

The Librarian's Disaster Planning and Community Resiliency Guidebook

Librarians Fulfilling Their Role as Information First Responders

Appendix 1

Pandemics, Epidemics, and Infestations

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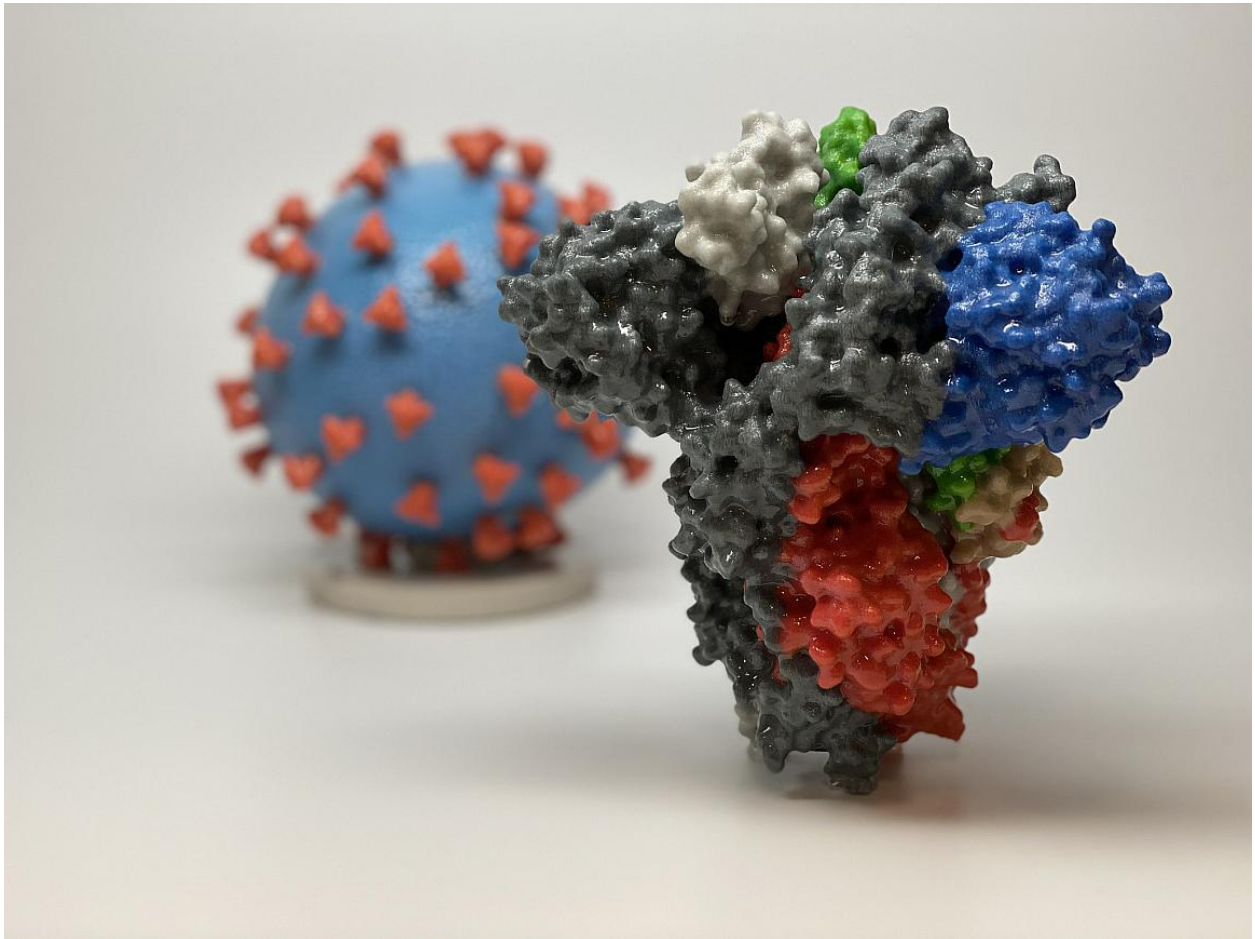


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*The foreground shows a 3-D representation of a spike protein of SARS-CoV-2 virus.
The background shows a 3D print of a SARS-CoV-2 virus particle. Credit: NIH*

Definitions:

Pandemic (pan' demik): An outbreak that is prevalent over a whole country or the world.

Epidemic (epə' demik): A widespread malady that occurs in a community for a limited time.

Infestation (infə' stāSHən): the presence of an unusually large number of vermin in a place.

Overview

Since management of a crisis begins with understanding its nature and extent, this Appendix begins with a discussion of the types of disease-related outbreaks that could lead to potential pandemics, epidemics, or infestations.

The discovery of the COVID 19 virus and its worldwide reach drove a flurry of activity aimed at helping libraries cope with a challenge to their mission. Physical sites were being closed just as large portions of the population move online and demanded access to library services.

Healthcare groups, the ALA and other public-service organizations produced advisory documents complete with checklists, outlining safe ways of closing, remotely operating, and eventually reopening libraries.

These are excellent resources and should be reviewed for detailed advice on library shutdowns and reopenings. Concurrently, libraries are learning how to operate virtually as they adjust to the changing needs of their communities.

This Appendix does not attempt to duplicate these efforts. Rather, its purpose is to augment the information covered earlier in this Guide. Librarians should apply the concepts of risk management emergency response, disaster recovery, and business continuity to the work demands of their institution given the demands and restrictions imposed by a widescale disease outbreak.

This Appendix lists a short summary of major illnesses over the past century that reached the pandemic level. Many of these diseases persist and have the potential to reemerge and grow to be pandemics. The table includes other illnesses plaguing society including a growing number of behavioral disturbances.

An operational checklist is included that highlights actions librarians can take in preparing for a community-wide outbreak.

The Appendix closes with a closer look at the most common illnesses threats facing libraries and the communities they serve along with suggestions on how to cope with each challenge.

Overview

Pandemics and epidemics occur more frequently than people realize. This is because they are often referred to by a familiar term such as the flu or the opioid crisis.

Other common illnesses such as measles, and surges of pest-borne maladies such as Lyme and West Nile disease are thought of as isolated cases. Few realize the extent to which these diseases spread and how deadly they can be.

Add to this infestation of bed bugs, 'killer hornets', lice, and social maladies such as cyber-crime and the challenges facing libraries become clear.

To fulfill their mission in a society where shutdowns and closings are becoming more frequent, libraries must adjust their policies, alter operating plans, and find new ways of delivering their services. Throughout this process attention must be paid to the health and welfare of both staff members and the community that uses the library.

Security Considerations

As services become increasingly digital, librarians are being called on to help citizens' make the transition to the cyber world. For example, senior citizens are now one of the largest users of social media systems and email communication among all segments of society has skyrocketed.

