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| Linn-Benton Community College, Department of Health and Human Performance |
| Introduction to Public Health |
| Course Material for HE100(updated 1/3/2021) |

Welcome to HE100: Introduction to Public Health

This course is considered a public health “survey” class because it briefly introduces a wide variety of topics within the public health field. If you find you want more information on any of the topics, you will find links at the end of each section of this document, as well as on your Moodle site, that will direct you to more in-depth information. In addition, we offer upper-level courses in public health and exercise sport science here at Linn-Benton Community College (LBCC) with specific emphasis in many of the topics you will cover in this class.

Part of successfully completing this course is by meeting the learning outcomes that have been set forth by the Health and Human Performance department and supported by LBCC. As a result of this class, you should be able to:

1. Identify the multifaceted determinants of disease in population health.
2. Identify the components of evidence based public health and apply them in a variety of public health situations.
3. Identify the fundamental roles of public health and how those roles are exhibited in public health organizations, funding, workforce, and regulations.
4. Identify and discuss the roles of public health in addressing health disparities and the needs of vulnerable populations.
5. Identify one or more occupations within the public health realm and describe the education/ credentialing process to enter that field.

With this in mind, you find that each section begins with the learning outcomes above as well as learning goals for the section (hint: meeting the goals will help you complete your assignments). This document serves as your textbook for the class. You will not need to purchase any other materials to complete the class.

In this document, there are ten sections; each section corresponds with the week in the term. Within each section, the key terms you will need to know to complete the class are in bold font and, as stated earlier, you will find hyperlinks to supporting information.

Let’s get started!

### Section 1: Public Health, what is it?

##### Learning Outcome:

1. Identify the multifaceted determinants of disease in population health.
2. Identify the fundamental roles of public health and how those roles are exhibited in public health organizations, funding, workforce, and regulations.

##### Learning Goals:

1. List/identify how public health influences your daily life
2. Define public health as a population health
3. Examine the history and evolution of public health



Public health is not easy to define because the meaning has changed throughout time and is often situational; however, the foundational ideas are still the same. In 1920, Charles-Edward Winslow defined public health as:

*The science and art of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private, communities and individuals* (Centers for Disease Control and Prevention , 2018)

Nearly 100 years later, the current definition presented by the Centers for Disease Control and Prevention (CDC) is not much different:

*Public health is the science of protecting and improving the health of people and their communities. This work is achieved by promoting healthy lifestyles, researching disease and injury prevention, and detecting, preventing and responding to infectious diseases* (Centers for Disease Control and Prevention , 2018)*.*

Notice the definition uses the terms “health of the people” and “communities”. This is because public health is about populations, not just individuals. In other words, public health is a big picture science realizing that for an individual to have a chance at a healthy lifestyle, first the health of the entire population must be addressed. It is important to note that a population might be a neighborhood, a school, a town, a state, a country – even a region the world.

As citizens, we have certain expectations: our drinking water is clean, the air we breathe is unpolluted, the food we buy is non-toxic, our medications have been tested to prevent harm, our cars and roads allow for safe travel- the list can go on. In order for we, the people, to be protected and improvements made, as Winslow noted, there must also be organized efforts in place. Today we see these “organized efforts” as policies, laws, programs and **public health systems**.

##### *The Public Health System*

The most common definition of a public health system is “all public, private, and voluntary entities that contribute to the delivery of essential public health services within a jurisdiction.”  The entities in the system include a wide variety of organizations and agencies such as state and local health departments, environmental agencies, and healthcare organizations (hospitals, clinics, etc.). There are many more, and they will be covered in Section 2 but for now, take a look at the graphic below for a better idea of the public health system.



Within the public health system, the Core Public Health Functions Steering Committee developed 10 essential services to align with the three core public health functions: [assessment, policy development, and assurance](http://publichealthne.org/phan-sections/public-health-education-section/marketing/core-functions-of-public-health/). These 10 services should be carried out by all communities to assure the well-being of its citizens. They are as follows:

1. Monitor health status to identify and solve community health problems
2. Diagnose and investigate health problems and health hazards in the community
3. Inform, educate, and empower people about health issues
4. Mobilize community partnerships and action to identify and solve health problems
5. Develop policies and plans that support individual and community health efforts
6. Enforce laws and regulations that protect health and ensure safety
7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable
8. Assure competent public and personal health care workforce
9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services
10. Research for new insights and innovative solutions to health problems

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| **The Three Core Functions of Public Health** Retrieved from<https://www.cdc.gov/nceh/ehs/10-essential-services/resources.html> |

##### *Looking Back: Public Health in our History*

Before humankind realized that we do play an active role in our own health and the health of our population, there was a common belief that illness was as a result of moral turpitude. In other words, if you were a bad person or committed an unacceptable act, then a god or a spirit would take revenge by taking your health (a belief still held true by some populations today). Later, humankind began to take notice that if something looked bad or smelled bad most likely made you sick and should be avoided. This was the start of sanitation. In fact, history shows that as far back as 500 BC, the Greeks and the Romans had extensive sanitation systems to provide clean water and to keep foul smelling water and waste away from the people. Also around this time, it was realized that if someone was sick, quarantining them kept others from getting sick. Medicine began to focus on curing the ill, science joined in to find the cause of illness, and eventually measures were taken to prevent illness from occurring. In the 1840s, the United Kingdom established the Public Health Act (however, it was still mostly focused on sanitation). Then, in 1912, the United States established the Public Health Service (PHS) that allowed congress to pass legislation to allow the PHS to investigate infectious diseases, sanitation practices, water supplies, and sewage disposal. This began the United States endeavor for prevention and interventions for population health.

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| ***Did you know?***It is thought that the third book of the Hebrew Bible, Leviticus (circa 1500 BC), is the first written health code in the world. In the book, there are topics that include personal and community responsibilities that include directions regarding bodily cleanliness, sexual health behaviors, and protection against contagious diseases. |

##### *Prevention and Intervention*

The main goal of public health prevention is to develop interventions that are aimed at preventing specific health outcomes by removing or modifying risk factors. For instance, vaccinations are still the most impactful intervention in our history. Not only did their introduction increase life expectancies in the United States by 62% (from 47 to 77 years) but saved the United States billions of dollars annually in health care costs. Sanitation rules have also evolved to increase our health and lifespans. With the Federal Water Pollution Control Act of 1948 (later it expanded to the Clean Water Act of 1972) and the Clean Air Act of 1970 we know we are, for the most part, safe in our environment. In 1966, the National Traffic and Motor Vehicle Safety Act was enacted so that the government could oversee not only the safety of motorized transportation, but the roads we travel as well.

Legislation and these Acts are not the only way that we prevent and intervene. We also have such mechanisms as health education, nutrition labeling, behavior techniques, and therapeutic intervention. These preventive interventions may be introduced or used at one of these three stages of prevention: primary (before the event occurs), secondary (detecting a health condition before consequences occur), or tertiary (stop or control the negative consequences of a health condition).

##### *Determinants of Health*

Public health is rooted in the idea that there are many factors that combine together to affect the health of individuals, communities, and populations. We are not just physical beings who are either genetically set to be healthy or unhealthy. Our health and behaviors are actually a result of our environment and our life circumstances. In other words, along with our genetic make-up, our health and behaviors are determined by our geographic location, the environment, policies and laws, health care access, income and education level, our social support and ability to interact with others, and more. These are collectively called [determinants](https://www.merriam-webster.com/dictionary/determinant).

The U.S. Department of Health and Human Services Healthy People program has set forth several categories where determinants may fall: policy-making, social factors, health services, individual behavior, and biology and genetics. Individual and population health is often determined by the interrelationships among these categories. For instance imagine the scenario where you have a person who is genetically predisposed to addiction, friends and families encouraged or did not stop binge drinking, the local law enforcement was lenient on drunken behavior because either they did not have the personnel or jail space available or there were no alcohol support services… what might be your end picture? Here, we see the determinants of genetics, social factors, policy, and health services influencing this dangerous behavior. It is with the understanding of this interconnectedness that many public health efforts are targeted at multiple determinants for greater effectiveness.



### Section 1 Additional Resources:

For more on public health defined:

American Public Health Association: <https://www.apha.org/what-is-public-health>

Centers for Disease Control and Prevention: [Key Terms in Public Health](https://www.cdc.gov/publichealth101/documents/public-health-key-terms.pdf)

The following websites offer great references to the history of public health if you are interested in furthering your knowledge:

 [A Brief History of Public Health.](http://sphweb.bumc.bu.edu/otlt/mph-modules/ph/publichealthhistory/publichealthhistory_print.html) Boston University School of Public Health

[History of Public Health.](https://www.sciencedirect.com/topics/medicine-and-dentistry/history-of-public-health) Science Direct

[Public Health in the United States](http://sphweb.bumc.bu.edu/otlt/MPH-Modules/PH/PublicHealthHistory/publichealthhistory8.html). Boston University School of Public Health

For more on preventive measures:

[Prevention in America](https://www.cdc.gov/pictureofamerica/pdfs/picture_of_america_prevention.pdf). CDC

### Section 2: The Scope of Public Health

##### Learning Outcome:

1. Identify the fundamental roles of public health and how those roles are exhibited in public health organizations, funding, workforce, and regulations.

##### Learning Goals:

1. Understand the powers and responsibilities of government in public health
2. Review non-governmental agencies of public health
3. Compare and contrast the differing political views around public health and the differences between social justice and market justice in healthcare.



##### *Federal Government*

As you read in Section 1, the United States government began passing laws and establishing organizations over 200 years ago in an effort to protect population health. It is the government’s responsibility to ensure that communities organize and make efforts toward protecting the health of their people. Here in the United States, the government’s responsibility for the health of its citizens is a result of the nature of democracy – meaning our health officials are either directly elected by the people or they are appointed by elected officials.

