HANDBOOK FOR COVID-19

Venugopal Damerla MD (Gopinatha dasa); Krishna Madhavan (Srinivasa Dasa) PhD;
Prasanna Tadi MD (Prasannatma dasa); Carolyn Williams PhD;

Abstract

COVID-19 is a pandemic currently ravaging almost every country in this world and as of 6th April 2020, over 1.3 million people have been infected and nearly 72,700 deaths have occurred. We, at the Prabhupada Research Institute for Integrative Medicine (PRIIMe), have compiled this handbook from various sources online and print material. We believe that this handbook would be a good manual in the hands of our learned devotees. This handbook summarizes some of the most important scientific material regarding the pandemic and the coronavirus. The handbook also lists the possible methods to keep ourselves aware and safe during this pandemic so that we may protect our family, friends, devotees and in particular the vulnerable section of the society and the Hare Krishna community. While it is imperative to follow the CDC guidelines for washing hands, sanitizing all frequently used articles such as mobile phones, chanting beads, wearing masks and social distancing, it would also be beneficial to learn about the pandemic as well as preventive measures which can be easily adopted to avoid contracting this disease.

Introduction

On December 31, 2019, China informed the World Health Organization of a cluster of cases of pneumonia of an unknown cause in Wuhan City in Hubei province[1]. On January 9, 2020, the WHO issued a statement saying Chinese researchers have made “preliminary determination” of the virus as a novel coronavirus[2].

A fatality rate of 5.55% is being noted due to COVID-19 across the world till April 6, 2020[3]. Cases have been reported from more than 180 countries including some prominent Hare Krishna communities[4]. Lockdowns, curfews, massive airport screenings, quarantines, and social distancing have become the norm across the globe.

In these critical times, access to authentic information is of paramount importance to quell fears. The primary focus of this publication is to ensure that devotees of International Society for Krishna Consciousness understand basic science of this pandemic to better equip them to remain safe and assist them focus on their services to the uplifting universal mission of Srila A.C.Bhaktivedanta Swami Prabhupada for a long time to come. For the benefit of our readers, we are now compiling the most relevant parts of our coverage in the form of an eBook, that we hope will be a handy guide to good health practices as well as in fighting misinformation.

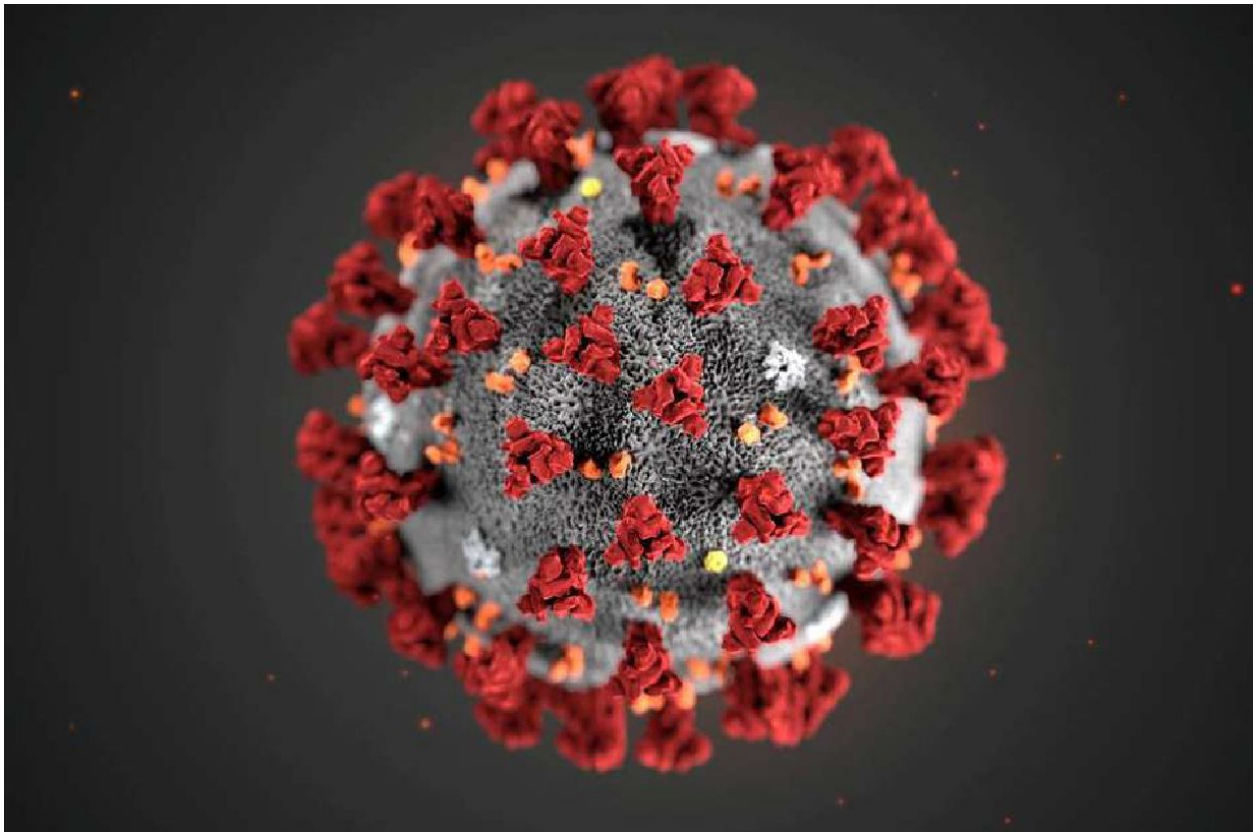
What are coronaviruses?