Paralleling the rise in online activity is an increase in cybercrime. As people change their focus to online shopping and banking; criminals move to exploit security weaknesses or lure people into various schemes and deceptions. Some security experts report that cyber attacks have increased to over 4,000 per day since the declaration of the pandemic by the World Health Organization in March of 2020. Increasingly, librarians are being asked for help to deal with these scams and bogus demands from criminals posing as tax agents or law enforcement officials.

The economic malaise that accompanies pandemic shutdowns has disproportionately affected some demographic groups. Especially those who depend on libraries for a core set of services. With staffing levels down and demand is increasing libraries are compelled to change.

Pandemics bring other unwelcome change to the relationship between librarians and users. For example, during widescale shutdowns and closures there is usually a marked increase in the consumption of drugs in communities. The economic strain felt by individuals and families during pandemics, especially when accompanied by forced business closings intensifies anger. Frustration grows and emotional outbreaks followed backed by verbal or physical violence.

All this emotion leads to an increase in angry confrontations.

Librarians encounter these issues everyday but during a pandemic the frequency and intensity of these exchanges may increase.

Most libraries have policies for dealing with unruly individuals but resources such as the local police may be strained during a widescale health event and not as available.

Some institutions have found it helpful to train their staff in the use of *Verbal Judo*.

Developed by Dr. George Thompson, a former police officer and martial arts expert; Verbal Judo has been in use by law enforcement and other professions since 1983.

Practitioners are taught how to listen and speak with emotionally upset individuals while displaying empathy and genuine concern. This creative approach to conflict resolution often diffuses dangerous situations and allows meaningful communication to take place. Students of this practice also learn to watch for signs of escalating behavior and are taught when to disengage from discussions.

Courses on Verbal Judo can be found online and at the Verbal Judo Institute (<https://verbaljudo.com>).

It is important to remember that staff members who work through these difficult times may need counseling support in the form of an employee assistance service. Run by trained mental health professionals, participation in these programs can be extremely helpful and employees should be encouraged to use these services.

Pandemic Impact

The impact of the March 2020 pandemic announcement was immediate and disruptive. Fear gripped some part of society as officials took to social media and the airwaves warning of shortages of key medical devices such as ventilators and personal protective equipment (PPE). Some citizens resorted to hoarding paper products putting further stress on supply chains struggling to meet the surging demand.

Libraries, businesses, and other institutions were ordered to shutter their work locations. Workers and students alike were sent home as society adjusted to a new operating climate. A survey by

Education Week estimates that the pandemic resulted in the closings of 124,000 school sites, affecting over 55 million students who were directed to continue their studies online.

Demand for library services surged just as facility and staffing restrictions were mandated. Buildings were quarantined and staff told to implement tele-working plans. While the public was directed to seek information and entertainment online, interest in eBooks grew significantly as did cable and broadcast TV watching.

Workers, including librarians were idled and struggled to pay their bills.

The closing of libraries, once the refuge of many segments of society affected some groups more than others.

Library directors and boards of trustees were left to develop strategies that kept their sites active and relevant to the community in the face of an economic downturn. Simultaneously, millions of citizens who were told to quarantine at home turned to their community library for information on the disease and ways of staying intellectually occupied.

Anyone with a compromised immune system was cautioned to stay at home and minimize contact with others. The homeless, non-native English speakers, the elderly, and individuals with vision or hearing challenges were suddenly cut off from a place they had come to depend on for assistance and support.

Societies' digital divide became more apparent as students from low-income families, lacking access to high-speed Internet connections or computing devices struggled to participate in online classes. Printing documents became more difficult as those who relied on libraries for this, and other services were left without options. Nationwide demand for young adult and juvenile electronic book titles rose by more than 50%.

Those who had come to think of their local library as a daytime shelter suddenly found they were locked out.

An Overview of Recent Pandemics

The declaration by the World Health Organization that the SARS CoV-2 virus had reached pandemic levels was the twelfth such announcement by authorities in the last 100 years.

Many of these illnesses persist in some form and continue to plague the world.

World-threatening Outbreaks 1918 - Present

<u>Outbreak</u>	<u>Date</u>	<u>Comment</u>
Spanish Flu	1918 – 1920	An example of a Type A influenza which targeted people aged twenty to forty. This H1N1 virus killed 50M and still circulates as a deadly seasonal flu.
Asian Flu	1957 – 1958	This is another stain of Type A flu (H2N2) that originated in birds. Death toll is estimated at 1.1M across the world, and 116,000 in the United States.
Cholera Outbreak	1961 – Present	Caused by the <i>Vibrio cholerae</i> bacteria, this was the seventh recorded outbreak of this disease. It continues to persist although most cases are limited to Africa and Indonesia.
Hong Kong Flu	1968 – 1970	Another Type A influenza (H3N2), this outbreak killed around 1M worldwide of which 100K were in the US.
Russian Flu	1977	An H1N1 coronavirus, this Type A flu caused the death of 700K. It is believed to be related to another flu pandemic which struck in 889 – 1890. The cold virus OC 43 is believed to be a surviving strain.
AIDS	1981 – Present	The human immunodeficiency virus (HIV) attacks the immune system. It killed over 30M. Effective treatments are only now, available.
SARS	2003 – Present	A coronavirus that likely originated in bats, Severe Acute Respiratory Syndrome (SARS) quickly spread to over two dozen countries and sickened thousands. It persists today.
MERS	2012 – Present	Middle East Respiratory Syndrome (MERS) is a viral infection first detected in Saudi Arabia. Likely it originated in bats, jumped to dromedary camels and then to humans.
Swine Flu	2009 – 2010	A strain of the H1N1 coronavirus, it mostly affects people under 65 who were not exposed to earlier strains and acquires some immunity. Nearly 600 K have died from this virus.
Ebola	2014 – 2016	A viral-based infection it spreads via contact with fluids and tissues of infected people. Ebola, like many viral infection runs in waves. The 2014 – 2016 outbreak in West Africa was very deadly.
Zika	2015 – 2016	Spread by mosquito bite, this viral infection was first identified in 1947 in Uganda. Cases date back to 1952 but in 2015 an outbreak in Brazil caused patients to suffer paralysis and fetal brain defects.
COVID 19	2020 – Present	Over 13M people were affected by this coronavirus. Vaccines are now in place to deal with the virus. Two new strains have been identified: the UK variant and the South African variant.

Not all pandemics are caused by viruses. Some illnesses can be traced to infectious bacteria or are carried by pests (e.g., mosquitos). Other outbreaks have their origin in social practices and changing cultural mores.

Economics and access to state-of-the-art medical care are also major factors in the control of widespread illnesses.

