National Center for Emerging and Zoonotic Infectious Diseases

Strategic Plan: 2018 - 2023

Centers for Disease Control and Prevention
National Center for Emerging and Zoonotic Infectious Diseases

VISION
Prevent infections, protect people, save lives
MISSION
To reduce illness and death associated with emerging and zoonotic infectious diseases and to protect against the unintentional or intentional spread of infectious diseases

NCEZID Strategic Plan: 2018–2023

The National Center for Emerging and Zoonotic Infectious Diseases (NCEZID)

was established in 2010 with a mission and scientific activities that trace back to the earliest days of the Centers for Disease Control and Prevention (CDC) including protecting against and responding to infectious disease outbreaks.

This document is a strategic roadmap for the work necessary to realize the Center's vision: prevent infections, protect people, and save lives.

NCEZID is responsible for the prevention, control, and management of a wide range of infectious diseases, including rare but deadly diseases such as anthrax and Ebola virus disease, as well as more common illnesses like foodborne disease and healthcare-associated infections. The Center's expert staff is on the frontlines every day preparing for and responding to infectious disease threats to the nation and the world. Our world-renowned science staff and programs also promote water safety, the health of mobile populations, combatting antibiotic resistance, and the identification and control of diseases transmitted by animals and insects (e.g., rabies, Zika, and Lyme disease).

NCEZID is one of the agency's principal sources of epidemiologic, clinical, and laboratory expertise for bacterial, viral, and fungal pathogens as well as infectious diseases of unknown origin. The nation relies on NCEZID to protect the country from more than 800 dangerous pathogens.

Collaborations with an ever-expanding network of partners—federal, state, and local public health departments; industry; clinical organizations; public health organizations; academia; and global multilateral organizations and ministries of health—help NCEZID identify mysterious illnesses, contain outbreaks, and prevent infections.

Today's infectious disease challenges

require collaboration and coordination with a wide variety of stakeholders and partners to advance infectious disease prevention and control.

Together, NCEZID and its partners are able to accomplish more than any organization or institution can by working alone. Our work would not be possible without the help and support of these partners.

Our diverse programs are supported by a variety of valuable stakeholders and partners including (but not limited to):

- State and local health departments
- Professional organizations
- National medical associations
- Patient safety advocates and organizations
- Businesses
- Academia
- Other federal agencies
- Non-governmental organizations

NCEZID's first strategic plan (2012–2017)

was developed shortly after its inception as a Center. This strategic plan is an update of the original one, a restatement and recalibration of priorities for the next five years (2018–2023).

This document is not intended to be a comprehensive catalog for all NCEZID activities. Rather, it provides an outline of work that must be done to fulfill the Center's mission, and emphasizes special, urgent initiatives and activities that could have a significant impact on the health of the nation going forward.

