


## COVID Worldwide: 50 Dangerous Beliefs — Fact Checking the Headlines

**Editorial Mission:** We help people make better decisions and judgments about critical medical issues, based on the current scientific evidence—not opinion. This report summarizes commonly held “dangerous” beliefs about COVID-19 as of July 14th, 2022. It points to credible studies or sources that challenge these popular COVID beliefs.




### Section 1: THE VIRUS

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DANGEROUS BELIEFS	CURRENT EVIDENCE (As of July 14, 2022)	EVIDENCE SHOWN IS NOT MEDICAL ADVICE
<p><b>1</b> COVID has now reached the stage where Omicron is under control and COVID is no longer an emergency in the U.S. and Europe.</p>	<p><b>COVID is not under control</b>, since new Omicron variants are regularly appearing—especially BA.4 and BA.5 in South Africa and BA.2.12.01 in North America.<sup>1</sup> Some variants have evaded the vaccines, leading to breakthrough infections. Omicron has killed over 1.5M more people than Delta worldwide. It is currently killing nearly 1,000 people every day. (Confirmed cases are a top 5 causes of death in many countries.)<sup>11</sup></p>	<p></p>
<p><b>2</b> Hospitalizations and death rates are dropping rapidly in highly vaccinated countries, so we can finally relax and ease up a bit.</p>	<p>Global statistics on COVID hospitalizations are scarce and unreliable for many places. U.S. total weekly COVID hospitalizations dropped from 100,000 (Jan.) to 10,000 (early April, 2022).<sup>2</sup> <b>Death rates globally remain high.</b> Worldwide, COVID (97% Omicron) killed at least 2.3M people from Jan. 31st thru April 7th (likely a large undercount said WHO).<sup>21</sup> Hospitalizations may climb again with future variants such as the Omicron BA.2 variant (in Europe and Asia) and potential spread of BA.4 and BA.5 from South Africa.<sup>22</sup></p>	<p></p>
<p><b>3</b> Each COVID variant is growing progressively less dangerous. Omicron proves the virus gets steadily weaker over time.</p>	<p>That is not COVID's history.<sup>3</sup> <b>Delta quickly led to a 250% upsurge in deaths.</b><sup>31</sup> The Gamma variant in 2021 had higher fatalities than the native virus from Wuhan.<sup>32</sup> The fatality trend line has not always gone down. There is no scientific reason for the next COVID variant to be weaker because Omicron is less severe or lethal on a per-person basis.<sup>3,33</sup></p>	<p></p>
<p><b>4</b> Omicron is a “mild” COVID variant because if you get sick from it you are much less likely to die even if you are unvaccinated.</p>	<p>You are at least 65% less likely to die from Omicron,<sup>4,41,42</sup> but you remain at risk of getting Long COVID.<sup>43</sup> Current data shows you are much more likely to infect others with Omicron since <b>it is far more infectious than all other variants.</b><sup>44,45</sup> Higher volumes of infected people means <b>more COVID deaths in total—and millions of Long COVID cases.</b><sup>45,46</sup></p>	<p></p>
<p><b>5</b> Omicron is a “mild” COVID variant because if you get sick, you are much less likely to be severely ill or hospitalized.</p>	<p>Getting Omicron currently has the “best” likelihood of recovery.<sup>5</sup> <b>Once you get Omicron, you are in the Long COVID risk pool.</b><sup>21</sup> Recovery from the short term illness hides the potential long-term impact. For example, with Poliovirus, most children have mild symptoms or none at all. A small subset of children die or are paralyzed for life.<sup>5,2</sup> Millions of “mild” COVID cases are expected to bring significant levels illness and deaths in the future.<sup>3,3,5,4</sup></p>	<p></p>
<p><b>6</b> We will eventually eradicate COVID like we did smallpox, but it will take science some time.</p>	<p><b>Eradicating COVID is considered impossible.</b> It's carried by too many different animals, spreads too easily and mutates too fast.<sup>6,61</sup> Malaria (spread by only one insect species) has persisted for centuries.<sup>62</sup> Eradicating smallpox, the only disease we have ended, took 25+ years of global cooperation.<sup>63</sup> TB has been with us since ancient Egypt.<sup>64</sup></p>	<p></p>
<p><b>7</b> Since we will never eradicate COVID, we might as well figure out how to “learn to live” with it sooner rather than later.</p>	<p><b>Many public health experts believe we cannot simply ignore or surrender to a virus that threatens millions worldwide each year</b> with death and long-term health issues.<sup>7</sup> There is a history of humanity fighting back as we did with sanitation, refrigeration, food inspections, and childhood vaccinations. There are reasonable choices to push back hard against the impact of COVID and to innovate without eliminating it.<sup>71,72</sup></p>	<p></p>
<p><b>8</b> Face masks are not worth all the trouble and now even the CDC says they are currently unneeded with a few exceptions.</p>	<p>The CDC mask recommendation is easily misunderstood. KN95 and N95 masks worn properly are worth the trouble to protect children, seniors and those on many meds who cannot be vaccinated or have weak immune systems. Masks also protect everyone from Long COVID. <b>An N95 mask worn properly allows you to be near an infectious person for a full day or more without getting COVID.</b> It is why most hospital workers can spend all day with infected patients and not get infected themselves.<sup>7, 81, 82</sup></p>	<p></p>
<p><b>9</b> Yes, some people are still in trouble if they get COVID, but it is not a lot of people, and they are going to have to learn to deal with COVID like all other diseases. We cannot live in a bubble to protect vulnerable people from a disease that will be like the flu.</p>	<p>25% of the global population (1.7 billion people) are at increased risk of dying from COVID because of their age or underlying health conditions.<sup>9,91,92,93</sup> That includes 500 million elderly.<sup>9,91,92,93</sup> Everyone is currently at risk for Long COVID.<sup>94,95</sup> COVID is more like the 1918 pandemic flu than the annual flu. <b>You do not need to live in a bubble to support reasonable precautions for the elderly and immunocompromised.</b><sup>96,97</sup> Measures such as KN95 masks, HEPA air filters in classrooms, offices and indoor spaces and avoiding unmasked crowds can save many lives, reduce hospitalizations and likely slow down new variants to let science get ahead of the virus in terms of vaccines and therapies.<sup>98</sup></p>	<p></p>

DANGEROUS BELIEFS	CURRENT EVIDENCE (As of July 14, 2022)	EVIDENCE SHOWN IS NOT MEDICAL ADVICE
<p><b>10</b> Hospitals and healthcare workers have been through some tough times but that's behind us now. Our health system can handle COVID going forward.</p>	<p><b>Hospitals have been severely stressed by 2 years of pandemic conditions. Many nurses &amp; doctors are burned out.</b> Even if hospitals have bed space for patients during the next wave/variant, many more doctors and nurses say they will quit. <b>Worldwide, at least 25% of all doctors and nurses show symptoms</b> of stress, many from coping with 20M COVID deaths, often without family at the bedside, as well as treating many more millions of cases of serious illness.<sup>10, 10.1, 10.2, 10.3, 10.4</sup></p>	<p>✖</p>
<p><b>11</b> Yes, Long COVID is a real problem. But it is not that common, and we still do not know that much about it. We cannot let fear of Long COVID affect our everyday lives.</p>	<p><b>Long COVID is a serious problem worth paying attention to.</b><sup>11</sup> It's likely to affect 10-30% of everyone who caught COVID including those who got "mild" Omicron and those who had no symptoms at all.<sup>11, 11.1, 11.2, 11.3, 11.4, 11.5, 11.6</sup> The CDC has stated that <b>Long COVID could afflict 5% to 80% of COVID patients.</b><sup>17</sup> In addition to the symptoms we've seen to date, we do not know how Long COVID will affect the development of young children who are largely unvaccinated or unboosted.<sup>18</sup></p>	<p>✖</p>
<p><b>12</b> If you have had COVID before, you are safe from getting it again. It is very unusual to get COVID twice.</p>	<p><b>It is not rare to get COVID twice.</b> For example, Prince Charles, financial reporter Neil Cavuto, Sen. Roger Wicker, and rock star Bryan Adams all got COVID twice. Eventually, people who get a seasonal cold or the flu, usually get it again. Everyone who gets COVID can get it again. It is transmitted easily in air, and it reinfects.<sup>12, 12.1</sup></p>	<p>✖</p>
<p><b>13</b> Omicron's effects are quite mild, and if you get it, it is no big deal, especially if you are vaccinated.</p>	<p><b>A "mild" variant would not have killed 900,000 more people than Delta.</b> A high percentage of people with Omicron are likely to experience long-term effects.<sup>13</sup> People were 40% more likely to die from getting Omicron in 2021 than from the 2021 flu.<sup>13.1</sup></p>	<p>✖</p>
<p><b>14</b> If you had a mild case of COVID and fully recovered, you are safe from experiencing much more serious health problems later.</p>	<p><b>A mild case of COVID does not guarantee no long-term problems.</b><sup>14</sup> Best estimates are that 10-30% of people will have symptoms of Long COVID or impact their future health from elevated rates of heart disease, Alzheimer's and cancer.<sup>14.1, 14.2, 14.3, 14.4, 14.5</sup> Currently, millions of people are suffering from their initial COVID symptoms a whole year after infection.<sup>14.6</sup></p>	<p>✖</p>
<p><b>15</b> Omicron has replaced previous COVID variants such as the Delta, Beta and Gamma. The old variants are no longer threats.</p>	<p><b>The old COVID variants are still with us,</b> just in much smaller numbers of people. Delta, Gamma, Beta, etc., <b>can reappear as fast as measles or an old strain of flu.</b><sup>15, 15.1</sup> Older variants can combine with Omicron. Most Omicron deaths are unvaccinated, but 40% of current U.S. deaths are double vaccinated and not boosted.<sup>15.2</sup></p>	<p>✖</p>
<p><b>16</b> Once you get fully vaccinated and boosted (or fully recover from having COVID), you're "immune" and can live normally again.</p>	<p>The amount of benefit from prior infection is hard to measure but can be quite small. <b>Often called "natural immunity" it varies widely by person, by severity of illness, and by the strain you had or are now being exposed to.</b> Studies indicate that many mild cases offer limited or no sustainable future benefit unless combined with vaccines.<sup>16, 16.1, 16.2</sup></p>	<p>✖</p>
<p><b>17</b> I am fully vaccinated, boosted and had COVID, so I am "bulletproof" and can never get it.</p>	<p><b>There is no bulletproof "immunity" to COVID. Like a suntan, protection fades over time.</b><sup>17, 17.1</sup> COVID protection drops weekly and can drop to almost zero in 6 months.<sup>17.2, 17.3</sup> This is very different from measles or mumps where a few childhood shots protect you for life.<sup>17.4</sup></p>	<p>✖</p>
<p><b>18</b> If you are a healthy adult under 60 or so, Omicron was never really a big threat to you.</p>	<p>Omicron kills a smaller percentage of infected people, but infects more people, causing more total fatalities. <b>Currently, almost 25% of COVID deaths are people under 50</b> who have no underlying health conditions.<sup>18, 18.1, 18.2</sup></p>	<p>✖</p>
<p><b>19</b> If you are a young child or teen, and in good health, then COVID and Omicron were never really a big threat to you.</p>	<p>There is a difference between immediate and long-term threats that take time to show up. At least 75% of U.S. children and adolescents have been infected to date.<sup>19</sup> Long COVID may affect 1 million or more children with chronic impairments.<sup>19.1</sup> <b>More than 8,000 children ages 0-9 are confirmed dead of COVID so far.</b><sup>19.2, 19.3, 19.4</sup></p>	<p>✖</p>
<p><b>20</b> Since kids rarely get serious COVID, schools do not need to go overboard on protections such as air cleaners and mask requirements.</p>	<p><b>At least 75% of U.S. children and adolescents have been infected to date and more than 1,000 have died.</b><sup>20, 20.1</sup> The U.S. represents about 5% of estimated global COVID deaths.<sup>20.2</sup> Long COVID may ultimately affect 1 million or more U.S. kids with chronic impairments, which could translate to tens of millions at risk globally.<sup>20.3, 20.4, 20.5</sup> To defend against further spread, some schools may decide to take precautions such as KN95 masks and air filters.</p>	<p>✖</p>
<p><b>21</b> COVID death counts are exaggerated because some people died from something else, and also happened to be positive for COVID when they died.</p>	<p>Unfortunately, the opposite is true. <b>Research has revealed that many governments are dramatically under-reporting cases and fatalities.</b> India reported 500,000 COVID deaths. The likely figure is 4-5 million dead. Russia has reported 348,000 deaths. They probably had 1 million or more. The global death toll from COVID currently stands at an estimated 20M, based on "excess deaths" rather than official government sources.<sup>21, 21.1, 21.2</sup></p>	<p>✖</p>



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<b>22</b> When someone in your family gets COVID, it is inevitable that you will get COVID too.	This is not the case. In families that use protective measures, <b>less than 1/3 of the time does another family member get infected—even with Omicron.</b> This is referred to as the “secondary attack” rate, a term used by scientists. <sup>22, 22.1, 22.2, 22.3, 22.4, 22.5</sup>	Risk can be from 23-25%. 
<b>23</b> We are all going to get COVID eventually, so we might as well get it over with by getting the mild Omicron variant and being done with it.	With COVID, you cannot be just done with it, any more than you can get a cold and be done with all colds in the future. It is never safe to get this virus. <b>Long COVID has devastated lives and the lives of others unintentionally infected.</b> The risk and moral hazard are likely far greater than many people realize. Obviously, nobody wants to hurt others thoughtlessly but 20-30% of all cases are believed to have no symptoms. <sup>23, 23.1, 23.2, 23.3</sup>	
<b>24</b> Society can treat COVID like flu: voluntary vaccinations for those who want them, no lockdowns or school closures, and no bureaucratic control over our lives.	COVID may potentially become like the flu some years from now, but in 2021 people were 40% more likely to die from getting Omicron than to die from that year’s flu. <sup>24, 24.1</sup> <b>We have no scientific basis to predict COVID’s future evolution.</b> COVID could become a mild nuisance or just as easily turn into something much worse such as MERS, SARS, smallpox, measles, or HIV. <sup>24.2, 24.3, 24.4</sup> TB has killed hundreds of millions of people. <sup>24.5</sup>	

## Section 2: VACCINES AND LOGISTICS

DANGEROUS BELIEFS	CURRENT EVIDENCE (As of July 14, 2022)	EVIDENCE SHOWN IS NOT MEDICAL ADVICE
<b>25</b> Obviously, the entire world needs to be vaccinated as quickly as possible, but it is going to take some time to do it.	<b>Global vaccination is in everyone’s interest.</b> A new variant has emerged on average every 4 months for 2 years. <sup>25, 25.1</sup> Omicron proved that half the population can get infected in a few months. <sup>25.2</sup> There are now millions of vaccine doses about to expire unused around the world. <sup>25.3</sup> This is likely due to a failure to approach vaccination programs comprehensively including having sufficient personnel and funding.	
<b>26</b> When it comes to vaccinating the world, we are doing the best we can.	<b>Countries can move vaccines “the last mile” into patient’s arms with more programs that are fully coordinated and funded.</b> For example, billions of doses are needed in places where there are not enough doctors and nurses, but there are millions of community health workers ready to assist. <sup>26, 26.1, 26.2, 26.3</sup>	
<b>27</b> We have delivered vaccines and medicines all over the world and we have promised to do much more in the coming years. Western nations have done more than their share.	The countries with the strongest economies have donated hundreds of millions of vaccine doses worldwide. These countries also invented most of the vaccines. <sup>27</sup> <b>The world still needs 20 billion doses, and it will require global cooperation to deliver them.</b> <sup>27.1</sup> Only just over 16% of populations in low income countries have had 1 dose and almost none have had boosters. <sup>27.2, 27.3, 27.4</sup> Since viruses spread so quickly, and ignore national borders, this puts everyone around the world at risk to a new variant, in every country.	
<b>28</b> Right now, there are plenty of vaccine doses available around the world. Doesn’t that solve the global vaccination problem?	It’s true that we have hundreds of millions of vaccine doses available to be used, but <b>they are not making it into patients’ arms in low-income countries.</b> Much is lacking: trucks, refrigeration, trained clinicians, syringes, local vaccine manufacturing and fill-finish, among other things. Result: <b>dose deliveries are falling; vaccination rates are at their lowest ever in the pandemic;</b> and wealthy countries will have to destroy hundreds of millions of expiring vaccine doses by summer of 2022. <sup>28, 28.1, 28.2, 28.3, 28.4</sup>	
<b>29</b> We basically “won the war” against COVID by discovering and mass-producing effective vaccines. Now it is just a mopping-up operation.	The COVID pandemic has already killed an estimated 20 million people worldwide, including 1 million Americans, based on “excess deaths” reported in each country. <sup>29, 29.1, 29.2</sup> <b>We are preparing for inevitable future waves (or new future pandemics) and are not ready.</b> We would be stronger with more people vaccinated, boosted, trained, and ready to treat citizens. Worldwide, “getting vaccines in arms” is likely the only way to ensure the war does not return to every country. <sup>29.3</sup>	
<b>30</b> If you are vaccinated with 2 shots, you are mostly protected. Having 1 shot is useful, though not ideal.	<b>Protection varies widely by the variant and the time since your 2nd shot.<sup>30</sup> For example, having 2 shots &amp; no booster provides only 0-10% protection against getting Omicron.</b> <sup>30.1, 30.2</sup> Studies show vaccine effectiveness typically wanes by 30% or more after as little as 4 months. <sup>30.2, 30.3, 30.4</sup> Like a deep suntan, infection and hospitalization protection steadily fades.	
<b>31</b> New, variant-specific vaccines can quickly be developed for when the next major variant arrives. Shouldn’t we wait for those vaccines?	<b>So far, variant-specific vaccines have neither been approved by regulators nor been manufactured at scale.</b> There is no guarantee of success. Current Omicron-specific vaccines, being tested now, are performing worse against certain variants of Omicron than the original vaccines. If we create a better vaccine, the next variant may arrive before we can scale up production and we could be worse off. <sup>31, 31.1</sup>	