Communicable Disease Terminology

To understand the danger posed by diseases it is helpful to be familiar with several medical concepts.

Infectious disease: Any communicable illness caused by an external organism that enters (infects) the body.

Epidemic: A sudden outbreak of a disease that is new to an area or represents a sudden increase in the number of people being infected.

Infection Escalation: An endemic disease can develop into an epidemic if the pathogen mutates to a more dangerous form.

Flattening the Curve: This term applies to the number of infectious cases recorded over time. A 'flat curve' implies two things. First, the number of new infection cases equals the number of people being cured (IN = OUT). Second, that the total number of cases is manageable given the capacity of the healthcare system.

Resistant strains. Some diseases, or their variants develop an immunity to medical therapies and have become so resistant that physicians are forced to use riskier treatments to defeat the contagion. Avoiding this development of resistive disease stains is one reasons patients are urged to complete the prescribed consumption of antibiotics and not stop prematurely.

Thoroughly killing an infection helps prevent new, more resistant strains from developing.

The Meaning of 'H' and 'N'. Viruses are classified by their combination a profile of two proteins. The hemagglutinin or "H" proteins, of which there are 16 (H1 to H16), and neuraminidase or "N" proteins, of which there are nine (N1 to N9). Virus strains can easily be recognized by their bi-protein identifier, e.g., H1 N1 or H3 N4.

Pathogenicity. Type A viruses are further classified by their pathogenicity, which is the ability of a particular virus strain to cause disease in chickens.

Highly pathogenic avian influenza viruses in poultry are usually H5 or H7 subtypes of Type A influenza, although low pathogenic forms of these H5 and H7 viruses also exist.

Tracing the Origin Point

Many diseases are no longer geographically constrained. First time outbreaks of contagions and pest infestations are becoming more common as travel, trade, and transportation (the *3 Ts*) opens new pathways for infectious diseases to follow.

Librarians working in areas where immigration is common, should pay close attention to outbreaks of uncommon diseases and immediately report such cases to local healthcare authorities.

Knowing when and where a disease first appeared can be of immense help to epidemiologists trying to develop a containment and coping strategy.

Complicating disease investigations is climate change which is modifying both the migration pattern of certain disease carries (e.g., mosquitoes) and opening new breeding grounds for pests (fire ants and African bees).

Privacy concerns are also raised as an objection to origin tracing.

A few things to consider:

- Caution should be taken when purchasing sterilization equipment including ultraviolet machines that are being marketed to libraries. Few studies have been conducted that measure the effectiveness of these products or their effect on collection materials.
- Isolation of people and objects remains the safest approach to dealing with an outbreak.
- Devote some of your crisis response plan to the subject of pandemic preparation.
- Disease outbreaks often reoccur, sometimes separated by months or years. Don't be caught ill prepared. Stockpile vital supplies and check to be sure components haven't expired.
- The severity of the recurring waves of disease will vary depending on the level of immunity achieved by the community, efficacy of treatment options, and preventative practices such as social distancing.

Typical Pandemic Lifecycle

The Center for Disease Control (CDC) uses a five-level model which outlines a strategy for knowing when to reestablish services. This model provides a blueprint for handling subsequent flare-ups.

This framework describes how organizations should address three component areas:

- Facilities – including access rights
- Staffing levels - and associated responsibilities
- Patron and community support services.

Center for Disease Control 5-stage Life Cycle

Copyright Center for Disease Control	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
	Day 0	Day 14	Day 28	Day 42	Return to Normal
Disease Transmission Level	Population demonstrates substantial vulnerability Infection rate is increasing.	Population demonstrates moderate vulnerability Infection rate is slowing, but increasing.	Population begins to demonstrate resistance to the disease. Infection rate is dropping.	Population demonstrates low infection rate. Illness is contracting.	Pandemic ends. Return to normal operations.
Public-facing Service Level	Immediate closure of facilities. Teleworking plans implemented.	Building remains closed. Essential workers are allowed	Partial reopening. Some touchless services are restored.	Building reopened with some special precautions such as social distancing policies.	Full services are restored. Staffing levels return to normal. Full interaction with the public.
Staffing Level Commitment	Staffing is limited to one essential worker. Staff interacts via web and telcomm services.	Some staff return to the facility. Partial teleworking remains in place.	Most staff has returned to the facility. Job sharing is in effect. Teleworking is minimal.	Full staff has returned to work. Job sharing continues as full services are restored.	Normal staffing is in effect.

Libraries can use this model to craft an operating plan that addresses shutdown and reopening during an outbreak.

What We Have Learned

Every library should prepare a *service catalog* detailing the services they will offer under various conditions. This can be as simple as providing meeting space to share information with library patrons or a private room where first responders can relax and tend to the needs of their family.

Regardless of the outbreak's nature certain policies such as social distancing are effective in controlling the spread of the disease. Controlling the number of new infections is a key step in helping libraries return to operations.

Operating Guidelines Checklist

The following checklist augments the operating recommendations of established authorities such as the American Library Association, Center for Disease Control, The National Library of Medicine, and others.

These suggestions also compliment strategies established by many local and national emergency response organizations.

Yes No Staff Responsibilities

- | | | |
|---|---|---|
| — | — | Have you developed a plan to cross train staff on all vital services prior to an outbreak? |
| — | — | Has your staff been trained to cope with individuals who exhibit symptoms of the outbreak? |
| — | — | Does someone on staff have responsibility for managing social media during an outbreak (e.g., Twitter or Instagram)? |
| — | — | Have staff established a communication briefing link with local healthcare professionals? |
| — | — | Has someone on staff been given responsibility for coordinating with local first responders during an outbreak? to one or more staff members? |
| — | — | Has someone on staff been assigned responsibility for coordinating announcements with local media? |
| — | — | Have staff been trained on how to handle quarantined items such as books, computers, reference look-up devices, DVDs, etc., after handling by the public? |
| — | — | Have you a policy on how to handle staff members who request paid time off (PTO) or leave time during the pandemic? |
| — | — | Have you set up a training on the creation of a Family Emergency Plan? |
| — | — | Have you equipped employees with the hardware needed to support a teleworking plan (e.g., headset)? |
| — | — | Have you established or contracted for staff access to an employee assistance program (EAP) to help staff members cope with the stress-associated working conditions during the outbreak? |
| — | — | Has a staff member been assigned responsibility to monitor business and individual support programs associated with outbreaks? |

Yes No Facility Setup Recommendations

- | | | |
|---|---|---|
| — | — | Have you made efforts to extend the reach of library WiFi services to allow access from outside the facility? |
| — | — | Have you reconfigured tables and benches to accommodate patrons who wish to access WiFi from outside the facility? |
| — | — | Have you placed signage around the workplace that outlines the new hygiene and social distancing procedures? |
| — | — | Have you updated library signage to inform patrons of how to keep in touch with developments at the library (e.g., Facebook)? |
| — | — | Has signage been designed in a highly graphic format for easy interpretation by children and non-English speakers? |
| — | — | Have you reviewed waste handling procedures to insure the safe handling of materials during a pandemic or epidemic? |
| — | — | Have you established new <i>touchless</i> procedures describing how patrons can review, use, and checkout library assets? |
| — | — | Have you developed new quarantine guidelines for the handling of returned library assets? |
| — | — | Have you set aside a secure area where touched items can undergo isolation during quarantined periods? |
| — | — | Have you installed plastic 'sneeze sheets' around staff workspaces? |

- ___ ___ Have you outfitted the facility with social distancing signage and guidance markers?
- ___ ___ Have you budgeted for increased amounts of digital assets such as eBooks?