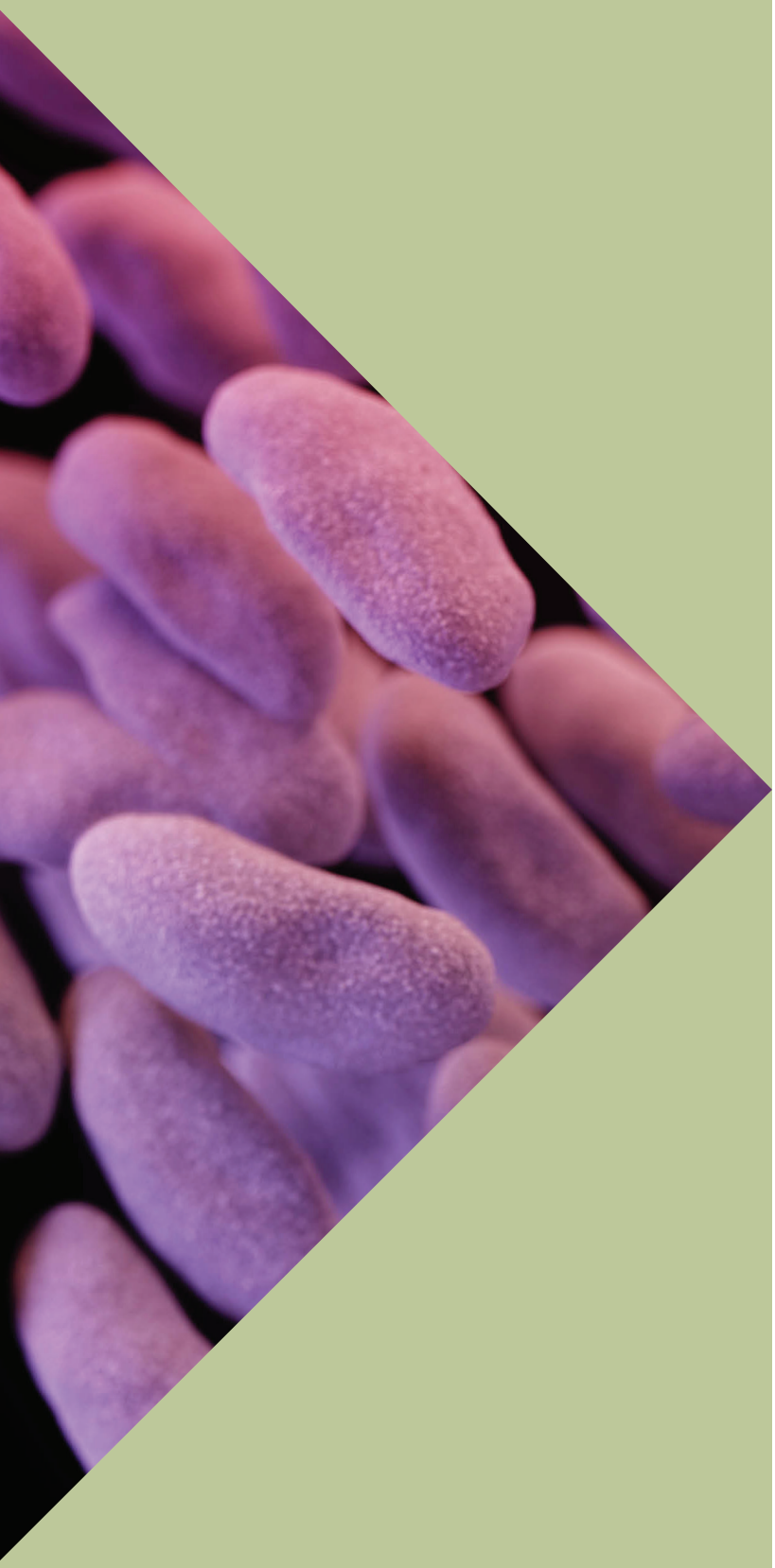
The strategic plan provides clear, consistent, and carefully considered guidance focusing on Center activities that will most efficiently prevent infections, protect people, and save lives.

The success of NCEZID's strategic plan

requires continued leadership, partnership, and excellence in a wide range of diverse but interrelated areas such as:

- Infectious disease surveillance, epidemiology, laboratory, behavioral, and social science
- State-of-the-art laboratory services and support for CDC's infectious disease laboratories
- Domestic and global health security (e.g., preparedness and response against emerging infections and biothreats)
- Detection of and response to disease outbreaks caused by bacterial, viral, and fungal organisms
- Advanced Molecular Detection, including next-generation sequencing and related technologies
- Healthcare-associated infections
- Antibiotic resistance
- Foodborne and waterborne diseases
- Vector-borne diseases
- High-consequence but rare infectious diseases (e.g., anthrax and Ebola)
- Diseases that affect special and vulnerable populations (e.g., Native Americans), and understanding the role of sociodemographic and cultural factors in disease
- Discovery of new pathogens and investigation of undefined illnesses
- The connection between human health, animal health, and the environment (i.e., One Health)
- Trend analysis, health economics, and predictive science
- Health communication, education, evaluation, and behavioral science
- Clinical guidelines

STRATEGY 1:
Strengthen public health fundamentals



1.1: Improve infectious disease epidemiologic capacity domestically and globally

- Apply advances in scientific methodologies for surveillance, outbreak investigations, program evaluations, and applied research in order to improve capacity for early disease detection, response, and control.
- Continue to enhance CDC surveillance to inform prevention and treatment of disease and provide data that can be used by CDC as well as public health, academic, and clinical partners to prevent, control, and manage infectious diseases.
- Move toward seamless integration of epidemiologic, laboratory, and clinical data.
- Use evolving health information technology (IT) tools (e.g., electronic health records and portable digital information-capturing and -transmittal devices) to improve timely reporting and use of public health data at federal, state, and local levels.
- Discover and share what is known about the behavioral and social determinants of infectious diseases with a focus on disease prevention and protective actions.

