stylist. I quit doing appraisals in March. I have friends who work at home and rarely go out, much younger than myself.

You decide your risk level. Everyone is different. I try not to be judgmental, but don't like people not wearing face masks who could infect me.

Summary of appraiser inspection risks (lots more detail below)

Now we know that lots of people in a crowded indoor space over a period of time is risky. Outdoors is better than inside.

- Risk factors
- Density of occupants. The more people per sq.ft. of GLA, the higher the risk. How many were there before you came who could be infected.
 - Children and elderly. Sometimes the owner wants them to stay in the home. Children can get infected (see data below). They must wear face masks. You may need to bring smaller children's masks.
 - Volume of space. High ceilings are good, but most homes are 8 ft. with maybe some higher areas.
 - Ventilation. How long doors and windows are open before you come. Cooling and heating inside home in summer and winter is an issue. I ran out of time to write about this issue, which is substantial with some locations such as office buildings with no windows. I will update it in my free weekly email newsletter.
 - Speaking to occupants - speaking from car by cell phone is best otherwise both you and the occupant wear face masks and maintain distancing. Do not speak inside the home. 5 min-

utes speaking face to face inside, without a face mask, can be risky.

- Everyone inside the home wears a face mask. Bring washable cloth face masks if needed. You can wash and re-use them. Or, bring disposable masks, which is safer.
- Physical distancing is difficult. We have never done it before. Occupant follows you inside and/or outside. Difficult to control. How to ask the person to move back. What if they refuse to move.

- Risky homes: hoarder homes, etc.

The Bottom Line: When to leave because it is not safe. For example, occupant on living room couch obviously sick with coughing, sneezing, etc. Occupant refuses to wear mask and maintain physical distancing.

Risky homes

We have all appraised homes packed with stuff, sometimes at a hoarder level. Maintaining distance from furniture, newspapers, etc. is tricky. A medical gown or other protective clothing can help you protect from any virus particles.

Sometimes going up and down stairs (inside and outside) require holding tightly onto railings. Be sure you have gloves available.

Information and instructions to occupants before the appraisal

Best is to have the home vacant and no one nearby who will come back to be sure you "don't miss the new deck", etc.

- All will have to leave the house before you go inside.
- If cannot leave the house (elderly etc.) will need face mask. You will provide an inexpensive disposable mask or a reusable cloth one if necessary.
- Open windows and doors - state how long before you come. The longer the better.
- Communication at the home - which occupant. Only outside. Cell phone is best from your car.

I have spoken with appraisers who say they "don't worry" about getting it and don't do physical distancing or wear face masks. The reason they give is very few cases where they lived. Or, no one does this where they live. With more states mandating face masks, this will change.

PPE - Face coverings

When using face masks, you try to have as little air as possible getting into your lungs. It is a trade-off between comfort, utility and safety.

The only way to get no air into your lungs is to have your own source of oxygen, such as using tanks on your back, similar to what firefighters use. Some healthcare workers using "bubble suit" or covering their entire head plus double face masks, when they are working with very sick and active patients (i.e., doing intubation). But, this makes it difficult to work with patients. Others are using covering for the head only. See fotos.

I have used bandannas, cloth masks, surgical masks, n95 masks, and industrial respirators. No face masks are comfortable. But, using face masks is dramatically better than lockdowns.

Face coverings were required starting April 17 when inside buildings, in my Bay Area county and nearby counties. Within a week, almost everyone wore a face mask. On June 5, 2020 they were required outside when leaving your house and within 30 ft. of another person not in your household. The orders have not been rescinded.

In my city, people without face coverings inside buildings are relatively rare. However, often, people outside walking or jogging, take the masks up and down from their faces when not within 30 ft. of others.

How tight does the mask cover your nose and mouth and keep out air?



Smaller children need their own masks, smaller than adult masks.

Bandannas are useful when running, sports, etc. It is not tight but is less cumbersome than other masks.

Cloth masks are relatively inexpensive (or free). Their protection varies widely, so you may want to get more information on them (what is in the layers, how held on face, etc.). Can have some very creative designs also, which can be fun and "loosen up the look" of your other PPE.

Surgical masks are relatively loose and are designed to protect the health care provider and the patient. They are more comfortable than the masks below.

N95 masks must be carefully fitted to fit very close to your face with very small gaps. You cannot have a beard or any other hair on your face that interferes with the face mask fitting tightly. Check online for tips on fitting n95 masks properly. Industrial masks have a vent in the front to let air out. I put tape over the vent as it lets your air out. Always cover the vent.

I used an industrial respirator when I used to do landscape maintenance many years ago. They are large, relatively heavy, but fit the face reasonably well. Some hospitals are using

elastomeric respirators, also used for industrial uses. See photo on previous page.

I would use an elastomeric respirator, if I was appraising properties now, for maximum protection. They are available on Amazon.

Which are the most effective face masks?

N95 (also N99) and elastomeric respirators are the best as they fit tightly around the nose and mouth.

Unlike N95 masks, bandannas and cloth coverings cannot stop the smallest droplets. But crude coverings that can block some large droplets.

Masks will probably only reduce the amount of droplets, not stop them completely, but that may be enough to prevent someone from becoming infected or result in a milder case.

I could find only two recent published studies that compared face masks, probably because cloth face masks were not widely used before COVID-19.

From Thorax journal: a single-layer "no sew" mask, a two-layer variety made to specifications from the CDC, and a three-layer surgical mask were tested. The surgical mask did the best job overall, but the two-layer CDC mask was still "significantly better" at containing droplets than the single-layer covering. However, "even a single-layer face covering is better than no face covering."

The results were not surprising. Surgical masks are made of multi-layered polypropylene with a water-resistant outer layer, and they're regulated based on their ability to catch droplets. Prior studies showed that cloth masks with more layers generally perform better. You probably need at least 3 layers. Other factors, like the material, design, fit, and how frequently a mask is washed, also make a difference.

From Lancet: "A bandana made of T-shirt material cuts that distance droplets travel slightly more than 3.5 feet, while a folded handkerchief reduces that to one foot, three inches. A stitched cotton mask: just 2.5 inches, while an over-the-counter commercial cone mask, found at drug-stores, can allow droplets to go an average of eight inches."

Both articles included interesting videos of the tests.

Good discussion and analysis with links to the two studies: time.com/5870840/mask-study-covid-19

Good Q&As on masks: **Google NPR What you need to know about protective face masks.**

PPE - gloves, booties, face shields, goggles, etc.

You decide the level of risk that is best for you. Some appraisers use no PPE, others use masks, but not gloves, etc.

You must use new disposable gloves for every home, or sanitize gloves between homes. Otherwise you could spread the virus to the occupants. Droplets could possibly fall on your feet or the floor if someone is coughing or sneezing, so you may want to use booties. There have been incidences of healthcare workers getting virus from walking on a floor in an ER or a room occupied by a COVID patient.

Goggles can be useful for protecting your eyes if someone is coughing or sneezing, or you sometimes touch that part of your face.

You may want to consider using a gown if you are in a home that is packed with stuff, such as a hoarder home. Keep one in your car.

Face shields are relatively inexpensive and may help protect the part of the face they cover. Use it with a face mask. Probably best to get one with the most protection, such as in the front, sides and below. They are available on Amazon for under \$20.

A brief look at the past

Viral and bacterial pandemics and epidemics have been affecting humans for thousands of years. The first detailed written information in the West is from Rome and Greece 2,000 years ago.