Yes No New Policies

- ___ ___ Have you reviewed waste handling procedures to insure the safe handling of materials during a pandemic or epidemic?
- ___ ___ Have you developed new quarantine guidelines for the handling of returned library assets?
- ___ ___ Have you established special cleaning procedures and schedules for high traffic areas (front desk, restrooms) or those needing special cleaning attention?
- ___ ___ Have you developed a policy requiring temperature checking of individuals before admission to the facility?

Yes No Cleaning and Waste Recommendations

- ___ ___ Have you developed new facility cleaning schedules that emphasis the CDC's sanitation guidelines?
- ___ ___ Have you ensured that anyone responsible for clean-up and sanitation has the required training to meet healthcare requirements? Has staff been trained on the correct handling of food and human waste left by library visitors?
- ___ ___ Have you verified that those responsible for the sanitation of any mobile vehicle (e.g., bookmobile) are trained on the proper way to clean and care for the vehicle?

Yes No Emergency Preparedness

- ___ ___ Do you have a telework plan?
- ___ ___ Have you considered gradually acquiring and stockpiling PPE supplies for use by patrons and staff during an outbreak?
- ___ ___ Have you updated your FAQs and responses so they can quickly be edited and made relevant at different stages of an outbreak?
- ___ ___ Have you distributed your updated crisis response plan to appropriate stakeholders?
- ___ ___ Have you printed a detailed blueprint of the facility and stored it in a safe but prominent disclosed location? Example, with one of the facility's fire extinguishers.
- ___ ___ Have return procedures been updated to ensure safe handling of items not yet quarantined?
- ___ ___ Have you generated a list of resources needed to support quarantine services (e.g., tables, gloves, etc.)?
- ___ ___ Have you conducted a teleworking exercise to ensure that everyone understands how to log into work sessions and actively participate in the program?

Yes No Community Communications

- ___ ___ Have you developed a *service catalog* of support activities the library can offer during the different phases of an outbreak?
- ___ ___ Have you discussed the type of resources the library can offer students during times of social distancing with school officials so they can issue appropriate homework assignments?
- ___ ___ Have you discussed the type of resources the library can offer first responders during outbreaks?
- ___ ___ Have you developed a communications plan for notifying the community of developments at the library during the phases of the outbreak?
- ___ ___ Have you established new *touchless* procedures describing how patrons can review, use, and checkout library assets?

Various Sources of Pandemics, Epidemics, and Infestations.

Bacteria-caused pandemics, epidemics and infestation are common. History records outbreaks of cholera, tuberculosis, and typhoid as far back as 12,000 years. The Judeo-Christian bible refers to plagues that devastated Egypt as well as cases of leprosy and other diseases that are made to seem commonplace. Estimates now hold that up to 90% of Native Americans died from smallpox carried to the America's by Europeans.

Pests of various types are dangerous carriers of disease and parasites. Eradicating these disease transporters is difficult. Pests return periodically and reestablish themselves in areas quickly. Librarians confronted with an infestation of pests can find the experience overwhelming and quite destructive as these vermin destroy building and even library contents.

Human-based plagues (i.e.: **social plagues**) represent an even more complicated challenge as librarians are put in the awkward position of trying to manage the activities of people who are impaired, unbalanced, or irrational. Increasing addiction rates, poverty, poor healthcare, human trafficking, and many other of societal ills are all visible to librarians who interface with all levels of society daily.

These interactions are not without danger. Having well-defined and practiced procedures for dealing with threats ranging from irrational homeless people to the dangers posed by sexual predators haunting cyberspace; can make a huge difference in the quality of life of a community.

Virus infections such as the flu and SARS represent dangerous recurring diseases. Healthcare specialists recognize four major categories and several minor types of outbreaks that have the potential to spread throughout the community.

Influenza and Virus Overview

There are four types of influenza viruses: Types A, B, C and D. Of these, type D is not known to be dangerous to humans. The remaining three virulent types of influenza represent some of the greatest killers in history. For example, periodic influenza outbreaks (virus Type A) cause millions to suffer and hundreds of thousands to require hospitalization. Since 2010, roughly eight to thirteen percent of hospitalized cases have ended in death.

Approximate Figures: Impact of Influenza Outbreaks 2010 - 2020				
Flu Season	Symptomatic Illnesses	Medical Visits	Hospitalizations	Deaths
2010-2011	21,000,000	10,000,000	290,000	37,000
2011-2012	9,300,000	4,300,000	140,000	12,000
2012-2013	34,000,000	16,000,000	570,000	43,000
2013-2014	30,000,000	13,000,000	350,000	38,000
2014-2015	30,000,000	14,000,000	590,000	51,000
2015-2016	24,000,000	11,000,000	280,000	23,000
2016-2017	29,000,000	14,000,000	500,000	38,000
2017-2018*	45,000,000	21,000,000	810,000	61,000
2018-2019*	36,000,000	17,000,000	490,000	34,000
2019-2020*	38,000,000	18,000,000	400,000	22,000

Influenza generally strikes populations in the northern and southern hemispheres during the winter season. Populations living near the equator can experience outbreaks at any time. Once exposed, symptoms of the flu can come on rapidly, usually within three to four days and lead to hospitalization.

What Librarians Should Watch For

The chart below shows the categories of disease that can lead to a pandemic. Influenza is caused by a virus such as in the COVID-19 pandemic of 2020. Librarians should be mindful of these possible illnesses and watch for indication of infection among staff and patrons who exhibit these symptoms.

Central to managing a pandemic is understanding how the disease spreads. Each category is transmitted in different ways and librarians must institute different precautions to deal with the danger of infection.