1.2: Continually improve laboratory quality, safety, and capacity

- Create innovative, practical, and cost-effective laboratory ests (e.g., culture-independent and point-of-service laboratory tests) to provide more rapid diagnoses, especially for outside-of-healthcare settings.
- Improve the ability to rapidly translate diagnostic laboratory information into effective public health interventions.
- Embrace a culture of continuous quality improvement in NCEZID laboratories to secure their identity as national and nternational centers of high-quality reference diagnostics.
- Support a network of state, local, federal, and international laboratories that adhere to strict policies of safety and security and provide rapid testing capacity to respond to biological threats and other public health emergencies.

1.3: Strengthen state, local, and territorial public health systems

- Strengthen collaborations and identify opportunities with public health partners to bolster state and local public health program fundamentals and program delivery.
- Provide effective leadership and assistance for NCEZID's cooperative agreements (e.g., the Epidemiology and Laboratory Capacity for Infectious Diseases (ELC) and the Emerging Infections Program (EIP)) to support epidemiologic investigations, laboratory infrastructure and expertise, surveillance, and prevention and intervention strategies for state and local health departments.

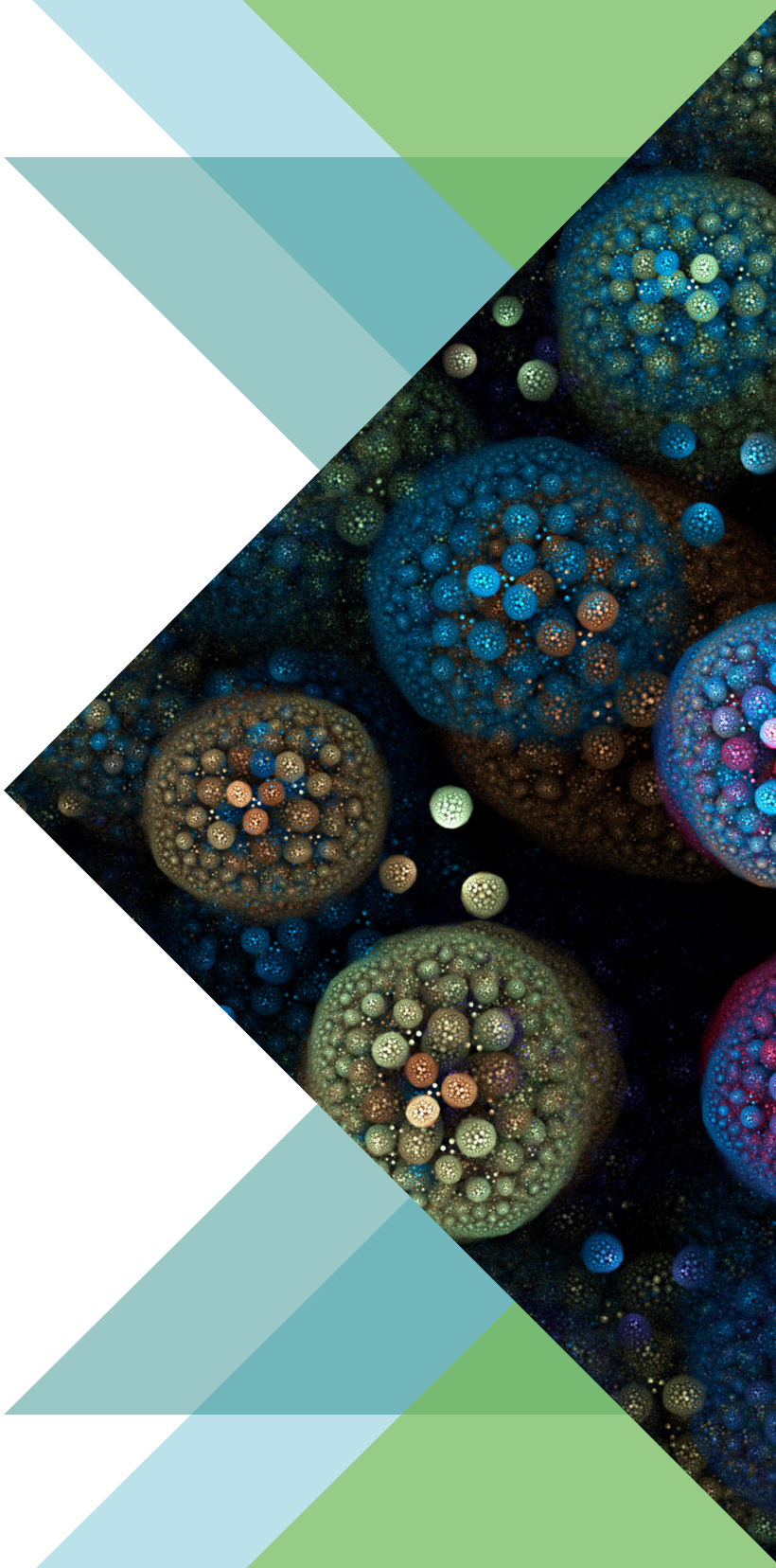
- Improve capacity of state and local health departments to assess their impact and to communicate objectives and accomplishments.
- Use targeted approaches in partnership with healthcare and community organizations to enhance public health program fundamentals and efficiency of responses to outbreaks and other public health emergencies.
- Provide guidance and support to healthcare systems and public health partners to prevent and treat infections (e.g., infection control guidance, laboratory guidance, and clinical guidance).

