

HealthePeople®

## HealthePeople Strategy Before, During and After Pandemics

Ideal System for Dealing with Pandemics



by

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## **DEDICATION**

*People who help build, achieve, and sustain a healthy and thriving future for all forever.*

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## About the Author

**Gary (Chris) Christopherson** continues to work countrywide and locally on improving health, reducing vulnerability and building a surviving and thriving future. Currently, he develops strategy, management, and policy for creating, managing and sustaining large positive change and building a better, thriving future for all forever

**Thrive!**<sup>®</sup> and **HealthePeople**<sup>®</sup> draw on his 30+ years' experience creating, managing and sustaining large positive change at country and local levels in public and private sectors. He founded **Thrive!** (building a thriving future) and **HealthePeople** (building a healthy future). [ThrivingFuture.org](http://ThrivingFuture.org); [HealthePeople.com](http://HealthePeople.com)). He served as a senior leader, manager and policymaker responsible for multi-billion-dollar policy, programs and budgets and thousands of employees. His public service includes: Principal Deputy Assistant Secretary and Acting Assistant Secretary of Defense for Health Affairs and Senior Advisor, Department of Defense; Associate Director, Presidential Personnel, Executive Office of the President, White House; Senior Fellow, National Academy of Public Administration; Senior Advisor to Chief Operating Officer and Deputy Director for the Quality Improvement Group, Centers for Medicare and Medicaid Services, DHHS; Senior Advisor to Under Secretary, Veterans Health Administration, VA; Senior Fellow, Institute of Medicine, National Academy of Sciences; Chief Information Officer, Veterans Health Administration, VA; Director of Health Legislation, House Select Committee on Aging, U.S. House of Representatives.

He wrote several public policy and administration books, including **HealthePeople**<sup>®</sup> - **Achieving Healthy People, Communities, Countries and World, First People Thriving Health Systems – Achieving Healthy and Thriving First People, Thrive! - Building a Thriving Future, Thrive! - People's Guide to a Thriving Future, The Thrive! Philosophy, Behavior Effectiveness Model, Thrive! – All Thrive Forever, and Thrive! Endeavor.** Available [Amazon.com](http://Amazon.com) and [ThrivingFuture.org](http://ThrivingFuture.org).

He is a sculptor of abstract art, focusing on Thrive! sculptures and creating over 200 sculptures. GChris Sculpture at [GChris.com](http://GChris.com).

He wrote several books. **Thrive Sculpture and Thought** highlights Thrive! sculptures and messages each communicates. Science-fiction books include **Xtinct - Universal Justice for Earth, Thrive! - Escape from Extinction, Extinction – Failure to Thrive, black box and The Thrive! Endeavor.** Children's fiction books entitled **Thrive or Not to Thrive? – Tale of Two Tomorrows, Angel – Thriving Creator of Artful Things and T!rrific (terrific) -What will you do to thrive?** Available [Amazon.com](http://Amazon.com) and [GChris.com](http://GChris.com).

He received his bachelor's in political science and his master's in urban and regional planning from the University of Wisconsin (Madison), and did doctoral work in health policy and management at John Hopkins University School of Public Health.



## **HealthePeople® - HealthePeople Strategy Before, During and After Pandemics.**

### **Ideal System for Dealing with Pandemics**

**HealthePeople Strategy Before, During and After Pandemics.** HealthePeople's primary focus is on people getting and being healthy. And it understands and takes on challenges posed by human pandemics. COVID-19 is just the latest and one of the most challenging. HealthePeople, as should current health system(s), will succeed by successfully addressing human pandemics simultaneously with achieving and maintaining healthy persons, communities, countries, and world. (Figure 1. Microscope View of SARS-CoV-2 Virus. Source: National Institutes of Health.)

In the past, the world had the Spanish Flu pandemic. More recently, the COVID-19 pandemic. There have been others in the past. In the future, there will be other pandemics. HealthePeople enables us to better prepare for, manage during, and handle the aftermath of any pandemic. (Figure 2. Spanish Flu 1918. Source: National Museum of Health and Medicine (NMHM), Military Health System, DoD.)

When in place, HealthePeople Thriving Health Systems provide a coordinated community strategy to successfully manage pandemics (like COVID) and all other health conditions (non-COVID) simultaneously and successfully.