Many times people and leaders were in denial for a period of time, suppressed news, had face masks disputes, large gatherings of people, lock down vs. open, etc. This occurred in the 1918 Spanish flu, the most recent U.S. pandemic. It has occurred in many other countries over time, since the Rome and Greece days.

Lots more details in the April 1 newsletter.

My science background - why I write about the pandemic

I discovered science in my high school biology class my sophomore year. After I graduated from college I worked in several labs. My first job was in a toxicology lab.

I worked for a biotech company that had a Level 2 containment room with many hazardous viruses so I know what is required to be completely safe. Also, I was in medical school for a year, but had to drop out due to a severe illness. It helps me understand the medical issues.

I understand the importance of science and the scientific method. I will always be a scientist, although I have not practiced it since I started appraising in 1975. I am compelled to be objective. "The scientific method is defined as a method of research in which a problem is identified, relevant data is gathered, a hypothesis is formulated from this data, and the hypothesis is empirically tested." It is similar to appraising.

This year is the first time I have ever written about science. I am really enjoying it, especially letting appraisers know about the "science side" of the pandemic. There is lots of misinformation out there.

Physical distancing - 3 ft. vs. 6 ft. vs. 13 ft. vs. ???

The WHO's three-foot guideline follows some of the earliest research into how diseases spread. In the 1930s, Harvard researcher William F. Wells measured how far large exhaled droplets traveled and arrived at the three-foot figure.

In 2003, a group of researchers found that SARS, an illness caused by a similar coronavirus, was transmitted to others as far as six feet away from an infected person while traveling on an airplane. Several experts have cited this study as the most likely source for the CDC's six-foot guideline.

Lydia Bourouiba, an MIT researcher, argued in a recent report that coughs and sneezes create complex "turbulent gas clouds" that might carry pathogens as far as 27 feet. A new University of Nebraska study specifically examining patients with COVID-19 found that the virus may travel not just on heavy, short-range droplets, but also in much finer-and more mobile-aerosol clouds.

New laboratory research released in May by the National Academy of Sciences found potentially infectious droplets can remain suspended in air for as long as 14 minutes.

To read more, and get links, Google "Where does the six-foot rule for social distancing come from?" In Fortune magazine.

Droplets vs. Aerosols - distance traveled

Now we know that indoor vs. outdoor and droplets vs. aerosols (size of particles) are both major factors. Plus the amount of ventilation indoor: a lot or very little is very important.

At first, most experts thought that COVID was like the flu: it spread mainly by droplets, estimated spreading up to 3 ft. WHO said 3 ft., based on the distance that flu

droplets go. 6 ft. seems to be from SARS research on droplets.

Now we know that aerosols (very small particles) can travel for much longer distances, both up and down in the air, for 13 ft. or much longer.

What is virus "shedding"?

Viral shedding occurs when a virus replicates inside your body and is released into the environment. At that point, it may be contagious.

One location of the virus is in your throat, which is why testing mucus samples are taken from far back in your throat. When you breathe, speak loudly, etc. droplets with viruses are expelled. This is called "shedding". The more shedding in your surroundings, the greater the risk to you.

Particle size: droplets vs. aerosols

These two terms are considered to be a range of particle size, arbitrarily divided into two categories.

When you exhale outside in the winter, you can see where your breath particles go. If you smoke, you can see where the smoke goes in the air, and how far.

A droplet is defined as a virus-filled particle of breath or spittle that comes out of the nose or mouth of an infected individual when they breathe, speak, cough or sneeze. Droplets generally fall to the ground within a few feet of the person who expels them. Or, A large droplet could travel through the air and land on your body.

An aerosol is defined as a microscopic virus-packed particle that's also expelled from an infected person's mouth when breathing, speaking, coughing or sneezing. Unlike a droplet, smaller aerosol particles can remain suspended in the air. They float and follow the air streams. When a person breathes, clouds of tiny virus particles that have accumulated may be traveling on air currents.

When are people most infectious (high viral load)?

Studies show people with the coronavirus are most infectious just at the point when they first begin to feel unwell. This feature has made it so hard to control spread of the virus, but it can be done through rigorous testing and physical distancing.

Studies from Germany and the United States suggest that people with mild symptoms can be infectious for up to 8-9 days, and "it can be a lot longer for people who are more severely ill". "That means you could be in the restaurant feeling perfectly well and start to get a fever, you are feeling ok, you didn't think to stay home, but that's the moment at which your viral load could be actually quite high,"

"And it's because the disease can spread at that moment that the disease is so contagious, that's why it spread around the world in such an uncontained way, is because it's hard to stop this virus." Source: CDC, June 9

People can shed the virus before they have symptoms, but this is generally less risky than individuals with symptoms. Source: UC Davis July 17.

What does this mean for you? Assume everyone is infected.

When is breathing most risky?

The greatest risk is from breathing air expelled by someone with an active infection especially, who is coughing and sneezing. Larger particles are being expelled. The risk from small, aerosolized particles is presumed to be less serious, but there is limited data.

The more particles that are expelled the worse. Just breathing is the least risky. Speaking (pre-virus normal close up conversations) is more risky. Shouting, speaking loudly, singing, etc. is riskiest.

The recent "super spreader" events in bars, funerals, family gatherings, etc. demonstrate this transmission method. Many people are in enclosed

spaces with few, or no, face masks. Lots and lots of particles are expelled.

Inside vs. outside

There are two new studies suggesting that most Covid-19 transmission happens indoors, not outdoors. In China, a study of 318 outbreaks found that transmission occurred outdoors in only one of them.

In Japan, a study found that "the odds that a primary case transmitted Covid-19 in a closed environment was 18.7 times greater compared to an open-air environment." (Note, however, that both of these are preprint papers (not yet peer reviewed).

How long speaking with someone does it take to get infected?

Speaking increases the release of respiratory droplets about 10 fold (as compared with breathing); ~200 virus particles per minute. Again, assuming every virus is inhaled, it would take ~5 minutes of speaking face-to-face to receive the required exposure.

The CDC says a person should be tested or isolated if they've been exposed to someone infectious, closer than six feet for at least 15 minutes, regardless whether either was wearing a mask or not.

When walking or in a grocery store, for example, you pass by people. You don't speak or say a few words. There is not much risk unless the person is coughing or sneezing in your face. Say nothing or very little at the checkout stand, your riskiest location.

Whether or not you come down with Covid-19 depends on two primary factors: dosage (how many viral particles you inhale) and duration (for how long you inhale them). The exact thresholds are not known.

Speaking loudly is more risky as loud speech can emit thousands of oral fluid droplets per second.

The longer you speak, the higher the risk. Face to face, within 6 ft., is riskiest overall, but small particles can go up to 15-20 ft. inside a room.

If the other person wears a face mask, it reduces your risk of getting infected. Face masks can also offer the wearer some protection, though how much varies greatly, depending on the type of mask. (See the face mask section of this article.)

Outdoor risk

"Outside is definitely safer," said Erin Bromage, a comparative immunologist and biology professor at the University of Massachusetts, Dartmouth. "But it's the type of interactions you have when you're outside that are important."

It depends on the number of people, size of space, etc.

Crowded backyard parties are much more risky than eating lunch outside, separated by 6 ft. with your own tables and not sharing utensils. I have done it. Lots more fun than zoom.

Another example is the recent outside protests. No increased cases were reported. Most people wore masks.

