

# Outbreaks:

PROTECTING  
AMERICANS FROM  
INFECTIOUS DISEASES

# 2015

ISSUE REPORT



DECEMBER 2015

## Acknowledgements

**Trust for America's Health** is a non-profit, non-partisan organization dedicated to saving lives by protecting the health of every community and working to make disease prevention a national priority.

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# Infectious Diseases *Policy Report* SERIES

## Outbreaks: Protecting Americans from Infectious Diseases 2015

Infectious diseases — most of which are preventable — disrupt the lives of millions of Americans each year. But the country does not sufficiently invest in basic protections that could help avoid significant numbers of outbreaks and save billions of dollars in unnecessary healthcare costs.

U.S. investments in infectious disease prevention ebb and flow, where there is a major ramp up when a new eminent threat emerges, but then falls back when the problem seems contained.

In the most recent example last year, the Ebola outbreak resulted in ephemeral attention and emergency supplemental funding to backfill gaps in the nation's ability to respond. But, lags in even emergency funding processes meant much of the support came too late to address immediate needs in states and in Africa. And the funding was not at a sufficient level to shore up ongoing gaps, leaving the United States still vulnerable for when the next emerging threat arises.

Fighting infectious disease requires constant vigilance. Policies and resources must be in place to allow scientists and public health and medical experts to have the tools they need to: control ongoing outbreaks — such as HIV/AIDS, antibiotic-resistant superbugs and foodborne illnesses; detect new or reemerging outbreaks — such as Middle East Respiratory Syndrome Coronavirus (MERS-CoV), measles and avian flu; and monitor for potential bioterrorist threats — such as anthrax or smallpox.

There needs to be a fundamental rethinking of the policies and priorities that contribute to a range of outbreaks, including:

- **Superbugs:** More than two million Americans contract antibiotic-resistant infections each year, leading to more than 23,000 deaths and \$20 billion in direct medical costs and more than \$35 billion in lost productivity;<sup>1</sup>
- **Middle East Respiratory Syndrome Coronavirus:** While there have only been two MERS-CoV cases in the United States as of fall of 2015 and this were of individuals traveling from other locations, the novel coronavirus that causes a severe viral respiratory disease has infected more than 1,600 individuals, spreading from the Middle East to South Korea through international travel, causing a significant outbreak. MERS is fatal in more than 30 percent of cases;<sup>2</sup>
- **Foodborne Illness:** More than 48 million Americans get sick, 128,000 are hospitalized and 3,000 die from contaminated food annually;
- **HIV/AIDS and Viral Hepatitis:** More than 1.2 million Americans are living with HIV, and almost one in eight do not know they are infected.<sup>3</sup> There has been a significant increase in new infections among young gay men — accounting for the majority of almost 50,000 new HIV infections in 2010.<sup>4</sup> Approximately 5 million Americans are infected with the hepatitis B virus (HBV) or hepatitis C virus (HCV), but two out of three people infected

with HBV and 50 percent infected with HCV do not know it.<sup>5</sup> HBV and HCV put people at risk for developing serious liver diseases and cancer.<sup>6</sup> A recent sharp rise — more than doubling — of heroin addiction in less than a decade is contributing to a corresponding increase in HIV and hepatitis C infections.<sup>7</sup> An estimated 29,718 new HCV infections occurred in 2013. New cases of HCV infection are predominantly among young persons who are white, live in non-urban areas (particularly in Eastern and Midwestern states), have a history of injection drug use, and previously used opioid agonists such as oxycodone.<sup>8</sup> Each person who injects drugs is projected to then infect 20 more individuals.<sup>9</sup> New cases of HCV are also resulting from healthcare-associated infections (HAI) — 44 outbreaks (of two or more cases) of viral hepatitis related to healthcare were reported to CDC between 2008 and 2014, with 95 percent (42) of those cases in non-hospital healthcare settings.<sup>10</sup>

- **Healthcare-associated Infections:**

Around one out of every 25 people who are hospitalized each year contracts a healthcare-associated infection leading to around 75,000 deaths a year.<sup>11</sup>

- **Influenza (The Flu):** Between 5 percent and 20 percent of Americans get the flu each year. The severity and impact of the flu can range from 3,000 to 49,000 deaths a year, more than \$10 billion in direct medical expenses and more than \$16 billion in lost earnings.<sup>12, 13</sup>

- **Global Public Health Capacity:**

Countries without an adequate public health system that can prevent, detect and respond to infectious disease threats are more prone to outbreaks that can spread across borders (including to the United States) with significant economic and health effects.



The best offense to fighting infectious diseases is a strong and steady defense. The country needs to establish a clear, consistent set of baseline capabilities and provide ongoing resources to be consistently ready to combat ongoing problems as well as the next emerging threat.

The Trust for America's Health (TFAH) and the Robert Wood Johnson Foundation (RWJF) issue the *Outbreaks: Protecting Americans from Infectious Diseases* report to examine the country's policies to respond to ongoing and emerging infectious disease threats.

To help assess policies and the capacity to protect against infectious disease outbreaks, this report examines a range of infectious disease concerns. The report highlights a series of 10 indicators in each state that, taken collectively, offer a composite snapshot of strengths and vulnerabilities across the health system. The indicators are not a comprehensive assessment or analysis but represent areas of priority infectious disease and health security interests. These indicators help illustrate the types of policy fundamentals that are important to have in place not just to prevent the spread of disease in the first place but also to detect, diagnose and respond to outbreaks. In addition, the report examines key areas of concern in the nation's ability to prevent

and control infectious diseases and offers recommendations for addressing these gaps.

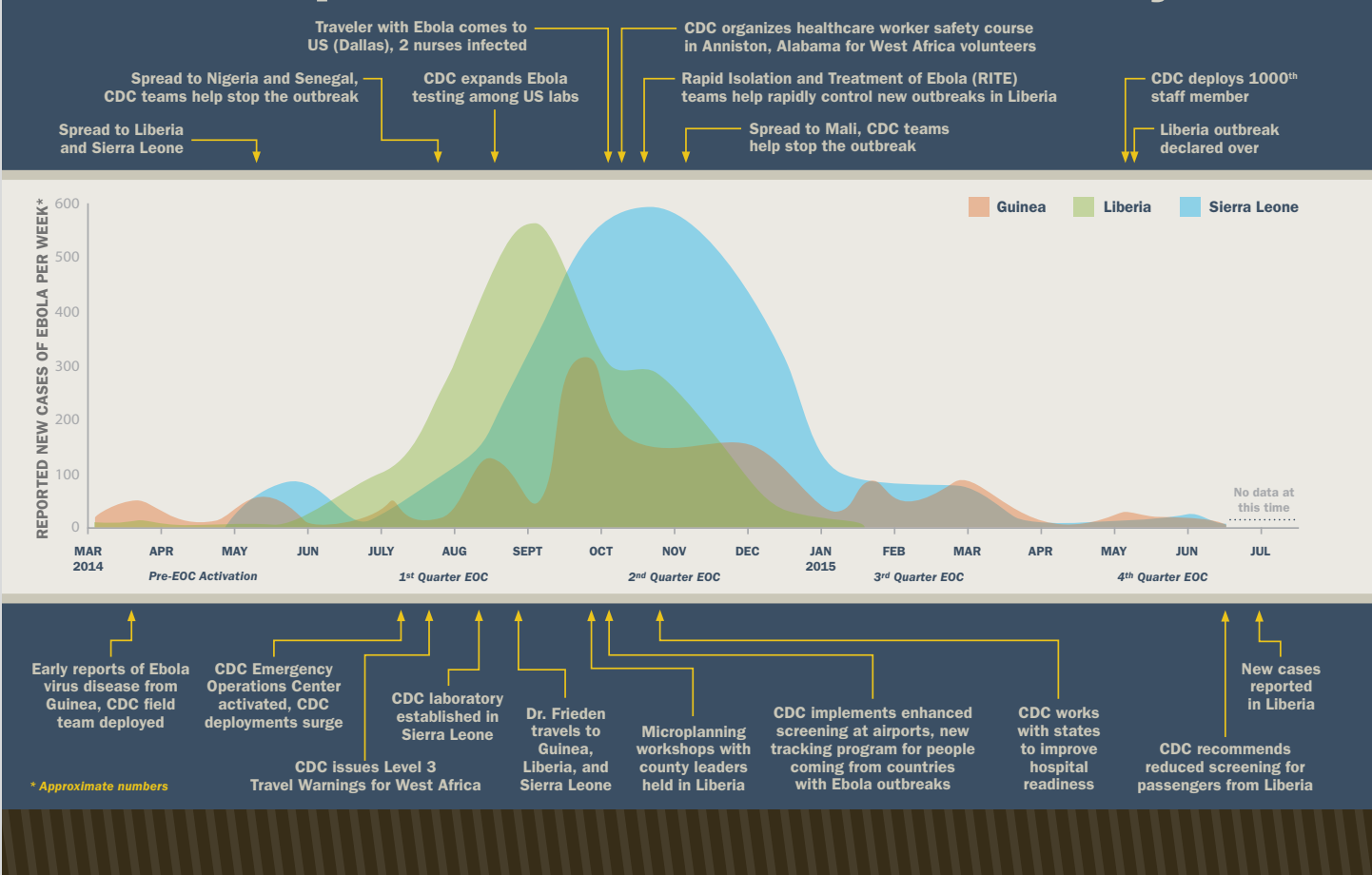
The *Outbreaks* report provides the public, policymakers and a broad and diverse set of groups involved in public health and the healthcare system with an objective, nonpartisan, independent analysis of the status of infectious disease policies; encourages greater transparency and accountability of the system; and recommends ways to assure the public health and healthcare systems meet today's needs and works across borders to accomplish their goals.

Protecting the country from infectious disease threats, whether bacterial, viral or parasitic, is a fundamental role of government, and all Americans have the right to basic protections no matter where they live. While government is only one partner in the fight against infectious diseases — along with the healthcare sector; pharmaceutical, medical supply and technology companies; community groups, schools and employers; and families and individuals — government at all levels has the ability to set policies and establish practices based on the best science available to better protect Americans from infectious disease threats.

## Ebola Lessons Learned and Preparing for MERS-CoV and Other Emerging Infections

The Ebola outbreak raised domestic and international concerns about the need to better prepare for potential major new disease outbreaks. Ebola is a deadly viral hemorrhagic fever with symptoms that include severe headache, muscle pain, vomiting, diarrhea and unexplained bleeding or bruising and can be transmitted through bodily fluids. There is currently no approved cure or vaccine and survival often depends on supportive care and the patient's immune response. The current outbreak emerged in 2013 in West Africa and was largely contained by mid-2015. From 2013 through October 2015, there have been 28,635 total cases, including 11,313 deaths from Ebola in several West African nations. There were four cases diagnosed and another seven airlifted and treated in the United States with two fatalities.<sup>14</sup>

### CDC's Response to Ebola: March 2014 – July 2015



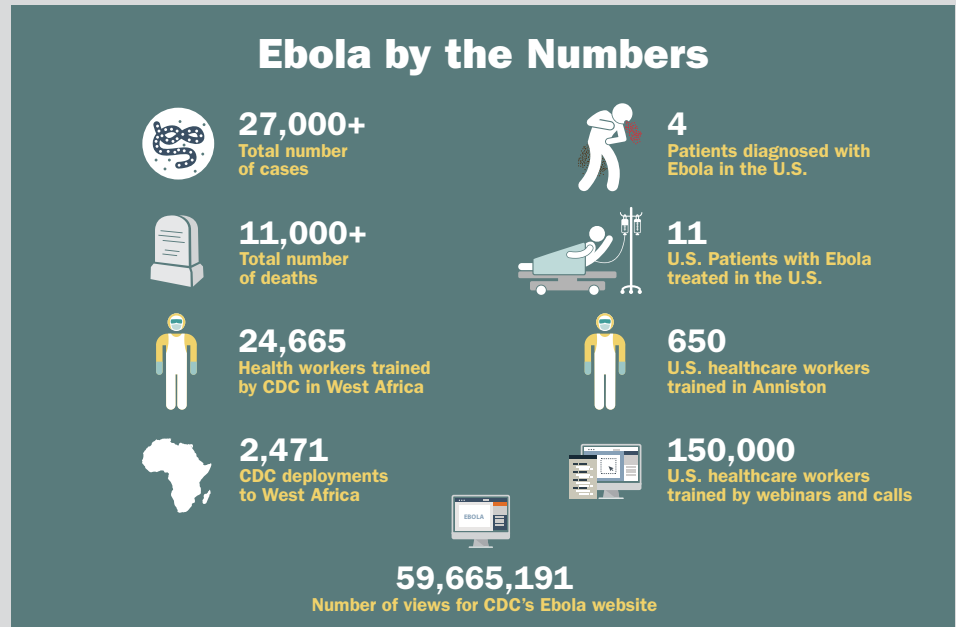
Source: CDC

The outbreak demonstrated how quickly a new threat can arise — and how complacency and lapses in sustained support and funding for preparedness can leave countries and communities unnecessarily vulnerable.

“Because there was so little preparation, the world lost time ... trying to answer basic questions about combating Ebola. In the next epidemic, such delays could result in global disaster. The problem was not the fault of any single institution — it reflects a global failure,” according to a review by Bill Gates in the *New England Journal of Medicine*.<sup>15</sup>

The World Health Organization (WHO), U.S. Centers for Disease Control and Prevention (CDC), the Office of the Assistant Secretary for Preparedness and Response (ASPR) at the U.S. Department of Health and Human Services (HHS) and many professional health organizations have reviewed lessons learned about ways to better prevent and prepare for major disease outbreaks, finding:<sup>16, 17, 18, 19, 20</sup>

- Preparedness requires constant vigilance — including ongoing maintenance and funding for core prevention, detection and infection control capabilities among health providers and public health agencies.
- Countries around the world must work together to prevent and control outbreaks. This must include supporting surveillance and sharing information about potential outbreaks — and pooled resources and expertise should be used to mount a quick, strong response and containment activities. Working



Source: CDC

to prevent and contain emerging outbreaks is important as the first and most effective line of defense, and must feature a funded and maintained global warning and response system, and trained experts (including incident managers, epidemiologists and disease intervention specialists for contact tracing), diagnostics, medicines and other equipment must be deployed rapidly. In 2014, the United States joined the Global Health Security Agenda (GHSA) with more than 40 countries to work together to better prevent, detect and respond to emerging outbreaks before they become epidemics.<sup>21, 22</sup> These GHSA efforts build on the lessons of long-standing global health activities including Global Disease Detection and the Field Epidemiology Training Program.

- Within the United States, CDC must act quickly to issue and regularly update guidance and training for the public and health professionals — with clear, science-based information. This should include a scientifically-based risk assessment

of what type of domestic clinical response is warranted for different types of threats — for instance, not to overreact to an international outbreak that poses limited threat to the wide U.S. population and not to under-prepare for a disease that could spread widely and cause severe impact. Infection control policies, protocols and guidelines should be regularly maintained, exercised and updated across the health system.

- All healthcare facilities should have basic baseline infection control policies and protocols in place — and that can be adapted for different types of outbreaks and threats. For instance, to be prepared for an outbreak like Ebola, healthcare facilities should be part of a regionalized, tiered system where patients can be quickly and effectively isolated and transported to facilities with increased infection control and treatment capabilities as needed. In response to the Ebola outbreak, HHS, state health departments and

## Screening by the Numbers\*



**18,672**

Travelers who entered the U.S. from Guinea, Liberia, and Sierra Leone



**203,453**

Travelers screened when leaving a country with widespread transmission



**3,797**

Guinea



**122,931**

Guinea



**9,576**

Liberia



**35,685**

Liberia



**4,413**

Sierra Leone



**44,834**

Sierra Leone



**13,304**

CARE kits distributed



**150**

Travelers denied boarding in countries with widespread transmission



**12,300**

CARE phones distributed

\*10/11/2014 – 5/30/2015

Source: CDC

- healthcare providers developed a regional tiered system where they could safely transport patients—after initial intake, containment and treatment—for more advanced care to 55 hospitals designated as Ebola treatment centers and/or one of nine specialized bio-containment units around the country. In addition, HHS designated three centers, including Emory University, University of Nebraska Medical Center and Bellevue Hospital as members of the National Center for Ebola Training for ongoing training and certification of other institutions for preparedness against Ebola and other highly infectious diseases. These preparations should be maintained for future outbreaks, regardless of the pathogen, and other plans must also be in place for an outbreak that would be widespread, such as a severe pandemic flu.
- Systems must be in place to monitor citizens and healthcare professionals potentially exposed to an infectious threat.

- Plans must be maintained to ensure the recommended personal protective equipment (PPE) are available for health professionals during outbreaks and that guidelines for use are clearly established, updated and quickly communicated as an outbreak develops. There must also be processes to ensure ongoing training in the use of PPE to ensure equipment is used proficiently and that fit testing protocols are established and followed.
- All healthcare facilities should have basic procedures for the safe storage and disposal of hazardous waste and contaminants.
- Quarantine policies based on science should be established for different types of scenarios so they are not being developed in a reactionary context.
- The United States needs to develop more measured and proportionate strategies for screening risk in international travelers and if and when travel restrictions may be appropriate — that is more



grounded in science versus perception. This is particularly important for ensuring many of the resources and trained professionals are not diverted away from what are often more effective and needed containment efforts.

- Planning must also include how to maintain ongoing public health and healthcare needs and functions during an emergency. Health agencies have limited standing capacity and resources — and if all resources and personnel are diverted to an emerging emergency, it leaves other vulnerabilities and gaps.

- Effective risk communications strategies that allow for sharing information with the public in a way that conveys accurate information during an evolving situation and avoids unnecessary panic — must be better developed and in place. Communications should address multiple audiences and be culturally and linguistically appropriate for different communities.

- Increased investments must be made toward improving vaccine and treatments — and the ability to quickly and effectively distribute and administer medicines—for infectious diseases.

Currently, the Middle East Respiratory Syndrome Coronavirus is testing global capacity for disease prevention and control. The disease was first reported in Saudi Arabia in 2012. As of November 2015, there have been 1,618 total cases and 579 deaths — a death rate of more than 30 percent.<sup>23</sup> There is no vaccine or specific antiviral treatment for the disease. Most of the cases have been within or related to travel to the Arabian Peninsula, but in 2015, there



## HEALTH ADVISORY:

### Middle East Respiratory Syndrome (MERS)

**Going to the Arabian Peninsula?**  
A new disease called MERS has been identified in some countries.

The risk to most travelers is low, but you should take these steps to prevent the spread of germs:

- Wash your hands often.
- Avoid touching your face.
- Avoid close contact with sick people.

**Symptoms include fever, cough, and shortness of breath.**

**If you get sick within 14 days of being in the Arabian Peninsula, call a doctor and tell the doctor where you traveled.**

For more information: visit [www.cdc.gov/travel](http://www.cdc.gov/travel) or call 800-CDC-INFO.



Source: CDC



## HEALTH ADVISORY: MERS

### Middle East Respiratory Syndrome

**Were you in the Middle East recently?**

- Watch for fever with cough or difficulty breathing.
- If you get sick within 14 days of leaving, call a doctor.
- Tell the doctor you traveled.

[www.cdc.gov/travel](http://www.cdc.gov/travel)

U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention

Source: CDC

were more than 180 reported cases in South Korea, resulting in 36 deaths.<sup>24</sup> The United States had two reported cases in 2014 involving healthcare workers returning from Saudi Arabia.

Trust for America’s Health, the Infectious Diseases Society of America (IDSA) and UPMC Center for Health Security developed a set of recommendations for improving system-wide readiness for potential emerging diseases, such as MERS, based on lessons learned from Ebola and previous outbreaks:<sup>25</sup>

- **Build upon Ebola and All-Hazards Preparedness in the Health System:** The Ebola response supplemental funding helped backfill some ongoing gaps and address immediate concerns in a subset of healthcare facilities, but is still insufficient to build adequate and sustainable infection control capacity throughout the country and improve public health systems and necessary function. Continued and expanded support is needed to maintain base-level infection control as well as the tiered, regional response system that came out of the Ebola response. There needs to be funding for ongoing and regular drilling within and between healthcare facilities, public health departments and emergency response teams to simulate and refine local preparedness and responses to outbreaks of potentially deadly infectious diseases.
- **Routinely Take Complete Travel Histories upon Intake and Be Prepared to Promptly Isolate Potential Cases Needing Evaluation:** Travel histories should become a routine part of intake of patients in the outpatient and inpatient systems, not just during times of crisis. Healthcare facilities should ensure travel history queries are built into electronic health records and post signs in multiple languages that remind patients to inform providers of travel history and symptoms. Providers and healthcare staff must also be trained to understand risk patterns — such as relevancy of travel history, which is important to be able to prioritize

likely and timely diagnoses. For instance, knowing which countries in West Africa had Ebola concerns versus other locations that present the more likely chance of exposure to malaria or other concerns.

- **Strengthen Communication**  
**Strategies:** In communicating with the public and healthcare workers, public health should take into account uncertainty of an evolving situation and partner with trusted community sources in outreach to at-risk communities. Public health should establish relationships with media ahead of crises and leverage social media to ensure accurate information reaches the public. Communications strategies must prepare the public — as well as policy makers — that policies may shift as understanding of the threat evolves. And CDC should build bidirectional communication pathways with state and local public health departments on a regular basis, not just during the outbreak.
- **Incorporate Health Alerts into Practice:** Improved systems are needed to ensure that health agencies, hospitals and healthcare providers receive and acknowledge health alerts from CDC and state and local public health agencies. Healthcare professional societies and unions, hospital administrators, laboratories and others must ensure their workforce is informed and well-trained on appropriate procedures for newly emerging and ongoing threats. Public health and health systems should also consider the most effective way

to reach their providers, including language-appropriate email, text, staff meetings and/or posted signs.

- **Modernize Disease Surveillance:** A key component of infectious disease prevention and control is the ability to identify new outbreaks and track ongoing outbreaks. Policymakers should work to support real-time and interoperable disease tracking, ensuring resources that allow public health agencies and clinical healthcare systems to incorporate and use new information streams such as electronic health records and electronic laboratory reporting; advance new technologies like point-of-care diagnostics; perform web-based reporting to public health; and build enhanced baseline epidemiologic and surveillance capabilities at the state and local public health level.
- **Advance Shared Framework for Isolation, Quarantine, Movement and Monitoring Decisions:** Movement and monitoring guidance, and its appropriate application to at-risk persons is essential to containing potential infectious outbreaks. Federal, state and local public health and policy leaders should come together and agree on a common decision-making framework ahead of the next outbreak to help states make movement and monitoring decisions that (1) are based upon the best available scientific and medical evidence; (2) preserve social and economic continuity to the greatest extent possible; and (3) are in the best interest of public health.

# State by State Indicators

## State-by-State Infectious Disease Prevention and Control Indicators

All Americans deserve to be protected against infectious disease threats, no matter where they live.

CDC has identified strategies and fundamental capabilities that should be in place to fight infectious diseases in a *Framework for Preventing Infectious Diseases: Sustaining the Essentials and Innovating for the Future*. Core elements of the framework include focusing on:

- Strengthening public health fundamentals, including infectious disease surveillance, laboratory detection and epidemiologic investigations;
- Identifying and implementing high-impact strategies — such as vaccinations, infection control, rapid diagnosis of disease and optimal treatment practices — to limit the spread of diseases and systems to reduce the diseases transmitted by animals or insects to humans; and
- Developing and advancing policies such as integrating clinical infectious disease preventive practices into U.S. healthcare systems; educating and working with the public to understand how to limit the spread of diseases; and working with the global health community to quickly identify new diseases and reduce rates of existing diseases.<sup>26</sup>

Infectious disease control and prevention is a concern in every state. However, policies and programs vary

from state-to-state. To help assess infectious disease control capabilities, the *Outbreaks* report examines a series of 10 indicators based on high-priority areas and concerns. It is not a comprehensive review; but collectively, it provides a snapshot of efforts to prevent and control infectious diseases in states and within the healthcare system.

The indicators were selected after consulting with leading public health and healthcare officials. Each state received a score based on these 10 indicators. States received one point for achieving an indicator and zero points if they did not. Zero is the lowest possible score and 10 is the highest. The scores ranged from a high of eight in Delaware, Kentucky, Maine, New York and Virginia to a low of 3 in Idaho, Kansas, Michigan, Ohio, Oklahoma, Oregon and Utah.

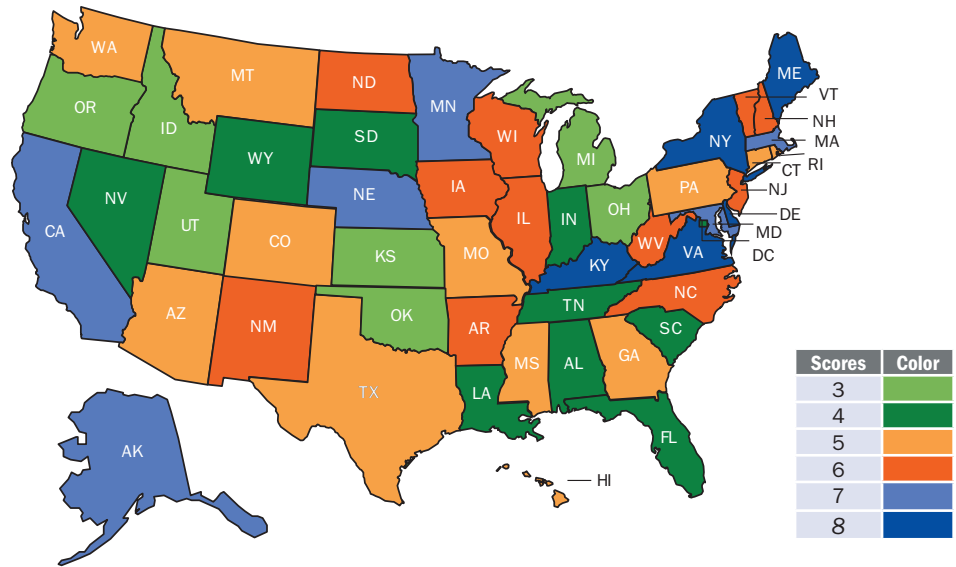
Scores are not intended to serve as a reflection of the performance of a specific state or local health department or the healthcare system or hospitals within a state, since they reflect a much broader context, including resources, policy environments and the health status of a community, so many of the indicators are impacted by factors beyond the direct control of health officials.

## STATE INDICATORS

	(1) <b>Public Health Funding:</b> State increased or maintained funding for public health from FY 2013 to 2014 and FY 2014 to 2015.	(2) <b>Flu Vaccination Rates:</b> State vaccinated at least half of their population (ages 6 months and older) for the seasonal flu from Fall 2014 to Spring 2015.	(3) <b>Childhood Immunization School Requirement Policies:</b> State law either excludes philosophical exemptions entirely or requires a parental notarization or affidavit to achieve a religious or philosophical exemption for school attendance.	(4) <b>HIV/AIDS Surveillance:</b> State requires reporting of all (detectable and undetectable) CD4 (a type of white blood cell) and HIV viral load data to their state HIV surveillance program (as of July 2013).	(5) <b>Syringe Exchange Programs:</b> State explicitly authorizes syringe exchange programs (SEP).
Alabama				✓	
Alaska	✓		✓	✓	
Arizona	✓			✓	
Arkansas	✓	✓	✓	✓	
California			✓	✓	✓
Colorado	✓			✓	✓
Connecticut		✓			✓
Delaware	✓	✓	✓	✓	✓
D.C.	✓			✓	✓
Florida	✓			✓	
Georgia	✓		✓	✓	
Hawaii	✓	✓		✓	✓
Idaho	✓				
Illinois	✓			✓	
Indiana				✓	
Iowa	✓	✓	✓	✓	
Kansas					
Kentucky	✓		✓	✓	✓
Louisiana	✓			✓	
Maine	✓			✓	✓
Maryland	✓	✓		✓	✓
Massachusetts		✓		✓	✓
Michigan	✓			✓	
Minnesota	✓	✓	✓	✓	
Mississippi			✓	✓	
Missouri	✓			✓	
Montana	✓		✓	✓	
Nebraska	✓	✓	✓	✓	
Nevada	✓				✓
New Hampshire		✓	✓	✓	
New Jersey	✓		✓		✓
New Mexico			✓	✓	✓
New York	✓			✓	✓
North Carolina		✓	✓	✓	
North Dakota	✓	✓		✓	
Ohio				✓	
Oklahoma				✓	
Oregon	✓			✓	
Pennsylvania	✓	✓			
Rhode Island	✓	✓		✓	✓
South Carolina	✓			✓	
South Dakota	✓	✓		✓	
Tennessee			✓	✓	
Texas		✓	✓	✓	
Utah	✓			✓	
Vermont			✓		✓
Virginia	✓	✓	✓	✓	
Washington				✓	✓
West Virginia	✓	✓	✓	✓	
Wisconsin	✓			✓	
Wyoming	✓			✓	
<b>Total</b>	<b>34 States + D.C.</b>	<b>18 States</b>	<b>20 States</b>	<b>43 States + D.C.</b>	<b>16 States + D.C.</b>

	(6) <b>Climate Change and Infectious Disease:</b> State currently has climate change adaptation plans completed.	(7) <b>Central Line-Associated Bloodstream Infections:</b> State reduced the standardized infection ratio (SIR) for central line-associated blood stream infections between 2012 to 2013.	(8) <b>Public Health Laboratories:</b> State laboratories reported having a biosafety professional from July 1, 2014 to June 30, 2015.	(9) <b>Public Health Laboratories:</b> State laboratories provided biosafety training and/or information about courses for sentinel clinical labs in their jurisdiction from July 1, 2014 to June 30, 2015.	(10) <b>Food Safety:</b> State met the national performance target of testing 90 percent of reported <i>Escherichia coli</i> ( <i>E. coli</i> ) O157 cases within four days.	Total Score
Alabama			✓	✓	✓	4
Alaska	✓	✓	✓		✓	7
Arizona			✓	✓	✓	5
Arkansas				✓	✓	6
California	✓		✓	✓	✓	7
Colorado				✓	✓	5
Connecticut	✓	✓			✓	5
Delaware			✓	✓	✓	8
D.C.					✓	4
Florida	✓				✓	4
Georgia			✓	✓		5
Hawaii					✓	5
Idaho			✓	✓		3
Illinois		✓	✓	✓	✓	6
Indiana			✓	✓	✓	4
Iowa			✓	✓		6
Kansas			✓	✓	✓	3
Kentucky		✓	✓	✓	✓	8
Louisiana			✓	✓		4
Maine	✓	✓	✓	✓	✓	8
Maryland	✓		✓		✓	7
Massachusetts	✓		✓	✓	✓	7
Michigan			✓			3
Minnesota			✓	✓	✓	7
Mississippi		✓		✓	✓	5
Missouri			✓	✓	✓	5
Montana			✓	✓		5
Nebraska			✓	✓	✓	7
Nevada				✓	✓	4
New Hampshire	✓			✓	✓	6
New Jersey		✓	✓	✓		6
New Mexico			✓	✓	✓	6
New York	✓	✓	✓	✓	✓	8
North Carolina			✓	✓	✓	6
North Dakota			✓	✓	✓	6
Ohio			✓		✓	3
Oklahoma				✓	✓	3
Oregon	✓					3
Pennsylvania	✓		✓		✓	5
Rhode Island					✓	5
South Carolina			✓	✓		4
South Dakota				✓		4
Tennessee		✓			✓	4
Texas			✓	✓		5
Utah					✓	3
Vermont	✓		✓	✓	✓	6
Virginia	✓		✓	✓	✓	8
Washington	✓		✓		✓	5
West Virginia			✓		✓	6
Wisconsin	✓		✓	✓	✓	6
Wyoming			✓		✓	4
	<b>15 States</b>	<b>9 States</b>	<b>36 States</b>	<b>35 States</b>	<b>39 States+ D.C.</b>	

## MAJOR INFECTIOUS THREATS AND KEY FINDINGS



SCORES BY STATE					
8 (5 states)	7 (6 states)	6 (11 states)	5 (12 states)	4 (9 states & D.C.)	3 (7 states)
Delaware Kentucky Maine New York Virginia	Alaska California Maryland Massachusetts Minnesota Nebraska	Arkansas Illinois Iowa New Hampshire New Jersey New Mexico North Carolina North Dakota Vermont West Virginia Wisconsin	Arizona Colorado Connecticut Georgia Hawaii Mississippi Missouri Montana Pennsylvania Rhode Island Texas Washington	Alabama D.C. Florida Indiana Louisiana Nevada South Carolina South Dakota Tennessee Wyoming	Idaho Kansas Michigan Ohio Oklahoma Oregon Utah

INDICATOR SUMMARY	
Indicator	Finding
1. Public Health Funding Commitment	34 states and Washington, D.C. increased or maintained funding for public health from Fiscal Year (FY) 2013 to 2014 to FY 2014 to 2015.
2. Vaccinations	18 states vaccinated at least half of their population (ages 6 months and older) against the seasonal flu from fall 2014 to spring 2015.
3. Vaccinations	20 states' laws either exclude philosophical exemptions entirely for vaccinations or require a parental notarization or affidavit to achieve a religious or philosophical exemption for school attendance.
4. HIV/AIDS Surveillance	43 states and Washington, D.C. require reporting of all (detectable and undetectable) CD4 (a type of white blood cell) and HIV viral load data to their state HIV surveillance program (as of July 2013).
5. Syringe Exchange Programs	16 states and Washington, D.C. explicitly authorize syringe exchange programs.
6. Climate Change and Infectious Disease	15 states currently have completed climate change adaption plans that include the impact on human health.
7. Healthcare-Associated Infection Control	Between 2012 and 2013, the standardized infection ratio (SIR) for central line associated blood stream infections decreased significantly in nine states.
8. Public Health Laboratories	36 state laboratories reported having a biosafety professional (between July 1, 2014 and June 30, 2015).
9. Public Health Laboratories	35 state laboratories reported providing biosafety training and/or information about biosafety training courses for sentinel clinical labs in their jurisdiction (between July 1, 2014 and June 30, 2015).
10. Food Safety	39 states met the national performance target of testing 90 percent of reported Escherichia coli (E.coli) O157 cases within four days.



## NATIONAL HEALTH SECURITY PREPAREDNESS INDEX

The National Health Security Preparedness Index™ (NHSPI) was developed as a new way to measure and advance the nation's readiness to protect people during a disaster — including major infectious disease outbreaks caused by nature or acts of bioterrorism. The NHSPI measures the health security preparedness of the nation by looking collectively at existing state-level data from a wide variety of sources. Uses of the Index include guiding quality improvement, informing policy and resource decisions, and encouraging shared responsibility for preparedness across a community. The National Health Security Preparedness Index aims to provide an accurate portrayal of how prepared our nation is to both prevent health incidents and effectively respond should an incident occur. The Index is a tool for advancing health security preparedness — our ability to serve and protect our nation's greatest asset, its people.

The NHSPI was developed by the Association of State and Territorial Health Officials (ASTHO) in partnership with CDC and more than 20 development partners — including TFAH and RWJF — and was first released in 2013. The 2014 version included 194 measures from more than 35 sources — and reviewed six domains for preparedness, including Health Security Surveillance, Community Planning and Engagement, Incident and Information Management, Healthcare Delivery, Countermeasure Management and Environmental and Occupational Health. In 2015, RWJF, in collaboration with the University of Kentucky, took the lead for managing and maintaining the Index.

In 2014, the total national average for the indicators was a 7.3 out of a possible 10. The state scores ranged from 6.5 in Alaska to 8.1 in Utah and Virginia. The index is available at: [www.nhspi.org](http://www.nhspi.org).

## INDICATOR 1: PUBLIC HEALTH FUNDING COMMITMENT — STATE PUBLIC HEALTH BUDGETS

**KEY FINDING:** 34 states and Washington, D.C. increased or maintained funding for public health from Fiscal Year (FY) 2013 to 2014 to FY 2014 to 2015.