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<b>32</b> Pretty soon we will have a shot that prevents infection from ALL coronaviruses so we will not need more shots in the future.	<b>A vaccine that protects against all coronaviruses is probably years away</b> from being developed and approved as safe and effective. R&D is important, but viruses are hard to defeat. Viruses have existed on Earth for more than a billion years. Counting on a miracle shot is risky and unpredictable—as HIV has proved. <sup>32, 32.1, 32.2</sup>	✕
<b>33</b> Yes, vaccine hesitancy is a problem, but it doesn't threaten the vaccinated population and people should have a right to choose what to believe.	<b>Up to 50% of people are vaccine hesitant or averse in some countries.</b> If they keep getting infected they will spread new COVID variants locally and perhaps worldwide. Vaccine hesitancy risks everyone's future, not just those making a personal choice. <sup>33, 33.1</sup> Long before COVID, vaccinations were required for children in many nations (not only high-income countries) before they expose other children and those children's parents. <sup>33.2, 33.3, 33.4</sup>	✕
<b>34</b> Almost all COVID deaths are among unvaccinated people. With 2 doses, or 2 doses and a booster, you are not going to be hospitalized or die unless you are old or have health problems.	That was true once, but COVID-19 keeps evolving. <b>Globally, 1 million vaccinated people have died from COVID,</b> mostly in the past 3 months and very few with 2 shots and a booster. Omicron deaths are now happening among the vaccinated in countries with high vaccination rates more than 6 months earlier because that is most of their population. <sup>34, 34.1</sup> A virus keeps multiplying relentlessly—24 hours a day, 7 days a week. It is an ongoing battle to protect people from trillions and trillions of mutating particles. <sup>34.2, 34.3</sup>	✕
<b>35</b> We don't really face any problem packaging vaccines. We had plenty of multi-dose glass vials and they seem to work fine.	Multi-dose vials were an emergency choice, due to short supplies and high costs of single-dose vials, which are safer. <b>Medical glass vial shortages were serious before COVID and grew sharply after COVID began.</b> <sup>35, 35.1</sup> Shortages of medical-grade vials, suitable for administration in clinics, will grow as orders mount in the next two years to cover most of the world. The only way the world can regularly and reliably administer boosters is emulate the flu vaccination strategy by moving to single-dose, prefilled syringes. <sup>35, 35.1, 35.2, 35.3</sup>	✕
<b>36</b> UNICEF predicted a shortage of several billion vaccine syringes, saying it would drive widespread syringe reuse. But we don't read about it, so presumably this risk has been averted.	Syringe shortages and reuse are very real problems worldwide. However, health workers and national health ministries are reluctant to acknowledge syringe shortages (it's mismanagement) or syringe reuse (which is malpractice). <sup>36, 36.1</sup> In most of the world, <b>governments have diverted millions of syringes from routine child immunization efforts to use for COVID.</b> <sup>36.2, 36.3</sup> They are using non-vaccine syringes to keep up, an approach which in the 1980s and '90s led to millions of HIV and hepatitis infections. <sup>36.4</sup>	✕
<b>37</b> The world has not seen large outbreaks of vaccine-preventable diseases in kids, so routine immunization programs are fine.	Last year, UNICEF reported the fewest kids immunized in more than a decade of steady improvements. <b>Partly because of syringe diversion to COVID and other factors, more than 30 million children around the world are now under-vaccinated or unvaccinated.</b> <sup>37, 37.1</sup> Consequently, they are at risk for diseases much more deadly to them than COVID, including measles, polio, tetanus and diphtheria. <sup>37.2</sup>	✕
<b>38</b> We have plenty of health workers in the field, so like smallpox, they can vaccinate the world against COVID. And we can just keep re-boosting the world's population.	<b>We are far below having enough medically-trained health workers to vaccinate the world's population</b> with a doctor, nurse or pharmacist prepping and using a syringe. WHO estimated before COVID that we would be short 18M health workers by 2030. <sup>38, 38.1</sup> COVID has made this gap much bigger, much sooner. We need solutions that allow people to help themselves and their families quickly and without medical personnel. <sup>38.2, 38.3</sup>	✕

Section 3: STRATEGY

DANGEROUS BELIEFS	CURRENT EVIDENCE (As of July 14, 2022)	EVIDENCE SHOWN IS NOT MEDICAL ADVICE
<b>39</b> COVID help for other countries is a humanitarian act, but it doesn't really help or affect the donors.	<b>When any one country gets a dangerous highly-contagious new variant, every other country is likely to get it before too long.</b> The virus doesn't care about man-made borders. COVID began in China. Beta came from South Africa. Gamma came from Brazil. Delta came from India and killed 4-5M in India alone. Omicron came from Botswana and has killed 3M so far. The pattern is clear, global and 100% consistent. <sup>39, 39.1, 39.2</sup>	✕
<b>40</b> China has done an excellent job keeping COVID under control. If China loses control and COVID spreads widely over there, it will be their problem, not ours.	China has kept COVID under control <b>but many experts doubt they can keep control</b> because Omicron is so easily transmitted. This is what happened in Hong Kong with the BA2 Omicron variant and a large vaccine-hesitant elderly population. In the 2nd quarter 2022, Shanghai had 250,000 cases and was locked down for two months. If China loses control before a scalable cure or treatment is found and widely produced, the impact will be felt worldwide and could be severe. China alone has 1.4 billion people. <sup>40, 40.1, 40.2, 40.3, 40.4, 40.5</sup>	✕



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<b>41</b> All pandemics eventually end. COVID has lasted more than 2 years and looks like it's due to end soon.	<b>Many pandemics never end, and we have no way to predict when COVID will.</b> Smallpox lasted hundreds of years. <sup>41</sup> Measles at least 200 years. <sup>41</sup> Flu has been with us for centuries. <sup>41,2</sup> HIV jumped from African apes 40 years ago and has killed 35M people. <sup>41,3, 41,4</sup> Ancient Egypt had tuberculosis. <sup>41,5</sup> The COVID virus could be a threat for many generations. <sup>41,6, 41,7</sup>	📺
<b>42</b> Pandemics are natural phenomena, and we should not get overly concerned about the next one. We have new tools and experience, and we are ready.	Until now all pandemics have been natural. <b>The next naturally-occurring pandemic could be far deadlier and kill 100s of millions of people.</b> Pandemics have the potential to collapse global trade, production and cripple critical food supplies on several continents. The next pandemic could intentionally be much worse in the form of a human-made <b>lab-engineered bioweapon.</b> We are not ready for either future. <sup>42, 42,1, 42,2</sup>	📺
<b>43</b> If I stand 6 feet away from someone, I am mostly safe from getting infected or infecting others. Tiny water droplets we breathe in or out with the virus fall to the ground.	This was thought to be the case initially but has turned out to be proven wrong. <b>COVID is an invisible “aerosol” that can travel 20+ feet from an infected person.</b> <sup>43, 43,1, 43,2</sup> <b>Aerosols linger in the air in a room for hours, like the smell of tobacco smoke.</b> You can get infected by walking into a room 30 minutes after an infected COVID person is gone. <sup>43, 43,1, 43,2</sup> Social distancing and masks are part of a total defense that includes KN95 masks worn properly and indoor ventilation upgrades to remove the airborne virus. <sup>43, 43,1, 43,2, 43,3</sup>	📺
<b>44</b> In hospitals, uninfected patients rarely get COVID from other patients who have the virus.	<b>Studies show that hospital patients spread COVID</b> because many hospital ventilation systems were not designed to stop the spread of aerosols—especially when hospitals are overcrowded. <sup>44, 44,1</sup> In many hospitals documented transmissions at peak periods of between 10-15% of patients. <sup>44</sup> They enter COVID-free and die or leave infected.	📺
<b>45</b> Outdoor sporting events and outdoor concerts are mostly safe. It is hard to get infected with COVID while outdoors.	<b>Crowded outdoor spaces are more dangerous than uncrowded indoor spaces.</b> COVID is an aerosol much like cigarette smoke or perfume aroma. If every 5th stadium attendee were smoking a cigar, you would naturally smell it. You can get COVID outdoors as easily as you can smell a cigar from 20 feet away. <sup>45</sup>	📺
<b>46</b> It takes being with someone 10 or 15 minutes to inhale enough virus to get sick with COVID.	<b>Omicron can infect you in less than a minute.</b> You can be infected in as little as 15 seconds if you are in a small room with unmasked people, and if you are not properly masked yourself. <sup>46, 46,1</sup> Viruses exploit every opportunity to transmit themselves.	📺
<b>47</b> We have now reached the point where so many people have had COVID and so many people have been vaccinated that we have developed a kind of “herd immunity” or at least strong resistance in our population.	<b>Herd immunity is not possible when people can be reinfected multiple times. This is the case with a coronavirus.</b> We can achieve herd resistance, but that steadily fades as the protection from vaccinations declines over time. <sup>47</sup> Only 6% of the world population has had COVID and about 50% of the world is currently 2-dose vaccinated, but booster rates are low and everyone may be vulnerable at some level to the next variant. <sup>47,1, 47,2</sup> Reinfection with new strains may not provide any added “resistance” but rather damage your immune system over and over again. This increases your risk of harm. <sup>47</sup>	📺
<b>48</b> Countries that had very few COVID restrictions protected their populations just as well as counties with much tighter restrictions, so mandates and restrictions really were not worth it.	<b>The U.S., which has imposed relatively light (or inconsistent) protective measures, has experienced a COVID death rate 7x higher per million than South Korea, which imposed strict measures.</b> Cumulative U.S. fatalities were 2,989 per million people. Korea’s were 447 per million people. <sup>48, 48,1, 48,2</sup> The claim that “personal responsibility” works better than coordinated mask mandates, indoor crowd limitations and social distancing is not supported by the data.	📺
<b>49</b> We cannot afford to hurt our economy and make everyone worse off just because COVID is still a threat to a limited part of the population. We need to make smart trade-offs.	<b>We do not keep businesses open without sensible precautions for everyone if we can do so while protecting children.</b> “Save the economy or defend against COVID” is likely to be a false choice based on the data. Reasonable and effective precautions such as masks and air filters are readily available and highly effective at slowing or stopping transmission. Public health experts state that we can do both things well and it does not need to be expensive or burdensome. <sup>49, 49,1, 49,2, 49,3, 49,4</sup>	📺
<b>50</b> I am wearing a mask. All masks are pretty much the same.	<b>Cloth or standard surgical masks are 90% ineffective against airborne viruses like COVID.</b> To stop COVID you need a KN95 or N95 mask (or better) that captures tiny viruses by design and with electrostatic charges in the woven fibers. Masks are real medical equipment. That is why doctors and nurses can work with COVID patients all day and not get infected. <sup>50, 50,1, 50,2, 50,3</sup>	📺

## About Plain Talk Reports



**Plain Talk Reports** is a free online resource that regularly spotlights dangerous, widely-held beliefs on a serious medical topic — beginning with COVID — and provides a concise fact check in plain English based on current scientific evidence or an authoritative source. U.S. and global editions are published regularly as a public service with no commercial or political influence of any kind. All Reports appear on [www.plaintalks.com](http://www.plaintalks.com) and associated websites; supplementary material is posted on Twitter and YouTube. Plain Talk Reports is published by TEDMED, the health and medicine edition of the TED organization, and written and edited by the ApiJect Global Initiative team.

*Medical Disclaimer: Information provided in Plain Talk Reports is not medical advice and is not intended to be used as such. Readers should consult their personal physicians for medical guidance.*

### TEDMED

**TEDMED** is the independent non-profit health and medicine organization of the globally recognized TED conference. For more than 20 years, many TEDMED talks have appeared on the TED.com website and have been viewed globally tens of millions of times. Communicating relevant and accurate scientific thinking to the public is fundamental to both TED and TEDMED's mission.

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## Acknowledgments

### The ApiJect Global Initiative

Safe Injections and Access for All

**The ApiJect Global Initiative** is a team within ApiJect Systems, Corp. that carries out the company's public benefit mission as a U.S. Public Benefit Corporation. Based in Geneva, Switzerland, the ApiJect Global Initiative works to improve global understanding of COVID response and other critical issues in health and medicine.

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# Plain Talk Short Videos on Our YouTube Channel



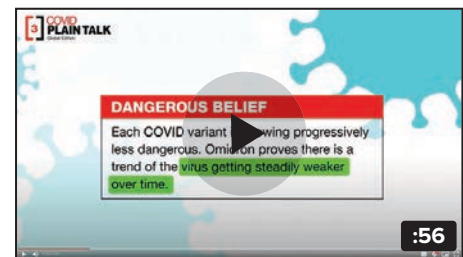
Each of the 50 Dangerous Beliefs, plus relevant Current Evidence, is available in a quick, simplified video (typically around 1 minute in length). Visit Plain Talk's YouTube channel at [www.youtube.com/plaintalk.html](http://www.youtube.com/plaintalk.html), or click on the **video play-button icon** on top of each video screen, for each Current Evidence. Here are some examples of the dozens of videos you can choose from.



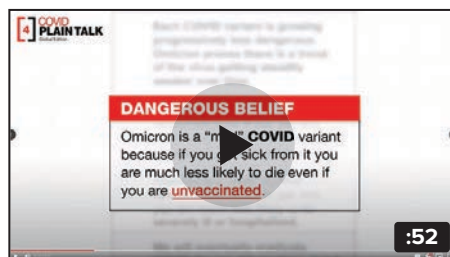
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The Plain Talk “Watch List” is a compilation of currently circulating beliefs that Plain Talk Reports believes are mistaken or largely unsupported, and potentially harmful if they were to become widely believed or acted upon. In the future, if one of these beliefs becomes sufficiently widespread it will be added to the list of Dangerous Beliefs.

## Section 1: THE VIRUS

DANGEROUS BELIEFS ... WATCH LIST		
<b>W1</b> If you get COVID 2 or 3 times, as long as they’re all mild cases, it’s no big deal.	<b>W5</b> We won’t see another COVID variant until the fall.	<b>W10</b> Most of the world has already had COVID, so the global pandemic is nearly over.
<b>W2</b> Long COVID is when you get COVID and it doesn’t go away. If COVID symptoms go away, then Long COVID is not a problem.	<b>W6</b> COVID is a respiratory disease not a brain disease.	<b>W11</b> No matter what variant of COVID shows up, it won’t be as deadly as SARS or MERS were.
<b>W3</b> Based on low reported rates of COVID deaths in Africa, it appears that people in African countries are largely resistant or immune to COVID.	<b>W7</b> Most people who get really sick or die from COVID are either old, obese or sick with something else already.	<b>W12</b> I cannot get COVID just by walking into an empty room.
<b>W4</b> If you’ve had COVID before, future COVID infections will be less severe.	<b>W8</b> When I got two shots, they said I was fully vaccinated. Now they have boosters, but boosters only last a while. I really don’t think boosters are necessary.	<b>W13</b> In the U.S., I have checked the “Community Level” map on the CDC website. My area is shown in green, not orange, so I don’t have to worry about COVID being highly infectious where I live.
	<b>W9</b> The new mRNA vaccines can change your DNA.	

## Section 2: VACCINES AND LOGISTICS

DANGEROUS BELIEFS ... WATCH LIST		
<b>W14</b> Certain of the approved COVID vaccines are not safe for children.	<b>W20</b> Fully vaccinated used to mean two shots. Now it means three or even four shots. Nobody can keep up. This is just going to go on forever.	<b>W24</b> The ingredients in COVID-19 vaccines are linked to so many suspicious side effects that some must be true, including the possibility that mRNA can change your DNA or have other genetic effects. .
<b>W15</b> How well a COVID vaccine works will vary according to a person’s blood type.	<b>W21</b> Athletes don’t need to be vaccinated or boosted because their immune systems are naturally strong.	<b>W25</b> COVID vaccines have been reported to have adverse effects on fertility, menstrual cycles and even the ability to conceive, so why take the added risk of a new vaccine?
<b>W16</b> You shouldn’t get a booster or a vaccine shot if you have just recovered from COVID.	<b>W22</b> You can get rough indication of how well a vaccine will work for you based on the severity of your reaction to the shot. If you didn’t have a strong reaction to the vaccine, you probably aren’t protected.	<b>W26</b> The CDC’s own data and many TV shows have reported that thousands of people died or suffered terrible health effects shortly after getting vaccinated, so the vaccines are clearly not safe.
<b>W17</b> I’ve had COVID and I’m vaccinated with a booster, so I am totally safe now and can ignore the virus.	<b>W23</b> Pregnant women were not included in the vaccine test groups, so why would you risk exposing pregnant women or unborn children to the vaccine?	
<b>W18</b> I have made it this far without being vaccinated or infected so why get vaccinated at all		
<b>W19</b> The next generation of much-better COVID vaccines is almost here.		