Coronaviruses are a large family of viruses with some causing less severe common cold to more severe diseases such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS). The SARS-CoV-21 is a coronavirus very similar to the one that caused SARS. Many coronaviruses are zoonotic, meaning they are transmitted from animals to humans. These viruses are positive stranded RNA viruses with large genomes in size from 27-33kb.

While the SARS coronavirus is thought to be an animal RNA virus from an as-yet-uncertain animal reservoir, perhaps bats, that spread to other animals (civet cats) and first infected humans in the Guangdong province of southern China in 2002, the MERS coronavirus was passed on from dromedary camels to humans in Saudi Arabia in 2012. There is

evidence that the more virulent and contagious, mutated SARS-CoV-2 strain was transmitted to a human host from infected pangolins and/or bats possibly by contact or inhalation from blood and urine at an exotic meat/wet market in Wuhan, China[5].

A closer look at SARS-CoV-2



The ultrastructural morphology exhibited by the SARS-CoV-2 seen in an illustration released by the Centers for Disease Control and Prevention on January 29, 2020.

Like other coronaviruses, SARS-CoV-2 virus particles are spherical and have mushroom-shaped proteins called spikes protruding from their surface, giving the particles a crown-like appearance. The spike binds and fuses to human cells, allowing the virus to gain entry. Researchers at the University of Texas at Austin and the National Institutes of Health,

U.S., have produced a 3D atomic scale map of the protein of the SARS-CoV-2 that binds to and infects human cells. Mapping the 3D structure of the protein — spike (S) glycoprotein — will allow better understanding of how the virus binds to the human cells. Knowing the structure of the spike protein will, in turn, allow scientists to develop vaccines and antivirals against the virus and even better diagnostics.

The spike protein of the novel coronavirus shares 98%sequence identity with the spike protein of the bat coronavirus, the researchers say. The results were published in the journal Science[6]. Similar yet different. The researchers also found that like in the case of the SARS coronavirus, the spike protein of the SARS-CoV-2 that causes Coronavirus Disease 19 (COVID-19) binds to the cellular receptor called angiotensin-converting enzyme2 (ACE2), which serves as the entry point into human cells. But unlike in the case of SARS, the spike protein of the novel coronavirus binds to the cell receptor with much higher affinity — 10- to 20-fold higher. Researchers reported that the genome of the virus is stable (unlike several other common cold viruses which rapidly mutate) which increases the effectiveness of a vaccine[7].