34 states and Washington, D.C. increased or maintained public health funding from FY 2013 to 2014 to FY 2014 to 2015. (1 point.)		16 states cut public health funding from FY 2013 to 2014 to FY 2014 to 2015. (0 points.)	
Alaska (19.1%)	Missouri (1.9%)	<b>Alabama (-0.5%)<sup>^</sup></b>	New Mexico (-1.6%)
Arizona (4.2%)	Montana (0.0%)	California (-13.3%)	North Carolina (-2.3%) <sup>^</sup>
Arkansas (0.8%)	Nebraska (8.6%)	Connecticut (-1.4%)	Ohio (-6.1%) <sup>^</sup>
Colorado (9.8%)	Nevada (14.3%)	Indiana (-1.0%) <sup>^</sup>	Oklahoma (-0.8%)
Delaware (3.6%)	New Jersey (4.3%)	<b>Kansas (-1.1%)<sup>^</sup></b>	Tennessee (-3.2%)
D.C. (11.7%)	New York (0.1%)	Massachusetts (-11.6%)	Texas (-1.9%)
Florida (6.1%)	North Dakota (14.5%)	Mississippi (-0.7%)	Vermont (-3.5%)
Georgia (3.3%)	Oregon (25.4%)	<b>New Hampshire (-3.7%)</b>	Washington (-11.1%) <sup>^</sup>
<b>Hawaii (1.8%)</b>	Pennsylvania (1.7%)		
Idaho (6.7%)	<b>Rhode Island (4.5%)</b>		
Illinois (4.6%)	South Carolina (1.6%)		
Iowa (5.3%)	South Dakota (14.6%)		
Kentucky (3.4%)	Utah (7.9%)		
Louisiana (28.3%)	Virginia (3.2%)		
Maine (0.1%)	West Virginia (19%)		
Maryland (7.3%)	Wisconsin (15.3%)		
Michigan (2.2%)	Wyoming (3.5%)		
Minnesota (2.3%)			

Notes: Bolded states did not respond to a data check conducted in the fall of 2015; the most recent publicly available information was used for the states that did not reply or supply additional information.

\*Budget decreased for second year in a row.

<sup>^</sup>Budget decreased for third year in a row.

This indicator illustrates a state’s commitment and ability to provide funding for public health programs that support the infrastructure and workforce needed to improve health in each state, including the ability to prevent and control infectious disease outbreaks.

Every state allocates and reports its budget in different ways. States also vary widely in the budget details they provide. This makes comparisons across states difficult. For this analysis, TFAH examined state budgets and appropriations bills for the agency, department, or division in charge of public health services for FY 2013 to 2014 and FY 2014 to 2015, using a definition as consistent as possible across the analyses of the two budget cycles, based on how each state reports data. TFAH defined “public health services” broadly to include all state-level health spending

with the exception of Medicaid, CHIP or comparable health coverage programs for low-income residents.

Based on this analysis (adjusted for inflation), 16 states made cuts in their public health budgets. Six states cut their budget for two or more years in a row. The median spending in FY 2014 to FY 2015 was \$35.77 per capita — up from FY 2013 to FY 2014 levels of \$31.06 — around the same rates as six years ago in FY 2008 (\$33.71).

Public health funding is discretionary spending in most states and, therefore, is at high risk for significant cuts during tight fiscal climates. States rely on a combination of federal, state and local funds to support public health activities, including infectious disease prevention, immunization services and preparedness activities. The overall infrastructure of public health programs supports the ability

to carry out all of their responsibilities.

It is important to note that several states that received points for this indicator may not have actually increased their spending on public health programs. For instance, the ways some states report their budgets, by including federal funding in the totals or including public health dollars within healthcare spending totals, make it very difficult to determine “public health” as a separate item.

This indicator is limited to examining whether states’ public health budgets increased or decreased; it does not assess if the funding is adequate to cover public health needs in the states, and it should not be interpreted as an indicator or surrogate for a state’s overall performance.

*For additional information on the methodology of the budget analysis, please see Appendix C: Methodology for Select State Indicators.*



## INDICATOR 2: FLU VACCINATION RATES

**KEY FINDING:** 18 states vaccinated at least half of their population (ages 6 months and older) for the seasonal flu from fall 2014 to spring 2015.<sup>27</sup>

18 states vaccinated at least half of their population (ages 6 months and older) for the seasonal flu from fall 2014 to spring 2015. (1 point.)		32 states and Washington, D.C. did not vaccinate half of their population (ages 6 months and older) for the seasonal flu from fall 2014 to spring 2015. (0 points.)	
Arkansas (50.5%)	New Hampshire (52.1%)	Alabama (45.8%)	Missouri (49.1%)
Connecticut (52.8%)	North Carolina (52.4%)	Alaska (44.0%)	Montana (44.4%)
Delaware (53.3%)	North Dakota (51.0%)	Arizona (41.6%)	Nevada (39.7%)
Hawaii (52.0%)	Pennsylvania (50.3%)	California (44.2%)	New Jersey (46.8%)
Iowa (53.8%)	Rhode Island (58.7%)	Colorado (49.0%)	New Mexico (49.6%)
Maryland (52.1%)	South Dakota (59.6%)	D.C. (46.7%)	New York (48.6%)
Massachusetts (54.9%)	Texas (50.1%)	Florida (39.2%)	Ohio (46.1%)
Minnesota (51.9%)	Virginia (51.8%)	Georgia (44.1%)	Oklahoma (49.1%)
Nebraska (54.0%)	West Virginia (51.1%)	Idaho (42.2%)	Oregon (44.3%)
		Illinois (41.9%)	South Carolina (48.3%)
		Indiana (44.7%)	Tennessee (48.8%)
		Kansas (48.0%)	Utah (46.9%)
		Kentucky (48.3%)	Vermont (49.9%)
		Louisiana (44.7%)	Washington (49.5%)
		Maine (49.5%)	Wisconsin (44.1%)
		Michigan (44.3%)	Wyoming (40.4%)
		Mississippi (44.9%)	

Source: CDC, *Flu Vaccination Coverage, United States, 2014-2015 Influenza Season*

Vaccination is the best prevention against the seasonal flu. CDC recommends all Americans ages 6 months and older get vaccinated, yet fewer than half of Americans ages 6 months and older were vaccinated against the flu in the last three flu seasons (2012 to 2013, 2013 to 2014 and 2014 to 2015).<sup>28</sup>

In addition to protecting Americans from the seasonal flu, establishing a cultural norm of annual flu vaccinations can help ensure the country has a strong mechanism in place to be better able to vaccinate all Americans quickly during a new pandemic or unexpected disease outbreak.

This indicator examines if at least half (50 percent) of a state's population (ages 6 months and older) was vaccinated against the flu during the 2014 to 2015 season. HHS has set a goal for the nation to vaccinate 70 percent of adults and 70 percent of children as part of the *Healthy People 2020* initiative.<sup>29</sup>

The highest vaccination rate was in South Dakota at 59.6 percent and the lowest was in Florida at 39.2 percent.<sup>30</sup> Eighteen states vaccinated 50 percent of their population or higher and 48 states and D.C. vaccinated 40 percent or higher. Nationally, 47.1 percent of Americans ages 6 months and older were vaccinated.

- Rates are significantly higher for children (59.3 percent) compared to adults (43.6 percent).
- The lowest numbers are among adults ages 18 to 64 at just 38.0 percent. Traditionally, there has been a much stronger focus on encouraging seniors and children to get vaccinated, since they often have more severe illnesses along with the flu and have more interaction with the healthcare system.

If all seniors received a newly available high-dose version of the flu shot, flu cases among this vulnerable population could drop 25 percent.<sup>31</sup>



Source: CDC

# Is it Flu or Ebola?



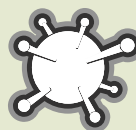
## Flu (influenza)



The flu is a common contagious respiratory illness caused by flu viruses. The flu is different from a cold.

Flu can cause mild to severe illness, and complications can lead to death.

## Ebola



Ebola is a rare and deadly disease caused by infection with an Ebola virus. Sporadic outbreaks have occurred in some African countries since 1976.

## How Flu Germs Are Spread



The flu is spread mainly by droplets made when people who have flu cough, sneeze, or talk. Viruses can also spread on surfaces, but this is less common.

People with flu can spread the virus before and during their illness.

## How Ebola Germs are Spread



People get Ebola by direct contact with

- The body fluids of a person who is sick with or has died from Ebola.
- Objects contaminated with body fluids of a person sick with Ebola or who has died of Ebola.
- Infected fruit bats and primates (apes and monkeys)
- And, possibly from contact with semen from a man who has recovered from Ebola (for example, by having oral, vaginal, or anal sex)

## Who Gets The Flu?



Anyone can get the flu.

Some people—like very young children, older adults, and people with some health conditions—are at high risk of serious complications.

## Who Gets Ebola?



People most at risk of getting Ebola are

- People with a travel history to countries with widespread transmission or exposure to a person with Ebola.
- Healthcare providers taking care of patients with Ebola.
- Friends and family who have had unprotected direct contact with blood or body fluids of a person sick with Ebola.

## Signs and Symptoms of Flu



The signs and symptoms of flu usually develop within 2 days after exposure. Symptoms come on quickly and all at once.

## Signs and Symptoms of Ebola



The signs and symptoms of Ebola can appear 2 to 21 days after exposure. The average time is 8 to 10 days. Symptoms of Ebola develop over several days and become progressively more severe.

- *People with Ebola cannot spread the virus until symptoms appear.*



- **Fever or feeling feverish**
- **Headache**
- **Muscle or body aches**
- **Feeling very tired (fatigue)**
- **Cough**
- **Sore throat**
- **Runny or stuffy nose**



- **Fever**
- **Severe headache**
- **Muscle pain**
- **Feeling very tired (fatigue)**
- **Vomiting and diarrhea develop after 3–6 days**
- **Weakness (can be severe)**
- **Stomach pain**
- **Unexplained bleeding or bruising**

For more information about the flu and Ebola, visit [www.cdc.gov/flu](http://www.cdc.gov/flu) and [www.cdc.gov/ebola](http://www.cdc.gov/ebola).

May 4, 2015  
CS25296-1

Each year, between 5 percent and 20 percent of Americans get the flu. Between 3,000 and 49,000 Americans die each year from the flu and more than 220,000 are hospitalized.<sup>32,33</sup>

Between 2004 and 2012, 830 children between 6 months and 18-years-old died from flu complications; 43 percent of these children were otherwise completely healthy.<sup>34</sup> In the 2014 to 2015 flu season, there were 145 influenza-associated pediatric deaths.<sup>35</sup>

In addition to its health effects, flu has a serious impact in terms of healthcare and worker absenteeism costs. Seasonal flu can often result in a half day to five days of work missed, which affects both the individual and his or her employer. Annually, the flu leads to approximately \$10.4 billion in direct costs for hospitalizations and outpatient visits and \$76.7 billion in indirect costs.<sup>36</sup>

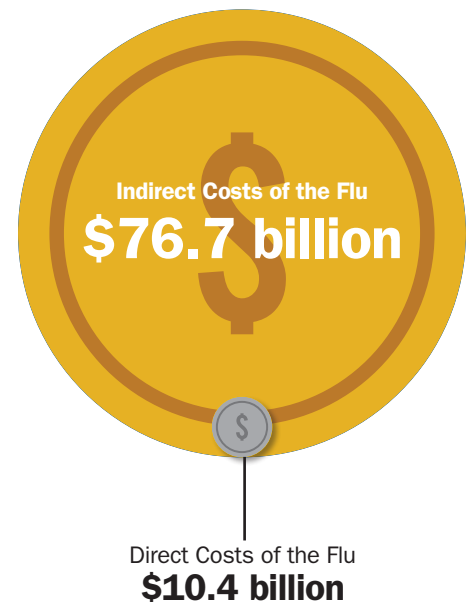
Nearly one-quarter (22.7 percent) of healthcare workers were not vaccinated against the flu during the 2014 to 2015 season.<sup>37</sup> Healthy People 2020 has set a goal of 90 percent of healthcare workers vaccinated each flu season.<sup>38</sup> Vaccination coverage was highest among healthcare personnel working in hospitals (90.4 percent) and lowest among those working in long-term care settings (63.9 percent). Rates were higher among healthcare professionals whose employers required that they be vaccinated (96 percent). In settings with no employer requirement for vaccination, coverage was higher where vaccination was offered on-site at no cost for one day (73.6 percent) or multiple

days (83.9 percent) and lowest among personnel working in settings where vaccine was neither required, promoted, nor offered on-site (44 percent).<sup>39</sup>

CDC estimates that during the 2013 to 2014 flu season, vaccination resulted in over 90,000 fewer hospitalizations than otherwise would have occurred. Overall, 16.9 percent of adverse health outcomes associated with influenza were prevented.<sup>40</sup> By preventing hospitalizations, influenza immunizations can save \$80 per year, per person vaccinated.<sup>41</sup>

The historically low demand for seasonal vaccinations has translated into making flu vaccine development a low priority — without a steady demand, incentives to manufacture and research new influenza vaccines are reduced.

Under the Affordable Care Act (ACA), all vaccines routinely recommended by the Advisory Committee on Immunization Practices (ACIP), including flu shots, are covered when provided by in-network providers in group and individual health plans and for the Medicaid expansion population with no co-payments or cost sharing, but states are still able to determine coverage and cost-sharing for their traditional Medicaid population. As of 2013, 38 states and D.C. required Medicaid coverage of flu shots with no-copay, while six states required a co-pay (Alaska, Colorado, Kentucky, Mississippi, Missouri and Montana).<sup>42</sup> Medicare Part B covers annual flu vaccinations for beneficiaries with no co-pay.



### INDICATOR 3: CHILDHOOD IMMUNIZATION SCHOOL REQUIREMENT POLICIES

**KEY FINDING:** Twenty states' laws either exclude philosophical exemptions entirely for vaccinations or require a parental notarization or affidavit to achieve a religious or philosophical exemption for school attendance.

20 states' laws either exclude philosophical exemptions entirely or require a parental notarization or affidavit to achieve a religious or philosophical exemption from school immunizations requirements for school attendance. (1 point.)		30 states and Washington, D.C. laws do not either exclude philosophical exemptions entirely or require a parental notarization or affidavit to achieve a religious or philosophical exemption from school immunizations requirements for school attendance. (0 points.)	
Alaska	Nebraska	Alabama	Missouri
Arkansas	New Hampshire	Arizona	Nevada
California**	New Jersey	Colorado	New York
Delaware	New Mexico	Connecticut	North Dakota
Georgia	North Carolina	D.C.	Ohio
Iowa	Tennessee	Florida	Oklahoma
Kentucky	Texas	Hawaii	Oregon
Minnesota	Vermont**	Idaho	Pennsylvania
Mississippi*	Virginia	Illinois	Rhode Island
Montana	West Virginia*	Indiana	South Carolina
		Kansas	South Dakota
		Louisiana	Utah
		Maine	Washington
		Maryland	Wisconsin
		Massachusetts	Wyoming
		Michigan	

Source: CDC's State School Vaccination Exemptions Laws (as of March 2015)


Note: \*Mississippi and West Virginia do not allow nonmedical exemptions.<sup>43</sup>

\*\*Effective July 1, 2015, California repealed religious and philosophical exemptions and Vermont repealed philosophical exemptions.

This indicator examines how challenging states make opting out of mandated childhood vaccinations requirements for school attendance for nonmedical reasons. States receive a point for the indicator if they have a law that either excludes philosophical exemptions entirely or require a parental notarization or affidavit to achieve a religious or philosophical exemption. Twenty states meet this threshold.<sup>44</sup> Every state in the nation allows parents to opt out of vaccine requirements for their children for medical reasons — e.g., suppressed immune systems or a history of reactions like anaphylaxis or Guillain-Barré Syndrome.<sup>45</sup> States may also have different definitions for medical providers, where states with broad definitions of providers can impact the ability of families to get a medical exemption. States that allowed for philosophical exemptions as well as religious exemptions had more than 2.5 times higher opt-out rates.<sup>46</sup>

## Vaccines for Children

20 years of protecting America's children



The Vaccines for Children program was established in 1994 to make vaccines available to uninsured children. VFC has helped prevent disease and save lives...big time!

CDC estimates that vaccination of children born between 1994 and 2013 will:

- prevent **322 million** illnesses } 
  
more than the current population of the entire U.S.A.
- help avoid **732,000** deaths } 
  
greater than the population of Boston, MA.
- save nearly **\$1.4 trillion** in total societal costs } 
  
or \$4,473 for each American

(that includes \$295 billion in direct costs)

www.cdc.gov/immunization/usingthevaccinesforchildrenprogram — UNITED STATES, 1994-2013    HHS-10-0641 04.03.2013

U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention

[www.cdc.gov/features/vfcprogram](http://www.cdc.gov/features/vfcprogram)

Source: CDC

Depending on the number of children foregoing vaccinations, these exemptions can threaten herd immunity (general immunity of an infection within a population) and put communities at risk. Not only are the unvaccinated children themselves at risk, their status threatens others, including infants too young to be vaccinated, children not yet old enough to receive the entire series, or those with certain medical conditions. Experts report that herd immunity protections require 90 percent or higher vaccination rates. The national median for kindergartener vaccination rates for key recommended vaccinations is: 94 percent against measles, mumps and rubella ((MMR) — 2 doses); 94.2 percent against pertussis/whooping cough (94.2 percent — 5 doses of DTaP (diphtheria, tetanus and pertussis)); and 93.6 percent against chicken pox (varicella — 2 doses).<sup>47</sup> While many states are below 90 percent on a particular vaccine, only Arkansas and Colorado have rates below 89 percent for the three vaccinations.

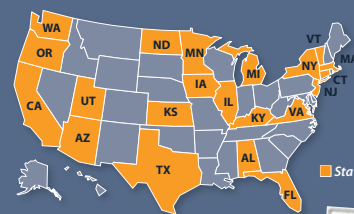
In recent years, there have been a number of outbreaks in community clusters, including in some communities with high levels of religious-based vaccine exemptions in Texas, Florida and Brooklyn, New York.<sup>48, 49, 50</sup>

Exemptions and the ease of obtaining vaccinations can help predict increased disease risk among exempted children themselves and others in their community.<sup>51</sup> Comparing opt-out policies with surveillance data shows correlations between states with easier opt-out policies and vaccine-preventable

## National childhood vaccination rates remain high, but children still at risk for disease

Knowing the vaccination rates in your community is important.

Unvaccinated people tend to **cluster** and put communities at **risk** for outbreaks of diseases like measles.



Many states are making vaccination data available online so you can see local vaccine coverage and vaccine exemption data.

States that report local-level coverage and exemption data online as of 2015.

To find out if your state makes this information available, check with your state health department or visit:

[www.cdc.gov/vaccines/schoolvaxview-states/](http://www.cdc.gov/vaccines/schoolvaxview-states/)



\*April 2015, Arizona Department of Health Services

Know the rates in your community and protect your child by vaccinating according to the recommended schedule.



Published August 27, 2015

Source: CDC, Vaccination Coverage Among Children in Kindergarten — United States, 2014–15 School Year. MMWR; 2015;64:897–904  
[www.cdc.gov/mmwr/preview/mmwrhtml/mm6433a2.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6433a2.htm)

[www.cdc.gov/vaccines/parents](http://www.cdc.gov/vaccines/parents)

NCIRDig526 | 08.27.2015



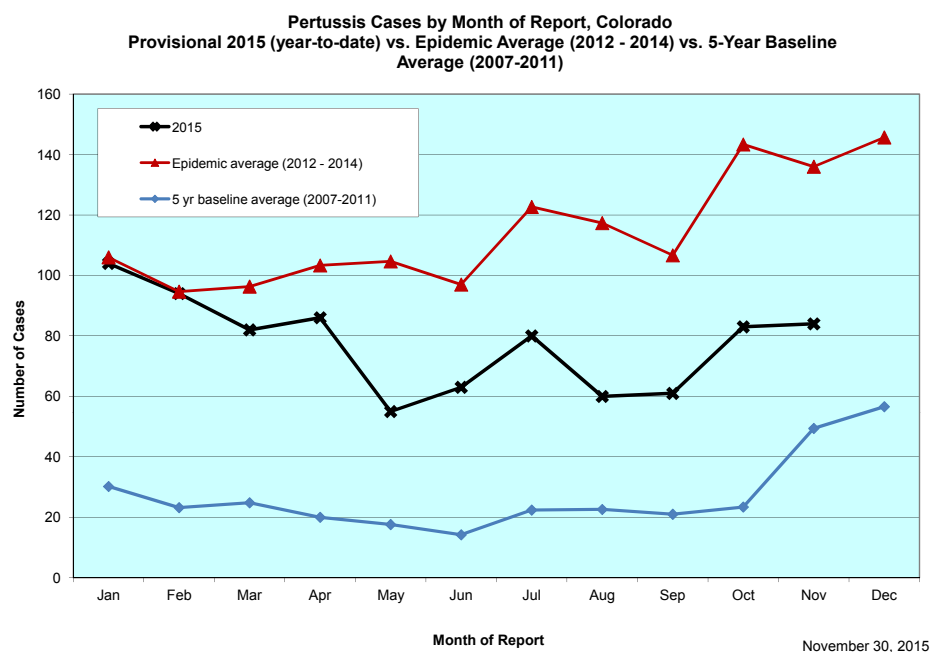
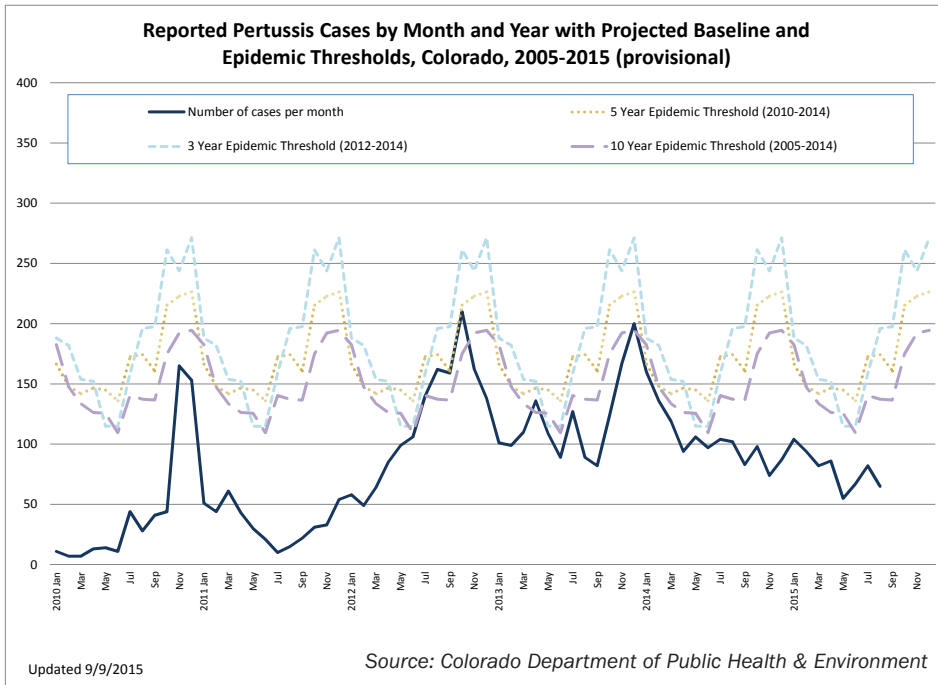
U.S. Department of Health and Human Services  
 Centers for Disease Control and Prevention

disease outbreaks. For example, in 2013, researchers compared geographic clusters of the 2010 pertussis outbreak in California (9,120 cases) with the number of exemptions in those areas and found that communities in an exemption cluster were 2.5 times more likely to be in a pertussis cluster.<sup>52</sup>

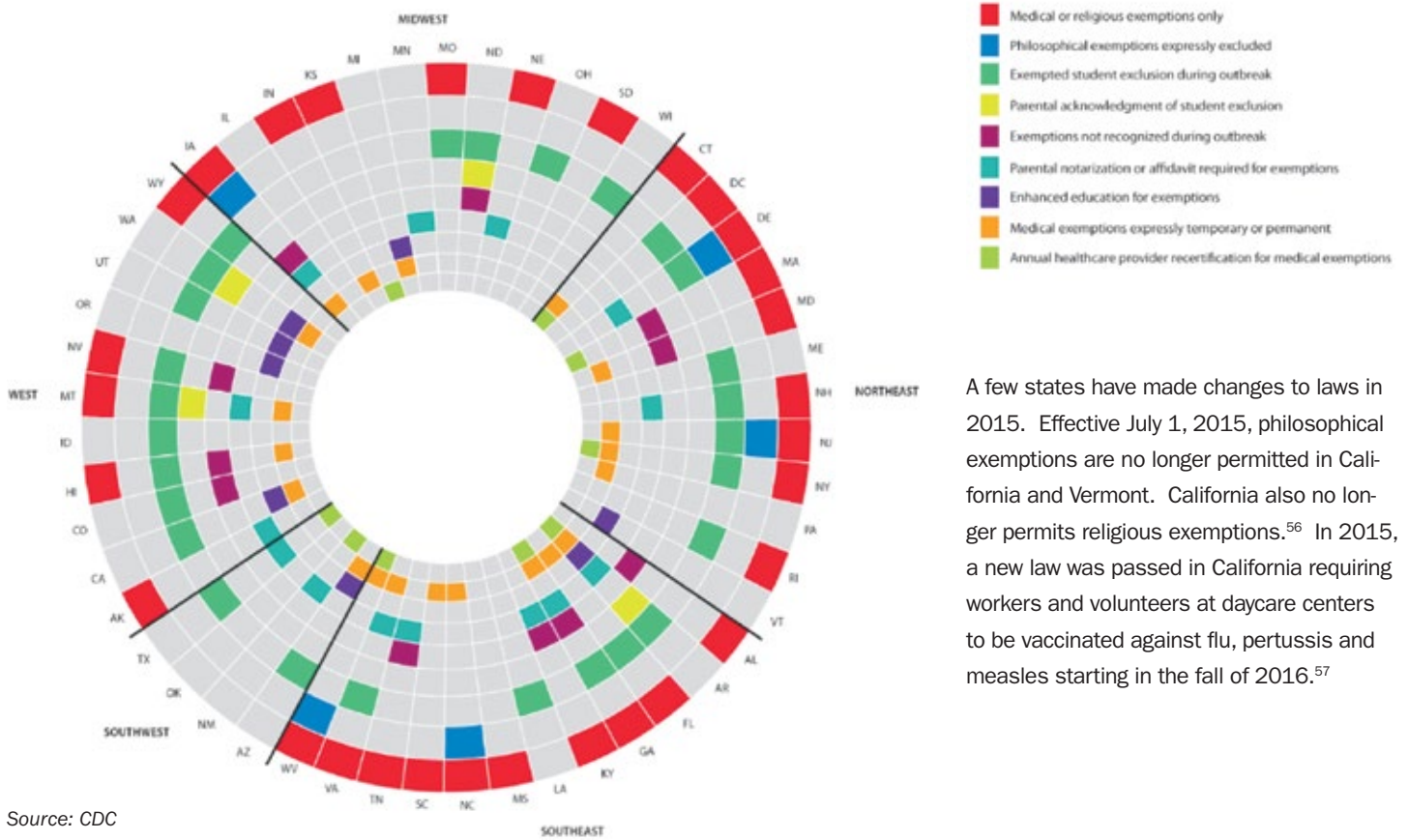
In addition, in Colorado, which has the lowest reported estimated rates in the country of kindergarteners receiving recommended vaccination for measles, mumps and rubella (86.9 percent), pertussis/whooping cough (84.3 percent) and chickenpox (85.4 percent), the state

departments of health and education have not had the statutory authority to enforce whether or not local schools document if students have received a vaccination or an exemption or bar attendance for students who have not provided documentation.<sup>53</sup> Currently, parents in the state seeking non-medical exemptions from school and child-care vaccine requirements only had to submit the request once during a student's tenure. Also, there is no enforcement for schools to document and report on whether or not students are vaccinated or exempt — and many schools do not track status or bar students from school who are not in compliance. The state Board of Health passed new rules, which go into effect in July 2016, requiring schools to report students' immunization and status rates — and that information will be made publicly available, and students will be required to submit information about their immunization status or file an exemption every school year. The state will not, however, withhold funds or take action against schools not in compliance. Colorado had more than double the national rate — and the second highest rate among states — of whooping cough in the nation in 2014, at 24.3 per 100,000 people.<sup>54</sup>

CDC's 2015 examination of state exemption laws highlights the varieties of ways states try to protect their residents. During outbreaks, some states will not honor exemptions and will require students be immunized (Hawaii and Kentucky), while others will not allow the unvaccinated to attend school (Arkansas, Georgia and Wyoming). Others do not allow permanent medical exemptions — students' medical status must be periodically evaluated to determine whether an exemption is still medically necessary (Connecticut and New Mexico).<sup>55</sup>

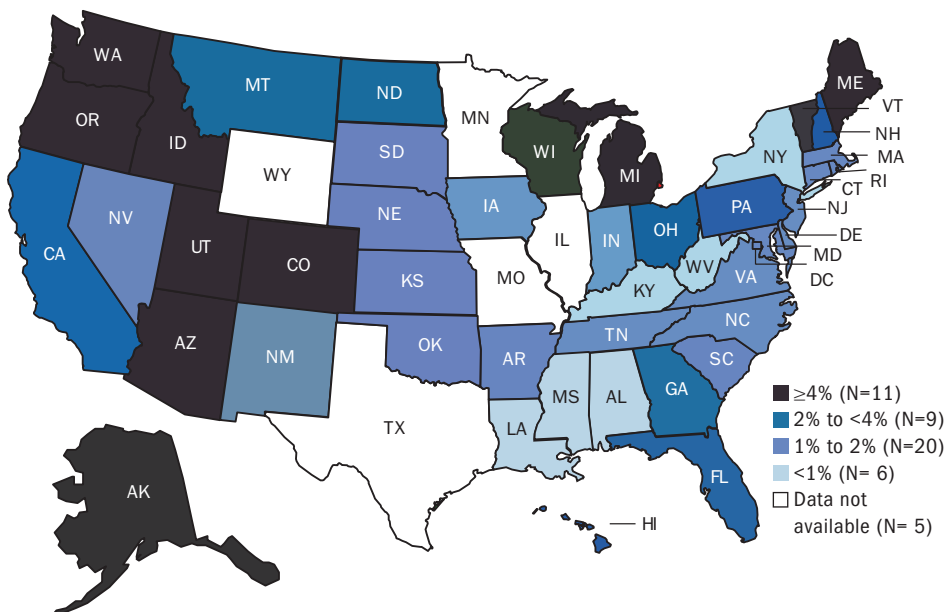


## State School Vaccination Exemptions Laws as of March 2015



A few states have made changes to laws in 2015. Effective July 1, 2015, philosophical exemptions are no longer permitted in California and Vermont. California also no longer permits religious exemptions.<sup>56</sup> In 2015, a new law was passed in California requiring workers and volunteers at daycare centers to be vaccinated against flu, pertussis and measles starting in the fall of 2016.<sup>57</sup>

## Estimated percentage of children enrolled in kindergarten who have been exempted from receiving one or more vaccines,\* by state† — United States, 2014–15 school year



\* Exemptions might not reflect a child's vaccination status. Children with an exemption who did not receive any vaccines are indistinguishable from those who have an exemption but are up-to-date for one or more vaccines.

† Seven states used a sample for exemption data: Colorado, Delaware, Hawaii, Nevada, South Carolina, Virginia, and Wisconsin.

Source: CDC

## PRESCHOOLER IMMUNIZATION GAPS (2014)

In general, vaccination rates among children entering kindergarten are high. For the 2014-2015 school year, median vaccination coverage was 94.0 percent for 2 doses of measles, mumps, and rubella vaccine; 94.2 percent for the local requirements for diphtheria, tetanus, and acellular pertussis vaccine (DTaP); and 93.6 percent for 2 doses of varicella vaccine among the 39 states and Washington, D.C. with a 2-dose requirement.<sup>58</sup> However, there is a much bigger gap in preschooler vaccination rates. The failure to vaccinate all preschoolers with all of the recommended immunizations on time leaves more than 2 million young children unnecessarily vulnerable to preventable illnesses.<sup>59</sup> There is also wide geographic variation. The 2014 coverage rates for the combined childhood vaccine series (MMR,

polio, hepatitis B, varicella, DTaP pneumococcal conjugate vaccine (PCV) and Haemophilus influenzae type b (Hib)) for 19- to 35-month-old children ranged from 63.4 percent in West Virginia to 84.7 percent in Maine.

Improved vaccination registries and education to parents, child and daycare providers (including home-based child care) and healthcare providers about the importance and safety of vaccines are important steps for increasing rates. This should include encouraging providers to check patients' vaccinations records whenever they go for other doctor visits or emergency care — and updating vaccinations when there are gaps. Vaccination of patients should be considered as a quality performance measure for pediatricians and other providers as part of delivery of value-based care.

Recommended Vaccination (by 13 months unless otherwise noted)	% NOT Receiving
Childhood full series 4:3:1:3:3:1:4	28.4%
Rotavirus	28.3%
Pneumococcal – ≥3 doses	7.4%
DTaP – 4+ doses	15.8%
Hepatitis B – 3 doses*	8.4%
Varicella	9.0%
MMR	8.5%
Polio	6.7%

\*Note: The first vaccination dose of hepatitis B is recommended to be administered at birth (before discharge); many children receive their first dose after the recommended schedule. By preschool age, there is a recommendation children should have received 3 scheduled doses of the vaccine



## MEASLES AND PERTUSSIS (WHOOPING COUGH) OUTBREAKS

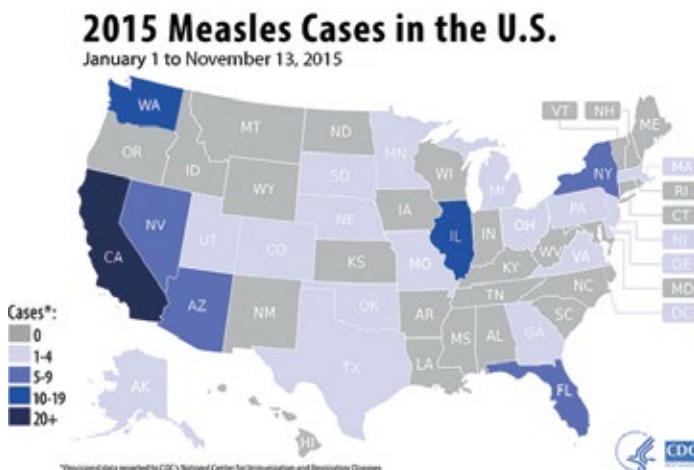
In recent years, there have been a number of outbreaks of vaccine-preventable diseases among children, including measles and whooping cough.

### Measles

Measles is a highly contagious, viral illness that can lead to health complications, including pneumonia, encephalitis and eventually death. Those infected can carry the virus for up to three weeks before a rash develops.<sup>60</sup> Prior to routine vaccination, measles infected approximately three to four million Americans each year and killed 400 to 500 individuals. In addition, 48,000 individuals were hospitalized and another 1,000 developed chronic disability from measles encephalitis. Widespread use of measles vaccine has led to a greater than 99 percent reduction in measles cases in the United States compared with the pre-vaccine era.<sup>61</sup>

In 2000, measles was declared eliminated in the United States, with subsequent reported cases each year due to travelers. In 2014, there were more than 600 measles cases reported in the United States in 27 states — a total of 23 outbreaks according to the CDC.<sup>62</sup> In 2015, (as of September 18), a total of 189 measles cases from 24 states and Washington, D.C. have been reported to CDC — the largest outbreak being associated with Disney theme parks in southern California. More than half of the individuals whose infections were associated with the outbreak at Disney were young adults. Measles outbreaks place a tremendous strain on state and local public health. The total economic burden on state and local public health institutions that dealt with the 16 outbreaks in 2011 was estimated between \$2.7 million and \$5.3 million.<sup>63</sup> On July 2, 2015, Washington State Department of Health confirmed a measles-related death; prior to that, the last reported measles-related death was in 2003.<sup>64</sup>

Unvaccinated individuals are far more likely to contract measles than those who have been vaccinated. Because measles is still endemic in many parts of the world, individuals traveling from outside the country continually import the disease, and outbreaks can occur in communities with low vaccination coverage.<sup>65</sup> There may be missed or delayed diagnosis because many clinicians in the United States have never seen a measles case due to our high vaccination rates and rapid response to outbreaks.



# Measles

IT ISN'T JUST A LITTLE RASH

Measles can be dangerous, especially for babies and young children.

MEASLES SYMPTOMS TYPICALLY INCLUDE

- High fever (may spike to more than 104° F)
- Cough
- Runny nose
- Red, watery eyes
- Rash breaks out 3-5 days after symptoms begin

Measles Can Be Serious

- About 1 out of 4 people who get measles will be hospitalized.
- 1 out of every 1,000 people with measles will develop brain swelling due to infection (encephalitis), which may lead to brain damage.
- 1 or 2 out of 1,000 people with measles will die, even with the best care.

## Protect your child from measles

Measles is still common in many parts of the world. Unvaccinated travelers who get measles in other countries continue to bring the disease into the United States.

Give your child the best protection against measles with two doses of measles-mumps-rubella (MMR) vaccine:

- 1st dose at 12-15 months
- 2nd dose at 4-6 years

Traveling abroad with your child?