In contrast, bars are being shut down all over the country due to significant infections.

Most people use 6 ft. physical distance outside, which is a good choice.

Who transmits (spreads) the virus?

People with obvious symptoms are the most risky for virus spreading (coughing, sneezing, breathing problems, etc.).

Pre-symptomatic (time before symptoms show), can transmit the virus.

Now we know that 20-45% of cases are asymptomatic.

Flu symptoms begin about 2 days (but can range from 1 to 4 days) after the virus enters the body.

COVID symptoms are delayed

longer and typically start after about five to six days. However, studies have shown that symptoms could appear as soon as three days after exposure to as long as 13 days later.

What does this mean for you? Another reason to assume everyone is infected.

How safe is going inside a home for an appraisal compare with other places, such as grocery stores?

General breathing is relatively low risk, 20 viral particles per minute into the environment, even if every virus ended up in your lungs (which is very unlikely), you would need 1000 viral particles divided by 20 per minute = 50 minutes.

Speaking increases the release of respiratory droplets about 10 fold; ~200 virus particles per minute. Again, assuming every virus is inhaled, it would take ~5 minutes of speaking face-to-face to receive the required dose.

Anyone you spend greater than 10 minutes with in a face-to-face situation and no face masks is potentially infected. Anyone who shares a space with you (say an office) for an extended period is potentially infected.

Density of people in a home - a big risk factor for appraisers

Occupants who are not there during your inspection can leave aerosol particles, which can remain in the air for up to an hour, generally. There is limited information on this as it is new.

In documented "super spreader" events, such as funerals and family gatherings, people were close together and talking. The more people in an indoor space, the higher the risk of spreading the virus.

The greater the density of people (number of sq.ft. of living area per person), the more your exposure to any viruses both from droplets and airborne aerosols that stay in the air.

For example, 2 people per bedroom plus 2 people sleeping on couches or the floor (6 people total) in a 1,000 sq.ft. home, the density 167 sq.ft. per person (1,000 divided by 6). If there were 4 people living there, the density would be 350 sq.ft. per person (1,000 divided by 4). Or, 6 people in 2,000 sq.ft. home is 333 sq.ft. per person.

High density can occur in lower income neighborhoods in areas with high rents as more occupants are needed to pay the rent. Others are multi-generational homes found in some urban and rural areas.

Almost all the data is person per bedroom or by room. The only data I could find on person per sq.ft. was from Measuring Overcrowding in Housing by HUD. Google it, which says overcrowding starts at 167 sq.ft. per person.

Also a factor is the length of high density. Do most go to work or stay at home? They are all probably at home in the evenings and nights. You may want to go when there are fewer people at the home.

Multigenerational households tend to have more density.

There is no single, widely accepted standard for Unit Square Footage-per-person, so HUD developed one.

Per HUD, about 2.5% of the households surveyed in 2005 had less than 165 sq.ft. per person.

Why what scientists say about COVID keeps changing

Basic epidemiology has not changed for many decades, including back to the Spanish Flu in this country. For example: not gathering in crowds, wearing face masks, staying at home, hand washing, etc.

It is becoming obvious that COVID-19 is very different from the other viruses that we know about, including the coronavirus vaccines in the annual flu shots. We will know a lot more in 2 years, 5 years, 10 years, etc. But, we had to make major deci-

sions early in the pandemic, based on the viruses we know about.

Scientific research is shared openly and is transparent. For COVID this means new results can change what we understand about it.

When new data and research is available, recommendations change. Face masks is a good example, plus not recognizing that 20-45% of cases never have symptoms. Not making the changes is a very, very bad mistake, costing lives.

I have been writing about the virus in my free weekly newsletter since February 21, 2020. Over a very short period of time, what appraisers need to do to stay safe has changed.

When the virus first started, scientists assumed it would be similar to influenza, where children are a major source of infection. We now know that this is not correct. Usually the only complication was pneumonia. The death rate from flu averages 0.1 percent. COVID is current estimated at .6% to 1% (estimates vary) or 6 to 10 times the flu death rate, which is typically 30,000 to 60,000 people per year. Note: there are differing, and changing, estimated death rates for both seasonal flu and COVID.

COVID was assumed to be a respiratory infection (lungs/breathing) like the flu. But, it is becoming clearer that it also affects blood vessels in organs (brain, kidney, liver, lungs). It can take a long time to recover because of this damage to your body. It can become a chronic disease.

At first, scientists focused on the risk of larger droplets being expelled from the lungs by coughing and sneezing. They dropped down quickly, typically within 6 ft.

Recently, the risk of infection from very small aerosolized particles in the air that can spread widely, particularly indoors, is being recognized.

What does this mean for you? Every day there is new scientific information about COVID that could

change how you keep safe. Use the resources at the end of this article to keep up to date.

Preprint vs. peer reviewed scientific research papers and why does it matter?

Before the pandemic, academic researchers submitted their research to scientific journals and their peers reviewed them. Similar to what the Appraisal Institute does in their publication *The Appraisal Journal*.

But, scientists can't wait to know of good ideas about therapies (treatments), vaccines, the coronavirus itself and how it works, etc.

Instead, preprints are used. A preprint is a version of a scientific manuscript posted on a public server prior to formal peer review. Several companies are providing public servers for preprints. Some do preliminary reviews before posting.

Many thousands of coronavirus-related research papers are being published every month as preprints, without the usual peer review as a quality check.

For the details: *Google NPR the pandemic is pushing scientists to rethink how they read research papers*

Role of CDC and WHO

CDC (Centers for Disease Control and Prevention) started in 1948 and WHO (World Health Organization) in 1946. The CDC became world recognized as "the experts". In many companies, their similar organization includes the name CDC.

WHO is an international organization, with many countries, so decision-making can be difficult and it tends to move slowly. However, it is the world leader in epidemics and pandemics and declared COVID-19 a pandemic on March 11.

CDC started in a small office to prevent malaria from spreading across the nation, especially in the South. It has always been a completely inde-

pendent scientific organization.

For the current pandemic, CDC is not very publicly visible, unfortunately.

Recently, they have published results of several research projects.

What about therapeutics (treatments)?

Therapeutics are a treatment, therapy, or drug.

I ran out of room (and time) to discuss therapeutics. A good place is the NIH. *Google NIH and treatment guidelines. It is a bit technical.*

Therapeutic approval is much easier than for a vaccine. Often existing therapeutics, especially drugs, can easily be repurposed for COVID.

Here are two available free online therapeutics trackers *Google:*

- *RAPS therapeutic tracker*
- *Statnews therapeutic tracker*

Some people have COVID symptoms for a long time, even young people

Per recent CDC report, relatively little is known about the clinical course of COVID-19 and return to baseline health for persons with milder, outpatient illness.

Most studies to date have focused on adults hospitalized with severe COVID-19.

This report indicates that even among symptomatic adults tested in outpatient settings, it might take weeks for resolution of symptoms and return to usual health.

Not returning to usual health within 2-3 weeks of testing was reported by approximately one third of respondents.

Even among young adults aged 18-34 years with no chronic medical conditions, nearly one in five reported that they had not returned to their usual state of health 14-21 days after testing.

In contrast, over 90% of outpatients with influenza recover within

approximately 2 weeks of having a positive test result.

Is COVID -19 a vascular (blood vessel) disease?

A few months ago, I listened to a podcast where a medical examiner said she saw lots of blood clotting in different organs in COVID-19 patients, including the brain.