Section 3: **STRATEGY**

DANGEROUS BELIEFS ... WATCH LIST		
<p><b>W27</b> Since home tests aren't included in a lot of COVID case counts, we really have no idea how widespread COVID is or isn't.</p>	<p><b>W32</b> The biggest problem faced by many Low- and Medium-Income Countries is simply getting enough vaccines, because wealthier countries have bought up all the supply.</p>	<p><b>W37</b> Good ventilation (open windows) or good filtration (special filters) are enough to protect people indoors. We don't need both.</p>
<p><b>W28</b> Good ventilation makes little or no difference in your chances of getting COVID.</p>	<p><b>W33</b> Many poorer countries have far bigger health problems than COVID, such as malaria or clean water. They should devote their limited resources to those issues.</p>	<p><b>W38</b> Children get sick all the time, so classroom settings where kids play and touch each other make it impossible to defend against COVID virus circulation, no matter what protective steps we take.</p>
<p><b>W29</b> A healthy diet or certain special diets protect against COVID.</p>	<p><b>W34</b> Scientist keep changing their minds with new studies coming out all the time. They really don't know what's going on or they're doing.</p>	<p><b>W39</b> If you test positive on a PCR test you are definitely still infectious.</p>
<p><b>W30</b> TV news is generally pretty reliable on COVID. If some COVID-related news or issue is not on TV, it's not a big deal yet for things relating to me.</p>	<p><b>W35</b> Masks affect children's mental health or their ability to learn.</p>	<p><b>W40</b> If you have don't have any COVID symptoms, you are not dangerous to others.</p>
<p><b>W31</b> The CDC, the NHS and other government agencies keep changing the rules on how they measure COVID risk in my area. I can't bother keeping up.</p>	<p><b>W36</b> If children aren't wearing masks, teachers should not wear them either.</p>	<p><b>W41</b> COVID home tests aren't really worth the trouble because it takes 3 days from when you are infected to when you can test positive.</p>

# Glossary of Terms and Definitions

## **ACE2 (Angiotensin-converting enzyme 2)**

ACE2 is a naturally occurring protein in the human body that helps “unlock the door” and let COVID infect a person. This particular protein is naturally found on the surface of many different types of cells in a healthy human body. But in addition to helping COVID virus cells to invade the body, ACE2 can also contribute to inflammation and heart disease. It is called an “angiotensin-converting enzyme” because angiotensin is a protein that narrows blood vessels or otherwise increases blood pressure, while an enzyme is a substance produced by the body (usually also a protein) that helps cause a specific biochemical reaction...in this case, an unintended side-effect is a vulnerability to The Coronavirus.

## **ACUTE / ACUTE PHASE**

Having a sudden onset, sharp rise, and short course. The acute phase of COVID-19 is typically signaled by signs or symptoms such as cough, fever, shortness of breath. This phase is associated with rapid virus reproduction and your body’s immune response. The duration of acute infection is typically days to weeks though it can last months or even years with “Long COVID.”

## **ADVERSE EVENT**

An unexpected medical problem that happens during treatment with a drug or other therapy. Adverse events may be mild, moderate, or severe, and may be caused by something other than the drug or therapy being given. Sometimes called an adverse effect. Serious adverse events after getting a COVID-19 vaccination are rare, but may occur since more than 8 billion doses have been given globally as of April 2022.

## **ADVISORY / ALERT**

A report giving information (as on COVID-19) and often recommending action to be taken.

## **AEROSOL**

A substance released in a fine spray or mist. Typically composed of very small liquid droplets or molecules that can remain suspended in air for up to several hours, and that do not travel in direct paths. These tiny invisible droplets are emitted by people, in different amounts, during breathing, talking, singing, coughing, sneezing, shouting and other forms of vocalization or exhalation. The best way to imagine an aerosol is the smell of perfume or small amounts of cigarette smoke that can’t be seen but can be easily smelled.

## **AIR FILTER**

Central furnace or Heating/ventilation/air conditioning (HVAC) filters are designed to filter air as it is circulated throughout a home, office or any indoor space. Portable air cleaners and centralized HVAC or special HEPA filters can dramatically reduce indoor air pollutants, including viruses, that are airborne.

## **AIRBORNE / AIRBORNE TRANSMISSION**

Airborne transmission is defined as the spread of an infectious agent caused by the transmission of droplet nuclei (aerosols) or other tiny droplets that remain infectious when suspended in air so other people can breathe them. Airborne transmission of SARS-CoV-2 can also occur during medical procedures that generate droplets or aerosols (“aerosol generating procedures”).

## **ANIMAL-TO-HUMAN TRANSMISSION**

A zoonosis (zoonotic disease or zoonoses -plural) is an infectious disease that is transmitted between species from animals to humans (or from humans to animals). In direct zoonosis the disease is directly transmitted from animals to humans through media such as air (e.g., influenza) or through bites and saliva (e.g., rabies, malaria). In contrast, transmission can also occur via an intermediate species (referred to as a vector), which carry the disease pathogen first to infect another animal that does not get sick and then on to humans.

## **ANOSMIA**

A condition that causes a person to lose partially or completely his or her sense of smell. Symptoms include loss of smell and change in how foods taste. Familiar foods can suddenly be tasteless. Loss of smell is a symptom of certain variants of COVID-19 in some people.

## **ANTIBODY**

Antibodies are tiny proteins that are just one part of your immune system which has evolved to fight off a nearly infinite variety of infections and protect you from getting sick in the future. Antibodies to SARS-CoV-2, the virus that causes COVID-19, can be detected with a blood test in the blood of people who have recovered from COVID-19 or people who have been vaccinated against COVID-19. A typical person makes and circulates billions of antibodies against hundreds of thousands of different viruses and bacteria.

## **ANTIBODY TEST**

A way to measure the number of SARS-CoV-2 antibodies in a specific person’s blood. A higher number of these antibodies means the person’s body is better able to attack the SARS-CoV-2 virus as a first line of defense to stop the virus from quickly spreading to the body’s organs. Antibodies are a bit like the first volunteer fire fighters who show up quickly and work to keep the fire from spreading until the big heavy-duty professional fire equipment shows up (T-cells and B-cells).

## **ANTIBIOTICS**

Antibiotics, also known as antibacterials, are medications that destroy or slow down the growth of bacteria (but not viruses since they are generally far smaller than bacteria). They include a range of powerful drugs used to treat diseases caused by bacteria. When a disease is caused by viruses, such as cold, flu, and most coughs, antibiotics cannot treat them directly but can be used if bacterial infections occur at the same time. COVID-19 vaccines do not influence or interact with antibiotics, so when indicated, antibiotics may be taken at any time relative to COVID-19 vaccine administration.

## **ANTIGEN**

An antigen is any foreign or threatening substance that causes your immune system to produce antibodies against it. This means your immune system does not recognize the substance and is trying to destroy it as fast as possible and also “learn” how to destroy it again if it ever shows up in the future. An antigen may be a substance from the environment, such as chemicals, bacteria, viruses, or pollen. An antigen may also form inside the body. SARS CoV-2 is a novel antigen. This means that human immune systems has never seen this virus before in 2 million years of human history. Every person’s immune system has to learn how to fight it for the first time .

## ANTIGEN TEST

A way to use a cotton swab to collect a sample of the liquid in a person's nasal, cheek and/or throat passages, which is then tested to detect the presence of antigens (a protein that helps trigger an immune response in the body). Results showing higher levels of antigens can identify people with active infections. A positive result generally means a person currently has COVID-19 and depending on their levels of active virus can spread the virus to others.

## ANIMAL RESERVOIR

Animal (non-human) reservoirs consist of domesticated and wild animals that are infected by pathogens and thus serve as a storehouse of that pathogen. Humans are subject to certain diseases that have animal reservoirs. Many of these diseases are transmitted from animal to animal, with humans as incidental hosts. Many newly recognized infectious diseases in humans, including COVID-19, HIV/AIDS, Ebola and SARS, are thought to have emerged from animal hosts, although in some cases those hosts have not yet been identified. Pathogens in animals can mutate and change just as they do in humans, which is a major challenge for the future course of COVID-19 globally.

## ANTISEPTIC

The quality of preventing or inhibiting the growth or action of microorganisms in or on living tissue (such as the skin or mucous membranes). Antiseptic kills microorganisms such as bacteria, viruses, and fungi using chemicals called biocides.

## ANTI-VAX / ANTI-VAXXER

“Anti-vax” refers to opposition to vaccination and vaccination requirements, or refusal to be vaccinated or have one's children vaccinated. An “anti-vaxxer” is a person who opposes the use of vaccines or regulations mandating vaccination. Some anti-vaxxers are vehemently against all vaccines, others just certain vaccines that they believe are unnecessary or dangerous. Some people, who are neither supporters of certain vaccines or specifically opposed to them, are referred to as “vaccine hesitant.”

## ANTIVIRAL

Antiviral medications are very specific medicines that have proven to help the body fight off harmful viruses. The drugs can ease symptoms and shorten how long a viral infection persists. Antivirals also lower the risk of getting or spreading viruses, specifically those that cause herpes and HIV. One approved antiviral treats the coronavirus that causes COVID-19. Paxlovid, Nirmatrelvir, ritonavir, remdesivir and molnupiravir are antiviral medicines.

## ARTIFICIAL IMMUNITY

This is the general term for manmade protection against future infection. (“Immunity” is a misleading word.) Protection can be created in several different ways. Historically, vaccine-induced protection is acquired through the introduction of a killed or weakened form of the disease organism into the patient's body through vaccination. Modern alternatives create just parts of the virus to teach the immune system to be ready, but those parts are not sufficient to make you sick with the disease. If an immune person comes into contact with that disease in the future, their immune system will recognize it and immediately produce the antibodies needed to fight it.

## ASYMPTOMATIC:

The medical term for lacking symptoms or not showing symptoms, even though you have a disease or illness. Developing COVID-19 affects everybody differently. Some people do not experience any

outward symptoms, while other people have severe symptoms that require hospitalization. If no symptoms appear in a person with the disease, it is known as asymptomatic COVID-19.

## BA.1, BA.2

Two highly infectious variants of the Omicron branch of the virus that causes COVID. The BA.2 branch is about 30% more contagious than BA.1 — the first Omicron lineage that sparked the winter surge of COVID-19 cases in December 2021. As of February 2022, the Omicron variant has mutated into three lineages: BA.1, BA.2, and BA.3. Because BA.2 is more infectious than BA.1 it has outcompeted BA.1 and mostly replaced it as the dominant strain of Omicron in the U.S. China and Europe and will eventually do so worldwide.

## B CELLS

B cells are a specialized type of immune system cells called lymphocytes (immune cell made in bone marrow, found in blood and lymph tissue). These “white blood” cells (sometimes called blood plasma) produce antibodies, which play a key part in your immune system's effectiveness at attacking pathogens. Each B cell contains a single round nucleus. Lymphocytes account for about 25% of all white blood cells, and B cells represent approximately 10% of total lymphocytes.

## BACTERIA

Bacteria are small single-celled organisms that may be harmful, neutral or helpful to the human body. The human body is full of bacteria, and in fact is estimated to contain trillions (1,000 billion is a trillion) more bacterial cells than human cells. Most bacteria in the body are harmless, and some are even helpful such as bacteria that we need to digest our food. A relatively small number of bacterial species cause disease. COVID-19 is caused by a virus, not a bacteria (see Virus). Antibiotics do not work against viruses. If you develop a bacterial infection as a complication, antibiotics may be recommended to treat that part of the infection.

## BOOSTER / BOOSTER DOSE

A COVID booster shot is an additional dose of a vaccine given after the protection provided by the original shot(s) has begun to decrease over time. The booster helps people maintain strong protection from severe coronavirus disease. Many childhood diseases require a booster or a set of booster shots administered every few years to fully train your immune system to resist a certain virus.

## CDC

The abbreviation for the U.S. Centers for Disease Control and Prevention – the official national public health agency of the United States. It is a U.S. federal agency, under the Department of Health and Human Services, and is headquartered in Atlanta, Georgia with offices around the world to help safeguard the world from diseases and public health disasters.

## CLINICAL TRIAL

The technical term for a highly controlled series of research studies in which one or more human subjects are assigned to one or more groups that may or may not receive a drug or use a new medical device. Clinical trials are carefully designed to evaluate the effects of those interventions on health-related biomedical or behavioral outcome and can cost as much as \$5 million to \$50 million to conduct over a period of years. Currently, there are about 7,804 registered COVID-19 studies, that are either vaccine-related or have at least one drug intervention from 149 different countries around the world.

## **CLOTH MASK**

A non-medical mask made of textiles, normally cotton, worn over the mouth and nose. In non-health care settings, multiple-layer fabric cloth masks can be adequate barriers for limiting the amount respiratory droplets and help to reduce viral transmission if they are worn consistently and properly, covering the nose and mouth. Cloth masks vary widely in quality and are unreliable. The CDC (Centers for Disease Control) clarified its stance on various kinds of masks, acknowledging that the cloth masks frequently worn do not offer adequate protection against COVID-19.

## **COMORBIDITY**

Another disease, precondition or infection that occurs at the same time (or earlier) from a different infection such as diabetes. Some comorbidities are not diseases themselves such as obesity.

## **CONFIRMED CASE**

A confirmed case is an individual who had a confirmatory viral test performed by way of a regulator-approved throat swab, nose swab or saliva test where that specimen tested positive for SARS-CoV-2, which is the virus that causes COVID-19 (see probable case). Published statistics usually only use a subset of confirmed cases since many confirmed cases are done using home tests that are not reported. Publicly measured confirmed cases are the “official counts” that are published and often dramatically understate the true number of total cases.

## **CONGREGATE SETTING**

An environment where a number of people reside, meet or gather in close proximity for either a limited or extended period of time. Examples of congregate settings include homeless shelters, group homes, prisons, and detention centers.

## **CONJUGATE VACCINE**

Conjugate vaccines or immunogen conjugates are type of vaccine formulation that use advanced forms of immune system enhancers. Conjugate vaccines are used extensively to generate protection against invading pathogens or to produce specific antibodies against a target molecule. Conjugate vaccines reduce vaccine serotypes in the top of the throat that connects the interior of the nose to the respiratory system. They consequently decrease harmful spread of a pathogen.

## **CONSPIRACY THEORY**

A theory that explains an event or set of circumstances as the result of a secret plot, usually involving powerful conspirators; or a theory asserting that a secret of great importance is being kept from the public. Conspiracy theories can paradoxically be emotionally reassuring. They provide simple, truthful-sounding explanations for events that otherwise seem inexplicable, random or arbitrary and often make your political opponents look bad. These theories are almost never true because, as a well-known political sage once explained, “Two people can keep a secret if one of them is dead.”

## **CONTACT TRACING**

The practice of identifying, notifying, and monitoring individuals who may have had close contact with a person having a confirmed or probable case of an infectious disease as a means of getting that person to be much more careful and thus controlling the spread of infection.

## **CONTAGIOUS**

When something is contagious it can be transmitted by direct or indirect contact with an infected person. Researchers estimate that

people who get infected with the coronavirus can spread it to others 2 to 3 days before symptoms start and are most contagious 1 to 2 days before they feel sick. Not all “contagious” things are physical. An idea can be contagious, or a musical tune can spread, as can a joke!

## **CONTAINMENT PHASE**

Steps introduced to prevent a virus from spreading for as long as possible, such as detecting early cases and trying to establish who the infected person has been in contact with. Lockdowns of areas, cities or even regions are a kind of large-scale containment strategy, as are the restrictions on public transportation widely used in China’s “zero-COVID” policy.

## **CONTAINMENT STRATEGY / MEASURES**

Containment strategies are typically the policy-level plans, rules and requirements that are designed to minimize the risk of transmission of a virus from infected to non-infected individuals, in order to stop the outbreak in a certain society, or limit it to a particular geographic region. Families or schools can have personal-level containment strategies when they are planning ahead for ways to slow the spread of infections.

## **CONVALESCENT PLASMA THERAPY**

A form of therapy that uses blood from people who have recovered from an illness to help others recover. The U.S. Food and Drug Administration (FDA) has given emergency authorization for convalescent plasma therapy with high antibody levels to treat COVID-19. It may be used for some hospitalized people ill with COVID-19 who are either early in their illness or who have weakened immune systems. Some studies have indicated limited effectiveness of this type of therapy for certain similar groups (called cohorts) of people with COVID.

## **COPD (Chronic Obstructive Pulmonary Disorder)**

A chronic inflammatory lung disease that causes obstructed airflow from the lungs. Symptoms include breathing difficulty, cough, mucus (sputum) production and wheezing. About 80% of people recover fully from COVID-19 without medical treatment. But your COPD puts you at higher risk to get seriously sick if you were to get infected with SARS-CoV-2, the virus that causes COVID-19.

## **CORONAVIRUS**

Any of a group of RNA viruses that cause a variety of respiratory, gastrointestinal, and neurological diseases in humans and other animals. This virus is named “corona” because it is a spherical shape with spiky projections, which looks somewhat like the halo, or corona, around the sun. Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus.