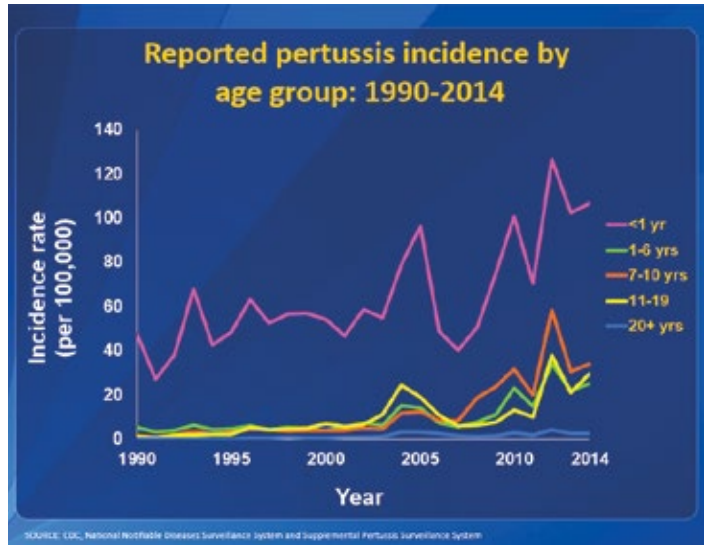
Infants 6 to 11 months old need 1 dose of measles vaccine before traveling abroad. Children 12 months and older should receive 2 doses before travel. Check with your pediatrician before leaving on your trip to make sure your children are protected.

## Pertussis (Whooping Cough)

Pertussis, commonly known as whooping cough, is a highly contagious bacterial respiratory infection that can be fatal in infants. Early symptoms mirror those of a cold, but infection progresses into a severe cough that can affect breathing. The best way to prevent pertussis is through vaccination. However, young infants who are the group at highest risk for severe disease, do not even begin their primary series of pertussis vaccination until 2 months of age. CDC recommends that pregnant women and all individuals who will have contact with a newborn be vaccinated.<sup>66</sup>

Pertussis does not only sicken infants. In the past several years, infections have increased in children ages 7 to 10 and in adolescents ages 13 to 14.<sup>67</sup> In 2014, nearly 33,000 cases of pertussis were reported to CDC — with the largest number of cases from California (8,723), Texas (2,576) and Wisconsin (1,515).<sup>68</sup>

Outbreaks can strain health departments because of the manpower required to identify and ensure treatment or vaccination of contacts. In one outbreak, the direct costs to a local health department for response to a whooping cough outbreak was estimated at \$2,200 per case, compared to a few dollars spent per dose of vaccine.<sup>69, 70</sup>




**Outbreaks of whooping cough are happening across the United States.** This disease can cause your baby to have coughing fits, gasp for air, and turn blue from lack of oxygen. It can even be deadly. When you get the whooping cough vaccine (also called Tdap) during your third trimester, you'll pass antibodies to your baby. This will help keep him protected during his first few months of life, when he is most vulnerable to serious disease and complications.

Talk to your doctor or midwife about the whooping cough vaccine.



Born with protection against whooping cough.  
www.cdc.gov/whoopingcough

43 states and Washington, D.C. require reporting of all CD4 and (detectable and undetectable) HIV viral load data (as of July 2013). (1 point.)		7 states do not require reporting of all CD4 and (detectable and undetectable) HIV viral load data (as of July 2013). (0 points.)
Alabama	Missouri	Connecticut
Alaska	Montana	Idaho
Arizona	Nebraska	Kansas
Arkansas	New Hampshire	Nevada
California	New Mexico	New Jersey
Colorado	New York	Pennsylvania
D.C.	North Carolina	Vermont
Delaware	North Dakota	
Florida	Ohio	
Georgia	Oklahoma*	
Hawaii	Oregon	
Illinois	Rhode Island	
Indiana	South Carolina	
Iowa	South Dakota	
Louisiana	Tennessee	
Kentucky	Texas	
Maine	Utah	
Maryland	Virginia	
Massachusetts	Washington	
Michigan	West Virginia	
Minnesota	Wisconsin	
Mississippi	Wyoming	

### INDICATOR 4: HIV/AIDS SURVEILLANCE

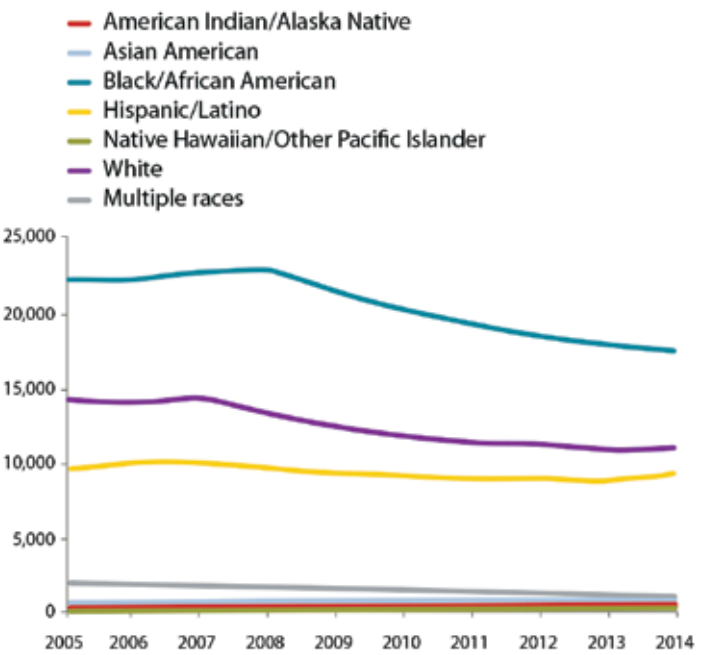
**KEY FINDING:** Forty-three states and Washington, D.C. require reporting of all (detectable and undetectable) CD4 (a type of white blood cell) and HIV viral load data to their state HIV surveillance program (as of July 2013).

Source: CDC's Prevention Status Report and HIV State Laws review  
 \* Required reporting as of September 2014.

More than 1.2 million Americans are living with HIV, and almost one in eight do not know they are infected. Since the epidemic began, more than 658,000 Americans have died due to AIDS.<sup>71</sup> While overall diagnoses of HIV declined 19 percent between 2005 and 2014 – driven largely by declines among heterosexuals (35 percent), people who inject drugs (63 percent) and Black women (42 percent) – there continues to be an alarming rise in new HIV diagnoses among young gay men of color (ages 13 to 24).<sup>72</sup>

- There are around 50,000 new HIV diagnoses each year.
- Between 2005 and 2014, there was an 87 percent increase in diagnoses among young Black gay and bisexual men, and a 24 percent increase among Latino gay and bisexual men.<sup>73</sup>
- Blacks represent nearly half of Americans living with AIDS. Young gay Black men (ages 13 to 24), are at the highest risk for new HIV infections — seven times that of White men, twice that of Latino men, and nearly three times that of Black women.<sup>74</sup>
- According to CDC, half of young people with HIV do not know they are infected.
- Worldwide, an estimated 36.9 million people are living with HIV/AIDS, nearly half of whom are women — with 2 million new HIV infections and 1.2 million deaths attributable from AIDS in 2014 alone.<sup>75</sup>

### HIV Diagnoses by Race/Ethnicity, 2005-2014



Source: Centers for Disease Control and Prevention

This indicator examines whether a state requires reporting of all CD4 and HIV viral load results (detectable and undetectable) to the state HIV surveillance program — currently, 43 states and Washington, D.C. have this requirement, which is an increase from 36 states and Washington, D.C. in 2012.<sup>76, 77</sup>

CDC and the Council of State and Territorial Epidemiologists (CSTE) recommend reporting both detectable and undetectable viral loads. An HIV viral load test measures the amount of virus in a person’s blood, while a CD4 lymphocyte test measures his or her immune function and can determine the stage and progression of HIV infection. The results are often used to monitor disease progression and guide timing for clinical care, as well as assessing testing and prevention efforts.<sup>78</sup>

These data are critical to the health of people living with HIV, because they help ensure that individuals are linked to HIV medical care and retained in care, and a number of health departments have begun using the data to help re-engage individuals who have

dropped out of care.<sup>79</sup> National analyses to monitor progress against HIV are only effective if all HIV-related CD4 and viral load test results are reported by every state and jurisdiction.

Nationally, CDC estimates that only 30 percent of those living with HIV are virally suppressed.<sup>80</sup> Jurisdictions where high rates of viral load suppression are achieved have seen declines in infection rates, in contrast to national trends.

**1 in 8 people with HIV don't know they have it.**

**Get the facts. Get Tested. Get involved.**

Find out more about HIV, including where to get tested, at [gettested.cdc.gov](http://gettested.cdc.gov)

**490,000 AFRICAN AMERICANS LIVING WITH HIV** IN 2011

- 85% DIAGNOSED
- 40% ENGAGED IN CARE
- 36% PRESCRIBED ART
- 28% VIRALLY SUPPRESSED

VIRAL SUPPRESSION KEEPS PEOPLE HEALTHY AND REDUCES TRANSMISSION.

[www.cdc.gov/hiv](http://www.cdc.gov/hiv) GET EDUCATED. GET TESTED. GET TREATED.

**HIV and Latinos**

Did you know not all Latinos with HIV are getting the care they need?

Of Latinos diagnosed with HIV:

- 83.0% linked to care
- 54.8% retained in care
- 43.3% prescribed ART
- 35.6% virally suppressed\*

[www.cdc.gov/oneconversation](http://www.cdc.gov/oneconversation)

\*Virus at low enough levels to stay healthy and reduce transmission risk.

Get Tested. Get in Care. Stay in Care. Live Well.

## HIV SCREENING AND MEDICAID COVERAGE

According to a survey conducted by the Kaiser Family Foundation’s Commission on Medicaid and the Uninsured, published in February 2014, 34 states and Washington, D.C. reported coverage of routine HIV screening under their Medicaid programs, while 16 states reported coverage of testing only when it is considered “medically necessary.”<sup>81</sup>

The U.S. Preventive Services Task Force (USPSTF) and CDC recommend routine HIV screening for all adolescents and adults.

HIV screening is considered particularly important so those who may not know they are infected can receive treatment as soon as possible and can take action to prevent spreading the infection to others. An estimated 30 percent of new HIV infections are from people living with HIV who are unaware of their infection, and more than 90 percent of new HIV infections in the United States could be averted by diagnosing people living with HIV and ensuring they receive prompt, ongoing care and treatment.<sup>82</sup>

Experts believe that providing screening services for Medicaid beneficiaries is particularly important since these Americans include many of the lowest-income and most vulnerable in terms of quality of health and risk for HIV infection. In 30 states, more than 20 percent of individuals diagnosed with HIV are covered by Medicaid, and in 12 states, more than 30 percent of individuals with HIV are covered by Medicaid.<sup>83</sup>

16 states and Washington, D.C., explicitly authorize syringe exchange programs. (1 point.)		34 states do not explicitly authorize syringe exchange programs. (0 points.)	
California	Maryland	Alabama	Nebraska
Colorado	Massachusetts	Alaska	New Hampshire
Connecticut	Nevada	Arizona	North Carolina
D.C.	New Jersey	Arkansas	North Dakota
Delaware	New Mexico	Florida	Ohio
Hawaii	New York	Georgia	Oklahoma
Kentucky	Rhode Island	Idaho	Oregon
Maine	Vermont	Illinois	Pennsylvania
	Washington	Indiana*	South Carolina
		Iowa	South Dakota
		Kansas	Tennessee
		Louisiana	Texas
		Michigan	Utah
		Minnesota	Virginia
		Mississippi	West Virginia
		Missouri	Wisconsin
		Montana	Wyoming

Source: LawAtlasSM, April 201584

Note: \*Due to a recent outbreak of HIV (increase from fewer than 5 cases to 79 cases in a three month period in Scott County Indiana), Indiana passed a law in 2015 identifying short-term syringe exchange programs in counties with a declared public health emergency.<sup>85, 86</sup>

## INDICATOR 5: SYRINGE EXCHANGE PROGRAMS

**KEY FINDING:** Sixteen states and Washington, D.C. explicitly authorize syringe exchange programs (SEPs).

One of the most effective, scientifically-based methods for reducing HIV/AIDS and viral hepatitis is syringe exchange programs.<sup>87, 88</sup> These programs, however, have been at the center of political debates, many of which are based on some long-held misperceptions, creating a challenge for the medical community and policymakers.

A recent escalation of heroin use and other injection drug use — related to people transitioning from using prescription opioid painkillers to heroin (also an opioid), which is cheaper and more easily available in some communities — has contributed to a significant rise in hepatitis C infections and the potential for increases in HIV/AIDS. Many policymakers are reexamining SEPs as an effective strategy for helping to reduce rates.

- Heroin use has grown 63 percent in the past decade (from 2002-2004 to 2011-2013), with more than half a million Americans using the drug in 2013, leading to more than 8,200 deaths.<sup>89</sup>

- Nationally, new acute hepatitis C infections have increased by 151.5 percent in reported cases from 2010 to 2013 (increases are attributed to both real incidence and heightened detection efforts).<sup>90</sup> Of the 39 states that reported data in both 2010 and 2013, 28 states had an increase in persons newly infected with HCV. According to CDC, the increase has predominantly been among young adults (under 30-years-old) who are white, live in non-urban areas, particularly in the East and Midwest, and have a history of injection drug use and previously used prescription painkillers.<sup>91, 92</sup>
- In Kentucky, Tennessee, Virginia and West Virginia, acute HCV infections increased by 364 percent from 2006 to 2012 — a majority of those infected have been white adolescents and adults under 30 who inject drugs.<sup>93</sup>
- There were nearly 30,000 acute HCV infections in 2013.<sup>94</sup> An estimated 2.7 million Americans have chronic hepatitis

- C virus infection. A majority of these people do not know they are infected because they do not look or feel sick.
- The number of HCV-related deaths has increased from 15,601 in 2007 to 19,368 in 2013 — and the acute disease and death rates are expected to continue to rise significantly as Baby Boomers — who do not know they have a chronic infection — age into the symptoms of the disease.<sup>95, 96</sup>
- There are around 50,000 new HIV infections each year.<sup>97</sup> People who inject drugs represented 15 percent of people living with HIV in 2011. More than 1.2 million Americans are living with HIV/AIDS, and nearly one in eight do not know they are infected.<sup>98</sup> The rate of new infections is expected to increase as injection drug use increases — including in places where HIV rates have traditionally been low, such as in Appalachia.<sup>99</sup>

Syringe programs are public health programs where people who inject drugs are provided with new, sterile syringes, needles and other supplies, or can exchange used needles for clean ones, so the disease is not passed from one drug user to another. SEPs help control the spread of disease and reduce accidental needle sticks among law enforcement and the public by providing safe disposal of used syringes. In addition, many SEPs are part of a comprehensive prevention program for people who inject drugs to provide resources or connect them with services that help target the underlying problems and/or refer individuals to substance use treatment or other health and social services and job programs.

SEPs have been endorsed by the Institute of Medicine (IOM), World Health Organization, American Academy of Pediatrics (AAP), American Medical Association (AMA), American Nurses Association (ANA), the American Public Health Association (APHA), Infectious Diseases Society of America (IDSA), HIV Medicine Association (HIVMA) and a range of leading experts.<sup>100, 101, 102</sup> The national organization, Drug Policy Alliance, also recommends that the United States end state policies that criminalize syringe possession and limit sterile syringe distribution, lift the ban on federal funding for syringe access programs, expand syringe exchange services, and permit over-the-counter sales of syringes.<sup>103</sup> Research has shown that SEPs decrease rates of infection and needle sharing, and do not increase neighborhood crime.<sup>104</sup> For instance:

- CDC has found SEPs lower the incidence of HIV/AIDS among people who inject drugs by 80 percent;<sup>105</sup>

- An analysis of people who inject drugs in New York City showed that those who did not participate in SEPs were three times more likely to become infected with HIV than those who did;<sup>106</sup>
- Washington, D.C. saw a 70 percent drop in newly diagnosed HIV cases within 2 years following the establishment of its SEP;<sup>107</sup> and
- SEPs help link people who inject drugs to services and care, which can help decrease drug use and related problems.<sup>108</sup> These services often include on-site medical care; screening and counseling for HIV, hepatitis C, and sexually transmitted infections; distribution of condoms, food, and clothing; and referrals to substance misuse treatment.

Preventing new infections saves money. A recent calculation showed that expanding SEP coverage to 10 percent of people who inject drugs would prevent nearly 500 new HIV infections annually. This service expansion would cost an estimated \$64 million — significantly less than the estimated \$193 million lifetime cost of treating 500 new HIV infections.<sup>109</sup>

Syringe access is governed by a set of state and local laws across the country. Currently, federal funding of SEPs is banned in the United States. The ban was put in place in 1988, repealed in 2009, and reinstated by Congress in 2011.<sup>110</sup> The President's FY 2016 budget includes a request that communities be allowed to make the decision to use federal funding for syringe exchange in conjunction with local law and health authorities. Draft appropriations measures from Congress maintain the ban on federal funds for purchase of syringes; the House and Senate Appropriations Committees

included language in the FY2016 appropriations reports that would allow use of federal funding for related program elements, such as substance use counseling, if the state or local health department and CDC determine there is a risk or significant increase of hepatitis C or HIV infections due to injection drug use.

This indicator examines whether states specifically authorize SEPs. According to a 2015 analysis by LawAtlasSM, 16 states and Washington, D.C. authorize such programs, which provide people who inject drugs access to clean syringes and needles in efforts to stem the transmission of HIV and other bloodborne diseases like hepatitis B and C. Having a law to explicitly authorize SEPs is important for establishing the ability to protect the public health of citizens. This does not reflect other states that have removed legal barriers to syringe programs but do not directly authorize them.

In 2015, following the escalation of new HCV and HIV infections, Kentucky and Indiana both passed legislation allowing counties to establish syringe programs.<sup>111</sup> Kentucky's first SEP opened in June 2015.<sup>112</sup> While Indiana's SEP is temporary, according to assessments, it has contributed to decreases in people who inject drugs who shared syringes from 18 percent at their first recorded visit to 5 percent at their most recent visit.<sup>113</sup>

Among the states that explicitly authorize SEPs, variations exist, such as whether syringe exchanges must be approved locally or if programs are limited to 1-for-1 exchanges. Other measures some states have taken to reduce potential harm and use include:<sup>114</sup>

- Twenty-eight states have limited or removed barriers to syringe



distribution in prescription and paraphernalia laws.

- Fourteen states have removed syringes from their definition of drug paraphernalia by removing terms such as needles, syringes, and injection from the definitions section, amending lists of illegal drug paraphernalia to explicitly exclude syringes, or providing exceptions to allow distribution of syringes to prevent bloodborne diseases.
- Some states require prescriptions for the retail sale of syringes, but these

can vary. Some include requiring adults to have a prescription to purchase syringes, some limit how many syringes can be purchased at one time, some limit sales to pharmacies and some require retailers to ask for buyer information, such as the buyer's name and purpose of the syringe.

Even without legislative authorization, many states and localities operate SEPs. According to the North American Syringe Exchange Network, as of May 2015, there are 228 syringe exchange programs in 35 states and Washington, D.C.<sup>115</sup>

## INDICATOR 6: CLIMATE CHANGE AND INFECTIOUS DISEASE

**KEY FINDING:** 15 states currently have completed climate change adaptation plans that include the impact on human health.

15 states currently have climate change adaptation plans that are completed. (1 point.)		35 states and Washington, D.C. do not currently have complete climate change adaptation plans. (0 points.)	
Alaska	New York	Alabama	Missouri
California	Oregon	Arizona**	Montana
Connecticut	Pennsylvania	Arkansas	Nebraska
Florida	Vermont	Colorado**	Nevada
Maine	Virginia	Delaware*	New Jersey*
Maryland	Washington	D.C.**	New Mexico
Massachusetts	Wisconsin	Georgia	North Carolina**
New Hampshire		Hawaii*	North Dakota
		Iowa**	Ohio
		Idaho	Oklahoma
		Illinois	Rhode Island*
		Indiana	South Carolina**
		Kansas	South Dakota
		Kentucky	Tennessee
		Louisiana	Texas
		Michigan**	Utah**
		Minnesota*	West Virginia
		Mississippi	Wyoming

Source: Center for Climate and Energy Solutions

Note: \*Plans in progress. \*\*Adaptation Plan Recommended in the Climate Action Plan.

This indicator examines which states have comprehensive climate adaptation plans, which includes a plan by a governmental body that has at least two sections. These can include planning for changing risk of emerging and reemerging infectious diseases due to changing temperatures and weather patterns, and issues such as vector control, air quality and food and water safety.

According to reviews by the Center for Climate and Energy Solutions (C2ES), 15 states currently have comprehensive climate adaptation plans, and four additional states have plans in progress.<sup>116</sup> While the existence of a plan does show consideration of concerns by a state, it does not necessarily mean a state is currently following or has invested in supporting the plan.

Health departments, the healthcare systems and community partners have an important role to play in helping

communities prepare for the adverse effects of climate change, given their role in building healthy communities.

Different regions of the country face different health threats due to climate change — including those related to sea-level rise and associated flooding, prolonged drought and water insecurity, hurricanes and other severe weather, and extreme heat events.<sup>117</sup> Climate change will require enhanced monitoring of potential disease vectors and outbreaks. Factors like potential changes in water quantity and quality, air quality, average and extreme temperatures and insect control are all important public health concerns. Certain zoonotic and vector-borne diseases, as well as food and waterborne diseases, may increase in incidence and spread as changes in temperature and weather patterns allow pathogens to expand into different geographic regions. For instance:

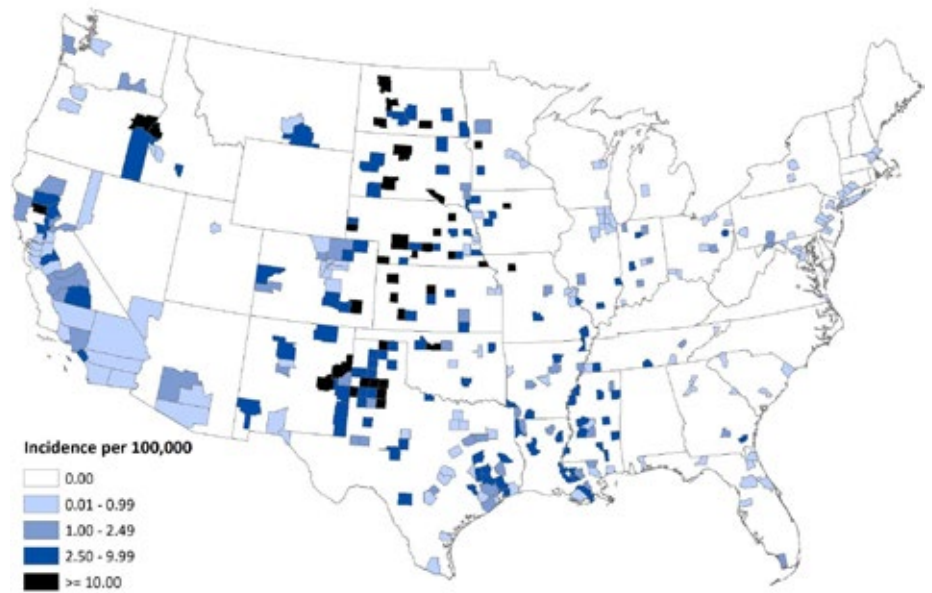


- The presence and number of rodents, mosquitoes, ticks and other insects and animals that can carry infectious diseases (disease vectors) rise in warmer temperatures. So as extreme temperatures increase in severity and duration, the geographic and spatiotemporal patterns of diseases ranging from West Nile virus to Lyme and other tick-borne diseases to encephalitis are expected to shift.<sup>118</sup>

- Climate change may have an effect on the timing of migration of wild birds. Wild birds are a concern for public health because they can be infected by a number of microbes that can be transmitted to humans. In addition, birds migrating across national and intercontinental borders can become long-range carriers of any bacteria, virus or parasite they harbor. Birds were the source of the rapid spread of West Nile virus after it was first identified in 1999, and by 2012 the virus had been reported in humans, mosquitoes, and birds in 48 states. In addition to West Nile virus, migratory birds were reported to be one possible source of the 2006 global outbreak of the H5N1 avian influenza virus.<sup>119</sup> Since December 2014, the United States has experienced highly pathogenic avian influenza incidents among poultry flocks and wild bird.<sup>120</sup>

- Annual influenza seasons and potential epidemics occur primarily during cold weather, while meningococcal meningitis is associated with dry climates. Changing weather patterns put people in different regions at increased risk for both diseases.<sup>121, 122</sup>

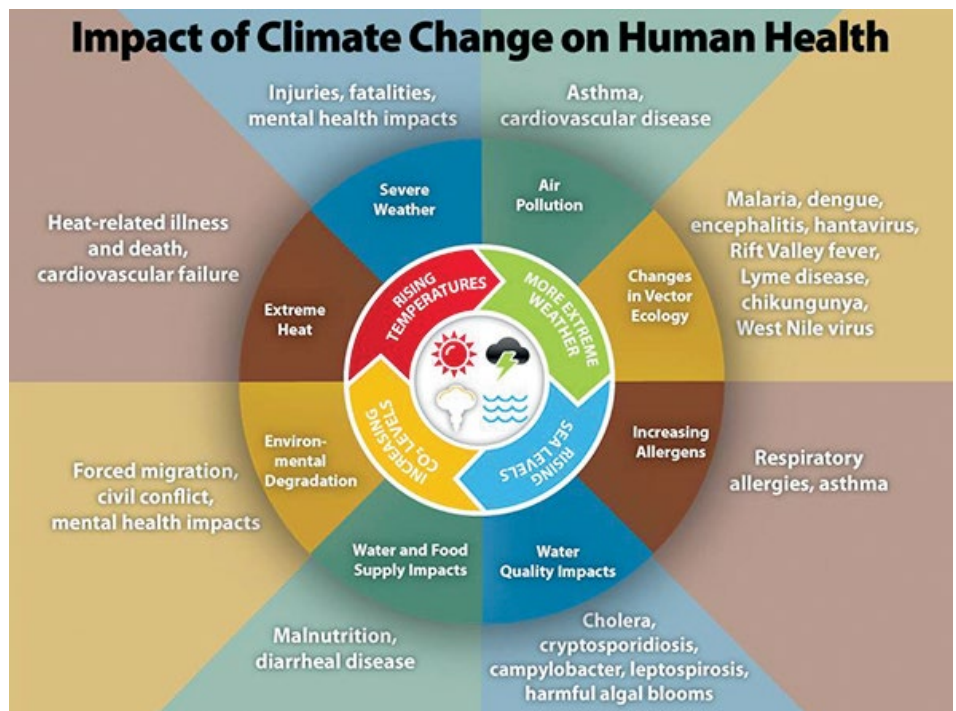
### West Nile virus neuroinvasive disease incidence reported to ArboNET, by county, United States, 2014



Source: ArboNET, Arboviral Diseases Branch, Centers for Disease Control and Prevention

West Nile virus neuroinvasive disease incidence maps present data reported by state and local health departments to CDC's ArboNET surveillance system. This map shows the incidence of human neuroinvasive disease (e.g., meningitis, encephalitis, or acute flaccid paralysis) by county for 2014 with shading ranging from 0.01-0.99, 1.0-2.49, 2.50-9.99, and greater than 10.0 per 100,000 population.

Counties from the following states reported neuroinvasive disease cases to ArboNET in 2014: Arizona, Arkansas, California, Colorado, Connecticut, District of Columbia, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, and Wisconsin.



Source: CDC

- The rise in extreme weather events and natural disasters also leads to a more fertile environment for the spread of infectious diseases and germs. For instance, cryptosporidiosis outbreaks — which cause diarrheal disease — are associated with heavy rainfall, which can overwhelm sewage treatment plants or cause lakes, rivers and streams to become contaminated by runoff containing waste from infected animals. Experts also believe that an El Niño occurrence may have contributed to increases of cholera.<sup>123</sup> Communities recovering from a disaster may see food or waterborne illnesses associated with power outages or flooding, as well as infectious disease transmission in emergency shelters.

CDC, the Environmental Protection Agency (EPA), IOM, the National Institutes of Health (NIH) and the Federal Emergency Management Agency (FEMA) have worked to identify potential threats and ways to help adapt to and mitigate against the problems climate change may pose to the health of Americans.<sup>124, 125, 126, 127, 128, 129</sup> In addition, in 2013, the President issued an Executive Order to prepare for the effects of climate change, including how increases in excessively high temperatures, heavy downpours, wildfires, severe droughts, permafrost thawing, ocean acidification and sea-level rise affect communities and public health.<sup>130</sup> In 2014, an updated National Climate Assessment laid out

actions for federal agencies to take to prevent and mitigate the impacts of climate change.<sup>131</sup> And in 2014, HHS released a Climate Adaption Plan, which includes the ability to provide healthcare and programs during emergency climate-related emergencies.<sup>132</sup> In 2015, U.S. Surgeon General Vivek Murthy highlighted the public health impacts of climate change during a White House Summit on Climate Change and Health, and the Obama administration announced actions to support resilience to climate change, including early warning systems and climate change medical education.<sup>133</sup>

CDC's Climate-Ready States and Cities Initiative in FY 2014 awarded \$4.5 million in grants to 16 states and two cities to conduct planning and build resilience to the health impacts of climate change using the Building Resilience Against Climate Effects (BRACE) framework.<sup>134</sup> CDC will assist awardees in developing and using models to more accurately anticipate health impacts, monitor health effects, and identify the most vulnerable areas in their region. Awardees include departments of health in Arizona, California, Florida, Illinois, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New York City, New York State, North Carolina, Oregon, Rhode Island, San Francisco, Vermont and Wisconsin.<sup>135</sup>

Between 2012 and 2013, 9 states reduced the number of central line-associated blood stream infections. (1 point.)	41 states and Washington, D.C. had either the same or more central line-associated blood stream infections between 2012 and 2013. (0 points.)	
Alaska	Alabama	Nebraska
Connecticut	Arkansas	Nevada
Illinois	Arizona	New Hampshire
Kentucky	California	New Mexico
Maine	Colorado	North Carolina
Mississippi	Delaware	North Dakota
New Jersey	D.C.	Ohio
New York	Florida	Oklahoma
Tennessee	Georgia	Oregon
	Hawaii	Pennsylvania
	Idaho	Rhode Island
	Indiana	South Carolina
	Iowa	South Dakota
	Kansas	Texas
	Louisiana	Utah
	Maryland	Vermont
	Massachusetts	Virginia
	Michigan	Washington
	Minnesota	West Virginia
	Missouri	Wisconsin
	Montana	Wyoming

Source: CDC, National and State Healthcare-Associated Infections: Progress Report  
 Note: Puerto Rico's central line-associated blood stream SIR was reduced between 2012 and 2013.

## INDICATOR 7: REDUCTIONS IN CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS

**KEY FINDING:** Between 2012 and 2013, the standardized infection ratio (SIR) for central line-associated bloodstream infections decreased significantly in 9 states.

Approximately 1 out of every 25 hospitalized patients will contract a healthcare-associated infection, which is an infection patients can get while receiving medical treatment in a healthcare facility.<sup>136</sup> Healthcare-associated infections not only happen in hospitals but can also occur in outpatient surgery centers, nursing homes and other long-term care facilities, rehabilitation centers, community clinics or physicians' offices.

This indicator examines one form of HAI — central line associated blood stream infections (CLABSI) — and whether a state reduced infection rates from 2012 to 2013. According to CDC's National and State Healthcare-Associated Infections: Progress Report, nine states and Puerto Rico met this objective.<sup>137</sup> In addition, CDC reviewed how states performed compared to

the national standard infection ratio (SIR), and found that 17 states had rates that were statistically significantly better: Alaska, California, Hawaii, Idaho, Illinois, Michigan, Minnesota, Missouri, New Hampshire, Ohio, Oklahoma, Oregon, Pennsylvania, South Dakota, Tennessee, Vermont and West Virginia.

A central line is a tube that is typically inserted in a patient's large vein, usually in the neck, chest, arm or groin, to give important medical treatment. When not put in correctly or kept clean, central lines can become a freeway for germs to enter the body and cause deadly infections in the blood. These infections are usually serious, often resulting in the prolongation of hospital stay and increased cost and risk of mortality.<sup>138</sup> Nationally, the number of CLABSI infections has decreased overall — by 46 percent — from 2008, when

the standard infection ratio benchmark was established (0.54) to be able to track progress overtime.<sup>139, 140</sup>

A person's risk for an HAI, which includes a range of antibiotic-resistant infections, increases if they are having invasive surgery, if they have a catheter in a vein or their bladder, or if they are on a ventilator or are on a prolonged course of antibiotics as part of their care.<sup>141, 142</sup> In 2011, there were an estimated 722,000 HAIs and 75,000 patients with HAIs died during their hospitalizations in the United States.<sup>143</sup> Of the infections, 157,500 were from pneumonia; 157,500 from surgical site infections; 123,100 from gastrointestinal illness; 93,300 from urinary tract infections; 71,900 from primary bloodstream infections; and 118,500 from other types of infections.<sup>144</sup> Clostridium difficile, which caused 12.1 percent of HAIs, was the most commonly reported pathogen.

HAIs cost the country \$28 to \$33 billion in preventable healthcare expenditures each year.<sup>145</sup> A 2013 meta-analysis found that CLABSIs were the most costly HAIs at \$45,814 per case.<sup>146</sup> According to CDC, if 20 percent of these infections were prevented, healthcare facilities could save nearly \$6 to \$7 billion, and reducing infections by 70 percent could result in \$25 to \$32 billion in savings.<sup>147</sup>

Prevention and education efforts have been helping to decrease the rates of HAIs. CDC, the Centers for Medicare and Medicaid Services (CMS), states and medical providers have launched

+ **HEALTHCARE - ASSOCIATED INFECTIONS**

**WHAT PATIENTS CAN DO**

**BE INFORMED. BE EMPOWERED. BE PREPARED.**

6 **WAYS TO BE A SAFE PATIENT**

1

SPEAK UP.

Talk to your doctor about all questions or worries you have. Ask them what they are doing to protect you.

- ▶ If you have a catheter, ask each day if it is necessary.
- ▶ Ask your doctor how he/she prevents surgical site infections. Also ask how you can prepare for surgery to reduce your infection risk.

4

KNOW THE SIGNS AND SYMPTOMS OF INFECTION.

Some skin infections, such as MRSA, appear as redness, pain, or drainage at an IV catheter site or surgery site. Often these symptoms come with a fever. Tell your doctor if you have these symptoms.

6

PROTECT YOURSELF.

Get vaccinated against flu and other infections to avoid complications.

2

KEEP HANDS CLEAN.

Be sure everyone cleans their hands before touching you.

3

GET SMART ABOUT ANTIBIOTICS.

Ask if tests will be done to make sure the right antibiotic is prescribed.

5

WATCH OUT FOR DEADLY DIARRHEA. (AKA *C. difficile*)

Tell your doctor if you have 3 or more diarrhea episodes in 24 hours, especially if you have been taking an antibiotic.



245525-E

a series of provider education and prevention initiatives.<sup>148, 149</sup> In addition, in 2008, Medicare provided an incentive to reduce infections by adopting a “no pay” rule for infections acquired during a hospital stay, requiring the hospitals themselves to cover any costs incurred by these infections.<sup>150</sup> According to a 2012 survey, 80 percent of infection-control professionals believe the rules have resulted in a greater focus on reducing HAIs. The ACA also requires in-patient hospitals to report certain infections to National Healthcare Safety Network (NHSN) in order to receive their full payment updates, and the information is available on the CMS’ Hospital Compare website.<sup>151</sup> The NHSN is the largest healthcare-associated infection reporting system in the United States, serving more than 17,000 healthcare facilities of all types.<sup>152</sup>

Many states are seeing decreases in HAIs. Between 2008 and 2013, there were 46 percent fewer central line-associated bloodstream infections and 19 percent fewer surgical site infections related to 10 surgical procedures in in-patient healthcare settings.<sup>153</sup> There were an estimated 30,800 fewer invasive Methicillin-resistant Staphylococcus aureus (MRSA) infections in the United States from 2005 to 2011, with hospital-onset MRSA decreasing by more than 60 percent.<sup>154</sup> Hospital-onset MRSA decreased 8 percent between 2011 and 2013.<sup>155</sup>

## How CDC Helps Resolve Outbreaks in Healthcare Facilities

### Milestones in an Epi-Aid Investigation



**CDC reviews the situation for lessons learned and takes steps to prevent similar outbreaks**



U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention

## INDICATORS 8 AND 9: PUBLIC HEALTH LABORATORIES

**KEY FINDING:** 36 state laboratories reported having a biosafety professional (from July 1, 2014 to June 30, 2015.)

36 state laboratories reported having a biosafety professional from July 1, 2014 to June 30, 2015. (1 point.)		15 state laboratories and in Washington, D.C. reported not having a biosafety professional. (0 points.)
Alabama	Missouri	Arkansas
Alaska	Montana	Colorado
Arizona	Nebraska	Connecticut
California	New Jersey	D.C.
Delaware	New Mexico	Florida
Georgia	New York	Hawaii
Idaho	North Carolina	Mississippi
Illinois	North Dakota	Nevada
Indiana	Ohio	New Hampshire
Iowa	Pennsylvania	Oklahoma
Kansas	South Carolina	Oregon
Kentucky	Texas	Rhode Island
Louisiana	Vermont	South Dakota
Maine	Virginia	Tennessee
Maryland	Washington	Utah
Massachusetts	West Virginia	Washington
Michigan	Wisconsin	
Minnesota	Wyoming	

Source: Association of Public Health Laboratories 2015 survey

**KEY FINDING:** 35 state laboratories provided biosafety training and/or provided information about biosafety training courses for sentinel clinical labs in their jurisdiction from July 1, 2014 to June 30, 2015.