1.4: Develop partnerships, policy, and effective communication messaging to protect the public's health

- Work with public and private partners to identify broad-based solutions to public health problems at the federal, state, and local levels.
- Conduct high-level policy analysis to inform decision-making and forecast the impact of targeted public health actions.
- Employ principles of clear communication and appropriate mass media channels to ensure that NCEZID science is effectively translated to prevent and control disease through broad public awareness and action.
- Develop novel, behavioral, and social science based health communication strategies for infectious disease threats that maximize electronic communications (e.g., social media, web-based applications).

1.5: Attract, maintain, and develop a highly skilled, motivated, and diverse workforce to fulfill the mission of NCEZID

- Develop an NCEZID recruiting approach that emphasizes scientific excellence and supports an effective and efficient organization.
- Strengthen the development of NCEZID staff's technical and leadership skills.
- Support the agency's commitment to diversity in the workforce.
- Continue NCEZID's growth as a learning organization by regularly evaluating its organizational culture, focusing on fostering professional growth, innovation, and cultural competence.
- Plan for staff succession by actively engaging in workforce analysis, talent development, knowledge management, and recruitment strategies.



STRATEGY 2:
Implement high-impact prevention and intervention strategies

2.1: Use targeted, effective strategies to reduce the burden of foodborne and waterborne diseases

- Apply new technologies to more quickly and effectively detect and respond to foodborne and waterborne disease outbreaks to reduce the incidence of common, but preventable, infections.
- Identify opportunities for prevention and intervention by expanding scientific information on the incidence, trends, burden, source attribution, and characteristics of foodborne and waterborne pathogens and infections.
- Use what is learned from outbreaks, inspections, and monitoring systems to develop new and improve existing strategies for preventing foodborne and waterborne disease.
- Improve identification of antimicrobial resistance mechanisms and best practices to slow the spread of resistance in enteric and fungal pathogens, including in animal and food production.
- Strengthen efforts and partnerships to prevent water-, sanitation-, and hygiene (WASH)-related diseases domestically and globally, particularly to slow the spread of cholera.

2.2: Conduct research and implement proven methods to prevent and control unknown, emerging, and re-emerging high-consequence pathogens

- Improve domestic and global efforts to detect, prevent, and control emerging, high-consequence pathogens, including biothreat agents.
- Develop and test laboratory methods to rapidly evaluate vaccine ability to neutralize high-consequence pathogens.
- Enhance and expand CDC's work on developing innovative diagnostic and surveillance technology, such as e-pathology and laboratory reporting networks.

2.3: Develop and implement strategies to prevent, detect, and control vector-borne pathogens

- Identify and detect vector-borne pathogens and diseases causing illness in people.
- Work with jurisdictions and communities to prevent exposure to vector-borne pathogens and mitigate consequences of exposure.
- Implement vector-borne disease diagnostics, surveillance, control, and prevention programs in collaboration with international and domestic public health partners.
- Support the implementation and evaluation of innovative vector control strategies (e.g., sterile insect techniques and traps).

2.4: Slow the development of new antibiotic resistance, prevent the resistance that already exists from spreading, and promote safety and quality in healthcare delivery systems and patient care

- Enhance state, local, and regional public health capacity to prevent, detect, and respond to new and emerging antibiotic resistance faster (e.g., state/local DOH capacity, Antibiotic Resistance Lab Network).
- Continue to prevent healthcare-associated infections and other adverse health events using data-driven, tailored approaches to aggressively target prevention implementation in states and facilities with high infection rates.
- Promote CDC's guidelines for infection control and enhance infection control in high-risk facilities (e.g., skilled nursing homes).
- Improve antibiotic use and implement antibiotic stewardship programs in all healthcare settings.

