

INVESTMENT IN RESEARCH SAVES LIVES AND MONEY

Infectious Diseases

Almost everyone has had the experience of coming down with a cold, the flu, or a bad reaction from eating spoiled or contaminated food. These illnesses are examples of infectious diseases. Infectious diseases are caused by different types of germs, including viruses, bacteria, parasites, and fungi. Some of these germs are spread directly by person-to-person contact, or through airborne droplets when an infected person coughs or sneezes. Others are transmitted indirectly via contaminated objects, food and drinking water, insects, the environment, or even infected animals.¹ Infectious diseases cause significant morbidity and mortality in the U.S. and globally. There is also a growing threat of emerging diseases for which we have no cure, as well as diseases which are becoming resistant to currently available treatments.

TODAY

Flu is a droplet-borne disease caused by the influenza virus. The 2017-18 flu season resulted in

48.8 million infections and **79,400** deaths in the U.S.²

In 2017, over **119,000** people had a staph infection in the U.S., resulting in almost

20,000 deaths. Caused by the bacteria *Staphylococcus aureus*, staph infections are commonly associated with health care facilities, though they can be acquired in other settings.⁴ Staph bacteria can cause a variety of issues, including skin infections, food poisoning, and pneumonia.⁵

Hepatitis C is a blood-borne virus that affects the liver and can lead to chronic liver damage. There are more than

3 million people in the U.S. living with hepatitis C.⁶

COST

\$11.2 billion:

The average annual economic cost of seasonal flu in the U.S.⁷

\$25-31 billion:

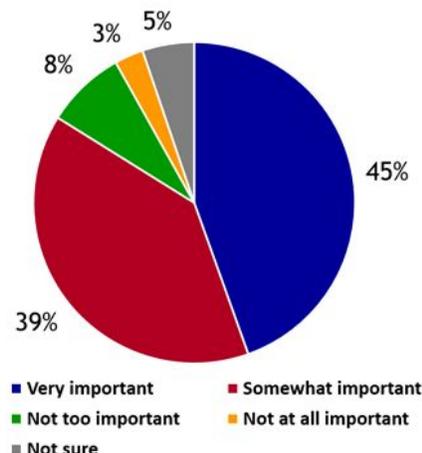
The estimated medical cost savings if the U.S. could reduce health care-associated infections by 70%.⁸

\$115 billion:

The cost to U.S. health care that could be averted by eliminating Hepatitis C over the next decade.⁹

Strong Majority Say the President and Congress Should Assign a High Priority to Faster Medical Progress

How important is it for the President and Congress to assign a high priority to ensuring faster medical progress?



Research Delivers Solutions

The flu vaccine, typically manufactured using an egg-based process, **prevents millions of infections each year**.¹⁰ In 2016, the FDA approved a cell-based flu vaccine that allows for a **faster start-up of vaccine production**, which could be useful in the case of a pandemic.¹¹ Many researchers are also working on the development of a universal flu vaccine that would provide **longer-lasting protection** against a **broader variety of flu viruses**.¹²

Some *Staphylococcus aureus* infections are **resistant to one or more antibiotics**, making them particularly difficult to treat. Researchers are studying how best to detect, prevent, and respond to methicillin-resistant *Staphylococcus aureus*, or MRSA. A 2015 study from the CDC demonstrated that using disinfectant and antibiotic ointment in intensive care units **reduced bloodstream MRSA infections by 37%**.^{13, 14}

Prior to 2010, treatment for hepatitis C required regular injections, often had severe side effects, and was only 40-50% effective. Insights on the biology of the hepatitis C virus have led to the development of multiple new drugs that are well-tolerated and highly effective, with cure rates of 95-99%.¹⁵

Source: A Research!America poll of U.S. adults conducted in partnership with Zogby Analytics in January 2019

Infectious Diseases

Then. Now. Imagine.

THEN

In 1900, mortality due to infectious diseases was 797 deaths per 100,000 in the United States. The three leading causes of death were pneumonia, tuberculosis, and gastrointestinal illness.^{16, 17}

NOW

The mortality rate from infectious diseases in 2014 was 34 per 100,000.¹⁷ Public sanitation efforts, along with the development of vaccines, antibiotics, and other public health tools, mean far fewer people today are dying from infectious diseases.^{2, 17, 18}

IMAGINE

A world where no one has to die from preventable infectious diseases.