36 state laboratories provided biosafety training and/or information about biosafety training courses for sentinel clinical labs in their jurisdiction from July 1, 2014 to June 30, 2015. (1 point.)		14 state laboratories and in Washington, D.C. did not provide biosafety training and/or information about biosafety training courses for sentinel clinical labs in their jurisdiction. (0 points.)
Alabama	Missouri	Alaska
Arizona	Montana	Connecticut
Arkansas	Nebraska <sup>^</sup>	D.C.
California <sup>^</sup>	Nevada <sup>^</sup>	Florida
Colorado <sup>*</sup>	New Hampshire <sup>*</sup>	Hawaii
Delaware	New Jersey	Maryland
Georgia	New Mexico <sup>*</sup>	Michigan
Idaho <sup>^</sup>	New York <sup>^</sup>	Ohio
Illinois <sup>*</sup>	North Carolina <sup>*</sup>	Oregon
Indiana <sup>^</sup>	North Dakota <sup>^</sup>	Pennsylvania
Iowa <sup>^</sup>	Oklahoma <sup>^</sup>	Rhode Island
Kansas <sup>^</sup>	South Carolina	Tennessee
Kentucky <sup>^</sup>	South Dakota	Utah
Louisiana <sup>^</sup>	Texas <sup>^</sup>	Washington
Maine <sup>^</sup>	Vermont <sup>^</sup>	West Virginia
Massachusetts	Virginia <sup>*</sup>	Wyoming
Minnesota	Wisconsin	
Mississippi <sup>^</sup>		

Source: Association of Public Health Laboratories 2015 survey

Note: \* State provided training and information about training. ^ State provided information about training courses only.

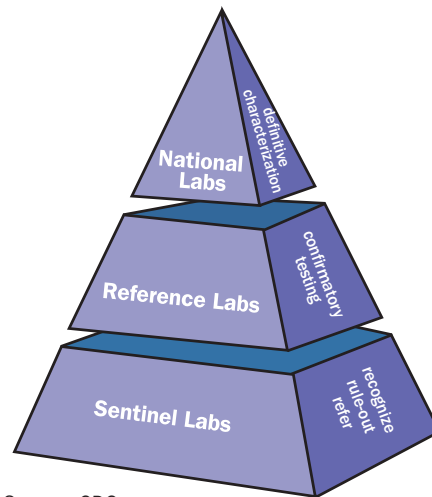
Public health laboratories are essential to quickly identifying and diagnosing new outbreaks and tracking ongoing outbreaks.

Labs require highly expert staffing, extensive safety measures, specialized equipment, reagents and other biological materials to use for testing, and enough capacity to test for a large threat or multiple threats at once. They have ongoing responsibilities, such as testing water and environmental conditions, as well as responding to emergencies and novel threats, such as an outbreak of Salmonella or a suspicious white powder that could potentially be used during an act of bioterrorism.

Since 2001, public health labs have created networks to be more efficient and effective, so that every state has a baseline of capabilities but does not have to invest the resources required to maintain every type of state-of-the-art equipment or staffing expertise. For example, samples can be shipped to facilities with the needed expertise as quickly and safely as possible.

The Laboratory Response Network for Biological Threat Preparedness (LRN-B) includes labs with a hierarchy of different capabilities, so labs with increased capabilities provide support for other labs, consisting of:<sup>156</sup>

- National laboratories — including those operated by CDC, U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID), and the Naval Medical Research Center (NMRC) — are responsible for specialized strain characterizations, bioforensics, select agent activity and handling highly infectious biological agents;
- Reference laboratories, which are responsible for investigation and/or



Source: CDC

referral of specimens. They are made up of more than 100 state and local public health, military, international, veterinary, agriculture, and food- and water-testing laboratories; and

- Sentinel laboratories, which provide routine diagnostic services, rule-out and referral steps in the identification process. While these laboratories may not be equipped to perform the same tests as LRN Reference laboratories, they can test samples.

Labs not only help detect and diagnose problems, the information they provide helps public health officials track the emergence and spread of different outbreaks and is an essential part of monitoring disease threats and understanding how to control them.

In 2010, CDC began funding 57 state, local and territorial health departments to encourage increased electronic reporting of lab results to help make reporting faster and more complete.<sup>157</sup> Data collected since then show various improvements. By the end of July 2013, 54 of the 57 jurisdictions were getting some laboratory reports through Electronic Laboratory Reporting (ELR), and 62 percent of laboratory reports

were being received through ELR compared to 54 percent in 2012.

CDC's Epidemiology and Laboratory Capacity for Infectious Diseases (ELC) Cooperative Agreements provide state, local and territorial health department grantees with financial and technical resources to strengthen epidemiological, laboratory and health information systems to detect, prevent and control infectious diseases. The ELC cooperative agreements totaled \$110 million in awards in FY2015.<sup>158</sup>

These indicators examine two important components of ensuring safety in laboratories. First, according to an annual survey conducted by the Association of Public Health Laboratories (APHL), 36 state labs reported that they have a professional committed to biosafety on staff (from July 1, 2014 to June 30, 2015). Second, 35 state labs reported they provided biosafety training and/or information about biosafety training courses for sentinel clinical labs in their jurisdiction (with 20 providing training, 21 providing information about courses and six providing both (Colorado, Illinois, New Hampshire, New Mexico, North Carolina and Virginia)).

According to the Occupational Safety and Health Administration (OSHA), there are over 500,000 lab workers in the United States. These workers can be exposed to a range of chemical, biological and radiological hazards. While lab safety is governed by myriad regulations at the national, state and local level, OSHA has developed standards and published guidance over the years to improve safety.<sup>159</sup>

## BSL 1



### BSL 1

- 1 controlled access
- 2 hand washing sink
- 3 sharp hazards warning policy
- 4 personal protective equipment
- 5 laboratory bench
- 6 autoclave

## BSL 2



### BSL 2

- 1 controlled access
- 2 hand washing sink
- 3 sharp hazards warning policy
- 4 physical containment device
- 5 personal protective equipment
- 6 laboratory bench
- 7 autoclave

## BSL 3 (WITH RISK-BASED ENHANCEMENTS)



### BSL 3

- 1 self-closing double-door access
- 2 controlled access
- 3 personal shower out
- 4 sharp hazards warning policy
- 5 hand washing sink
- 6 sealed penetrations
- 7 physical containment device
- 8 powered air purifying respirator
- 9 laboratory bench
- 10 autoclave
- 11 exhaust HEPA filter
- 12 effluent decontamination system



## BSL 4



### BSL 4

- 1 self-closing double-door access
- 2 controlled access
- 3 sharp hazards warning policy
- 4 hand washing sink
- 5 sealed penetrations
- 6 physical containment device
- 7 positive pressure protective suit
- 8 laboratory bench
- 9 autoclave
- 10 chemical shower out
- 11 personal shower out
- 12 supply and exhaust HEPA filters
- 13 effluent decontamination system



● Required safety equipment    ● Risk-based enhancements

www.cdc.gov/24-7



Many workers handle a variety of biological hazards, including blood borne agents, research animals and federally regulated biological agents (e.g., viruses, bacteria, fungi, prions) and toxins that have the potential to pose a severe threat to public health and safety. These select agents or toxins must be properly stored and handled to ensure the safety of the worker, his or her immediate environment and the larger public as a whole.

A biosafety program requires consistent use of good microbiological practices, use of primary containment equipment and proper containment facility design.<sup>160</sup> One of the primary elements of lab safety is personal protective equipment — the protective gear workers wear to keep them safe as they carry out their jobs. These include respirators, goggles and disposable gloves. In working with the select agents and toxins that are regulated federally, workers must use PPE and agents must be properly stored and handled. PPE is selected based on the hazard to the worker and must be properly fitted, maintained in accordance with manufacturing specifications, and properly removed and disposed of or cleaned to avoid contaminating the worker, others or the environment.<sup>161</sup>

Properly maintained Biosafety Cabinets (BSCs) are another key component of laboratory safety; they provide an effective containment system for safe manipulation of Biosafety Level 2 (BSL-2) and 3 (BSL-3) agents. BSCs protect lab workers and the immediate lab environment from infectious aerosols generated within the cabinet and must be certified when installed, whenever they are moved and at least annually.<sup>162</sup>

## LABORATORY SAFETY LAPSES

In 2014, safety lapses in the handling of dangerous pathogens were identified at multiple U.S. government laboratories. CDC hired a top laboratory safety official in 2015 to provide agency-wide leadership and accountability for laboratory safety and quality, and FDA hired a safety official to address gaps in FDA labs.<sup>163, 164, 165</sup>

In 2015, additional incidents were identified in military laboratories. In September, anthrax bacteria was found on the floors of two military laboratories in a Utah facility, outside the designated containment area.<sup>166</sup> This facility had inadvertently sent live anthrax spores — instead of deactivated samples — to all 50 states and nine countries for research and testing.<sup>167</sup> CDC inspectors found labeling errors in

plague and encephalitis samples at additional labs. Samples labeled as dead or weakened do not require the personal protective equipment when handling that live samples do and can put lab workers at risk. No illnesses have been caused by these safety lapses so far, but the Pentagon has ordered a freeze on all operations in the nine U.S. labs that work with the most dangerous agents.<sup>168</sup>

While no staff were sickened and the public was never at risk, these incidents and their potential for harm is troubling. They highlight a lack of training, oversight, and failures of safety protocol by individuals. Laboratory safety is critical not just to protect laboratorians and the public, but to enable lifesaving research to continue.

## MEANINGFUL USE

Meaningful Use is defined as “the use of certified electronic health record (EHR) technology in a meaningful manner (for example electronic prescribing); ensuring that the certified EHR technology is connected in a manner that provides for the electronic exchange of health information to improve the quality of care; and that in using certified EHR technology the provider must submit to the Secretary of Health & Human Services information on quality of care and other measures.” Through its “Medicare and Medicaid Programs: Electronic Health Records Incentive Program,” CMS is providing incentive payments to eligible hospitals, providers and critical access hospitals that adopt and successfully demonstrate meaningful use of certified EHR technology.<sup>169</sup>

One public health objective for meaningful use is electronic lab reporting — transmitting laboratory reports to public health agencies on reportable conditions. Its benefits include improved timeliness, reduction of manual data entry errors, and reports that are more complete. The vision for ELR — as determined by a task force comprised of experts from CDC, the Council of State and Territorial Epidemiologists and the Association of Public Health Laboratories — is that “all labs (public and private) conducting clinical testing identify laboratory results that indicate a potential reportable condition for the jurisdictions they serve, format the information in a standard manner, and transmit appropriate messages to the responsible jurisdiction; all jurisdictions can and do receive and utilize the data.”<sup>170</sup>

## INDICATOR 10: FOOD SAFETY

**KEY FINDING:** 39 states met the national performance target of testing 90 percent of reported *Escherichia coli* O157 cases within four days.

39 states met the national performance target of testing 90 percent of reported <i>E. coli</i> O157 cases within four days (in 2013). (1 point.)		11 states did not meet the national performance target of testing 90 percent of reported <i>E. coli</i> O157 cases within four days (in 2013). (0 points.)
Alabama (100%)	Missouri (97%)	Georgia (81%)
Alaska (100%)	Nebraska (100%)	Idaho (73%)
Arizona (100%)	Nevada (100%)	Iowa (88%)
Arkansas (100%)	New Hampshire (100%)	Louisiana (0%)**
California (97%)	New Mexico (94%)	Michigan (86%)
Colorado (98%)	New York (99%)	Montana (85%)
Connecticut (100%)	North Carolina (97%)	New Jersey (79%)
D.C. (N/A)*	North Dakota (100%)	Oregon (38%)
Delaware (100%)	Ohio (100%)	South Carolina (80%)
Florida (100%)	Oklahoma (100%)	South Dakota (89%)
Hawaii (95%)	Pennsylvania (91%)	Texas (75%)
Illinois (92%)	Rhode Island (100%)	
Indiana (100%)	Tennessee (99%)	
Kansas (100%)	Utah (96%)	
Kentucky (90%)	Vermont (100%)	
Maine (100%)	Virginia (98%)	
Maryland (97%)	Washington (93%)	
Massachusetts (100%)	West Virginia (100%)	
Minnesota (91%)	Wisconsin (90%)	
Mississippi (100%)	Wyoming (100%)	

Source: CDC, National Snapshot of Public Health Preparedness, 2015. Note: \*Data were not available for Washington, D.C. \*\* State did not report.

Annually, around 48 million Americans suffer from foodborne illnesses. Around one million of those who are stricken in a given year will suffer from long-term chronic complications, such as kidney failure and brain and nerve damage.<sup>171, 172</sup> Foodborne illnesses are responsible for around 128,000 hospital visits and kill approximately 3,000 individuals each year.<sup>173</sup> Virtually all of these illnesses could be prevented if stronger measures were taken to improve the U.S. food safety system.

This indicator examines how quickly states test reported cases of *Escherichia coli* O157 — one of the most common foodborne illnesses in the United States. Thirty-nine states met CDC’s national performance target of testing 90 percent of reported *E. coli* O157

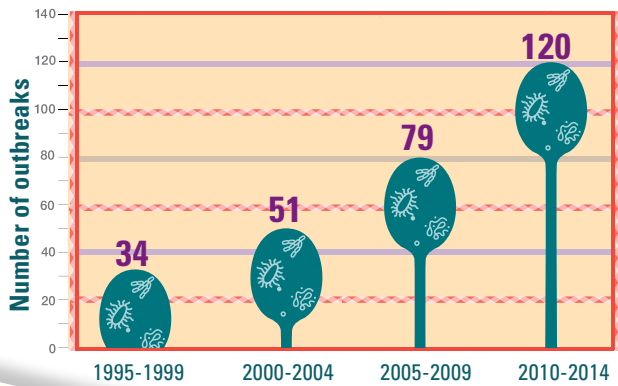
cases within four days. Nine states tested between 60 percent and 89.9 percent of reported cases and two states tested fewer than 60 percent.<sup>174, 175</sup> Quickly detecting *E. coli* O157 contamination serves as a marker for the ability of states to protect their populations and the nation from foodborne illness.

*E. coli* is a diverse group of bacteria that live harmlessly in the guts of humans and animals. However, some pathotypes of *E. coli* can cause acute gastro-intestinal illness that may lead to systemic disease. Most reported outbreaks are caused by Shiga toxin-producing *E. coli* (STEC) O157, which is primarily transmitted through the fecal-oral route. People can be sickened by consuming contaminated leafy greens, raw dairy products and undercooked meat<sup>176</sup>

## Government and food industries need to work together to make food safer.

### More multistate outbreaks are being found

**Why?** Better methods to detect and investigate, and wider food distribution.

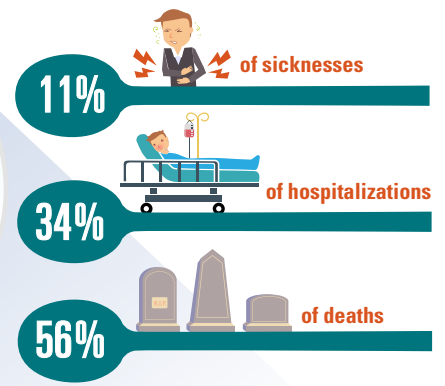


SOURCE: CDC National Outbreak Reporting System, 1995-2014.

### Multistate outbreaks: less common, but more serious

**Why?** The deadly germs *Salmonella*, *E. coli* and *Listeria* cause **91%** of multistate outbreaks.

**Only 3%** of all US foodborne outbreaks are multistate, but they cause more than their share of outbreak sicknesses, hospitalizations and deaths:



SOURCE: CDC Vital Signs MMWR, November 2015.

CDC's National Snapshot of Public Health Preparedness and Prevention Status Report highlight practices recommended by the Council to Improve Foodborne Outbreak Response that can help states prevent or reduce foodborne illness. One practice is increasing the speed of pulsed-field gel electrophoresis (PFGE) testing (DNA fingerprinting) of reported *E. coli* O157 cases. According to the CDC, "Speed of PFGE testing is defined as the annual proportion of *E. coli* O157 PFGE patterns reported to CDC...within four working days of receiving the isolate in the state public health PFGE lab."<sup>177, 178</sup> Detecting outbreaks quickly not only prevents new cases of illness, but can help the food industry identify gaps and minimize adverse economic

impact. Food safety surveillance faces the additional challenge of culture independent diagnostics, which provide a quick diagnosis, but do not provide a PFGE isolate that often are used to enable public health officials to identify an outbreak.

According to the U.S. Department of Agriculture's (USDA) Economic Research Service, *E. coli* costs the country over \$271 million a year.<sup>179</sup>

In 2015, CDC was notified of 546 ill persons with confirmed Cyclospora infection from 31 states. Previous U.S. outbreaks of Cyclosporiasis have been linked to imported fresh produce, including cilantro from the Puebla region of Mexico.

# National Issues & Recommendations

## National Issues and Recommendations

Successes in fighting infectious diseases — due to vaccines, antibiotics and vigilant public health practices — have been dramatic, but have also contributed to a national complacency. This has resulted in a lack of sufficient support to maintain and grow the defenses needed to address them.

Overuse of antibiotics and underuse of vaccines — and limited incentives for a research and development pipeline — along with inadequate and fluctuating resources for core infectious disease prevention practices have resulted in major gaps in the country's ability to detect, diagnose, treat and contain the spread of illnesses.<sup>180</sup> This puts the nation at unnecessary risk when new threats emerge — like Ebola, MERS, a new strain of pandemic flu or new foodborne illness outbreak — and hampers the ability to tackle ongoing problems — like HIV, antibiotic-resistant infections or even the seasonal flu. Most infectious diseases are preventable — and millions of Americans become unnecessarily sick or die each year, and infectious diseases cost the country more \$120 billion each year, but the country has not maintained a sustained commitment to address them.<sup>181</sup>

Without sufficient attention and resources, much of the nation's approach to fighting infectious disease has not been modernized in decades. Moving forward, the country should make it a priority to define baseline capabilities — that must

be consistently maintained and regularly updated with advances in technology.

Key areas of recommendation include to:

- A. Increase Resources to Maintain and Modernize Public Health Capabilities and Have Consistent and Science-Based Policies Across the Country
- B. Modernize Disease Surveillance — For Detecting, Tracking and Containing Disease Threats
- C. Incentivize and Support Medical Countermeasure Research, Development and Distribution
- D. Address Climate Change Impact on Infectious Disease Outbreaks
- E. Build Community Resilience
- F. Improve Health System Preparedness, Including Enhancing Surge Capacity and Infection Control
- G. Improve Vaccination Rates
- H. Combat Antibiotic Resistance
- I. Reduce Sexually Transmitted Infections (STIs) and TB
- J. Fix Food Safety

## A. Increase Resources to Maintain and Modernize Public Health Capabilities and Have Consistent and Science-Based Policies Across the Country

Stable, sufficient, dedicated funding is essential to assure that states and communities around the country have the basic capabilities needed to prevent and contain disease outbreaks. Infectious disease control requires constant vigilance — and inadequate and fluctuating resources leave gaps in the ability to quickly detect, diagnose, treat and contain the spread of illnesses.

Preparedness is at a higher baseline than it was prior to the September 11th and anthrax tragedies, but it remains a long way from the identified goals of what is needed to maintain basic capabilities to protect against a range of potential infectious disease and other health threats on an ongoing basis. After 2001, significant investments were made — and important progress was achieved in many areas — but many of the goals were never fully addressed, and as attention and resources have waned, some of the accomplishments that were made have also eroded.

- **Some key areas of accomplishment:** Emergency operations planning and coordination; public health laboratories; vaccine manufacturing; the Strategic National Stockpile (SNS); pharmaceutical and medical equipment distribution and administration; surveillance and epidemiologic investigation; information sharing, and communications; legal and liability protections; increasing and upgrading public health staffing trained to prevent and respond to emergencies; and limited improvements in medical surge capacity.

- **Some significant never-well-addressed gaps:** Coordinated, interoperable, real-time biosurveillance; the ability to provide mass care in emergencies; maintaining a stable medical countermeasure (MCM) strategy to continue research and development of vaccines; antiviral medications and antibiotics; chemical and radiation laboratory services, and the ability to help communities become more resilient to cope with and recover from emergencies.
- **Cuts to preparedness — resulting in eroding capabilities:** The major source of support for public health preparedness in states — the Public Health Emergency Preparedness (PHEP) Cooperative Agreement Funding — has been cut from a high of nearly \$1 billion in FY 2006 to \$644 million in FY 2015; Hospital Preparedness Program (HPP) has been cut by more than half — from \$515 million in FY 2004 to \$255 million in FY 2015;<sup>182</sup> funds for the Strategic National Stockpile have not been sufficient to replenish medicines, vaccines, diagnostics and equipment, it addresses a limited number of infectious diseases and many of the

countermeasures for communicable diseases are in shortage, high-cost and/or are no longer sold or produced in the United States; and health departments in 48 states, two U.S. territories and Washington, D.C. have reported budget cuts, and state and local health departments have lost 19 percent of their workforce — or 51,000 jobs — since 2008.<sup>183</sup>

The 2014 Ebola outbreak served as the most recent illustration of the dynamic where a new threat exposes ongoing gaps and vulnerabilities in the system. In lieu of investing in a steady system where appropriate response capabilities are in

place, emergency supplemental funds are needed. The emergency funds are often too late to support the immediate crisis — so scarce dollars are diverted from ongoing public health concerns. And, the cost of ramping up quickly during an emergency is significantly higher than if a solid foundation is maintained — so, once they are available for use, the emergency funds help to pay back expenditures in the aftermath of a crisis — but little is left to pay for future needs or to fill in costs incurred from diverting resources and staff to other public health responsibilities during the time of an emergency.

## DIVISION OF EMERGENCY OPERATIONS COORDINATING CDC'S RESPONSE TO PUBLIC HEALTH EMERGENCIES

Oversees CDC's Emergency Management Program, which is responsible for the overall coordination of the agency's preparedness for, response to, and recovery from public health emergencies, including operating CDC's Emergency Operations Center.

### RESPONSE TO PUBLIC HEALTH THREATS

#### BEFORE

**TRAINING:** CDC prepares its responders by improving their technical skills and getting them ready to deploy to the site of the emergency.

**EXERCISE:** practice responding to different public health threats ranging from natural disasters to pandemic emergencies.

#### DURING

**LOGISTICS:** works 24/7/365 during CDC's emergency response to a public health threat by purchasing and shipping needed supplies and equipment; shipping specimens; and making travel arrangements for CDC personnel deploying to the site of the emergency.

**COMMUNICATION:** CDC's emergency risk communication for all-hazards preparedness and response involves ensuring timely, consistent, targeted, and actionable information reaches the public and stakeholders during emergencies.

#### AFTER

**AFTER ACTION REPORT:** an evaluation conducted after every CDC emergency response that identifies what was done well and what can be improved.

### CDC'S EMERGENCY OPERATIONS CENTER (EOC)



Established in 2003 as a state-of-the-art facility at CDC headquarters in Atlanta

Has supported CDC's response to **50+** public health threats

Can seat up to **230 people** at a time for **8-hour shifts**



Operates **24/7/365**, providing around-the-clock health monitoring and emergency response



Deploys scientific experts to the site of the emergency to collaborate on a response



Coordinates delivery of supplies and equipment during an emergency

The command center for monitoring and coordinating CDC's emergency response to public health threats in the United States and around the world.



### CDC WATCH DESK

Doctors, public health agencies, and the general public report public health threats to CDC through the EOC Watch Desk.

In 2015, the EOC Watch desk received:



**25,188** calls



**1,906** calls from city, county, or state health departments



**2,883** calls from clinicians/hospitals

### INCIDENT MANAGEMENT SYSTEM (IMS)

A standardized emergency response operating system used to manage CDC's response by coordinating the roles of CDC and state public health officials.

### EMERGENCY RESPONSE ACTIVATION LEVELS

**LEVEL 3**

Lowest activation level, CDC experts on the specific type of emergency with staff from their program area lead the response with minimal assistance from the Division of Emergency Operations to address the primary needs of the response.

**LEVEL 2**

A mid-level response, CDC experts on the specific type of emergency with a large number of staff from their program area lead the response with significant assistance from the Division of Emergency Operations to meet the time-sensitive tasks/needs of the response beyond CDC's core business hours.

**LEVEL 1**

The highest level of response reserved for critical emergencies, which often require substantial agency-wide effort and response needs are beyond the lead CIO's capacity because of the magnitude of the event.



Centers for Disease Control and Prevention  
Office of Public Health Preparedness and Response

## Key Federal Infectious Disease Program Funding

CDC—INFECTIOUS DISEASES										
	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010 <sup>1</sup>	FY 2011 <sup>1</sup>	FY 2012 <sup>1</sup>	FY 2013 <sup>1</sup>	FY 2014 <sup>2</sup>	FY 2015
Immunization and Respiratory Diseases	\$519,858,000	\$585,430,000	\$684,634,000	\$716,048,000	\$721,180,000	\$748,257,000	\$778,947,000	\$678,935,000	\$744,700,000	\$798,405,000
HIV/AIDS, Viral Hepatitis, STI and TB Prevention*	\$963,133,000	\$1,002,513,000	\$1,002,130,000	\$1,006,375,000	\$1,118,712,000	\$1,115,995,000	\$1,109,934,000	\$1,048,374,000	\$1,072,834,000	\$1,117,609,000
Emerging and Zoonotic Infectious Diseases*	\$212,165,000	\$221,643,000	\$217,771,000	\$225,404,000	\$281,174,000	\$304,193,000	\$304,226,000	\$291,073,000	\$339,300,000	\$404,990,000

\* In 2011 CDC integrated two existing national centers: the National Center for Preparedness, Detection, and Control of Infectious Diseases and the National Center for Zoonotic, Vector-Borne, and Enteric Diseases to create the National Center for Emerging and Zoonotic Infectious Diseases.

^ Viral Hepatitis was added in 2007

<sup>1</sup> FY10-FY14 numbers reflect total budget authority and include PPHF funding for Immunization and Respiratory Diseases, HIV/AIDS and Emerging and Zoonotic Infectious Diseases

<sup>2</sup> FY2014 numbers are enacted levels. Beginning in FY14, CDC moves funds from each budget line to the Working Capital Fund for business services, resulting in different operating budgets from enacted levels. Source: <http://www.cdc.gov/fmo/topic/wcf/index.html>

**Immunization and Respiratory Diseases**  
 Source FY 2015: <http://rules.house.gov/sites/republicans.rules.house.gov/files/113-1/PDF/113-HR83sa-ES-G.pdf>  
 Source FY 2014: <http://docs.house.gov/billsthisweek/20140113/113-HR3547-JSOM-G-I.pdf>  
 Source FY 2012-2013: [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2013\\_CDC\\_Full-Year\\_CR\\_Operating\\_Plan.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2013_CDC_Full-Year_CR_Operating_Plan.pdf)  
 Source FY 2009-2011: [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2014\\_CJ\\_CDC\\_FINAL.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2014_CJ_CDC_FINAL.pdf), pg. 52  
 Source FY 2008: [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2013\\_CDC\\_CJ\\_Final.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2013_CDC_CJ_Final.pdf), pg. 41  
 Source FY 2007: [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2012\\_CDC\\_CJ\\_Final.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2012_CDC_CJ_Final.pdf), pg. 51  
 Source FY 2006: [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2011\\_CDC\\_CJ\\_Final.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2011_CDC_CJ_Final.pdf), pg. 53

**HIV/AIDS, Viral Hepatitis, STI and TB Prevention**  
 Source FY 2015: <http://rules.house.gov/sites/republicans.rules.house.gov/files/113-1/PDF/113-HR83sa-ES-G.pdf>  
 Source FY 2014: <http://docs.house.gov/billsthisweek/20140113/113-HR3547-JSOM-G-I.pdf>  
 Source FY 2012-2013: [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2013\\_CDC\\_Full-Year\\_CR\\_Operating\\_Plan.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2013_CDC_Full-Year_CR_Operating_Plan.pdf)  
 Source FY 2009-2011: [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2014\\_CJ\\_CDC\\_FINAL.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2014_CJ_CDC_FINAL.pdf), pg. 74  
 Source FY 2008: [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2013\\_CDC\\_CJ\\_Final.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2013_CDC_CJ_Final.pdf), pg. 60  
 Source FY 2007: [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2012\\_CDC\\_CJ\\_Final.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2012_CDC_CJ_Final.pdf), pg. 70  
 Source FY 2006: [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2011\\_CDC\\_CJ\\_Final.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2011_CDC_CJ_Final.pdf), pg. 73

**Emerging and Zoonotic Infectious Diseases**  
 Source FY 2015: <http://rules.house.gov/sites/republicans.rules.house.gov/files/113-1/PDF/113-HR83sa-ES-G.pdf>  
 Source FY 2014: <http://docs.house.gov/billsthisweek/20140113/113-HR3547-JSOM-G-I.pdf>  
 Source FY 2012-2013: [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2013\\_CDC\\_Full-Year\\_CR\\_Operating\\_Plan.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2013_CDC_Full-Year_CR_Operating_Plan.pdf)  
 Source FY 2009-2011: [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2014\\_CJ\\_CDC\\_FINAL.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2014_CJ_CDC_FINAL.pdf), pg. 108  
 Source FY 2006-2008: [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2011\\_CDC\\_CJ\\_Final.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2011_CDC_CJ_Final.pdf), pg. 99

CDC OFFICE OF PUBLIC HEALTH PREPAREDNESS AND RESPONSE FUNDING TOTALS AND SELECT PROGRAMS														
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014 <sup>^</sup>	FY 2015 <sup>^^</sup>
CDC Total*	\$1,747,023,000	\$1,533,474,000	\$1,507,211,000	\$1,622,757,000	\$1,631,173,000	\$1,472,553,000	\$1,479,455,000	\$1,514,657,000	\$1,522,339,000	\$1,415,416,000	\$1,329,479,000	\$1,231,858,000	\$1,323,450,000	\$1,352,551,000
State and Local Preparedness and Response Capability**	\$940,174,000	\$1,038,858,000	\$918,454,000	\$919,148,000	\$823,099,000	\$766,660,000	\$746,039,000	\$746,596,000	\$760,986,000	\$664,294,000	\$657,418,000	\$623,209,000	\$655,750,000	\$661,042,000
SNS	\$645,000,000	\$298,050,000	\$397,640,000	\$466,700,000	\$524,339,000	\$496,348,000	\$551,509,000	\$570,307,000	\$595,661,000	\$591,001,000	\$533,792,000	\$477,577,000	\$535,000,000	\$534,343,000

\* CDC Total also includes CDC Preparedness and BioSense

\*\* May include Public Health Emergency Preparedness (PHEP) cooperative agreements, All Other State and Local Capacity, Centers for Public Health Preparedness, Advanced Practice Centers (FY2004-09), Cities Readiness Initiative, U.S. Postal Service Costs (FY 2004), and Smallpox Supplement (FY 2003).

<sup>^</sup> FY2014 numbers are enacted levels. Beginning in FY14, CDC moves funds from each budget line to the Working Capital Fund for business services, resulting in different operating budgets from enacted levels. Source: <http://www.cdc.gov/fmo/topic/wcf/index.html>

<sup>^^</sup> Totals do not include Ebola funding

Source FY 2015: <http://rules.house.gov/sites/republicans.rules.house.gov/files/113-1/PDF/113-HR83sa-ES-G.pdf>  
 Source: FY 2014: <http://docs.house.gov/billsthisweek/20140113/113-HR3547-JSOM-G-I.pdf>  
 Source: FY 2012-13: [http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations\\_budget\\_form\\_pdf/FY2013\\_CDC\\_Full-Year\\_CR\\_Operating\\_Plan.pdf](http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2013_CDC_Full-Year_CR_Operating_Plan.pdf)  
 Source: FY 2010-11: U.S. Centers for Disease Control and Prevention. "2011 Operating Plan." [http://www.hhs.gov/asfr/ob/docbudget/2011operatingplan\\_cdc.pdf](http://www.hhs.gov/asfr/ob/docbudget/2011operatingplan_cdc.pdf)  
 Source: FY 2002-09: <http://www.cdc.gov/phpr/publications/2010/Appendix3.pdf>

## Key Federal Infectious Disease Program Funding

NATIONAL INSTITUTES OF HEALTH (NIH)—INFECTIOUS DISEASE														
	FY 2002	FY 2003*	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015^^
National Institute of Allergy and Infectious Diseases	\$2,367,313,000	\$3,706,722,000	\$4,304,562,000	\$4,402,841,000	\$4,414,801,000	\$4,417,208,000	\$4,583,344,000	\$4,702,572,000	\$4,818,275,000	\$4,775,968,000	\$4,486,473,000	\$4,230,080,000	\$4,392,670,000	\$4,358,541,000
<p>* In 2003 NIAID added biodefense and emerging infectious diseases (BioD)</p> <p>^^ Totals do not include Ebola funding</p> <p>Source FY 2015: <a href="http://rules.house.gov/sites/republicans.rules.house.gov/files/113-1/PDF/113-HR83sa-ES-G.pdf">http://rules.house.gov/sites/republicans.rules.house.gov/files/113-1/PDF/113-HR83sa-ES-G.pdf</a></p> <p>Source FY 2013-2014: <a href="http://officeofbudget.od.nih.gov/pdfs/FY15/FY2015_Supplementary_Tables.pdf">http://officeofbudget.od.nih.gov/pdfs/FY15/FY2015_Supplementary_Tables.pdf</a></p> <p>Source FY 2012: <a href="http://officeofbudget.od.nih.gov/pdfs/FY14/POST%20ONLINE_NIH.pdf">http://officeofbudget.od.nih.gov/pdfs/FY14/POST%20ONLINE_NIH.pdf</a></p> <p>Source FY 2002-2011: <a href="http://officeofbudget.od.nih.gov/pdfs/FY12/Approp.%20History%20by%20IC%292012.pdf">http://officeofbudget.od.nih.gov/pdfs/FY12/Approp.%20History%20by%20IC%292012.pdf</a></p>														

OFFICE OF ASSISTANT SECRETARY FOR PREPAREDNESS AND RESPONSE FUNDING TOTALS AND SELECT PROGRAMS														
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015^^
ASPR Totals	--	--	--	--	\$632,000,000	\$694,280,000	\$632,703,000	\$788,191,000	\$891,446,000	\$913,418,000	\$925,612,000	\$897,104,000	\$1,054,375,000	\$1,045,580,000
HPP^	\$135,000,000	\$514,000,000	\$515,000,000	\$487,000,000	\$474,000,000	\$474,030,000	\$423,399,000	\$393,585,000	\$425,928,000	\$383,858,000	\$379,639,000	\$358,231,000	\$254,555,000	\$254,555,000
BARDA**	--	--	--	\$5,000,000	\$54,000,000	\$103,921,000	\$101,544,000	\$275,000,000	\$304,948,000	\$415,000,000	\$415,000,000	\$415,000,000	\$415,000,000	\$415,000,000
BioShield Special Reserve Fund	--	--	\$5,600,000,000*	--	--	--	--	--	--	--	--	--	\$255,000,000	\$255,000,000
<p>* One-time Funding</p> <p>^ HPP moved from HRSA to ASPR in 2007</p> <p>** BARDA was funded via transfer from Project BioShield Special Reserve Fund balances for FY2005-FY2013</p> <p>^^ Totals do not include Ebola funding</p> <p>Source FY 2015: <a href="http://rules.house.gov/sites/republicans.rules.house.gov/files/113-1/PDF/113-HR-83sa-ES-G.pdf">http://rules.house.gov/sites/republicans.rules.house.gov/files/113-1/PDF/113-HR-83sa-ES-G.pdf</a></p> <p>Source FY 2014: <a href="http://www.hhs.gov/budget/fy2015/fy2015-public-health-social-services-emergency-budget-justification.pdf">http://www.hhs.gov/budget/fy2015/fy2015-public-health-social-services-emergency-budget-justification.pdf</a></p> <p>Source FY 2013: <a href="http://www.hhs.gov/budget/fy2015/fy2015-public-health-social-services-emergency-budget-justification.pdf">http://www.hhs.gov/budget/fy2015/fy2015-public-health-social-services-emergency-budget-justification.pdf</a></p> <p>Source FY 2012: <a href="http://www.hhs.gov/budget/safety-emergency-budget-justification-fy2013.pdf">http://www.hhs.gov/budget/safety-emergency-budget-justification-fy2013.pdf</a></p> <p>Source FY 2010-11: <a href="http://www.hhs.gov/asfr/ob/docbudget/2011operatingplan_phsef.pdf">http://www.hhs.gov/asfr/ob/docbudget/2011operatingplan_phsef.pdf</a></p> <p>Source FY 2008-09: <a href="http://www.hhs.gov/asfr/ob/docbudget/2010phsef.pdf">http://www.hhs.gov/asfr/ob/docbudget/2010phsef.pdf</a>, p. 8</p> <p>Source FY 2007: <a href="http://www.hhs.gov/budget/09budget/budgetfy09cj.pdf">http://www.hhs.gov/budget/09budget/budgetfy09cj.pdf</a>, p. 288</p> <p>Source FY 2006: <a href="http://www.hhs.gov/asfr/ob/docbudget/2008budgetinbrief.pdf">http://www.hhs.gov/asfr/ob/docbudget/2008budgetinbrief.pdf</a>, p. 109</p> <p>Source BARDA FY 2005-06: <a href="http://www.hhs.gov/asrt/ob/docbudget/2010phsef.pdf">http://www.hhs.gov/asrt/ob/docbudget/2010phsef.pdf</a>, p. 45.</p> <p>Source HPP FY 2005: <a href="http://archive.hhs.gov/budget/07budget/2007BudgetInBrief.pdf">http://archive.hhs.gov/budget/07budget/2007BudgetInBrief.pdf</a>, p. 20</p> <p>Source HPP FY 2004: <a href="http://archive.hhs.gov/budget/06budget/FY2006BudgetInBrief.pdf">http://archive.hhs.gov/budget/06budget/FY2006BudgetInBrief.pdf</a>, p. 16</p> <p>Source HPP FY 2003: <a href="http://archive.hhs.gov/budget/05budget/fy2005bibfinal.pdf">http://archive.hhs.gov/budget/05budget/fy2005bibfinal.pdf</a>, p. 16</p> <p>Source HPP FY 2002: <a href="http://archive.hhs.gov/budget/04budget/fy2004bib.pdf">http://archive.hhs.gov/budget/04budget/fy2004bib.pdf</a>, p. 14</p>														



## KEY INFECTIOUS DISEASE AND EMERGENCY RESPONSE RESPONSIBILITIES

Requirements for an effective 24/7 approach to combat infectious disease threats include:

- Strong surveillance to identify and monitor ongoing and emerging infectious disease outbreaks;
- Intensive investigative capabilities — including an expert scientific and medical workforce and comprehensive laboratory capabilities — to quickly diagnose outbreaks;
- Containment strategies, including medicines and vaccines to prevent and stop the spread of a disease, well-trained public health disease intervention specialists in all states ready to deploy to conduct contact tracing (identifying how the disease has spread) and under special circumstances collect specimens, and isolation and quarantine when necessary;
- Streamlined and effective communication channels so health workers can swiftly and accurately communicate with each other, other front-line workers and the public about 1) the nature of the disease threat; 2) the risk of exposure and how to seek treatment when needed; and 3) any actions they or their families should take to protect themselves;
- A focused and effective response strategy, including targeted communications, to address the concerns of at-risk populations, such as children, the elderly, pregnant women and groups or areas that are particularly susceptible to a particular threat;
- Coordination and partnership with the healthcare sector to ensure people in need have access to and receive the best available treatment at any stage of an outbreak — including surge capacity for mass outbreaks when necessary;
- An informed and engaged public that can provide material and moral support to professional responders, and can render aid when necessary to friends, family, neighbors and associates;
- Improving research and development of strategies to support non-pharmaceutical disease containment for emerging outbreaks when no or before vaccines or medicines are available; and
- A strong research capacity that is able to rapidly develop new vaccines or medical treatments to counter new threats.