She mentioned that it may mean that some of the blood vessels were affected by COVID. I did not see anything about it in medical journals so did not write about it. I was worried because my mother had vascular dementia and died after a few years.

People who are infected have health issues in many part of their bodies, such as toes, heart, brain, etc., which is very unusual. This does not happen with the flu, also a coronavirus.

Our lungs take the oxygen from the air and distribute it by blood vessels throughout the body. The lung air sacs are a prime target of the virus.

A recent autopsy study of coronavirus patients revealed that blood clotting was present not only in the lungs - but could be found in organs throughout the body.

The study was published on June 25 in the Lancet's eClinicalMedicine, autopsies of seven COVID-19 patients revealed clotting in small blood vessels in "multiple organs."

A recent study led by researchers at University College London described more than 40 patients with COVID-19 who experienced a multitude of different brain effects, including severe neurological complications such as delirium, brain inflammation, stroke and nerve damage.

For more info *Google COVID blood clotting.*

Can you get re-infected?

There is no evidence now that you can get re-infected from another person.

285 people were investigated in a South Korea study. They all tested negative for the virus after recovering, but weeks later tested positive again.

The scientists followed up with nearly 800 of those people's personal contacts, such as family members.

They found no evidence that they had contracted the virus from the people who had a fresh positive result. The scientists also tried to grow the virus in secretions from these patients. They could not.

People may have a "residual" virus from their original infection, which has occurred in Ebola.

Or, there may be an inflammatory condition producing symptoms, such as in "long haulers", mostly people with mild symptoms who did not go to the hospital but developed "rolling waves" of symptoms for many months after the original infection, including neurologic, heart and gastro-intestinal. Many are young and some will have long term disabilities.

Antibody tests are often used, but they don't always test all the types of antibodies and don't test for T-cells, which are used to fight infections.

For more info *Google "covid reinfected south korea study"*.

Scientific resources I use

I use scientific sources directly, or from news sources that fact-check rigorously. In my weekly free newsletter I link to sources that are understandable by my readers and not too technical.

Fortunately, Google points to more reliable sources first. They are more reliable than many other sources, such Facebook or other web sites.

Dr. Anthony Fauci - the "big picture"

Dr. Fauci is "cautiously optimistic". Sometimes the COVID mess gets me down, but he reminds me that there is some hope. Google his name and his appearances will come up or try youtube. Videos are better as you can see his facial expressions. It is like seeing and hearing a good friend talk to you.

Fauci and I look at the pandemic the same way: write and speak only about the virus with no politics. We both "think like" scientists. Similar to appraising: state the facts and give your opinion. Be honest and not misleading.

He has been involved in epidemics since HIV/AIDS, a very controversial epidemic and is now working on vaccines. He has advised 6 presidents, starting with Regan. He has been dealing with politicians for 40 years and is still. He says what he thinks and is a very believable person who admits his mistakes.

I don't always agree with Fauci, as there are differences of opinion in science (and appraising), particularly when the situation changes as fast as the pandemic.

Where to get reliable information - scientific resources I use

There is lots of news about COVID-19, especially new therapeutics or vaccines. But, I always check out what I hear at the resources below. I use resources for the general public and for scientists.

I also listen to many podcasts. I have done a lot of speaking and writing. When I speak I am much more candid than when I write. I have never used a pre-written script.

I always tell the people listening that you may not have read some of what I will be saying today. In podcasts I often get ideas that I have not read about.

Below are the resources I use regularly, and consider the most reliable,

including fact checking.

I subscribe to these podcasts that have interviews and comments:

- Bloomberg's Prognosis Daily: Coronavirus

- Epidemic with Dr. Celine Grounder Interviews with various experts

- Coronavirus: Fact vs Fiction Hosted by CNN's Dr. Sanjy Gupta Interviews and Gupta's analysis.

Other podcasts I subscribe to sometimes have podcasts on coronavirus, but those above focus on it. I sometimes include links to the most relevant podcasts in my free weekly email newsletter.

Email newsletters I subscribe to and use regularly

See which one(s) you like. They are all fact checked and reliable.

Bloomberg's newsletter:
Bloomberg Prognosis Sign up at [Bloomberg.com/coronavirus](https://www.bloomberg.com/newsletters/sign-up)

Kaiser Health Foundation - Sign up at <https://khn.org/news/tag/coronavirus/> Newsletter signup at the bottom of the page on the right. I like Morning Briefing (headlines only) and First Edition (brief descriptions)

Time Health (Time Magazine) - <https://time.com/newsletters/>

Washington Post. *Google Washington post Coronavirus Updates*

Google CNN. Coronavirus: Fact vs. Fiction Newsletter

Google WebMd: Coronavirus Update

Web sites

khn.org/news/tag/coronavirus/
www.bloomberg.com/coronavirus
www.nih.gov/coronavirus - current information, especially on vaccines, but can be technical.

The Wall St. Journal has some free articles. *Google The Corona Crisis.*

New York Times has some free articles. *Google new york times coronavirus briefing.*

You can also go to the web sites of the podcasts above.

Local and state news sources

I read lots of local and state news.

Governor Newsom, in California has regular, sometimes weekly updates. Many governors are good sources of reliable news. My city has a weekly newsletter with information and stats on my city, such as number of cases, local government efforts to support small businesses, changes in what is allowed regarding "reopening".

I subscribe to my local newspaper, which has daily email updates on breaking news, plus a daily newspaper.

Local television news can also be a good source.

What does this mean for you?

The amount of news on COVID, from many sources, is almost overwhelming now.

Be sure you use a reliable source. There is a lot of misinformation. I only use news media that fact check.

See if any of the publications you like have reliable information.

I have good resources above. Many publishers with paid newspapers and magazines offer free information to everyone on coronavirus, including mine.

Google is good at filtering out unreliable information from the top of the results.

Since I am scientific, I look for the technical side of what is happening. I want to know the source so I can check it out. This is similar to appraising when you want to find out why did a comp sell for that price.

For example, a common question from my friends is can you get infected twice. I finally found the primary source: a study in South Korea.

Hopefully, a vaccine will be available, but that is very uncertain. The vaccine may only be effective on 50% of the people (FDA requirement), not last for very long and require more doses, etc.

The Vaccine Race

We want a vaccine. Which is easier? Shut downs and getting 95% of the population to wear face masks or a vaccine?

When people know that I am writing articles on COVID, their first question is always "What about vaccines?"

Researchers all over the world are developing vaccines. Over 140 vaccines are in preclinical phase. 32 are in Phase I and II clinical trials. Six are in Phase III.

The administration's Operation Warp Speed has allocated \$10 billion for a vaccine and has selected three vaccines so far. Moderna is in Phase 3 clinical trials. Oxford/AstraZeneca and Pfizer/BioNTech are in Combined Phase 2-3 clinical trials. .

Fortunately, vaccine approval has been standardized for quite awhile. Everyone knows what needs to be done and the risks.

Only about 10% of vaccines are approved by the FDA. We need a lot of vaccines to test in clinical trials.

NOTE: Information on the vaccines is changing very fast, on a daily or hourly basis. THE EFFECTIVE DATE OF THIS ARTICLE IS JULY 31, 2020. This newsletter comes out monthly. I will have updates in my free weekly newsletter.

The Vaccine Testing Process

Preclinical Testing: Scientists give the vaccine to animals such as mice or monkeys to see if it produces an immune response.