High transmissibility

The much greater binding affinity to the cell receptor explains the apparent high human-to-human transmissibility of the virus compared with the SARS coronavirus. It is 10 times more transmissible than the seasonal flu (Influenza A and B) even by people without symptoms. “The high affinity of the 2019-nCoV S for human ACE2 may contribute to the apparent ease with which the 2019-nCoV can spread from human-to-human,” the researchers write. “Additional studies are needed to investigate this possibility.” Since both the SARS coronavirus and the 2019 novel coronavirus share structural similarity and bind to the same receptor, the researchers tested three monoclonal antibodies specific to SARS virus for their ability to bind to the novel coronavirus. But none

of the three antibodies tested were found to be effective in inhibiting the novel coronavirus from binding to the human receptor ACE2 and prevent or treat the disease.

Understanding the disease

The disease caused by the 2019-novel CoronaVirus is termed as COVID-19. The World Health Organization has declared COVID-19 to be a pandemic and has a 10 times higher fatality rate than seasonal flu. The symptoms of COVID-19 appear within two to 14 days after exposure and include fever, cough, a runny nose, loss of taste, smell and progress to difficulty in breathing over 5-9 days. About 81% of people recover after exhibiting mild symptoms over 2-3 weeks, 15% develop significant shortness of breath due to reversible lung damage requiring oxygen support and 5% of people develop severe shortness of breath requiring ventilator support to open airways clogged with solidified mucus for 11-23 days in an intensive care unit. The physical age of many seriously ill patients being above 70-80 years, tobacco/ alcohol use, comorbid conditions like diabetes and hypertension.

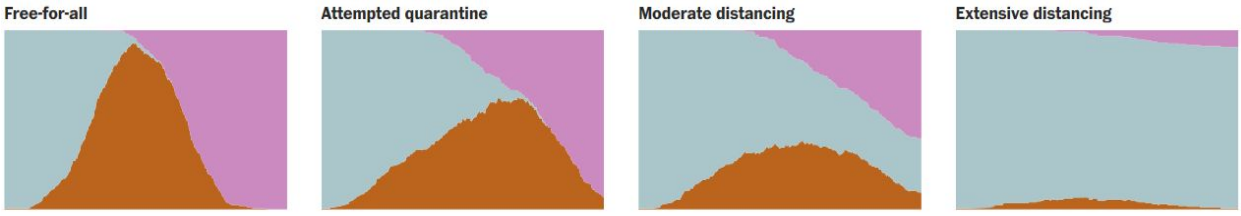
How does the disease spread?

It primarily spreads through the respiratory droplets of infected people in places which lack proper air circulation. Coronavirus-19 has been shown to float in air for up to 3 hours after someone sneezes or coughs and can be inhaled by another person entering the space. If a person touches a surface or object that has been infected by the virus and then touches his own mouth, nose, or eyes, he may get infected.