There have been a number of efforts by the IOM, the Transforming Public Health Project funded by the RWJF, CDC and other leading public health groups that have called for establishing and assuring that baseline capabilities are in place nationally and are consistently met across the country.<sup>184,185</sup> This may be achieved through new funding mechanisms or by giving states and localities more flexibility in exchange for increased demonstration of capabilities

and accountability to be achieved — but the current system is not achieving the needed results. For instance, modernizing business practices and finding efficiencies may require exploring innovative approaches such as regionalization, increased healthcare and public health integration, public-private partnerships, resource-sharing and working with Accountable Care Organizations (ACOs), or within new capitated care structures and global health budgets.

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## SOME KEY CDC INFECTIOUS DISEASE PROGRAMS

- **CDC's Epidemic Intelligence Service**

**(EIS):** EIS officers serve as expert “disease detectives” who conduct investigations, research and surveillance — around the United States and abroad. EIS is a two-year post-graduate training program for physicians, nurses, veterinarians and PhD-trained scientists.

- **CDC's Division of Global Health Protection:**

The Division works in over 60 countries to build global public health capacity to rapidly detect, fight and control disease outbreaks. This includes the Global Disease Detection (GDD) Program, the Field Epidemiology Training Program (FETP), National Public Health Institutes Program, Global Health Security, and Emergency Response and Recovery.<sup>186</sup> The GDD program works to strengthen global health security — especially supporting countries with limited capabilities — in order to rapidly detect, accurately identify, and promptly contain emerging infectious disease and intentional bioterrorist threats that occur.<sup>187</sup> FETP has trained more than 3,000 field epidemiologists globally to become “disease detectives” in their home countries and quickly identify causes of communicable and non-communicable outbreaks. CDC has begun providing technical support to 30 countries through the Global Health Security program to better prevent, detect and respond quickly and effectively to public health threats in accordance with the Global Health Security Agenda.

- **Public Health Emergency Preparedness Cooperative Agreement Program:**

PHEP provides formula-based cooperative agreement funds to states, territories and urban areas to build and sustain the ability to prepare for and respond to all types of major health emergencies.<sup>188</sup> PHEP focuses on 15 key capability areas, including community preparedness; community

recovery; emergency operations coordination; emergency public information and warning; facility management; information sharing; mass care; medical countermeasure dispensing; medical materiel management and distribution; medical surge; non-pharmaceutical interventions; public health laboratory testing; public health surveillance and epidemiological investigations; responder safety and health; and volunteer management.<sup>189</sup>

- **Strategic National Stockpile:** The SNS is a national repository of antibiotics, chemical antidotes and other medicines and medical supplies for use during a major disease outbreak, bioterror or chemical attack or other public health emergency.<sup>190</sup> Push Packages of supplies are kept in secure locations around the country and are immediately deployed during emergencies — and/or the federal government also can employ systems to work with some private pharmaceutical distribution companies and pharmacies to be able to distribute vaccines or medicines during an outbreak.

- **WHO Collaborating Center:** CDC's Influenza Division has served as a WHO Collaborating Center for Surveillance, Epidemiology, and Control of Influenza in Atlanta, Georgia since 1956 and is the largest global resource and reference center supporting public health interventions to control and prevent pandemic and seasonal influenza. As a WHO Collaborating Center, CDC's Influenza Division plays a major role in year-round surveillance for early detection and identification of antigenically drifted seasonal influenza viruses as well as novel influenza A viruses that may have pandemic potential. The Influenza Division collects and analyzes influenza viruses from around the world for epidemiological, antigenic (immune response), antiviral susceptibility and genetic characterizations.

# DIVISION OF STRATEGIC NATIONAL STOCKPILE AMERICA'S EMERGENCY MEDICAL SUPPLIES TO PROTECT THE PUBLIC'S HEALTH

To prepare and support partners and provide the right resources at the right time to secure the nation's health

**+**  
THE STRATEGIC NATIONAL STOCKPILE (SNS) contains  
**>\$6 billion**  
worth of medicines and medical supplies

**SNS HAS THE ABILITY TO RESPOND TO:**

**Bacterial and viral diseases**



**Pandemic influenza**



**Radiation/nuclear emergency**



**Chemical attacks**



**Natural disasters**



## THE STRATEGIC NATIONAL STOCKPILE



### Managed Inventory

Includes specific medicines, vaccines, and supplies for a defined need



### CHEMPACK

Forward-placed containers of nerve-agent antidotes that can be used to respond to a chemical attack



### Federal Medical Station

Rapidly deployable reserve of beds, supplies, and medicines to accommodate 50-250 people with health-related needs and low-acuity care



### 12-hour Push Package

50 tons of emergency medical resources that can be delivered anywhere in the U.S. within 12 hours



The SNS holds medical supplies unavailable from other sources and specially designed for unusual or rare threats



90% of the U.S. population is within one hour of a CHEMPACK location

## PARTNERSHIPS IN PREPAREDNESS

CDC's Division of Strategic National Stockpile works with state and local health departments, as well as the private sector, to ensure that medicine and supplies get to the people who need them most during an emergency.

## HOW?



**Practice:** Leading training courses and exercises to prepare state and local partners to receive, distribute and dispense SNS resources during an emergency.



**Send in the SNS Experts:** If needed, multiple teams of experts are prepared to deploy to locations receiving SNS resources.



**Community Resilience:** Create relationships between public health and community partners for distributing and dispensing SNS resources in an emergency.



Centers for Disease Control and Prevention  
Office of Public Health Preparedness and Response

CS2560968

## RECOMMENDATIONS: Public Health — Leadership, Foundational Capabilities and Funding

To achieve a more effective, efficient and modern approach to combating infectious disease threats, TFAH recommends that health departments at the federal, state and local levels establish foundational capabilities to ensure consistent, basic levels of protection across the country — and public health departments at all levels must receive adequate funding to achieve these capabilities, including:

- **Infectious disease policy — including for emerging threats — should be driven by the best available science and be consistent across the country, especially in the midst of a dynamic outbreak:**

Public health should be based on the best available evidence to weigh the potential benefits and harms of policies such as social distancing, direct monitoring of travelers and quarantine.

- **Appointing a permanent Special Assistant to the President for Health Security:** There should be a White House public health leadership position to manage infectious and other public health threats — and be responsible for coordinating a government-wide approach to preparedness, response and recovery efforts. While the appointment of an emergency Ebola response coordinator was important, there is an ongoing gap in the permanent structure of the White House to respond effectively to emerging and ongoing public health threats.

- **Improving federal, state, local and interstate coordination during a multi-agency emergency response:** At the federal level, in addition to increased White House leadership and engagement, there must be improved interagency synchro-

nization and integration in response to outbreaks and other public health emergencies ranging from the West Virginia chemical spill to the Ebola outbreak. There must also be improved coordination across the levels of governments and agencies within government as well as across regions, states and jurisdictions.

- **Increasing support for global infectious disease prevention and control programs:**

Infectious disease control strategies rely on the ability to detect and contain diseases as quickly as possible — which means working with other countries and across borders to contain threats globally. Additional support and priority must be placed on strengthening global public health infrastructure and the Global Health Security Agenda — including the need to improve surveillance, laboratory systems, public health workforce, communications and other basic capabilities; and global health programs at CDC, the State Department, Department of Defense, National Institutes of Health and other U.S.-based programs; and partnering with WHO and other countries.

- **Increasing funding for public health at the federal, state and local levels:**

Federal, state and local health departments must receive a sufficient level of funding, and some existing funding lines may need to be realigned to be able to ensure all states are able to meet and maintain a core set of foundational capabilities so they can adequately respond to emerging and ongoing threats. The use of all federal public health funds and the outcomes achieved from the use of funds must be transparent and clearly communicated with the public.

- **Defining, prioritizing and fully funding a set of foundational capabilities for public health departments at all levels of government:**

Public health departments need the tools and skills that are necessary to provide basic public protections while adapting to and effectively addressing changing health threats. The IOM and RWJF's Transforming Public Health project have identified key foundational capabilities.<sup>191</sup><sup>192</sup> In 2015, Washington state issued Foundational Public Health Services: A New Vision for Washington State, their assessment of defined, basic set of capabilities and programs that must be present in every community in order to efficiently and effectively protect all people in Washington.<sup>193</sup>

- **Maintaining the Prevention and Public Health Fund (PPHF):** The PPHF invests in systems that are essential to infectious disease prevention, such as epidemiology and laboratory capacity grants, the 317 Immunization Program, and healthcare associated infection prevention efforts.

- Exploring new funding and business models to assure sufficient levels of funding to support foundational capabilities — including better integration of public health with the larger healthcare system. The federal government and states should develop a new financing system for public health that gives priority to foundational capabilities and assures that every American is served by a health department that has these capabilities. This can be achieved through new funding mechanisms or by giving states more flexibility with existing funding streams. Modernizing busi-

ness practices and finding efficiencies may require innovative approaches such as regionalization of some capabilities, public-private partnerships, resource sharing and participating in Accountable Care Organizations or Accountable Health Communities (AHCs).<sup>194</sup> This should include continued and expanded emphasis for ongoing training and drilling between local health departments, healthcare systems and emergency response teams in preparedness for possible outbreaks of highly infectious diseases.

- **Establishing an emergency reserve**

**fund:** When a major new outbreak threat occurs, the current appropriations process, even for emergency supplemental funding, lags behind the spread of the disease, and this lack of available resources hampers the response and requires diverting resources from other ongoing public health priorities. There should be a contingency fund for rapid use during an emergency, which would allow an immediate response to a crisis.

- **Advancing a shared framework for isolation, quarantine, movement and monitoring decisions:** Guidance can be used

to control outbreaks by restricting individuals exposed to infectious diseases and contact with others. Despite years of experience and planning for quarantine scenarios, the federal government and state governments struggled to respond to the domestic Ebola threat with a cogent and consistent approach to administer and execute quarantine and isolation, raising the question of transparency and reliance on uniform scientific and medical rationale. Federal, state and local public health and policy leaders should come together and agree on a common decision-making framework ahead of the next outbreak to help states make movement and monitoring decisions that 1) are based upon the best available scientific and medical evidence; 2) preserve social and economic continuity to the greatest extent possible; and 3) are in the best interest of the public's health.<sup>195</sup>

- **Improving and coordinating risk communications:** The Ebola outbreak raised concerns about risk communications and media relations capabilities — there was a significantly disproportionate sense of concern in relation to the very low risk that Americans faced. Conflict-

ing messages from different sources and unnecessary actions taken based on perception rather than science compounded the confusion and contributed to rising levels of fear. Improved communications strategies could help better educate and inform the public and communities about their relative risk and what measures, if any, are being taken or are needed to help protect themselves and their families. In communicating with the public and healthcare workers, public health should take into account uncertainty of an evolving situation and partner with trusted community sources in outreach to at-risk communities. Public health should establish relationships with media ahead of crises and leverage social media to ensure accurate information reaches the public. Communications strategies must prepare the public — as well as policy makers — that policies may shift as understanding of the threat evolves. CDC communication should coordinate with international counterparts — such as WHO — and should also build bidirectional communication pathways with state and local public health departments on a regular basis, not just during the outbreak.

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## A NATIONAL BLUEPRINT FOR BIODEFENSE: Leadership and Major Reform Needed to Optimize Efforts<sup>196</sup>

In October 2015, the bipartisan Blue Ribbon Study Panel on Biodefense issued a Blueprint identifying the need for increased leadership to elevate coordination and collaboration and drive innovation to improve the nation's preparedness for biological threats. Panel members include: former Senator Joseph

Lieberman (co-chair), Governor Thomas Ridge (co-chair); former U.S. Secretary of HHS Donna Shalala, Senator Thomas Daschle, Representative James Greenwood and Kenneth Wainstein. The Blueprint for Biodefense recommendations included: having a strong comprehensive national biodefense strategy and plan,

modernizing and updating biosurveillance and information systems, improving and incentivizing the medical countermeasures enterprise, providing support to build and maintain coordinated and functional hospital preparedness and maintaining sufficient and ongoing support for state and local preparedness capacity.

## B. MODERNIZE DISEASE SURVEILLANCE: For Detecting, Tracking and Containing Disease Threats

One of the most fundamental components of infectious disease prevention and control is the ability to identify new and track ongoing outbreaks.

Currently, the United States lacks an integrated, national approach to biosurveillance — which limits the rapid detection and tracking of diseases. As of 2011, there were more than 300 different health surveillance systems or networks supported by the federal government.<sup>197</sup> Most of the systems are not integrated or interoperable and serve an array of different purposes.

Surveillance allows health professionals to quickly identify an emerging infectious disease or foodborne illness outbreak. But systems that track ongoing concerns must also be modernized to provide more timely and coordinated data, so health professionals can better detect and contain threats. For instance, there is often a lag in the reported data for diseases like HIV/AIDS, which limits the ability to target effective prevention strategies and interventions when they are needed. The recent rapid growth of hepatitis C outbreaks — corresponding to the rise in injection drug use in some communities — shows the importance of being able to identify long-standing disease concerns in real-time and to assess how effective prevention and control strategies may be or when adjustments or further action is needed. For instance, the lack of appropriate subtyping tools has been a challenge for identifying the source of recent outbreaks of cyclosporiasis, a foodborne parasitic infection, in the United States.

Current systems do not capitalize on the advances that have been made in information technology to be able to track disease threats and trends — compromising the ability to quickly detect, diagnose and contain outbreaks.

- At a federal level, CDC runs the majority of national human health surveillance networks. Some of these include the Arboviral Surveillance System (ArboNET), BioSense, Electronic Food-Borne Disease Outbreak Reporting System (eFORS), Emerging Infection Program (EIP), Environmental Public Health Tracking Network, Global Disease Detection and the National Outbreak Reporting System (NORS).
- Within each state there are also often more than a dozen health surveillance systems that work independently and voluntarily feed data to the corresponding national network at CDC.
- In addition, other federal agencies and departments have their own biosurveillance systems, including the Environmental Protection Agency, Department of Homeland Security (DHS), USDA, Food and Drug Administration (FDA), Department of Veterans Affairs (VA), Department of Defense (DoD) and the Office of the Director of National Intelligence (ODNI).



In 2014, CDC released a Surveillance Strategy to facilitate consolidating systems, eliminate unnecessary redundancies and reduce reporting burdens by supporting a system that would achieve four cross-cutting priority initiatives: standardizing health data and exchange systems through the Notifiable Diseases Surveillance System (NNDSS) Modernization Initiative, enhancing the National Syndromic Surveillance Program (including BioSense) to make real-time pre-diagnostic data from electronic health records more accessible and usable, accelerating electronic lab reporting and enabling rapid electronic mortality reporting through the National Vital Statistics System (NVSS). CDC is currently working to integrate

surveillance systems through shared IT services. This work will provide new opportunities for data integration; data analysis and visualization; and advancing work with electronic health records and other emerging health information technology. These efforts can be accelerated through additional resource investments. Based on progress to date, CDC anticipates:

- By 2016, 90 percent of data on nationally notifiable diseases will be transmitted through NNDSS using Health Level 7 (HL7) standards thereby enhancing timeliness, availability and usability by CDC programs and state, territorial, local and tribal (STLT) agencies.

- In 2016, the NSSP will provide enhanced systems and tools through the BioSense Platform to support timely exchange of syndromic surveillance data among local, state, and federal agencies for nationwide situational awareness and response to hazardous events and disease outbreaks.
- In 2016, 70 percent of laboratory reports to public health agencies (CDC and states) will be received as electronic lab reports.
- In 2016, 70 percent of death reports (i.e., cause of death) occurring in at least 25 states will be transmitted electronically to public health agencies within one day of registration and to CDC/National Center for Health Statistics.<sup>198</sup>

## RECOMMENDATIONS: Modernizing Disease Surveillance

Disease surveillance needs to be dramatically improved to become a true real-time, interoperable system, able to quickly identify outbreaks and threats and implement containment and treatment strategies. Advances in health information technology (HIT) and EHRs provide new opportunities to integrate and improve systems. TFAH recommends expeditiously moving forward on the recommendations of the 2014 CDC Surveillance Strategy,<sup>199</sup> the 2012 National Biosurveillance Strategy<sup>200</sup> and the 2013 National Biosurveillance Science and Technology Roadmap<sup>201</sup> and addressing key concerns, including:

- **Modernizing and integrating systems:** Significant new investments are needed to update the disease surveillance landscape, including internal CDC systems and state and local informatics capacity. The federal government should work to upgrade systems to the latest technologies to allow for real-time and interoperable tracking of diseases — to more efficiently collect and analyze data, to better identify threats and to understand how threats can be interrelated. By investing in modernization now, the public health system at the federal and state levels could save money in the long run by reducing duplicative, work-intensive legacy systems.

- At a state and local level, many health departments still lack the basic hardware, software, and staff training to be able to receive and interpret data from EHRs or other sources and to be able to integrate or upgrade systems. Support for building and maintaining baseline capabilities should be a high priority.

- CDC should review its grants that include a disease surveillance component to ensure they dovetail with the agency's surveillance strategy by prioritizing interoperability and integration of data systems, upgrading state and local health informatics workforce and technical capacity, adapting to a standardized messaging language, and reducing redundancy and reporting burden.

- **Supporting new technological advances:**

Even the most developed systems at CDC must continually be upgraded to take advantage of new technological advances. For instance, technologies to make point-of-care (POC) diagnostics increasingly available would greatly improve appropriate care during mass emergencies. Also, prioritizing funding of CDC's Advanced Molecular Detection (AMD) initiative to build molecular sequencing and bioinformatics capacities would allow public health workers to rapidly look for

a pathogen's match to more efficiently identify an outbreak.<sup>202</sup>

- **Leveraging Health Information Technology:** The increased widespread and consistent use of EHRs and electronic laboratory reporting have the potential to provide public health officials with data in real time and offer two-way communication between healthcare providers and health departments. This can allow health departments with better, faster data to track outbreaks and let providers know about risks to their patients in a more timely way. The Office of the National Coordinator for Health Information Technology (ONC) must work with software developers, public health professionals, providers and laboratorians to ensure information exchange is feasible and accessible while maintaining patient privacy. Government agencies should set standards for data, identify what health information is most relevant for public health purposes, and ensure that public health agencies have ready access to these data and the capacity to analyze information. CDC should continue to explore the feasibility and implementation of a cloud-based platform for electronic case reporting. Such a platform would enable healthcare providers and public health to exchange de-identified health data on a common system, rather than separate systems for each state.



## C. Incentivize and Support Medical Countermeasure Research, Development and Distribution

The government is often the only real customer for most medical countermeasure products, such as anthrax and smallpox vaccines. As a result, the U.S. government has invested in the research, development and stockpiling of emergency MCMs for a pandemic, bioterror attack, emerging infectious disease outbreak, or chemical, radiological, or nuclear event.

Development of medical products for the nation's biodefense is a key piece of any public health emergency response. A successful domestic MCM enterprise will prepare the nation for new threats, expected or unexpected, by building the science, policy and production capacity in advance of an outbreak.

Congress enacted Project BioShield in 2004 to spur development and procurement of MCMs. The Pandemic and All-Hazards Preparedness Act (PAHPA) of 2006 established and authorized the Biomedical Advanced Research and Development Authority (BARDA) to speed up the development of MCMs by supporting advanced research, development and testing; working with manufacturers and regulators; and helping companies devise large-scale manufacturing strategies. BARDA bridges the funding gap between early research and production.<sup>203</sup> The Project BioShield Special Reserve Fund (SRF) was originally established as a \$5.6 billion fund, over 10 years, to guarantee a market for newly developed vaccines and medicines needed for biodefense that would not otherwise have a commercial market. After delivering 12 new medical countermeasures to the Strategic National Stockpile, that

initial investment has been depleted and is now dependent on substantially decreased appropriations of \$255 million annually.

The Public Health Emergency Medical Countermeasures Enterprise (PHEMCE), created in 2006 by HHS, is made up of federal partners, including the Office of the Assistant Secretary of Preparedness and Response, CDC, FDA, NIH, DoD, VA, DHS and USDA, responsible for protecting the nation from the health effects associated with chemical, biological, radiological and nuclear (CBRN) threats, through the use of MCMs. In 2014, ASPR released a PHEMCE Strategy and Implementation Plan, which provide the blueprint the PHEMCE will follow for the next five years to achieve its strategic goals, which include developing critical MCMs, establishing clear regulatory pathways, developing operational plans for use, and addressing gaps and plans for making sure new MCMs are available for all sectors of the population.<sup>204</sup> PHEMCE will require significant new investments to achieve the goals outlined.

BARDA, along with partners at NIH, FDA, CDC, DoD, international health agencies and private companies have been instrumental in making advances

toward developing vaccines and treatments being piloted for Ebola. Due to Ebola supplemental funding, BARDA's portfolio of Ebola MCMs grew from no candidates in early 2014 to 10 vaccine and therapeutic candidates in eight months to address the current and future Ebola epidemics and potential Ebola-related bioterrorism acts.<sup>205</sup>

In 2015, in addition to multiple Ebola products, HHS invested in research and development of a new anthrax vaccine and test, novel antibiotics, mass decontamination response, a treatment for mustard gas, experimental flu antivirals, more effective flu vaccines, and burn treatments.<sup>206</sup> All told, BARDA investments have resulted in over 160 candidate products in the pipeline for CBRN threats and pandemic influenza, with eight products receiving FDA approval in the past three years and 12 products procured for the SNS through Project BioShield.<sup>207</sup>

- **FDA and Biomedical Infectious Disease Research, Development and Safety:** FDA plays an important role in the development and approval of new drugs and devices. The agency can also expedite the development



Source: Bavarian Nordic

and availability of medical products — treatments, vaccines, diagnostic tests and PPE — to help bring an epidemic under control as quickly as possible. Under its Emergency Use Authorization (EUA) authority, FDA can allow the use of an unapproved medical product — or an unapproved use of an approved medical product — for a larger

population during emergencies, when there is no adequate, approved and available alternative.<sup>208</sup> In August 2010, FDA launched the Medical Countermeasures Initiative (MCMi) to help define and prioritize requirements for MCMs in public health emergencies, coordinate research, set deployment and use strategies, and facilitate access to products.<sup>209</sup>

## NEW SCREENING TESTS

Reliable, rapid and simple screening tests can speed up diagnosis and reporting and enhance faster access to care.

A new paper-based test has been developed to quickly diagnose Ebola, dengue fever and yellow fever in the field with no electricity or running water. It uses multicol-

ored, prism-shaped silver nanoparticles to detect multiple infections by capturing virus proteins from a patient's blood. The paper turns red for Ebola, green for dengue or orange for yellow fever. While not as accurate as the controlled lab-based tests PCR and enzyme-linked immunosorbent assay

(ELISA), these paper-based tests provide an important tool for health professionals out in the field to track outbreaks. The time and location of each test can be read by a cellphone and uploaded to the Internet to generate a map of the outbreak.<sup>210</sup>

## RECOMMENDATIONS: Improving Research, Development and Distribution of Medical Countermeasures

TFAH recommends that the United States place a higher priority on research, development and procurement of MCMs, including vaccines, medicines and diagnostics. Policymakers must ensure that the public health system is involved in this process, from initial investment through distribution and dispensing. The nation's MCM enterprise could be advanced through the following activities:

- Supporting the entire medical countermeasure enterprise, from initial research through stockpiling and community-level distribution and dispensing:** The PHEMCE must receive robust federal funding to ensure continuation of the pipeline, provide assurances to industry that the government will be a reliable partner in development and procurement of new products, and ensure products reach the intended recipients. These funding priorities should include no-year funding in the SRF for procurement; annual funding for advanced development at BARDA; regulatory science in FDA's MCMi to promote safe pathways to approval for new products; adequate resources for the SNS to maintain existing, expiring, and new product stockpiles; and support for state and local health capacity to dispense MCMs. The PHEMCE multiyear budget plan should be a guide for funding these programs for the coming years.
- Exploring alternate uses for MCM innovations:** Some MCM technologies, such as innovations in pandemic influenza vaccine development, may have applications for non-biodefense purposes, such as a severe flu season with a mismatched vaccine. HHS should work with international and private sector

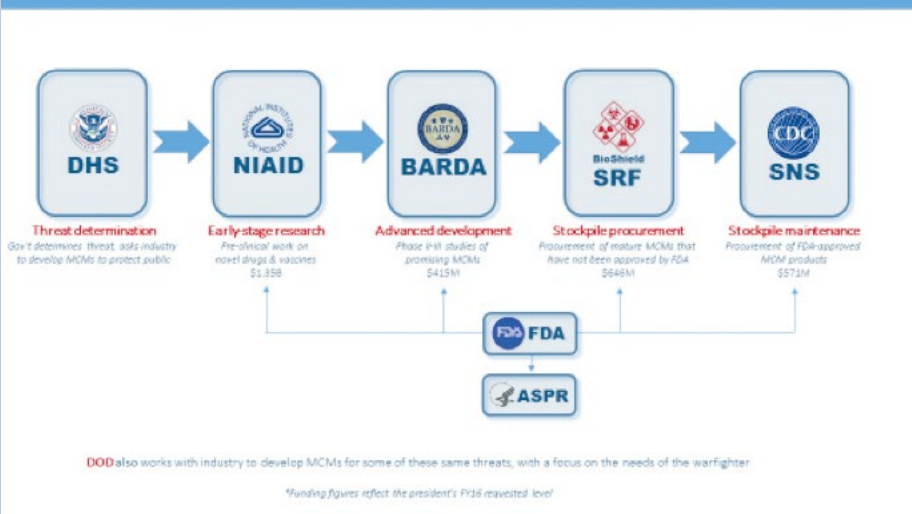
partners to determine the regulatory and scientific barriers to non-emergency use of biodefense technologies.

- Creating new incentives to encourage private sector partners to continue investing in medical countermeasures development:** New incentives are needed to ensure medical countermeasures are developed, licensed, and available to protect Americans from all national security threats. The major incentive for biopharmaceutical companies in biodefense — the “guaranteed market” intended by the BioShield Special Reserve Fund — is effectively gone with limited funding available. One option being explored is extending priority review vouchers for biodefense medical countermeasures to encourage companies to continue development efforts.
- Ensuring the development and availability of safe vaccines and medications for children and pregnant**

**women in the SNS:** Progress continues to be made to make sure there are safe options available for children. The federal government should set a goal to increase the development and procurement of pediatric and obstetrical MCMs so that the right countermeasure in the right dose and formulation at the right time can be safely delivered to all children during an emergency.

- Fostering public-private partnerships for distributing and administering vaccines and medications:** Federal, state and local health departments should partner with nongovernmental entities to develop the most efficient distribution and dispensing mechanisms for MCMs in an emergency. In some communities, private sector, healthcare, community-based or faith-based organizations may have better systems in place to reach target populations.

### HHS Medical Countermeasure Development Pathway



Source: Alliance for Biosecurity

## D. Address Climate Change Impact on Infectious Disease Outbreaks

Health departments have an important role to play in helping communities prepare for the adverse effects of climate change, given their role in building healthy communities. Public health workers are trained to develop communication campaigns that both inform and educate the public about health threats and can use these skills to educate the public about climate change-related disease prevention and preparedness. Public health departments are also on the frontlines when there is an emergency, whether it is a natural disaster or an infectious disease outbreak. These types of emergency preparedness and response skills will be invaluable as extreme weather events become more common.

### RECOMMENDATIONS: Preventing and Preparing for the Adverse Impact of Climate Change on Infectious Disease Outbreaks

To help prevent and prepare for the new and increased infectious disease threats that climate change poses, TFAH recommends:

- **Ensuring every state has a comprehensive climate change adaptation plan that includes a public health assessment and response:** State and local health agencies should engage in public education campaigns and establish relationships with vulnerable populations as part of any plan. States should update state hazard mitigation plans to include climate change adaptation, as proposed by FEMA.
- **Improving prioritization and coordination across public health and environmental agencies:** Public health agencies at all levels must work in coordination with environmental and other agencies to undertake initiatives to reduce known health threats from food, water and air, and educate the public about ways to avoid potential risks. State and local public health departments are also uniquely positioned to help states understand the health impacts of climate change as they work to develop and implement state plans to curb carbon pollution emissions under the EPA Clean Power Plan.
- **Developing sustainable state and local mosquito control programs:** A review by ASTHO found that many states and local communities are challenged to develop and maintain vector control programs, especially in tight budgetary times and when emergency situations have quieted, but that these programs are a vital public health strategy to help control vector-borne diseases.<sup>211</sup>
  - A review by the Council of State and Territorial Epidemiologists of capabilities for surveillance, prevention and control of mosquito-borne virus infections found that the number of staff working at least half time on WNV surveillance has dropped by 41 percent and the number of states conducting mosquito surveillance dropped from 96 to 80 percent; 58 percent of states have reduced mosquito trapping capabilities; and 68 percent of states reduced mosquito testing from 2004 to 2012.<sup>212</sup> Cuts in federal support via the Epidemiology and Laboratory Capacity cooperative agreement program has resulted in reduced mosquito surveillance (trapping, testing or both) in 70 percent of states and 75 percent of local health departments.
- **Expanding the National Environmental Health Tracking Network:** The CDC's environmental public health tracking program should be expanded and fully funded to cover every state. Currently, the program only supports efforts in 23 states and New York City. CDC should be provided with the mandate and resources to expand the network so it can become a centralized, nationwide health tracking center, and each state should receive the necessary funding to fully conduct health-tracking activities. A fully funded tracking network should demonstrate interoperability with the larger HIT system to facilitate two-way communication between clinicians and state and local public health officials.
- **Building resilience to climate-related health effects at the federal, state and local level:** Climate change preparedness should be a required element of PHEP and HPP plans and grants. Funding should be significantly increased to expand CDC's Climate Ready States and Cities Initiative nationwide and to build capacity at the federal, state and local level to understand the impact of climate change and apply this to long-range health planning.

## ONE HEALTH

CDC is part of an international effort that recognizes the importance of human health being connected to the health of the environment and animals.<sup>213</sup> Many new and emerging illnesses are transmitted from animals to humans over time — such as MERS, avian flu or vector-borne diseases transmitted through mosquitos or ticks; and scientists estimate that six in every 10 infectious diseases in humans are spread from animals. Being able to

prevent and rapidly contain the spread of novel, emerging and reemerging diseases before they spread globally has significant implications for national security as well as health.

The initiative focuses on efforts around the globe to prevent and quickly contain zoonotic disease threats. A recent review highlighted One Health activities in 17 different international locations between May 2013 and April 2014.<sup>214</sup>

### National Center for Emerging and Zoonotic Infectious Diseases

## One Health and Zoonoses Activities at 17 Select International Locations

May 2013-April 2014



### Changes Contributing to the Emergence and Reemergence of Animal-Borne Infectious Diseases

Cause	Effect
Human populations are growing and expanding into new geographic areas.	As a result, more people live in close contact with wild and domestic animals. Close contact provides more opportunities for diseases to pass between animals and people.
The earth has experienced changes in climate and land use, such as deforestation and intensive farming practices.	Disruptions in environmental conditions and habitats provide new opportunities for diseases to pass to animals.
International travel and trade have increased.	As a result, diseases can spread quickly across the globe.

Source: One Health, CDC

## E. Build Community Resilience

Ensuring communities can cope with and recover from emergencies such as infectious disease outbreaks is a significant challenge to public health preparedness.



The most vulnerable members of a community, such as children, the elderly, people with underlying health conditions and those with limited-English proficiency, face special challenges that must be considered before disaster strikes.

