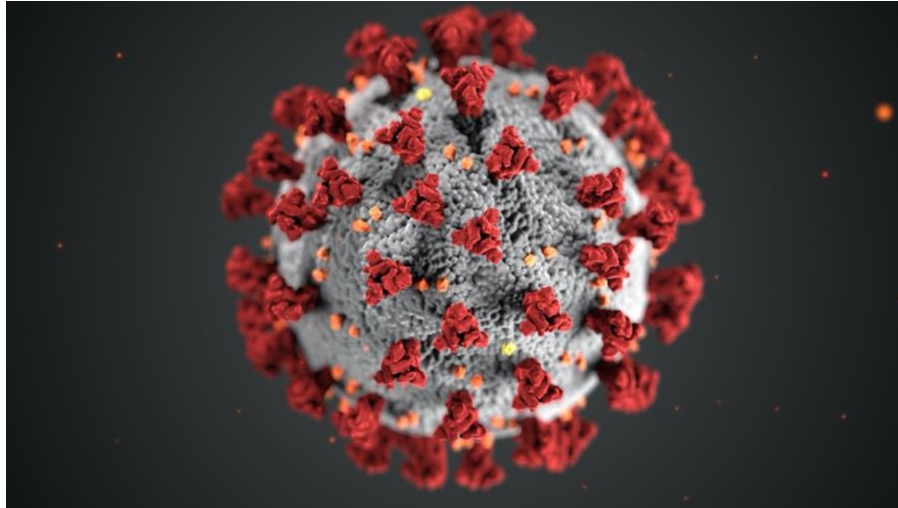


White Paper: SARS CoV-2 & COVID-19



Credit: Alissa Eckert and Dan Higgins/CDC

The Saffrosystems Team would like to extend our sincerest wishes to those who have been directly and indirectly impacted by the current COVID-19 pandemic.

1. Disclosure Note

We have put together this white paper on the SARS-CoV-2 virus and COVID-19 disease, in order to provide summarized information from a variety of experts. We are not a group of medically boarded physicians, or health experts, but, rather, we are a group of impassioned, caring, and driven-based citizen-scientists. The information presented hereafter is not intended to diagnose, treat, cure or prevent any disease and the Food and Drug Administration have not evaluated any statements. The Saffrosystems Team strongly recommends talking to your doctor prior to using any new health approach and has intended for this SARS-CoV-2 virus and COVID-19 disease white paper to be purely informative in its pursuit.

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2. Introduction to Coronaviruses

Although COVID-19 is a novel virus, coronaviruses have likely been around with humanity for some time. At least since the 1960s, the cause of infections—such as the common cold—have been attributed to coronaviruses (The American College of Physicians, 2020). More recently, human coronaviruses have been found to cause Severe Acute Respiratory Syndrome-SARS and Middle East Respiratory Syndrome-MERS. In infecting both humans and animals through the process of zoonotic transmission (when pathogenic diseases jump from animals to humans) Middle East Respiratory Syndrome-MERS-CoV and SARS-CoV are two of the most recent coronaviruses to make this jump, prior to SARS-CoV-2 (The American College of Physicians, 2020).

The etymological source of COVID is: CO, denoting the “*Corona*”, Latin for “crown”, which is the shape of the viral cells. VI, meaning “*Virus*”, Latin for “poisonous or noxious element”, also the modern-day derivative of virus. D, indicating “*Disordine/Dis*” in Latin, which translates to “disease/malady/disorder” (Tomassi, 2020, p. 2). The ‘19’, in ‘COVID-19’, simply refers to the year when the viral outbreak occurred (2019). For the purposes of this white paper, the focus will be on the integration of herbal medicine, nutritional supplements and whole foods into a self-care routine for boosting your whole body-immunological defenses.