Phase 1 Safety Trials: Scientists give the vaccine to a small number of people to test safety and dosage as well as to confirm that it stimulates the immune system.

Phase II Expanded Trials: Scientists give the vaccine to hundreds of people split into groups, such as children and the elderly, to see if the vaccine acts differently in them. These trials further test the vaccine's safety and ability to stimulate the immune system.

Phase III Efficacy Trials: Scientists give the vaccine to thousands of people and wait to see how many become infected, compared with volunteers who received a placebo. These trials can determine if the vaccine protects against the coronavirus. 30,000 people volunteer, with typically 20,000 getting the virus and 10,000 getting a placebo.

Approval: In the U.S., the FDA approves vaccines. In June, the FDA stated that a vaccine would have to protect at least 50% of vaccinated people to be considered effective.

Regulators in each country review the trial results and decide whether to approve the vaccine or not. During a pandemic, a vaccine may receive emergency use authorization before getting formal approval.

Combined Phases:

Another way to accelerate vaccine development is to combine phases. Some coronavirus vaccines are now in Phase I/II trials, for example, in which they are tested for the first time on hundreds of people.

Source: New York Times.

=====

Types of vaccines

Genetic Vaccines

Vaccines that use one or more of the coronavirus's own genes to provoke an immune response. - Moderna and Pfizer/BioNTech - Although these two are in in Phase 3 trials now, none has ever been licensed for human use.

Viral Vector Vaccines

Vaccines that use a virus to deliver coronavirus genes into cells and provoke an immune response.- Oxford/AstraZeneca in Phase 2/3 trials

Protein-Based Vaccines

Vaccines that use a coronavirus protein or a protein fragment to provoke an immune response. - Novavax is in Phase 1/2 trials.

Whole-Virus Vaccines

Vaccines that use a weakened or inactivated version of the coronavirus to provoke an immune response.

Repurposed Vaccines

Vaccines already in use for other diseases that may also protect against Covid-19. - Australia

Source: New York Times

Operation Warp Speed Vaccines 4 are clinical trials

Moderna and Pfizer/BioNTech's BNT162 are genetically engineered. Oxford/Zeneca is a modified Chimpanzee virus.

One is based on existing vaccines, which may make it easier to test. When looking for a new vaccine, many researchers use currently existing vaccines.

Novavax began a Phase I/II Combined trial on May 26.

All four are planning 2 doses, separated by a period of time, such as a month.

On July 31, Sanofi and its partner, GlaxoSmithKline, has secured possible \$2.3 billion in funding.

Clinical trials are expected to start in September with Phase 3 completed by the end of the year. The vaccine relies on a protein-based technology that the company already uses to produce an influenza vaccine. It is similar to a technique used by Novavax.

What are some of the issues in getting an effective and safe vaccine?

- Only 10% of vaccines get final approval. Manufacturing and distribution is very expensive and takes time.
- How many different vaccines will be approved? More is better because each is different on how it affects people.
- How long will it be effective? Will booster shots be required? If so, how often. Measles needs one dose. Annual flu vaccines, which mutate, gets new vaccines every year.
- Efficacy threshold required per FDA, is only 50%. That means a successful vaccine would minimize the most serious symptoms in just half of the people who receive it.
- FDA Commissioner Dr. Stephen Hahn said the agency would "consider an emergency use authorization" if needed on July 30. Hydroxyquinone was approved but the approval was withdrawn as it was not effective.

- How many doses will be required and how frequently? For example, 2 doses 30 days apart to start, with annual booster shots. Or, only one injection.

- FDA only requires that a new vaccine works on 50% of the people.

What about the other people?

- How much protection? Sometimes there is only partial protection.

- How fast will it be distributed to 330 million Americans? If two are needed, this means 660 million shots must be given.

- Who will it work on? Young or old people? Other demographic groups? Maybe multiple vaccines for different groups?

- Who will get the vaccine? Everyone agrees on healthcare workers, but what about anyone else?

- What about all the people in the world who need a vaccine?

- Some vaccines require a very cold storage temperature. Some countries may not be able to provide this easily.

Why do vaccines take so long to become available?

Per the CDC, there are six stages of vaccine development: exploratory, pre-clinical, clinical development, regulatory review and approval, manufacturing and quality control, which typically takes 10-15 years.

Researchers have been working on an AIDS virus for about 35 years, but there is an effective drug treatment which must be taken for the rest of your life.

After you get a vaccine approved by the FDA, you then build a manufacturing facility and a system to distribute the vaccine.

First you have to have a virus to test, which takes time. Next you go to clinical trials. Phases 1 and 2 don't take too long and can be dealt with in a few months, if all goes well.

But, the Phase 3 trial can take a long time, especially to see how long the virus remains effective and any side effects over time. Before a vac-

cine can be approved for general use, the virus must be given to a much larger group of 20,000 and compared with an unvaccinated 10,000 control group (or 15,000 in each group), to see whether it really prevents disease.

The Phase 3 trial is the most time-consuming step in testing, because researchers have to wait for enough participants to be exposed to a virus naturally. "You cannot compress time when you're relying on a natural exposure to occur,"

Once the vaccine is approved, a manufacturing plant must be built and a large amount of vaccine produced. Last, the vaccine must be put into vials and distributed. This takes lots of time and money. Companies are not willing to spend the money without the vaccine approval.

Why are we hearing the end of this year or early next year for an approved vaccine?

Today, the process has been accelerated in many ways

- Combining clinical trial phases, such as running two phases at the same time. For example, combining Phases 2 and 3.
- A much shorter period for Phase 3, such as 3 months.
- Substantial financial commitment from the government, such as is being done in the U.S.

So far, Operation Warp Speed has committed \$1.6 billion to Oxford/AstraZeneca, \$1.9 billion to BioNTech, \$1.95 billion to Pfizer/BioNTech, \$1.2 billion to Novavax and up to \$2.3 billion to Sanofi/GlaxoSmithKline. They are all working on manufacturing and/or distribution.

Is "Operation Warp Speed" too fast?

Some experts, including Dr. Fauci, estimate a vaccine could arrive in at least 6 to 12 months.

But, the name makes some people nervous about moving too fast and releasing a vaccine that is not safe.

Will the FDA be "pushed" into approving the drug before then? The November 3 presidential election is coming fast.

On the plus side, the administration has made a substantial commitment and is pouring money into vaccine development.

Our record for developing an entirely new vaccine is at least four years - more time than we want to wait.

Less than 10 percent of drugs that enter clinical trials are ever approved by the FDA.

The rest fail in one way or another: They are not effective, don't perform better than existing drugs or have too many side effects.

That's why we need to develop many vaccines to go through clinical trials.

What if a promising vaccine actually makes it easier to catch the virus,

or makes the disease worse after someone's infected? That's been the case for a few HIV drugs and vaccines for dengue fever, because of a process called vaccine-induced enhancement, in which the body reacts unexpectedly and makes the disease more dangerous.

Months normally pass between phases so that researchers can review the findings and get approvals for subsequent phases. Combining phases, being done now, can speed it up. Or, doing 1 and 2 or 2 and 3 at the same time or overlapping.

Rushing through Phase 3 clinical trials is risky, such as only three months. You have to wait to see who is infected in both groups (get the vaccine and get a placebo), which may need more time if there are a relatively low number of current cases. Also, side effects may take awhile to show up. You won't know how long the vaccine protection last.

What about vaccine distribution including vials for the vaccine and maybe two doses required? Our country has not done well getting a supply of PPE sent out to where it is needed and there were issues with ventilators

during the pandemic.