Disease Category	Recognized Diseases	Transmission Vector	Symptoms and Characteristic	Current Treatment
Viruses	<ul style="list-style-type: none"> Common Cold Herpes Smallpox Influenza Polio 	They survive in air, water and on various surfaces, depending on the strain of the virus.	Once infected, the virus takes over the host's cells and reproduces copies of itself.	Antibiotics <i>do not work</i> . Coping with viruses requires a special class of antivirals including Ribavirin or Oseltamivir.
Bacteria	<ul style="list-style-type: none"> Bubonic Plague Cholera Tuberculosis Typhoid Fever Leprosy 	Bacteria can be transmitted via air, food, water, insect bites, and physical contact. Lives inside people and rats.	They can cause severe localized infections or go systemic. Disease examples include sepsis, trachoma, and blindness.	Antibiotic drugs are the main course of treatment. High level of sanitation is also a preventative treatment including garbage removal, pest control and clean water.
Parasites	<ul style="list-style-type: none"> Malaria Trypanosomes Sleeping Sickness Elephantiasis Chagas Disease 	They are carried on other pests such as tsetse flies and many other carriers.	These are one of the most wide-spread disease carriers. They are considered animals and once they infect a host – it is doomed to die.	One or more antibiotics such as quinine are used to treat these diseases. Sometimes a combination of antibiotics are used.
Worms	<ul style="list-style-type: none"> Schistosomiasis Onchocercidae Guinea Worms Tape Worms. 	Worms and their larvae are easily transmitted. Infection comes, from swimming in polluted water and eating undercooked food.	Worms can express themselves in many ways. Blindness, malnutrition, and severe inflammation. Some will bore through the human body and exit through the skin.	Infections by worms can be treated by inexpensive drugs. Key is prevention and this involved eliminating the breeding sites of the worms.
Other Causes <ul style="list-style-type: none"> Fungus Prion Polluted Water Spoiled Food 	<ul style="list-style-type: none"> Athlete's foot yeast infections Mad Cow Disease Severe diarrhea Food poisoning 	These contagions can be transmitted in many ways. Human to human contact, food consumption, and sexual contact.	Humans experience these infections in many ways including irritated skin, internal organ damage and disruption of digestive processes.	Ointments and various medications are available to treat these generally non-fatal diseases.

In person-to-person infections, viruses spread over relatively short distances through the air when an infected person coughs or sneezes. A sneeze or cough can propel half a million viral particles 3 to 6 meters. This is one reason people are encouraged to direct these expressions into a handkerchief or their sleeve. Ideally, this is followed by using a sanitizer or washing with soap and hot water.

A person may be contagious before they show symptoms, so encouraging individuals to avoid contact once they feel sick is not always a successful policy. Imposing a social distancing program at the beginning of an outbreak is a more effective way of reducing the spread of virus-borne diseases.

Infection Rates

Diseases have different levels of infection rates, also referred to as commutability.

Some virus strains are very infectious while others are less virulent.

One measure used to forecast the expected number of cases *directly* generated by one infected individual in a population where all individuals are susceptible is the called the basic reproduction number, denoted as R_0 (pronounced *R nought* or *R zero*).

R_0 should not be confused with a similar metric R_e , or the effective reproduction number.

R_t indicates the number of cases that are expected to occur in the total population given the state of inoculation or similar precautions.

Diseases with a high R_0 rating are easily spread. Close contact with a high R_0 rate disease represents a danger to the community.

Disease Transmission

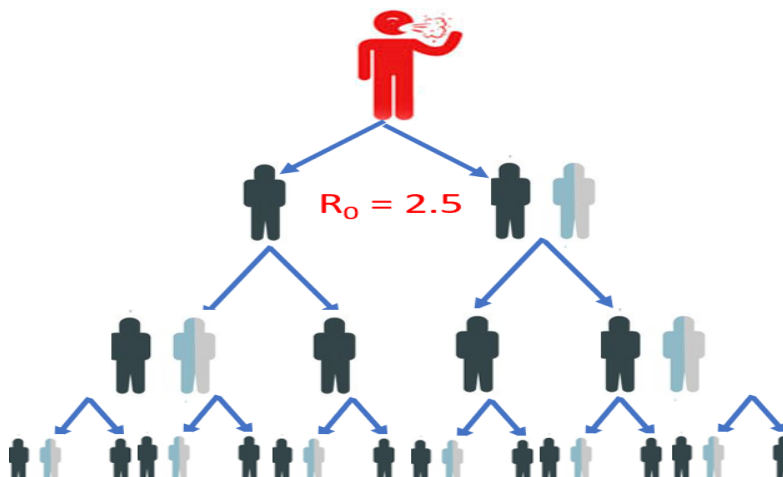
From the table below it is clear why breakouts of childhood diseases such as measles and chickenpox are so common. The R_0 transmission rate can change as viruses morph and develop new strain. Some strains may be resistant to earlier treatment regimens but vulnerable to new strategies.

R_0 Rates for Commonly Occurring Diseases

Disease	Transmission	R_0 (Infections Rate)	Incubation Period
Measles	Aerosol	12–18	9 to 12 days
Chickenpox (varicella)	Aerosol	10–12	9 to 21 days
Mumps	Respiratory droplets	10–12	14 to 18 days
Polio	Fecal–oral route	5–7	7 to 14 days
Rubella	Respiratory droplets	5–7	14 to 21 days
Pertussis	Respiratory droplets	5.5	7 to 14 days
COVID-19	Respiratory droplets	3.8–8.9	11 to 14 days
Smallpox	Respiratory droplets	3.5–6	17 days
HIV/AIDS	Body fluids	2–5	Weeks to Months
SARS	Respiratory droplets	3.1–4.2	1 to 10 days
Common cold	Respiratory droplets	2–3	1 to 3 days
Diphtheria	Saliva	1.7–4.3	2 to 5 days
Influenza: 1918 pandemic strain	Respiratory droplets	1.4–2.8	2 to 7 days
Ebola: 2014 Ebola outbreak	Body fluids	1.5–1.9	21 to 42 days
Influenza: 2009 pandemic strain	Respiratory droplets	1.4–1.6	1 to 4 days
Influenza: seasonal strains	Respiratory droplets	0.9–2.1	2 days
MERS	Respiratory droplets	0.3–0.8	2 to 14 days

Some parents intentionally infect their children to stop the effects of these diseases later in life when they can be more debilitating. This strategy can work with certain diseases but is not a viable strategy for pests or infections that can recur or are difficult to treat such as Lyme disease.

Example: Spread of Infection if $R_0 = 2.5$



Attempts in the United Kingdom, Sweden, and other areas to cope with the COVID 19 pandemic by encouraging a large percentage of the population to actively seek infection, have proven unsuccessful.

Super Spreader Events

In some jurisdictions groups of people ignored social distancing guidelines and came together in large groups. Known as *super-spreaders* these gatherings including political rallies, religious services, and other social events such as *spring break*.