Coronaviruses are enveloped, single-stranded RNA viruses that accumulate mutations throughout the process of viral replication. These “virion-subtypes” occur via the transmission of the viral cells from one host to another (The American College of Physicians, 2020). As a result, specific protein structures arise, which coincides with the coronavirus subtype replication patterns, and is also the traditional method of tracking the mutation rate in virions. However, virion subtypes are now further refined by RNA genotyping that has identified four subgroups of the coronavirus scientifically taxonomized: alpha, beta, gamma, and delta (The American College of Physicians, 2020). For example, gamma and delta coronaviruses have only been identified in animals, whereas alpha and beta coronaviruses are zoonotic—found in both humans and animals. The RNA genotyping taxonomy of MERS-CoV, SARS-CoV and SARS-CoV-2 is classified as a beta coronavirus, although the latter coronavirus has been referred to as the “novel beta coronavirus” (The American College of Physicians, 2020). SARS-CoV (beta coronavirus) has been found to share roughly 79.5% of the genetic material as SARS-CoV-2 (novel beta coronavirus) (Petric, 2020).

You may be asking yourself at this point: What does all this scientific categorization mean, and why is it important? In preceding the pathogenic transmission into humans, any microbe will likely have acquired a high genetic diversity. Put another way, the more diversity that viral cells pick up during the course of transmission between animals, the stronger the opportunistic likelihood for the viruses to jump to the human species and cause dysfunctions. The ability to track the rate of transmission, the mutation rate itself, and the total number of infected individuals—the denominator in understanding the mortality rate caused by COVID-19—is all a function of understanding the protein and RNA-based structures of the SARS-CoV-2 virus.

3. Delineating Fact from Misinformation

Going back to the idea of the denominator needed to understand the *actual* mortality rate, rather than the *projected* mortality rate of COVID-19, the total number of mortalities is well defined by post-mortem methodologies (the numerator). The precise cause of death in SARS-CoV-2 infected individuals may be harder to track when compounded with coexisting conditions and age (Fauci et al., 2020). For example, someone who has an autoimmune disorder is already paying taxes on their immune system and liver, among other organs in the body, while the compounding viral load from a SARS-CoV-2 infection may overburden the ability for the immune system to respond effectively. This is known as immune vulnerability, and when coupled with a viral respiratory infection, it may manifest in clinical symptoms of acute lung injury-ALI with respiratory failure, sepsis and cytokine storms (Tisoncik et al., 2012). Thus, there is a potential for (multi-) organ failure, which could be a cause of death. However, the indicating symptoms that led to the over-taxation on the whole-body systems may be a form of autoimmunity, which is coupled with an acute respiratory viral infection (COVID-19). The epidemiological and statistical gap is more clearly indicated in the denominator, and not the numerator, of the rate of mortality by COVID-19.

According to a study that was conducted by researchers at the University of Goettingen on March 31, 2020, the average detection rate of SARS-CoV-2 infected individuals was estimated to be around 6% (Bommer and Vollmer, 2020). On that date there were 189,510 total US confirmed cases; but on April 7th, the total confirmed cases in the US reached 368,533, with 1,363,365 confirmed cases in the world, and 76,420 global deaths (Johns Hopkins University, 2020 [Updated at 11:59PM EST]). At the same time, Bommer and Vollmer estimated “the

number of infections to be a few tens of millions” (2020, p. 1). Thus, the relative significance, as measured by mortality rate of COVID-19 is much lower than what the news-media reports day-in and day-out. In fact, Bommer and Vollmer further stated that: “The average detection rate is around six percent, making the number of cases that is reported in the news on a daily basis rather meaningless” (2020, p. 1). As of July 12th, the world death toll reached 566,210, with 12,785,483 total confirmed cases, thus yielding a mortality rate of less than 5%, but with no stratification for age and other variables (Johns Hopkins University, 2020 [Updated at 2:15PM EST]). In the words of Dr. Fauci, director of the National Institute of Allergy and Infectious Diseases since 1984:

“If one assumes that the number of asymptomatic or minimally symptomatic cases is several times as high as the number of reported cases, the case fatality rate may be considerably less than 1%. This suggests that the overall clinical consequences of COVID-19 may ultimately be more akin to those of a severe seasonal influenza (which has a case fatality rate of approximately 0.1%) or a pandemic influenza (similar to those in 1957 and 1968) rather than a disease similar to SARS or MERS, which have had case fatality rates of 9 to 10% and 36%, respectively” (Fauci et al., 2020, p. 1268).