**Pandemics.** Keep in mind that an infectious disease can be initiated and spread by human or non-human action. A person could take an infectious agent from nature or from a lab or from some other source and intentionally or unintentionally spread it to other persons. A mistake in a lab is one example. Biological warfare or terrorism is another. An animal, for example a bat or monkey, could host an infectious agent and transmit it to another animal or directly to humans. Humans and/or animals could spread it further to many people.

Keep in mind that some infectious agents can infect other people when the infected person is asymptomatic, mildly symptomatic, or severely ill. There could even be cases where the person may not be infected but can be carrier and may infect other persons.

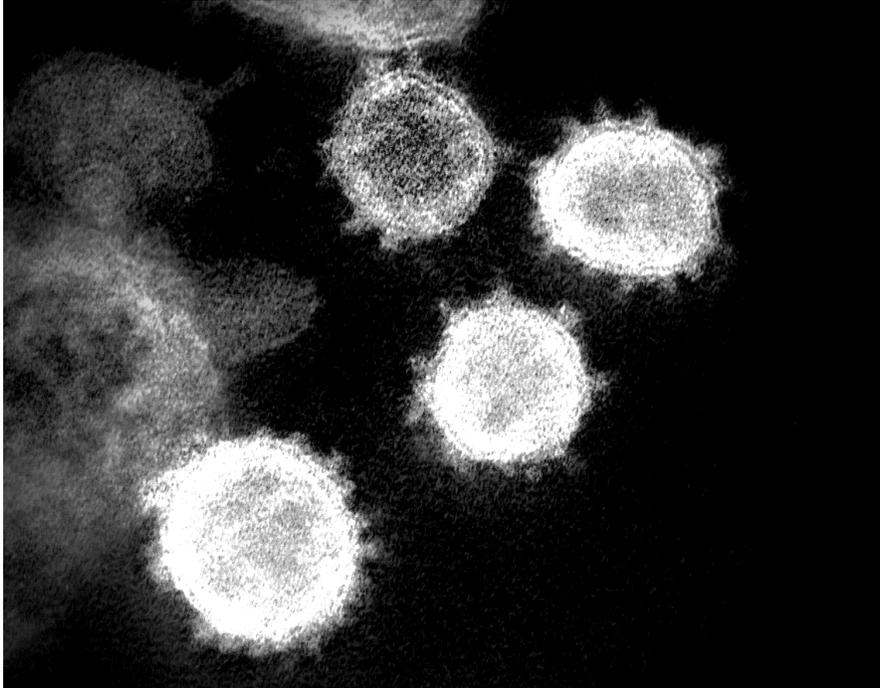


Figure 1. Microscope View of SARS-CoV-2 Virus. Source: National Institutes of Health.



Figure 2. Spanish Flu 1918. Source: National Museum of Health and Medicine (NMHM), Military Health System, DoD.

It is critical to look for early signs of infection and related illness. When an infection is identified when only one or a few people are infected, it can generally be controlled. If not and depending on the infectious agent's transmissibility, infections may quickly spread and be difficult to control. Spanish Flu and COVID-19 are examples of infections not identified early enough and not controlled early enough. Both had devastating consequences.

Key lesson from the Spanish Flu and COVID-19 is that the next pandemic may be different than any previous pandemic and may require different strategies, a different surveillance and response system, different vaccines, different protective measures, different treatments, and may have different near and long term consequences for people and their communities, countries and world.

Keep in mind that some pandemics are not one-time pandemics. Some infectious agents can persist and some vaccines need to be repeated annually. Some infections become endemic. That is, they continue and they continue to be a threat on a year-to-year basis.

**Pandemic – Thriving Health Systems.** Better than our current “health system” and much better for dealing with pandemics, a Thriving Health System gives us our best chance to be healthy throughout our lifetime.<sup>1</sup> Our having a Thriving Health System for our community ensures we are healthier people in a healthier community. We are better prepared to deal with pandemics.

A Thriving Health System has persons and their communities at the center. At the center is the person and the person's Primary Health Support surrounded by all needed and wanted Health Support. It adjusts when locations, time, person, and community change. It takes into account all of personal and community characteristics and all of health and well-being. It understands personal and community environment and its impact on health and well-being. It understands and uses the full range of health and thriving support to improve and sustain health and well-being. It connects all of these, with information and other support, into a fully integrated and supportive system for persons and communities.

When faced with the challenges unique to pandemics, a Thriving Health System successfully prepares for, successfully manages during, and successfully deals with an onerous or less onerous aftermath. (Figure 10.3 “Thriving Health Systems Ensure Healthier People.”)