The resilience of a community — including its ability to recover from disasters — is inextricably linked to that community’s capacity to promote health, wellbeing and engagement.<sup>215</sup>

Resilience is strongly tied to ongoing strong relationships between public health officials and the communities they serve. The benefits of cross-sector collaborations were on display in response to the Boston Marathon bombing, for example, as the city depended on partnerships with nonprofit and faith-based partners to help the city heal.<sup>216</sup> Resilience is also dependent on public efforts to improve the overall health and wellbeing of

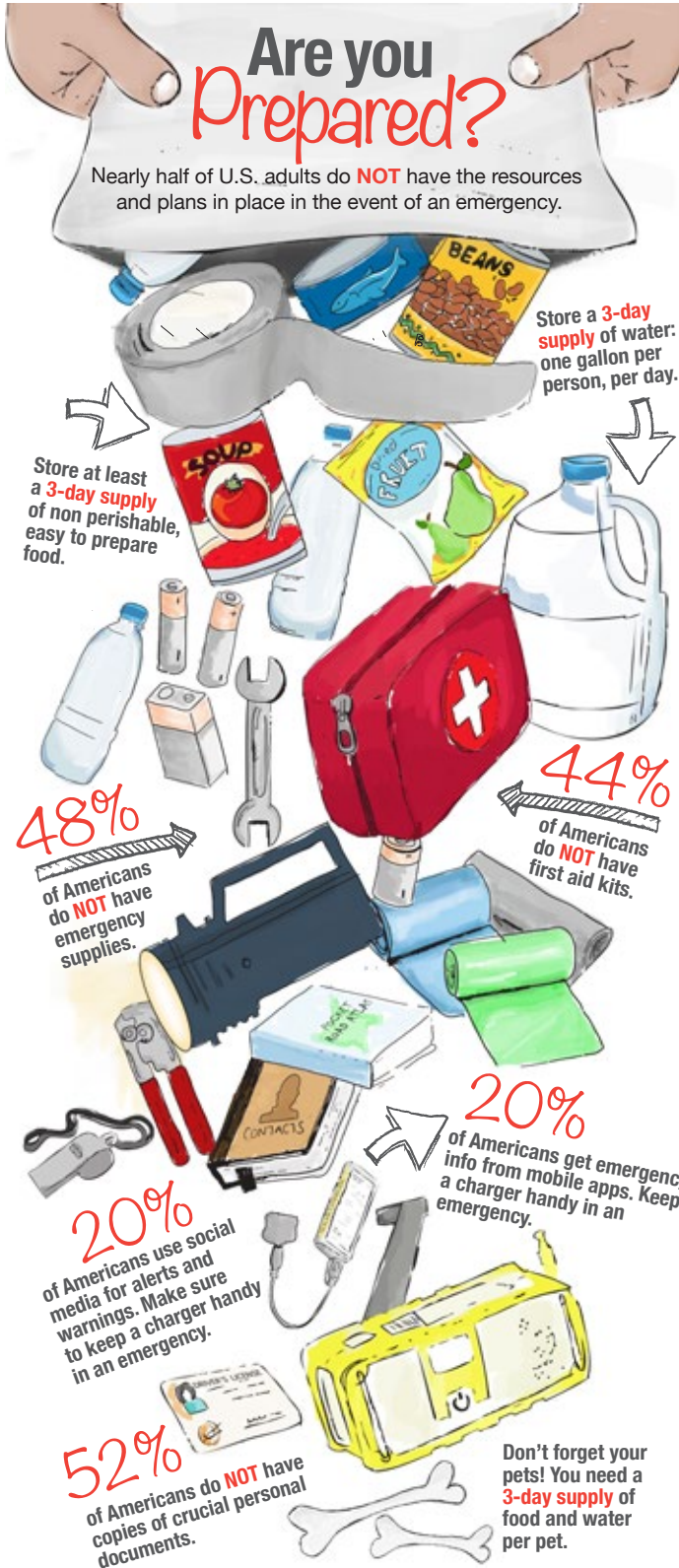
the community.<sup>217, 218</sup> Access to high-quality health and behavioral health services and social services (including those that address homelessness and substance misuse) on an everyday basis can mitigate vulnerabilities for ongoing disease threats and during disasters.<sup>219</sup>

Experts recommend that improving resilience, particularly among vulnerable populations, requires:

- Improving the overall health status of communities so they are in better condition to weather and respond to emergencies. Initiatives and programs supported by the Prevention and Public Health Fund can assist in these efforts;
- Providing clear, accurate, straightforward guidance to the public in multiple languages via trusted sources respecting different cultural perspectives — and delivered via multiple media, beyond the Internet, such as radio, racial and ethnic publications and television;

- Developing ongoing relationships between health officials and members of the community, so they are trusted and understood when emergencies arise; and
- Engaging members of the community directly in emergency planning efforts.

Building community resilience is one of the two overarching goals identified by HHS in the release of the draft Biennial Implementation Plan for the National Health Security Strategy. It calls for fostering informed, empowered individuals and communities. Numerous tools are available to help communities develop resilience capabilities. In 2013, HHS and DHS launched a Community Health Resilience Initiative (CHRI), a public-private collaboration intended to provide stakeholders with resources and guidance to promote resilience in their communities.<sup>220</sup> CDC has also funded the development of a Community Resilience Index: Composite of Post-Event Wellbeing (CoPE-WELL), to develop a predictor of the ability of a community to prepare for, survive and rebuild from a disaster scenario.<sup>221</sup> In 2015, HHS also launched the EmPOWER Map, which helps communities reach Medicare beneficiaries with electricity-dependent equipment who could be at risk during a power outage.<sup>222</sup> RAND also has online toolkits and trainings available to help communities leverage existing resources to build resilience.<sup>223</sup>



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## RECOMMENDATIONS: Improving Community Resilience

Helping build healthier and stronger communities ensures they can cope with and recover from major outbreaks, health emergencies and other disasters more easily. TFAH recommends that improving community resilience should be a top priority for federal, state and local governments, and they should:

- **Support prevention and public health programs:** Prevention programs that help improve the health of communities, such as diabetes and obesity prevention efforts and infection control programs, can decrease the vulnerability for infectious diseases by improving American's underlying health and contribute to strategies to contain the spread of infections and reduce the need for chronic disease services during an emergency.
- **Include community resilience in emergency preparedness plans:** It is important for health officials to know and understand special needs and concerns in different areas of the community, particularly where there are many vulnerable populations. Health officials and emergency management officials must have plans and mechanisms in place to provide assistance to these neighborhoods in times of crisis, and members of these communities should be part of any emergency planning effort to ensure

the needs and concerns of the public are heard and addressed. Federal partners must provide strong technical assistance to allow for the creation of models that can be adapted to meet the needs of specific communities.

- **Build community partnerships and integrate preparedness activities into the ongoing work of public health departments and other social services and community organizations:** Building partnerships and preparedness engagement between health departments and other services, agencies and community groups, such as housing and faith-based organizations, creates important channels for reaching and providing assistance to at-risk individuals and neighborhoods in times of crisis — and should be a core foundational capability for health departments.<sup>224</sup>
- **Incorporate community resilience into hospital activities:** Under recent changes to nonprofit hospitals' Form 990 reporting, the Internal Revenue Service (IRS) will allow a hospital's efforts on community resilience to count as a community benefit activity.<sup>225</sup> Hospitals should incorporate community-wide disaster preparedness planning into their community benefit efforts.

- **Prioritize plans for protecting children:** Special efforts must be made to work with childcare centers and schools to coordinate and plan for emergencies. All childcare facilities should have appropriate disaster plans in place, and public health officials should work with parents, educators, schools and school systems to ensure every school has a plan in place and that the plans are tested. Children should be taught how to be prepared, for example by creating plans to reunify with teachers or parents.
- **Ensure rebuilding efforts incorporate best practices for making the community even stronger:** As communities recover from a disaster, they should be rebuilt to maximize community resilience, health outcomes and social services. The IOM's 2015 report, *Healthy, Resilient, and Sustainable Communities After Disasters: Strategies, Opportunities, and Planning for Recovery*, laid out strategies for communities to improve upon the pre-disaster status quo, including integrating health considerations into recovery decision-making through National Disaster Recovery Framework, engaging the community through accessible information and training, and coordinating recovery resources.<sup>226</sup>



## GUARANTEED PAID SICK LEAVE

Nearly 40 percent of private-sector employees cannot earn paid sick days for their own illness or injury or to care for an ill family member. And low-wage workers are much less likely to be offered paid sick leave than highly paid workers.

Paid sick days help reduce the spread of contagious illnesses and diseases and increase access to preventive care among workers and their families. When workers without paid sick leave get sick, they face the impossible choice of going to work and potentially infecting others or staying home and risking losing their jobs.

Employees who are sick and possibly contagious in the workplace enable the spread of illness among co-workers and customers alike, and the very industries

and occupations that require frequent contact with the public are some of the least likely to provide paid sick days. This increases the chance of infectious diseases spreading through contact with food, co-workers and the general public — and it could threaten the productivity and safety of America's businesses.

Paid sick days help to ensure workers can comply with science-based guidance on controlling the spread of an outbreak. According to a 2010 report, almost 26 million employed Americans age 18 and older may have been infected with the H1N1 influenza in 2009, and nearly eight million people took no time off work while infected.<sup>227</sup> Another recent study found that providing employees who have the flu with

one or two days off could reduce workplace infections by up to 40 percent<sup>228</sup> while another estimates that seasonal flu results in \$18.9 billion per year in indirect costs attributable to lost productivity.<sup>229</sup>

Paid sick days also improve access to preventive care by giving employees the ability to take time to go to a clinician and to ensure their children get routine check-ups and immunizations. A 2012 CDC report found that workers without paid sick time are less likely to get screened for cancer.<sup>230</sup> There are clear signs that delaying or skipping necessary preventive care can result in poor health outcomes and more costly care for the more than 43 million American workers who lack paid sick days and their families.



## F. Health System Preparedness and Enhancing Surge Capacity and Infection Control

In public health emergencies, such as a new or major disease outbreak, a bioterror attack or catastrophic natural disaster, U.S. hospitals and healthcare facilities are on the front lines providing triage and medical treatment to individuals. The ability of our healthcare system to quickly provide safe care for an influx of patients during an emergency is critical, but it is often identified as one of the most difficult components of a preparedness response.

Not only must healthcare facilities be able to quickly ramp up staffing to meet increasing demand, but they must be able to do so with clear and effective safety protocols in place, including adequate personal protective equipment and staff that are highly trained to protect not only patients, but themselves.

- **Basic Infection Control and Safety:**

It is critical that all medical care be provided under conditions that minimize or eliminate risks of healthcare-associated infections and adverse events. Outbreaks and large-scale patient infections continue to be associated with breakdowns in standard precautions and lack of adherence to recommended prevention practices. A strong foundation in infection control and prevention is needed across the healthcare continuum. This will require clear standards, training, and dedicated resources.

- **Emerging Threats:** Healthcare facilities must have standard procedures in place when new serious outbreaks occur to be able to safely diagnose and treat patients, and to ensure that other patients and the healthcare workers themselves are protected from exposure.

This requires a solid foundation built on basic infection control principles, sufficient personal protective equipment and training in the proper use, removal and disposal of protective gear. There must also be regular drilling to simulate potential outbreaks and identify gaps in preparedness.

- **Surge Capacity:** During a severe health emergency — such as a pandemic flu outbreak or mass bioterror attack — the healthcare system would be stretched beyond normal limits. Patients would quickly fill emergency rooms and doctors' offices, exceed the existing number of available hospital beds, and cause a surge in demand for critical medicines, healthcare providers and equipment. The challenge of how to equip hospitals and train healthcare staff to evaluate and care for the large influx of critically injured or ill patients who require treatment after or during a public health emergency remains a challenging issue for public health and medical preparedness. Emergency rooms and intensive care units (ICUs) often have limited numbers of beds, staff and equipment during normal conditions and would be tested if there were a major influx of patients.



The Hospital Preparedness Program, administered by ASPR, provides leadership and funding through grants and cooperative agreements to states, territories and eligible cities to improve surge capacity and enhance coordinated community and hospital preparedness for public health emergencies.<sup>231</sup> HPP was created to build capabilities in the areas of health system preparedness, health system recovery, medical surge, emergency operations coordination, fatality management, information sharing, responder safety and health and volunteer management. HPP supports regional coalitions of healthcare facilities and public and private partners to better use assets across systems, disseminate

information and coordinate planning and response efforts.<sup>232, 233</sup> Through the planning process and cooperation within healthcare coalitions, facilities are learning to leverage resources, such as developing interoperable communications systems, tracking available hospital beds, and sharing assets such as mobile medical units. HPP was reauthorized in the Pandemic and All-Hazards Preparedness Reauthorization Act (PAHPRA, P.L. 113-5), but funding for the program has been cut from a high point of \$515 million in 2004 and is now funded at about \$255 million annually to support the entire nation's health system preparedness.

## RECOMMENDATIONS: Enhancing Health System Preparedness for Infectious Diseases and Surge Capacity

Health system preparedness capacity and capabilities have been one of the most persistent problems in public health preparedness and require increased agreement and implementation on crisis standards of care and improved integration of preparedness concerns into overarching healthcare systems and coordination across public health and healthcare providers. To help improve health system preparedness concerns, while also ensuring safety protocols are in place, TFAH recommends:

- **Continuing to rebuild and modernize the Hospital Preparedness Program, including focusing on:**

- Rebuilding the program by restoring funding to enable adequate development of healthcare coalitions and training and exercising of hospital staff;
- Continuing to prioritize coordination between the inpatient and outpatient health systems, including long-term care facilities and clinical laboratories, and ensure that healthcare coalitions are reaching out to these partners;
- Strengthening coordination between the HPP and CDC programs, including PHEP and other infectious disease control efforts;
- Defining a minimum set of standards and population size that a healthcare coalition must meet to be considered effective. While HPP has avoided being overly-prescriptive with grantees, limited budgets demand that healthcare coalitions should meet a federally-defined standard for their ability to respond to a disaster;
- Refining HPP measures and aligning measures with other health system

quality initiatives, such as CMS measures, Joint Commission standards and National Quality Forum (NQF) measures. The payment system should also promote preparedness and community health resilience by incorporating key indicators of preparedness into clinical quality measures, such as Medicare's shared savings program and Merit-Based Incentive Payment System.<sup>234</sup>; and

- Publicly reporting outcomes data from HPP measures so policymakers can track progress and gaps in the program.

- **Improving hospital preparedness — as a partnership across hospitals, HPP and public health — for emerging and ongoing infectious disease threats:**

- Every hospital should have baseline capabilities for screening and basic isolation capabilities to ensure healthcare workers and patients are safe from a potential threat — including training in infection control and use of protective gear and safe removal and disposal of protective gear and waste. To maximize efficient and effective use of expertise and resources, HHS, state public health departments and hospitals should maintain the “tiered” system created with Ebola response funds — where patients are safely transported to a set of hospitals with increased capabilities and facilities to treat different potential scenarios for a range of types of emerging threats — to ensure a nationwide capability to screen, triage and treat a mass influx of patients during a severe pandemic flu outbreak. This should include supporting and assuring Emergency Management System (EMS) capacity and capabilities as first responders as well as in handling inter-facility transport;

- Hospitals, public health agencies and emergency response units should invest in individual and joint training, drills and preparing frontline health-care workers for unfamiliar infections and disasters;
  - Every hospital and outpatient health-care system should be able to screen for emerging threats, isolate patients when necessary, protect healthcare workers and other patients, and prepare patients for transport if unable to treat;
  - Health systems and HIT vendors should incorporate health alerts from CDC into electronic medical records so that the triage process includes relevant screening questions and decision support. Health providers should routinely take travel histories upon intake and be prepared to promptly isolate potential cases needing evaluation;
  - The inpatient and outpatient healthcare system, HPP and healthcare coalitions, Joint Commission and CMS should ensure health facilities incorporate pediatric considerations, such as those proposed by the Emergency Medical Services for Children National Resource Center, into disaster preparedness plans and capabilities;<sup>235</sup> and
  - Clinical laboratories should have ongoing staff training to ensure familiarity and adherence with protocols for handling, packaging and preparing dangerous pathogens and waste for transport.
- **Incorporating preparedness into the healthcare delivery system:**
    - CMS should finalize and expedite the release of emergency preparedness requirements for Medicare and Medicaid participating providers, which were proposed in 2013.<sup>236</sup> Once finalized, CMS and ASPR should work together to align those requirements with HPP, provide technical assistance to eligible entities, ensure coordination between CMS suppliers and local healthcare coalitions and track progress;
    - Expand telemedicine and telephone triage, such as the Flu On Call model,<sup>237</sup> to increase surge capacity and concentrate resources where needed; and
    - The HPP program and CDC's PHEP program should ensure that communities and health systems are regularly exercising and evaluating emergency response plans.
  - **Establishing and implementing effective crisis standards of care and resource allocation planning:**
    - Public health must take a leadership and quality assurance role to ensure health facilities and systems are engaging in meaningful crisis and contingency standards of planning and using resources created by the IOM and ASPR's Communities of Interest website. If necessary, the federal government should require crisis standards planning of PHEP and HPP grantees. Meanwhile, given recent shortages of everyday medical products, the roles and potential actions of federal agencies, including ASPR, CMS and FDA, should be clarified before the next outbreak, disaster drug or medical supply shortage.

## RECOMMENDATIONS: Reducing Healthcare-Associated Infections Across the Healthcare Spectrum

HAIs continue to be an ongoing, serious preventable problem, where millions of Americans are infected each year while receiving routine medical care in hospitals and through outpatient and long-term care facilities. HAI tracking and oversight is currently limited in non-hospital settings.

Recent efforts to improve infection control practices have started showing promising results in reducing HAIs. TFAH recommends that public health and healthcare officials should make limiting HAIs a top priority in hospitals and across the U.S. healthcare system, which includes:

- **Aligning incentives to promote prevention:** Initiatives like the Medicare “no pay” rules and prevention-oriented healthcare payment strategies outlined in a call to action in the American Journal of Infection Control can provide incentives for healthcare providers to improve practices to reduce infections and infection-related costs.<sup>238</sup>
- **Supporting State HAI and Infection Control Programs:** Key areas where states can play a critical role in supporting infection control and HAI prevention:
  - Coordinate and assess infection control capacity across healthcare facilities in each jurisdiction;
  - Ongoing tracking of local facilities performance through National Healthcare Safety Network to identify facilities in need of

assistance and to monitor national progress in infection control;

- Support the identification of single infections and clusters of infections, and rapidly implement control measures; and
  - Implement and facilitate new infection control licensure requirements for healthcare workers and collaborate with state hospital associations and medical societies to survey infection control training needs and provide CDC supported trainings.
- **Fully and Swiftly Implementing the National Action Plan to Prevent Healthcare-Associated Infections: A Roadmap to Elimination:**<sup>239</sup> Some key strategies in the *Action Plan* include:
- Reducing inappropriate and unnecessary use of devices, like catheters and ventilators;
  - Expanding HAI prevention efforts beyond the hospital setting, to include ambulatory surgery centers, dialysis clinics, and long-term care (LTC) facilities, including finalizing the CMS proposed rule to improve antibiotic stewardship, vaccination and other infection control practices in LTC;<sup>240</sup>
  - Adhering to the best hygiene practices;
  - Prescribing antibiotics only when absolutely necessary;
  - Improving education, communication and best-practice protocols as the regular standard-of-care throughout entire healthcare facilities; and

- Improving reporting and regulatory oversight of HAIs and financial incentives for reducing the number of infections.
- **All healthcare facilities should make following infection control best practices a top priority:**
- Efforts to define and enforce basic standards of infection control in inpatient and outpatient settings (e.g., CDC's Guide to Infection Prevention for Outpatient Settings)<sup>241</sup> and effective oversight activities (e.g., audits and inspections), though increasing, require strengthening at both the state and federal levels.
- In order to have a robust infection prevention program that is able to prevent infections day to day and scale up operations during a public health emergency, healthcare facilities must have appropriate infection prevention personnel staffing, ample training and observation to ensure that guidelines are followed precisely, and technology and equipment to maximize efficiencies and provide real-time data to help infection prevention specialists detect and prevent infection.
- Healthcare facilities must work to target HAI prevention efforts. CDC has developed the Targeted Assessment for Prevention (TAP) strategy, which uses National Healthcare Safety Network data for action to target healthcare facilities and specific units within facilities with a disproportionate burden

of HAIs so that gaps in infection prevention in the targeted locations can be addressed. TAP reports are available within the NHSN application for use by hospitals and NHSN Groups with access to hospital data for catheter-associated urinary tract infections (CAUTI), central line-associated bloodstream infections and laboratory-identified (LabID) event Clostridium difficile infections (CDI).<sup>242</sup>

- **Ensuring the country maintains sufficient personal protective equipment and infection control training to be able to provide adequate protection for healthcare workers, patients and others during an outbreak:** Limits in the availability and training on the appropriate use of PPE were a cause for concern for healthcare workers and others during the Ebola outbreak and pandemic H1N1. Different outbreaks require different PPE responses, and it is important to have strategies, training and support in place for different scenarios. Issues of sufficiently available appropriate PPE could become exponentially amplified during a widespread outbreak. Healthcare and public health systems and accrediting bodies should ensure systems and supplies are in place to provide the appropriate staff — healthcare workers, first responders, and ancillary staff such as cleaning professionals — with adequate training on the PPE and infection control procedures relevant to their roles.

## G. Improve Vaccination Rates — for Children and Adults

Vaccines are the safest and most effective way to manage many infectious diseases in the United States. Some of the greatest public health successes of the past century — including the worldwide eradication of smallpox and the elimination of polio, measles and rubella in the United States — are the result of successful vaccination programs.<sup>243</sup> A recent model estimated that from 1994 to 2013 the Vaccines for Children program in the U.S. will have prevented as many as 322 million illnesses and 732,000 deaths at a net savings of \$1.38 trillion in societal costs.<sup>244</sup>

However, despite the recommendations of medical experts that vaccines are effective and that research has shown vaccines to be safe, on average, an estimated 45,000 adults and 1,000 children die annually from vaccine-preventable diseases in the United States.<sup>245</sup>

Millions of Americans are not receiving the recommended vaccinations. For instance, more than 2 million preschoolers do not receive recommended vaccinations; there have been outbreaks of measles, mumps and whooping cough around the country; vaccination gaps put teens and young adults at risk for HPV and bacterial meningitis; and more than 35 percent of seniors have not received the recommended pneumococcal vaccination.<sup>246, 247, 248</sup>

While many efforts focus on vaccines for children, it is also important to address the fact that currently, there is no real system or structure in place to ensure adults have access to or receive

the vaccines they need unless they are part of institutions that have vaccine requirements, such as being enrolled in colleges or universities, serving in the military or working in a healthcare setting. Significant numbers of adults do not have regular well care exams, switch doctors or health plans often or only seek care from specialists who do not traditionally screen for immunization histories or offer vaccines. This makes it extremely difficult to establish ways for people to know what vaccinations they need and for clinicians to track and recommend vaccines to patients.

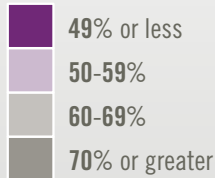
The Community Preventive Services Task Force, which evaluates the available evidence base for public health programs and strategies, has found that when education and registry systems are in place and used, combined with other intervention components, they are effective in improving vaccination rates.<sup>249</sup>



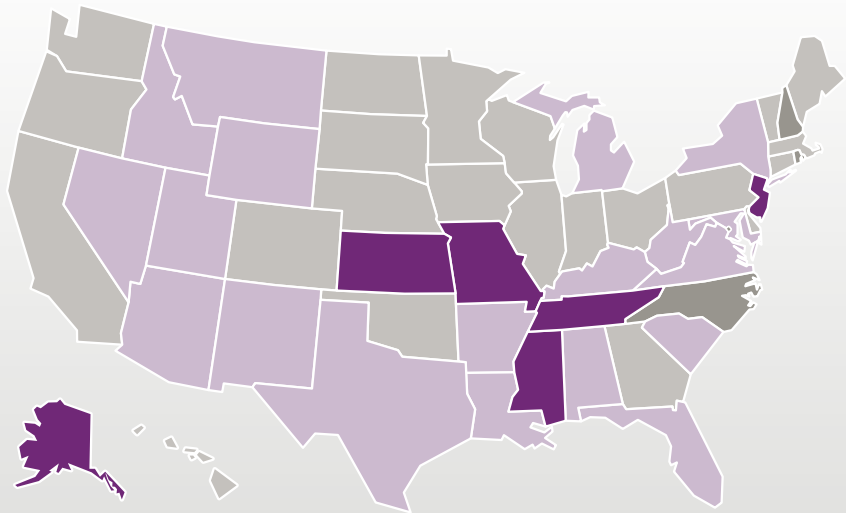
**HPV VACCINATION IS THE BEST WAY TO PREVENT MANY TYPES OF CANCER**  
**MANY ADOLESCENTS HAVEN'T STARTED THE HPV VACCINE SERIES**

**NATIONWIDE**  
**4 OUT OF 10**  
**GIRLS ARE UNVACCINATED**

National coverage is 60%  
 Coverage by state:

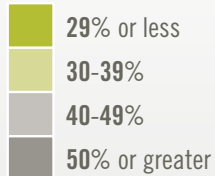


Percentage of adolescent girls who have received one or more doses of HPV vaccine\*

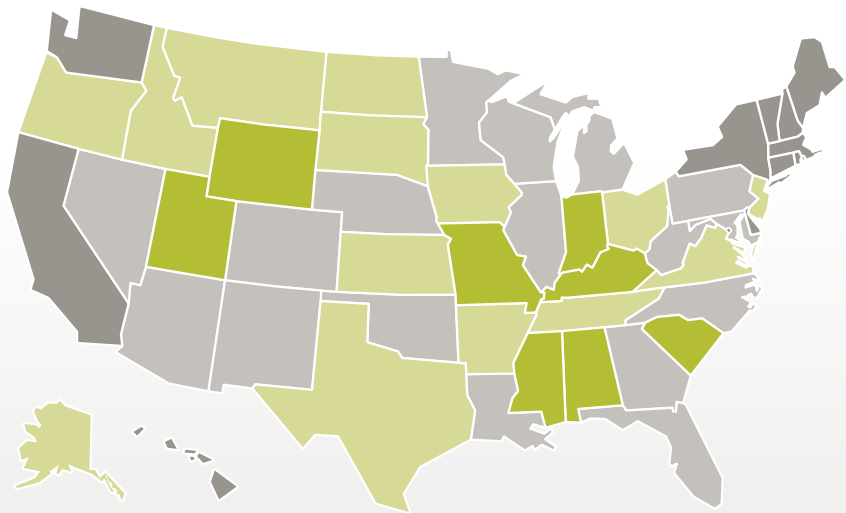


**NATIONWIDE**  
**6 OUT OF 10**  
**BOYS ARE UNVACCINATED**

National coverage is 42%  
 Coverage by state:



Percentage of adolescent boys who have received one or more doses of HPV vaccine\*



**IMPROVING HPV VACCINATION RATES WILL HELP SAVE LIVES.**  
 A high national Tdap vaccination rate of 88% shows that it is possible to achieve high HPV vaccination coverage.

\*Estimated coverage with  $\geq 1$  dose of Human Papillomavirus (HPV) vaccine, either quadrivalent or bivalent, among adolescents aged 13-17 years, National Immunization Survey-Teen (NIS-Teen), United States, 2014  
 Source: MMWR July 31, 2015

[www.cdc.gov/hpv](http://www.cdc.gov/hpv)

NCIRDig524 | July 31, 2015



U.S. Department of Health and Human Services  
 Centers for Disease Control and Prevention

## RECOMMENDATIONS: Increasing Vaccination Rates

Improving the nation's vaccination rates would help prevent disease, mitigate suffering, and reduce healthcare costs. TFAH recommends a number of actions that can be taken to increase vaccination rates for children, teens and adults around the country, including:

- **Minimize vaccine exemptions:** States should enact and enable universal childhood vaccinations except where immunization is medically contraindicated. Non-medical vaccine exemptions, including personal belief exemptions (PBE), enable higher rates of exemptions in those states that allow them. School exemption rates should also be made publicly available so parents and educators understand the risks. The National Vaccine Advisory Committee (NVAC) recommends states with existing PBE policies should strengthen policies so that exemptions are only available after appropriate parent education and acknowledgement of risks to their child and the community.<sup>250</sup>
- **Boosting demand for vaccines:** Federal, state and local health officials, in partnership with medical providers and community organizations, should continue to expand assertive campaigns about the importance of vaccines, particularly stressing and demonstrating the safety and efficacy of immunizations. Targeted outreach should be made to high-risk groups and to racial and ethnic minority populations where the misperceptions about vaccines are particularly high.<sup>251, 252</sup> To increase confidence and demand for vaccines, an NVAC committee has also recommended an index to measure and track vaccine confidence, consistent communications assessment and feedback for vaccine confidence, and a repository

of tools for providers to communicate with parents.<sup>253</sup> Training is also needed for providers to ensure they are able to effectively educate patients and make a strong recommendation for vaccines across the life cycle.

- **Making adult vaccinations routine — including regular recommendations and referrals:** Private providers and health systems should have standing orders for vaccinations so every provider of care for adults can assess the need and recommend, and either provide directly or refer to another provider for vaccination. Vaccine locator systems should be expanded to build an effective vaccine referral system so providers can ensure the vaccine is administered, just as for mammograms or other preventive services. EHRs should provide reminder recalls to patients and providers through text messages or other communications. A routine adult vaccination schedule should be established, where healthcare providers are expected to purchase, educate, advise about and administer immunizations to patients.
- **Expand alternate delivery sites:** NVAC has recommended including expansion of vaccination services offered by pharmacists and other community immunization providers, vaccination at the workplace, and increased vaccination by providers who care for pregnant women.<sup>254</sup>
- **Increasing provider education:** Professional medical societies and medical and nursing schools should support ongoing education and expanded curricula on vaccines and vaccine-preventable diseases, and expand standard practice for providers to discuss and track

vaccination histories for all patients — including adults — and offer vaccinations to adults during other doctor and hospital visits.

- **Bolstering immunization registries and tracking:** Federal and state policy-makers should take steps to facilitate interoperability and data use between immunization registries and EHRs as well as between state immunization registries. This will help track when patients receive vaccines, improve information sharing and data security across providers, remind providers to routinely provide recommended vaccinations, remind patients of vaccinations and address gaps. State health information exchanges or hub models may make this process simpler by encouraging integration of registry data into EHRs and enabling immunization registries (immunization information system (IIS)) data exchange between states. Measures must be taken to encourage greater participation by healthcare providers and pharmacists, particularly private providers, in registries. Lifespan registries would also help better track patients' medical history to ensure they have received all needed vaccinations throughout their lives — to help improve and track vaccination rates for both children and adults.
- **Supporting expanded research and use of alternatives to syringe administration of vaccination:** Experiences with alternative delivery methods, such as using the nasal mist administration of live-attenuated influenza vaccine (LAIV), have been well-received by the public and have contributed to increased uptake in pediatric and adult vaccinations.<sup>255, 256</sup>

- Ensuring first dollar coverage and access to all recommended vaccines under Medicaid, Medicare and private insurance:** State Medicaid programs are not currently required to offer all recommended adult vaccinations without co-payments. While some states offer coverage of all recommended vaccines, others do not, and many have co-payments, which present a significant cost barrier to getting immunized. The ACA also incentivizes state Medicaid programs to cover preventive services for adults, such as recommended vaccines, by offering a 1 percent Federal Medical Assistance Percentage (FMAP) increase to states that cover services without cost sharing, but as of 2015, only 11 states covered all recommended services, including: California, Colorado, Delaware, Hawaii, Kentucky, New Hampshire, New Jersey, New York, Nevada, Ohio and Wisconsin. Medicare also does not consistently provide first dollar coverage for vaccines, and the different policies dictate what is covered under Part B and Part D, leaving many seniors with gaps in coverage. Beneficiaries can get flu, pneumococcal and HBV (for at-risk individuals) vaccine coverage under Medicare Part B, but an out-of-pocket payment may be required, depending on the shot and provider. The rest of the recommended vaccines are covered under Medicare Part D, the prescription drug benefit, but the

patient must get immunized by an in-network pharmacist or find a healthcare provider who accepts Part D and carries the needed vaccine, and not all beneficiaries have Part D coverage. All public and private payers should ensure that all ACIP-recommended vaccines are covered without cost sharing requirements.

- Requiring on-time immunizations — based on the medically-recommended vaccines for a person’s age and health status — as a quality measure for all health plans.**
- Continuing support for vaccine programs:** The Vaccines for Children (VFC) and Section 317 immunization programs provide a safety net for individuals who are uninsured or remain outside of the traditional healthcare system, such as children who are eligible but not enrolled in Medicaid/State Children’s Health Insurance Program (CHIP). Section 317 grants to states have also been key to building the immunization infrastructure, including enhancing registries, monitoring the safety and effectiveness of vaccines, responding to outbreaks, and conducting surveillance, outreach and service delivery.
- Requiring universal immunization of healthcare personnel for all ACIP recommended vaccinations:** The Infectious Diseases Society of American, the Society for Healthcare Epidemiology of Amer-

ican (SHEA) and the Pediatric Infectious Diseases Society (PIDS) support universal immunization of healthcare personnel (HCP) by healthcare employers (HCE) as recommended by ACIP. According to a joint policy statement by the three Societies, mandatory immunization programs are the most effective way to increase HCP vaccination rates.<sup>257</sup> The Societies also support requiring comprehensive educational efforts to inform HCP about the benefits of immunization and risks of not maintaining immunization.

- Support development of maternal immunizations:** Consistent with the recommendation of two federal advisory committees, the Secretary of HHS should ensure inclusion of maternal immunizations in the vaccine injury compensation program (VICP) in order to allow claims to be pursued in the VICP to address a barrier to developing and delivering vaccines for pregnant women to protect the newborns.<sup>258, 259</sup> These vaccines are a critical tool to protect the health of newborn babies, who remain vulnerable to dangerous vaccine preventable diseases until they can receive the full series of vaccinations themselves. Recognizing obstetricians and gynecologist as primary care providers would help promote immunizations among all women by ensuring these doctors can receive reimbursements for vaccinating women.

## VACCINE PREVENTABLE DISEASES

Anthrax, Cervical Cancer, Diphtheria, Haemophilus influenza type b (Hib), Hepatitis A, Hepatitis B, Human Papillomavirus, Influenza (flu),

Japanese Encephalitis, Measles, Meningococcal disease, Mumps, Pertussis (Whooping cough), Pneumococcal disease, Polio, Rabies,

Rotavirus, Rubella, Smallpox, Tetanus, Typhoid Fever, Varicella (Chickenpox), Yellow Fever and Zoster (Shingles).

## H. Curbing Antimicrobial Resistance and Superbugs

Antimicrobial resistance presents one of the greatest threats to human health around the world. While antibiotics have been used to treat numerous bacterial infections since the 1940s, over time, some bacteria have adapted so that antibiotics can no longer effectively treat them. In these cases, once easily cured infections like those due to *Staphylococcus* or *Streptococcus* can be lethal.

While antibiotic treatment is often appropriate and can even be lifesaving for many types of infections, antibiotics are significantly overused. Studies have found that up to half of human antibiotics prescribing is unnecessary — and they are often used longer than is recommended.<sup>260, 261</sup>

Each year more than 2 million Americans develop antibiotic-resistant infections — and at least 23,000 of these people die as a result.<sup>262</sup> These are considered to be conservative estimates, since surveillance is often incomplete, so national estimates are based on limited samples from select cities and surveillance systems.

Antibiotic resistance leads to more than eight million additional days Americans spend in the hospital a year, costs the country an estimated extra \$20 billion in direct healthcare costs and at least \$35 billion in lost productivity annually.<sup>263, 264</sup>

As resistance rates continue to increase, exponentially more people are expected to get sickened and die due to resistant infections, and there are few new antibiotics in the pipeline for approval.<sup>265</sup> Many pharmaceutical

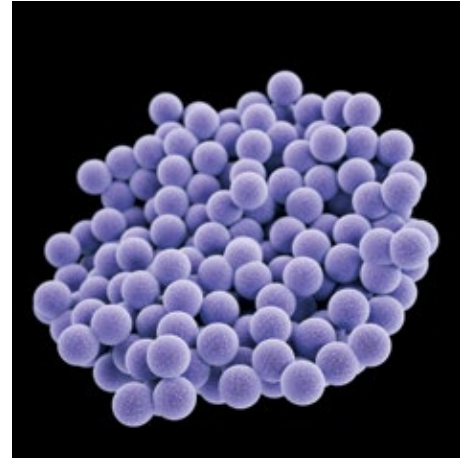
companies have abandoned antibiotic research and development because they are less profitable than drugs to treat other conditions.