2.5: Increase public health action to identify, prevent, and reduce infectious diseases and disparities in at-risk populations

- Promote the standardized collection and reporting of data to identify at-risk populations, including detailed race and ethnicity, age, gender, pregnancy status, language, and country of birth/country of origin.
- Design and implement surveillance, prevention, and intervention strategies for and with at-risk populations or groups experiencing health disparities.
- Develop new knowledge on infectious disease prevalence in order to reduce health disparities among at-risk populations specifically including Alaska Natives and other Native American populations.
- Conduct research and evaluation that identifies the role of sociodemographic context and culture in infectious disease transmission and control in order to better understand and address health disparities in infectious disease.

STRATEGY 3:
Enhance preparedness, outbreak detection, and outbreak response

3.1: Improve public health laboratory capacity for biological threat preparedness and response

- Enhance capacity of federal, state, local, and other partners to prepare for, detect, respond to, and prevent infectious disease threats, including those associated with bioterrorism (e.g., anthrax), to protect the health of all U.S. citizens.
- Design and develop novel diagnostic laboratory tests for biological threats and emerging infectious diseases for deployment to a network of state, local, federal, and international laboratories.
- Strengthen domestic and international laboratory systems to enhance biosecurity, including improving the capacity of the Laboratory Response Network for timely detection and characterization of biothreat agents.
- Maintain a surge testing laboratory for outbreak response and emergency support.
- Develop and update medical countermeasures and nonmedical mitigation strategies.

3.2: Strengthen outbreak prevention, management, and response in collaboration with clinical and public health partners

- Respond rapidly in the investigation of local, state, national, and international outbreaks of diseases.
- Provide scientific and programmatic leadership to CDC's public health preparedness and responses, including centralized scientific resources for CDC's infectious disease laboratories.
- Increase the nation's laboratory capability to identify infectious disease threats (e.g., developing, manufacturing, and distributing diagnostic test kits).
- Develop and maintain regulatory mechanisms for the use of medical countermeasures and CDC-developed laboratory tests.
- Support interagency activities focused on preparedness and response to emerging infectious diseases.
- Increase the knowledge and use of incident management structure and functions.
- Encourage public compliance with proposed nonmedical mitigation strategies during future emergencies by examining psychological, structural, and cultural factors that contribute towards cooperation.

3.3: Strengthen global capacity to prevent, detect, and respond to international outbreaks of public health concern that cross borders by air, land, or sea

- Promote effective surveillance and interventions designed to prevent the importation of infectious diseases into the United States.
- Improve planning and operational preparedness through lessons learned from prior emergency responses involving imported infectious diseases.
- Advance the adoption and implementation of 2005 International Health Regulations (IHR) core capacities and other global health policies in collaboration with other U.S. and international partners.

3.4: Detect and respond to infectious diseases spread through the movement of people, animals, and cargo

- Strengthen infectious disease screening, surveillance, and prevention efforts for globally mobile populations (e.g., tuberculosis prevention).
- Provide recommendations to safeguard the health of U.S. residents traveling internationally or living abroad.
- Identify and implement behavioral and other science-based infectious disease prevention strategies to help protect at-risk populations.

3.5: Improve international collaboration and capacities for emerging infectious disease prevention, surveillance, control, and research

- Improve global infection prevention and control practices to prevent and control outbreaks in healthcare facilities.
- Provide technical support and assistance for infectious disease laboratory, epidemiology, surveillance, and behavioral science and evaluation capacity to international partners.
- Provide consultation and training to domestic and global partners to bolster their readiness to respond to infectious diseases.

STRATEGY 4:
Innovate to stop emerging and zoonotic infections

4.1: Optimize innovative ways to capture, analyze, and visualize critical public health data for decision making

- Develop tools to strengthen the ability to forecast changes in patterns related to globally mobile populations and disease outbreaks.
- Identify and implement innovative approaches to eliminate healthcare-associated infections.
- Support the development of new surveillance strategies for emerging threats.
- Develop and validate new tools and tests to aid laboratory detection and identification of new, unknown, emerging, or bioterror disease threats.