## **COVAX**

COVAX is the vaccine-focused arm of the Access to COVID-19 Tools (ACT) Accelerator, a ground-breaking global collaboration to accelerate the development, production, and equitable access to COVID-19 tests, treatments, and vaccines. COVAX is co-led by the Coalition for Epidemic Preparedness Innovations (CEPI), Gavi and the World Health Organization (WHO), alongside key delivery partner UNICEF. Its aim is to accelerate the development and manufacture of COVID-19 vaccines, and to guarantee fair and equitable access for every country in the world.

## **COVID**

An acute respiratory illness in humans caused by a coronavirus, capable of producing severe symptoms and in some cases death,

especially in older people and those with underlying health conditions. It was originally identified in China in 2019 and became pandemic in 2020.

### **CT SCAN**

A procedure that uses a computer linked to an x-ray machine to make a series of detailed pictures of areas inside the body. The pictures are taken from different angles and are used to create 3-dimensional (3-D) views of tissues and organs. A contrast agent (dye) may be injected into a vein or swallowed to help the tissues and organs show up more clearly. A CT scan may be used to help diagnose disease, plan treatment, or find out how well treatment is working. Also called CAT scan, computed tomography scan, computerized axial tomography scan, and computerized tomography.

### **CYTOKINE / CYTOKINE STORM**

Cytokines are small cell-signaling proteins that are secreted by numerous cell types. They help regulate both the innate and adaptive immune systems. They also create inflammation which helps the body fight infections. COVID-19 infection is accompanied by an aggressive inflammatory response with the release of a large amount of pro-inflammatory cytokines in an event known as “cytokine storm.”

### **DANGEROUS BELIEF**

A dangerous belief is a mistaken or highly questionable idea about health that is (a.) not supported by current scientific studies or by responsible consumer media; (b.) in the judgment of our Advisory Committee, is held by a significant percentage of people, or has received widespread media exposure; and (c.) if widely acted upon, could have significant, negative consequences for individual health and society’s well-being. Dangerous Beliefs stand in contrast to beliefs that are simply wrong, but not dangerous or not widely held, such as “Mosquitos spread COVID” or “One brand of mRNA vaccines is better than another.”

### **DEATH RATE**

In the context of the COVID pandemic, the death rate is a measure of the number of people who die from the disease compared to how many get the disease. Confusion over this term, or differing definitions, can make countries’ numbers look vastly different, even if their populations are dying at the same rate. There are, in fact, two kinds of fatality rate. The first is the proportion of people who die who have tested positive for the disease. This is called the “case fatality rate.” The second kind is the proportion of people who die after having the infection overall; as many of these will never be picked up, this figure must be an estimate. This is the “infection fatality rate.”

### **DEXAMETHASONE**

A cortisone-like medicine or steroid that can be a life-saver for patients with severe or critical COVID-19. It is also used to treat several different conditions, such as inflammation (swelling), severe allergies, adrenal problems, arthritis, asthma, blood or bone marrow problems, kidney problems, skin conditions, and flare-ups of multiple sclerosis.

### **DIAGNOSE / DIAGNOSIS**

The process of determining the nature of a disease or disorder and distinguishing it from other possible conditions. The term comes from the Greek gnosis, meaning knowledge. A health history, physical exam, and tests, such as blood tests, imaging tests, and biopsies, may be used to help make a diagnosis.

### **DIRECT TRANSMISSION**

In direct transmission, an infectious agent is transferred from a reservoir (person or animal with the disease) to a susceptible host by direct contact or droplet spread. Direct contact occurs through skin-to-skin contact, kissing, and sexual intercourse. Direct contact also refers to contact with soil or vegetation harboring infectious organisms.

### **DISINFECTANT**

An agent used to disinfect something, especially a chemical agent that is used especially on hard surfaces and in water (such as drinking water or wastewater) to destroy, inactivate, or significantly reduce the concentration of pathogens (such as bacteria, viruses, and fungi).

### **DISINFORMATION**

Disinformation is false information deliberately created and disseminated with malicious intent. Most disinformation that has circulated about COVID-19 vaccines has focused on vaccine development, safety, and effectiveness, as well as COVID-19 denialism.

### **DNA**

DNA, or deoxyribonucleic acid, is the hereditary material in humans and almost all other organisms. It is a genetic code that allows the reproduction of exact copies of cells and allows parents to pass on their physical traits to children. Every cell in a person’s body has the same DNA. mRNA is not the same as DNA, and it cannot combine with our DNA to change our genetic code.

### **DOSE**

A quantity of a drug or medicine taken or recommended to be taken at a particular time.

### **DOUBLE MASKING**

Wearing one mask on top of another. It helps improve the fit and filtration of your mask.

### **DROPLET**

A very small drop that can linger in the air for hours, and can float on the slightest breeze to move a long distance from the person or animal who emitted it in a cough or sneeze.

### **DRY COUGH**

A cough is a reflex action that clears your airway of irritants and mucus. There are two types of coughs: productive and nonproductive. A productive cough produces phlegm or mucus, clearing it from the lungs. A nonproductive cough, also known as a dry cough, does not produce phlegm or mucus.

### **DYSGEUSIA**

Dysgeusia is a taste disorder. People with the condition feel that all foods taste sour, sweet, bitter or metallic. Dysgeusia can be caused by many different factors, including infection such as COVID-19, some medications and vitamin deficiencies. Treatment involves addressing the underlying cause of dysgeusia.

### **DYSPNEA**

Shortness of breath. It is often described as an intense tightening in the chest, air hunger, difficulty breathing, breathlessness or a feeling of suffocation. Very strenuous exercise, extreme temperatures,

obesity and higher altitude all can cause shortness of breath in a healthy person. Shortness of breath is a possible symptom of COVID-19.

## **EVIDENCE**

Facts that establish or support conclusions. Evidence-based medicine (EBM) equates evidence with scientific evidence and views factors such as clinical expertise as important in moving from evidence to action. In contrast, we suggest that EBM should acknowledge multiple dimensions of evidence including scientific evidence, theoretic evidence, practical evidence, expert evidence, judicial evidence and ethics-based evidence.

## **EFFECTIVENESS**

A measure of how well a drug, vaccine or other medicine performs in the real world.

## **EFFECTIVE RATE**

The percentage or amount of effectiveness that is actually achieved after everything has been considered, rather than a rate that is planned, offered, etc.

## **EFFICACY**

The degree to which a vaccine prevents disease, and possibly also transmission, under ideal and controlled circumstances – comparing a vaccinated group with a placebo group.

## **EMA (European Medicines Agency)**

An international government body and regulatory organization. The mission of the European Medicines Agency (EMA) is to foster scientific excellence in the evaluation and supervision of medicines, for the benefit of public and animal health in the European Union (EU).

## **EMPHYSEMA**

Emphysema is a lung condition that causes shortness of breath. In people with emphysema, the air sacs in the lungs (alveoli) are damaged. Over time, the inner walls of the air sacs weaken and rupture — creating larger air spaces instead of many small ones. In the absence of pathological lungs, COVID-19 can cause giant emphysema. The severity is related to the size of the emphysema, which is a source of compressive phenomenon.

## **ENDEMIC**

The Centers for Disease Control and Prevention (CDC) says an endemic disease is consistently present, but it spreads at predictable rates that can be managed by communities. These rates may be higher than desired levels, however. Currently, infections with SARS-CoV-2 and the resulting COVID-19 disease remain very high across the U.S. and the world. In 2022, as the spread of the disease and the number of infections stabilized, health experts began to discuss the possibility of COVID-19 becoming an endemic disease.

## **EPIDEMIC**

Epidemic is a sudden, often unexpected rise in the number of cases of a particular disease. An epidemic is typically limited to a specific region or geographic area. Examples of epidemics include outbreaks of measles and hepatitis A. However, not all epidemics are contagious. In December 2019, the coronavirus was considered an epidemic within a region of China.

## **EPIDEMIC CURVE / PEAK**

An epidemic curve (epi curve) shows progression of illnesses in an

outbreak over time. Epi curves depict when people became ill by day, week, or month. In foodborne outbreak investigations, this information is often shown by the week people became ill. Despite progresses in determining the magnitude and timing of epidemics, epidemic peak time predictions for H1N1 and COVID-19 were inaccurate, with the peaks delayed with respect to predictions.

## **EPIDEMIOLOGY**

The scientific, systematic, and data-driven study of the distribution (frequency, pattern) and determinants (causes, risk factors) of health-related states (infectious diseases, non-infectious disease etc.) and events in specified populations (neighborhood, school, city, state, country, global). It is also the application of this study to the control of health problems.

## **EUA (Emergency Use Authorization)**

Emergency Use Authorization (EUA) is a grant of authority given by the FDA that enables faster medical use of certain measures when urgently needed to strengthen the nation's public health. Especially likely to be granted regarding protections against chemical, biological, radiological, and nuclear (CBRN) threats including infectious diseases, by facilitating the availability and use of medical countermeasures (MCMs) needed during public health emergencies.

## **EXCESS DEATHS**

The number of deaths from all causes during a crisis above and beyond what we would have expected to see under “normal” conditions. Excess deaths are typically used in epidemiology and public health. It is a more comprehensive measure of the total impact of the pandemic on deaths than the confirmed COVID-19 death count alone. It captures not only the confirmed deaths, but also COVID-19 deaths that were not correctly diagnosed and reported as well as deaths from other causes that are attributable to the overall crisis conditions.

## **EXPONENTIAL GROWTH**

A very high-speed rate of expansion where the rate of increase (how fast something is growing) keeps going higher as the quantity increases. In mathematical terms it is growth where the exponent of 10 to the x power keeps growing from 10 to 100 to 1,000 to 10,000 etc... For example, exponential growth is the situation where the more people who have an infectious illness, the faster it spreads in proportional terms.

## **EXPOSURE**

The condition of being subjected to something, as to infectious agents or extremes of weather or radiation, which may have a harmful effect or a harmful cumulative effect. The time from exposure to symptom onset (known as the incubation period) for COVID-19 is generally two to 14 days. Symptoms typically appeared within five days for early variants, and within four days for the Delta variant and about three days for the Omicron variant.

## **FACT CHECKING**

Fact-checking is a process that seeks to verify supposed factual information, to promote the veracity and correctness of reporting by consulting reliable sources that often show the underlying data or references to that data. Fact-checking can be conducted before or after a text or video is published or otherwise disseminated.

## **FAKE NEWS**

“Fake news” is a term that has come to mean different things to different people. At its core, we are defining “fake news” as those news stories that are false: the story itself is fabricated, with no verifiable facts, sources or quotes that are material to the story

being reported. Sometimes these stories may be propaganda that is intentionally designed to mislead the reader or may be designed as “clickbait” written for economic incentives (the writer or publisher profits based on the number of people who click on the story). In recent years, fake news stories have proliferated via social media, in part because they are so easily and quickly shared online and because some governments or media organizations have spent many millions of dollars creating and/or promoting those false or intentionally misleading stories.

## **FDA**

The U.S. Food and Drug Administration (FDA) is the globally respected national U.S. regulatory agency responsible for protecting the public health by ensuring the safety, efficacy, and security of human and veterinary drugs, biological products, and medical devices; and by ensuring the safety of the U.S. food supply, cosmetics, and products that emit radiation. FDA is working with U.S government partners, including the CDC, and international partners to address the COVID pandemic.

## **FEVER**

A fever is a temporary increase in your body temperature, often due to an illness. Having a fever is a sign that something out of the ordinary is going on in your body. For an adult, a fever may be uncomfortable, but usually isn't a cause for concern unless it reaches 103 F (39.4 C) or higher. For infants and toddlers, a slightly elevated temperature may indicate a serious infection.

## **FFP2 MASK (Filtering Facepiece Respirator)**

FFP stands for “filtering face piece.” It is a European standard for mask efficiency, ranging from one, the lowest grade, to three, the highest. FFP2 masks filter at least 94% of all aerosols, including airborne viruses such as COVID-19. America's N95 and China's KN95 masks provide similar levels of protection. These disposable masks have several layers of different fabrics, including a polypropylene filter, made by “melt-blowing” polymer to create minuscule, irregular fiber patterns that can trap the smallest airborne particles often using tiny electrical charges (electrostatic) that trap viruses that are so small that 100 million can fit in the head of a pin.

## **FLU**

A common viral infection caused by one of many types of influenza virus that can be seriously sickening or deadly, especially in high-risk groups. The flu attacks the lungs, nose and throat. Young children, older adults, pregnant women and people with chronic disease or weak immune systems are at high risk. Symptoms include fever, chills, muscle aches, cough, congestion, runny nose, headaches and fatigue.

## **FLU SHOT**

Influenza (flu) vaccines (often called “flu shots”) are vaccines that protect against some number of different influenza viruses that research indicates are likely to be the most common during the upcoming season. Since the virus mutates every year like clockwork, scientists must guess which strains are most likely to show up and their guesses can be hit or miss for any given flu season. A typical year has shots that are about 30% effective though “efficacy” (effectiveness) can range from 15-60%. Most flu vaccines are “flu shots” given with a needle, usually in the arm, but there also is also a nasal spray flu vaccine.

## **FOMITE**

Objects or materials such as clothes, utensils, and furniture which are likely to be able to carry small amounts of infectious pathogens.

SARS-CoV-2 is primarily transmitted via droplets and aerosols expelled during speaking, coughing, sneezing, and other respiratory actions. It is secondarily transmitted via small deposits on environmental surfaces called fomites when infectious viral particles are transferred from an infected person to a surface, and subsequently to the mucous membranes of a susceptible host. Fomites may become contaminated in two ways: either from direct deposit of bodily fluids such as respiratory droplets, or via cross-contamination from contaminated hands.

## **FULLY VACCINATED**

The status of having the entire course of vaccines or vaccinations recommended by medical authorities where the number of vaccinations needed may change over time due to mutations or waning protection from vaccines or prior infection. In the COVID pandemic, patients are considered “fully vaccinated” after receiving their second dose of most vaccines, followed a few months later by at least one and sometimes two booster shots based on their risk grouping.

## **GAIN-OF-FUNCTION**

Gain-of-function (GOF) research involves experimentation that aims or is expected to increase the transmissibility and/or virulence of pathogens. Such research aims to improve understanding of disease-causing agents, their interaction with human hosts, and/or their potential to cause pandemics. The ultimate objective of such research is to better inform public health and preparedness efforts and/or development of medical countermeasures. The term was originally coined to describe two controversial research projects on a particularly dangerous type of bird flu influenza virus (H5N1) and was later applied to specific experiments on coronavirus.

## **GENOME**

A genome is the complete set of genetic information in an organism. It provides all the information the organism requires to function. In living organisms, the genome is stored in long molecules of DNA (deoxyribonucleic acid) called chromosomes. Small sections of DNA, called genes, code for the RNA (ribonucleic acid) and protein molecules required by the organism

## **GENETIC SEQUENCING**

A process in which the individual basic parts of an organism's DNA are identified. This technique is used to learn more about the genome of the organism as a whole, and to identify specific areas of interest and concern. Genetic sequencing can be done on any cell in the body to look for potential problem variations of genes (mutations) that were carried or miscopied from either parent's germ cell (egg or sperm). A mutation that is inherited is called a germline mutation. Genetic testing looks for germline mutations. Targeted gene sequencing (Genetic Sequencing) examines a subset of 100-500 genes most likely to have been mutated. It is enabled by a technique called Next Generation Sequencing.

## **GENOMIC SEQUENCING**

Whole genome sequencing looks at all the genes in an organism whether large or very small (e.g., from the human genome to the Coronavirus-19 genome). Genomic sequencing goes beyond testing for SARS-CoV-2 and allows scientists to classify a virus as a particular variant and determine its lineage. Genomic surveillance has been a key component of public health efforts throughout the COVID-19 pandemic.

## **GUIDELINES**

Guidelines are generally defined as “systematically developed statements to assist medical professionals, scientists and patients



to make decisions about appropriate health care for specific circumstances.” Guidelines are “tools” to help decision-makers make better decisions and therefore it is essential that both development and implementation strategies are clearly focused on the “end user” decision-makers.

### **HAND HYGIENE**

A set of hand-related cleanliness practices designed as a simple yet effective way to prevent infections. Frequently cleaning your hands, using hand sanitizers, and other steps can prevent the spread of germs, including those that are resistant to antibiotics and are becoming difficult, if not impossible, to treat.

### **HEALTH DISPARITIES / INEQUALITIES**

Preventable differences in the burden of disease, injury, violence, or opportunities to achieve optimal health that are experienced by socially disadvantaged populations. Health disparities are generally considered highly undesirable, unfair, uneconomic and undemocratic and are directly related to the historical and current unequal distribution of social, political, economic, and environmental resources.

### **HEALTH LITERACY**

The degree to which individuals have the capacity to obtain, process, and understand basic health information needed to make informed health decisions. Low health literacy is more prevalent among older adults, minority populations, people with low incomes or educations and medically underserved people. Health literacy is therefore more important than ever for people to navigate the information they need and use health information well.

### **HEALTH MINISTRY / MINISTER**

Ministry: the agency of a country's government typically responsible for protecting and promoting public health and providing welfare and other social services. The Minister is typically the title of the leader in charge of such an agency. Some governments have separate Ministers for Mental Health.

### **HEPA**

An acronym for "high efficiency particulate air [filter]" (as officially defined by the U.S. Dept. of Energy). HEPA is a specialized type mechanical air filter. This type of air filter can theoretically remove at least 99.97% of dust, pollen, mold, bacteria, and any airborne particles with a size of 0.3 microns (a  $\mu\text{m}$  is a millionth of a meter). HEPA filters can catch particles that contain coronaviruses.