In 2014, the White House released The National Strategy for Combating Antibiotic Resistant Bacteria and a related executive order establishing a DoD, USDA and HHS Task Force for Combating Antibiotic Resistance. The strategies focus on: slowing the development of resistant bacteria; strengthening surveillance; advancing development of diagnostic tests; accelerating research of new antibiotics and vaccines; and improving international collaboration. The President's Council of Advisors on Science and Technology (PCAST) also released a report in 2014, outlining recommendations around new antibiotics and diagnostics, surveillance and stewardship with federal and private partner goals to be reached by 2020.<sup>266</sup> The White House followed with a more detailed National Action Plan in 2015, laying out specific actions and milestones across federal agencies to achieve the goals of the strategy, and is developing a companion National Action Plan for Combatting MDR TB.<sup>267, 268</sup>

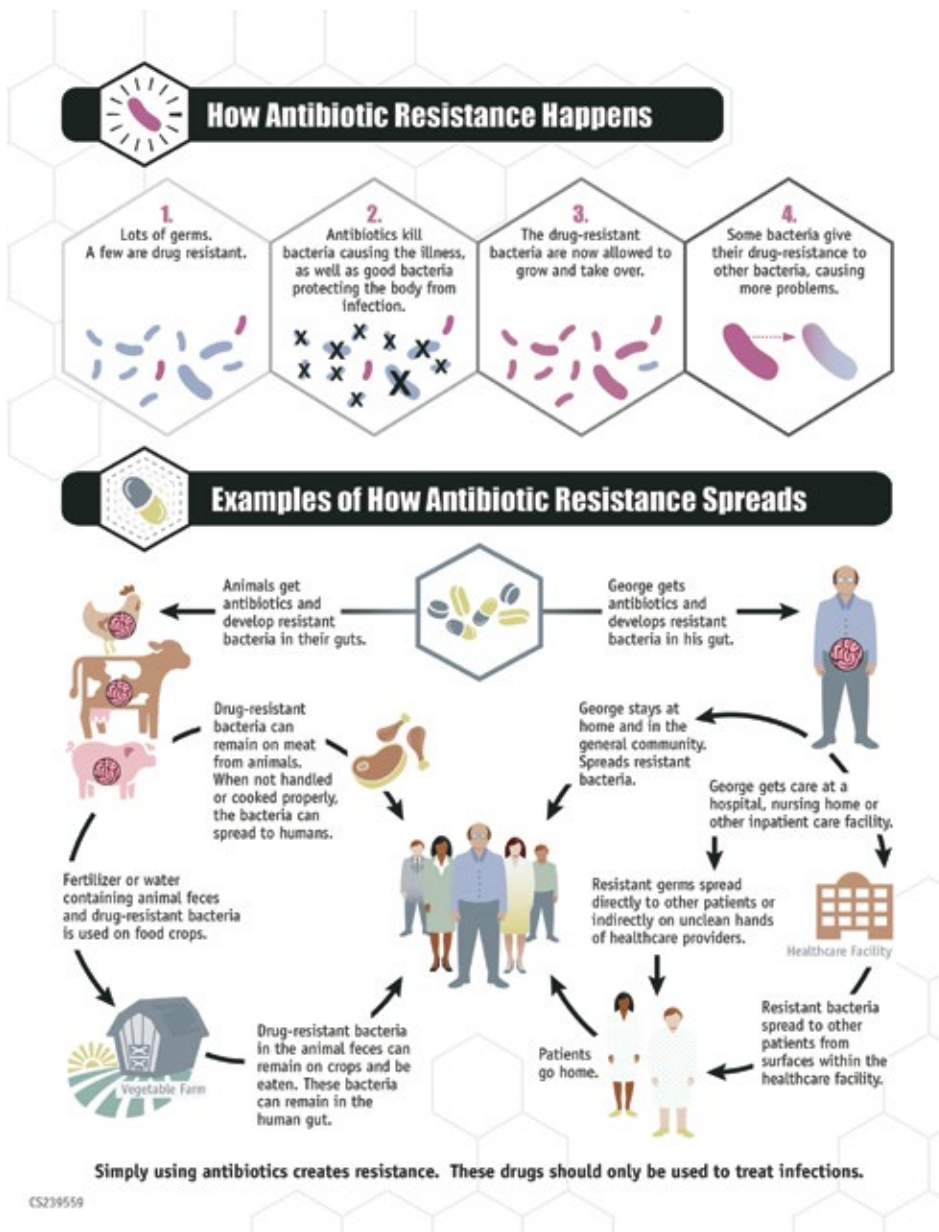
Estimated minimum number of illnesses and deaths caused by antibiotic resistance\*:

At least  **2,049,442** illnesses,  
 **23,000** deaths

\*bacteria and fungus included in this report



Source: CDC



Source: CDC

**ANTIBIOTIC RESISTANT THREATS IN THE UNITED STATES, 2013 — CDC'S REPORT AND PRIORITIZATION OF THREATS<sup>269</sup>**

CDC issued an *Antibiotic Resistance Threats in the U.S. 2013* report in which it prioritized a list of 18 organisms that are an urgent, serious or concerning threat to patient safety in the United States as they are resistant or increasingly resistant to antibiotics or have become more common because of widespread use of antibiotics.<sup>270</sup> Most of the infections are healthcare-associated, sexually transmitted, or food/water/agricultural-associated. Threats from the reduced ability to treat infections range from carbapenem-resistant Enterobacteriaceae to methicillin-resistant *Staphylococcus aureus* and *Streptococcus* (common “strep throat”). According to CDC, urgent threats identified include:

- **Drug-Resistant Gonorrhea:** More than 820,000 Americans are infected with gonorrhea each year.<sup>271, 272</sup> One-third of cases are drug-resistant and there is only one drug regime that is still recommended for treating the infection. Despite revised guidance and good adherence to treatment, reported gonorrhea cases are increasing and CDC continues to warn that the potential for gonorrhea to become untreatable in the near future remains real.<sup>273, 274</sup>

- **Carbapenem-resistant Enterobacteriaceae (CRE):** A healthcare-associated bloodstream infection with as high as a 50 percent death rate. There were 9,000 infections and 600 deaths.<sup>275</sup> The CDC has identified a new strain of CRE that produces OXA-48-like carbapenemases — the “phantom menace” — which is able to transfer their invulnerability to other normal bacteria found in the human body.

U.S.OXA-48-like isolates were retrospectively identified from 2009. Testing for the bacteria has not been made a standard practice. Forty-three known cases have been reported in the past five years.<sup>276, 277</sup>

- ***Clostridium difficile* (C.diff)** is often healthcare-associated and causes life threatening diarrhea or colon inflammation. There were 500,000 infections, 15,000 deaths in 2011.<sup>278</sup>

## DEADLY DIARRHEA:

C. DIFFICILE CAUSES IMMENSE SUFFERING, DEATH

IMPACT



500,000

Caused close to half a million illnesses in one year.



Comes back at least once in about 1 in 5 patients who get *C. difficile*.



Caused 15,000 deaths in one year



1 in 11 people 65 and older died within a month of *C. difficile* infection diagnosis.

RISK



People on antibiotics are 7-10 times more likely to get *C. difficile* while on the drugs and during the month after.



Being in healthcare settings, especially hospitals or nursing homes.



More than 80% of *C. difficile* deaths occurred in people 65 and older.

SPREAD



Touching unclean surfaces, especially those in healthcare settings, contaminated with feces from an infected person.



Dirty hands.



Failing to notify other healthcare facilities when patients with *C. difficile* transfer from one facility to another.

PREVENT



Improve prescribing of antibiotics.



Use best tests for accurate results to prevent spread.



Rapidly identify and isolate patients with *C. difficile*.



Wear gloves and gowns when treating patient with *C. difficile*. Remember that hand sanitizer doesn't kill *C. difficile*.



Clean room surfaces with EPA-approved, spore-killing disinfectant (such as bleach), where *C. difficile* patients are treated.

[http://www.cdc.gov/HAI/organisms/cdiff/Cdiff\\_infect.html](http://www.cdc.gov/HAI/organisms/cdiff/Cdiff_infect.html)  
[www.cdc.gov/media](http://www.cdc.gov/media)



**U.S. Department of Health and Human Services**  
Centers for Disease Control and Prevention

## RECOMMENDATIONS: Reducing Antibiotic and Antimicrobial Resistance

TFAH recommends policies that help curb antibiotic overuse and encourage new antibiotic development become high national priorities, including:

- **Funding and rapidly implementing the 2014 Executive Order and National Strategy for Combating Antibiotic-Resistant Bacteria (CARB), and National Action Plan for Combating Antibiotic-Resistant.**<sup>279, 280, 281</sup>

In its FY 2016 budget request, the Administration requested over \$1 billion in new funds for HHS and other agencies to combat antibiotic resistance. The national CARB strategy should receive significant new funds, including the Antibiotic Resistance Solutions Initiative at CDC, which would carry out a multi-pronged approach to reducing inappropriate prescribing, improving detection of resistant bacteria, investing in new and evidence-based interventions, and supporting global partnerships.

- **Reducing overprescribing:** Effective antibiotic stewardship must be embraced across the healthcare system, especially in outpatient and long-term care facilities. CMS, CDC, accrediting organizations, healthcare facilities and medical organizations must work together to reduce overprescribing and misuse of antibiotics by tracking and publicly reporting prescribing data, educating providers and patients about the harm of inappropriate prescribing, and providing clinical decision support

through HIT. CMS should make an effective, facility-appropriate antibiotic stewardship program a Condition of Participation for all CMS-enrolled facilities, including the recently proposed rules for long-term care.<sup>282</sup> Healthcare facilities should participate in CDC's National Healthcare Safety Network Antimicrobial Use and Resistance (AUR) Module, which allows them to report and analyze antimicrobial usage at their facility as part of antimicrobial stewardship efforts and submit data through NHSN. AUR module data will also help CDC to track regional and national trends in drug resistant disease and plan more targeted and effective interventions. Finally, antibiotics usage and stewardship should be added as National Quality Forum quality measures.

- To address overuse in healthcare facilities, California, which has required hospital antibiotic stewardship programs since 2014, passed a law in 2015 that requires all skilled nursing facilities and veterinary practitioners to adopt and implement stewardship programs consistent with CDC and CMS guidelines.<sup>283, 284</sup>
- Increased development and use of rapid point-of-need diagnostics are also important to inform treatment choices and quickly identify — or rule out — when antibiotic use may be appropriate or necessary.<sup>285</sup>

## RECOMMENDATIONS: Reducing Antibiotic and Antimicrobial Resistance

- **Reducing overuse in agriculture:** The FDA should fully implement guidance to industry regarding the nontherapeutic use of antibiotics in food animals, such as by eradicating inappropriate use for disease prevention, requiring real veterinary oversight on the farm and a system to monitor how antibiotics are being used on the farm, and tracking the impact of these policies on antibiotic usage and resistance. FDA should also finalize a rule to collect and make available species-specific data around the use of antibiotics in animals, which will help establish baseline data to see if FDA actions are affecting usage.<sup>286</sup> To address overuse in agriculture, California passed a law in 2015 that requires livestock producers to get veterinary prescriptions for medically important antibiotics for use in food animals, bans growth promotion and routine prevention uses of antibiotics, and creates a monitoring and tracking system.<sup>287</sup>
- **Incentivizing development of new antibacterial drugs and diagnostics through BARDA and other mechanisms:** Additional funds are needed to support the development of products to combat superbugs, while ensuring investments continue in other critical areas.
- **Creating a limited population antibiotic drug approval pathway:** FDA should be able to approve drugs for a limited population of patients with serious or life-threatening infections and for drugs that fill an unmet need based upon more limited data. This mechanism would speed access to new antibacterial drugs to the patients who most need them. In addition, the limited indication would help protect those new antibacterial drugs from losing their effectiveness through overuse.
- **Improving surveillance:** The country needs better data to monitor resistance patterns to inform local action to interrupt transmission, determine which interventions are working and where they can be expanded. National programs with sufficient state/local public health resources to identify emerging patterns of both resistance and antibiotic use will quantify the magnitude of antibiotic use in the U.S. and inform new interventions.
- **Reducing transmission by increasing coordination between healthcare facilities and health departments to track and contain superbugs:** CDC has recommended steps for healthcare facilities — which include improved coordination and regionalization of HAI prevention activities, developing systems to alert facilities when patients with drug-resistant germs are being transported and ensuring data are effectively shared across healthcare systems and public health departments.
- State and local health departments, meanwhile, should be properly resourced to dedicate staff to coordinate with facilities in the area, work with CDC to better track and prevent infections and improve antibiotic use, and know the antibiotic resistance threats in the area.<sup>288</sup>
- **Vaccinations should be incorporated into the national AR strategies:** The National Vaccine Advisory Committee has recommended greater consideration for the role of vaccines in National Strategies to Combat Antibiotic Resistant Bacteria,<sup>289</sup> including: national milestones related to the uptake of vaccines that can help reduce the transmission of resistant bacteria and inappropriate antibiotic prescribing, such as Hib, pneumococcal, and influenza vaccines; surveillance efforts should determine the effects vaccine uptake has on resistant pathogens and help target vaccination efforts; an economic incentives analysis to identify strategies to encourage development of vaccines against resistant pathogens such as MRSA and *C. difficile*, to ensure a pipeline of vaccines for a potentially less profitable market; and better coordination between NVAC and the President's Advisory Council on CARB, including an NVAC representative on the President's Advisory Council on CARB.



## I. Reduce Sexually Transmitted Infections and TB

Each year, there are 20 million new sexually transmitted infections in the United States — with half of those among 15- to 24-year-olds. Overall, around 110 million Americans have some form of STI.

STIs can have serious health consequences — including reproductive health problems and some forms of cancer. STIs cost the country around \$16 billion in direct healthcare spending annually.<sup>290</sup>

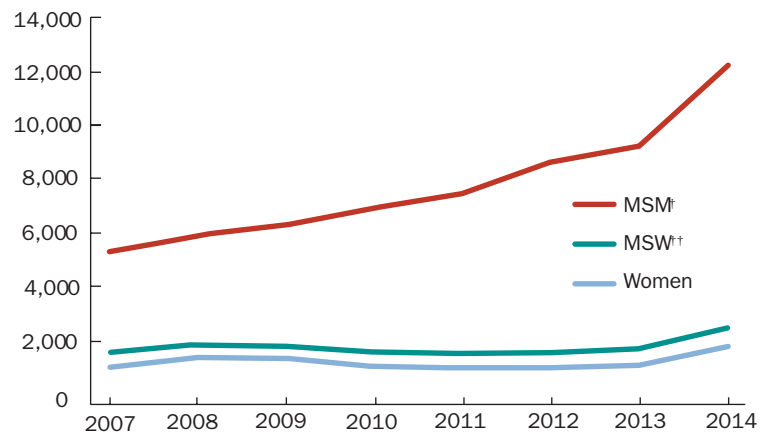
Prevention through safe sex and condom use, syringe exchange programs, HPV and hepatitis B vaccines and routine screening can help identify those in need of treatment and help prevent the additional spread of the diseases and ensure those who need treatment receive appropriate care and services.<sup>291, 292</sup> In addition, providing treatment to those who have HIV is one of the most effective ways to limit the continued spread of the disease to others.

Infectious disease prevention strategies should be coordinated and considered collectively.<sup>293, 294, 295, 296, 297, 298</sup> For example, STIs can make a person more likely to transmit or be infected by HIV. In addition, syphilis, gonorrhea, HIV/AIDS, viral hepatitis and TB can have some overlap in at-risk populations, including racial and ethnic minorities as well as men who have sex with men and people who

inject drugs. For instance, of Americans living with HIV, 25 percent are also co-infected with HCV and 10 percent are co-infected with HBV, and HIV is one of the biggest risk factors for progression of TB, while TB accelerates HIV progression.<sup>299</sup> HIV coinfection with syphilis is high—

among states reporting syphilis cases with known HIV status in 2014, 51 percent of cases in MSM were among men who were HIV-positive, 11 percent of cases among men who have sex with women, and 6 percent of cases among women.<sup>300</sup>

### Gay and Bisexual Men Face Highest – and Rising – Number of Syphilis Infections

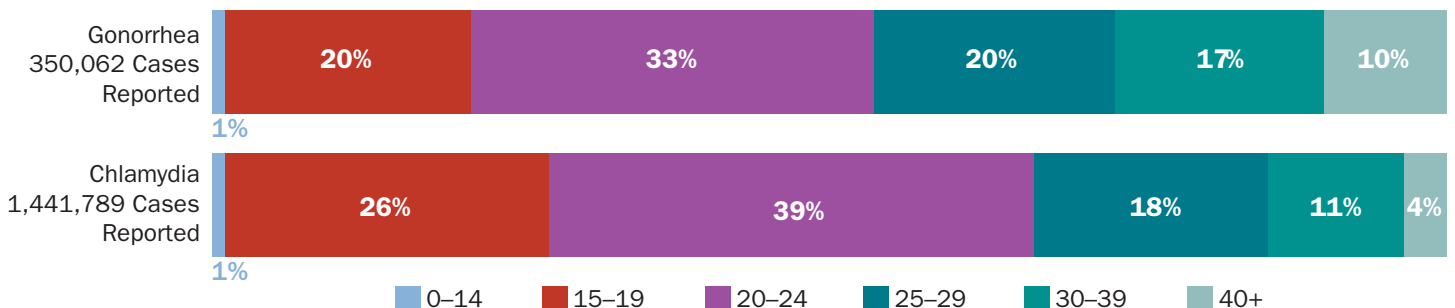


† Men who have Sex with Men †† Men who have Sex with Women

Note: Based on available data from states reporting sex of sex partners

Source: CDC

### Most Reported Chlamydia and Gonorrhea Infections Occur among 15–24-Year-Olds



Percentages may not add to 100 because ages were unknown for a small number of cases.

Source: CDC

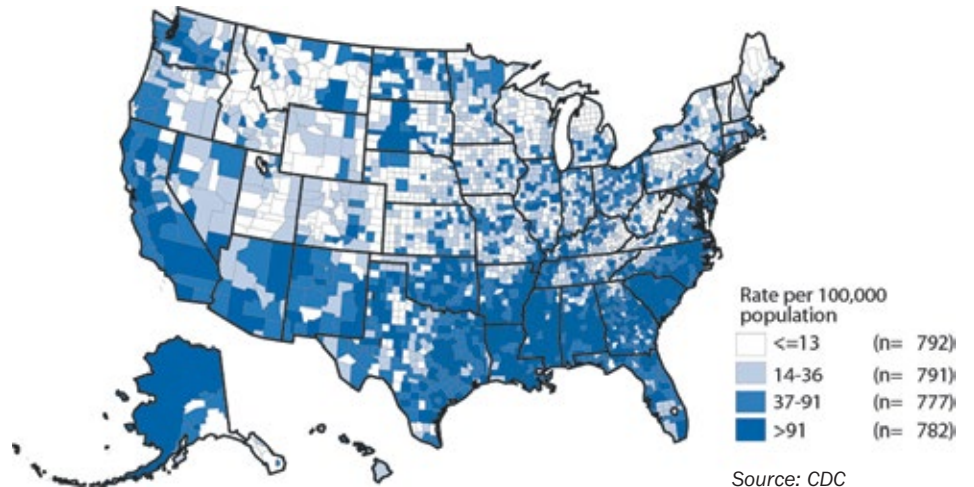
## SEXUALLY TRANSMITTED INFECTIONS

The sexually transmitted infections chlamydia, syphilis and gonorrhea are still largely curable with antibiotics. Yet, they are increasing in the United States. In 2014, increases were seen in all three nationally reported STIs. The more than 1.44 million cases of chlamydia represent the highest number of annual cases of any condition ever reported to CDC. Gonorrhea increased more than 5 percent from 2013 to 2014, driven by a more than 10 percent increase among men.<sup>301</sup>

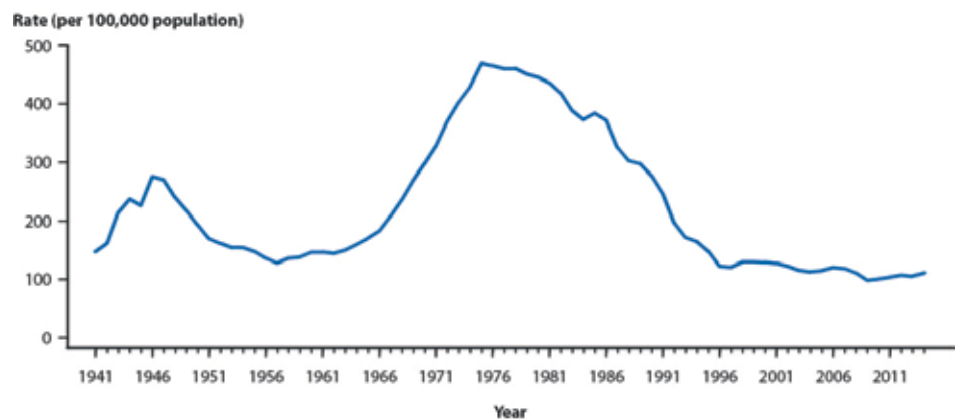
CDC reports that most of the increases are among young adults, who get infected soon after they first engage in sexual activity. Half of the 20 million new STIs that occur every year are among 15- to 24-year-olds.<sup>302</sup>

Primary and secondary syphilis increased more than 15 percent from 2013 to 2014; if not adequately treated, syphilis can lead to permanent visual impairment and stroke. Congenital syphilis in babies increased 27.5 percent over the same time period. Babies infected with syphilis during pregnancy may have developmental delays or other poor health outcomes. Historically, up to 40 percent of babies born to women with untreated syphilis may be stillborn or die from the infection.

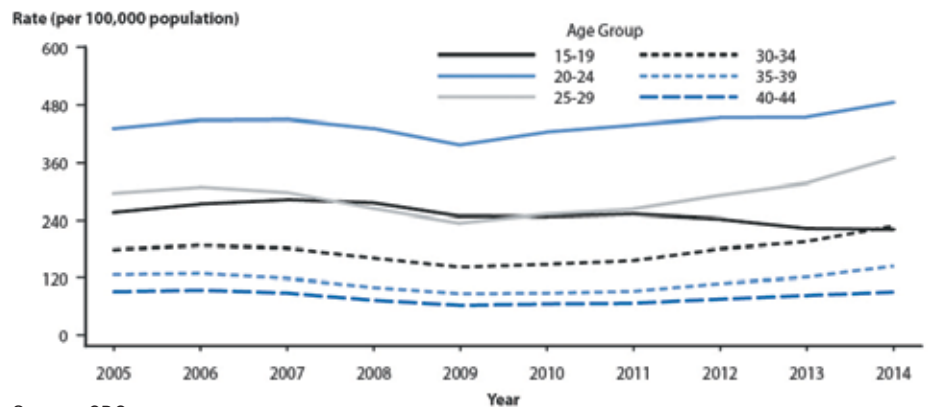
### Gonorrhea — Rates of Reported Cases by County, United States, 2014



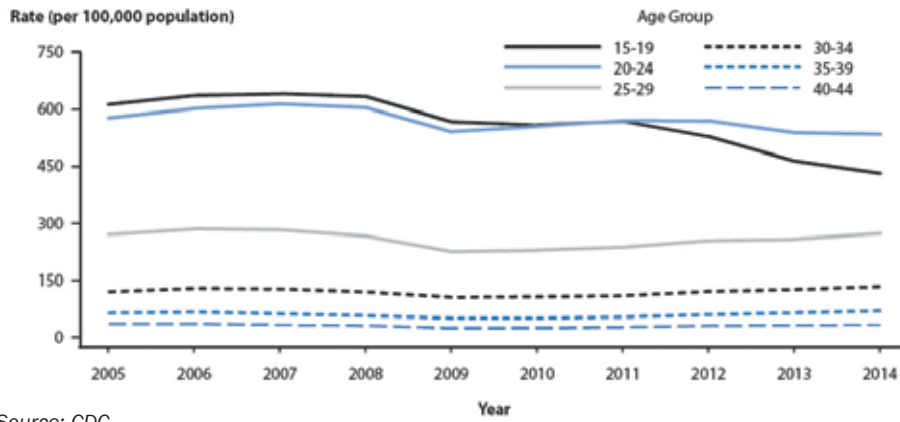
### Gonorrhea — Rates of Reported Cases by Year, United States, 1941–2014



### Gonorrhea — Rates of Reported Cases Among Men Aged 15–44 Years by Age, United States, 2005–2014

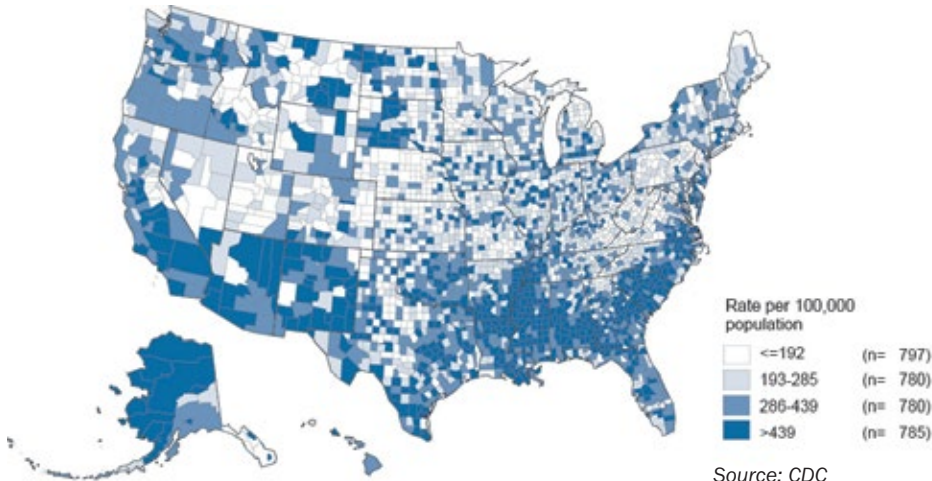


**Gonorrhea — Rates of Reported Cases Among Women Aged 15–44 Years by Age, United States, 2005–2014**



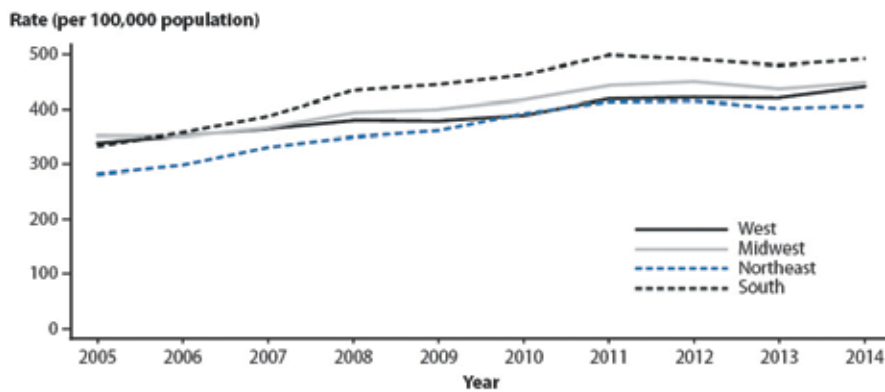
Source: CDC

**Chlamydia — Rates of Reported Cases by County, United States, 2014**



Source: CDC

**Chlamydia — Rates of Reported Cases by Region, United States, 2005–2014**



Source: CDC

## RECOMMENDATIONS: Strengthening STI Prevention and Control

Some key recommendations include:

- **Promote provider adherence to U.S. Preventive Services Task Forces and Bright Futures Guidelines for STI screening.**

- Screening for STIs in certain populations remains low.<sup>303</sup> Both the USPSTF guidelines for preventive care for adults and Bright Futures guidance for preventive care for teens and youth include routine screening — and follow up treatment as necessary — for at-risk populations.

- **Increase support for STI Disease Intervention Specialists (DIS).**

- Specialists employed by public health agencies conduct contact tracing, connection to care, and counseling for all reported cases of syphilis, not just those found in public clinics. As cases of syphilis rise, increasing the capacity of this workforce will

become increasingly important. In addition, they have an important role in identifying new HIV cases and in connecting those with HIV who have fallen out of care, back into care.

- **Support investigations into the causes behind STI increases and programs to address them.**

- Understanding the causes behind increasing rates, especially among certain populations, is important for being able to address the problem.
- Strengthen STI surveillance systems by linking health department surveillance systems with electronic health records.
- Initiate pilot programs intended to reduce STI rates among highly impacted populations.
- Promote widespread adaptation of successful models and pilot programs.

## HIV/AIDS

Successful treatment regimens have led to complacency and a belief that HIV/AIDS is under control. But, HIV/AIDS is still a significant health concern — with more than 1.2 million Americans living with HIV, and 50,000 new HIV infections in the most recent reported year (2010).<sup>304</sup>

In 2015, the White House released a revised *National HIV/AIDS Strategy for the United States* outlining ongoing policy efforts and for the next five years, including:<sup>305</sup>

- Reducing new HIV infections, including focus on the most at-risk communities;
- Increasing access to care and improving health outcomes for people living with HIV;
- Reducing HIV-related disparities and health inequities; and
- Achieving a more coordinated national response to the HIV epidemic.

## RECOMMENDATIONS: HIV/AIDS Prevention and Control

For decades, the country has approached the HIV/AIDS epidemic focused on individual behavioral risk, but the research shows that is only one part of the equation.

More effective strategies include focusing on prevention and improving the overall wellbeing and health of members of the lesbian, gay, bisexual and transgender (LGBT) community. This includes developing supportive and respectful policies that help reduce stigma, discrimination and bullying.<sup>306</sup>

Some key recommendations from TFAH to better prevent and control HIV/AIDS include:

- **Implementing a full continuum approach to eliminating AIDS — from prevention to reducing HIV risk behaviors to ensuring access and sustained treatment (and treatment as prevention) to supporting access to pre-exposure prophylaxis.**<sup>307</sup>
  - Recent studies have shown that HIV-positive individuals with full viral suppression are far less likely to transmit HIV infection, while modeling studies have demonstrated the potential for “treatment as prevention” or “test and treat” initiatives in combination with other approaches to dramatically slow the HIV epidemic.<sup>308</sup> These strategies can only be successful if individuals know their HIV status and receive full treatment.
  - The U.S. Public Health Service’s guidance supports the use of pre-exposure prophylaxis (PrEP) — to promote regular use of anti-retroviral drugs by those who are not infected with HIV to prevent transmission from an infected partner. PrEP has been shown to



“HIV, taking my meds makes you undetectable. And that makes me unstoppable.”

Aaron – St Louis, MO  
Living with HIV since 2011.

**HIV  
TREATMENT  
WORKS**

This is my disease. It’s in my body and I need to know everything I can to fight it. I stay informed. I talk to my doctor. I talk to my pharmacists. And I share my story through my own YouTube channel called My HIV Journey. Three years ago, when I met my partner Phil, I told him I was HIV-positive in our first conversation. He said, ‘That’s OK. There are lots of ways to protect ourselves.’ Phil takes PrEP and I take my meds every day. In this relationship, HIV ends with me.



**Get in care. Stay in care. Live well.**  
[cdc.gov/HIVTreatmentWorks](http://cdc.gov/HIVTreatmentWorks)

reduce the risk of HIV infection in people who are high risk by more than 90 percent, when taken consistently.<sup>309</sup>

## RECOMMENDATIONS: HIV/AIDS Prevention and Control

### ● **Adopting strategies to end AIDS in every city and state:**

A number of communities are rededicating themselves to the fight against HIV/AIDS — setting a goal of ending AIDS — by increasing their priority, support and investment in the full continuum of effective policies and approaches. For instance:

- New York launched a Blueprint to End the AIDS Epidemic in New York State — with a goal of reducing new annual infections from 3,000 down to 750 by 2020. The main components of their three-point plan include: 1) identifying persons with HIV who remain undiagnosed and linking them to healthcare; 2) retaining persons diagnosed with HIV in healthcare to maximize virus suppression so they remain healthy and prevent further transmission; and 3) facilitating access to Pre-Exposure Prophylaxis for high risk persons to keep them HIV negative.<sup>310</sup>
- San Francisco has set a goal to be an AIDS-free city — including supporting improved overall public health, health and social services; early and sustained treatment; and PrEP. The number of new infections was reduced by half between 2004 and 2011, down to around 300 new cases a year.<sup>311</sup>

- While Washington, D.C. has one of the highest rates of HIV/AIDS (2.5 percent) in the nation, the newly diagnosed rate was reduced by 57 percent from 2007 to 2013.<sup>312</sup> This includes an 87 percent reduction in intravenous drug use transmission. The city has launched a “90-90-90-50” plan with the goal of 90 percent of people knowing their HIV status, 90 percent who are living with HIV/AIDS in care or treatment, 90 percent of people living with HIV having an undetectable level of the virus in their bodies and reducing the number of new diagnoses by 50 percent by 2020.

- **Routine screening for all sexually transmitted infections, as recommended by the U.S. Preventive Services Task Force — and reassessing sexual risk reduction guidelines for treatment as prevention and pre-exposure prophylaxis:** CDC should release revised guidelines to assist individuals in assessing their risk in the context of these new treatment and chemoprophylaxis approaches to match the most recent evidence-based epidemiological data.
- **All state Medicaid programs should cover routine screening of HIV, regardless of risk** (consistent with CDC and USPSTF guidelines).

- **All federal and state healthcare policies should be revised and aligned to support full access to comprehensive PrEP services for those for whom it is appropriate and desired, including with support for medication adherence — and all insurers should fully cover PrEP for designated individuals.**

- **Coordinating prevention strategies and treatment when appropriate for HIV/AIDS, hepatitis and TB:** Since the at-risk populations often overlap for the conditions, it is important to coordinate strategies, surveillance and treatment programs for the conditions, which also helps more efficiently use available resources.

- **Removing all restrictions on syringe exchange programs — and support public safety campaigns and syringe exchange programs to help prevent HIV and viral hepatitis:** In addition, there should also be increased state, local and private support for syringe exchange programs and campaigns to inform the public about the effectiveness of syringe exchange programs for limiting the spread of HIV/AIDS, HBV and HCV, including for protecting first-responders and healthcare workers.

## ADDRESSING THE SOCIAL DETERMINANTS OF HEALTH INEQUITIES AMONG GAY MEN AND OTHER MEN WHO HAVE SEX WITH MEN IN THE UNITED STATES

In the United States, gay men and other MSM continue to be profoundly affected by HIV/AIDS. Among MSM, a history of two prior sexually transmitted disease (STD) infections have been found to be associated with an eight-fold increased risk of HIV infection.<sup>313</sup> Representing approximately 2 percent of the overall population, MSM comprise a majority of new HIV infections (66 percent in 2010) and represent more than half (56 percent) of all persons living with an HIV diagnosis. HIV incidence is disproportionately higher among Black MSM than any other risk group.

MSM also face a variety of other mental, physical and sexual health disparities, including substance abuse and depression, both of which correlate with high-risk behaviors for HIV infection, as well as suicide. MSM also have elevated rates of syphilis, gonorrhea, and other STIs, which are associated with an increased risk for HIV infection as well. Young MSM are more likely than their heterosexual counterparts to report emotional distress, depression, or self-harm, and are at higher risk of suicidal ideation or attempts and becoming homeless.

The many health inequities experienced by MSM constitute a syndemic — i.e. multiple social determinants that each independently influence health outcomes, and which mutually reinforce and amplify each other. Among MSM, the syndemic comprising HIV, STIs, mental health, substance abuse and violence has profound implications for HIV prevention — as numerous health challenges may overwhelm the capacity of

some MSM to reduce their sexual risks. Moreover, for MSM who are also racial minorities, social determinants of health may intersect in various, overlapping domains, including not only sexual orientation, but race, poverty, educational attainment and immigration status.

Strategies to address health inequities among MSM — including, but not limited to, HIV — include interventions to 1) increase individual resiliency, 2) foster a supportive community, 3) improve access to quality healthcare, and 4) transform the environmental context in which people live. While new biomedical interventions such as pre-exposure prophylaxis or treatment-as-prevention show promise, their uptake will also be affected by social determinants. Addressing social determinants at every stage of life will require an array of linked individual, biomedical and structural interventions throughout the life course. To account for environmental factors, community-level and structural interventions must include health policy and legislation, economic and social interventions and cross-sector collaborations. Improved federal coordination is also essential.

In the long term, however, reducing societal oppression and marginalization of LGBT people will diminish the need for individual and community-level interventions. The increasing recognition that for MSM, HIV constitutes but one of many health challenges provides an opportunity to refocus efforts to fight HIV by incorporating interventions within the context of MSM health and wellness promotion.

## GAY AND LESBIAN TEENS AT INCREASED RISK FOR INJECTION DRUG USE

Lesbian, Gay and Bisexual (LGB) teens are at higher risk for drug use — including injection drug use — compared with heterosexual teens.<sup>314</sup> According to CDC's Youth Risk Behavior Surveillance (YRBS) data from 2001 to 2009, 17.7 percent of gay and lesbian teens and 9.6 percent of bisexual teens had tried heroin, compared to only 1.8 percent of heterosexual teens.<sup>315</sup>

## HEPATITIS B AND C

Around five million Americans have HBV or HCV, but between 65 percent and 75 percent do not know they have them.<sup>316</sup> As they age, they are at risk for developing serious liver diseases or cancer unless they receive treatment. Baby Boomers are five times more likely to have HCV, and one in 12 Asian Americans has HBV.<sup>317, 318</sup> An independent Milliman report found total medical costs for HCV patients could more than double over the next 20 years — from \$30 billion to \$80 billion per year.<sup>319, 320</sup>

- In 2013, USPSTF recommended routine one-time HCV screening of individuals born between 1945 and 1965 for the first time, which means the test is now available to these individuals who are enrolled in new group or individual health insurance, Medicare or Medicaid Expansion programs with no cost-sharing.<sup>321</sup> A 2013 study of 1,578 patients born between 1945 and 1965 found that only 2 percent (31) of these Baby Boomers were screened for HCV.<sup>322</sup>
- A number of new direct acting drugs — including Harvoni, Sovaldi and Viekira Pak as well as other drugs currently under development or in review for approval — have advanced treatment options and have very high cure rates for HCV. The costs of these treatments, however, can reach \$100,000 for the required twelve-week cycle, and some patients need two cycles of treatment.<sup>323</sup> Because of the cost, some states and payers have instituted barriers to access for treatment, such as requiring abstinence from substance use or waiting until patients' liver disease is advanced. According to a review by the Center for Health Law and Policy Innovation of Harvard Law School, many of these barriers do not have a basis in clinical evidence.<sup>324</sup>

FIND OUT IF YOU HAVE


# HEPATITIS C

IT COULD SAVE YOUR LIFE

BORN FROM 1945-1965?