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| *The success or failure of any government in the final analysis must be measured by the well-being of its citizens. Nothing can be more important to a state than its public health; the state’s paramount concern should be the health of its people. - Franklin Delano Roosevelt* |

##### *Legal Obligations*

If you are familiar with our  [United States Constitution](http://constitutionus.com/), then you know there is no mention of health or health care coverage. However, under the interpretation of the Tenth Amendment, the public’s health is primarily the responsibility of the individual states. Because of the state’s independence of each other, no two states have exactly the same public health programs or support. However, one thing all states do have in common is the collection of health statistics about the population, school records, immunization rates, and environmental regulations around sanitation. (Section 3 of this booklet will address health data further).

This does not mean that the federal government is hands-free when it comes to public health authority. Because of the Interstate [Commerce Clause of the United States Constitution](https://www.law.cornell.edu/wex/commerce_clause), the federal government has the right to regulate commerce within the states and, currently in the United States, we treat healthcare as a commercial product (unlike other industrialized nations who have universal health care or social medicine). This means that the federal government offers incentives for states that support federal programs like [Medicare and Medicaid](https://www.cms.gov/) (up to 45% of a state’s funding) and allows programs such as the Occupational Safety and Health Administration ([OSHA](https://www.osha.gov/)), the Environmental Protection Agency ([EPA](https://www.epa.gov/)), and the Food and Drug Administration ([FDA](https://www.fda.gov/)) to overrule states on varying levels of exposures. It is important to note that the federal government is not obligated to get involved with public health. For example, the federal government may choose to give funding to a state that follows the Medicaid guidelines for legal blood alcohol limit; however, they may not give funding or set standards for such things as violence or child abuse.

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| Please note the paragraph above is simply an introduction to the federal public health services. The U.S. Health and Human Services’ [United States Public Health Service Commissioned Corps](https://www.usphs.gov/) webpage is where you will find a full listing of federally supported public health services. |

##### *Ethical Obligations*

Since our United States Constitution does not mandate legal responsibility for the health of the American people, many argue that at the very least, an ethical government should be responsible for the health of its people. The following is a quote from the American Public Health Association (APHA) in regard to their stance on government and its role in public health:

*Society must create and maintain the conditions under which members of the community can be healthy. The responsibility for maintaining and improving the public's health lies with all sectors of society* (American Public Health Association, 1995).

This means that the federal government, along with states and United States territories, must work collaboratively with complex and multidisciplinary networks of people and organizations – both public and private – to produce environments in which people have the opportunity to be as healthy as possible. This includes an alignment of policy of all public health agencies: national, state, and local.

##### *State Government*

As stated earlier, a state's basic legal authority in public health comes from the self-governing powers given to the state under the United States Constitution. This results in many differences in agency powers and funding from state to state. This also means that some states set policies that must be followed by local agencies (some of which must be followed for the local agencies to receive funding). However, most states are involved in activities such as immunization recording and reporting, infectious disease control and reporting, health education, and collection and reporting of health statistics. In addition, most states are where licensing and credentialing are maintained in an effort to assure that all healthcare providers, whether licensed or credentialed, are operating under set standards and competencies for quality of care.

Most states are also responsible for its citizens who are uninsured or underinsured (some states pass this on to the local public health authorities: generally this includes Medicaid and the Children’s Health Insurance Program ([CHIP](https://www.medicaid.gov/chip/index.html)). This means determining Medicaid eligibility standards as well as determining payment and reimbursement amounts for facilities/practices that take Medicaid patients/clients fall under the state’s oversight.

##### *Local Government*

Local public health agencies are more focused on their populations and promoting and protecting the health of specific groups within the population. The federal government has given this power to the local governments because of their knowledge and focus on specific populations, ability to identify particular health determinants, undertake health inequalities, and shape their services to meet local needs.

The services and programs most commonly provided by local public health agencies include administering adult and childhood immunizations, initiating and maintaining programs for preventing communicable diseases (including epidemiology and surveillance), community health assessments, designing, deploying, and evaluating community outreach and education, various environmental health services, food safety and credentialing, and restaurant inspections.

To find your state and local health departments and listings of their services follow this [link](https://www.publichealthonline.org/state-public-health-resources/).

##### *Nongovernmental Agencies*

While our governments have most of the responsibility for public health, there are many non-governmental agencies that play large roles in the education, research, and lobbying for your health and healthcare options. Most all are agencies that focus on specific health conditions such as the [American Heart Association](https://www.heart.org/), the [Alzheimer’s Association](https://www.alz.org/) and the [American Cancer Society](https://www.cancer.org/). Some of these agencies are funded by a combination of federal, state, or local governmental grants as well as fundraising but others, such as the Robert Wood Johnson Foundation or Kaiser Family Foundation philanthropic foundations rely solely on donations and endowments.

##### *Political Views and Public Health*

It is no surprise that our major political parties (Democrat and Republican) have different views on the role of government and health. The Democratic view on healthcare is that all Americans should have access to high quality affordable healthcare as part of the American way. This means governmental policies, laws, and financial support (through taxes) are enacted to ensure every citizen has basic healthcare and does not have to choose between paying for healthcare or paying for food and shelter. If you take a look at [Democratic presidents throughout our history](https://www.beckershospitalreview.com/news-analysis/a-brief-history-on-the-road-to-healthcare-reform-from-truman-to-obama.html), you will see that they all fought in one way or another for at least basic healthcare for all Americans. President Johnson signed Medicare into law in 1965 and gave basic healthcare to older adults in America. In 1997, under President Clinton’s Whitehouse, the Democrats passed the Children’s Health Insurance Program (CHIP), which today covers over 9.6 million children (1/2/2021). In 2010, the Democrats passed [The Patient Protection and Affordable Care Act](https://www.healthcare.gov/glossary/affordable-care-act/) (aka: The Affordable Care Act or “Obamacare”) – the first comprehensive health reform.

Contrary to the Democratic view, the Republican view is that health care should not be government-centered. Instead, healthcare should be a commodity in a free market like any other product (i.e. car buying). They believe that you, the patient should drive the need and demand for the healthcare system. Your demand would lead to competition and this competition in the market would drive prices down. Republicans believe that the more freedom in choosing health care, and being able to self-manage health care costs (i.e. pre-tax health spending plans), then the healthcare system as a whole will run more efficiently.

##### *Social Justice and Market Justice in Healthcare*

As you read above, the fundamental difference in healthcare ideology of the two major parties centers on the level of government involvement allowed in healthcare. There are two philosophies that address the role of government in healthcare: **social justice** and **market justice**. The social justice view proposes that it is the government’s responsibility to ensure the equal distribution of healthcare access and quality across a society - no matter one’s ability to pay, social status, geographical location, etc. On the contrast, the market justice perspective believes it is the individual’s responsibility to access healthcare, i.e. the quality of healthcare based on your personal effort, behaviors, and ability to pay.

### Section 2 Additional Resources

*Please note our HE 210 (Introduction to Health Services) offers more specific views into federal, state, local, and non-governmental public health agencies.*

Health and Human Services Agencies: <https://www.usphs.gov/aboutus/agencies/hhs.aspx>

Federal Registry of Public Health Services: <https://www.federalregister.gov/agencies/public-health-service>

State and Local Public Health Resources: <https://www.publichealthcareeredu.org/public-health-departments/>

CDC: State, Tribal, Local & Territorial Public Health Professionals Gateway: <https://www.cdc.gov/stltpublichealth/>

### Section 3: Analytical Methods (and data) in Public Health

##### Learning Outcome:

1. Identify the components of evidence based public health and apply them in a variety of public health situations.

##### Learning Goals:

1. Understand the role of statistics in evidence-based public health evaluation and planning
2. Examine the field of epidemiology and the role of the discipline in public health
3. Find current vital statistics and evaluate their relevance in public health situations.



##### *Evidence-Based Public Health*

In order to accurately determine the health of our society – past, present, and future – as well as assess former and current public health interventions and plan future programs, we must rely upon **evidence-based** approaches. When you see the phrase “evidence-based public health practice”, this means that the programs and policies were developed, implemented, and evaluated using the principles of scientific reasoning. This includes systematic uses of data from information systems, planning models (covered in HE 225), health and behavior theory, and [empirical](https://www.thefreedictionary.com/empirical) evidence or [empirical data](http://www.yourdictionary.com/empirical-data).

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| *An evidence-based practice is a practice that has been rigorously evaluated in experimental evaluations – like randomized controlled trials – and shown to make a positive, statistically significant difference in important outcomes* (Oregon Research Institute, 2018) |

##### *Data in Public Health*

There are two research methods used to gather empirical data: qualitative research and quantitative research. Qualitative data are data that can be observed but not measured with standard tools and are used primarily to describe something. Qualitative variables can be placed into specific categories based on a characteristic (i.e. eye color, zip code, favorite flavor). Quantitative data deal only with numbers that can be measured or ranked with a standard tool or measurement (i.e. height, weight, time, and cost). ***Note:*** *for majors taking HE220, these concepts will be covered in depth. For non-majors or those who wish to know more, please see the additional resources at the end of this section.*

Think of a time when you visited a healthcare facility. When you arrived, you most likely filled out a survey with your name, age, gender, race, type of insurance, and symptoms (qualitative data). Then, perhaps you were weighed, your height measured, and your blood pressure gauged (quantitative data). It may be that you had to have another type of diagnostic test such as blood work, a urinalysis, or even a diagnostic imaging procedure (x-ray, MRI, etc.). Have you ever been curious as to what happens with these data?



The information collected in the office and all resulting test information are all kept in your medical record. While [the Health Insurance Portability and Accountability Act of 1996](https://www.hhs.gov/hipaa/for-professionals/security/laws-regulations/index.html) assures the protection of your private health information, certain information is used to determine what “kind” (age, gender, etc.) of individuals utilize different types of healthcare practices. There are also data collected based on your diagnoses using a set of alphanumeric codes set forth by the [World Health Organization](http://www.who.int/)  (WHO) called the International Statistical Classification of Diseases and Related Health Problems or ICDs for short. No matter the data type, public health professionals called [epidemiologist](https://www.publichealthonline.org/epidemiology/)s may use the data to examine rates of infection, birth rates, death rates, or the magnitude of certain health outcomes (this is how we know we have 439.2 new cases of cancer per 100,000 people each year). With this information the epidemiologist, along with public health professionals from different disciplines (covered in Section 7), can then plan for such things as funding needs, new building needs, the number of practitioners needed, education programs, or even help get a political figure elected.