### **HERD IMMUNITY**

Also known as “population immunity.” Herd immunity occurs when enough people in a total population are either immune or highly resistant to a disease so that unvaccinated people are unlikely to contract a circulating disease, or unlikely suffer serious effects from it. WHO supports achieving “herd immunity” only through vaccination, not by allowing a disease to spread through the population, as this would result in unnecessary cases and injuries or deaths. Herd immunity cannot occur (or is largely ineffective) if a virus or bacteria regularly mutates in such a way that having had an infection earlier from the pathogen does not fully prevent a person from getting the same “disease” again. This is the case with the flu, a common cold or COVID-19 as well as many other diseases.

### **HETEROLOGOUS / HOMOLOGOUS VACCINATION**

Heterologous administration occurs when two different types of vaccines are given that use the same or overlapping ways to vaccinate against a single disease. An effective vaccine usually

requires more than one-time immunization in the form of prime dose and a booster. Traditionally the same exact vaccines are given multiple times (sometimes with different doses) as homologous boosts. New findings suggested that a booster dose can be done with different type or brand of vaccine containing the same antigens (e.g., 2 Moderna shots with a Pfizer booster). In many cases such heterologous prime-boost can be more effective at preventing serious illness than a homologous prime-boost approach.

### **HHS, DEPARTMENT OF**

The U.S. Department of Health and Human Services (HHS) is a federal services and regulatory agency. It is tasked “with protecting and enhancing the health and well-being of all Americans, by providing for effective health and human services and by fostering sound, sustained advances in the sciences underlying medicine, public health, and social services.” HHS has a \$131 billion budget in FY 2022, the largest budget of any agency of the U.S. Government including the Department of Defense. Well known divisions, sub-agencies or departments of HHS include the Center for Medicare and Medicaid, the FDA, the NIH, the CDC, the U.S. Public Health Service, BARDA, the Strategic National Stockpile, the ASPR and many others.

### **HIGH QUALITY MASK**

High Quality Masks or Respirators (also known as filtering facepiece respirators – FFP, N95, KN95) are designed to protect health workers who provide care to highly contagious patients such as COVID-19 patients in settings and areas where aerosol generating risks are present. They are also recommended for health workers providing care to suspected or confirmed COVID-19 patients in settings where ventilation is known or likely to not filter out viruses quickly or the ventilation system is not properly maintained. High quality masks such as N95 or KN95 masks are critical in protecting people who do not want to spread COVID if they become infected (with or without symptoms) or do not want to become infected and develop COVID themselves in areas where aerosol concentrations of Coronavirus-19 are a possibility.

### **HOSPITALIZED**

Placed in a hospital for medical care or observation.

### **HUMAN CHALLENGE TRIALS**

Also called a controlled human infection trial. Challenge trials are a type of clinical trial for a vaccine or other pharmaceutical involving the intentional exposure of the test subject to the condition being tested such as being infected by COVID-19. Human challenge studies may be ethically controversial because they involve exposing test subjects to dangers beyond those posed by potential side effects of the substance being tested. Animal or primate/monkey trials are often used instead of human trials because many societies view the value of human life above those of animals.

### **HYDROXYCHLOROQUINE & CHLOROQUINE**

Two anti-malarial medications also used against some auto-immune diseases. Chloroquine, along with hydroxychloroquine, was an early experimental treatment for COVID-19. Neither drug prevents SARS-CoV-2 infection or has proven to be effective in accelerating recovery in carefully controlled scientific trials. WHO does not recommend hydroxychloroquine to prevent COVID-19. This recommendation is based on six trials with more than 6,000 participants who did not have COVID-19 and received hydroxychloroquine.

### **HYGIENE**

Hygiene is a series of practices performed to preserve health. According to the World Health Organization (WHO), hygiene refers

to conditions and practices that help to maintain health and prevent the spread of diseases. It covers a wide range of possible activities from hand-washing, to sneezing into your upper arm instead of your hands, proper hand washing methods, the proper wearing of well-fitted quality masks when appropriate, etc.

### **ICU / INTENSIVE CARE UNIT**

Intensive care refers to the specialized treatment given to patients who are seriously unwell and require critical medical care where death or permanent damage is a real risk. An intensive care unit (ICU) is the hospital zone and/or team that provides the critical care and life support for acutely ill and injured patients. Unless you are an emergency admission, you will need a referral from your doctor or specialist to be admitted to the ICU.

### **IMMUNIZATION, IMMUNIZE**

Immunization is the process of giving a vaccine to a person to protect them against either certain kinds of future infections or specific diseases that result from infections that cannot be avoided. Typically, immunity (actually, a level of protection) from immunization is similar to the immunity a person might get from having had the actual disease, but instead of getting the disease you get a vaccine. Most vaccines are given by needle (injection) but some are given by mouth (orally) or sprayed into the nose (nasally). Immunizations are also called vaccinations, needles, shots, or jabs.

### **IMMUNITY**

The body's level of resistance to infection or toxin. When used by scientists, as opposed to the general public, the term immunity does not mean 100% freedom from harm. This is different than immunity from legal prosecution, or diplomatic immunity, which does mean that you cannot be prosecuted and thus tends to be total immunity (see sterilizing immunity). In science, immunity is specifically the ability of an organism to fight off a particular infection or toxin, or to reduce or minimize its effects, by the action of specific antibodies or sensitized white blood cells. Immunity is a scale of resistance to infection up to 100% (called sterilizing immunity), but in the case of COVID it does not mean guaranteed avoidance of infection.

### **IMMUNOCOMPROMISED / IMMUNOSUPPRESSED**

Having a weakened immune system. People who are immunocompromised have a significantly reduced ability to fight infections and other pathogens. This may be caused by certain diseases or conditions that stress or harm the immune system, such as AIDS, cancer, diabetes, malnutrition, and certain genetic disorders. It may also be caused by certain medicines or treatments, such as anticancer drugs (e.g., chemotherapies), radiation therapy, and stem cell or organ transplant. Also called immunosuppressed.

### **IMMUNOLOGY / IMMUNE SYSTEM**

Immunology is the study of the immune system, an important branch of the medical and biological sciences. The immune system protects us from infection through various lines of defense. Viewed as a total system (like a national highway or train system) the human immune system is so amazing in defending us from millions of attacking pathogens per hour that it is considered one of the most complex interconnected processes in the known universe (along with the human brain). If the immune system is not functioning as it should, it can result in certain diseases being far more likely to cause problems or death. When the immune system attacks a person's own body, it is called an autoimmunity disorder such as in the case of HIV, many allergies, Type 1 diabetes and lupus.

### **IMPORTED CASE**

Although the definition of imported cases when used internationally mostly refers to cases imported from abroad, from the perspective of epidemiology, an imported case means that the patient was infected non-locally and imported the disease into the local area.

### **IN VITRO**

Literally meaning in glass, or in the glass. In vitro studies are those performed with microorganisms, cells, or biological molecules outside their normal biological context (usually in a glass dish called a petri dish or a test tube). Colloquially called "test-tube experiments," these studies in biology and its subdisciplines are traditionally done in labware such as test tubes, flasks etc. Studies conducted using parts of an organism that have been isolated from their usual biological surroundings permit a more detailed or more convenient analysis than can be done with whole organisms; however, results obtained from in vitro experiments often do not fully or accurately predict the effects on a whole living organism.

### **INCIDENCE**

The rate of new cases or events over a specified period for the population at risk for the event. In medicine, the incidence is commonly the newly identified cases of a disease or condition per population at risk over a specified timeframe.

### **INCIDENCE RATE**

The number of new cases of a disease within an at-risk population. This helps determine how quickly a disease is spreading. It is often expressed in units of population, such as "per 100,000 people."

### **INCUBATION PERIOD**

The time between infection and the appearance of the first symptoms. Coronavirus has a typical incubation period of around 3-5 days. However, this period can be as long as 14 days in certain people or in certain circumstances. For COVID, the contagious period where you can start to infect other people begins two days before symptoms appear — which is a very big problem because many people unknowingly spread COVID before they have any idea they are infected. The COVID contagious period typically ends 10 days after symptoms start, but can last for months in immunocompromised people that never fully clear the COVID-19 coronavirus because their immune systems aren't strong enough to overcome and eliminate a rapidly growing, steadily mutating virus infection.

### **INDEX CASE**

The single patient in an outbreak who is first identified as sick by the health authorities, and who makes them aware that an outbreak might be emerging even if that patient isn't the person who goes on to infect other people. For outbreaks of disease that are not spread from human to human, such as Legionnaire's disease, there can still be a "first" index case. For many outbreaks, the index case will never be known—the worldwide HIV epidemic is one example.

### **INDIRECT TRANSMISSION**

The transfer of an infectious agent from a reservoir to a host without directly interacting with the infected person. You can get infected from objects that have coronavirus on their surface for example. If the indirect form of transmission is from an organic or viral intermediary, that intermediary is called a vector.

### **INFECTION / INFECTIOUS**

Infection is the state of the body having the presence of a pathogen or toxin. This state results from one or more pathogenic agents or

microorganisms (e.g., bacteria, viruses, protozoans, or fungi) in or on the body of a suitable host. Infectious means the state of a carrier being able to transmit a pathogen, toxin or disease to other people, organisms, etc.

### **INFECTION CONTROL**

A practical, evidence-based approach to public health policy and practice that helps to prevent patients and health workers from being harmed by avoidable infections. Measures to achieve such prevention range from hygienics to surveillance and analysis of potential disease presence. Effective infection control requires constant action at all levels of the health system, including policymakers, facility managers, health workers and those who access health services. At many hospitals, a lack of effective infection control leads to the spread of disease and is a leading cause of death and injury.

### **INFECTION FATALITY RATE**

Also known as IFR for short. This is the proportion of deaths among all infected people for a specific infectious disease. In contrast to the case fatality rate (CFR), which is based on the number of clinically ill people, IFR includes all cases of asymptomatic (no symptoms of any kind) infection.

### **INFLUENZA**

A specific group of viral infections that attack your respiratory system -- nose, throat, and lungs. Influenza is commonly called the flu, but it's not the same as stomach "flu" viruses that cause diarrhea and vomiting. For most people, the flu resolves on its own after 1-2 weeks which can be very unpleasant and sometimes require hospitalization. Usually in less than 1 in 200 cases of influenza the resulting complications can be deadly, typically in either very young or very old patients. Influenza is a permanently mutating unstable group of viruses which is why there is no herd or sterilizing immunity at the current time. Influenza is an annual global pandemic that starts in the Australian summer each year with a new unpredictable strain which is then carried by migrating birds around the world to infect millions of people and killing many tens of thousands of them. In some years and as many as several hundred thousand people can die worldwide when the new strain is particularly aggressive.

### **INFODEMIC**

A relatively new term that describes the widespread sharing of a large amount of wrong information including false or misleading claims in digital and physical environments during a disease outbreak. Infodemics directly cause confusion and encourage risk-taking behaviors that can harm health or economic harm. It also leads to mistrust in health authorities and undermines the public health response. An infodemic can intensify or lengthen outbreaks when people are unsure about what they need to do to protect their health and the health of people around them.

### **INFUSION THERAPY**

Administration of medication or fluids through a needle or catheter, usually intravenously (IV) into your arm or a special "port" that has been implanted in patients who need to receive frequent new drugs directly to their bloodstream. Infusion is a way of delivering medication that cannot be taken orally, or that need to be dispensed at a carefully controlled pace in order to avoid bad reactions such as with many chemotherapies.

### **INTERFERONS**

Proteins that are part of your natural defenses. They tell your immune system that germs or cancer cells are in your body. And

interferons trigger killer immune cells to fight those invaders. Interferons got their name because they "interfere" with viruses and keep them from multiplying.

### **ISOLATION / ISOLATE**

The state (isolation) of being separated from others, or the action (to isolate) of separating or quarantining people. Isolation is sometimes used as a way to try to prevent disease from spreading since other people are physically kept away as much and as far as possible.

### **KAWASAKI DISEASE**

Also known as KD or as Kawasaki syndrome, an acute febrile (fever-related) illness of unknown cause that primarily affects children younger than 5 years of age. Clinical signs include fever, rash, swelling of the hands and feet, irritation and redness of the whites of the eyes, swollen lymph glands in the neck, and irritation and inflammation of the mouth, lips, and throat. CDC is investigating reports of multisystem inflammatory syndrome in children (MIS-C) associated with COVID-19 which may present with Kawasaki disease-like features.

### **KN95 MASK**

A specialized type of filtering mask. KN95s offer enhanced protection as do all well-fitting NIOSH-approved respirators. (N95s offer the highest level of pre-tested protection.) In short, KN95 masks are the Chinese standards for high quality masks, whereas N95 masks are the U.S. (United States) standards for respirator masks

### **LATERAL FLOW TEST (LFT)**

Also referred to as a rapid test or home test, an LFT is a simple device intended to detect the presence of a target substance in a liquid sample in 5-30 minutes, without the need for specialized and costly equipment. Home pregnancy tests are an example. COVID-19 lateral flow tests, also known as COVID-19 rapid diagnostic tests, offer a means of quickly testing for SARS-CoV-2, the virus that causes COVID-19, typically delivering a result in 15-30 minutes. The material being tested comes from a patient's nose and throat, and the kit contains antibodies specific to viral proteins. It is called lateral flow because a liquid with your cells gradually flows through a short narrow strip of paper that has been impregnated with certain chemicals that show colored lines when a test is positive.

### **LINEAGE**

A group of closely related viruses with a common ancestor. SARS-CoV-2 has many lineages that can be traced back to the original strain that first appeared in Wuhan, China; all of which cause COVID-19.

### **LONG COVID**

An informal term commonly used to describe signs and symptoms that continue or that develop several weeks after recovery from an acute infection of COVID. Depending on how long you have ongoing symptoms for, it can be called one of 2 things: (a) Ongoing symptomatic COVID. This is where your symptoms continue for more than 4 weeks. If your symptoms last for longer than 12 weeks, it will then be called; (b) Post-COVID Syndrome. This is where your ongoing symptoms continue for longer than 12 weeks and cannot be explained by any other condition. Long COVID is estimated to occur in 5-20% of all COVID cases and is far more common in unvaccinated cases and severe cases. Mild or asymptomatic (no symptoms) can still lead to crippling cases of Long COVID, even among healthy people with no other risk factors except having had a so-called mild case.

### **LMICS (Low- and Middle-Income Countries)**

Nations with a gross national income (GNI) per capita between \$1,036 and \$4,045. By comparison, upper middle-income economies are those with a GNI per capita between \$4,046 and \$12,535 (2021). Middle income countries (MICs) are home to 75% of the world's population and 62% of the world's poor. At the same time, MICs represent about one third of global GDP and are major engines of global growth. Most countries in South America, Africa and Asia fall into this category.

### **LOCKDOWN**

A restriction policy for people or all the members of an entire community to stay at home or stay where they are, usually due to specific risks to themselves or to others if they were to move and interact freely. Due to the COVID-19 pandemic, a number of non-pharmaceutical interventions (NPIs) colloquially known as lockdowns (encompassing stay-at-home orders, curfews, quarantines, cordons sanitaires and similar societal restrictions) have been implemented in numerous countries and territories around the world. These restrictions were established with the intention to reduce the spread of SARS-CoV-2, the virus that causes COVID-19.

### **LOCAL TRANSMISSION / COMMUNITY TRANSMISSION**

Local transmission occurs when infected individuals can trace the person they were infected by. Community transmission, also known as community spread, is the process of an infectious illness spreading through a large group of people in a general way, so that the source of the infection in a particular case is not known. The community transmission of a virus essentially implies that a virus is moving freely in the community.

### **LONG-HAULER**

People living with post-COVID syndrome, including a person showing symptoms of Long COVID. The problem has several names. The National Institutes of Health refer to long-term COVID-19 symptoms as PASC, which stands for post-acute sequelae of SARS-CoV-2. More common terms are post-COVID syndrome, Long COVID or long-term COVID.

### **MASS TESTING**

The practice of testing a population as a whole group regardless of reason, not confined to only those who are showing symptoms or have recently been exposed to a virus. Such widespread testing is designed to find people with active infection who are asymptomatic (no symptoms but infected) or pre-symptomatic (infected, but no symptoms showing yet) so that quarantine, and rapid finding and testing of close contacts, can hopefully interrupt spread before it gets completely uncontrollable (out of control).

### **MEDIAN INCUBATION PERIOD**

The time between exposure to the virus and the appearance of the first symptoms. A new study by the University of Massachusetts Amherst calculates that the median (half under and half over the number) incubation period for COVID-19 is just over 5 days and that 97.5% of people who develop symptoms will do so within 11.5 days of infection.

### **MEDICATION**

A dosage form that contains one or more active and/or inactive ingredients. Medications come in many dosage forms, including tablets, capsules, liquids, creams, and patches. They can also be given in different ways, such as by mouth, by infusion into a vein, or by drops that are put into the ear or eye. A medication typically delivers the active ingredient to prevent, diagnose, treat, or relieve symptoms of a disease or abnormal condition.

### **MERS**

Abbreviation for Middle East Respiratory Syndrome. MERS-CoV refers to a deadly viral respiratory illness caused by a specific kind of coronavirus (CoV), the same family of viruses that can cause the common cold and COVID-19. MERS-CoV was first reported in Saudi Arabia. Since then, it's been reported in other countries in the Middle East and in Africa, Europe, Asia and the United States. Approximately 34% of all known 2,428 cases in the last outbreak of MERS died (839 people), making it a very dangerous coronavirus.