While the severity that many humans have faced around the world combating COVID-19 infections should not be downplayed, the statistics should be highlighted, which are being misrepresented and communicated by our mass news-media outlets globally.

4. Complimentary Integrative Health Approaches for Immunological Health

In order to help build herd immunity, a resistance-transition point towards contagious pathogens for a population, a significant number of individuals in the population must become immune to the pathogen. Aside from the omnipresent need for a vaccine, and the number of infected individuals who have developed neutralizing antibodies to the SARS-CoV-2 virus, the use of Complimentary Integrative Health-CIH therapies may be supportive as a general booster to the immune system, thus potentially adverting the severity of the illness. CIH approaches may be optimal for supporting the whole body in its immunological stresses. CIH is a rather broad field that involves disciplines such as, but not limited to, herbal medicine, nutritional and dietary therapy, acupuncture, aroma, aqua, and chiropractic therapy. Additionally, the coupling of CIH self-care routines should not be used as a substitute for a healthy diet, routine physical fitness

and optimal sleep, as well as reducing overall stress, but, rather, serve as an adjunctive form of care. Hereafter, the focus will be on nutritional supplementations, herbal medicine and whole food preparations.

4.1. Nutritional Supplements and Herbal Medicine

Vitamin C (L-Ascorbic Acid), Zinc (acetate or other organically bound form) and cholecalciferol (vitamin D₃) are three nutrients that relate to the fortification of the immune system during viral and bacterial outbreaks, among playing other key roles in the body (Boma, 2020; Singularity University, 2020). In addition, a number of plants have been used in the traditional medical systems for thousands of years in China—Traditional Chinese Medicine (TCM)—and India—Ayurvedic medicine. Oregano (*Origanum* spp.), rosemary (*Rosmarinus officinalis*), thyme (*Thymus vulgaris*), lemon balm (*Melissa officinalis*) and peppermint (*Mentha x piperita*) have all been found to have antiviral, antibacterial and antifungal qualities. Astragalus (*Astragalus membranaceus*), Korean ginseng (*Panax ginseng*), woad (*Isatis indigotica*), chameleon plant (*Houttuynia cordata*), yarrow (*Achillea millefolium*), garlic (*Allium sativum*) and ginger (*Zingiber officinale*) may all be beneficial in decreasing the over-taxation of our whole body and immunological systems, while additionally helping to modulate other health-related ailments, e.g. obesity or diabetes (ginger and glycemic control). Turmeric (*Curcuma longa*) with black pepper (*Piper nigrum*), calendula (*Calendula officinalis*), raspberry leaf (*Rubus idaeus*), red clover flower and leaf (*Trifolium pretense*) and dong quoi (*Angelica sinensis*) have been traditionally incorporated to decrease inflammation, and increase the ability for the body to rid of internal by-product toxins. In particular, the use of *Astragalus* spp. has been efficacious and safe in the Far-Eastern fight against epidemics, including SARS-CoV (Braun & Cohen, 2015; Luo et al., 2020; Gong et al., 2018).

All of the aforementioned plant species may be readily prepared in an herbal tea in varying doses depending on the plant and preferred therapeutic effect. For example, astragalus may be used as follows: 1.2-1.5g for a ‘booster-dose’ on day 1, and 1g for days 2-5. The dry root of astragalus should be seeped in a strainer for 20-30 minutes prior to consumption. In order to enhance flavor, and to increase the therapeutic effects across the whole-body system, Korean ginseng, ginger, rosemary, lemon balm and peppermint may be added. Lastly, vitamin D and zinc should be taken with some sort of fat (eggs, cheese, yogurt, etc.) and preferably in the mornings, while vitamin C is a water-soluble vitamin and should thus be taken with water — and

preferably, a low fat-based meal. Denote that copper deficiency may occur with chronic intake of zinc, as the two minerals compete for places to be absorbed within the small intestine.