A Global Perspective

Globally, infectious diseases are a **leading killer of infants and children under 5**.¹⁹

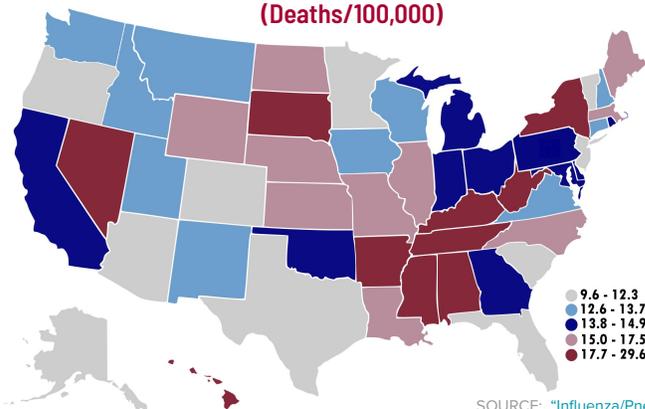
Infectious diseases **disproportionately impact low and middle-income countries**, and also act to **perpetuate poverty**.^{21, 22}

Tuberculosis, HIV/AIDS, and malaria, three of the world's deadliest infectious diseases, accounted for **3 million deaths** in 2017.²⁰ While global health efforts have been successful in decreasing the burden of these diseases, in all three cases drug resistance poses a major obstacle to continued progress. In 2017, there were an estimated **558,000** new cases of multi-drug resistant tuberculosis.

Global health is our health.

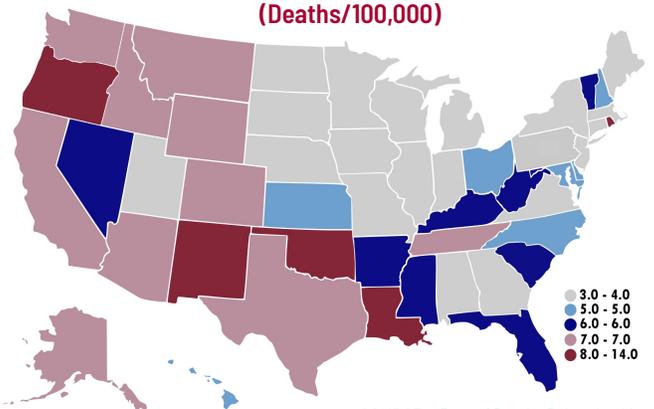
Since the 1970's, about 40 newly emerging infectious diseases have been reported, including Ebola, SARS, avian influenza (bird flu), and Zika.²³ These emerging infections are often highly deadly.²⁴ Contagious diseases do not respect international boundaries. With increased global travel and connectivity, ongoing and emerging infectious disease threats happening abroad will ultimately impact us here at home.

Mortality from Influenza and Pneumonia, 2017
(Deaths/100,000)



SOURCE: "Influenza/Pneumonia Mortality by State, National Center for Health Statistics, CDC, 2019"

Mortality from Hepatitis C, 2017
(Deaths/100,000)



SOURCE: "Rate of Deaths Related to Hepatitis C, 2016". HepVu, Emory University Rollins School of Public Health and Gilead Sciences, Inc.

This factsheet is intended to provide a glimpse into the diverse and complex universe of infectious diseases. Find more information on these diseases [here](#).

Research!America 241 18th St S, Arlington, VA 22202 | 703.739.2577
www.researchamerica.org | info@researchamerica.org

The Albert and Mary Lasker Foundation is a founding partner in this series of fact sheets. www.laskerfoundation.org

1. "How Are Diseases Transmitted?" Healthline
2. Hansen et al. "Infectious Disease Mortality Trends in the U.S." 2016
3. "2017-2018 Flu Season Burden Estimates." CDC, 2018.
4. "Deadly Staph Infections Still Threaten the U.S." CDC, 2019
5. "Staphylococcal Infections." MedlinePlus.
6. "Hepatitis C." Office of Population Affairs, HHS, 2019
7. Putri et al. "Economic burden of seasonal influenza in the US." 2018
8. "Healthcare-Associated Infections." Healthy People 2020
9. "Eliminating hep C today could reduce future U.S. health care spending [..]. PhRMA, 2015
10. "Vaccine Effectiveness." CDC, 2018
11. "Cell-Based Flu Vaccines." CDC, 2019
12. "Influenza Vaccine Advances." CDC, 2016
13. "What CDC is Doing to Combat MRSA." CDC, 2019
14. "MRSA study [..]." CDC, 2015
15. Dahiya et al. "The Revolutionary Changes in Hepatitis C Treatment: A Concise Review." 2019
16. Armstrong et al. "Trends in Infectious Disease Mortality in the U.S. [..]." 1999
17. "Achievements in Public Health, 1900-1999." CDC, 1999
18. "Despite reduction in infectious disease mortality in U.S. [..]." IHME, 2018
19. "Causes of child mortality." WHO, 2017
20. "Global Health Security." The Global Fund.
21. "Burden of Disease." Roser and Ritchie, Our World in Data, 2018
22. Griffiths and Xiao-Nong Zhou. "Why research infectious diseases of poverty?" WHO, 2012
23. "Emerging Infectious Diseases." Baylor College of Medicine
24. Morens and Fauci. "Emerging Infectious Diseases: [..]." PLOS Pathogens, 2013