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| ***Did you know?***Currently the U.S. healthcare system uses the ICD-10 codes that are made up of three to seven digits each specifying one of over 68,000 diagnoses. For example, if you were diagnosed with a broken nose, your medical records would have ICD-10-CM diagnosis code S02.2XXA listed. Using this number not only universally describes the injury (fracture of nasal bones, initial encounter for closed fracture) but also is a specific billable code for insurance reimbursement. |

##### *Epidemiology*

Epidemiology is the study of health conditions (from birth to death and all in between) that occur in people. The study is not interested in a single person, like your physician might be, but instead considers a population’s health. Epidemiology is most often defined as, “the study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems” (Friis & Sellars, 2009). In other words, the epidemiologist uses data from qualitative and quantitative studies as part of investigations to determine the differences between populations’ states of health, find the cause of health conditions, determine who is at risk, and then determine how to control or stop the spread of new health outcome cases.



##### *Measures of Epidemiology*

In epidemiology, two big areas of interest in data collection are incident rates (IR) and prevalence (P). Incidence means the number of new cases that occur in a specific period of time. For example, a local restaurant receives a delivery of vegetables that are contaminated with bacteria. Within hours of consumption, most individuals will begin showing symptoms of nausea, vomiting, diarrhea, and/or stomach cramps. This means that within 48 hours, most everyone who ate the vegetables at that restaurant and who acquired the bacteria would have been symptomatic. Knowing the specified time of food poisoning allows the epidemiologist to link all the persons with symptoms back to a particular location or food source. When, however, looking at the number of cases of cancer, it might be that the time period between exposure and health outcome is long (five, ten, even twenty years) or unknown. In this instance, incidence often uses a specific time such as the number of new cases in a one-year period. ***Note:*** *for majors taking HE220, incidence along with all other measures of epidemiology will be covered in depth. For non-majors or those who wish to know more, please see the additional resources at the end of this section.*

Where incidence was the new cases in a specific time period, prevalence is the existing cases in a population at the time of interest. Prevalence allows us to look what proportion of the entire population may have a specific health outcome (i.e. what proportion of the population had a stroke in 2018), or prevalence may be used to narrow a population down to specific characteristics (what proportion of women age 35 and older who smoke and take hormonal contraceptives had a stroke in 2018). Doing this not only allows us to see the extent of a health outcome on the entire population, but also the magnitude of those with known risk factors.



##### *Vital Statistics*

Vital statistics are information that has been collected through an agency or organization under the authority of the government to record live births, deaths, fetal deaths, marriages, and divorces. The collection of vital statistics dates back to 1869 and is the oldest public health example of inter-governmental data sharing.

### Section 3: Additional Resources

Evidence-based public health

* [Evidence-Based Clinical and Public Health: Generating and Applying the Evidence](https://www.healthypeople.gov/sites/default/files/EvidenceBasedClinicalPH2010.pdf). Published by the Centers for Disease Control and Prevention
* [Evidence-Based Practices & Programs](https://prevention.nih.gov/research-priorities/dissemination-implementation-research/evidence-based-practices-programs). Published by the National Institutes of Health

Qualitative and Quantitative Data

* [Qualitative vs. Quantitative](https://www.simplypsychology.org/qualitative-quantitative.html) by Saul McLeod from Simply Psychology

Epidemiology

* The British Medical Journal [“What is Epidemiology”](https://www.bmj.com/about-bmj/resources-readers/publications/epidemiology-uninitiated/1-what-epidemiology)
* CDC Game: [Solve the Outbreak](https://www.cdc.gov/mobile/applications/sto/web-app.html)
* [Vax](http://vax.herokuapp.com/): A game about epidemic prevention

Vital Statistics

* National Center for Health Statistics, [Vital Statistics Data Available Online](https://www.cdc.gov/nchs/data_access/vitalstatsonline.htm)

### Section 4: Public Health and Diseases

##### Learning Outcome:

1. Identify the multifaceted determinants of disease in population health.

##### Learning Goals:

1. Examine the burden of both infectious and chronic disease on healthcare and the economy.
2. Identify infectious agents and determine the modes of transmission, the chain of infection, and the risk and significance of emerging and reemerging infectious diseases.
3. Understand the biomedical and behavioral basis of chronic disease.



##### *The Burden of Diseases*

Disease burden is the impact of a health condition (injury, illness, death, etc.) and is measured by the financial cost as well as mortality (death rates) and morbidity (illness rates). In 2019 the United States’ total national health expenditures, health care inflation, health care spending (as a part of the US economy), and medical waste (i.e. unnecessary testing, excessive administrative cost) surpassed $3.6 trillion. The number for 2020 may be significantly higher once all the data from the COVID-19 pandemic has been evaluated. The prediction as we begin 2021 is that in 2020, 18 percent of the United States gross domestic product was spent on healthcare (CMS.gov). This does not include the burden on families of finding health care providers or caretakers or the financial loss from time off work.

As for morbidly and mortality rates measurements such as quality-adjusted life years ([QALYs](https://www.eufic.org/en/understanding-science/article/measuring-burden-of-disease-the-concept-of-qalys-and-dalys)), disability-adjusted life years ([DALYs)](https://www.eufic.org/en/understanding-science/article/measuring-burden-of-disease-the-concept-of-qalys-and-dalys) are used to quantify, or count, the number of years of potential life lost due to disease ([YPLLs](https://www.healthknowledge.org.uk/public-health-textbook/research-methods/1a-epidemiology/years-lost-life)). For example, it is estimated that smoking causes over 3.1 million YPLLs among men each year. For current numbers on YPPLs in the United States, please see the [2016 report](https://www.cdc.gov/nchs/data/hus/2016/018.pdf)  from the CDC.



*Infectious Diseases*

Infectious diseases are caused by microorganisms, such as bacteria, viruses, fungi, or parasites. These pathogenic diseases can be spread from one person to another either directly (direct human to human contact) or indirectly (touching contaminated objects, contact with infected animals, birds, or insects). *(Note: for more chains of transmission see the CDC’s “*[*Chain of Infection*](https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section10.html)*”).* Excluding the current COVID-19 pandemic, the most common types of infectious diseases in the United States are: influenza (the flu), AIDS/HIV, sexually transmitted diseases, and viral hepatitis. In fact, influenza has remained a leading cause of death in the United States since death rates have been recorded.

The role of public health and infectious diseases is to focus on the prevention, control, and even elimination of disease causing organisms. For instance, vaccinations – one of our earliest known wide-spread public health interventions – still remain the largest method of protection and reduction of the spread of disease. Since 1900, the use of vaccines has led to life expectancies more than doubling, preventing more than 2.5 million deaths a year, and significantly decreasing childhood mortality.

The CDC has outlined priorities of public health to prevent infectious disease (Centers for Disease Control and Prevention, 2015) that include:

1. The need to strengthen public health fundamentals, including infectious disease surveillance, laboratory detection, and epidemiologic investigation,
2. use tools and interventions to identify and implement high‐impact public health interventions to reduce infectious diseases, and,
3. develop and advance policies to prevent, detect, and control infectious diseases.

To make these priorities a reality, and have the United States healthcare system ready and able to prevent and control infectious diseases as well as responding to new and/or emerging threats (i.e. [drug resistance bacterial infections](https://www.cdc.gov/drugresistance/index.html) or [bioterrorism](https://emergency.cdc.gov/bioterrorism/)), requires a multidisciplinary approach that is systematic, sustainable, and coordinated. For example, responding to a [cholera](https://www.cdc.gov/cholera/general/index.html) outbreak after a flood takes health care professionals to test/treat and send samples to a lab. The lab should quickly be able to confirm the bacteria and pass the information on the national, state, and local public health offices. From there, the public health offices contact the media to disseminate information and alert first responders. First responders will be in charge of distributing information on how to purify water and/or distributing bottled water. The Department of Transportation may need to clear roads or find alternate routes of travel to get the bottled water into the affected areas. Additionally, the local and state environmental agencies will begin posting warning signs on open water sources and the public sanitation works will shut off water and/or begin the purification protocol.

*Chronic Diseases*

According to the definition from the CDC, a chronic disease is one that lasts a year or more and will require ongoing medical attention and/or limits the activities of daily living that results in a decreased quality of living (Centers for Disease Control and Prevention, 2018). Half of all Americans live with at least one chronic disease such as heart disease, cancer, diabetes, obesity, stroke, even tooth decay. One-fourth of all Americans live with two or more such diseases. Unfortunately, chronic diseases are the leading causes of death and disability in America, and, as noted above, they are also a leading cause of high healthcare costs. In the beginning of this section you were introduced to quality-adjusted life years and disability-adjusted life years: worldwide, the United States ranked 29th for females and 27th for males using these indicators.

We know that most chronic diseases are caused by risky behaviors. For instance, poor nutrition plays a role in diabetes, obesity, heart disease, tooth decay, and cancers. As you have or will learn in your PE 231 class, lack of physical activity, tobacco use, and excessive alcohol use are also controllable risk factors. The role of public health is to stop risky behaviors through avenues such as education, policy setting and state and local laws (example: in 2012, New York City banned “supersized” sodas). Again, this is covered in more detail in LBCC’s PE 231: Lifetime Health and Fitness classes as well as HE 225: Social and Individual Determinants of Health.

There are, however, some chronic diseases that are not a result of lifestyle choices or behaviors. There are chronic diseases with unknown origins such as certain cancers, fibromyalgia, or chronic headache syndrome. Other chronic diseases are a result of genetic disorders such as Alzheimer's disease, cystic fibrosis, sickle cell disease, or Type I diabetes. Public health is still actively involved in educating the public, setting policy and procedures around research to prevent and treat these diseases, and working to make sure insurance covers the needs of those affected.