**Pandemic – Person-Centered Health.** Every person will be differently affected by a pandemic. Every person is different with respect to the person's health and non-health conditions. Different in how the person interacts with a community health system. To achieve the optimal health requires optimal personal health by the person and optimal interaction with a community health system by the person. How this all optimally supports the person is shown in Figure 3.)

**Pandemic – Prepare For and Prevent.** At all levels (community, country, world), there must be an effective surveillance and response system in place and fully functional.

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<sup>1</sup> Thriving Health Systems are comprehensive health systems that can be of almost any size and for any type of community. Community includes legal communities (e.g., village, town, city, county, State, nation), geographic areas (e.g., regions), groups (e.g. ethnic groups, affinity groups), and world.

# Thriving Health Systems Ensure Healthier People

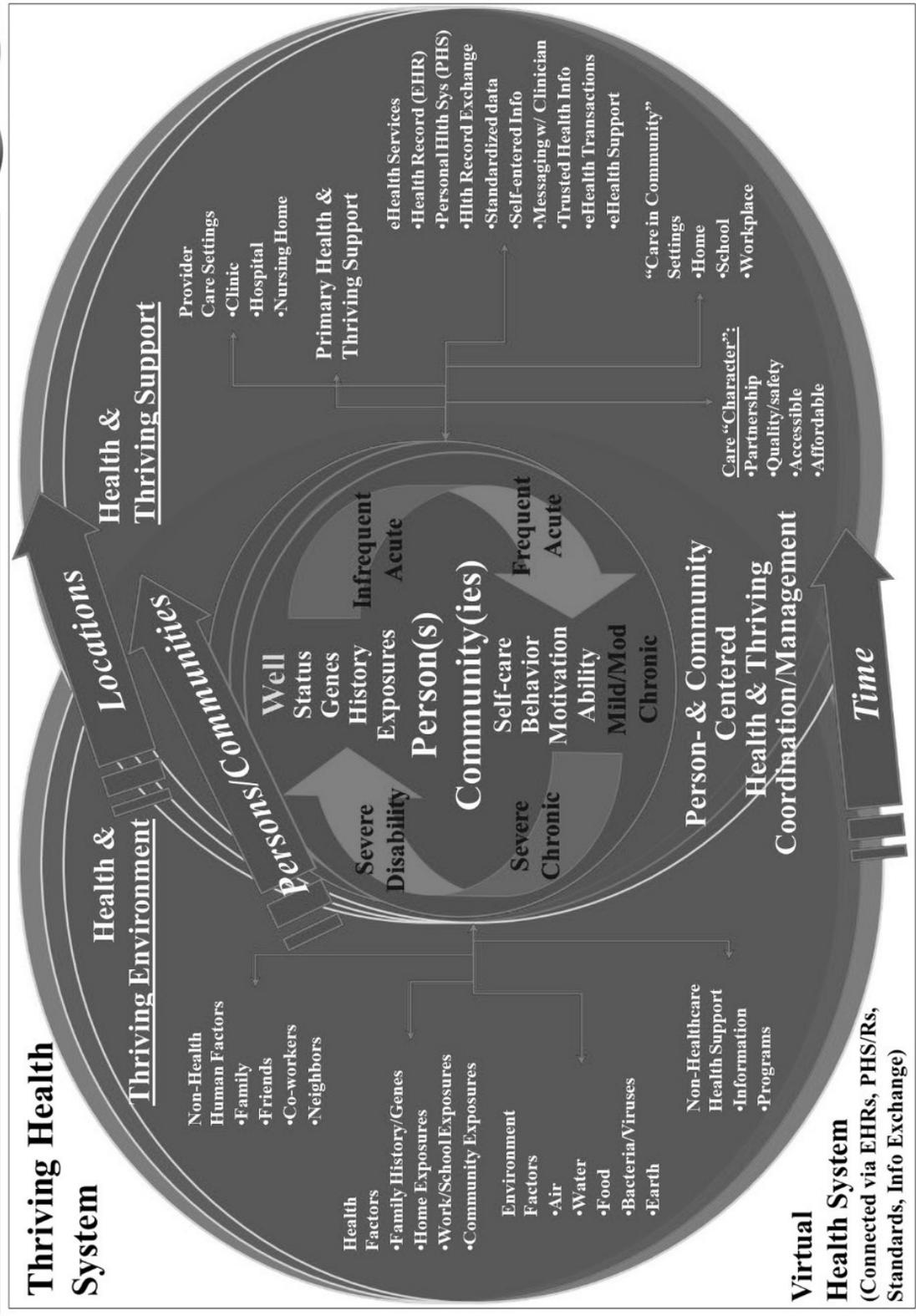


Figure 3. “Thriving Health Systems Ensure Healthier People.”

