

Public Health, like fire and police, is a public safety organization. Every day public health ensures safe food and water, prevents and controls disease outbreaks, prevents child abuse and neglect, and ensures that babies born with life threatening conditions are quickly identified and treated. These are just some of the ways a strong public health system protects our children and families.

The Institute of Medicine has defined public health as “what we do collectively to assure the conditions in which people can be healthy.” Public health is based on the principles of disease and injury prevention, health protection, and health promotion.

Over the past century, using those principles, public health (unbeknownst to most) has been quietly working to protect and improve the well-being of all Americans. Because of the implementation of many public health initiatives over the years, life expectancy has increased, injuries have decreased, and our nation is safer than any point in history. It is estimated that 25 of the 30 years of expanded life expectancy in the 20th century was due to public health initiative. Without the work of public health, we would have to worry about the food and water we consume, rampant spread of disease, unsanitary living conditions, and needless death and injury.

Below are a list of what the Centers for Disease Control and Prevention call some of the more important public health achievements over the past 100 years. Each of those achievements recognizes that continued efforts are needed to sustain and advance those accomplishments.

Vaccinations

Vaccines, which bridge the gap between biomedical science and public health, are one of the greatest achievements of the 20th century. Prior to the advancement of immunizations, people routinely died from infectious diseases. Vaccines have eradicated smallpox globally and polio in the U.S., and have drastically reduced measles, diphtheria, rubella, pertussis (whooping cough) and other diseases. Immunizations are necessary for two reasons: to protect the individual and to protect communities. Vaccines protect entire populations by preventing the spread of disease from one individual to another. The more people immunized the less chance for a disease to spread.

According to the CDC, an estimated 11,000 children are born each day in the United States, each requiring 15-19 doses of vaccine by age 18 months to be protected against 11 childhood diseases. When you add to that adult vaccines, it becomes obvious that a well-functioning public health system is needed to create, license, distribute, monitor, and evaluate vaccines and oversee this essential but complex effort. In addition, new vaccines will be necessary to address emerging 21st century infectious diseases.

Prevention and Control of Infectious Diseases

With a combination of improved sanitation, immunizations, antibiotics, and access to medical care, deaths from infectious diseases have declined markedly in the United States during the 20th century. This decline contributed to a sharp drop in infant and child mortality and to the 29-year increase in life expectancy. In 1900, 30.4% of all deaths occurred among children aged less than 5 years; in 1997, that percentage was only 1.4%. In 1900, the three leading causes of death were pneumonia, tuberculosis (TB), and diarrhea and enteritis, which caused one third of all deaths. Of these deaths, 40% were among children aged less than 5 years. Today only one category of infectious disease (influenza and pneumonia) is in the top 10 leading causes of death and it is number 8.

However, bacteria are quite hardy and adaptable. In the last 30 years, there has been an increase in the number of bacteria that are immune or resistant to antibiotics. There has also been a decline in the number of new antibiotics being developed. Because of this, over 2 million infections and over 23,000 deaths occur on an annual basis in the United States due to antibiotic resistant organisms.

While great progress has been made in the prevention and control of infectious diseases, there are new challenges in the 21st century that will require enhanced public health action.

Maternal and Infant Health

At the beginning of the 20th century, for every 1000 live births, six to nine women in the United States died of pregnancy-related complications, and approximately 100 infants died before age 1 year. From 1915 through 1997, the infant mortality rate declined greater than 90 percent to 7.2 per 1000 live births, and from 1900 through 1997, the maternal mortality rate declined almost 99 percent to less than 0.1 reported death per 1000 live births. Environmental interventions, improvements in nutrition, advances in clinical medicine, improvements in access to health care, improvements in surveillance and monitoring of disease, increases in education levels, and improvements in standards of living contributed to this remarkable decline.

Despite these successes, the US infant mortality rate is worse than most other developed countries and the maternal mortality rate has started to increase. In addition, the US has the highest teen pregnancy rate among industrialized countries. With 11,000 infants born each day, Maternal and Child Health (MCH) services remain a core part of public health work.