**Section 4: Additional Resources**

Burden of Disease

* National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), [Health and Economic Costs of Chronic Diseases](https://www.cdc.gov/chronicdisease/about/costs/index.htm)
* [The Global Burden of Disease, 2017](http://www.healthdata.org/gbd/publications)

Infectious Disease

* Course offering at LBCC: HE 253 AIDS and Sexually Transmitted Diseases
* [The History of Vaccines](https://www.historyofvaccines.org/)
* CDC [Office of Infectious Diseases](https://www.cdc.gov/oid/)

Chronic Diseases

* [National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP)](https://www.cdc.gov/chronicdisease/index.htm)
* [Behavioral Risk Factor Surveillance System](https://www.cdc.gov/brfss/)
* [Chronic Disease Interactive Data Applications](https://www.cdc.gov/chronicdisease/data/statistics.htm)

**Section 5: Mental Health, Substance Abuse, and Violence**

Learning Outcome:

1. Identify the multifaceted determinants of disease in population health.
2. Identify and discuss the roles of public health in addressing health disparities and the needs of vulnerable populations.

Learning Goals:

1. Interpret the prevalence of various mental health disorders in the United States including: depression, anxiety/trauma, psychosis and psychotic disorders, substance use disorders, self-injury, and violence.
2. Examine the role of public health in mental health promotion in the United States



Please note: this section will not cover the biological components of mental health, substance abuse, or violence but is intended to introduce the role of public health in these issues. These topics are covered in our PE 231, HE 151, and HE 225 classes.

*Mental Health:*

Mental health affects how we feel and how we think. It includes not only our thinking selves, but our emotional, psychological, and social well-being. Mental health is crucial from childhood, through adolescence and into adulthood. Good mental health means we are able to relate to others, handle stress, and make healthy choices in life. Just as we learned of physical illness in Section 4, there is also mental illness. Mental illnesses are conditions that affect a person’s thinking, feeling, moods, and/or behaviors. As with physical illnesses, these conditions can be a one-time event, happen on occasions, or be chronic. Over 50 percent of Americans will be diagnosed with some type of mental illness over their lifetime with one in five being diagnosed in any given year and one in twenty-five currently living with a serious mental illness. It is not specific to adults: twenty percent of all children in the United States have had a debilitating mental illness.

*Impact of Mental Illness*

Serious mental illness (i.e. major depression, bipolar disorder, or schizophrenia) cost the public an average of $201 billion per year. In the United States, mood disorders are the third most common cause of hospitalization among children and adults 18 to 44 years of age. Additionally, individuals living with mental illness often face an increased risk of both chronic and infectious disease such as heart disease and HIV. These individuals also die an average of 25 years earlier than others – often from a treatable medical condition. For reasons of stigma or lack of health care access (over 7.5 million Americans- that is 17%- with mental health issues do not have health insurance), it is estimated that 56.5% of adults with mental illness not receive any treatment in a given year. Among those who do seek treatment, it is estimated over 20% report unmet needs. Among youth with major depression, it is estimated that over 63% do not receive any mental health treatment.

*Preventing Mental Illness and Promoting Mental Health*

Mental illness has always had a stigma associated with it and many speculate it is because we cannot “see” specific symptoms or injury as we can with a cold or a broken bone. There was a time many associated mental illness with violence that caused fear and the resulting stigma that still exists today (in the earliest writings of mental illness, it was assumed people were possessed with evil spirits). The first comprehensive public health report on mental health, *Mental Health: A Report of the Surgeon General*, was not released until 1999. This was significant because not only was it the first such report, but because it acknowledged that mental health was vital to health and that mental disorders are real health conditions. This report called for “a broad public health approach that included clinical diagnosis and treatment of MI, as well as surveillance, research, and promotion of mental health” (Centers for Disease Control and Prevention, 2018). Since then, there has been growing awareness of and progress made in mental health including the formation of a U.S. Department of Health and Human Services division called SAMHSA (Substance Abuse and Mental Health Services Administration). In addition, the CDC integrated mental health promotion and mental illness prevention with its chronic disease prevention efforts. In February, 2020, cuts were made to many of the Department of Health and Human Services (HHS) and its various sub-agencies- including SAMHSA. For the 2021 year, under President Trump’s FY2021, SAMHSA budget would be cut by $142 million (as of 1/2/21, this is the most current information, this may change under new leadership). However, mental health programs are expected to get a 17.7 percent increase to $19.3 million of funding in 2021.

*Substance Abuse*

People misuse and abuse substances such as alcohol, illegal drugs, prescription drugs, and tobacco for various reasons. However, one thing they all have in common is the impact it makes on our society and public health. The most recent data on substance abuse reveals a cost in the United States of over $740 billion annually in healthcare expenses, criminal activities, and lost work productivity.

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| Substance Abuse Cost |
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|   | **Health Care** | **Overall** | **Year Estimate Based On** |
| Tobacco | $168 billion | $300 billion | 2010 |
| Alcohol | $27 billion | $249 billion | 2010 |
| Illicit Drugs | $11 billion | $193 billion | 2007 |
| Prescription  Opioids | $26 billion | $78.5 billion | 2013 |
|  |  |  |  |
| Source: National Institute on Drug Abuse https://www.drugabuse.gov/related-topics/trends-statistics#supplemental-references-for-economic-costs |

Substance abuse not only affects the user but also families, communities, and segments of the population. The effects are collective and often contribute to significant mental, physical, and social health problems.

In 2016 the Surgeon General’s Report on Alcohol, Drugs, and Health was released addressing the problems of substance misuse and abuse in the United States The report recognizes that in order to reduce the prevalence of these issues and inform officials and policy-makers about effective methods to address substance abuse, public health must take a comprehensive approach. The report specifically calls for a systematic approach to (U.S. Department of Health & Human Services, 2016, pp. 1-4):

1. Defining the problem through the systematic collection of data on the scope, characteristics, and consequences of substance misuse;
2. Identifying the risk and protective factors that increase or decrease the risk for substance misuse and its consequences, and the factors that could be modified through interventions;
3. Working across the public and private sector to develop and test interventions that address social, environmental, or economic determinants of substance misuse and related health consequences;
4. Supporting broad implementation of effective prevention and treatment interventions and recovery supports in a wide range of settings; and
5. Monitoring the impact of these interventions on substance misuse and related problems as well as on risk and protective factors.

In 2018, a second publication, Facing Addiction in America: The Surgeon General’s Spotlight on Opioids was released as a response to the growing opioid epidemic and increasing mortality rate from opioid misuse/abuse (115 deaths per day in 2016). The FY 2021 budget request for state-level opioid grants is $1.59 billion. This funding to the states is intended to increase access to medication-assisted treatment, reduce unmet treatment needs, and reduce opioid-related mortality rates through the provision of prevention, treatment, and recovery activities.

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| *Substance abuse refers to the harmful or hazardous use of psychoactive substances, including alcohol and illicit drugs. Psychoactive substance use can lead to dependence syndrome - a cluster of behavioral, cognitive, and physiological phenomena that develop after repeated substance use and that typically include a strong desire to take the drug, difficulties in controlling its use, persisting in its use despite harmful consequences, a higher priority given to drug use than to other activities and obligations, increased tolerance, and sometimes a physical withdrawal state*. – World Health Organization (WHO). Retrieved from <http://www.who.int/topics/substance_abuse/en/> |

*Violence*

It was not until about 40 years ago that violence was viewed as a public health issue. While viewed as a threat to health prior to that time, it was not actually a rise in violence that brought attention to the matter but the decreased morbidity rates with the prevention and treatment of many infectious diseases (i.e. tuberculosis, pertussis, typhus). Subsequently, as these rates decreased, homicide and suicide began to climb in the ranks of causes of death (Note: Since 1965 homicide and suicide have consistently been among the top 15 leading causes of death). The rise of child abuse and intimate partner violence gained recognition in the 1960s and 1970s as social problems and demonstrated the need to use more than the criminal justice system in solving these problems. In 1979 the Surgeon General released the first *Healthy People* with 15 priority areas aimed at bettering the health of the American people. One of these priority areas was to take control of stress and violent behavior by calling for communities to stop ignoring the consequences of violent behavior on the mental, physical, and social health of its people.

In 1983 the CDC established the Violence Epidemiology Branch with the goal of focusing on stopping child abuse and neglect, violence among youth, sexual violence, intimate partner violence, elder abuse, and suicidal behavior. The combined research, prevention efforts, and services associated with violence have given indications of the roots of violent behavior and how the forms of violence are interconnected. Using a public health approach (a type of scientific method) the CDC is working to stop violence before it can begin by monitoring violence-related behaviors as well as injuries and deaths that result from violence. Additionally the CDC continues research on factors that put people at risk as well as protect them from violence, works with state and local agencies with prevention programs and policies, and monitors existing strategies that are effective or have been found effective in preventing violence.