**Person.** Each person should manage own personal health as successfully as possible. First key is for person to be as healthy as possible before any pandemic. This increases person's ability to prevent infection, reduce pandemic producing infection and death, and reduce recovery time and long term health consequences. Second key is prevention of infection by personal protective measures – immunization, personal protective equipment (e.g. masks, gowns, face shields, gloves), disinfecting person and surrounding environment, and physical distancing from others that a person might infect or might infect the person. Third key is prevention and treatment of non-pandemic illnesses and injuries that might either make a person more susceptible to the pandemic or that might be made worse by the pandemic or might be made worse by not being prevented or treated in a timely fashion. Fourth key is to make sure, to the extent financially feasible, to have on hand medications, food, and other necessities for three to six months. (Figure 4. Persons wearing masks. Source: CDC.)



Figure 4. Persons wearing masks. Source: CDC.

It is critical to work cooperatively with the community's public health department and health care system to protect others from a person and to protect a person from other persons.

When a pandemic occurs, a key question is how much existing immunity exists for each person. There are certain immunities which are general based on previous exposures. There are certain immunities which are specific to a previous exposure. There are certain immunities and other human protective measures that are inherent in some people and in the human species. Until a new pandemic emerges, it is uncertain which immunities and human protective measures will help, how much they will help, and how long they will help.

**Public Health.** In dealing with any pandemic, public health measures are the key to successfully protecting health. First, it is critical to have an effective public health system in place. This can help with ensuring clean air and water. Ensuring a safe and healthy food supply. Ensuring safe housing. Ensuring safe work places. Educating people on what each person and family can do to get and stay healthy and to protect themselves and others from health threats, including pandemics.

One key is surveillance for early signs of an infectious disease. We now have many tools that can be used to help with surveillance. Sensors of many types. Electronic media that can spot telltale incidents and trends and communicate them widely. Public health systems and health care systems can identify illnesses indicative of a transmissible infection. This applies to community, country, and world. That will enable us to identify a pandemic early, determine who and where is at risk, and develop and initiate protective and treatment measures.

For decades, we have known how to do community and global surveillance and response.<sup>2</sup> Tragically, we did not do this for COVID-19 until it was much too late. Too many became ill. Too much disruption of normal life. Too many died. We must not make this mistake with future pandemics.

A second key is immunization. That means we need to have in place an effective system for understanding the associated virus or bacteria, developing safe, efficacious, and effective vaccines to prevent infection, and successfully vaccinating the people at risk. Work continues on how to create and produce vaccines faster while ensuring safety and efficacy. In the case of COVID-19, vaccines have been created much faster than in the past but still too slow to prevent too many infections, hospitalizations, and deaths. Depending on the efficacy and safety of the vaccine, it is critical to ensure people trust the vaccine and the vaccination process.

It is likely that there will not be enough vaccine initially to vaccinate all who need and/or want it. Priorities will have to be set. This is difficult. Should the first be health and long term care workers who care for those who become ill? Or the most vulnerable, if infected, to becoming seriously ill and die? Or the most vulnerable to becoming infected because the infectious agent is most likely to infect them? Or the most necessary to daily life, including health and long term care workers and also people necessary to providing food (grocery store workers, farmers, food processing workers, and food transport workers) and other critical supplies? Or teachers and children necessary to ensure learning continues? Or other workers necessary to providing income to their families and themselves ensure food, shelter, health care and other necessities? These are some of the tough questions with major implications for slowing down the pandemic, sustaining basic living and preventing the most severe near and long term health, economic and learning consequences.

It is critical to get enough people immunized and protected to produce herd immunity. If not achieved, then other protective measures will still be needed. If not a long lasting immunity like with flu, then additional vaccinations will be needed as well as other protective measures. (Figure 5. Person receiving immunization. Source: CDC.)

A third key is protective measures appropriate to the associated virus or bacteria. This will depend on the method of transmission. If airborne transmission, this will require quarantining, masks, proper ventilation and filtering, physical distancing, hand washing, and disinfecting. If contact transmission, this will require quarantining, hand washing, and disinfecting. If food transmission, this will require removing the affected food and avoiding that food. These are just a few of the transmission modes and associated protective measures.