4.2: Develop, implement, and evaluate innovative methods and tools to better prevent and control emerging and zoonotic infectious diseases domestically and globally

- Advance a One Health approach to prevent, detect, and respond to emerging and zoonotic infectious diseases.
- Strengthen collaborations to prevent spread of zoonotic infections by promoting best practices for environmental health and animal health, including livestock, pets, and wildlife.
- Develop and lead implementation of emerging technologies in laboratory, epidemiology, communications, and information technology.
- Implement the containment strategy as an important approach to detect, identify, and stop germs with unusual antibiotic resistance before they spread.
- Conduct vector-borne disease community prevention trials (e.g. Lyme disease) in collaboration with state, local, and tribal partners.

4.3: Accelerate development and application of novel diagnostic methods and technology, including advanced molecular detection

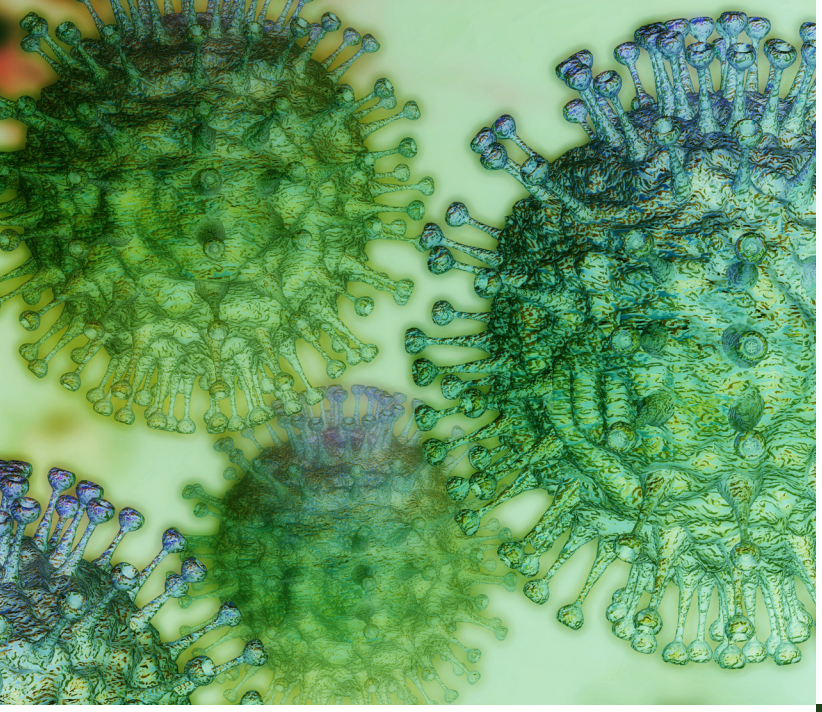
- Develop practical applications of DNA sequencing technology to support public health priorities.
- Integrate practical applications of DNA sequencing into routine public health practice while continuing to look for and adapt other, related technologies with the potential to benefit public health.
- Accelerate the development of metagenomic technologies to enable faster diagnosis of infectious diseases and to solve looming public health problems related to culture-independent diagnostic technologies.
- Ensure that CDC and state public health laboratories implement methods and technologies to detect and prevent new and emerging antimicrobial resistant threats.

4.4: Identify and deploy innovative clinical and public health approaches through collaborations with state and local health departments, academia, healthcare, and the private sector

- Identify opportunities for greater public health impact by expanding collaboration across existing CDC-funded partners and programs.
- Explore opportunities to transfer diagnostic and intervention technologies to private sector for large scale application.
- Identify innovative vector control solutions through collaborations with academia and the private sector through the Vector-Borne Centers of Excellence.

4.5: Conduct and invest in innovative research to identify and combat antibiotic resistance

- Invest in extramural and intramural innovation to address critical questions related to healthcare-associated infections and antimicrobial resistance.
- Look for new ways to identify and evaluate strategies to combat antibiotic resistance and improve prevention interventions in both healthcare and community settings.
- Continue to build the Antibiotic Resistance Isolate Bank in collaboration with FDA to advance the development of diagnostic tests to identify and characterize resistant bacteria, and to accelerate research and development for new antibiotics.
- Inform and foster research to understand resistance mechanisms in animal agriculture and food production to advance development of new vaccines, improve prevention and control interventions, and identify new approaches to antibiotic use.
- Explore unanswered questions about antibiotic resistance and humans, animals, and the environment (e.g., surface water and soil).



PREVENT INFECTIONS

PROTECT PEOPLE

SAVE LIVES