4.2. Whole-Food Therapy

Beta glucans, sugar-based chemical compounds from fruiting fungal bodies (mushrooms)—such as turkey tail (*Trametes versicolor*), maitake (*Grifola frondosa*), poria (*Wolfiporia extensa*), reishi (*Ganoderma lucidum*), himematsutake (*Agaricus blazei*) and artist's conk (*Ganoderma applanatum*)—have been therapeutically used in Traditional Chinese Medicine for various purposes, but one vital indication is in supporting immune response (Li et al., 2011; Skenderi, 2004; Weil, 2020). Turkey tail is rich in polysaccharidal-beta glucans, which have been used in the treatment of cancer in Traditional Chinese and Ayurvedic medicine (Torkelson et al., 2012). The use of these fungi is therapeutically applied in a myriad of health-related ailments, but has nevertheless been commonly used as an adjunctive source of immunomodulating qualities. As it were, the plant-based preparations may stimulate the production of various cells that are part of the immune system. The mushrooms may then increase the efficacy and safety of these immune-based cells via their modulatory functions in combating pathogenic infections. Likewise, the nutritional supplements will also support the fortification of the immunological systems through a variety of mechanisms and pathways.

5. 'Whole-Systems' Conclusion

What follows is a table that summarizes the utility, preparation methods and dosages recommended for various therapeutic actions.

Table. N-nutrient supplement; H-herbal medicine; WF-whole foods

CIH Therapy	Primary Action	Secondary Action	Preparation/Dosage
(N1) Vitamin C (L-Ascorbic Acid)	Antioxidative and pre-oxidative	May stimulate production and support function of immunological cells	Supplemental pill/2.5-3g daily (water-soluble)
(N2) Zinc (acetate or other organically bound form)	Immunological Functions	May stimulate the production of immunological cells	Supplemental pill/50mg daily (acid-soluble)
(N3) Cholecalciferol (vitamin D ₃)	Calcium balance and expression of genes	May enhance innate immunity	Supplemental pill/700-1200IU daily (fat-soluble)

(H1) Astragalus (<i>Astragalus membranaceus</i>)	Stimulation of immunological system	Helps tonify whole body systems and blood	Herbal tea/1-1.5g for 5 days at a time
(H2) Korean ginseng (<i>Panax ginseng</i>)	Modulation of immunological system	Antioxidative and helps tonify whole body systems	Herbal tea/1.5-2g 2-3 times daily, for 1 month
(H3) Lemon balm (<i>Mellisa officinalis</i>)	Modulation of immunological system	Sedative, may help reduce nonspecific and overall stress	Herbal tea/1.5-4.5g daily, for 1 week-10 days
(H4) Peppermint (<i>Mentha x piperita</i>)	Helps relax gastric muscles — antispasmodic	Antibacterial and may increase efficacy of antibiotics	Herbal tea/3-6g daily, for 1 week-10 days
(H5) Rosemary (<i>Rosmarinus officinalis</i>)	Antimicrobial functions	Antioxidative functions	Herbal tea/800mg-1.8g daily, for 1 week-10 days
(H6) Oregano (<i>Origanum spp.</i>)	Antiviral	Anti-inflammatory and antispasmodic for upper-respiratory tract	Herbal tea/800mg-1.2g daily, for 1 week-10 days
(H7) Ginger (<i>Zingiber officinale</i>)	Anti-inflammatory	Helps tonify gastric (digestive) system	Herbal tea/1-3g daily, for 10 days-2 weeks
(H8) Licorice (<i>Glycyrrhiza glabra</i>)	Anti-viral	Expectorant (supports the riddance of mucosa)	Herbal tea/2-4g 2-3 times daily, for 1 week-10 days
(H9) Tumeric (<i>Curcuma longa</i>)	Anti-inflammatory	Helps tonify whole body systems	Herbal tea and food/1.5-3g daily, for 1 month
(H10) Black pepper (<i>Piper nigr</i> a)	Anti-inflammatory	Modulation of immunological system	Herbal tea and food/1/4-1/2 teaspoon daily, for 1 month
(WF1) Turkey Tail (<i>Trametes versicolor</i>)	Modulation of immunological system	Anti-inflammatory	Cooked whole, or powdered supplement/3-5g daily, for 2-4 weeks
(WF2) Reishi (<i>Ganoderma lucidum</i>)	Modulation of immunological system	Anti-inflammatory	Cooked whole, or powdered supplement/3-5g daily, for 2-4 weeks
(WF3) Caterpillar Fungus (<i>Ophiocordyceps sinensis</i>)	Modulation of immunological system	Stimulation of neurological systems (memory, mood, etc.)	Cooked whole, or powdered supplement/3-5g daily, for 2-4 weeks

The SaffroSystems Team hopes that you have found this white paper to be informative.