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<sup>2</sup> The author, when leading the Military Health System (Department of Defense), co-led an effort with the Centers for Disease Control in the 1990s to develop a global infectious disease surveillance and response system. Though the strategy was developed, the actual system was not. The author changed positions and was unable to help complete the systems. The other partners also did not complete the system. The lack of a system made the COVID-19 impact much worse. Unless an effective system is put in place, future pandemics will have more devastating consequences than they should.

**Health Care.** In dealing with any pandemic that produces serious illness, health care will be key to minimizing illness and death. Since each pandemic may be different, preparing for future pandemics requires several measures. First key is that health care is monitoring its patients for any signs of an infectious agent that might produce serious illness. Second key is that it have in place procedures for handling infections. Third key is to have in place the necessary staff, facility, equipment, and supplies for containing and treating infections. This also requires having contingency plans in place if there are any shortages of staff, facility, equipment, and supplies. Third key is having in place effective protective measures for both staff and patients. Fourth key is that health care knows how it will manage both a pandemic and normal health conditions simultaneously. This may require collaboration, cooperation, and resource sharing among health care organizations.



Figure 5. Person receiving immunization. Source: CDC.

**Long Term Care.** In dealing with a pandemic, the most vulnerable people will need special attention. Long term care requires special attention because it cares for many of the most vulnerable people, cares for them often in a constrained environment (e.g., nursing homes, assisted living facilities), cares for them in a person's home that may be a less controlled environment, and depends on staff, often low wage, moving to and from the community to provide care and support that care.

First key is that long term care is monitoring its patients for any signs of an infectious agent that might produce serious illness. Second key is that it have in place procedures for handling infections. Third key is to have in place the necessary staff, facility, equipment, and supplies for containing and treating infections. This also requires having contingency plans in place if there are any shortages of staff, facility, equipment, and supplies. This will differ for facility based care versus home based care. Third key is having in place effective protective measures for both staff and patients. Fourth key is that long term care knows how it will manage both a pandemic and normal long term care simultaneously. This may require collaboration, cooperation, and resource sharing among health care and long term care organizations.

**Pandemic – Manage During.** When public health measures, for one reason or another, cannot or do not prevent a pandemic, then the health system must treat pandemic related health conditions at the same time as treating non-pandemic health conditions.

**Person.** First and foremost is for each person to continue to manage their own personal health as successfully as possible. First key is for the person to remain as healthy as possible during any pandemic. This increases a person's ability to prevent infection, reduce pandemic producing infection and death, and reduce recovery time and long term health consequences. Second key is to have and effectively use personal protective equipment (e.g. masks, gowns, face shields, gloves), disinfect person and surrounding environment, and physically distance from others a person might infect or might be infected by. Third key is prevention and treatment of non-pandemic illnesses and injuries that might either make a person more susceptible to the pandemic or that might be made worse by the pandemic or might get worse by not being prevented or treated in a timely fashion.

If a person is sick, critical to take precautions. Stay home when sick, except to get medical care. When sick, wear mask and avoid direct contact when around other people. If person in home is sick, protect remaining persons. For example, a separate room and bathroom is helpful.

But the person is not alone. Work cooperatively with the community's public health department and health care system to protect others from a person and to protect a person from others. Do whatever a person can do to protect others and to help community businesses, schools and other organization survive during a pandemic.

Students and staff in schools present several unique challenges. While student generally do best with in-school learning, it should be done but only be done if the students and staff can be kept safe. That includes wearing masks, washing hands, hand sanitizer, physical distancing, and good ventilation and air filtering. This goes beyond the school building and includes transportation to and from school. Virtual learning and home school learning are important depending on the circumstances, especially when students and staff are not being protected while at school. Learning outside in-school needs to be much better than most our current out-of-school learning systems. Schools need to incorporate the best out-of-school learning systems that best help students learn in both pandemic and non-pandemic environments (Figure 6. Students and Staff in School. Source: CNBC, Getty Images.)

**Public Health.** As has been shown, it is essential to have trusted, consistent communication of a pandemic's risk, both to who and when. Trusted, consistent communication of necessary actions by people, actions by public health, health and long term care providers, and actions by businesses and organizations. When communication is not trusted and consistent, people will not behave in a way to protect themselves and others and to contain the pandemic.