Will enough people take the vaccine?

Dr. Fauci says 75% minimum with 85% preferred need to take the virus to have "herd immunity".

But, only about 42% of people take the annual flu shot. Recent polls have found as few as 50% of people in the United States are committed to receiving a vaccine, with another quarter wavering. Of course, this may go up if the vaccine works with little side effects. The flu does not put you on a ventilator or give permanent damage to interior parts of your body.

The best way to get compliance on taking vaccines or using face masks, for example, is to have a consistent message at all levels of government, prominent actors and professional athletes, religious and cultural leaders, etc.

The media is important to send the message: newspapers, television news, Facebook, etc. For example: Defeat the Virus. Get vaccinated.

Who will get the vaccine?

Everyone agrees that healthcare workers should get it. But, does that include nurse's aides, janitors cleaning rooms, nursing home workers,

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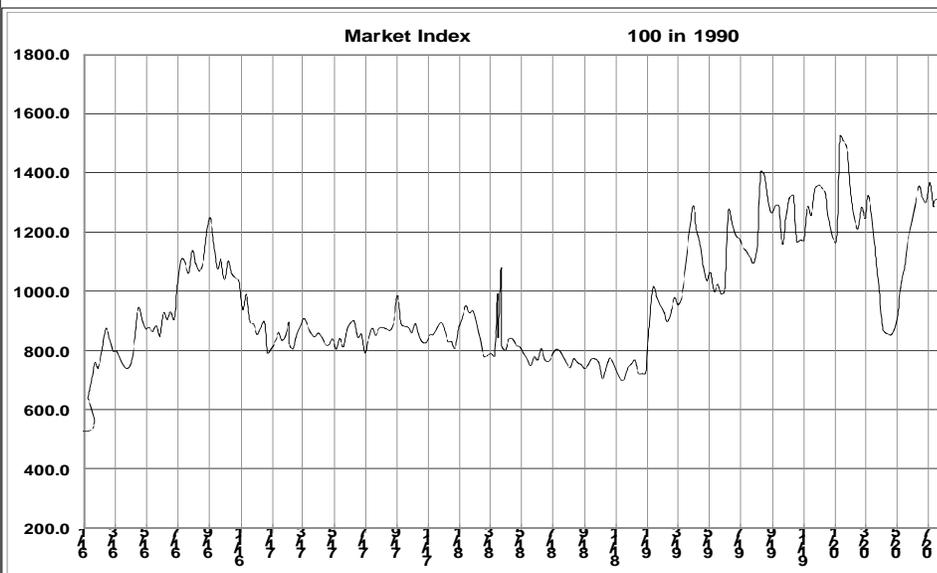
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etc. The people on the committee deciding this are not allowed to say much.

Elderly are definitely high risk, especially with underlying conditions. Also, they tend to get very sick and have high hospital expenses.

Who decides? On July 24, CDC and NIH charged a group of independent scientists and ethicists with developing guidelines to determine who should get the first doses of a COVID-19 vaccine, once one becomes available.

The work will be conducted by a special committee of experts from the National Academies of Sciences, Engineering, and Medicine and the National Academy of Medicine, an independent advisory body.

What about distribution?

Per information online: "Operation Warp Speed will expand domestic manufacturing and supplies of specialized materials and resources, such as glass vials, that can be necessary for distribution. Department of Defense's involvement will enable faster distribution and administration than would have otherwise been possible."

Fortunately, in the H1N1 swine flu pandemic in 2009, the administration had set up a distribution plan which was not used but is being used now as a guideline. The first case was April 2009. In June there were at least 1 million cases. In December 100 million doses of H1N1 vaccine were available for ordering. August 11 WHO announced the end of 2009 H1N1 influenza pandemic. To read more about it *Google H1N1 epidemic*

vaccine distribution.

How many vaccines are being developed?

Researchers around the world are developing more than 165 vaccines against the coronavirus, and 27 vaccines are in human trials. As of the effective date of this newsletter.

The totals	
Preclinical	140+
Phase I	18
Phase II	12
Phase III	6
Approval	1

(Chinese. Approved for limited use)

In Phase III or combined II and III are:

- Moderna was the first American company to put a vaccine into human trials. The vaccine uses messenger RNA (mRNA for short) to produce viral proteins. Moderna published promising Phase I results on July 14. Phase III trials in the U.S. have started, and the company hopes to have vaccine doses ready by early 2021.

- Oxford/AstraZeneca is based on a chimpanzee adenovirus called ChAdOx1. The vaccine is now in a Phase II/III trial in England, as well as Phase III trials in Brazil and South Africa. The project may deliver emergency vaccines by October.

AstraZeneca has said their total manufacturing capacity for the vaccine, if approved, stands at two billion doses.

- Pfizer/BioNTech's mRNA vaccine. The company expects to start Phase III trials by the end of July. On July 22, the Trump administration awarded a \$1.9 billion contract for 100 million doses to be delivered by December and the option to acquire 500 million more doses. If approved, Pfizer said they expect to manufacture over 1.3 billion doses of their vaccine by the end of 2021.

- Australia's Bacillus Calmette-Guerin vaccine was developed many decades ago as a protection against tuberculosis. The Murdoch Children's

Research Institute in Australia is conducting a Phase III trial, and several other trials are underway. They received \$15 million from the Bill and Melinda Gates Foundation. 15-50 million doses will be ready by the end of the year and 100 million by the end of next year.

- The private Chinese company Sinovac Biotech is testing an inactivated vaccine called CoronaVac. Sinovac launched a Phase III trial in Brazil in July. The company is also building a facility to manufacture up to 100 million doses annually.

- Wuhan Institute of Biological Products. Inactivated virus vaccine. The state-owned Chinese company Sinopharm launched Phase III trials in July in the United Arab Emirates. The vaccine could be ready for public use by the end of the year.

There is only one approved vaccine (for limited use).

The Chinese company CanSino Biologics developed a vaccine based on an adenovirus called Ad5, in partnership with the Institute of Biology at the country's Academy of Military Medical Sciences.

Source: New York Time Vaccine Tracker

Operation Warp Speed

Operation Warp Speed (OWS) aims to deliver 300 million doses of a safe, effective vaccine for COVID-19 by January 2021, as part of a broader strategy to accelerate the development, manufacturing, and distribution of COVID-19 vaccines, therapeutics, and diagnostics (collectively known as countermeasures). It has approved \$8 billion as of July 31.

The US government has chosen three vaccine candidates to fund for Phase 3 trials under Operation Warp Speed: Moderna's mRNA-1273 in July, The University of Oxford and AstraZeneca's AZD1222 in August, and Pfizer and BioNTech's BNT162

in September. All three have started clinical trials by the end of July.

Novavax began a Phase 1/2 trial on May 26. Synthesized pieces of the spike or surface protein of SARS-CoV-2 are grown in insect cells.

Their flu vaccine finished Phase III trials in March. On July 6, Novavax announced a U.S. government award of \$1.6 billion to support clinical trials and manufacturing.

On July 31, Sanofi and its partner, GlaxoSmithKline has secured up to \$2.1 billion in funding. Clinical trials are expected to start in September with Phase 3 completed by the end of the year. The vaccine relies on a protein-based technology that the company already uses to produce an influenza vaccine. It is similar to a technique used by Novavax.