SOME PEOPLE DON'T KNOW HOW OR WHEN THEY WERE INFECTED

People born from 1945-1965 are **5X MORE LIKELY TO BE INFECTED WITH HEPATITIS C**



**3 OUT OF EVERY 4** people with Hepatitis C were born between these years

Up to 75%


of people living with Hepatitis C **DO NOT KNOW THEY ARE INFECTED**



Many people can live with **HEPATITIS C** for **DECADES** WITH **NO SYMPTOMS**



HEP C Blood Test




CDC recommends anyone born from 1945-1965

GET TESTED


TESTED

KNOWING YOU HAVE HEPATITIS C can help you make important decisions about your health



Rx


Many people can get **LIFESAVING CARE AND TREATMENT**




Successful treatments can **ELIMINATE THE VIRUS** from the body

NOT TESTED

LEFT UNTREATED, HEPATITIS C can cause liver damage and **LIVER FAILURE**




HEPATITIS C is the **#1 CAUSE OF LIVER TRANSPLANTS**




HEPATITIS C is a leading cause of **LIVER CANCER**

Don't go down the wrong path, talk to your doctor about getting tested. It could save your life.



U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention





## RECOMMENDATIONS: Preventing and Controlling Viral Hepatitis

TFAH recommends a comprehensive strategy be carried out to better prevent, control and treat hepatitis, including:

- **Improving real-time surveillance to monitor and allow for containment of hepatitis outbreaks — which is urgently needed due to the rising epidemics of heroin use and hepatitis C infections:** Recent clusters of outbreaks show the urgent need for improved and real-time measurement of infections to allow for interventions to prevent the spread of the disease.
- **Ensuring everyone who is diagnosed receives appropriate care:** Every person diagnosed with HBV or HCV should have access to and receive a standardized level of care and receive support services. CMS and Medicaid programs should take the lead in ensuring patients receive the most effective treatments available and removing discriminatory coverage rules for HCV treatment.
- **Promoting universal HBV vaccination:** HBV vaccinations have helped reduce rates of infection by around 80 percent, but around 10 percent of infants still do not get vaccinated, and adults who came of age before the vaccine was available in 1992 or were born abroad where the vaccine is not widely used should also be vaccinated.
- **Making hepatitis B and C screening routine and active:** HBV and HCV screenings should be regularly conducted for at-risk groups, including persons of Asian heritage or born in countries with moderate to high rates for hepatitis B and Baby Boomers (individuals born between 1945 and 1965) for HCV, as recommended by the USPSTF.
- **Reducing disparities:** American Indians and Blacks have a disproportionately high rate of HCV infections — and strategies should be developed to improve education and support for those most at risk, including providing comprehensive treatment and wrap-around support.<sup>325</sup> Half of HBV infections in the United States are among Asian American and Pacific Islanders (AAPIs) — and concerted efforts should be made for improved screening and treatment as necessary for those at highest risk.<sup>326</sup>
- **Investing in biomedical, behavioral and health services research and development:** The investment in hepatitis-related biomedical and behavioral research must be significantly increased including support for understanding the differential impact of treatment among certain populations, improving screening and diagnostic tools, and for new and better vaccines. Research support should be more proportionate to the public health threat associated with hepatitis.

## TUBERCULOSIS (TB)

During the 1970s, rates of TB cases had significantly declined (from more than 84,000 cases to around 22,000).<sup>327</sup> The country experienced a resurgence of the disease in the mid-1980s — contributed to by complacency and cuts to control programs, the emergence of drug-resistant TB and HIV/AIDS and changing immigration patterns with more people arriving from countries with a high TB burden. After significant and dedicated funding was provided at the federal, state and local levels to support improvements in treatment, case finding, laboratory capacity, and infrastructure, the United States was able to regain control from the resurgence, and cases again declined. However, once rates went down and stabilized, the federal government and many states started cutting funds from TB prevention and control programs again — limiting the ability to effectively carry out these programs.

In 2014, 9,421 TB cases were reported in the United States with 66 percent of cases occurring among foreign-born persons.<sup>328</sup> While the number of cases of TB disease has declined annually since 1993, up to 13 million people in the United States are estimated to have latent TB infection (LTBI), which, if not treated, develops into TB disease in 5 percent to 10 percent of people. Asians continue to have the highest case rate (17.8 per 100,000 persons) among all racial or ethnic groups, as opposed to 2.96 per 100,000 persons overall.<sup>329</sup> Many states report having limited or no resources to devote to LTBI concerns. Annually, about 1 percent of U.S. TB cases are multi-drug resistant (MDR TB) and one or two are extensively-drug resistant (XDR TB). MDR TB and XDR TB require treatment for longer periods of time, with regimens that are more expensive and have more side effects. Most cases of MDR TB and XDR TB occur in persons born outside the United States.

### TAKE ON TB

Too many people in our country still suffer from tuberculosis (TB).


### 9,421 TB CASES REPORTED IN THE U.S. IN 2014

555 TB Deaths in 2013

A Typical TB Case Requires:

- PLUS X-rays
- Lab tests
- Follow-up & testing of contacts

180 days of medications



**\$435 MILLION**

Total cost to U.S. for TB cases in 2014.

**Our progress towards elimination may be slowing - the U.S. saw the smallest decline in cases in over 10 years!**

### TB CAN HAPPEN ANYWHERE & TO ANYONE!

To eliminate TB, we must reach the hardest hit populations.

**TB case rates are:**

**29x**

Higher for Asians than whites.

**8x**

Higher for African Americans than whites.

**8x**

Higher for Hispanics/Latinos than whites.



**2 out of every 3**

TB cases occur among foreign-born persons.

### DRUG-RESISTANT TB IS COMPLEX & COSTLY.

Drug-resistance threatens our ability to treat & control TB.

TOTAL 2014 CASES	DIRECT TREATMENT COST PER CASE
2 Extensively Drug-Resistant TB	\$482,000
91 Multidrug-Resistant TB	\$150,000
9,328 Tuberculosis (Drug-Susceptible)	\$17,000

### ELIMINATING TB REQUIRES A COMPREHENSIVE APPROACH.

CDC is committed to fighting TB whenever & wherever it occurs through:



Vigilant Surveillance



Better Diagnostics & Treatments



Testing & Treatment of High-Risk Populations



Education of Health Care Providers

**To learn more about TB, visit: [www.cdc.gov/tb](http://www.cdc.gov/tb)**

SEPTEMBER, 2015



Centers for Disease Control and Prevention  
1600 Clifton Road, NE  
Atlanta, GA 30333

Globally, an estimated 8.9 million people develop active tuberculosis each year, and 1.5 million die from TB.<sup>330</sup> About one-third of the human population is infected with TB, but most cases of these are latent TB infections and are not contagious.

Health Resources and Services Administration (HRSA) recommend routine TB testing for children at high risk for TB, but there currently is not a recommendation for routine screening for at-risk adults by CDC, HRSA or USPSTF.<sup>331</sup>

People who are at-risk for TB include those who do not receive regular or high-quality healthcare, including people who are homeless, foreign-born, incarcerated or co-infected with other conditions, and people with weakened or compromised immune systems.

States have the option of adding diagnosed TB patients to Medicaid.<sup>332</sup> The covered TB-related services include prescribed drugs, physician's services, lab and x-ray services, clinic and Federally Qualified

Health Center services, case management services and other services such as those designed to encourage completion of outpatient regimens, including directly observed therapy (DOT) — the recommended standard of care where healthcare professionals watch to make sure a patient is taking all of their treatment medication. Nine states have elected to provide this Medicaid waiver/expansion. There is receipt of matching federal dollars for treating these TB patients.

Many individuals — particularly lower-income and undocumented individuals and the homeless — still remain uninsured and/or do not receive or have access to routine medical care or attention, so there is a continued role for public health agencies to provide access to care and treatment. Public health agencies continue to do TB surveillance, contact tracing, outreach and education — as well as providing the direct medical care for TB patients. Even in states that elect to add TB patients to Medicaid, the majority of TB care is provided by health departments, and in many cases they are not able to recover the costs of TB care from insurers.

TB disease is treated with drug therapy, but it is imperative that people finish the medicine and take the drugs exactly as prescribed. It usually involves a regimen of drugs taken for six months to two years depending on whether the bacteria are drug resistant, and if so, the number of drugs to which they are resistant. Drugs used in regimens to treat MDR TB and XDR TB are difficult for patients to tolerate, which can contribute to non-adherence. If patients stop taking the drugs too soon or do not take the drugs correctly, they can relapse, die or develop drug resistance.

In recent years, shortages of medications and antigen used in skin tests for diagnosing TB — along with significant increases in costs of medications, budget cuts and hiring freezes — have

**TAKE ON TB** To eliminate tuberculosis (TB), we must reach the hardest hit populations.

**1 OUT OF 20**  
TB patients is a person experiencing homelessness.

[www.cdc.gov/tb](http://www.cdc.gov/tb)  Centers for Disease Control and Prevention National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention

reduced the capacity of some state and local TB programs. Weakened programs have compromised the ability of many states to conduct investigations to track down contacts TB patients may have had, to test for and treat TB infections and to provide directly observed therapy treatment. Drug shortages — for both MDR TB as well as TB disease and latent TB infections — put patients and communities at greater risk for illness and disease transmission, and can further the development of drug resistance. When drugs are unavailable, fewer treatment options exist for patients. They may be prescribed less effective drugs, which can cause more side effects or prolong treatment.

## TB AND DIABETES

There is a rising global co-epidemic of TB and diabetes. Diabetics are two to three times more likely to contract or die from TB, due to a weakening of the immune system. In addition, the drugs that treat each disease interfere with one another, complicating disease control.<sup>333</sup>

Worldwide, there were 390 million diabetics in 2013 and cases are projected to approach 600 million by 2035.<sup>334</sup>

Experts say that bi-directional screening of people living with TB for diabetes and people living with diabetes for TB is essential. India was the first country to create a national policy of addressing the diseases simultaneously after discovering high rates of diabetes among TB populations.<sup>335</sup> New treatment protocols are also being examined to better de-silo related infectious and non-communicable care.<sup>336</sup>

## RECOMMENDATIONS: Toward Eliminating TB in America

The resurgence of the disease is particularly troubling since TB is treatable, curable and preventable — and new antibiotic resistant strains of TB are worrisome. TB disproportionately affects Americans living in poverty, and those with HIV/AIDS who are at higher risk for the disease. TFAH consulted with a set of TB control experts to identify key recommendations for curbing a future resurgence of TB in the United States, which include:

- **Providing adequate federal, state and local support for TB prevention and control:** The United States has a goal to eliminate TB. Achieving that will require increased resources and prioritization. TB control efforts require strong surveillance for individuals and clusters of the disease, infection control programs in communities with outbreaks, and ensuring that infected patients receive full and complete treatment. The latter is important for their care and to limit the transmission of the disease. TB control efforts are the responsibility of state and local governments. CDC funds all 50 states, 10 major cities, and eight territories to assure comprehensive surveillance systems for reporting TB cases, healthcare providers and other personnel to assure evaluation of contacts, completion of therapy for persons with TB disease, and preventive therapy for high-risk persons with latent TB infection. Because TB is spread through the air, infection control programs must be in place in healthcare facilities and other conjugate settings. States should ensure routine screenings

in correctional facilities and also consider TB screening for international college students. At the federal level, consideration should be given to expanding the screening, and requirement for treatment, of persons entering the United States and seeking work visas or other longer-term stays within the United States. Additionally, plans, procedures and sufficient fiscal resources should be in place to ensure completion of therapy for persons who cross international borders with infectious TB disease.

- **Ensuring quality control in TB treatment:** Treating TB is an intensive and long process. It requires patients to take a full course of their medicine precisely as prescribed through directly observed therapy treatment, which may require additional services for patients who need food, housing, transportation, or substance use services. Infectious patients must be isolated until their treatment has rendered them noninfectious (which can take several weeks, or months if the person has drug-resistant TB) to stop the spread of the disease and are not able to sustain employment. Private healthcare providers and insurers should enter into contracts and arrangements with TB public health programs to refer patients to experts in TB care, since improper care can exacerbate the development of additional drug-resistant cases or forms of the disease or lead to the patient becoming ill again. Public health departments should be able to bill a patient's insurance company for direct service treatment costs.

- **Addressing the TB drug costs and shortages and biologics shortages:** The shortage of treatment medication and biologics used to diagnose TB infection and the growing cost of TB treatment is harmful to the appropriate care for individuals and control efforts in states. Ensuring sufficient quantities, adequate supplies of TB biologics (Tubersol and Aplisol) and payment for drugs are essential for effective TB control and monitoring of outbreaks and diagnosing new infections.
- **Supporting research and development of new treatments for TB:** Resources and incentives should be devoted to increased research for improved and alternate ways to treat the disease.
- **Encouraging all states to participate in the TB Medicaid waiver/expansion:** All states have the option of being able to add all TB patients to their Medicaid program and receive federal matching support. As of 2013, only nine states reported participating.<sup>337</sup>
- **Supporting routine screening and diagnostics for target high-risk groups:** USPSTF should adjust their guidelines to recommend TB screening for those at high risk. If supported by the USPSTF, screening would be a mandated benefit offered to Americans with new group and individual plans and those covered by Medicaid expansion with no-copayments.<sup>338</sup>
- **Requiring no-cost-sharing treatment for TB patients by public and private payers:** This is particularly important because of the higher-risk of TB among lower-income, undocumented and homeless populations.

## J. FIX FOOD SAFETY

Nearly all foodborne illnesses could be avoided with a stronger U.S. food safety system. There are around 48 million cases of illness each year, with 1 million resulting in long-term complications, 28,000 leading to hospital visits and 3,000 resulting in death.<sup>339, 340</sup>

The estimates of the economic costs of foodborne illnesses range from \$15.6 to \$77 billion annually in medical costs and lost productivity.<sup>341, 342</sup> Major outbreaks can also contribute to significant economic losses in the agriculture and food retail industries, which contributed \$789 billion to the U.S. gross domestic product (GDP) in 2013, a 4.7 percent share.<sup>343</sup>

*Salmonella* infections alone are responsible for an estimated \$365 million in direct medical costs annually and the number of infections has not decreased in the past 15 years.<sup>344</sup> For example, a 2015 outbreak due to contaminated cucumbers has led to more than 838 cases, 165 hospitalizations and four deaths from *Salmonella Poona* poisoning in at least 38 states. One hundred and sixty-five people have been hospitalized and four have died.<sup>345</sup>

According to CDC, produce is related to the highest percentage of illnesses (46 percent), but meat and poultry cause the most deaths (29 percent).<sup>346</sup> Norovirus is the leading cause of illness from contaminated food in the United States.<sup>347, 348</sup> Foodborne norovirus outbreaks result most commonly from handling of ready-to-eat foods by infected individuals, but can also occur due to use of fecally-contaminated water during production.<sup>349</sup> *Cyclospora cayatanensi*, a microscopic parasite, has caused large outbreaks of diarrheal illness linked to fecally-contaminated imported produce items.



Source: CDC

According to research conducted by University of Florida Emerging Pathogens Institute, the top 10 riskiest combinations of food and pathogens include *Campylobacter* in poultry, *Toxoplasma* in pork, listeria in deli meats and dairy products, and *Salmonella* in foods such as produce, eggs, and poultry.<sup>350</sup> These top 10 pathogen-food combinations are responsible for more than \$8 billion in annual economic loss. Of all these pathogens, *Salmonella* is the

leading cause of hospitalizations and death in the United States.<sup>351</sup>

In 2015, FDA finalized several major rules implementing portions of the Food Safety Modernization Act (FSMA): Preventive Controls for Human Foods and Preventive Controls for Animal Foods, which require covered facilities to analyze potential hazards and implement risk-based preventive controls in their production processes;

Produce Safety, which establishes standards for growing, harvesting, packing and holding of produce; the Foreign Supplier Verification Program for food importers to assure that imported food meets U.S. safety standards; and Accredited Third-Party Certification to establish accreditation of auditors to certify foreign food facilities.<sup>352</sup> The FY 2016 President's budget included a request for an additional \$109 million for FDA.<sup>353</sup>

## RECOMMENDATIONS: Improving and Aligning Food Safety Systems

To improve food safety in the United States, TFAH recommends:

- **Fully funding and implementing the Food Safety Modernization Act:** Sufficient funding should be devoted at the federal and state levels to be able to implement and enforce the law. FDA should ensure public health is the top priority as it implements FSMA prevention rules. FDA should also track implementation of these rules to ensure that proposed exemptions do not increase risk from foodborne illness.
- **Improving enforcement and inspection capacity:** FDA should work with states to ensure they are ready to enforce FSMA regulations, develop an operational strategy and ensure compliance across states.
- **Moving toward a unified government food safety agency:** The government

currently does not have a coordinated, cross-governmental approach to food safety. Right now, food safety activities are siloed across a range of agencies, and many priorities and practices are outdated. In 2014, FDA released a Food and Feed Program Action Plan as a framework to help realign operations. Each year the Office of Regulatory Affairs (ORA), the Center for Food Safety and Applied Nutrition (CFSAN), the Center for Veterinary Medicine (CVM) and the Office of International Programs (OIP) will identify deliverables to be accomplished that year. In the longer term, the Administration should develop a plan with a set timeline for how to restructure food safety functions across the federal government into a single, unified food safety agency to carry out a prevention-focused, integrated strategy. This same type

of coordinated, cross-governmental approach to food safety is also needed within each state.

- **Improving surveillance of foodborne illnesses:** Currently, foodborne illnesses are radically underreported in the United States and the quality of reporting varies dramatically by state. New standards and requirements should be put in place to incentivize states to improve reporting and penalize states for underreporting. Surveillance for foodborne illness outbreaks should be fully integrated with other HIT systems, which will help improve tracking and identification of the scope of problems as well as sources of outbreaks. FDA and CDC should also have a plan for requiring clinics to send cultures from rapid response tests showing problems to public health labs to allow for subtype pathogen testing.<sup>354</sup>

# Examples of Key Emerging and Emergency Threats

- **Pandemic Flu:** In addition to the seasonal flu, historically there have been three-to-four pandemic flu outbreaks each century. Pandemics occur when a new influenza virus emerges against which people have little-to-no immunity and the virus spreads internationally with sustained human-to-human transmission. While experts predict influenza pandemics will occur in the future, they cannot predict when the next pandemic will occur, what strain of the virus will be involved, or how severe the outbreak will be.<sup>355</sup> Once a novel influenza strain mutates and becomes easily transmissible among humans, it can cause a worldwide pandemic in a relatively short time.<sup>356</sup> A severe pandemic in 1918 resulted in 30 percent of the population becoming ill and 2.5 percent (625,000 Americans) of those who became ill died.<sup>357</sup> The most recent pandemic, the 2009 H1N1 Influenza (A) virus, while considered relatively mild, infected around 20 percent of Americans (approximately 60 million individuals), and resulted in approximately 274,000 hospitalizations and 12,000 deaths.<sup>358</sup>
- **Chikungunya:** A mosquito-borne virus that, while rarely fatal, causes fever and joint pain that can be excruciating.<sup>359</sup> There are no vaccines or treatments for chikungunya, but symptoms usually subside in about a week. In some people, joint pain can persist for months. In 2013, the disease first appeared in the Americas in the Caribbean Islands. As of July 3, 2015, more than 1.5 million cases have been reported to the Pan American

Health Organization (PAHO),<sup>360</sup> and through October 6, 2015, 510 cases have been reported to ArboNET from 39 states.<sup>361</sup> In 2014, 2,799 chikungunya cases were reported in the United States, most of which were in travelers returning home, and only 11 cases were contracted in the United States in Florida.<sup>362</sup>

- **Dengue Fever:** A mosquito-borne illness that causes flu-like symptoms and severe joint, muscle and bone pain, and there are no vaccines or treatments currently available. WHO estimates that 50 to 100 million infections occur yearly, including 500,000 cases of dengue hemorrhagic fever and 22,000 deaths, mostly among children. It is endemic in Puerto Rico and in many popular tourist destinations in Latin America, Southeast Asia and the Pacific islands. In the United States, small dengue outbreaks occurred in Hawaii in 2001, Texas in 2005 and most recently in Florida in 2013.<sup>363, 364</sup>
- **Chagas Disease:** Caused by the parasite *Trypanosoma cruzi*, it can lead to severe cardiac and gastrointestinal disease. It is transmitted to animals and people by insect vectors found exclusively in the Americas. As many as 8 million people in Mexico, Central America and South America—and more than 300,000 in the United States — have Chagas disease, the majority of whom do not know they are infected. Many U.S. healthcare professionals are not familiar with the disease which leads to under-diagnosis.<sup>365</sup>

## Examples of Key Emerging and Emergency Threats *Appendix A*

- **West Nile Virus:** A potentially serious illness that is spread by infected mosquitoes that contract the virus from feeding on infected birds for which there is no vaccine. The majority of infected individuals have no symptoms, but up to 20 percent of infected individuals develop symptoms, including fever, headache, body aches, nausea, vomiting, swollen lymph glands and rashes on the trunk of the body, that can last several weeks, and a one in 150 people infected

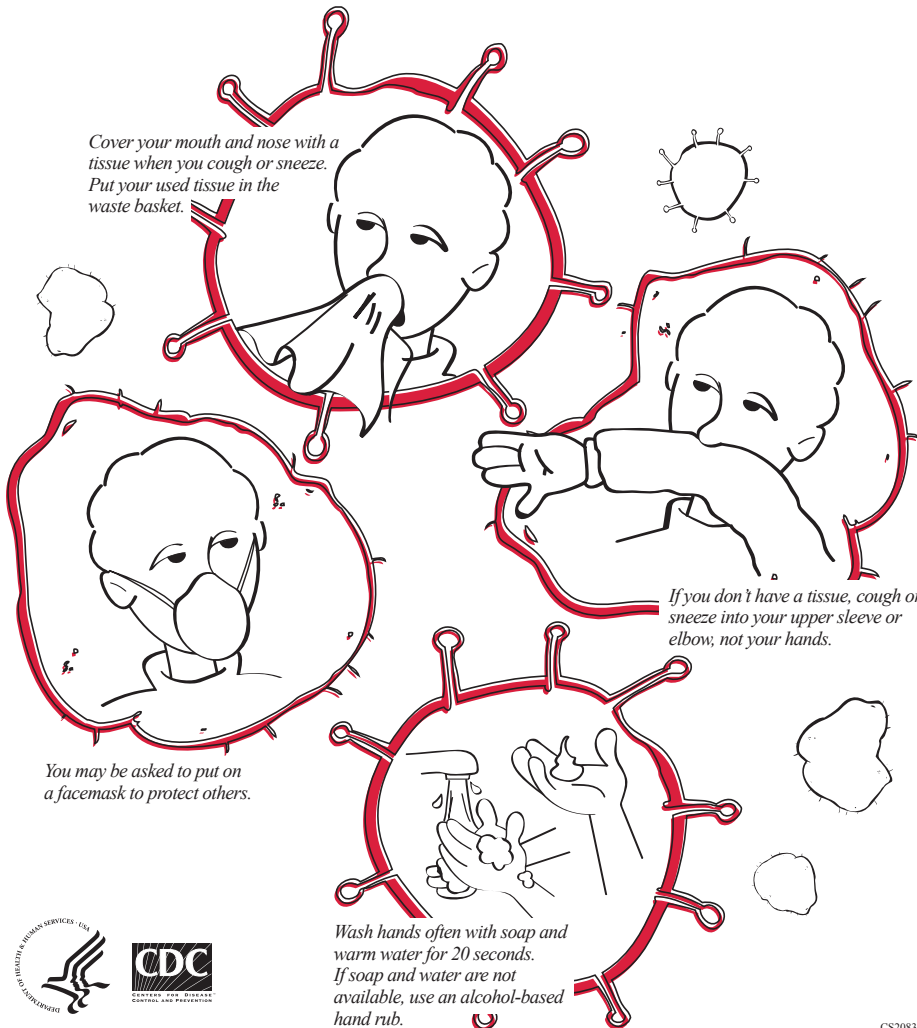
develop serious symptoms and in some cases permanent neurological effects. In 2014, 47 states and Washington, D.C. have reported WNV infections in humans, birds or mosquitoes. Overall, 2,002 cases of West Nile virus disease have been reported to CDC.<sup>366</sup> Older adults are at higher risk for developing WNV neuroinvasive disease.

- **Malaria:** A mosquito-borne disease that can also be transmitted through blood contamination or childbirth — resulting in fever, headache, fatigue, coma and death.<sup>367</sup> Antimalarial drugs can provide effective treatment, but resistance is emerging and spreading globally. Globally, in 2013, there were 198 million cases and 584,000 deaths, mostly among African children.<sup>368</sup> The United States experiences 1,500 to 2,000 cases of the disease per year mostly through exposed outside the country. Proven interventions in malaria endemic countries can have a profound impact on malaria control which saves lives, reduces risk of importation in the United States and advances the effort to eliminate malaria.

- **Valley Fever:** An infection caused by the fungus *Coccidioides*, which is endemic to the soils of the U.S. southwest, mainly Arizona and California that people can breathe in and the spores settle in the lungs.<sup>369</sup> Most people never experience any symptoms, but some patients develop flu-like symptoms, 5 percent to 10 percent develop long-term lung problems and 1 percent may develop meningitis or die.<sup>370</sup> Blacks, Filipinos, pregnant women and people with diabetes or weakened immune systems are most susceptible. Nearly 130,000 valley fever cases were reported to CDC during 1998 to 2012<sup>371</sup> and around 100 Americans die from valley fever annually.<sup>372</sup>

# Cover your Cough

— Stop the spread of germs that can make you and others sick! —



CS208322





## BIOTERRORISM THREATS

CDC classifies biological agents that could be used for an intentional bioattack into three categories:

- Category A, or “High-Priority Agents,” is considered the most dangerous and includes: Anthrax, botulism, plague, smallpox, tularemia and viral hemorrhagic fevers (e.g., Ebola, Marburg).
- Category B, or “Second-highest Priority Agents,” includes food safety threats (e.g., Salmonella and E. coli), ricin toxin, Typhus fever and viral encephalitis, among others.
- Category C, or “Third-highest Priority Agents” include emerging pathogens that could be engineered for mass dissemination in the future because of availability; ease of production and dissemination; and potential for high morbidity and mortality rates and major health impact. Hantavirus is an example of a Category C agent.<sup>373</sup>

Two threats that have been of high focus in U.S. bioterrorism preparedness strategies include:

- **Anthrax:** In September and October 2001, at least five envelopes containing *Bacillus anthracis* (anthrax) were mailed to Senators Patrick Leahy and Thomas Daschle and to members of the media in New York City and Boca Raton, Florida. After the bioterrorist attacks were identified, the FBI and the United States Postal Inspection Service (USPIS) formed a task force to investigate the crime. The investigation lasted seven years and was undertaken by FBI field offices in Miami, New York, Newark, New Haven, Baltimore and Washington, D.C. At the beginning of the investigation,

the limitations on scientific analysis prevented the task force from finding the culprit.

At least 22 victims contracted anthrax, and five people died from inhalation anthrax. An additional 31 people tested positive for exposure to anthrax spores. In all, 35 post offices and mailrooms were contaminated along with seven buildings on Capitol Hill in Washington, D.C.

Anthrax is a potentially lethal infection, particularly when it manifests as inhalation anthrax. Historically, numerous nations have experimented with anthrax as a biological weapon, including the U.S. offensive biological weapons program that was disbanded in 1969.<sup>374</sup> The worst documented outbreak of inhalation anthrax in humans occurred in Russia in 1979, when anthrax spores were accidentally released from a military biological weapons facility near the town of Sverdlovsk, killing at least 66 people.

- **Smallpox:** Although WHO declared that smallpox was eradicated in 1980, this contagious and deadly infectious disease caused by the *Variola major* virus, remains high on the list of possible bioterror threats.

The last naturally occurring case of smallpox was reported in 1977. Currently, there is no evidence of naturally occurring smallpox transmission anywhere in the world. Although a worldwide immunization program eradicated smallpox disease decades ago, small quantities of smallpox virus officially still exist in research laboratories in Atlanta, Georgia and in Novosibirsk, Russia.

# Federal, State and Local Public Health Responsibilities

## *Appendix B*

## Federal, State and Local Public Health Responsibilities

The nation's public health system is responsible for improving the health of Americans. Public health laws “authorize and obligate the government to protect and advance the public's health,” including against threats from infectious diseases.<sup>375</sup>

Federal, state and local health departments have different responsibilities and jurisdictions, and must also work in partnership with healthcare providers; the insurance, pharmaceutical and medical device industries; other areas of government; and community groups to effectively prevent and control diseases. Policies and programs to control infectious diseases are particularly complex since many of the core responsibilities are based in states, while diseases can easily spread across state lines and around the globe.

The federal government sets national health goals and priorities for the country. The federal government can track and report on information about diseases, conduct biomedical and prevention research, stockpile resources to supplement state and local response capabilities and provide technical assistance to states and localities.<sup>376</sup> Federal policies can steer efforts across the country by setting joint strategic priorities and establishing programs and then providing funds, often through grants, to carry out policies in states or local communities. Since communicable diseases pose threats to national security and travel across states, Congress authorized the tracking of infectious disease threats starting in 1878.<sup>377</sup> CDC, in consultation with state, local and tribal health departments and the Council of State and Territorial Epidemiologists, establishes and routinely updates a list of “notifiable”

diseases that states are required to report to CDC so they can be tracked and strategies can be developed to limit their spread.<sup>378</sup> There are more than 95 notifiable infectious diseases, ranging from anthrax to yellow fever.<sup>379</sup>

The federal government also has authority to isolate or quarantine patients infected with certain diseases who are arriving into the United States from a foreign country, are traveling between states, or who may come into contact with others who are traveling between states when they pose a threat to others or the national interest. This authority derives from the Commerce Clause of the Constitution. The U.S. Secretary of HHS is authorized to take measures to prevent the entry and spread of communicable diseases from foreign countries into the United States and between the states (section 361 of the Public Health Services Act (42 U.S. Code § 264)).<sup>380</sup> CDC has the responsibility for implementing these functions as deemed necessary to protect the public. Although rare, CDC may detain, medically examine and release persons arriving into the United States, or people traveling between states who are suspected of being exposed to or carrying communicable diseases of public health concern.

Federal isolation and quarantine are currently authorized by Executive Order of the President for cholera, diphtheria,

infectious TB, plague, smallpox, yellow fever, viral hemorrhagic fevers like Ebola, severe acute respiratory syndromes and influenza viruses that are causing or have the potential to cause a pandemic.<sup>381</sup> The President can revise the list by Executive Order. The U.S. Customs and Coast Guard offers aid in the enforcement of quarantine rules and regulations.<sup>382</sup> Breaking a federal quarantine order is punishable by fines and imprisonment.<sup>383</sup>

States bear most of the legal responsibility for protecting the health, safety and welfare of their citizens, granted by “police power” functions. States vary in how they are structured and many share different degrees of responsibility with local governments, but still maintain the ultimate power within their borders.<sup>384</sup> This authority “underlie[s] communicable disease laws authorizing surveillance, testing, screening, isolation and quarantine.”<sup>385</sup> Every state has the general public health authority to act to control communicable diseases, but state laws, programs and funding levels vary significantly. For instance, some states have very specific or very broad quarantine laws. In most states, breaking a quarantine law is a criminal misdemeanor.<sup>386</sup>

Public health laws can be controversial in terms of finding an appropriate balance between protecting against the risk to the public versus the rights of an individual or group. In most states, for most conditions, “liberty principles” and “informed consent” allow individuals to decide whether to treat an illness they may have, but this may then lead to required isolation of a person if the disease can be easily spread and pose a danger to others.<sup>387</sup>

States are able to establish their own quarantine and isolation policies, such as during the Ebola outbreak, and there has been significant variations in their



policies with many states choosing to differ from CDC’s recommendations. For example, some states had required mandatory quarantines for 21 days for healthcare workers returning from treating Ebola patients in West Africa even if they were at low risk for exposure and were symptom-free.<sup>388</sup>

U.S. infectious disease control strategies are complicated not just by interstate travel, but by international travel and immigration. In many cases, people carrying diseases are often not identified when crossing borders because they may have an infection or illness but are unaware of it, or they may not have developed severe enough symptoms to warrant special notice or attention. And, even in cases where a patient suspected of having a dangerous infectious disease has been identified, carrying out quarantine and isolation laws in a timely manner and across different jurisdictions can present a challenge. Therefore, disease outbreaks anywhere are of concern everywhere.

WHO revised International Health Regulations (IHR) to set standards for and require notification to WHO of any “public health emergency of international concern” or of any

significant evidence of public health risks outside their territory that may lead to or cause the international spread of disease. More than 190 nations have signed onto the IHR.<sup>389</sup> However, many countries do not adequately fund public health programs, have large endemic public health crises, do not have strong healthcare systems and do not have a tradition of setting standards for adopting evidence-based disease control practices or for adopting principles of objectivity, fairness and transparency.<sup>390</sup> Efforts like the WHO and CDC’s Global Disease Detection (GDD) program help provide some additional support to less wealthy nations, but there is wide variance and major gaps in public health programs around the world to control outbreaks like Ebola and ongoing threats like HIV/AIDS and malaria and the ability to quickly identify and contain new diseases.

According to the National Intelligence Council, emerging infectious diseases “endanger U.S. citizens at home and abroad, threaten U.S. armed forces deployed overseas, and exacerbate social and political instability in key countries and regions in which the U.S. has significant interests.”<sup>391</sup>

# State Public Health Budget Methodology

## *Appendix C*

## State Public Health Budget Methodology

TFAH conducted an analysis of state spending on public health for the last budget cycle, fiscal year 2014-2015. For those states that only report their budgets in biennium cycles, the 2015-2017 period (or the 2014-2016 and 2015-2016 for Virginia and Wyoming respectively) was used, and the percent change was calculated from the last biennium, 2013-2015 (or 2014-2016 and 2014-2015 for Virginia and Wyoming respectively).

This analysis was conducted from September to October of 2015 using publicly available budget documents through state government web sites. Based on what was made publicly available, budget documents used included either executive budget document that listed actual expenditures, estimated expenditures, or final appropriations; appropriations bills enacted by the state's legislature; or documents from legislative analysis offices.

"Public health" is defined to broadly include all health spending with the exception of Medicaid, CHIP, or comparable health coverage programs for low-income residents. Federal funds, mental health funds, addiction or substance abuse-related funds, WIC funds, services related to developmental disabilities or severely disabled persons, and state-sponsored pharmaceutical programs also were not included in order to make the state-by-state comparison more accurate since many states receive federal money for these particular programs. In a few cases, state budget documents did not allow these programs, or other similar human services, to be disaggregated; these exceptions are noted. For most states, all state funding, regardless of general revenue or other

state funds (e.g. dedicated revenue, fee revenue, etc.), was used. In some cases, only general revenue funds were used in order to separate out federal funds; these exceptions are also noted.

Because each state allocates and reports its budget in a unique way, comparisons across states are difficult. This methodology may include programs that, in some cases, the state may consider a public health function, but the methodology used was selected to maximize the ability to be consistent across states. As a result, there may be programs or items states may wish to be considered "public health" that may not be included in order to maintain the comparative value of the data.

Finally, to improve the comparability of the budget data between FY 2013-2014 and FY 2014-2015 (or between biennium), TFAH adjusted the FY 2014-2015 numbers for inflation (using a 0.992 conversion factor based on the U.S. Dept. of Labor Bureau of Labor Statistics; Consumer Price Index Inflation Calculator at <http://www.bls.gov/cpi/>).

After compiling the results from this online review of state budget documents, TFAH coordinated with the Association of State and Territorial Health Officials (ASTHO) to confirm the findings with each state health official. ASTHO sent out emails on October 30, 2015 and state health officials were asked to confirm or correct the data with TFAH staff by November 12, 2015. ASTHO followed up via email with those state health officials who did not respond by the November 12, 2015 deadline. In the end, six states did not respond by December 4, 2015 when the report went to print. These states were assumed to be in accordance with the findings.

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