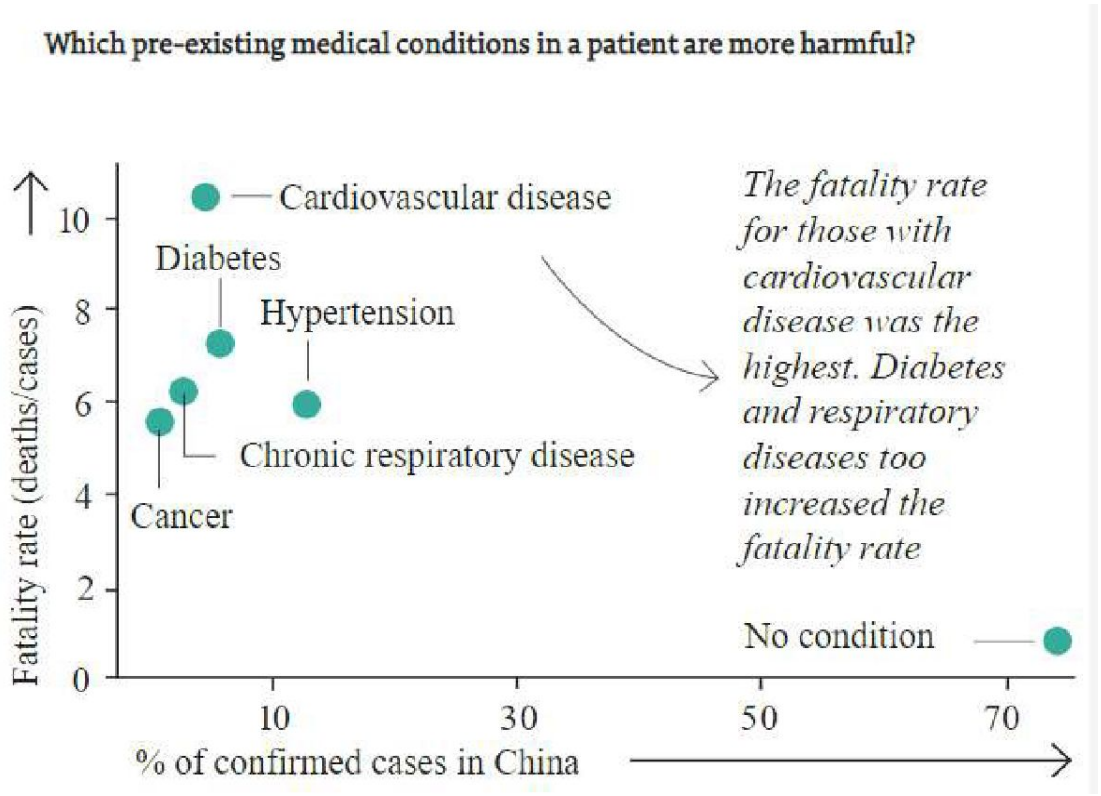
Who is affected?

While people of all physical ages (not biological age) can be affected by the disease, people aged 80 and above are at the highest risk of dying due to COVID-19, according to case records analyzed by the Disease Control and Prevention Centers in China and South Korea. Victims of the virus with pre-existing medical conditions such as cardiovascular disease and diabetes have a higher fatality rate than others. Also, the rate of fatalities was relatively higher for retirees. Due to less virulent strain the fatality rate is about 2.94% in India and 2.69% in USA, whereas it is higher ranging from 6.18 to11.4%, in countries such as the UK, France, Italy, Iran and Spain possibly due to a more aggressive strain. In such places with high infection rates, cultural factors such as a larger extent of physical (social) mingling of people might also contribute. It is possible that ISKCON communities find it hard to avoid congregating as it is the exact opposite of recommended social distancing, thereby increasing infection transmission rates.

To slow the outbreak, health officials worldwide are encouraging people to avoid public or congregating. We appeal to devotees to stay home more often and keep their distance from others. If people are less mobile and interact with each other less, the virus has fewer opportunities to spread. Some people will still go out. Maybe they cannot stay home because of their work and other obligations, or maybe they simply refuse to heed public health warnings. Those devotees are not only more likely to get sick themselves, they are more likely to spread the infection. We Control the desire to be in public places by temporarily closing down public spaces like our temples or preaching centers- we are actually saving lives! We request you to utilize modern technology virtual platforms to replace any type of event avoiding physical congregation (*ie*)Sunday programs, festivals and other educational activities.



Even with different results, moderate social distancing will usually outperform the attempted quarantine, and extensive social distancing usually works best of all. Above are graphs of a computer-based model of infection spread and compared results of different grades of social distancing[8]. The last one is noteworthy, where instead of allowing a quarter of the population to move, only we let just one of every eight people move. Slope of the red curve, which represents the number of sick people, rises rapidly as the disease spreads and then tapers off as people recover. Therefore, it is math not prophecy. The spread can be slowed, if devotees practice “social distancing” by avoiding public spaces and generally limiting their movement and travel.



Ref : J Infect. 2020 Mar 30. pii: S0163-4453(20)30146-8. doi: 10.1016/j.jinf.2020.03.019. [Epub ahead of print]

What are the symptoms?