These events are credited with fueling viral infections and serve to promote epidemics and pandemic.

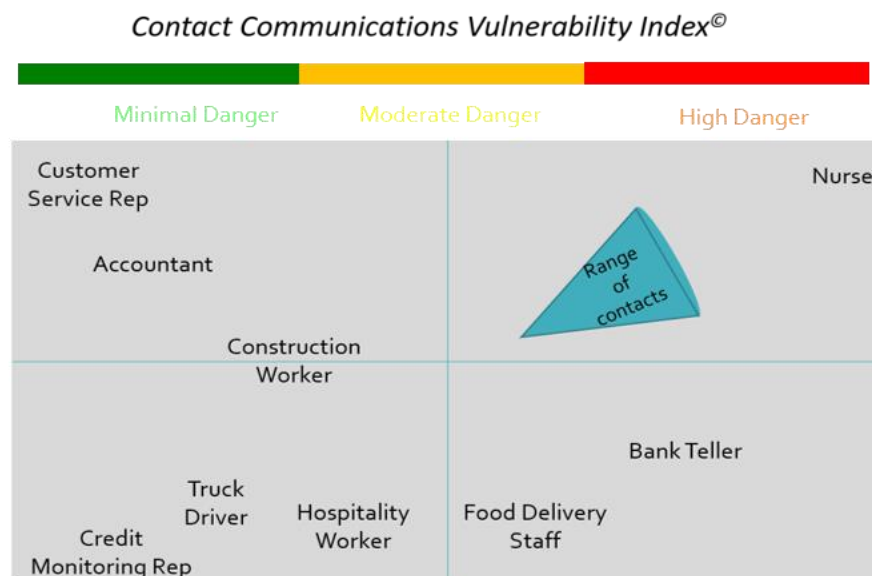
Studies on infection rates conducted at the Massachusetts Institute of Technology found that 10% of infected individuals were responsible for 80% of follow-on infections. So even small gatherings with only a few asymptomatic or pre-symptomatic people could significantly advance infections among those in the group if the disease has a high R_0 rating.

Librarians may be subject to a second type of *super-spreader* event.

This occurs when individuals in a fixed location have contact with a large flow of people.

Retail outlets and libraries are candidates for this inadvertent way of promoting disease transmission. This is a major reason why these sites are closed in the early days of an epidemic or pandemic.

The likelihood of librarians meeting an infected individual is proportional to the number of interactions they have with the public and their role in the library.



Keeping social contact to a minimum through quarantining, frequent disinfecting of objects and surfaces, and an aggressive vaccination or sanitation program – yields excellent results.

The *Contact Communication Vulnerability®* chart above illustrates where various jobs fit on a scale that rates the need for close communications with the requirement of proximity. The closer the contact, the greater the likelihood of contracting an illness.

Not addressed by this model are other significant environmental factors including size of the workplace, air flow, number of other occupants, and duration of stay. All of these factors impact the likelihood of infection.

Known as *herd immunity* (a.k.a. community immunity), health professionals indicate that a community in which 80% of the people have immunity (naturally or via vaccination), is generally safe from the dangers of a pandemic or epidemic.

While this strategy can succeed, as the annual outbreak of influenza (the flu) demonstrates, many diseases develop new strains that put this strategy at risk.

Viral Persistence on Surfaces

As previously mentioned, diseases can be carried by air-borne particles a distance of up to 6 meters (33 ft.). If these particles have a high R_0 rate, breathing air near an infected individual can lead to infection.

Touching, speaking, sneezing, or coughing can release millions of contagious particles to float in the air where they eventually settle on people or a surface. Particles that land on surfaces can last for days and pose a danger of future infection. This explains why returned books and other materials should be quarantined.

If an infected person covers their mouth or nose with their hands during a coughing or sneezing episode, they can deposit large amounts of contagious particles on their palms and fingers. Subsequently touching another person, shaking hands, or even holding an object allows the infected particles to spread creating new opportunities for infection. Knowing this, health professionals advocate social distancing, coughing into one's sleeve and the use of disposable cutlery, cups, dishes, and plates.

Preventing the spread of infectious particles is an important component of a viral containment strategy and why stringent sanitation procedures must be enacted in every library.

Physical setting can have a significant impact on the successful transmission of a contagion. For most diseases, contact between individuals in open, airy, outdoor sites is safer than close contact in enclosed areas. If you must work in an air-conditioned setting, change filters frequently and choose ones rated to block the flow of contagious particles. If the opportunity presents itself to work outdoors in an open setting – take it. Many air conditioning and filtering systems aren't designed to deal with air-borne virus or bacterial contagions. This is one more reason for not dining inside if visiting a restaurant.

This is also true of pest transmission such as a lice or bed bugs who thrive in closed settings. Filtering systems are not equipped to deal with these types of pests.

Survival Periods for COVID 19		
Metal		5 days
Wood		4 days
Paper		4-5 days
Glass		4-5 days
Plastic		6-9 days
Ceramics		5 days

When developing library operating policies consideration must be given to the re-infection rate of disease present in the community. Unfortunately, some diseases change and take on new characteristics, requiring new control strategies.

This table shows the length of time the COVID 19 virus can survive on various surfaces based on laboratory conditions. Actual times may vary.

When re-stacking books or releasing reserved materials, librarians should factor into the hold period, the wait time needed to eliminate the danger of reinfection from these objects.

Left unchecked and allowed a nurturing environment, these pests can quickly multiply and become a major threat to a community.

For example, the *Yersinia pestis* bacteria which is spread by infected fleas and small animals has been responsible for three types of plague outbreaks: bubonic, septicemic, and pneumonic. The bubonic plague that struck Europe, Asia, and Africa in the 14th century is estimated to have killed 50M people.

Today, bubonic plague is prevalent in more than twenty countries. In the United States, cases (other than travelers) are confined to the southwestern states.

While currently controlled, the potential for a widescale outbreak of *Yersinia pestis* remains a serious threat.

Steps to take if dealing with infestations of parasites or bacteria

If you suspect that you or your staff has been exposed to a dangerous disease, do the following:

1. Use posters and flyers to increase awareness among staff, patrons, and contractors.
2. Wash your hands frequently and thoroughly, especially before preparing food.
3. Avoid touching your face. Many viruses enter the body through the throat, eyes, and nasal cavity.
4. Get vaccinated. It is one way to take personal responsibility and show concern for the community.
5. Use antibiotics as prescribed. Complete the consumption of all medication.
6. If you feel ill, stay home and isolate from others. Social distancing works!
7. Disinfect high traffic areas in your workplace and home (e.g., bathrooms) frequently.
8. Don't share personal items such as combs or razors.
9. Travel wisely. Minimize contact with other passengers and try to stay isolated.
10. If you show symptoms of an illness, don't wait. Contact a healthcare professional immediately.
11. Inform others. If you are diagnosed with a communicable disease, tell those you have been in contact with recently so they can take steps to avoid or minimize illness.