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| **Timeline of Violence as a Public Health Problem**Source: Taken directly from *Timeline of Violence as a Public Health Problem,* CDC https://www.cdc.gov/violenceprevention/overview/timeline.html |
| **Year** | **Event** |
| 1979 | The United States Surgeon General’s Report, *Healthy People*, identifies violence as one of the 15 priority areas for the nation.  The report states that violence can be prevented and should not be ignored in the effort to improve the nation’s health. |
| 1980 | A landmark Department of Health and Human Services Report – *Promoting Health/Preventing Disease: Objectives for the Nation* – establishes the first violence prevention objectives for the nation. |
| 1981 | CDC epidemiologists begin one of the first collaborative efforts with law enforcement to investigate a series of child murders in Georgia. |
| 1983 | CDC establishes the Violence Epidemiology Branch to focus public health efforts on violence prevention. |
| 1985 | The Surgeon General’s Workshop on Violence and Public Health focuses the attention of the public health world on violence and encourages all health professionals to become involved. |
| 1985 | CDC investigates a pattern of suicides in Texas, the first demonstrated use of field epidemiological techniques to identify suicide clusters. |
| 1985 | The Report of the Secretary’s Task Force on Black and Minority Health is released. The Report underscores the importance of addressing interpersonal violence as a public health problem and identifies homicide as a major contributor to health disparities among African-Americans. |
| 1986 | CDC establishes the Division of Injury Epidemiology and Control. |
| 1986 | CDC establishes extramural research programs to study injuries and violence. |
| 1989 | Report of the Secretary’s Task Force on Youth Suicide is released. |
| 1990 | “Violent and Abusive Behavior” is included as 1 of 22 public health priority areas in Healthy People 2000. It calls for “cooperation and integration across public health, health care, mental health, criminal justice, social service, education, and other relevant sectors.” |
| 1990 | The Youth Risk Behavior Surveillance System is established by CDC to monitor priority health risk behaviors among adolescents, including violence-related behaviors that contribute markedly to the leading causes of death and disability in the United States. |
| 1992 | CDC receives its first congressional appropriations for youth violence prevention. |
| 1993 | A special issue of *Health Affairs* addresses violence as a public health issue – the first special issue to examine violence as a public health problem. |
| 1993 | CDC establishes the Division of Violence Prevention, one of three within the newly created National Center for Injury Prevention and Control. The Division leads CDC’s efforts to prevent injuries and deaths caused by violence. |
| 1993 | CDC publishes *The Prevention of Youth Violence: A Framework for Community Action* to mobilize communities to effectively address the epidemic of youth violence sweeping the nation. |
| 1994 | CDC and the National Institute of Justice collaborate on the National Violence against Women Survey. The survey, implemented in 1995-1996, provides the first national data on the incidence and prevalence of intimate partner violence, sexual violence, and stalking. |
| 1994 | Congress passes the Violence Against Women Act which authorizes coordinated community responses to prevent intimate partner violence and state block grants for rape prevention and education. CDC receives appropriations in 1996 to support both efforts. |
| 1996 | The World Health Assembly passes a resolution and declares that “violence is a leading worldwide public health problem.” |
| 1996 | The National Research Council recommends establishing a Federal Task Force on Violence Against Women with CDC as the lead agency. |
| 1999 | The U.S. Surgeon General releases the *Call to Action to Prevent Suicide* report. |
| 2000 | The World Health Organization (WHO) creates the Department of Injuries and Violence Prevention. |
| 2000 | CDC receives a congressional appropriation to establish 10 National Academic Centers of Excellence for Youth Violence Prevention. |
| 2001 | The U.S. Surgeon General releases a comprehensive report synthesizing the state of knowledge on youth violence and its prevention. |
| 2001 | The National Strategy for Suicide Prevention is released by the Department of Health and Human Services. |
| 2001 | CDC receives first congressional appropriation for child maltreatment prevention. |
| 2002 | CDC and WHO produce the first *World Report on Violence and Health* – the first comprehensive report on violence as a global public health problem. |
| 2002 | CDC establishes Domestic Violence Prevention Enhancements and Leadership Through Alliances (DELTA), a program to focus on primary prevention of intimate partner violence (IPV). |
| 2002 | CDC receives appropriation to establish the National Violent Death Reporting System – the first state-based surveillance system to link data from multiple sources with the goal of enhancing violence prevention efforts. By 2004, the system is in 17 states. |
| 2004 | CDC begins placing a greater emphasis on the social ecological model to guide violence prevention efforts. |
| 2006 | CDC launches Choose Respect, the first national communication initiative designed to prevent unhealthy relationship behaviors and dating abuse. |
| 2007 | CDC publishes a study that estimated the medical and productivity-related costs of violence in the United States exceed $70 billion each year. |
| 2007 | CDC conducts a national survey on violence against children in Swaziland and publishes the findings in *The Lancet*. Findings become a catalyst for change that leads to a global public-private partnership to end violence against children with a focus on sexual violence against girls (Together for Girls). |
| 2009 | CDC launches the VetoViolence website – a free, online, interactive, and engaging site with violence prevention tools, trainings, and resources based on the best available evidence and research. One year later, the VetoViolence Facebook page is launched and becomes the fifth largest CDC Facebook page with nearly 17,000 fans. |
| 2009 | CDC launches *Dating Matters* – a comprehensive teen dating violence prevention initiative for 11-14 year olds living in high-risk urban communities. |
| 2011 | CDC releases a report on intimate partner violence, sexual violence and stalking in the United States. The report is based on data from a new surveillance system, the National Intimate Partner and Sexual Violence Survey (NISVS). NISVS was launched by CDC in 2010 with the support of the National Institute of Justice and the Department of Defense. |
| 2010 | CDC’s Domestic Violence Prevention Enhancements and Leadership Through Alliances (DELTA) program is reauthorized under the Family Violence and Prevention Services Act. The reauthorizing language formally uses the DELTA name for the first time. |
| 2012 | The U.S. Surgeon General and the National Action Alliance release the *2012 National Strategy for Suicide Prevention* to guide prevention efforts over the next decade. |
| 2013 | CDC releases *Essentials for Childhood* – its strategic framework for creating safe, stable, and nurturing relationships and environments for all children. Five states are funded to implement the framework; 24 other states see the short- and long-term benefits of *Essentials* and begin implementing the framework without CDC funding. |
| 2014 | “Preventing Suicide: A Global Imperative” is released by the World Health Organization. The report is the first of its kind to draw attention to the global problem of suicide. |
| 2014 | CDC receives an appropriation to expand the National Violent Death Reporting System from 18 to 32 states. In 2016, with an additional appropriation, the system is expanded to 40 states, DC, and Puerto Rico. |
| 2014 | CDC releases *Connecting the Dots: An Overview of the Links Among Multiple Forms of Violence* to share research on the connections between different forms of violence and how these connections affect communities. In 2016, CDC releases its *Strategic Vision for Connecting the Dots* in its program, practice, policy, research and communication efforts. |
| 2016 | CDC releases a suite of technical packages to help states and communities take advantage of the best available evidence to prevent child abuse and neglect, sexual violence, and youth violence. Technical packages to prevent suicide and intimate partner violence are released the following year. |
| 2016 | CDC, in collaboration with multiple UN and international agencies, releases *INSPIRE: Seven Strategies for Ending Violence Against Children* to advance the adoption of effective strategies to prevent violence against children in countries around the world. |
| 2017 | CDC releases a comprehensive report to help states better understand the extent of intimate partner, sexual violence and stalking victimization in their state to guide prevention efforts. |
| 2017 | CDC scientists estimate the economic burden of rape in the United States. The results show a staggering lifetime cost to society of $122,461 per victim for a total lifetime cost to society of nearly $3.1 trillion (in 2014 dollars). |

**Section 5: Additional Resources**

Mental Health

* [National Institutes of Mental Health](https://www.nimh.nih.gov/health/topics/index.shtml)
* Mentalhelath.gov: [What is Mental Health?](https://www.mentalhealth.gov/basics/what-is-mental-health)
* [Minority Health and Mental Health Disparities Program](https://www.nimh.nih.gov/about/organization/gmh/minority-health-and-mental-health-disparities-program.shtml)
* [Suicide Prevention Hotline](https://suicidepreventionlifeline.org/)
* [American Foundation for Suicide Prevention](https://afsp.org/)

Substance Abuse

* [Executive Summary of The Surgeon General’s Report on Alcohol, Drugs, and Health](https://addiction.surgeongeneral.gov/sites/default/files/executive-summary.pdf)
* SAMHSA’s National Helpline – 1-800-662-HELP (4357)
* Substance Abuse and Mental Health Services Administration (SAMHSA): [Topics](https://www.samhsa.gov/topics)
* Substance Abuse- Healthy People 2020

Violence

* CDC: [Violence Prevention](https://www.cdc.gov/violenceprevention/index.html)
* [Violent crime in the U.S. - statistics & facts](https://www.statista.com/topics/1750/violent-crime-in-the-us/)
* [The Public Health Approach to Violence Prevention](https://www.cdc.gov/violenceprevention/pdf/PH_App_Violence-a.pdf)

**Section 6: Environmental Health**

Learning Outcome:

1. Identify the fundamental roles of public health and how those roles are exhibited in public health organizations, funding, workforce, and regulations.
2. Identify and discuss the roles of public health in addressing health disparities and the needs of vulnerable populations.

Learning Goals:

1. Describe the public health related steps in the regulatory processes in terms of risk assessment.
2. Identify current legislation and regulation regarding environmental issues.
3. Explain the concept of environmental injustice and the role of public health in abolishing injustices.



*Environmental Health*

Environmental health is the field of science that researches environmental influences on our health and works to protect us from injury and illness originating both our natural environment (i.e. air, water and soil) as well as man-made or “built” environments (i.e. buildings, roads, homes and waste management). The field of environmental health also examines unnatural or “altered” environments such as the chemical, biological, physical and social features of the surroundings where we live, work, and play (i.e. no place to safely walk, pesticides, and invasive species) and how we interact with these surroundings. With this research, public health then works to assess and control the environmental factors that can potentially affect the health of the community.

To understand how the environmental components interact and affect our health, public health or environmental professionals use public health (or human health) assessments and ecological risk assessments. A public health or human health assessment is used to examine the human health effects of an agent (i.e. lead, cigarette smoke). The human health assessment also evaluates the toxicity and the exposure to the agent. An ecological risk assessment determines the likelihood of an exposure and the resulting impact or stress to the ecosystem from an exposure. (See Table 6.1 for the Environmental Protection Agency definitions and interactive links). From the information obtained from the health assessment and the ecological assessment, the risk researcher then evaluates the frequency (how often) and magnitude (how much) exposure occurs as a consequence of contact with the known hazard. This information is then integrated with known hazard information on toxicity that is based on exposure levels, predictions of the probability of illness or injury with exposure, and the magnitude of the illness or injury (i.e. a skin rash, a chronic illness, death). From this, safety precautions are issued, policy and procedures designed, and laws passed.