It is critical to continue to prevent or reduce transmission of a pandemic's virus or bacteria. The approach will vary depending on how transmission occurs. If airborne, wearing masks, maintaining physical distance, avoiding crowds, and having good ventilation are key. If by direct contact, avoiding direct contact with other persons and affected surfaces, and doing good hygiene (disinfecting hands and surfaces) are key. If via food, avoid that food temporarily and substitute with non-affected food. When available, safe and effective immunizations should be used. Maintaining good health generally helps prevent an illness and increase resilience. These public health measures reduce the impact of a pandemic on the person, the community, and the health system. (Figure 7. Slow the Spread of COVID-19. Source: CDC.)

Public health should partner with their health care providers to successfully execute a coordinated strategy for dealing with a pandemic. HealthPeople community health systems provide a coordinated community strategy to successfully manage pandemics (like COVID) and all other health conditions (non-COVID) simultaneously and successfully.



Figure 6. Students and Staff in School. Source: CNBC, Getty Images.

**Health Care.** Unfortunately, many current health systems, while dealing with COVID-19, reduced and/or shut down many non-COVID health services. That was unfortunate and should not have happened for any significant time. HealthPeople health systems are designed to successfully manage pandemics (like COVID) and all other health conditions (non-COVID) simultaneously and successfully.

There are many ways to accomplish this in a community or country health system. First and foremost, people and health providers must be kept safe. Second and critical, people must get and keep as healthy as possible while using a health system.

Health staff caring for pandemic and non-pandemic people must have personal protective equipment (masks, clothes, eyewear, etc.) sufficiently protective from a pandemic's virus or bacteria. All surfaces potentially being contacted by people or staff must be sufficiently disinfected in terms of frequency and of method of disinfecting. All spaces in which persons and staff enter must have sufficient ventilation and protective air filtering. Even with all this, some health staff may become infected. Some may die. (Figure 8. Hospital ICU Treating COVID-19 Patients. Source: NY Times.)

# Slow the Spread of COVID-19

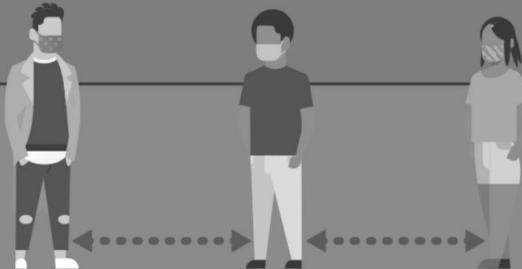


WASH YOUR HANDS OFTEN

WHEN OUT WITH YOUR FRIENDS, WEAR A MASK



AND STAY 6 FEET APART FROM OTHERS



CLEAN FREQUENTLY TOUCHED OBJECTS



DO NOT TOUCH YOUR EYES, NOSE, AND MOUTH

COVER YOUR COUGHS AND SNEEZES



STAY HOME IF YOU ARE SICK



[cdc.gov/coronavirus](https://cdc.gov/coronavirus)

CS 318104-A 08/06/2020

Figure 7. Slow the Spread of COVID-19. Source: CDC.



Figure 8. Hospital ICU Treating COVID-19 Patients. Source: NY Times.

Managing care during a pandemic is challenging on its own. But when health staff also become infected, ill and die, a special problem is created. Just at the time when they are needed most is when many will be stricken and become unavailable to provide care. As we have learned in COVID-19, facilities, equipment, and supplies may be in short supply. But it is the shortage of health staff that will most limit what can be done in a pandemic to provide needed care.

In terms of friends, family or personal caregivers, a person being treated with a transmissible infection should not have visitors unless very important to a person's care and treatment outcome. To help, a person's personal caregivers and family should be educated on how they can help, such as by avoiding infection, providing social support (including by electronic media), and supporting care. Any treatments that can be carried out effectively by telehealth and where the person lives should be done that way until the pandemic ends.

Depending on the health system, separate facilities (within a health system or between multiple health systems) may be an option. Separate protected areas within a facility may be an option. Separate times, with complete cleaning and ventilating in between times, may be an option. Which approach is best will also depend on a pandemic's intensity (transmissibility, illness amount and degree, lethality) and community spread. Each pandemic and each health system will have its own unique characteristics and most appropriate strategy.