The U.S. government's Operation Warp Speed program is expected to name five or more vaccine projects to receive billions of dollars in federal funding before there's proof that the vaccines work.

Operation Warp Speed (OWS) is a collaboration of several US federal government departments including Health and Human Services and its subagencies, Agriculture, Energy and Veterans Affairs and the private sector. Within OWS, the US National Institutes of Health (NIH) has partnered with more than 18 biopharmaceutical companies to accelerate development of drug and vaccine candidates for COVID-19 (ACTIV).

For lots more info, go to the source of the information above:
www.nih.gov/coronavirus

Also *Google Operation Warp Speed*.

What is the U.S. government funding for COVID-19?

Many products have been funded: vaccines (7), diagnostics, etc.

BARDA, Biomedical Advanced Research and Development Authority (BARDA) is in charge. It is part of the HHS Office of the Assistant Secretary for Preparedness and Response,

For a complete list of what the U.S. government is funding or partnering with, *Google BARDA's Rapidly Expanding COVID-19 Medical Countermeasure*.

COVID Vaccine Trackers - very useful

The best one is from the New York Times, which I use. Unfortunately, you have to subscribe to get access. But sometimes you can get it *Google New York Times Virus Tracker*.

NIH has a clinical trial tracker at www.nih.gov/coronavirus with links to the studies

Here are two available free online *Google*:

- *RAPS vaccine tracker*
- *Statnews vaccine tracker*

Reading about a new vaccine on Facebook is not the best way to get information. I strongly suggest googling the vaccine name, as Google puts scientific links and fact checked reliable news web site links. Also, be sure an article has a link to the study, not just a press releases, which may or may not be reliable.

Human Challenge Trials

Since the early days of the pandemic, some researchers have advocated a fast way to determine whether a COVID-19 vaccine works: Intentionally attempt to infect vaccinated volunteers with the virus, SARS-CoV-2.

Ethicists and vaccine scientists both raised red flags, and the discussion has remained mostly theoretical. But now two key elements are taking shape: a large corps of volunteers willing to take part in a "human challenge" trial, and the well-understood lab-grown virus strains needed for the studies.

They are generally considered only when rescue with a lifesaving treatment or intervention is available should a vaccine candidate not protect a volunteer from the disease. But there is no cure and few reliable available now against COVID.

This method has a long history in vaccines. In 1796, Edward Jenner, an English physician, purposely infected his gardener's 8-year-old son with cowpox.

For more info, *Google human challenge trials stat news. Google NIH challenge trials for current info on COVID*.

How to keep up with what is happening daily, and sometimes hourly

For now, a virus is top news as that is the most likely way for the U. S. to defeat the virus. Shut downs and tests/quarantining/contact tracing requires cooperation among everyone in the U.S.

I will put updates in my free weekly email newsletter.

To get information on the vaccines the U.S. is tracking for possible approval, go to nih.gov/coronavirus



Editor's comments: Use the free version of Grammerly (Chrome extension) to fix grammatical errors in your templates and long text writing to make your appraisals more understandable and professional!! The paid version is much more powerful. The best price is \$139.95 per year

Ever need help with your writing style, including correctness, clarity, tone, formality, and even alternate word suggestions? Everyone, including professional writers, makes errors. Grammarly suggests spelling, grammar, and style changes in real-time.

Grammarly will cost you \$29.95 per month, \$59.95 per quarter, or \$139.95 per year. While these prices may seem high, Grammarly provides a significant variety of features that offer real value for the price. Once I became familiar with Grammarly, I never questioned the price again, and have been a user for over five years. Users can opt to try the free version. It checks for spelling and grammar mistakes. Grammarly's business license costs \$15 per member per month, billed annually. Grammarly requires an active internet connection to access their software engine and databases. The website can be found at www.grammarly.com

Grammarly offers support for both the Windows and macOS platforms, and browser extensions are supported for Chrome, Edge, Firefox, and Safari. A Microsoft Office add-in is also available for the Mac and Windows platforms. Grammarly is also available for Android and iOS users with their mobile keyboard app.

Two essential features include Grammarly's Goals and Performance. Load a new document, and Grammarly will adjust its suggestions based on the context of your writing. Here, you can specify your writing style, whether it be to inform, describe, convince, or tell a story. Premium users can choose between different intended readers, including Academic, Business, and Creative. The Performance window identifies metrics such as word count, reading time, and vocabulary and readability metrics. A readability score is based on the Flesch reading ease test. Both of these advanced features make Grammarly more useful.

Performance

Text score: 84 out of 100. This score represents the quality of writing in this document. You can increase it by addressing Grammarly's suggestions.

84

Word Count

Characters 3,432
Words 520
Sentences 43

Reading time 2 min 4 sec
Speaking 4 min 0 sec
time

Readability

Metrics compared to other Grammarly users

Word length 5.3
Sentence length 12.1
Readability score 50 ⓘ

Above average
Above average

Your text is likely to be understood by a reader who has at least a 9th-grade education (age 15). Aim for the score of at least 60-70 to ensure your text is easily readable by 80% of English speakers.

Vocabulary

Metrics compared to other Grammarly users

Unique words 50% ⓘ

Below average

CLOSE

Grammarly can quickly scan the document for inconsistencies in date formats, abbreviations, and capitalizations. It quickly searches for errors, suggest fixes, and implements the changes all with your approval.

The Grammarly Add-in for Microsoft Office (Windows and Mac) is found on Word's Office Ribbon. Users of the Windows version will also find Grammarly available in Outlook. Issues within your document can individually be viewed in one of four categories including; correctness, clarity, engagement, and delivery, or you can choose to see Grammarly's suggestions collectively. Grammarly will open a sidebar window listing suggested corrections while highlighting the referenced text.