Know the facts and act on them. If there is any doubt, consult with a healthcare professional immediately.

Pests

Warm weather heralds the beginning of a danger period from several disease and pest-borne infectious agents.

Common pests known to carry disease or foul work areas include fleas, roaches, spiders, ants, birds, and rodents (mice, rats, and squirrels).

Except for spiders and ants, any of these creatures can carry and dispense disease-causing bacteria.

Steps to take

1. Support an awareness program by placing posters in the workplace and occasionally holding discussion seminars.
2. Clean up liquid spills (e.g., coffee) quickly and completely. Many liquids attract pests.
3. If food or related supplies (e.g., sugar for coffee) is stored onsite, carefully bag and keep these items in air-tight containers.

4. Inspect all cardboard boxes and bags looking for pests or signs of nesting.
5. Fold all empty boxes and discard for recycling.
6. Immediately report leaky pipes, broken cupboards, damaged fly screens, etc.
7. Regularly check for signs of infestation.
8. Make it easy to access cleaning supplies.
9. Place awareness posters around the work area.
10. Use strong liners in trash cans (plastic?) and empty them frequently.
11. Encourage a clean and tidy work area

Seasonally, other pests such as mosquitoes and ticks may arise during warm weather periods (spring and summer). These pests can infect humans with a range of diseases such as zika, Lyme disease, and malaria.

Insects and Flying Pests

Infestation of flying insects including wasps, hornets, and bees can pose a danger to your staff and visitors.

A new addition to the list of winged pests are murder hornets (a.k.a. Asian giant hornets). These insects measuring more than two inches in size have recently been sighted in the Pacific northwest as well as western Canada. They are not a direct threat to humans but like Africanized bees, will attack if disturbed or threatened.

Murder hornets are known to prey on honeybees and so represent an indirect danger to the world's food supply.

Steps to take if you have an infestation of flying pests

If you come across a nest of bees, hornets, or wasps:

1. The best course of action is to contact an exterminator who has the equipment and training to safely remove the threat from your work area.
2. Do not attempt to remove or poison the nesting area yourself.
3. Immediately cordon off the area where the nest is located.
4. Avoid contact with the insects while they are flying.
5. Caution children to stay away from the nest area.
6. Do not allow pets to roam the area near the nest.

Head Lice

There are over five hundred species of *sucking louse* which are the tiny pests that feed on blood and attach to human hair. Of these, only three species feed on human blood. These three species of lice cannot live on pet blood and it is not necessary to treat animals for hair lice.

Lice are very mobile and can move from the human body into clothing especially bulky sweaters, towels, or blankets.

Steps to Take - Lice

- Treat only people who have a live lice infection. Do not use lice killing agents on people who do not have an infection.
- Inform everyone who the individual has been in contact with that there is an outbreak of lice. Everyone in the work area should be screened (e.g., using a lice comb) and urged to practice enhanced sanitation.
- Avoid pesticide-based shampoos. Normal shampoo is sufficient and will have fewer side effects.
- If a person has lice, go to: <https://www.epa.gov/ipm/about-lice-and-their-control> for recommendations and suggestions.

- Vacuum carpets and padded furniture to remove hair and disturb possible breeding grounds.
- Do not use environmental sprays for lice. They are unnecessary. Lice infect humans, not environments. They can't live more than twenty-four hours without access to a host.
- Put potentially infected items such as stuffed animals, pillows, pillowcases, towels, etc., in a dryer set to *high heat* for thirty minutes or more. This will kill the lice and their offspring.
- Be diligent when inspecting for lice. They can appear overnight!

Bed Bugs

There are approximately ninety species of bed bugs (*Cimex lectularius*), but only three types pose a danger to humans. There has been a major resurgence of bed bugs since the earlier 1990's. Entomologists speculate that increased world travel has contributed to the increase in bed bug populations in the U.S.

Bed bugs are not known to transmit any infectious diseases, but their bite (they live on human blood) can result in skin rashes, blisters, itchiness and in some cases, fever. Eradication of bed bugs is difficult since they can live up to seventy days without food and thus can hibernate out of sight.

Steps to take if you suspect bed bugs

1. Begin with early detection. Unfortunately, the easiest way to know that you have an infestation is from the damage they do. Monitor if people are complaining about 'bug bites', if they are showing red bumps that follow a zigzag pattern or they develop blisters.
2. If you suspect you have an infestation, wash all your fabrics in hot water. Heat is a very effective treatment for these pests so dry things in high heat.
3. Fill in wall cracks. Bed bugs will cluster in these cracks to avoid direct contact with strong sunlight. Be sure to check the edges of wallpaper. Bed bugs move under the paper when they can.
4. Pay attention to the bindings of books and any crevasses caused by the jacket cover or other creases where pest might hide. Bed bugs are known to hide in wall cracks and under wallpaper.
5. Use garment steamers for objects that can't be put in a washer – such as chairs and couches.
6. Contact a professional extermination service and ask them to do an evaluation.

While difficult to get bed bugs under control – it can be done and with diligence, you can prevent a recurrence.

Social Plagues

Polluted water. This is a cause of great suffering and is a problem throughout the world. Recently, cities including Flint, Michigan, Newark, New Jersey and Regina, Saskatchewan have been diagnosed as having polluted water. Other municipalities such as Modesto and Fresno in California, Pittsburgh, PA., and Brady, TX, have been cited as having lead, arsenic, and seventeen other pollutants in their tap water. Libraries must respond to these dangers and ensure that staff and patrons have access to clean water for washing and consumption.

Unfortunately, there is little the library can do to prevent a water problem from developing. The focus then must be in equipping the community with the information they need to minimize the health impact of the pollution.

Drug Abuse

Illicit drug use is a blight on many cities in North America. This destructive social behavior has grown to the point that some communities have declared them epidemics.

Often, individuals suffering the side effects of these social plagues seek shelter and solace in their local community library. This puts staff in the uncomfortable position of being confronted with behaviors and health concerns that are outside their job responsibilities and for which they have little or no training.

Deciding in advance how prepare for these uncomfortable, but common situations should be a high priority for libraries across the country.

Other Considerations

Many of the threats discussed in this appendix pose a danger to the library facility and the collections it houses.

Pests such as termites and rodents can do great harm to buildings as well as books documents and cultural items. Insects such as cockroaches, silverfish, beetles, and booklice can infest libraries in subtle ways and remain undetected until significant damage occurs. These same vermin can cause damage to cultural items that are in the library's custody such as fabrics, paintings and other artifacts.