The types of treatment available and relative effectiveness has a major impact on how treatment is managed. Early in a pandemic, there may be no specific treatments yet available. In that case, health providers will rely on what has been most effectively used in the past for similar health conditions. They may be effective. They may make the situation worse. They may just be supportive care. Key that health providers monitor each patient to find the best treatment course. Key that health providers understand what is working best and why and what is not working or making the condition worse. When a specific treatment for the infection becomes available, it will be necessary to determine if the treatment applies to the patient being treated. Age, ethnicity, cognitive level, affordability, and other health conditions may affect treatment. Monitoring must be done for side effects and treatment failures.

While a community or country health system may have to establish priorities in times of insufficient resources to successfully manage both pandemic and non-pandemic health conditions, it is critical that additional resources, including non-traditional resources, be brought to bear to manage both. This is where great creativity and resolve will be critical to successfully manage both pandemic and non-pandemic health conditions. To not do so will result in a more devastating and challenging aftermath.

**Long Term Care.** Managing long term care, whether facility or home care, faces special challenges because of the vulnerability of people needing long term care.

First and foremost, people and staff must be kept safe. Second and critical, people must keep as healthy as possible relative to non-pandemic health.

Long term care staff caring for pandemic and non-pandemic people must have personal protective equipment (masks, clothes, eyewear, etc.) sufficiently protective from a pandemic's virus or bacteria. All surfaces in a facility or in a home potentially being contacted by people or staff must be sufficiently disinfected in terms of frequency and method of disinfecting. In a facility, all spaces in which persons and staff enter must have sufficient ventilation and protective air filtering. Even with all this, some long term care staff are likely to become infected. Some may die. (Figure 9. Nursing Home Outbreak. Source: LA Times.)

Managing long term care during a pandemic is challenging on its own. But when long term care staff also become infected, ill and die, a special problem is created. Just at the time when they are needed most is when many will be stricken and become unavailable to provide care. As we have learned in COVID-19, facilities, equipment, and supplies may be in short supply. But it is the shortage of long term care staff that will most limit what can be done in a pandemic to provide needed care.

In terms of friends, family or personal caregivers, a person should not have visitors unless important to a person's care and outcome. To help, a person's personal caregivers and family should be educated on how they can help, such as by avoiding infection, providing social support (including by electronic media), and supporting care.

Depending on the community, separate facilities (within a long term care system or between multiple systems) may be an option. Separate protected areas within a facility may be an option. Which approach is best will also depend on a pandemic's intensity (transmissibility, illness amount and degree, lethality) and community spread. Each pandemic and long term care system will have its own unique characteristics and most appropriate strategy.

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Figure 9. Nursing Home Outbreak. Source: LA Times.

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Depending on the community, separate facilities (within a long term care system or between multiple systems) may be an option. Separate protected areas within a facility may be an option. Which approach is best will also depend on a pandemic’s intensity (transmissibility, illness amount and degree, lethality) and community spread. Each pandemic and long term care system will have its own unique characteristics and most appropriate strategy.

The types of treatment available and relative effectiveness has a major impact on how treatment is managed. Key that long term care providers monitor each patient to find the best treatment course. When a specific treatment for the infection becomes available, it will be necessary to determine if the treatment applies to the patient being treated. Age, ethnicity, cognitive level, affordability, and other health conditions may affect treatment. Monitoring must be done for side effects and treatment failures.

While a long term care system may have to establish priorities in times of insufficient resources to successfully manage both pandemic and non-pandemic health conditions, it is critical that additional resources, including non-traditional resources, be brought to bear to manage both. This is where great creativity and resolve will be critical to successfully manage both pandemic and non-pandemic health conditions. To not do so will result in a more devastating and challenging aftermath.

**Pandemic - Handle Aftermath.** Handling the effects of a pandemic requires handling both direct and indirect effects and both near and long term effects. To not do this means a pandemic has negative impacts. The direct illness and death impact of the pandemic. The downstream impact of health care not provided timely or completely. The near and long term impacts.

**Person.** In the aftermath of a pandemic, people may face many health and non-health issues. Some pandemics will result in direct effects such as long term health problems requiring ongoing health care and even long term care. Families may have long term stress related health issues. People may suffer from more depression and other mental health issues. Some people whose non-pandemic health care for illness and injury was reduced or delayed may face increased health problems.

Some pandemics will result in indirect effects such as lost school learning. May result in economic problems due to lost income, health-related bills, and damaged or closed businesses and other organizations. Charities may face great demand just when donations decline. When indirect effects are major, government, especially Federal and State, should provide necessary support, including financial assistance. That will have taxpayer impacts and may impact needed government support.