The early recognition of COVID-19 patients are those who come in with Severe Acute Respiratory Infection (SARI) who also have a history of foreign travel or close contact with another COVID-19 patient. As earlier stated, "COVID–19 may mostly present with mild symptoms but may progress to moderate or severe illness; the latter includes severe pneumonia, ARDS [Acute Respiratory Distress Syndrome], sepsis and septic shock." People with mild symptoms like dry cough, low grade fever, sore throat, muscle pains are advised to self-quarantine staying in one room, along with other members of the household for 14 days from the first day of symptoms. Progression to more serious symptoms like worsening shortness of breath, chest congestion, mental status changes and high fever warrants immediately going to a nearest hospital emergency room.

How can it be detected?[9]

The virus can be detected using a Rapid Antibody Test as well as RT-PCR test for mass screening. An RT-PCR or reverse transcription polymerase chain reaction test is DNA-based and can also quickly tell if someone harbours the virus but as of now, only symptomatic people are being tested. Please consult your physician or area's public health department for further details of test sites and if you are eligible to undergo testing.

What is the treatment?

For mild symptoms, experts recommend strict quarantine to one room for 2 weeks and wearing a mask all the time to reduce viral shedding. Before returning to normal activities, it is recommended to get a rapid antibody test. If the test demonstrates the presence of a specific IgG antibody to coronavirus-19, long term immunity is very likely. There is no current evidence from randomized controlled trials to recommend any specific treatment for suspected or confirmed severe COVID-19 patients. No specific antivirals are recommended for treatment of those suffering from respiratory ailment due to lack of adequate evidence from medical literature. After anecdotal efficacy, several trials are currently underway to test confirm use of convalescent plasma infusions, anti-virals, BCG vaccine and the antimalarial drug hydroxychloroquine.

The guidelines advise the treating doctors to closely monitor patients with severe acute respiratory infection for signs of clinical deterioration, such as rapidly progressive respiratory failure and sepsis, and apply supportive care interventions immediately. "Application of timely, effective, and safe supportive therapies is the cornerstone of therapy for patients that develop severe manifestations of COVID-19," it said.

Protecting yourself against COVID-19[10]

Guidelines by the World Health Organization specify that one of the ways to reduce the risk of infection is by regularly and thoroughly cleaning one's hands with an alcohol-based hand rub or washing them with soap and water. Regular washing becomes important as the virus tends to be viable from hours to more than a day on different surfaces that are regularly touched with hands.

Washing with soap

The grime on our hands contains innumerable viruses and bacteria. Washing with water without using soap helps reduce the amount of microbes but does not remove most of the virus and bacteria completely. Using soap, therefore, becomes far more effective in removing microbes. Viruses such as coronavirus, influenza-causing viruses, Ebola, Zika have their genetic material encased in a layer of fat called the lipid envelope. Soap molecules are pin-shaped with a head that is water loving (hydrophilic) and a tail that is oil-loving (oleophilic). Being oleophilic, the tail portion of the molecule tends to have an affinity for and 'competes' with the lipids in the virus envelope. Since the chemical bonds holding the virus together are not very strong, the long oleophilic tail gets inserted into the envelope and tends to have a 'crowbar' effect that breaks the lipid envelope of the virus. The tail also competes with the bond that binds the RNA and the lipid envelope thus dissolving the virus into its components which are then removed by water.

Alcohol-based hand sanitizers

Like soap, the alcohol present in hand sanitizers dissolve the lipid envelope, thus inactivating the virus. In addition, the alcohol also tends to change the shape or denature the mushroom-shaped protein structures that stick out of the lipid envelope. The mushroom-shaped protein structures help the virus to bind to special structures found on human cells and enter the cells. To be effective, the sanitizers should contain at least 70% alcohol. Unlike soap lather, the alcohol does not come in contact with all parts of the hand. So, care needs to be taken to use sufficient sanitizer to increase the coverage. Unlike water, alcohol run does not remove the dead viruses from the hand. While a sanitizer can quickly reduce the number of microbes, it does not get rid of all types of germs and is "not as effective when hands are visibly dirty or greasy". This is the preferred method of removing live viruses on articles like mobile phones.