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| **Risk Assessments: EPA** |
| **Public Health/Human Health Risk Assessment** |
| [Step 1: Hazard Identification](https://www.epa.gov/risk/conducting-human-health-risk-assessment#tab-2) | Identify if the agent is hazardous to humans and the environment  |
| [Step 2: Dose-Response Assessment](https://www.epa.gov/risk/conducting-human-health-risk-assessment#tab-3) | How much an exposure leads to how much health outcome? |
| [Step 3:Exposure Assessment](https://www.epa.gov/risk/conducting-human-health-risk-assessment#tab-4)  | What do we know about how much, how long, and how often one is exposed.  |
| [Step 4:Risk Characterization](https://www.epa.gov/risk/conducting-human-health-risk-assessment#tab-5)  | What extra risk or health problems are associated with exposure?  |
|  |
| **Ecological Risk Assessment** |
| Phase 1: [Problem Formulation](https://www.epa.gov/risk/conducting-ecological-risk-assessment#tab-2)  | What is at risk and needs to be protected |
| Phase 2: [Analysis](https://www.epa.gov/risk/conducting-ecological-risk-assessment#tab-3)  | What is exposed, to what degree, and when/if there will be harmful effects (if so, what are they?) |
| Phase 3: [Risk Characterization](https://www.epa.gov/risk/conducting-ecological-risk-assessment#tab-4) | Use the results to estimate the risks and develop interventions.  |

*Environmental Legislation*

Environmental legislation is a collection of both laws and regulations intended to protect the environment and communities from harmful effects. The Environmental Protection Agency (EPA) has the authority to write regulations for the environment and environmental safety because of laws that have been enacted by Congress. Because of these regulations and the power from Congress, the EPA is able to hold organizations, businesses, and individuals legally accountable for environmental violations. Two widely recognized examples of regulations set forth by law and policed by the EPA are The Clean Air Act (CAA) and The Clean Water Act (CWA).

*Environmental Injustice and Health Disparities*

Environmental injustice is the disproportionate effect from environmental hazards among populations, usually minority or underrepresented. The purpose of environmental justice is to offer equal protection from environmental hazards to all communities, socioeconomic status, races, and others who have been underrepresented in the environmental protection process in the past. One such injustice is environmental racism. Recent findings show that there are strong minority and racial disparities in the location of hazardous waste producing and high pollution sites- majority of the populations around these sites (one to three mile radius) are people of color.

Racial inequality is not a new concept in the United States; however, there are many questions surrounding how environmental inequality begins in these communities. Some examples showing discrimination has occurred can be seen in Louisiana and Texas. In Louisiana, many large and polluting industries have built on land that was once slave plantations where many descendants and sharecroppers still live and work. In Houston, Texas, the city leaders decided since there was no zoning in the predominantly black neighborhoods, it would be okay to use the area for municipal landfills. Another tragic example occurred in Chicago in what was known as “Operation Silver Shovel” where city officials were paid to allow a mob associate to dump illegally in neighborhood areas that were predominantly Latino and black.

Exposure to hazardous waste – including materials from landfills, particulates from industrial smoke stacks, known hazardous chemical dumping, and chemical runoff into groundwater and streams – has been linked to several health issues. Cardiovascular disease, pulmonary disease and cancer are three leading health outcomes associated with exposure to hazardous waste. According to the CDC, all are diseases that strike minorities at disproportionate rates.

Since 1992, the EPA has been working to incorporate environmental justice in all areas that it oversees. To watch the most at-risk locations, the EPA designed the Environmental Justice Strategic Enforcement Assessment Tool (EJSEAT) through the EPA Office of Enforcement and Compliance Assurance (OECA) with a goal to “consistently identify areas with potentially disproportionately high and adverse environmental and public health burdens” (Environmental Protection Agency, 2011, p. 1). There is funding available through the EPA to help build local and regional collaboration to aid in identifying the areas most affected and to empower the communities affected to make decisions regarding policy that would help protect their health and safety.

**Section 6: Additional Resources**

Environmental Health

* [National Environmental Health Association](https://www.neha.org/about-neha/definitions-environmental-health)
* [CDC: National Center for Environmental Health](https://www.cdc.gov/nceh/)

Risk Assessment

* [EPA Risk Assessment](https://www.epa.gov/risk)

Environmental Laws and Regulations

* [EPA: Laws and Regulations](https://www.epa.gov/laws-regulations)

**Section 7: Healthcare Institutions and Professions in Public Health**

Learning Outcomes:

1. Identify the fundamental roles of public health and how those roles are exhibited in public health organizations, funding, workforce, and regulations.
2. Identify one or more occupations within the public health realm and describe the education/ credentialing process to enter that field.

Learning Goals:

1. Describe the roles that education and credentialing play in healthcare professions.
2. Identify a range of inpatient and outpatient healthcare facilities that exist in the United States



*Healthcare Professionals*

Cave paintings have shown that the first recognized “healers” were around as early as 25,000 BC. We also know that over 5,000 years ago, the Egyptians began practicing the first recorded surgeries. There was no practice of standards however, around 275 AD, Hippocrates put forth the Hippocratic Oath whereby physicians (even though there were no standards of practice or education) had to swear by the healing gods that they would not intentionally cause harm to a patient. It was not until the [Flexner Report of 1910](https://www.medicinenet.com/script/main/art.asp?articlekey=8795) that education and practice standards were instituted in medical schools. Today, the list of healthcare professionals is long and includes much more than physicians. To join one of these professions usually means an admission prerequisites to a program, specific coursework, competency exams, graduation or completion guidelines met, and official permission granted to practice in the field.

There are two broad fields of health professionals: clinical health professionals and allied health practitioners. (See Table 7.1 for examples). No matter the field, education and training are central to the development of health professionals. Meeting an education requirement means attaining a degree or a certificate from an accredited institution. Training is often offered by the healthcare facility (outside the educational institution) and may be specific to a location or job within that facility. For instance, some hospitals will train their own certified nursing assistants (CNAs) to fit the needs of their population (i.e. pediatric, geriatric, or orthopedic). Another example of in-house training is in gyms where a new employee completes their specific personal training or group training program regardless if that person holds another certificate or degree in the field of personal training.

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| **Table 7.1** |
| **Health Care Profession Examples** |
| **Clinical Health Professionals**Physician, nurse, dentist, optometrist, psychologist, pharmacist, chiropractor | **Allied Health Professionals**Physical therapist, occupational therapist, medical social worker, sonographer, lab assistant. |

To create and maintain a healthcare profession, it is essential to both define and enforce educational requirements. The two approaches that are used are called accreditation and credentialing. Accreditation means there is a quality assurance process to determine if education programs are meeting set standards for educational basics for a particular health profession. Accreditation evaluations are conducted by an external body such as the Liaison Committee on Medical Education (for medical schools), the Accrediting Bureau of Health Education Schools (for schools offering health education degrees), and the Accreditation Commission for Education in Nursing (all levels of nursing degrees and certificates).

Where accreditation ensures the educational institution is meeting set criteria, credentialing confirms that individuals in the healthcare field meet the qualifications necessary to practice. In addition, the credentialing process checks the background, education achievements, and legitimacy of the professional. From credentialing often comes **certification**. Certification is usually a profession-lead process to determine that the person wanting to become a healthcare professional not only completed the education process but is also able to pass a formal examination. Sometimes the certification is an end-process such as with a certified nursing assistant, medical and billing specialist, or dental assistant. Other times, certification is used to define specialties and subspecialties within a profession. Examples are seen in the nursing field such as an AIDS Certified Registered Nurse, a Certified Pediatric Nurse, or Advanced Oncology Certified Nurse.

Finally, there is licensing in healthcare professions. Licensing is a function of the state’s government and the requirements for licensure include some combination of education, training, and certification examination so the healthcare professional demonstrates competency in the field of practice. Maintaining a license generally requires completing continuing education courses, ongoing training, and, for some, periodic re-examination. Because licensing falls under the state government, guidelines may vary from state to state and additional education or certifications may be necessary to practice with a license in a different state.

*Healthcare Facilities in the United States*

A healthcare facility is, in short, any location where healthcare is provided. However, the type of care given, the location, the professionals employed, and the reimbursement mechanisms make the field diverse and often complicated to understand. (Note: this will be covered in greater detail in HE 210). For the purpose of this class we will look at these facilities in two broad categories: inpatient care and outpatient care.

Inpatient care means that medical care is received after a person has been admitted to a facility at least overnight: most hospital care is considered inpatient care for this reason. Persons admitted to an inpatient facility remain under the constant supervision of healthcare professionals following a healthcare plan or protocol. In contrast, outpatient care occurs in a facility where the patient is free to go after the care is given or procedure is performed (also called “ambulatory” facilities since one can “walk out” after treatment).

Hospitals are still the leading type of inpatient care in the United States In 2018, there were 6,146 registered hospitals in the United States with a total of 36,353,946 admissions and total operating expenditures of $1,112,207,387,000. (Note, these data are pre-COVID-19 pandemic). According to the [history of hospitals](https://essentialhospitals.org/about-americas-essential-hospitals/history-of-public-hospitals-in-the-united-states/), hospitals originated as single buildings that were sparsely located (people usually treated illness and injury at home as well as giving birth at home). Today, hospitals are more than a single building: most have grown into networks that include other inpatient facilities such as skilled nursing centers, rehabilitation facilities, and custodial care facilities. Other inpatient care facilities that have seen an increase of use are the facilities designed for the United States aging population. These include nursing homes, memory care facilities, assisted living facilities, and hospice centers.

In the United States each year over 84 percent of all adults visit an outpatient or ambulatory care facility: that equates to about 125.7 million physician visits alone. Over 41 percent of United States healthcare spending goes toward outpatient care. Part of this increase (85 percent higher usage between 1996 and 2013) has to do with access to care (See Section 2, the Affordable Care Act gave 50 million more Americans access to insurance in 2010) as well as the increased rates of chronic disease and subsequent declining health of our population. Nonetheless, this increased utilization of outpatient care has led to an increase in facilities such as urgent care clinics, quick-care clinics, rehabilitation centers, and mental health facilities.