Motor Vehicle Safety

The reduction of the rate of death that was attributed to motor-vehicle crashes in the United States represents the successful interaction of public health and the motorization of America. Six times as many people drive today as in 1925, and the number of miles traveled in motor vehicles is 10 times higher than in the mid-1920s. Despite this steep increase in motor-vehicle

travel, the annual death rate has declined from 18 per 100 million vehicle miles traveled (VMT) in 1925 to 1.7 per 100 million VMT in 1997. This represents a 90 percent decrease. Yet, there remain over 32,000 traffic-related deaths each year (approximately 90 deaths/day) in the United States. Much more work needs to be done in the areas of engineering, construction, law enforcement, emergency response, and education to continue to make progress on this major public health issue.

Safety of Food and Water

Early in the 20th century, contaminated food and water often caused typhoid fever, tuberculosis, botulism, and other foodborne diseases. Because of public health, improvements in sanitation, refrigeration, pasteurization improved the safety of the food supply. In 1900, the incidence of typhoid fever was roughly 100 per 100,000 population; by 1950, that had dropped to just 1.7. The precursor to today's advancements on keeping our food and water free of disease was the Pure Food and Drug Act, which was passed in 1906. With today's food chain being global in scope, new challenges and risks for food safety are evolving. New diagnosis and tracking mechanisms are needed to prevent widespread food-related health problems. The aging of our drinking water supply infrastructure will also require continued investment in its upkeep and improvement.

Fluoridation of Public Water

At the beginning of the 20th century dental cavities were very common. The commonality of these cavities typically led to much worse dental problems, and could result in deadly oral infections. After discovering that fluoride significantly decreases the rates of tooth decay, infusing municipalities' drinking water with fluoride became a public health staple. In doing so, we have seen a significant drop in dental problems, and an overall increase in oral health. These systems must be maintained as one of many efforts needed to sustain our progress in improving oral health.

Workplace Safety

Over a hundred years ago, it was hard to even know how many workers were dying or becoming ill from workplace hazards. Efforts by advocacy groups, researchers, labor, management, state and federal labor and health agencies, and others all helped improve workplace safety, but the country saw major changes in the 1970s when the Occupational Safety and Health Act created the Occupational Safety and Health Administration (OSHA) and National Institute for Occupational Safety and Health (NIOSH). OSHA is responsible requiring employers to provide workplaces free from recognized hazards likely to cause death or serious physical harm, and NIOSH conducts research and disseminates information on preventing workplace injuries and illnesses

These advances have greatly reduced workplace injuries and deaths. For example, in 2008 there were 5,214 fatal work injuries in the United States. In 1999, CDC estimated that if today's workforce of approximately 130 million had the same risk as workers in 1933 for dying from injuries, an additional 40,000 workers would have died in 1997 from preventable accidents.

Tobacco Control

Smoking is the leading preventable cause of death and disability in the United States. Diseases and conditions known to be caused by tobacco use include lung cancer, heart disease, atherosclerotic peripheral vascular disease, laryngeal cancer, oral cancer, esophageal cancer, chronic obstructive pulmonary disease, intrauterine growth retardation, and low birth rate. During the first decades of the 20th century, lung cancer was rare. As cigarette smoking became increasingly popular the incidence of lung cancer became epidemic. In 1930, the lung cancer death rate for men was 4.9 per 100,000, compared to 75.6 per 100,000 in 1990.

Since the 1964 Surgeon General's report on the health risks of smoking, the prevalence of smoking among adults has decreased, and millions of smoking-related deaths have been prevented. Smoking rates in the U.S. in 2014 hit an all-time low, with only about 16 percent of adults smoking cigarettes in 2014, which is nearly a 20 percent drop from the smoking rate in 2005. Smoking rates in the United States have dropped by half from 1965 to 2006 falling from 42 percent to 20 percent of adults.

Summary

While these and other public health achievements have transformed the American landscape, it is important to ensure that society continues to be protected by a modern and effective public health system. This will require an on-going investments in core public health services (as depicted above) and in the capability and capacity to respond to emerging public health issues with new public health tools. The rapid pace at which society is changing requires an adaptable system with resources appropriate to the needs. Services that prevent injury, disease, and workplace safety should not be hindered by lack of appropriate resources. If this became the situation, the overall health of society would be put at risk. Public health will continue to transform with our changing world, so it is imperative that public health has the opportunity to be forward-thinking. None of us are immune from the responsibility to continue give the American people the security they deserve.