### **MILD**

A term to describe something such as a feeling, attitude, or illness that is not very strong or severe. When doctors talk about mild COVID-19, they refer to an illness that is symptomatic but does not require hospitalization. But the illnesses encompassed in the "mild" category can mean many symptoms, including headache, congestion, or a loss of taste and smell. Some people may even be bedridden with a fever for a week or longer, and some die from what was originally diagnosed as "mild" COVID.

### **MISINFORMATION**

Incorrect claims or statements presented as fact or as scientifically validated knowledge, which mislead readers or listeners either intentionally or unintentionally. In other words, misinformation can be deliberate lies, or it can be mistaken claims shared by people who do not intend to mislead others. Misinformation often arises when there are information gaps or unsettled science, as human nature seeks to reason, better understand, and fill in the gaps. Some misinformation is intentionally malicious or acts intended to sow confusion and disruption to undermine authorities, economies, political events or societies.

### **MITIGATION**

In a medical context such as a pandemic, mitigation means the steps taken to avoid or reduce the spread of disease and minimize its broader effects on a population, its society and economy. According to the classic text, Disease Control Priorities, just a few examples of medical mitigation against pathogens that pose a pandemic risk might include having a hospital emergency plan to cope with a large influx of patients, improving water and sanitation systems, and preparing or implementing surge capacity to scale up production of needed medical supplies.

### **MONOCLONAL ANTIBODIES (MABS)**

Your body naturally makes antibodies to fight infection. However, your body may not have antibodies designed to recognize a novel (or new) virus such as SARS-CoV-2, the virus that causes COVID-19. Monoclonal antibodies, or mAbs, are made in a laboratory to fight a particular infection (in this case, SARS-CoV-2) and are given to you directly in an infusion. So, the mAb treatment may help kick-start your immune response if you are at high risk for serious symptoms or a hospital stay.

### **MORBIDITY**

The state of having or suffering from a specific illness or condition. While morbidity can refer to an acute condition, such as a respiratory infection, it often refers to a condition that's chronic (long-lasting). Some examples of common morbidities include: diabetes, high blood pressure (hypertension), heart disease.

### **MORBIDITY RATE**

A measurement of the portion of people in a specific geographical location who contracted a particular disease during a specific period of time. It indicates the frequency of the disease appearing in a population. The morbidity rate is shown as a percentage. It is

calculated by dividing the number of cases of a disease, injury, or disability by the total population during a specific time period.

### **MORTALITY RATE**

The incidence of death in a certain time window and geographic area or under the threat of a particular disease or condition, often given as an annual rate per 100,000 (Fig. 3.9). In most cases, in a forensic investigation, this time window is much smaller and should be adjusted accordingly.

### **MRNA**

A specialized molecule in the human body, called “messenger RNA.” This specialized “bio-messenger” carries genetic information from the DNA in the center (nucleus) of a cell, to the outer parts of the cell. The information guides the production of useful proteins that help defend the body against pathogens and toxins.

### **MULTI-DOSE VIALS**

A vial of liquid medication intended for parenteral administration (injection or infusion) that contains more than one dose of medication. Multi-dose vials are labeled as such by the manufacturer and typically contain an antimicrobial preservative to help prevent the growth of bacteria. All opened WHO-prequalified multi-dose vials of Covid-19 vaccines should be discarded at the end of the immunization session, or within six hours of opening, whichever comes first. When used safely, a new single-use syringe is deployed for each patient. The administrator withdraws the correct amount of a drug from a multi-dose vial and injects the drug, after which the used syringe is discarded. If a syringe is reused (which is improper procedure) the contents of the remaining doses in a multi-dose vial can be contaminated from the patient in which a syringe was previously used, thereby potentially transmitting a disease such as Hepatitis B, HIV, etc. Improper syringe use procedures with multi-dose vials kill an estimated 1 million people per year worldwide according to the WHO. This is partly why multi-dose vials are not frequently used in high-income countries and prefilled syringes are widely preferred.

### **MUTATION**

A change in a DNA sequence when a virus or other organisms makes copies of itself. Mutations can result from natural DNA copying mistakes made during cell division, from exposure to ionizing radiation such as x-rays, from exposure to certain chemicals called mutagens, from certain types of drugs that are meant to interfere with virus reproduction or from infection by viruses in other types of DNA such as human DNA.

### **MYOCARDITIS**

In simple terms, myocarditis is a disease that causes inflammation of the heart muscle. This inflammation enlarges and weakens the heart, creates scar tissue and forces it to work harder to circulate blood and oxygen throughout the body. Very rare reports of myocarditis have been received after the 2nd dose of COVID mRNA vaccines within a week of administration. It is considered a potential rare side-effect of an mRNA vaccine typically in males under age 18, the majority of whom recovered completely.

### **NATURAL IMMUNITY**

The condition of stronger resistance to infection that you get after being infected by a pathogen and your immune system responds by making antibodies to the pathogen. The infection can make you sick and potentially create permanent damage. But if you are exposed to that pathogen again in the future, your body's defenses spot it and fight back with antibodies and other related immune system “memory” responses. This makes you less likely to get

infected again or less likely to be as sick as before if the infection cannot be prevented. Less likely to be as sick is not a certainty, just a probability.

### **N95 MASK**

A respiratory protective device designed to achieve a very close facial fit and very efficient filtration of airborne particles. Note that the edges of the respirator are designed to form a seal around the nose and mouth. N95 masks are certified to FDA standards of quality and tested for life-threatening and life-protecting usage. N95 masks are almost always more expensive than nearly functionally equivalent KN95 masks that are not certified for life-preserving use by the FDA.

### **NATIONAL INSTITUTE OF HEALTH (NIH)**

NIH is the U.S. federal agency for medical research, supporting scientific studies that turn discovery into health. Scientific research is expensive and the U.S. government funds more primary medical research than any other country in the world. The NIH research budget is \$62.5 billion in 2023. The NIH also does more than research. For example, it has issued a set of guidelines for the diagnosis, treatment, and control of the coronavirus disease 2019 (COVID-19).

### **NEW NORMAL**

Changed circumstances that people probably have to accept or deal with as permanent conditions going forward. The term “new normal” first appeared during the 2008 financial crisis to refer to the dramatic economic, cultural and social transformations that caused economic uncertainty, layoffs and social unrest, impacting how we thought about our economy and our own sustainable lifestyles. This term has been used again during the COVID-19 pandemic to point out how the pandemic has changed the way we do things how we work, go to school, and how we operate in a world with a highly infectious deadly disease that isn't going away soon, if ever.

### **NHS (National Health Service UK)**

The umbrella term for the publicly funded healthcare systems of the United Kingdom (UK). Since 1948, The NHS has been funded out of general taxation. There are three systems which are referred to using the “NHS” name (the NHS in England, NHS Scotland, and NHS Wales). The NHS is a national single payer system (the government pays the bills) that all people in the UK can use with very limited additional costs, if any. Because it a nationwide system it has excellent data for the entire country all in one national data system. This allows for excellent analysis and case/symptom tracking that many other countries look to for detailed knowledge, including the U.S.

### **NOVEL CORONAVIRUS / NOVEL VIRUS**

Simply a term for a brand-new virus that has never been experienced in humans before and thus our 2 million-year-old immune systems have never “seen” before; and as a result, we don't know much about how the new virus will affect us over time. This kind of new virus event occurs rarely, but a few novel viruses (SARS, MERS, HIV, COVID-19) have emerged in the past 15 years. Only about 220 different viruses (in 26 families) of the millions of different viruses are harmful to humans, so a novel virus that creates disease in people and spreads rapidly is a rare big deal.

### **NPI (Non-Pharmaceutical Intervention)**

Actions, apart from getting vaccinated and taking medicine, that people and communities can take to help slow the spread of illnesses like pandemic influenza (flu). NPIs are also known as

community mitigation strategies. When deployed effectively, NPIs can make a very large difference in the amount of spread of a disease.

### **NUCLEIC ACID TEST**

A type of viral diagnostic test for SARS-CoV-2, the virus that causes COVID-19. Also called a Nucleic Acid Amplification Test, or NAAT. These tests detect genetic material (nucleic acids). NAATs for SARS-CoV-2 specifically identify the RNA (ribonucleic acid) sequences that comprise the genetic material of the virus. Sometimes referred to a PCR test (see PCR test).

### **OFFICE OF NATIONAL STATISTICS (ONS)**

The executive office of the UK Statistics Authority, a non-ministerial department which reports directly to the UK Parliament. The ONS is responsible for collecting and publishing statistics related to the economy, population and society at national, regional and local levels. The ONS, just like the U.S. CDC, publishes on its website the latest UK data and analysis on coronavirus (COVID-19) and its effect on the economy and society.

### **OMICRON, OMICRON VARIANT**

The Omicron variant of the COVID virus, like other variants, is comprised of several lineages and sublineages. The three most common lineages of Omicron currently are BA.1, BA.1.1 and BA.2. Omicron is the 15th letter of the Greek alphabet. Unlike some of the other Greek letters, it is recognizable in modern English as it takes the form of the letter "O." Sometimes mispronounced omnicon, there is no "n" in the Greek letter O.

### **OUTBREAK**

The occurrence of the total number of disease cases in an area in excess of normal expectancy. The number of cases varies according to the disease-causing agent, and the size and type of previous and existing exposure to the agent. Disease outbreaks are usually caused by an infection, transmitted through person-to-person contact, animal-to-person contact, or from the environment or other media. Outbreaks may also occur following exposure to chemicals, to radioactive materials or to other manmade agents.

### **PANDEMIC**

According to some strict medical definitions, a pandemic is the presence of an infectious disease in 3 or more continents. Other medical bodies such as the WHO define a pandemic more generally as an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people. Typically, a pandemic is the result of a new virus or virus strain for which people have no natural immunity. Because the SARS-CoV-2 virus was novel, humans had no natural defenses against it. This condition, combined with high rate of infectiousness, allowed the virus to spread rapidly via air travel initially, becoming a worldwide pandemic in a matter of months. In March 2020, the COVID-19 outbreak was declared a pandemic by the WHO.

### **PATHOGEN**

A pathogen is any harmful organism that causes disease. Your body is naturally full of billions of microbes and hundreds of trillions of very very small viruses. However, these microbes only cause a problem if your immune system is weakened or if they manage to enter a normally sterile part of your body. Pathogens can cause disease upon entering the body. All a pathogen needs to thrive and survive is a host. Pathogens can be transmitted in a few ways depending on the type. They can be spread through skin contact, bodily fluids, airborne particles and aerosols, contact with feces, and touching a surface touched by an infected person.

### **PATHOLOGY**

The study of disease. It is the bridge between science and medicine. It underpins every aspect of patient care, from diagnostic testing and treatment advice to using cutting-edge genetic technologies and preventing disease. It involves the examination of tissues, organs, bodily fluids, and autopsies in order to study and diagnose disease.

### **PATIENT ZERO**

The person who has the first case in a chain of infections is sometimes called "patient zero." Some medical experts and epidemiologists believe "patient zero" is an imprecise term, preferring to call the first case in an outbreak to come to the attention of investigators the "index case." The actual individual who introduced the disease at the start of the outbreak is called the "primary case."

### **PAXLOVID**

The first antiviral medicine to be given by mouth that is recommended in the EU and FDA for treating COVID-19. It contains two active substances, PF-07321332 and ritonavir, in two different tablets. PF-07321332 works by reducing the ability of SARS-CoV-2 (the virus that causes COVID-19) to multiply in the body while ritonavir prolongs the action of PF-07321332 enabling it to remain longer in the body at levels that affect the multiplication of the virus.

### **PCR TEST**

PCR stands for polymerase chain reaction. It's a test to detect genetic material from a specific organism, such as a virus. The test detects the presence of a virus if you have the virus at the time of the test. The test could also detect fragments of the virus even after you are no longer infected, sometimes as long as 30 days after you have cleared an infection but have inactive parts of the virus in your bloodstream that will be detected by the PCR test. For that reason lateral flow tests (home tests) are more useful in many cases since 2 or 3 consecutive days of negative results indicate you are no longer infectious since LFTs do not amplify viruses pieces, but simply measure total viral load.

### **PEDIATRIC**

Pediatrics is the branch of medicine dealing with the health and medical care of infants, children, and adolescents from birth up to the age of 18. The word "paediatrics" means "healer of children"; and is derived from two Greek words: (pais = child) and (iatros = doctor or healer)

### **PEER REVIEW**

The evaluation of scientific research or analytical work by one or more people with similar competencies as the original producers of the work (peers). Such a review functions as a form of self-regulation and quality control by expert members of a profession within the relevant field. Peer review methods are used to maintain scientific standards, improve performance, and provide credibility. In academia, scholarly peer review is often used to determine an academic paper's suitability for publication.

### **PERSON-TO-PERSON TRANSMISSION**

Passage of a disease from one individual to another through direct contact. Transmission occurs when an infected person touches or exchanges body fluids with someone else. This can happen before an infected person is aware of the illness. Sexually transmitted diseases (STDs) are usually transmitted this way.

### **PNEUMONIA**

A type of lung infection that inflames the air sacs in one or both

lungs. The air sacs may fill with fluid or pus (purulent material), causing cough with phlegm or pus, fever, chills, and difficulty breathing. A variety of organisms, including bacteria, viruses and fungi, can cause pneumonia. Pneumonia is a serious complication of the novel coronavirus, COVID-19.

### **POSITIVITY / POSITIVITY RATE**

The positivity rate is the percentage of COVID-19 tests that are positive for SARS-CoV-2 indicating existence or presence of COVID. The percentage of positive tests is a good measure (but not perfect) of how much virus is likely circulating among untested people. When the positivity rate is less than 1 or 2% we are generally confident that the rate in the whole population is low even if only a few thousand people are being tested. If the positivity rate is high, say 6-12%, then it is very likely that the rate of COVID infection is much higher in the total population that is not being tested. The highest COVID positivity rates have been 30%+ in some severe outbreak areas during the pandemic.

### **PPE (Personal Protective Equipment)**

PPE is the widely used abbreviation for personal protective equipment. It is specialized clothing or equipment worn by health workers and others for protection against health and safety hazards such as SARS CoV-2. These items are designed to protect many parts of the body, i.e., eyes, head, face, hands, feet, and ears.

### **PPI (Proton Pump Inhibitor)**

Medicines that work by reducing the amount of stomach acid made by glands in the lining of the patient's stomach, in order to treat certain disorders such as heartburn and ulcers. A large-scale study of PPI use in patients with COVID-19 suggests that PPI use is associated with a more severe COVID-19 course, especially among short-term users. The authors suggest that this increased risk may be due to alkalinization of the stomach, allowing for greater virus colonization.

### **PRE-EXISTING CONDITION**

A medical illness or injury that you have before you had a new diagnosis or before you started a new health care plan may be considered a "pre-existing condition." Conditions like diabetes, COPD, cancer, and sleep apnea, may be examples of pre-existing health conditions. They tend to be chronic or long-term.

### **PRE-PRINT / PRE-PRINT SERVER**

"Preprints" are preliminary versions of scientific manuscripts that researchers share by posting to online platforms known as preprint servers. These preliminary draft reports are being shared before peer-review and publication in an academic journal. Preprint servers are publicly available online archives that host these preprints and their associated data. They typically employ basic screening processes to guard against "offensive and/or non-scientific content and for material that might pose a health or biosecurity risk." However, these screening processes do not share the rigor of peer review.

### **PRE-SYMPTOMATIC**

A person who is pre-symptomatic has tested positive for infection but isn't yet displaying any signs or symptoms. Experts warn that pre-symptomatic COVID-19 carriers are the most contagious, as the virus can spread at least 48 hours before symptoms develop, which according to the U.S. Centers for Disease Control and Prevention usually appear two to 14 days after exposure. Without knowledge, a person in this stage can infect others while still feeling healthy.

### **PREFILLED SYRINGE (PFS)**

A single-dose container of injectable liquid medicine or vaccine to which a needle has been affixed by the manufacturer and which has been prefilled with the precise correct dose of drug. Studies have shown that prefilled syringes increase speed and convenience for administrators while reducing the possibility of dosing quantity mistakes, since health workers don't have to manually fill a syringe from a vial.

### **PREVALENCE**

In medicine, the prevalence of "x" is a measure of the total number of people in a specific group who have (or had) a certain disease, condition, or risk factor (such as smoking or obesity) at a specific point in time or during a given period of time. In other words, prevalence is the total number of active cases in a population within a specific timeframe. This number is useful because it tells you about the number of people currently infected.

### **PREVENTION**

In medicine, prevention is the action taken to decrease the chance of getting a disease or condition. Prevention includes a wide range of activities often known as "interventions," which are aimed at reducing risks or threats to health. Examples of preventive measures to reduce covid-19 infections include physical or social distancing, quarantining, higher levels of ventilation of indoor spaces, better filters or UV treatments in ventilation systems, covering coughs and sneezes, hand washing, and keeping unwashed hands away from the face. The use of quality face masks is highly recommended in public settings, health and care home settings, crowded indoor spaces and whenever people are exposed to others in indoor spaces where they are not sure those others are not infected or are at a high risk (elderly, immunocompromised) from your potential infection.