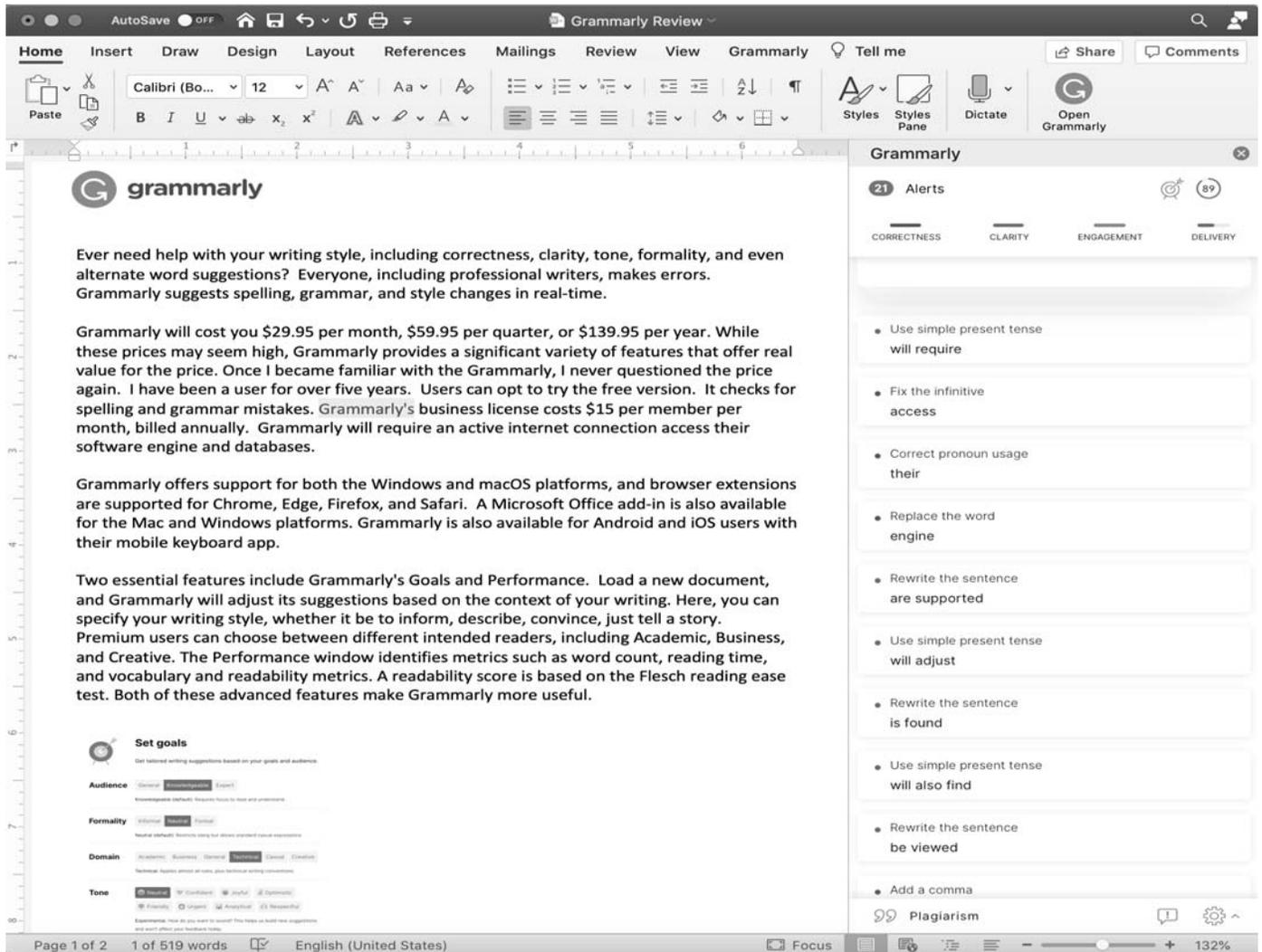


Figure 3: Grammarly's Alerts are located on the right, and the referenced text is highlighted for the selected suggestion/correction

About the author



R. Wayne Pugh, MAI, CRE, CCIM, FRICS is CEO of real estate consulting and appraisal firm R. Wayne Pugh and Co., the head of Software for Real EstateProfessionals Inc. and a principal member of Real Estate Counseling Group of America. He formerly served as president of the Appraisal Institute and as chair of the Louisiana Appraisal Board.

Wayne has been writing for many years on appraisal related tech products, including in this newsletter and Appraisal Institute publications.

GRAMMARLY FOR YOUR MOBILE PHONE OR TABLET

Grammarly's mobile app is available for Android and iOS devices. Grammarly's keyboard provides grammar and spelling corrections on the fly. It is used while writing emails, editing documents, and social media posts. The use of Grammarly on the iPhone is intuitive, making the app a favorite for most users.

Figure 4: Grammarly corrects the text when the user selects the correct option.

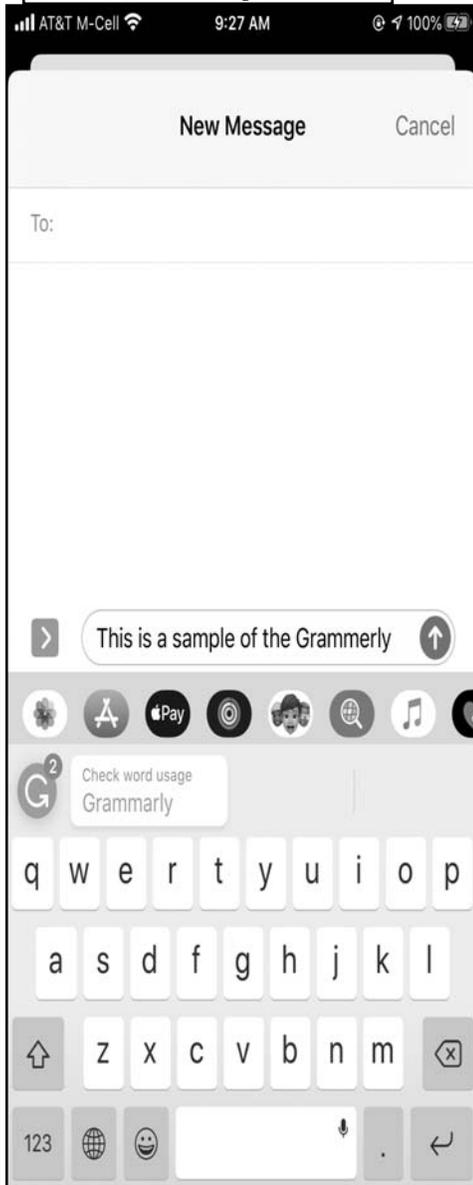


Figure 5: Grammarly Keyboard Settings

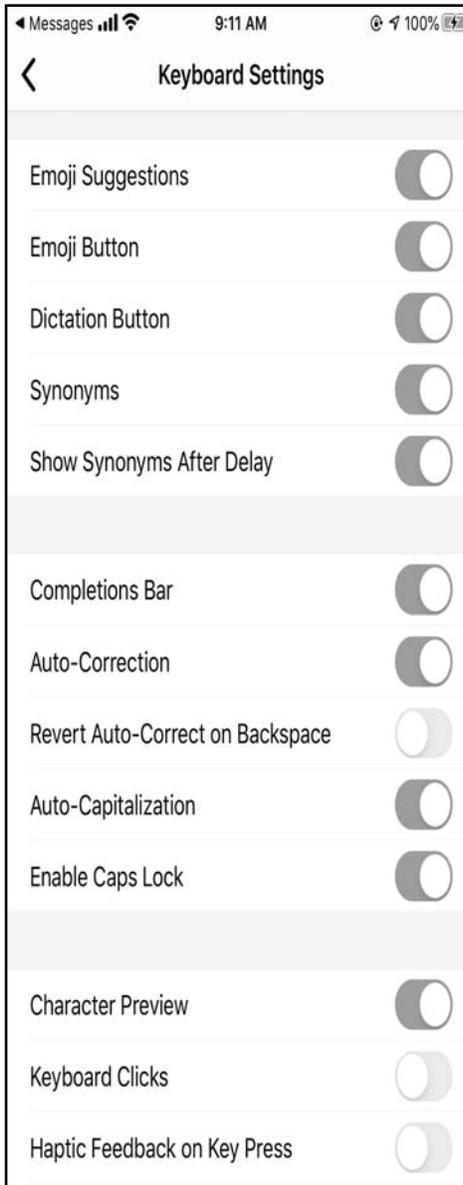


Figure 6: Grammarly Keyboard Settings (continued)



Grammarly provides suggestions or corrections on the line above the keyboard. The right recommendation can quickly be chosen by touching the corresponding word(s). Selecting the green Grammarly icon to the left of the suggestions loads a more detailed suggestion.

The suggestions are accurate and help to improve the readability of your typed text. Users may find the Grammarly suggestions for the free version to be inferior to those of the paid version.

A GREAT TOOL FOR THE EVERYDAY WRITER

Grammarly is the most complete and thorough editor for spelling, grammar, and style suggestions. Real estate appraisers spend a considerable amount of time writing and having the right tool to help pays off every day.