Using a mask

Medical masks help prevent the spread of coronavirus infection but if not available the CDC recommends any home made cloth mask wearing while in public. If worn properly, masks may be effective in preventing transmission of coronavirus[11].

But a 2010 study says: "Mask wearing was associated with reduced secondary transmission and should be encouraged during outbreak situations." Even the World Health Organization says wearing a medical mask is "one of the prevention measures to limit spread of certain respiratory diseases, including novel coronavirus (SARS-CoV-2), in affected areas".

Transmission through droplets from coughing and sneezing is one of the major routes of virus spread. When worn correctly, a mask can reduce the risk of inhaling droplets containing the virus. With many studies showing that people infected with novel coronavirus transmit the virus even before symptoms show up, it may be prudent to wear a mask especially when the virus is spreading in the community.

Maintaining a safe distance can be a challenge, especially when there is no way of knowing who is infected till such time the person starts showing visible symptoms.

Maintain Physical distancing rule (the phrase "social distancing" is a misnomer)

This is highly imperative. The WHO says that you should maintain at least 2 metre (6 feet) distance between yourself and anyone who is coughing or sneezing. This is because when someone coughs or sneezes they spray small liquid droplets from their nose or mouth which may contain virus. "If you are too close, you can breathe in the droplets, including the COVID-19 virus if the person coughing has the disease," says the WHO. We recommend speaking softly as loud speaking has been shown to cause more microdroplet production and avoid hugging or shaking hands. This is a great time to implement the Vedic way of greeting others with our hands folded (Namaste)

Avoid touching eyes, nose and mouth

Hands can pick up viruses as they come in contact with many surfaces. It can then transfer the virus to your eyes, nose or mouth. From there, the virus can enter your body and can make you sick.

Practice respiratory hygiene

Cover your mouth and nose with your bent elbow or tissue when you cough or sneeze. Then dispose of the used tissue immediately in a trash can with a lid which closes securely.

Mental health

Studies indicate that people are becoming more paranoid withdrawn increasing risks of depression, anxiety and even higher rates of suicide and divorce. To counter this, we create a worry-free psychological state using the various tools. Avoiding cluttering our minds with media exposure and mental inactivity can go a long way in fighting the virus. Each of us have a social responsibility to always give out positive messages to everyone we meet, appreciate and reassure them that this lockdown is inevitable and enjoy certain perks that come with it. Studies have shown that those who are mentally strong and happy, have robust immunity to fight all such viral infections. A depressed mood adversely affects our body's defense T-cell activity and compromises their ability to fight infections[12]. In moderate to severe cases, we highly recommend home based counselling by consulting a clinical psychologist.
Ultimately there will be an effective vaccine and an effective specific antiviral therapy in about a year.

For people without any serious health conditions, the following nutrients may help beneficial immune response to any upper respiratory viral infection and prevent complications.

- Zinc[13] – for prevention take 30mg daily but higher doses over 75mg-90mg are recommended if started within 24 hours with onset of symptoms (any formulation containing 9-24 mg of elemental zinc)

- Vitamin C[14] - 500mg to 1 gram daily
- Vitamins D3[15] supplement daily

Basic precautions to prevent disease:

- Drink lots of hot liquids; tea, soups & warm water.
- Take a sip of warm water every 20 minutes. This keeps your mouth moist and washes any of the virus that has entered your mouth and pushes it into your stomach where the gastric juices will neutralize it before it can get to the lungs.
- Gargle with an antiseptic in warm water such as salt or lemon juice every day if possible.
- The virus attaches itself to hair and clothes. Any detergent or soap kills it. Take a shower immediately when coming from outside and shampoo your hair.
- Wash metallic surfaces. The virus can remain viable on this surface for up to 9 days. When not in your home, wear gloves if possible, to avoid touching handrails, door knobs etc. if you cannot wear gloves or do not have any, wash your hands immediately and then shower.
- Regardless if you have gone outside, wash your hands every 20 minutes with soap that foams and do it for 20 seconds.
- Eat more vegetables. Try to elevate your zinc levels.
- Animals do NOT spread the virus to people. It is person to person transmission.
- Try to avoid eating and drinking too many cold things.
- If you feel a sore throat coming on, gargle with antiseptic immediately. Do it every hour. The virus enters through the throat where it remains for 3-4 days before it passes to the lungs.