### **PROTECTION**

It can be defined as the health measures designed to guard individuals, groups and populations through vaccine and non-pharmaceutical interventions and effective collaboration to prevent and mitigate the impact of infectious disease, environmental, chemical and radiological threats.

### **PROBABLE CASE**

A probable case is an individual who has not had a confirmatory test performed but shows COVID-19 symptoms or has either a positive antigen test or clinical criteria of infection and is at high risk for COVID-19 infection (e.g., high-transmission area).

### **PROPHYLACTIC, PROPHYLAXIS**

The term prophylaxis is a noun that means preventative or the state or action of prevention; prophylactic is an adjective that means preventive. From the Greek word "phylax," meaning "to guard" and "watching," prophylactic treatment is used in health care to prevent illness. Prophylactic candidates for COVID-19 were defined as any drug or biologic-based molecule used to prevent the covid infection, regardless of its administration route.

### **PROTEIN**

Proteins are large biomolecules and macromolecules that comprise one or more long chains of amino acids. Proteins perform a vast array of functions within organisms, including catalyzing metabolic reactions (creating energy through digestion), DNA replication, responding to stimuli, providing structure to cells and organisms, and transporting molecules from one location to another. Approximately 30,000 different proteins (collectively called your proteome) are the workhorses of the human body.

## **PUBLIC HEALTH AGENCY**

A public health agency is a governmental organization or government-approved entity that is supervised by or responsible to a local board of health or a health department, and is operated to provide services focused on the health of population groups and their environments.

## **PULMONARY**

The word pulmonary means "pertaining to the lungs." It is derived from the Latin root word pulmo, which means lung. If someone has pulmonary disease, this means they have a lung disease, and that may affect their ability to breathe well. COVID-19 can cause lung complications such as pneumonia and, in the most severe cases, acute respiratory distress syndrome, or ARDS. Sepsis, another possible complication of COVID-19, can also cause lasting harm to the lungs and other organs and death. When a patient is having trouble breathing and is placed on a ventilator or respirator or given supplemental oxygen they are suffering from pulmonary distress.

## **PULSE OXIMETER**

The pulse oximeter, or Pulse Ox, is a small inexpensive electronic device clipped onto a fingertip that measures the oxygen saturation of oxygen level carried in your red blood cells. This number is typical 94-99%. If this number is being measured correctly and is below 90 or steadily dropping it usually indicates a problem that requires prompt medical attention. Some pulse oximeters have reportedly not been accurate for dark-skinned people as they use a calibration of infrared light that sometimes reads differently for light-skinned users. If you have a symptom of shortness of breath or a known lung or heart condition, your doctor may recommend use of a pulse oximeter.

## **QUARANTINE**

A strict restriction on the movement of people, animals and goods, intended to prevent the spread of disease or pests. Quarantine is a strategy used to prevent transmission of COVID-19 by keeping people who have been in close contact with someone with COVID-19 apart from others.

## **R VALUE (also see reproduction number)**

The basic reproduction number, also known as the R or R<sub>0</sub>, which is the average number of people that one person with an infectious disease will likely infect in the future. The R of the original variant of SARS-CoV-2, the coronavirus that causes COVID-19, is estimated at around 2.5, compared to about 15 for measles, based on a population that has had no exposure to it. For example, an R of 2.5 would mean 100 people with the new coronavirus would likely go on to infect 250 people. Those 250 would in turn transmit it to 625 people. When the R is above 1, the virus will grow exponentially in a population with no immunity. At an R value of 1 each person infects one other person and the total stays steady as the first person recovers (or dies). At a sustained value below 1, the virus will gradually infect fewer people, until the epidemic dries up.

## **RANDOMIZED / CONTROLLED TRIAL / RCT**

A form of scientific experiment used to control factors not under direct experimental control. Examples of RCTs are clinical trials that compare the effects of drugs, surgical techniques, medical devices, diagnostic procedures or other medical treatments. Randomized trials use random groupings of people so unintentional (or intentional) bias doesn't distort the results. A controlled trial usually has a statistically separate matched group of people (called the control group) who either receive no treatment or the current standard treatment for the purposes of level of difference comparisons.

## **RECOVERY / RECOVERED**

Recovery is a process of change through which individuals improve their health and wellness or achieve freedom from immediate symptoms of a disease. On average about 98.2% of known COVID-19 patients in the U.S. survive, but each individual's chance of dying from the virus will vary depending on their age, whether they have one or more underlying health conditions and when and how often they have been vaccinated. The state of being "recovered" is to have successfully undergone this process of achieving better health or becoming symptom-free.

## **REPRODUCTION NUMBER (R<sub>0</sub>; see also R Value)**

R<sub>0</sub> (pronounced R naught or R zero) is the basic reproduction number, also known as basic reproduction ratio or rate which is an epidemiological metric used to measure the transmissibility of infectious agents. R<sub>0</sub> is a derivative of the following variables—the duration of infectivity after the patient gets infected, the likelihood of transmission of infection per contact between a susceptible person and an infectious individual, and the contact rate. R<sub>0</sub> is usually estimated after a virus has begun to spread using serologic or epidemiological data or using theoretical mathematical models based on similar prior infections on large scales.

## **REINFECTION**

The process of a person becoming infected with COVID after having recovered from an earlier bout with the disease. A person is considered to have been reinfected if they test positive again 90 days or more after their first positive test or if they had a negative PCR test and then subsequently test positive. For example: Through April 3, 2022, there have been 204,953 cases of reinfection in New York State, which represents about 4.0% of all confirmed COVID infections in the state.

## **REMDESIVIR**

A drug that inhibits or prevents a virus from replicating inside the human body by preventing the ordinary RNA transfer of DNA code information into a "messenger" format used in cell duplication. Intravenous Remdesivir is approved by the FDA for the treatment of COVID-19 in adult and pediatric patients (aged ≥12 years and weighing ≥40 kg). It is approved for the treatment of mild to moderate COVID-19 in high-risk, non-hospitalized patients (i.e., a 3-day course initiated within 7 days of symptom onset) and for the treatment of hospitalized patients with COVID-19 (i.e., a 5-day course). Remdesivir is expected to be effective against the B.1.1.529 (Omicron) variant of concern (always consult a physician for all medical advice).

## **RESISTANCE**

The meaning of this word varies depending on how it is used. If you have an infection with anti-microbial resistance (AMR), the term refers to the fact that most antibiotics will not work well or at all (a bad thing). If a person develops resistance to infection, that is good because your body is able to fight off getting sick or sicker. That use of "resistance" accordingly means the ability of your body or a drug to reduce the effect or impact of a specific pathogen (a pathogen is a bad thing). In other words resistance to a medicine is bad and resistance to an infection is good.

## **RESPECTED / TOP-TIER JOURNAL**

There are many thousands of scientific and medical journals in the world published in all major languages. Top-tier means those leading prestigious journals that the respective scientific and medical communities believe to be of the highest quality. Very generally, journals could be ranked by impact, but even high-impact journals may not be considered top-tier by a given research community / university / funding agency. The world's most respected scientific journals are Nature and Science. For medicine they would be JAMA, The New England Journal of Medicine and The Lancet.





## RESPIRATOR

A device designed to protect the wearer from inhaling hazardous elements in the atmosphere, including fumes, vapors, gases and particulate matter such as dust and airborne pathogens such as viruses. There are two main categories: the air-purifying respirator, in which respirable air is obtained by filtering a contaminated atmosphere, and the air-supplied respirator, in which an alternate supply of breathable air is delivered.

## RNA

Ribonucleic acid (RNA) is a molecule similar to DNA. But while DNA is a double strand woven together in a helix formation, RNA is single-stranded. An RNA strand has a backbone made of alternating sugar (ribose) and phosphate groups. There are currently two primary types of COVID-19 tests being used to test patients for COVID-19: molecular tests (also known as nucleic acid, RNA or PCR tests) and rapid antigen tests sometimes called lateral flow tests.

## RT-PCR

A way of measuring “messenger RNA,” the part of the human bio-system that carries DNA genetic instructions from the center of a cell to the outer parts of the cell, allowing replication to occur. This acronym stands for “reverse transcription polymerase chain reaction.” Basically RT-PCR is a laboratory test that combines artificially created DNA with the body’s organically created DNA, plus increasing the copying rate for certain specific parts of the DNA strand to get a reliable result for the test.

## SARS

Severe Acute Respiratory Syndrome (SARS) is a viral respiratory disease caused by a novel SARS-associated coronavirus. It was first identified at the end of February 2003 during an outbreak that emerged in China and spread to 4 other countries. SARS has a higher fatality rate than COVID-19 and its outbreak was confined to Asia when it first appeared.

## SUSPECT CASE

Individuals who may or may not be infected with COVID according to initial test results or the presence or absence of certain symptoms. Specifically, the term refers to people with the lowest level of evidence that they have been infected with COVID-19, but enough evidence so that health agencies track these suspect cases to see if those individuals become confirmed or probable cases.

## SURGICAL MASK

A loose-fitting, disposable device that creates a physical barrier between the mouth and nose of the wearer and potential contaminants in the immediate environment. Usually a distinctive light blue color, a surgical mask is not a high quality mask. These masks are made in different thicknesses and with different abilities to protect you from contact with airborne droplets or aerosols. Despite the use of the word surgical. Despite the use of the word surgical they were designed as lightweight masks that prevented surgeons from breathing directly into exposed areas not as viral masks such as N95 and KN95 masks.

## SARS

Severe acute respiratory syndrome (SARS) is a viral respiratory disease caused by a SARS-associated coronavirus. SARS is an airborne virus and can spread through small droplets of saliva in a similar way to the cold and influenza. It was first identified at the end of February 2003 during an outbreak that emerged in China and spread to 4 other countries.

## SCIENTIFIC JOURNAL

A professional publication that provides peer-reviewed articles and studies, typically authored by scientists, explaining scientific issues and especially reporting the results of specific scientific research studies. Usually specialized for different academic disciplines or subdisciplines. Often, the research challenges common assumptions and/or the research data presented in the published scientific literature in order to gain a clearer understanding of the facts and findings.

## SCREENING

Patient tests that look for diseases before symptoms appear. Screening tests can find diseases early, when they’re easier to treat. Since screening may find diseases at an early stage, there may be a better chance of curing the diseases. Screening can also include doing a genetic test to check for a person’s risk of developing an inherited disease.

## SELF-ISOLATION

Self-isolation means staying indoors and completely avoiding contact with other people. This includes the people you live with. It is sometimes called self-quarantine. You should self-isolate when there is a high risk that you could spread COVID-19 (coronavirus) to other people.

## SECONDARY ATTACK RATE

The secondary attack rate (SAR), is defined as the probability that an infection occurs among susceptible people within a specific group (i.e., household or close contacts). It can provide an indication of how social interactions relate to the risk of infecting other people.

## SECONDARY INFECTION

An infection that occurs during or after treatment for another infection. It may be caused by the first infection, the treatment itself, a hospital or clinic environment or by changes in the immune system that makes a patient more susceptible.

## SEQUALAE

A condition which is the consequence of a previous disease or injury, or an aftereffect of same. In some cases long COVID is referred to as COVID Sequelae.

## SEROLOGY / SEROLOGY TEST

A blood test that looks for signs of a previous COVID-19 infection. It detects antibodies, which are proteins in the blood that fight off infection. Antibody testing has a lot of promise because it will help us understand the pervasiveness of COVID-19 in our communities.

## SEROPREVALENCE SURVEY

A study that uses antibody tests to estimate the percentage of people in a population who have antibodies against SARS-CoV-2.

## SEVERE

The level of intensity of a specific event, as in mild, moderate or severe. The term “severe” is not synonymous with serious, as an event may be of a high level distress but relatively minor medical significance (e.g., a short severe headache or severe itching).

## SHELTER IN PLACE

The act or instruction of finding a safe location indoors and staying there until you are given an “all clear” or told to evacuate. During

COVID outbreaks in certain places, people were told to stay home for a period of time and shelter in place.

### **SIDE EFFECTS**

Also known as adverse reactions, side effects are unwanted or undesirable effects that are possibly related to a drug, vaccine or therapy. Side effects can vary from minor problems such as a runny nose or sore arm to life-threatening events, such as a heart attack or liver damage.

### **SOCIAL DETERMINANTS OF HEALTH**

Conditions in the places where people live, learn, work, and play that affect a wide range of health and quality-of-life risks and outcomes. They are not always obvious. For example, people from a foreign country may not speak the local language well enough and are thus afraid to go to the doctor even if they can afford it or there is no cost. It is a social determinant as opposed to a financial one.

### **SOCIAL DISTANCING / PHYSICAL DISTANCING**

A set of actions taken to stop or slow the spread of a highly contagious disease. The goal of social distancing is to limit face-to-face contact to decrease the spread of illness among people in community settings by keeping as much physical distance apart as possible when talking, singing, praying, etc.

### **SPANISH FLU / 1918 FLU**

Influenza that is caused by a subtype (H1N1) of a specific type of virus called an orthomyxovirus instead of say, a coronavirus. (Precisely, the Spanish flu which had different names around the world is the species Influenza A virus of the genus Influenzavirus A.) It was responsible for the global influenza pandemic of 1918–1919 at the end of World War 1 that killed an estimated 50 to 100 million people worldwide. Called “Spanish” flu in the U.S. because it was mistakenly believed to originate in Spain.

### **SPIKE PROTEIN**

A glycoprotein (a protein that also has carbohydrate groups attached) that protrudes from the envelope of some viruses (such as a coronavirus). This protruding feature or “spike” facilitates entry of the viron (the virus particle) into a host cell by binding to a specifically shaped receptor (an ACE2 receptor) on the surface of a host cell, followed by a fusion (merging) of the viral and host cell membranes (the cell wall and the viron shell).

### **STERILIZING IMMUNITY**

A unique immune status, which essentially prevents nearly all virus infection into the host for a substantial period of time. A Polio or Measles vaccine series can prevent future infections for many years and thus offer sterilizing immunity. “Sterilizing” immunity is different from the type of immunity that allows an infection to occur but with subsequent successful immune system response that overcomes and clears the virus, sometimes after a period of sickness.

### **SUB-VARIANT**

Just as a sub-species is a subgroup below the level of a species, a sub-variant is a subgroup below the level of a variant. In the context of COVID-19, Omicron was a sufficiently different mutation from the original coronavirus to be classified as a variant. BA.1, BA.2 and BA.3 are still recognizably in the Omicron “family,” but differ from the original Omicron. Health experts report the BA.2 subvariant may be up to seven times more transmissible than the original form of the virus.

### **SUPER-SPREADER EVENT**

A gathering of people in which in which a single infected individual infects an “unusually high” number of secondary cases. More generally, a gathering that results in more people than usual being infected by a transmissible disease. A dance party with people tightly packed and breathing hard in a low-ceiling room or a choir practice with everyone standing shoulder to shoulder in tight rows are ideal examples.

### **SUPPLY CHAIN**

The making and delivery of a variety of raw materials or components, and their step-by-step acquisition and transportation, necessary to produce and/or distribute a certain commodity. More broadly, the supply companies that furnish the raw materials and finished components for a commodity, or the series of distributors who bring the finished product to the marketplace. Supply chain breakdowns can be caused by anything from adverse weather to political and economic embargoes, raw materials shortages, and more. In a global pandemic, supply chain problems can prevent timely access to critical vaccines, medicines, or medical supplies and equipment or raw materials needed to make, deliver and administer medications.

### **SURGE / SURGE CAPACITY**

A surge is a sudden, great increase in demand or supply that was not expected. Surge capacity is the reserve ability or currently unused (available) capacity that permits a supplier to quickly ramp up supply in high volumes (either finished products or critical components) by providing immediate incremental production. Successfully meeting emergency demand by repurposing existing levels of production is not surge capacity in action, but an example of diversion, made necessary by the lack of surge capacity.

### **SYMPTOMATIC**

You are symptomatic if you are exhibiting symptoms that indicate the definite or possible presence of a disease or illness. In symptomatic cases of COVID-19, people may present a wide variety of symptoms including sore throat, headache, fatigue or loss of smell or taste. According to the Centers for Disease Control (CDC), symptoms for COVID-19 usually present within two to 14 days of exposure. You can be sick without any apparent symptoms (asymptomatic) or without realizing you truly have symptoms (“Oh, it’s just my regular allergies”).

### **T-CELL**

A part of the immune system, T-cells are specialized cells that develop from stem cells in the bone marrow. They help protect the body from infection and may help fight cancer. Along with B-cells, T-cells are the workhorses of fighting serious disease.

### **TELEMEDICINE**

Remote diagnosis and treatment of patients by means of telecommunications or online technology, usually a 2-way mobile based video conference service such as Apple FaceTime, Skype, What’s App or Zoom.

### **THERAPEUTICS**

Medicines, treatment, and care of a patient for the purpose of combating disease or alleviating pain or injury. (Before getting a disease, medical treatment would typically be called a preventative or a prophylaxis.) For example, the FDA has issued EUAs (Emergency Use Authorizations) for several monoclonal antibody treatments for COVID-19 as a therapeutic response to high-risk COVID-19 in adults and pediatric patients.

## **TOCILIZUMAB**

A drug used to treat adults and children aged 2 years and older with severe or life-threatening cytokine release syndrome. This syndrome can be caused by COVID-19 and by a type of immunotherapy called chimeric antigen receptor (CAR) T-cell therapy. Tocilizumab is also used to treat certain types of arthritis and a condition that causes inflammation of the lining of the arteries.