While not causally related to a disease outbreak the partial or full closing of a building, along with a reduction in onsite staff may result in indicators of these infestations going unnoticed for a period of time.

Librarians should review these dangers when doing their annual threat and vulnerability assessment. Both the American Library Association and the Library of Congress publish guidance on preventing and recovering from this type of damage.

In the Event of a Closure

Closing your library will generate operational questions that should be reviewed with library management, and in some cases legal counsel. Issues to be addressed include:

- The criteria for instituting partial or full closure of the library.
- Revisions to time-off policies including paid and unpaid sick leave.
- Training on the cleaning of work and office space used by staff members who report sick
- Modifications to payroll procedures especially for individuals not participating in direct deposit programs.
- Teleworking guidelines including reporting hours worked off the worksite (e.g., working from home).
- Approved policies for implementing social distancing at the library. For example, creating space between work areas by reducing the number of chairs per room.
- Limiting the population of the library in accordance with occupancy guidelines issues by local government.
- Closing of storage areas for coats and restrictions on items brought to the library (e.g., food).
- Criteria for suspending library programs such as story times and other.
- Guidance on staff usage of personal protective equipment (PPE).
- Guidance of provision of PPE to library patrons.
- Staff training on the disposal of used PPE items.
- Revised standards for the cleaning of high traffic areas including:
 - Rest rooms
 - Railings and doorknobs
 - Telephones
 - Photocopiers
 - Computer equipment, especially keyboards and mouse attachments

- Work area counters
- Disposal of trash and subsequent cleaning of wastebaskets
- Modified custodial responsibilities and maintenance schedule for seeing to the critical needs of the facility if the library is closed for an extended time. This should include:
 - Periodic security checks of doors and windows
 - Operation of heating and air conditioning equipment
 - Emptying of book drops
 - Mail retrieval, etc.
- Plans to maintain close communicate with staff.
- Activities that allow the library to maintain a good connection with the public.

Note to the Reader

Reader suggestions are most welcome and should be directed to:

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All comments will be reviewed and factored into future releases of this Guide.

Resources and Information

While some organizations focus on medical issues others address related needs such as food, shelter, and the need for companionship. Often, the economic problems caused by an outbreak exceed the impact they have on public health.

Below is a short explanation of the areas of responsibility of government agencies and a list of useful online resource.

Federal Responsibilities

The federal government takes primary responsible for passing laws, putting regulations in place, funding research, and setting national healthcare priorities. It regulates the cleanup of hazardous substances and approves various therapies. Departments in the federal government oversees the availability and sale of medications, vaccines, drugs, and antibiotics.

The federal government derives its' authority from two powers assigned it by congress. First, control of interstate commerce including the movement of medical items. Second, the authority to tax and spend money in support of general welfare. This funding includes personal health services through Medicaid and Medicare programs.

The federal government sets standards for medical training and testing but the actual licensing is granted by state medical boards.

The main unit responsible for delivering and monitoring health issues in the country is the United States Public Health Service (www.usphs.gov) which is under the jurisdiction of the Department of Health and Human Services (www.hhs.gov). Useful information on disease prevention and treatment can be found at these sites.

Subagencies of the Public Health Service include:

- Centers for Disease Control (www.cdc.gov). While the Centers for Disease Control are the main epidemiologic unit for the United States, it is empowered to directly assists states and localities. The CDC website contains current information on disease outbreaks and measure to contain and control the spread of infections.
- National Institutes of Health (www.nih.gov). The National Institutes of Health conduct research and supports study initiatives across the country. This site is an excellent source of information on outbreaks and programs related to national health concerns.
- Food and Drug Administration (www.fda.gov). Among other responsibilities, this organization oversees the legal distribution of many types of medical devices and treatment therapies.
- Health Resources and Services Administration (www.hrsa.gov). This organization maintains a separate website dealing with COVID 19 (<https://www.hrsa.gov/coronavirus>) issues.
- Alcohol, Drug Abuse(www.aacap.gov), and Mental Health Administration (www.healthcareadministrationedu.org/mental-health-administration) contains general information on the impact that events such as a pandemic can have on a community.
- Agency for Toxic Substances and Disease Registry (www.atsdr.cdc.gov)
- Native Americans and Eskimos are supported through the Indian Health Service (www.his.gov) in the Health Resources and Services Administration. Information specific to how pandemics and epidemics may affect this population can be found on this site.

Some other departments responsible for areas of health are the departments of Agriculture (www.USDA.gov), Office of Special Education and Rehabilitative Services (<https://www2.ed.gov>), and the Environmental Protection Agency (www.epa.gov).

State Resources

States have the primary responsibility for protecting public health and support programs that promote physical and mental welfare. State agencies are responsible for collecting and analyzing information, setting policies and overseeing environmental and personal health services. They have the power to conduct inspections, impose fine and other civil penalties, and carry out government mandates.

States follow two models as they relate to oversight of public health. Some operate their Board of Health as a free-standing independent agency responsible directly to the governor. Other states treat their Board of Health as part of a larger department (sometimes referred to as superagencies) and are given wider scope of responsibility.

There are fifty-five state Board of Health agencies of which thirty-three are standalone organizations. The remaining ones are divisions of larger state agencies.

Local Resources

Responsibility for containing communicable diseases falls to local agencies. They handle screening and immunization. In collaboration with state officials, they are empowered to allocate spare resources.

The United States consists of 3,040 counties, 39 independent cities, 18,878 municipalities, and 25 city - county consolidations. There are around 3,000 county and municipal health departments. In areas without local health departments, the citizenry is served by state health departments, local hospitals, and medical practitioners.

Local agencies are your path to relevant community information and resources. Librarians should contact local aid groups and establish a dialog. Hold joint exercises and work together to educate the community about physical and mental health.

Other Resources

Augmenting the agencies listed above are a host of private and non-profit relief organizations such as the Red Cross (www.redcross.org), the National Voluntary Organizations Active in Disasters (www.nvoad.org), and many faith and community-based support organizations. Some of these groups have a national presence while others are local.

Global Corp has compiled a list of non-governmental relief organizations. The list can be found at: <http://www.globalcorps.com/jobs/ngolist.pdf>

Establishing contact with these local organizations should be a goal of every emergency response plan.

Library Specific Information

The American Library Association (www.ala.org) has compiled information on pandemics as well as links to other useful sites. Another website worth visiting is that of the New Jersey State Library which has several pages of useful material including the popular [Ports in a Storm](#) seminar series and a list of resources (https://www.njstatelib.org/services_for_libraries/resources/disaster_planning).