Please Stay Healthy & Safe!

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Resources on SARS-CoV-2 & COVID-19

Online Seminars

Hosted by Boma, a global network that offers online learning experiences:

<https://boma.global/covid-19-summit/>

Hosted by Singularity University, a global learning and innovation community:

<https://su.org/summits/covid-19-virtual-summit/>

University of California, San Francisco, Department of Orthopaedic Surgery & American

Academy of Orthopaedic Surgeons on COVID-19

<https://www.crowdcast.io/e/covid19docsf/4>

Department of Human-Centered Artificial Intelligence, Stanford University, on COVID-19

<https://hai.stanford.edu/events/covid-19-and-ai-virtual-conference/video-archive>

Expert & Leader Feedback

Tony Robbins Interview with Six Experts on COVID-19

<https://podcasts.apple.com/us/podcast/the-tony-robbins-podcast/id1098413063?i=1000475052984>

Yuval Noah Harari on COVID-19 and Humanity:

<https://www.ft.com/content/19d90308-6858-11ea-a3c9-1fe6fedcca75>

Dr. Peter Diamandis & Dr. David Sinclair:

<https://www.youtube.com/watch?v=gHjKxwNAJVo>

Dr. Peter Diamandis & Dr. Bob Hariri

<https://www.youtube.com/watch?v=45Ke6C6SBfE>

Dr. Peter Attia and Dr. Michael Osterholm Discuss COVID-19

<https://peterattiamd.com/michaelosterholm/>

Dr. Peter Attia Podcast with Expert-Interviews on Immunology 101 and COVID-19

<https://peterattiamd.com/davidwatkins/>

<https://peterattiamd.com/stanleyperlman/>

United Nations Secretary General on COVID-19

<https://www.nytimes.com/video/world/100000007065902/united-nations-coronavirus.html?action=click>ype=vhs&version=vhs-heading&module=vhs®ion=title-area&cview=true&t=1>

Interactive Multimedia

World Health Organization Live COVID-19 Map

<https://who.sprinklr.com>

John's Hopkins University Live COVID-19 Map & Critical Trends

<https://coronavirus.jhu.edu/map.html>

Centers for Disease Control and Prevention COVID-19 Cases in the U.S.

<https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-in-us.html>

**The Biomedical Advanced Research and Development Authority-BARDA's List of Funded
Vaccination-Centric Companies**

<https://www.medicalcountermeasures.gov/app/barda/coronavirus/COVID19.aspx>



Reading Resources

Eclectic School of Herbal Medicine, an Herbalist's Perspective on COVID-19

<https://www.eclecticschoolofherbalmedicine.com/covid-19/>

American College of Physicians on COVID-19, an Online Textbook

<https://assets.acponline.org/coronavirus/scormcontent/-/lessons/2IoiqJx3-GPW7vnVnb9jgoLcuZ8LeERB>

WHO Updated COVID-19 Resources Page (Candidate Vaccines, Solidarity Trials, etc.)

<https://www.who.int/blueprint/priority-diseases/key-action/novel-coronavirus/en/>

Science Magazine Article on Effective Models for COVID-19

https://www.sciencemag.org/news/2020/04/suppress-and-lift-hong-kong-and-singapore-say-they-have-coronavirus-strategy-works?utm_campaign=news_daily_2020-04-14&et rid=211080054&et_cid=3285866

Science Magazine Article on the Source of SARS-CoV-2, and Beijing's June 11th Case

https://www.sciencemag.org/news/2020/06/source-beijing-s-big-new-covid-19-outbreak-still-mystery?utm_campaign=news_daily_2020-06-17&et rid=211080054&et_cid=3369689

Science Magazine Article on Reopening Schools in the COVID-19 Era

https://www.sciencemag.org/news/2020/07/school-openings-across-globe-suggest-ways-keep-coronavirus-bay-despite-outbreaks?utm_campaign=news_daily_2020-07-07&et rid=211080054&et_cid=3392146