As stated earlier, there are many other factors associated with both inpatient and outpatient facilities (i.e. measuring and defining quality of care, coordination of care between/among facilities, and reimbursement mechanisms). These topics are covered in HE 210 as well as HE250O. You may also find more information in the reference for this section.

**Section 7: Additional Resources**

Healthcare Professionals

* [Understanding Licensing, Credentialing, Certification, and Privileging](http://www.astho.org/Programs/Preparedness/Public-Health-Emergency-Law/Scope-of-Practice-Toolkit/Understanding-Licensing%2C-Credentialing%2C-Certification%2C-and-Privileging%282%29/)
* [Healthcare Occupations: Bureau of Labor Statistics](https://www.bls.gov/ooh/healthcare/home.htm)
* [A Guide to Public Health Careers](https://www.publichealthonline.org/careers/)

Healthcare Facilities

* [The Difference Between Inpatient and Outpatient Care](https://www.pbmchealth.org/blog/difference-between-inpatient-and-outpatient-care/)
* HHS.gov: [Health Care Providers & Facilities](https://www.hhs.gov/programs/social-services/health-care-facilities/index.html)
* CDC: [Healthcare in America](https://www.cdc.gov/nchs/data/misc/healthcare.pdf)
* [Fast Facts on U.S. Hospitals 2018](https://www.aha.org/statistics/fast-facts-us-hospitals)

**Section 8: Healthcare Reform and Insurance**

Learning Outcomes:

1. Identify the fundamental roles of public health and how those roles are exhibited in public health organizations, funding, workforce, and regulations.
2. Identify and discuss the roles of public health in addressing health disparities and the needs of vulnerable populations.

Learning Goals:

1. Define healthcare reform and discuss factors that influence its success.
2. Synthesize access, quality, and cost information to personal examples
3. Identify the types of insurance and medical coverage available in the United States



*Healthcare Reform*

As you read in Section 7 and your Week 7 course resources, healthcare systems are complex and ever-changing. In order to make sure that healthcare systems are continually and effectively meeting the needs of the population, healthcare reform is necessary. As noted in Section 2, there is often disagreement about how healthcare should look and operate in the United States- this means there is no clear definition of healthcare reform (the term “reform” infers continual, purposeful, and fundamental changes).

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| *Health care reform is a general rubric used for discussing major health policy creation or changes. These policy changes include governmental and private policies that affect health care delivery. Health care reform generally attempts to broaden the population that receives health care coverage, expand the array of healthcare providers, improve access to health care specialists, improve the quality of healthcare, and, finally, decrease the cost of health care* (Manchikanti, Helm, Benyamin, & Hirsch, 2017, p. 107) |

Dissatisfaction with the healthcare system and the desire to reform it is nothing new. Since the end of World War II, to some degree, every presidential administration has either proposed changes or supported changes to the U.S. healthcare system. One of the things that all supporters of reform have in common is the desire for better access to high-quality healthcare at a reduction of healthcare cost.

*Access, Quality, and Cost*

As of January 3,2020, it is estimated the United States is spending approximately 18 percent of its gross domestic product on healthcare – that equates to about $3.6 trillion nationally or $11,172 per person- making healthcare the largest single sector of our economy. Unfortunately, the amount of money spent on healthcare does not accurately reflect our nation’s health. America's health indicators rank last among 10 other industrialized nations proving we are not healthier and do not live longer despite medical advances. Statistics show that adults in the United States receive just half of recommended healthcare services. This is due, in part, to the lack of access. Not having access to healthcare does not necessarily mean there is no healthcare facility or service available; access issues can arise from financial limitations, organizational issues, even social or cultural barriers.

Reducing the cost of medical care always seems to be a logical step; the lower the cost the more people can afford healthcare leading to a healthier and more productive population. However, it is never that simple as the cost of healthcare is actually a combination of many factors such as professional salaries, technology, and insurance. Unfortunately, there is often a trade-off with cost versus quality: higher cost means higher quality and lower cost means lower quality. (Healthcare quality is a measure of how good healthcare is being delivered to patients). Healthcare reform has led to many initiatives aimed at decreasing cost while increasing the quality of healthcare delivery. (*Note: HE 210 and HE 250O go into more detail on quality assurance and reimbursement mechanisms in our healthcare system*).



*Health Insurance/Medical Coverage in the United States*

In the United States, over 46 percent of the total amount spent on healthcare is paid for by the government (federal, state, and local) and another 35 percent is paid for by private health insurance sponsored by employers. In short, government sponsored and employee sponsored healthcare plans make up the bulk of health insurance coverage in the United States. Health insurance is intended to cover medical expenses for illnesses, injuries and other health conditions.

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| ***Did you know?**** In 2018 the National Center for Health Statistics estimated that 27.5 million Americans (8.5%) under the age of 65 were uninsured.
* In 2018, 5.5% of children under the age of 18 were uninsured.
 |

Health insurance sponsored by the government includes Medicare, Medicaid, Children's Health Insurance Program (CHIP), TriCare, and the Indian Health Service (IHS). All government sponsored insurance has some eligibility criteria (i.e. age, income, military service) and limitations when seeking providers. (See Table 8.1 for a brief summary of the requirements/eligibility of government sponsored health insurance).

Approximately 50 percent of all Americans have the opportunity to purchase insurance through their employers. There are two leading types of employer-sponsored insurance: Fee for service plans and health maintenance organizations (HMOs). Fee-for-service plans are usually known as a preferred provider plan (PPO). This means that the insurance selected by the employer only works with a specified set of healthcare providers who have agreed to a contract offering such things as lower cost and easier access. A person who has a preferred provider plan does have the option to go outside the provider pool but must pay either more in deductibles or out-of-pocket expenses.

HMOs came about in 1973 (encouraged by the federal government) as an alternative to earlier employer supported insurance plans. HMOs, like the preferred provider plan, work with healthcare networks so they can offer lower premiums, deductibles, and out-of-pocket expenses. The difference between PPOs and HMOs is that all health care is coordinated through a selected Primary Care Physician (PCP) and there is no coverage for out-of-network visits.

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| **Table 8.1 Government Sponsored Healthcare** |
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| [Medicare](https://www.medicare.gov/sign-up-change-plans/decide-how-to-get-medicare/whats-medicare/what-is-medicare.html)  | Federal health insurance for people who are age 65 and older, specified younger people with certain disabilities, persons with End-Stage Renal Disease |
| [Medicaid](https://www.medicaid.gov/medicaid/index.html)  | Federal and State funded health insurance for low-income adults, elderly adults with disabilities, pregnant women, and children |
| [CHIP](https://www.healthcare.gov/medicaid-chip/childrens-health-insurance-program/) | State health insurance for children in families that earn too much money to qualify for Medicaid (note: in some states, pregnant are also covered) |
| [TriCare](https://www.tricare.mil/About) | Provided by the United States Department of Defense Military Health System and offers comprehensive health services to active service members, veterans, and their families.  |
| [Indian Health Services](https://www.ihs.gov/aboutihs/overview/) | Sponsored through the U.S. Department of Health and Human Service, it provides comprehensive health services to American Indians and Alaskan Natives. |

**Section 8 Resources**

Healthcare Reform

* [A Brief History on the Road to Healthcare Reform: From Truman to Obama](https://www.beckershospitalreview.com/news-analysis/a-brief-history-on-the-road-to-healthcare-reform-from-truman-to-obama.html)
* [Evolution of US Health Care Reform](http://www.painphysicianjournal.com/current/pdf?article=NDMwMQ%3D%3D&journal=104)
* [National Health Insurance—A Brief History of Reform Efforts in the U.S.](https://kaiserfamilyfoundation.files.wordpress.com/2013/01/7871.pdf)

Quality, Cost, Access

* [The Iron Triangle The Triple Aim - Institute for Healthcare Improvement](http://app.ihi.org/FacultyDocuments/Events/Event-2930/Posterboard-5943/Document-5657/FaerberStoryBoardTripleAim20170929.pdf)
* [Understanding Quality Measurement](https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/chtoolbx/understand/index.html)
* [The AHRQ](https://www.ahrq.gov/)

Insurance

* [The History of Insurance in the United States](http://www.ache.org/pubs/morrisey2253_chapter_1.pdf)

**Section 9: Public Health and Aging/ Public Health and Minority Health**

Learning Outcomes:

1. Identify the multifaceted determinants of disease in population health.
2. Identify and discuss the roles of public health in addressing health disparities and the needs of vulnerable populations.

Learning Goals:

1. Examine the trends of aging
2. Identify the role of public health in aging populations in the United States
3. Identify the role of public health in addressing health disparities among minority populations. 

*Aging*

By 2030, our population demographics will undergo a significant change: older adults will outnumber children for the first time in history. At this time all Baby Boomers will be at least 65 years old, meaning 1 in 5 of all people in the United States will be of retirement age (note: the group called the “oldest old” – those age 85 and older are the fastest growing segment). By 2050, the aging population will almost double- from 46 million to 88 million. Public health played a role in this growth with surveillance and monitoring systems, health promotion, disease prevention programs, and other public health tools intended to reduce morbidity and premature mortality and, in turn, increased the longevity and the population size. Unfortunately, not all older adults benefit from public health efforts. There are still many disparities in the health and well-being of this population –especially those of lower socioeconomic status and minorities. This is why it is imperative that all public health efforts be developed, implemented and evaluated using the social determinants of health as a guide. (Section 1).

As we age, we are at high risk for complicated health problems, multiple chronic illnesses, and disability (This population will be one of the biggest users of the healthcare system). With the increased population growth and the health disparities within the population, public health professionals need to use the social determinants of health (Section 1) to develop effective and innovative ways to meet the many needs of this population. In addition, more health professionals who are trained in aging will need to be added to the field.