- Avoid sleeping too much (2 to 3 hours) during daytime
- Avoid constipation
- Laugh more
- Practice aerobic exercise and pranayama (or deep breath relaxation) regularly.

Specific approaches:

- Please avoid cold and refrigerated items including very cold water, ice creams etc.; particularly when the weather is not too hot.
- Avoid foods with high fat like curd, full cream milk, etc.
- Avoid foods with high mucilaginous (sticky) content like banana, black gram (urad dal), okra (lady's finger), etc.
- Avoid excessively sweet or sour foods.
- Drink water which is boiled and cooled
- Some unpublished Ayurvedic prevention strategies against upper respiratory virus infections are in the Queries section

Summary and final recommendations:

ISKCON leadership has taken several measures to enforce physical distancing rules. Eg: Temporarily holding off on temple events, mass gatherings, street book distribution and restricting temple entry to stall the transmission of the Coronavirus-19.
A strict personal(hand and fomite) hygiene, optimal nourishment, positive emotional state and regular exercise can significantly reduce the risk of infection.

Some common queries:

Are there differences between symptoms caused by the flu and COVID-19?
Cough and cold could mean an allergy. A fever with cough and cold is a symptom of the flu. When you have fever with a cough which is complicated by breathlessness, it is a symptom of Coronavirus infection and you must call your doctor to rule it out.

Is there a link between a person's immunity and COVID-19 transmission?

Yes. Coronavirus is one of the weakest families of viruses. The deaths caused so far or people affected could have been ones with less immunity like children or the elderly. Sometimes, the virus enters a person's lungs and causes pneumonia. People with vulnerable immunity like the elderly succumb to this. For young people with good immunity, the effects of the virus may not be too strong but if you are someone with comorbid conditions like diabetes or cardiac disease, or if you are on immune-suppressive drugs, then the risk of infection is severe.

Contrary to the popular outdated understanding, current research clearly points that the human immune system is not just two dimensional (innate and adaptive) . In a healthy person there are many more cellular systems than our own playing a role. The many trillions of viruses, bacteria and millions of fungi outnumbering our own cells. They are constantly under intelligent surveillance involving a complex interplay of other factors at a genetic and molecular level other than the above two. Keeping immune health strong is mostly in our hands and achieved by optimal low calorie plant based diet, adequate sleep, regular aerobic exercise and maintaining a positive mental state.

Are there any home remedies to treat COVID-19?

The best thing is precaution only. You must keep away from a patient who coughs and sneezes. If you are coughing, you need to cover your face with a mask and not spread the droplets around. COVID-19 spreads through droplets. We try our best to avoid infection with Coronavirus but even if we contracted it, isn't game over! The following are some unpublished approaches from Ayurveda and Siddha systems which are generally helpful in routine viral upper respiratory infection prevention or treatment of mild cases (but are not effective in more severe form of COVID-19 which need immediate hospitalization)

a) Boiled with coriander seeds-15gms per 1litre of water boiled till 3/4th remains.
b) Boiled with ginger[16] - 10gms to 1 litre of water.

- Have tea or milk boiled with long pepper (pippali), ginger, offered Holy Basil ("prasada" tulasi), turmeric etc.

-Andrographis[17]: 1 teaspoon mix with 250 ml of water. boil it - reduce it to 60 ml - filter it. Take twice a day during fever. But only once in 2 days for prevention. This is a common herb in both ayurveda and siddha medicine systems.

-Aswagandha powder: 1 teaspoon twice a day with ghee or honey.