## **TOXIN**

Substances created by plants and animals that are poisonous (toxic) to humans. Toxins may also include some medicines that are helpful in small doses, but poisonous in large amounts. Most toxins that cause problems in humans come from germs such as bacteria.

## **TOXOID VACCINE**

A type of vaccine that employs a toxin (harmful product) made by the germ that causes a disease. These vaccines create immunity to the parts of the germ that cause a disease instead of the germ itself. That means the immune response is targeted to the toxin instead of the whole germ.

## **TRANSMISSION, TRANSMISSIVE**

Transmission is passing a disease from a person or animal to another person or animal. Transmissive is the quality of how easy a pathogen is to transmit. A virus may be “highly transmissive” (easy to pass to another person) or “low-transmissive” (not so easy to pass along). Transmission of SARS-CoV-2 can occur through direct, indirect, or close contact with infected people through infected secretions such as saliva and respiratory secretions or their respiratory droplets. The possible modes of transmission for SARS-CoV-2, including contact, droplet, aerosol, airborne, fomite, fecal-oral, bloodborne, mother-to-child, and animal-to-human transmission.

## **TREATMENT**

A generic, nonspecific term for various kinds of healthcare that may be intended to relieve illness, injury, mental health problems, etc. The application of medicines, surgery, psychotherapy, etc., to a patient or to a disease or symptom.

## **TOLERANCE**

The body's ability to limit the health impact caused by the problems associated with a given pathogen. Tolerance includes all the mechanisms that regulate the amount of harm. Tolerance may vary over time or be affected by other co-morbidities.

## **TRIAGE**

The process of sorting people based on their need for immediate medical treatment as compared to their chance of benefiting from such care. Triage is done in emergency rooms, disasters, and wars, when limited medical resources must be allocated to maximize the number of survivors.

## **TWINDEMIC**

Recently coined term referring to a possible severe flu season that occurs simultaneously with the COVID-19 pandemic. A blend of the terms “twin” and “pandemic.”

## **UNDER-VACCINATED**

A vaccination of significantly less than the proportion of a population that should be vaccinated to prevent widespread transmission. Or, giving a single person fewer vaccines or fewer doses than are recommended.

## **USAID**

The U.S. Agency for International Development, a federal agency that supports international development, primarily through its \$27 billion budget of taxpayer-supported civilian foreign aid and economic assistance. USAID supports COVID vaccinations in foreign countries on the grounds that (as its website says): “To beat the virus in the United States, we must also fight it abroad.”

## **VACCINE**

A substance that is administered (as by injection) to stimulate the body's future immune response to a specific infectious agent or disease so as to either completely prevent or minimize the body's potential damage or death from that infection. Note: vaccines are intended to strengthen a person's resistance to a pathogen (sometimes called immunity); they do not necessarily eliminate all possibility of infection or disease. (See VACCINE TYPES.)

## **VACCINE AVERSE, VACCINE HESITANT**

Vaccine averse or vaccine hesitant is a mental state that motivates a person to delay acceptance of vaccines, or refuse vaccination entirely, despite availability of vaccination services that have been approved as safe and effective by leading regulatory review agencies. Vaccine hesitancy has always had significant consequences, such as the resurgence of once eradicated vaccine-preventable diseases or failure to achieve or sustain herd immunity when possible. The current COVID-19 pandemic and the public reaction to the COVID-19 vaccine is another example of this substantial challenge. Vaccine aversion or hesitantly is related to but different from anti-vaccine, or anti-Vax.

## **VACCINE EFFECTIVENESS**

Per the CDC, vaccine effectiveness is a measurement of the proportionate reduction in cases among vaccinated persons.

## **VACCINE EFFICACY**

Per the CDC, vaccine efficacy is a measurement of the proportionate reduction in cases among vaccinated persons; term is used when a study is carried out under ideal conditions, for example, during a clinical trial.

## **VACCINE NATIONALISM**

An economic export control or shutdown strategy, imposed by a nation's government, that is intended to hoard domestically-produced vaccines and related supplies and equipment (such as vaccine syringes) produced by onshore manufacturers, in order to increase supply in their own country. The aim is to stock up supplies and vaccinate the people of one's own nation as soon as possible, regardless of the impact (or contract violations) of vaccine manufacturers' distribution for the rest of the world.

## **VACCINE TRIALS**

A clinical trial that aims at establishing the safety and efficacy of a vaccine prior to it being approved by one or more regulatory agencies.

## **VACCINE TYPES**

Major different types of vaccines include (1) weakened or attenuated vaccines; (2) inactivated vaccines; (3) antigen-based vaccines; (4) mRNA vaccines.

- 1) Weakened, or attenuated, vaccines consist of microorganisms that have lost the ability to cause serious illness but retain the ability to stimulate immunity. When introduced into a person's system, they may produce a mild or asymptomatic form of the disease. Attenuated vaccines have been approved for measles, mumps, polio (the Sabin vaccine), rubella, and tuberculosis.

- 2) Inactivated vaccines are those that contain organisms that have been killed or inactivated with heat or chemicals. Specifically, inactivated vaccines consist of virus particles, bacteria, or other pathogens that have been grown in culture and then killed to destroy disease-producing capacity. When injected into the body, inactivated vaccines elicit an immune response, but the response often is less complete than with attenuated vaccines. Because inactivated vaccines are not as effective at stimulation the immune system to fight off infection as those made from attenuated microorganisms, greater quantities of inactivated vaccines are administered.
- 3) Antigen-based vaccines require medical researchers to identify the genes of a pathogen (disease-causing microorganism) that encode the protein or proteins that stimulate the immune response to that organism, then mass-produce the immunity-stimulating proteins (called antigens) for use in vaccines. This technology has also made it possible to alter pathogens genetically and produce weakened strains of viruses.
- 4) mRNA vaccines use recombinant DNA technology (the process of taking a gene from one organism and inserting it into the DNA of another). This approach has proven useful in developing vaccines to viruses that cannot be grown successfully or that are inherently dangerous. Genetic material that codes for a desired antigen is inserted into the weakened form of a large virus, such as the vaccinia virus, which carries the foreign genes "piggyback." The altered virus is injected into an individual to stimulate antibody production to the foreign proteins and thus confer immunity.

#### **VAERS**

The Vaccine Adverse Event Reporting System is a program administered by the U.S. CDC and FDA, providing a national early warning system to detect possible safety problems in U.S.-licensed vaccines. Per the VAERS website, "VAERS is a passive reporting system, meaning it relies on individuals to send in reports of their experiences to CDC and FDA. VAERS is not designed to determine if a vaccine caused a health problem, but is especially useful for detecting unusual or unexpected patterns of adverse event reporting that might indicate a possible safety problem with a vaccine." Many people misunderstand VAERS because the problems reported by people (including deaths) must be compared to the normal frequency and volume of those same events in a similar large group of unvaccinated people that would have been statistically expected.

#### **VARIANT**

A variant is "a version of a virus that has accumulated enough mutations to represent a separate branch on the family tree" (Dr. Amesh A. Adalja, M.D., senior scholar at the Johns Hopkins Center for Health Security). In other words, a variant is a viral genome (genetic code) that may contain one or more mutations. In some cases, a group of variants with similar genetic changes, such as a lineage or group of lineages, may be designated by public health organizations as a Variant of Concern (VOC) or a Variant of Interest (VOI) due to shared attributes and characteristics. COVID-19 has spawned half a dozen important variants since first emerging in Wuhan, China in the late fall of 2019 including the latest variant to sweep the world called the Omicron variant. (See SUB-VARIANT.)

#### **VARIANTS OF CONCERN / HIGH CONCERN**

Variants of a virus are categorized by the WHO and CDC into three categories: (1) "variants of interest," (2) "variants of concern" and (3) "variants of high consequence." (The latter two terms are given separate definitions below.) The CDC states that a variant is classified as a Variant of Concern, when there is evidence of an increase in transmissibility, more severe disease (e.g., increased hospitalizations or deaths), significant reduction in neutralization by antibodies generated during previous infection or vaccination,

reduced effectiveness of treatments or vaccines, or diagnostic detection failures.

#### **VARIANT OF INTEREST**

Variants of interest refer to viruses for which scientists have seen several of the same genetic mutations emerge, so they are on the lookout for it. If or when a virus anywhere in the world is determined to have this genetic sequence, it gets updated into a database that is shared internationally, so health experts can see what is emerging in the biosphere (all living organisms around the world).

#### **VARIANT OF HIGH CONSEQUENCE**

A virus variation where vaccines (or other medical countermeasures) show markedly less effectiveness, even if they worked reasonably well against earlier variants.

#### **VECTOR**

In medicine, a carrier of disease or of medication. For example, in malaria a mosquito is the vector that carries and transfers the infectious agent. In molecular biology, a vector may be a virus or a plasmid that carries a piece of foreign DNA to a host cell.

#### **VENTILATION**

The process of introducing fresh air into indoor spaces while removing stale air. Letting fresh air into indoor spaces can help remove air that contains virus particles and thus help prevent the spread of coronaviruses such as the one that causes COVID-19. In poorly ventilated rooms, the amount of virus in the air can build up, increasing the risk of spreading COVID-19, especially if there are lots of infected people in the room. The virus can also remain in the air after an infected person has left. Frequent air changes in a room help prevent that from happening. A well-ventilated room will have the equivalent airflow of at least 6 air changes an hour. A typical building is engineered for 1-3 changes per hour. Hospital delivery and operating rooms may have 2-5 changes per hour. On a typical commercial airline flight, ventilators provide 10-15 changes per hour (every 4-6 minutes).

#### **VENTILATOR / CPAP / BIPAP**

A machine that mechanically assists a patient in the exchange of oxygen and carbon dioxide, a process sometimes referred to as artificial respiration. CPAP stands for "continuous positive airway pressure" and refers to a machine that uses mild air pressure, delivered through a mask over the nose and mouth, to keep the patient's breathing airways open while they sleep. CPAP delivers an even airflow at all times. BIPAP stands for "bilevel positive air pressure" and refers to a CPAP type ventilator that delivers higher pressure when the patient inhales, and lower pressure when the patient exhales.

#### **VIRAL LOAD**

A measurement of how much virus quantity a patient has in their body. This measurement can be ascertained by using blood, nasal swabs or bodily fluids to test for the presence and amount of virus. Viruses are incredibly tiny, so minute quantities of just a handful of infectious virus particles (virions) are all that is needed to create sickness in vulnerable people. It has been scientifically estimated that all the active CoV-19-2 viruses in the world together weigh less than 10 pounds.

#### **VIRAL SHEDDING**

The process of a patient releasing copies of a virus from their bodies. Patients with COVID-19 shed the virus or parts of destroyed or disabled viruses for about 14 days, starting 2 to 3 days before they start to have symptoms. Not all shedding is infectious.

## **VIROLOGY**

The branch of science that deals with the study of viruses. Virology covers all aspects of virus study and analysis from evolution, structure, life cycle and function to the diseases that they are responsible for and the host defenses against them.

## **VIRUS**

An infective agent that typically consists of a nucleic acid molecule in a protein coat, which is too small to be seen by even the most powerful light microscopes. Unlike much larger bacterial organisms that are clearly alive, viruses are not really alive in the typical sense. This is because a virus is able to multiply only within the living cells of a host in the same way that a few lines of computer code can only run if they are inside a full program in a compatible computer. Non-scientists often confuse viruses with bacteria, but a virus is a non-living collection of molecules that need a host to survive, while bacteria are free-living cells that can live inside or outside of a host body.

## **VULNERABILITY**

Susceptibility to injury or disease; specifically, a greater likelihood of becoming ill from a certain disease or a greater likelihood of passing a disease to others even if you do not become sick yourself.

## **VULNERABLE PERSON**

A person is one who is more likely than the average individual to become infected or have severe symptoms from a specific virus. In the context of COVID-19, vulnerable persons are elderly or immunocompromised individuals. However, many people not thought to be classed among the vulnerable (at high risk) population have also contracted COVID-19

## **WASTEWATER SURVEILLANCE / WASTEWATER MONITORING**

A public health tool, operated by the U.S. CDC, that tracks the presence of SARS-CoV-2, the virus that causes COVID-19, in wastewater samples collected in defined sewage processing zones across the country. Per the CDC, "People infected with SARS-CoV-2 can shed the virus in their feces, even if they don't have symptoms. The virus can then be detected in wastewater, enabling wastewater surveillance to capture presence of SARS-CoV-2 shed by people with and without symptoms. This allows wastewater surveillance to serve as an early warning that COVID-19 is spreading in a community."

## **WATCH LIST**

Potentially future dangerous beliefs. The Plain Talk "Watch List" is a compilation of currently circulating beliefs that our Advisory Committee believes are mistaken or largely unsupported, and potentially harmful if they were to become widely believed or acted upon.

## **WAVE**

In the context of an epidemic or pandemic, a wave is a sharp increase in cases that spreads across a significant portion of a population or a wide geographic area. Successive variants are often responsible for creating these new outbreaks. They are called "waves" because when charted on a graph, the line that depicts rapidly rising and then falling numbers of cases resemble ocean swells or waves.

## **WEALTHY COUNTRY**

Nations with large, robust economies that are able to afford state-of-the-art healthcare, medical treatment and medical equipment

and procedures for most of their population. In the context of a pandemic or epidemic, a wealthy country is one that has in place the necessary health workers, hospitals and clinics, medical equipment, access to vaccines, refrigeration and transport that are necessary to effectively combat a routine outbreak.

## **WET MARKET**

A live animal market where different species of animals – poultry, fish, reptiles, and mammals of every kind – are brought together in small spaces before being slaughtered and sold for food, making these venues breeding grounds for new viruses or virus variants that can be passed from animals to humans. Wet markets can also facilitate the transmission of other infectious diseases from animals to human beings. Though often officially banned, these chaotic markets of small entrepreneurs are a common sight in many areas of the world such as China and South Asia. A wet market in the Chinese city of Wuhan is likely to be the point of origin for COVID-19 to first jump from an unknown animal species to humans. Daily introduction of new animals in wet markets provides optimum conditions for the development of disease agents such as influenza. Animals may remain in the space from days to weeks. Add the daily contacts of live animals with humans (including children), and conditions are optimal for the transfer and evolution of infectious disease agents.

## **WHEEZE**

A high-pitched whistling sound made while breathing, often associated with difficulty breathing. Wheezing may occur during breathing out (expiration) or breathing in (inspiration).

## **"WITH" OR "FOR"?**

Hospital admission classification during the COVID-19 pandemic can describe patients as being admitted "with" COVID (meaning they are infected but show up at the hospital for some other reason such as chest pain or a broken leg); or patients can be described as admitted "for" COVID – meaning their most acute health issue, and the reason for admission, is COVID symptoms.

## **WHO (World Health Organization)**

Founded in 1948, WHO is the United Nations agency that connects nations, partners, and people to promote health, keep the world safe and serve the vulnerable. WHO's mission is for everyone, everywhere to attain the highest level of health. It maintains offices with thousands of employees around the world and is headquartered in Geneva, Switzerland. The WHO is not independent since it reports directly to the member states of the UN. This makes it difficult for WHO to pressure or go against the wishes of any member, even if that is best for global health.

## **WORKING FROM HOME / REMOTE WORK**

A form of social distancing where workers perform their jobs from home, typically using Internet connectivity to communicate with colleagues, customers, suppliers and the like. Helps avoid the spread of an infectious virus.

## **WUHAN**

The Chinese city with the wet market identified as the likely geographic origin point of SARS-CoV-2 and COVID-19. Wuhan, population 11 million, is also home to the Wuhan Institute of Virology, a research institute administered by the Chinese Academy of Sciences that is active as a premier research center for the study of coronaviruses. There is controversy over whether COVID originated at this Institute (possibly by an accidental spread of infection from a lab animal that was being used for research), or

from a nearby wet market in a manner that is still unclear. Current scientific consensus including a recently published peer-reviewed study in a top scientific journal strongly favors the wet market origin theory, despite the irony that China's leading top-tier bio security level laboratory is located less than 2 miles away.

### **ZERO-COVID**

A public health policy adopted by a handful of countries, most notably China, employing aggressive contact tracing, mass testing, strict quarantines, widespread and severe lockdowns, etc., aimed at stopping community spread of COVID-19 as soon as the virus is detected. The goal is to have as near to zero cases as possible, even if entire cities need to remain closed and everyone is forced to stay in their homes for weeks under penalty of severe consequences. The highly contagious Omicron variant has posed the biggest challenge yet to this policy with the world's largest city, Shanghai, being shut down for nearly 2 weeks in mid-April 2022.

### **ZOONOSIS / ZOONOTIC**

Zoonosis refers to the process of spreading any disease or infection, through natural transmission, from vertebrate animals to humans. More specifically, a disease that ordinarily resides in animal populations but somehow jumps to humans. Zoonotic describes a virus or disease that can be spread in such a fashion. Rabies and Lyme's Disease are examples of zoonotic pathogens.

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## Disclosure Statement

The publisher of Plain Talk Reports is Jay Walker, Chairman and CEO of ApiJect Systems, Corp., a public-benefit medical technology company. He is also an ApiJect shareholder. Simultaneously, Mr. Walker serves as Curator of TEDMED, the health and medicine edition of the TED organization.

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