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| ***Did you know?***Currently there are slightly over 7,300 practicing geriatricians (geriatric-focused physicians) in the United States. With an estimated 30% of the aging population needing geriatric services, we will need at least 21,500 geriatricians to meet the needs of these Baby Boomers. |

*Minorities*

America has been a land of diverse populations since its founding: diverse groups came from many different places to build the America we know today. History shows us there were issues with these differences and race relations from our beginning and unfortunately, they still remain today. Surveillance data from 2015 found that the mortality rates for African Americans was generally higher than whites from heart disease, stroke, cancer, asthma, diabetes, HIV/AIDS, and influenza. Further, only 54.4 percent of non-Hispanic blacks (compared to 75.8 percent of non-Hispanic whites) used private health insurance. Instead, over 43 percent relied on Medicaid (32 percent non-Hispanic whites) and 11 percent were uninsured (6 percent non-Hispanic whites).

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| ***Did you know?***The latest census data show us that approximately 66 percent of Americans report being white (non-Hispanic) leaving the remaining 34 percent viewed as racial or ethnic minorities. It is estimated that by 2050, that number will grow to 54 percent. |

*Public Health and Minorities*

In 1985, a landmark publication called the [*Report of the Secretary's Task Force on Black and Minority Health*](https://archive.org/details/reportofsecretar00usde) was released documenting the health disparities among both racial and ethnic minorities in the United States. Findings through surveillance of health indicators - such as life expectancy, disease registries, and infant mortality - determined that minorities experienced a disproportionate burden of preventable disease, death, and disability (higher than non-minorities). In addition to creating awareness of the discrimination issues, it also led to the development of the Office of Minority Health in 1986 and the Office of Minority Health Resource Center in 1987.

 In 2000, the National Center on Minority Health and Health Disparities was established in 2010, as part of the Patient Protection and Affordable Care Act, it was re-designated as an Institute. The Institute has an advisory council that briefs the Health and Human Service Secretary, the directors of both the Institutes of Health Director and the National Institute on Minority Health and Health Disparities on current status of the underserved minority populations. Each of these institutes works to learn more about the many aspects of minority health and health disparities, through the fields of genetic and biologic science, clinical research, behavioral health research, healthcare systems, occupational health and workforce development, and environmental justice.

**Section 9 Resources**

Aging

* [National Institute on Aging](https://www.nia.nih.gov/)
* [Fact Sheet: Aging in the United States](https://www.prb.org/aging-unitedstates-fact-sheet/)
* [Aging in the United States: Opportunities and Challenges for Public Health](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3487684/)
* [Preparing for Better Health and Health Care for an Aging Population](https://nam.edu/wp-content/uploads/2016/09/Preparing-for-Better-Health-and-Health-Care-for-an-Aging-Population.pdf)

Minority Health

* [Office of Minority Health](https://www.minorityhealth.hhs.gov/)
* [CDC: Minority Health and Equity](https://www.cdc.gov/minorityhealth/)
* [FDA: Minority Health](https://www.fda.gov/forconsumers/byaudience/minorityhealth/default.htm)
* [National Institute on Minority Health and Health Disparities](https://www.nimhd.nih.gov/)
* [HHS Office of Minority Health and Establishment of Federal Offices of Minority Health](https://www.cms.gov/About-CMS/Agency-Information/OMH/OMH-Offices.html)

**Section 10: Emergency Preparedness**

Learning Outcomes:

1. Identify the fundamental roles of public health and how those roles are exhibited in public health organizations, funding, workforce, and regulations.
2. Identify and discuss the roles of public health in addressing health disparities and the needs of vulnerable populations.

Learning Goals:

1. Describe the basic types of disasters
2. Understand the roles of public health agencies in emergency management
3. Find local, state and national resources for emergency preparedness 

The events of 2001 – the 9/11 terrorist attacks and the October anthrax attacks - showed the United States that 1) we were vulnerable, 2) we did not have adequate response systems, and 3) we need to be prepared before a disaster strikes.

*Types of Disasters*

Disasters are either natural or man-made and are capable of causing large scale illness, injury, death and property damage that may be too extensive for an existing health system to handle. Natural disasters, like forest fires, hurricanes, or tsunamis are called “predictable disasters” because they usually occur in known vulnerable areas that have existing emergency plans to deal with them (although the adequacy is often not known until after the disaster). These plans include evacuation protocols, management of water and wastewater utilities, and emergency response protocols. There are also unpredictable natural disasters like earthquakes and floods. For these types of events instead of evacuation plans, there may be a need for shelter in place plans on the individual level (for instance, here in Oregon, we often hear our news stations ask “do you have your earthquake kits ready?”).

Man-made disasters (sometimes called technological disasters) are almost always unpredictable. However, sometimes it is possible to identify the potential for a man-made disaster and minimize the impact, if not, totally avoid the disaster. Man-made disasters include events such as hazardous material releases, transportation accidents, nuclear explosions, radiation releases, or the collapse of a structure like a building or a bridge. Terrorist events, war, deliberate attacks, and bioterrorism also fall in this category.

*Public Health Response*

Whether natural or man-made, disasters harm not only their direct victims but survivors are often placed at significant risk from the condition left by the disaster. Some of the routine issues that public health handles after a disaster include measuring water and air quality, finding clean food and water sources, monitoring and reducing exposure to toxic chemicals or radiation, finding sufficient medical care and medical supplies, and providing temporary shelter to those who have been displaced. It is important for the public health authorities to not only plan and prepare for disasters but also work with other first responders and agencies to ensure coordination of services. After the [9/11 attacks](https://www.history.com/topics/9-11-attacks), the federal government funded programs throughout the United States to increase preparedness and response to disasters. However, when [Hurricane Katrina](https://www.history.com/topics/hurricane-katrina) hit in August of 2005, it was apparent that those initial efforts were not enough. After evaluation, both event responses were missing adequate coordination and communication. Public health authorities have stepped up their role in the planning and response to disasters by working with healthcare organizations, first responders, and disaster response agencies (i.e. American Red Cross) to coordinate not only the delivery of healthcare services but also insure important supplies distributed to those in need (this is usually called a community action plan). In the American Public Health Association publication *Public Health Management of Disasters: The Pocket Guide*, the author lists seven strategies necessary to address the community’s needs:

1. ensure the continuity of health care services (acute emergency care, primary care, and preventive care);
2. monitor the environmental infrastructure (water, sanitation, and vector control);
3. assess the needs of special populations (i.e. elderly, disabled, homebound, and non–English-speaking);
4. initiate injury prevention and surveillance programs;
5. ensure that essential facilities will be able to function post-impact (hospitals, health departments, physicians’ offices, storage sites for health care supplies, dispatch centers, paging services, and ambulance stations);
6. issue health advisories as needed;
7. allocate resources to match the needs of the disaster (Landesman, 2006, p. 8).

The CDC’s Public Health Emergency Preparedness program (PHEP) - established in 2002 as a response to the events of 2001 – has been working with states to help communities “prepare for, withstand, and recover from emergencies” (Centers for Disease Control and Prevention, 2018) through funding for state, local, and territorial public health departments. Their efforts within the PHEP jurisdictions have been successful – almost a 100 percent increase in all capabilities. Table 10.1 below shows the marked improvements.

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| **Table 10.1 Improvements in Public Health Emergency Preparedness Since 9/11** |
| PHEP JURISDICTIONS WHO: | Then | Now |
| Can mobilize staff during an emergency | 20% | 98% |
| Have an Incident Command System with pre-assigned roles in place | 5% | 100% |
| Have identified point-of-dispensing (POD) sites | 0% | 100% |
| Have sufficient storage and distribution capacity for critical medicines and supplies | 0% | 98% |

The PHEP program provides guidance to ensure that states and jurisdictions have the most current and accurate information needed to protect their communities, technical assistance for response mechanisms, and evaluation to determine the state’s capabilities in preparedness and response. The six crucial areas of the PHEP program include: community resilience, incident management, information management, countermeasures and mitigation, surge management, and biosurveillance. (See Table 10.2 for explanations of the six areas),

Public health plays an important role in both preparing for and responding to disasters, both natural and man-made. The first priorities for planning must include evacuation of the survivors and procuring medical care to the injured. These two tasks not only require planning, but also practice through either drills or through simulations. After the initial evacuation and medical needs are addressed, the response plan should include methods to ensure that the air, water, and food sources are not contaminated. In addition, if the disaster event has left any unsafe structures (buildings, bridges, roadways) or hazards (downed power lines or debris) plans should be in place to eliminate or mitigate these dangers. There are many agencies and organizations that are needed to carry out the response plans and the federal government has provided funding to all communities to ensure that there is communication and cooperation for success.

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| Table 10.2 Six Areas of the PHEP Program |
| Community Resilience  | How capable is the community of preparing and recovering from a disaster?  |
| Incident Management | Coordination and communication of all agencies that have been pre-identified as necessary to the disaster response. |
| Information Management | Making sure accurate and timely information is available before, during, and after disasters.  |
| Countermeasures and Mitigation | A countermeasure is an action that can prevent or mitigate the effects of an event such as getting clean water and safe food to areas that have had their sources contaminated  |
| Surge Management | Getting adequate medical care in events where the medical needs are far greater than average  |
| Biosurveillance  | The gathering, interpreting, and communicating the crucial information that might relate to disease activity (i.e. bioterrorism) or other threats of injury or illness. |
| Adapted from CDC’s Public Health Emergency Preparedness Program: Every Response is Local ( (Centers for Disease Control and Prevention, 2018) |

**Section 10 Resources**

Disaster Preparedness

* [Red Cross: Disaster Preparedness Plan](https://www.redcross.org/get-help/how-to-prepare-for-emergencies/make-a-plan.html)
* Ready.gov: [Plan Ahead for Disasters](https://www.ready.gov/)
* EPA: [General Information for Disaster Preparedness and Response](https://www.epa.gov/natural-disasters/general-information-disaster-preparedness-and-response)

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