**Public Health.** In the aftermath of a pandemic, public health and related public services may face many health and non-health issues. Some pandemics will result in direct effects such as supporting people with long term health conditions and catching up with postponed public health measures (like immunizations, public health nursing, women and infant care, health education, water testing, environmental protection, and business health inspections). Some pandemics will result in indirect effects such as overextending budgets, worn out staff, and losing staff who may be hard to replace.

All this can be minimized or avoided if public health, with public support, has the necessary resources and successfully handles both pandemic and non-pandemic public health issues timely and completely.

**Health Care.** In the aftermath of a pandemic, health care faces many direct and indirect issues. There may be longer term care of pandemic-related illnesses. With respect to non-pandemic health conditions, preventable illnesses are partially or totally not prevented. Treatable illnesses and injuries are not treated timely or completely. Emergency type illness and injury may be delayed, not treated, poorly treated, or be complicated by adding an infection (person or staff) related to the pandemic. Chronic illnesses, left untreated or poorly treated, have greater negative impacts.

With respect to pandemics not well controlled and related pandemic health conditions, there will be more pandemic-related morbidity and mortality. More people will be infected and need treatment. More severe illness will likely result in more longer term effects (health and non-health). More severe illness will likely result in more deaths. Non-health effects can include closed businesses, limited use of businesses like restaurants and other retail stores, breaks in supply chains, and schools going to virtual learning.

Health care may lose staff who may be hard to replace. Some medical care, like doctors' offices, may close due to severe financial impacts. When indirect effects are major, government, especially Federal and State governments, should provide necessary support, including financial assistance. That will have taxpayer impacts and may impact other needed government programs.

All this can be minimized or avoided if health systems have the necessary resources and successfully handles both the pandemic and non-pandemic illnesses and injuries timely and completely.

**Long Term Care.** In the aftermath of a pandemic, long term care faces many direct and indirect issues. With respect to non-pandemic health conditions, preventable illnesses are partially or totally not prevented. Treatable illnesses and injuries are not treated timely or completely. Emergency type illness and injury may be delayed, not treated, poorly treated, or be complicated by adding an infection (person or staff) related to the pandemic. Chronic illnesses, left untreated or poorly treated, have greater negative impacts. All these issues tend to be worse in long term care because of high vulnerability of people receiving long term care.

With respect to pandemics not well controlled and the related pandemic health conditions, there will be more pandemic-related morbidity and mortality for people needing long term care. More people will be infected and need treatment. More severe illness will likely result in more longer term effects (health and non-health). More severe illness will likely result in more deaths. Non-health effects can include lack of family support.

Long term care may lose staff which may be hard to replace. Since staff move to and from the community, there is more chance for infection to flow either way. For home care, staff are going to and from the person's home increasing the chance of infection. Government, especially Federal and State governments, should provide necessary support, including financial assistance. That will have taxpayer impacts and may impact other needed government programs.

All this can be minimized or avoided if long term care has the necessary resources and successfully handles both the pandemic and non-pandemic illnesses timely and completely.

**Community, Country, and World Collaboration and Cooperation.** Viruses and bacteria are driven to survive by any means they can. Viruses and bacteria do not recognize family, community, or country boundaries. As a result, we need to collaborate and cooperate across boundaries if we are to control destructive viruses and bacteria.

To limit impact of a pandemic, collaboration and cooperation must occur within communities, across communities, across states, and across countries. Especially in case of a highly infectious virus, cooperation and cooperation must occur globally. And when effective means of controlling a pandemic and treating its effects are available, they must be shared widely and equitably. Countries and communities with higher percentages of poor people and less capable health systems are often at greatest risk and least likely to be protected. Inequitable vaccine distribution and weak public health and health care and long term care systems are examples. To not do so means the pandemic will cause unnecessary illness and death and will retain a foothold for future pandemics with any who do not receive the means of near and long term control.

As we have demonstrated with COVID-19 and the Spanish Flu, the failure to collaborate and cooperate will delay and inhibit our response, will result in faster and wider spread of infections, will extend the length and breadth of a pandemic, and will result in much greater illness and death. These pandemics or the next pandemic has the potential to be an existential threat to the human species. (See Figure 10. "existential threat", Thrive! Sculpture by GChris.)

Figure 10.  
"existential threat",  
Thrive! Sculpture by  
GChris. Abstract  
Sculpture Based on  
Microscopic Image  
of SARS-CoV-2  
Virus.