-Holy Basil (Tulasi) decoction: tulasi 10 , pepper 5, boil with 200ml of water - drink once a day with honey.
-Hot water with pepper and cumin seed
- This regime is particularly valid when it is not too hot or when it is raining and should be used judiciously in hot and dry summer.

Are antibiotics effective in preventing and treating the new coronavirus?

No, antibiotics do not work against viruses, only bacteria. The new coronavirus (2019-nCoV) is a virus and, therefore, antibiotics should not be used as a means of prevention or treatment. However, if you are hospitalized for the 2019-nCoV, you may receive antibiotics because bacterial co-infection is possible.

Do vaccines against pneumonia protect you against the new coronavirus?

No. Vaccines against pneumonia, such as pneumococcal vaccine and Haemophilus influenzae type B (Hib) vaccine, do not provide protection against the new coronavirus. The virus is so new and different that it needs its own vaccine. Although these vaccines are not effective against 2019-nCoV, vaccination against respiratory illnesses is highly recommended to protect your health.

References:

1. Centers for Disease Control and Prevention. 2019 Novel coronavirus, Wuhan, China. Information for Healthcare Professionals. https://www.cdc.gov/coronavirus/2019-nCoV/hcp/index.html (Accessed on February 14, 2020).

2. World Health Organization. Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020. https://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020 (Accessed on February 12, 2020).

3. https://www.worldometers.info/coronavirus/

4. https://iskconnews.org/iskcon-uk-hit-hard-by-covid-19-uk-gbc-urges-devotees-not-to-take-it-lightly,7315/

5. Nature. 2020 Mar;579(7798):270-273. doi: 10.1038/s41586-020-2012-7. Epub 2020 Feb 3

6. Science. 2020 Apr 3. pii: eabb7269. doi: 10.1126/science.abb7269. [Epub ahead of print

7. https://www.biorxiv.org/content/biorxiv/early/2020/02/21/2020.02.21.959817.full.pdf

8. Courtesy: Washington Post

9. https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/testing.html

10. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/disinfecting-your-home.html

11. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html

12. H.Benson: Relaxation revolution: Enhancing your personal health through the science and genetics of mind-body healing. 2010 Scribner New York

13. Cochrane Database Systematic Reviews.(1)2006

14. JAMA. 308(13):1333-1339 2012

15. Respir Med J. 5:51-58 2011

16. Food and Nutrition and Sciences.3:1651-1657 2012

17. Phytomedicine.17(3-4):178-185 2010

Acknowledgements:

1. *Dr.A.U.Shankar Prasad, MD (Internal Medicine and Ayurveda)*
Director S.I.V.A.S Center for Health Institute for Integrative Medicine, Secunderabad, Telangana, India

2. *Dr.SelvaShanmugam, MD(Siddha), PhD*
Health India Foundation, Tamilnadu, India

Corresponding Author Email: Damerla95@gmail.com

Medical Disclaimer

The information on this document is not intended or implied to be a substitute for professional medical advice, diagnosis or treatment. All content, including text, graphics, images and information, contained on or available through this web site is for general information purposes only. PRIIMe makes no representation and assumes no responsibility for the accuracy of information contained on or available through this document, and such information is subject to change without notice. You are encouraged to confirm any information obtained from or through this web site with other sources, and review all information regarding any medical condition or treatment with your physician. NEVER DISREGARD PROFESSIONAL MEDICAL ADVICE OR DELAY SEEKING MEDICAL TREATMENT BECAUSE OF SOMETHING YOU HAVE READ ON OR ACCESSED THROUGH THIS DOCUMENT.

PRIIMe Health does not recommend, endorse or make any representation about the efficacy, appropriateness or suitability of any specific tests, products, procedures, treatments, services, opinions, health care providers or other information that may be contained on or available through this document. PRIIMe IS NOT RESPONSIBLE NOR LIABLE FOR ANY ADVICE, COURSE OF TREATMENT, DIAGNOSIS OR ANY OTHER INFORMATION OR SERVICES THAT YOU OBTAIN THROUGH THIS DOCUMENT.